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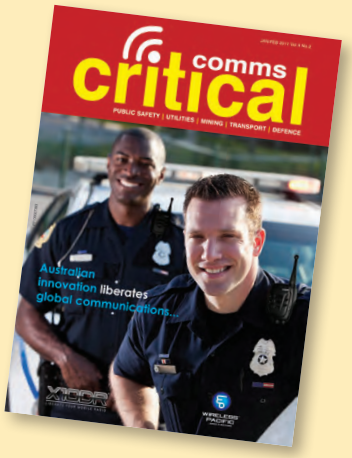
Inside

Jan/Feb 2017

ON THE COVER



In only three short years, the Australian-designed X10DR (pronounced extender) has become one of Australia's critical communications success stories. X10DR is being used in all four corners of the planet — from the USA to Europe, from Brazil to Toronto, Brunei to Dubai, and Morocco to the Cape of Good Hope. More than 10,000 are in operation.

X10DR was born out of a desire to solve a longstanding issue — how to communicate simply and reliably when you leave your vehicle. By wirelessly connecting with the vehicle's radio, X10DR enables users to communicate with enhanced, clear duplex audio, with the power and range of a mobile radio whilst not being tied to the vehicle.

X10DR is in daily use in a variety of industries and by services that rely on high-power mobile radios to ensure employee connectivity and safety. One such is Queensland's innovative electrical utility, Ergon Energy, which pioneered the use of X10DRs throughout its growing P25 trunked network.

X10DR has now entered its second generation with a swathe of new features and increased capabilities designed specifically for mission-critical emergency services, the energy sector and other professional mobile radio users. The new-generation X10DR incorporates features that customers have shown can really make a highly beneficial operational difference… all while adhering to X10DR's guiding design principle — simplicity that works.

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Transmit

I heard some interesting comments at Comms Connect Melbourne in November, concerning LTE. "There was a lot of talk about LTE at last year's show, but this year there's been hardly any at all," was how one attendee put it to me, referring mostly to the technology on show in the exhibition. It was a sentiment backed up by several other people I spoke with. Rightly or wrongly, the inference is that the LTE hype is far from living up to its promises. Perhaps it all depends on what one considers to be 'mission critical'.

The residents of the Canary Islands are soon to find out, as what is being called Europe's first mission-critical LTE network has gone live. The emergency services that look after the archipelago's two million residents now have a broadband network that works hand in hand with the extant TETRA system. It will be interesting to see how it goes.

As LTE heads towards maturity, another technology, 2G, is being switched off. This is sad news for those — such as your editor — who for many years have relied upon a trusty old Nokia mobile phone. After many years of reliable, energy-efficient (the battery lasts for days and days) and secure service, the time has come to assign it to the comms graveyard (ie, a shoebox that also contains several old Motorolas and sundry other devices). But I guess there's one good thing that will come of the 2G shutdown — I'll no longer be the envy… sorry, the butt of so many jokes at events such as Comms Connect.

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

March 2017
International Wireless Communications Expo 2016
27–31 March
Las Vegas Convention Centre
iwceexpo.com/iwce17

April 2017
Comms Connect Wellington
11–12 April
Te Papa Museum, Wellington
comms-connect.co.nz

May 2017
Critical Communications World
16–18 May
Asia World Expo, Hong Kong
tmt.knect365.com/critical-communications-world/

Australian & New Zealand Disaster and Emergency Management Conference
22–23 May
Jupiters Hotel, Gold Coast
anzdmc.com.au

June 2017
Comms Connect Sydney
6–8 June
Sydney Olympic Park
sydney.comms-connect.com.au

August 2017
APCO 2017
13–16 August
Colorado Convention Centre, Denver
apco2017.org

September 2017
AFAC17
4–7 September
International Convention Centre, Sydney
afacconference.com.au

For a full list of industry events, see: criticalcomms.com.au/events

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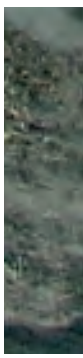
PSMB IN THE FIRING LINE

Jonathan Nally



The government's long-awaited response to the PSMB report has drawn both anger and caution from different sectors.

The federal government has announced its long-awaited response to the Productivity Commission's (PC) report into the provision of a public safety mobile broadband (PSMB) capability for Australia's emergency services organisations (ESO) — and not everyone is happy.

In early 2016, the government tasked the Commission with undertaking a 'first principles' analysis of the best way to deliver a PSMB capability for both state and federal public safety agencies by 2020.

The Commission's study found that commercial mobile networks are the most efficient, effective and economical way of delivering a public safety mobile broadband capability.

The other options were a fully private network paid for by the taxpayer, and a hybrid model using both private networks and commercial carriers.

In a joint statement, Minister for Communications Mitch Fifield and Minister for Justice Michael Keenan announced the federal government's response to the Commission's PSMB report.

"The government supports in principle the Commission's findings and recommendations," the statement said. "We are committed to working with all states and territories towards achieving an interoperable PSMB capability and will establish a committee of Commonwealth, state and territory officials to consider fully scoped proposals and report to the Council of Australian Governments in 2017."

The ministers said that the government's response had been informed by state and territory feedback on the report's recommendations.

"The government recognises that mobile broadband offers significant potential to improve the efficiency of the emergency services and the safety of its officers," the ministers said.

The first responders' view

But not everyone is impressed. The CEO of the Police Federation of Australia (PFA), Mark Burgess, has come out with all guns blazing, calling the government's position "lacklustre and spineless". (See the Spectrum column in this issue.)

"The announcement that 'a committee of Commonwealth, state and territory officials to consider fully scoped proposals and report to the Council of Australian Governments in 2017' is to be established as a response to the Productivity Commission's report on public safety mobile broadband shows that this government has no plan for the safety of Australians," said Burgess in a PFR statement.

According to Burgess, the whole endeavour "can only be described as the longest running episode of *Yes Minister*" and is "just another occasion where the decision on the allocation of public safety mobile broadband has been fobbed off to a talkfest".

"Government has been playing with this since 2011," said Burgess. "First there was the Public Safety Mobile Broadband Steering Committee jointly chaired by the Attorney-General and Department of Communications, then there was the Senate Committee, the Joint Parliamentary Committee and the Productivity Commission report. And now it's back to a committee.

"We have to question the intent of the government. Given that they have already announced that they are going to auction the unallocated 700 MHz, it's a committee looking into nothing. Very *Yes Minister*," he said.

Burgess added that the decision "makes a mockery of the government's comments that they 'recognise(s) that mobile broadband offers significant potential to improve the efficiency of the emergency services and the safety of its officers'".

"As we head into bushfire season, the government continues to play with the safety of all Australians by not having a plan in place that will ensure emergency services can communicate without fear of interruption in times of heightened need. The last thing we need is yet another committee," he said.

EMS images courtesy of Highway Patrol Images (via Flickr) under CC BY 2.0

> "THE GOVERNMENT CONTINUES TO PLAY WITH THE SAFETY OF ALL AUSTRALIANS BY NOT HAVING A PLAN IN PLACE THAT WILL ENSURE EMERGENCY SERVICES CAN COMMUNICATE WITHOUT FEAR OF INTERRUPTION." — MARK BURGESS

The PFA and other emergency-service providers made submissions to the 2011 Senate Committee inquiry into emergency communications. Upon its conclusion, the committee unanimously recommended that the "Commonwealth Government allocate sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR) radio-communications in Australia".

Two years later, the Joint Parliamentary Committee on Law Enforcement's Inquiry into Spectrum for Public Safety Mobile Broadband recommended that "an appropriate portion of the proceeds derived from the auction of spectrum to fund the allocation of 20 MHz of spectrum in the 700 MHz band for the purposes of a national public safety mobile broadband network".

"Handing this back to a committee is not the answer and is a monumental waste of taxpayers' money," said Burgess.

"We need the government to be firm and decisive and ensure that the safety of all Australians is protected by progressing the public safety mobile broadband issue with an allocation of 20 MHz of 700 MHz band spectrum to public-safety agencies as a priority."

"It is imperative that the proposed auction be stopped until the government advises the Australian community how they propose to provide public safety with a mobile broadband capability into the future," he concluded.

The industry view

Not quite so scathing in his assessment, but equally concerned about achieving a good outcome, is Ian Miller, director of radio communications consultancy Orange Horizons. According to Miller, "The response from the Minister has addressed the immediate needs — it acknowledges that the government paid for the PC report and acknowledges the contents — however, they are now asking the states and territories to put forward fully scoped proposals.

"From my interpretation, it means that any options can be put forward and it recognises that perhaps technology has advanced significantly since the PC enquiry," he added.

While Miller agrees that affordability is valid concern, "Like everything else from our governments, should they take the lowest-cost option or at least consider all of the options before making a final commitment?

"Regardless of the final decision, the way ahead must be to look at the various areas of concern — spectrum, technology, interoperability and governance," said Miller. "Once each of these areas has been investigated then each jurisdiction will be in a better position to negotiate service level agreements with the network supplier, regardless of whether that is a public carrier, a government or a hybrid model.

"To date, all of the discussion has been around spectrum and finance, and, whilst they are both important, nothing has been done about the operational needs, amount of data required, how it will be interfaced into operations, how will it be managed, plus other factors as well," said Miller.

For Miller, one of the major concerns is that with pressure on emergency services organisations to have resources at the front line, there has been a denigration of technical support and competence within those organisations. "To calculate exactly what should happen and what is needed, [the whole PSMB question] now needs to go to those who have a real understanding of what is involved — the fourth level of management," he said. "These are the operational staff who have an understanding of the daily needs and what is truly required."

Like everyone else involved in both the communications industry and the emergency services field, Miller is keen for the government to get a move on and make a decision — and the right decision at that — by learning from international experience.

"After a gestation of 39 weeks since the Productivity Commission report, it is to be hoped that the result is not stillborn and that a healthy and viable mobile broadband service can now be developed that suits the ESO needs and not just those of the finance departments," said Miller.

"Our collective governments now need to look at what is really needed, think outside the square and gather as much information as possible," he added. "Surely there should now be some fact-finding visits to the USA, UK, Korea, Belgium and the Middle East to look at what others are doing and learn from their experiences so far.

"With a totally new technology for our public safety agencies, we owe it to them to investigate all options and to make sure we learn from whatever sources there are," said Miller. "With public safety mobile broadband there are several systems under serious planning, and we must look at them and their experiences so far."

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News

NOKIA'S PUBLIC SAFETY LTE

Nokia has announced the launch of the Nokia Group Communications portfolio, which it said will expand its range of LTE-based public safety solutions. The company said the solutions "will enable first responder teams to securely communicate through new applications, such as instant video connectivity, alongside traditional push-to-talk features on a single device to enhance operations and safety". According to Nokia, compatibility with 3G and Wi-Fi networks will ensure high service availability even if there is no LTE network coverage. Nokia Group Communications can be used with the Nokia Compact Network, a rapidly deployable solution that allows first responders to quickly deploy a private network in emergency situations.
More info: bit.ly/2gFMZwZ

FRENCH PROJECT MOVES FORWARD

The second phase of the French LTE4PMR mission-critical communications research and development project has been planned out. The project team, led by Airbus Defence and Space, is undertaking finalisation of an LTE scheme for professional mobile radio. LTE4PMR will be focusing on three aspects in the coming 15 months. Firstly, the project will enable existing communications systems to interact with the project's LTE developments. Secondly, the project's engineers will adapt mobile LTE solutions to actual field use cases outlined by the end users during the first phase. Finally, LTE4PMR will bring in line the overall LTE solution with Release 13 of the 3GPP.
More info: bit.ly/2hsKTNl

Communications system

C-OTMplus (Communications on the Move-Plus) is an addition to the SwitchplusIP family of interoperability solutions, and is the big brother to the C-OTM small man-portable rugged solution.

This compact communications system enables interoperability and enterprise-level capability for small- to mid-tier organisations, integrating disparate IP and analog phones across landline and cellular networks, digital and analog radio networks, video, mapping, SCADA as well as WAN/LAN equipment in a small footprint.

Modular system design enables different sources to be automatically routed, patched and conferenced to provide a truly interoperable solution.
In addition to interoperability, C-OTMplus provides a standalone command centre with full dispatch and C4i capability for up to 20 operators across multi-organisation operations.

The touch screen-based operator position enables real-time command and control of entire communications infrastructures. It also provides Reach-Forward access to radio nets connected to deployable rapid incident response units and Reach-Back to enable local or national level centres to monitor remote communications via satellite or IP WAN. SwitchplusIP is designed, manufactured and supported in Australia.

Harris Corporation
www.c4i.com

Radio application

The Airbus Defence and Space TARANIS Smart radio application is designed for the Tactilon Dabat. It enables police officers and rescue services to monitor operations in real time during complex missions. End users can securely transfer data via LTE while still having all the mission-critical communications features of a TETRA terminal at their fingertips.

The application shows users their current location on a digital map, an overview of the units on the map and georeferenced symbols on the map, chat and notifications. This enables police officers to communicate securely by sending videos, photos and data, whether they are on the scene or in control rooms. The app is easy to use in stress situations. The application also helps train police for special operations or in analysing previous exercises.

Airbus Defence and Space Oy
www.airbusdefenceandspace.com

Yeah, yeah. We all know puppies are cute, but...

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News

ARCIA RELEASES PUBLIC SAFETY PAPER

With public safety mobile broadband for Australia still up in the air, ARCIA has released a discussion paper outlining its views on what such a network requires. The paper says that the organisation "believes very strongly that there now needs to be further activity at multiple levels as part of the overall development of a vision for the future development and implementation of this essential tool for our public safety agencies". According to ARCIA, the current national PSMB discussion should not be about spectrum or funding; rather, it should be about "the real operational parameters."

More info: bit.ly/2huyitP

CANADIAN DND SELECTS BARRETT

The Canadian National Defence Department (DND) has awarded Barrett Communications with a three-year contract to supply it with radio equipment. During the first phase of the contract, Barrett 2090 HF manpacks and Barrett 2050 HF transceivers will be supplied in base station configuration. The equipment will provide the user with secure long-range voice communications without the need for existing infrastructure. As part of the two-year field test, the Barrett HF range was assessed to ensure suitability in the extreme climate conditions experienced by the Canadian DND. RDG2 Technologies, the Barrett Communications distributor and system integrator in Canada, supported DND during the field test.

More info: bit.ly/2hqM7Mb

Power supply

The ICT Modular Power Series is a flexible, hot-swappable DC power system for high-power and redundant N+1 applications including LMR communications; fixed wireless broadband; cellular radio access networks; small cell, distributed antenna systems; and industrial DC power. The ICT Modular Power Series provides up to 150 A of high-efficiency power with 48, 24 or 12 V outputs available. It is available with single or dual 100 A battery breaker disconnects and four-output load distribution modules. The Intelligent Control Module provides Ethernet communications for remote monitoring and control of the system, including the ability to monitor current on each load output and power-cycle the four 20 A outputs on the optional Load Distribution Module.

When combined with the optional Battery Management Module, the Intelligent Control Module provides advanced battery functions including battery state of charge, estimated runtime remaining, temperature-compensated charging and battery discharge testing, along with advanced low-voltage disconnect features. The Intelligent Control Module provides an integrated, intuitive user interface, and SNMP is supported. Alarms can be sent to multiple email accounts. Four environmental site monitoring inputs are available for sensor monitoring and reporting using the onboard interface. A second slaved power shelf can be added, providing up to 5600 W of power for higher power requirements.

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SES tactical persistent surveillance is a fully integrated portable surveillance and communications system, designed to provide enhanced situational awareness for border security, special event monitoring and disaster response missions around the world.

The modular platform is based on lighter-than-air (LTA) inflatable aerostat technology, which hosts a variety of electro-optical (E/O) sensor and communications payload options at altitudes up to 305 m.

The sensor payload can transmit or backhaul ISR (intelligence, surveillance and reconnaissance) video and data via satellite to a centralised monitoring and control centre using small-aperture and quick-deploy flyaway Ku-band antennas. It enables security, military defence and first responder teams to monitor areas on demand to detect, locate, characterise, identify and track people, objects and potential threats up to 5 km away.

As part of its modular and multifaceted design, the product can incorporate MIMO (multiple-input, multiple-output) radio technology and provide a mobile ad hoc communications network with 3G, 4G, LTE or WIMAX broadband connectivity up to 32 km from an E/O sensor in areas where infrastructure is non-existent or destroyed.

Satellite-delivered IP service is also an option within the MIMO coverage area, enabling any IP-enabled device to support a broad range of field applications, including video streaming, voice, internet and remote mission-critical applications such as biometric identification.

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2G TURN-OFF DRIVES NEW SOLUTIONS

Michael Doherty, General Manager

The 2G switch-off will affect more than just mobile phones — other equipment will need to be urgently upgraded.

As of 1 December, Telstra will have shut down its 2G network and Optus will be following close on its heels, shutting down its 2G network in April. According to Telsyte, this will affect between 500,000 and 700,000 phones currently in use, effectively rendering them redundant. But, the ramifications of the 2G switch-off reach far beyond mobile phones.

2G, which has been around since 1991, was the first GSM mobile telecommunications network. At the time, it brought about a number of innovations due to the fact it enabled data services. From SMS text messages to picture messages to mobile web browsing, 2G revolutionised the mobile world.

But mobile comms are just the tip of the iceberg. The 2G network has also been used for many other applications, such as vending machines, ATMs, tracking devices and parking meters. With all of these needing to be updated, businesses and councils are up for many thousands or even millions of dollars in costs.

One of the most common devices still using the 2G network is the parking meter. 2G was introduced into parking meters in order to support credit card payments and provide additional convenience for motorists and parking managers. From there, the technology continued to evolve, from maintenance and enforcement notifications, to inventory management and pay-by-SMS.

The 2G network changed the parking meter game and provided perhaps one of the clearest earliest examples of M2M in action. Although 3G and 4G technology has since replaced the 2G network, there are still thousands of legacy machines lining our streets.

So, what will happen when the 2G network gets switched off? Will these machines still function? The answer, unsurprisingly, is no. Without the ability to communicate, credit card payments will not be taken, the machines will need to be checked regularly to ascertain when they need to be emptied and any additional functionality, such SMS payments, will not work. There's not an easy fix either. Councils and parking operators will have a decision to make as to whether to upgrade the modems to 3G/4G, replace the meters or implement entirely new technology.

A modern parking meter.

Upgrading to 3G or 4G

There are two options when upgrading legacy 2G meters — either upgrade the modem or completely replace the machine.

While upgrading the modem may seem like a simple fix, there are some complications that come with it. One such complication is power. The modem within parking meters is powered by batteries, which are carefully managed to ensure the machine uses minimal power and the batteries never go flat. Upgrading the modem could likely mean upgrading the batteries to support the power-hungry 3G and 4G hardware.

Completely replacing the machine also sounds like a simple idea. As they say, out with the old and in with the new. But new for how long? Parking machines have an average lifespan of 5 to 10 years. Can we say the 3G or even 4G networks will be available for that long? The pace of technological change is hitting unprecedented levels and it wouldn't be surprising if we see these newer networks replaced before parking meters need upgrading again.

As such, completely replacing these machines is an expensive, short-term solution. Additionally, new machines barely add any further functionality to the user. They are still the same old, hard-wired, static machines, which haven't really changed since the 1950s.

Into the 21st century

With the proliferation of smartphones and greater understanding of Internet of Things (IoT) technologies, new smart parking solutions are coming to the fore. One of the biggest shake-ups is that, in fact, we no longer need parking meters.

In Australia, smartphone penetration reached over 89% in 2016. There is no reason we cannot make use of the fact nearly all Australians have a powerful and connected computer in their pocket. In addition, the cloud has enabled businesses and councils to host parking information in a virtual environment, enabling machines to communicate with many different devices, systems and applications.

This has given rise to smart mobile parking technologies, such as CellOPark. These systems utilise the most recent mobile telecommunications network (4G/LTE) to manage, validate and enforce parking, as well as link up with other contemporary systems.

These smart mobile parking platforms not only futureproof but are also significantly more cost-effective. As they are entirely software based, there is no need for hardware or machinery. This removes the need for maintenance or physical upgrades of machines. It also means motorists no longer have to find a meter. They can pay for their parking through their smartphone, starting and stopping the session for the exact amount of time they've parked.

It's time local governments started to look towards such contemporary technology to futureproof parking systems. Typical local government procurement processes for parking technology see equipment replaced at a frequency of between 5 and 10 years. Compare this with the average smartphone tenure of only two years, and there is a compelling argument to start scaling back the deployment of expensive roadside strong boxes and let motorists enjoy the convenience of paying for parking using their smartphones.

The 2G switch-off shouldn't be seen as an inconvenience for local governments and councils. Instead, it should be seen as an opportunity to bring parking into the 21st century, using the new technologies, networks and software available today.

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COMMS CONNECT A STRONG SUCCESS

Jonathan Nally

A new venue, bigger crowds and a packed program ensured this year's Comms Connect Melbourne event was a huge success.

This year's Comms Connect Melbourne once again broke the record for the total number of attendees, with more than 1200 people participating in the exhibition and conference program.

In a break from last year, the speaker sessions, exhibition space and catering were all in the same hall in the Exhibition Centre (the preconference workshops were held as usual in the Convention Centre), resulting in more than double the floor size of previous Comms Connects. This was a very convenient arrangement that helped reduce the to and fro of earlier events.

"Moving down to the exhibition centre this year was always going to be a challenge, especially the acoustics in the theatres, but feedback suggests the effort was worth it," said WF Event's director, Paul Davis. "Whilst it wasn't a perfect arrangement, numbers were solid over the two days with overall attendance up slightly on previous years."

There were lots of stand-out presentations, but two particularly come to mind. One of them was data scientist Kevin Vinsen's overview of the Square Kilometre Array radio telescope and associated science projects in Western Australia. As well as impressing the audience with his 'out of this world' facts and figures, he also made the point that there will be lots of large technology contract opportunities coming up in the next few years, which would have been music to the ears (or should that be music of the spheres?) of those present.

US visitor and FirstNet senior advisor Bill Schrier gave a compelling presentation on the need for public safety mobile broadband, citing plenty of examples of where better data could have helped, and will help emergency services and first responders in the future.

The final session of the program expanded on this topic with a panel discussion featuring Schrier, Garry Kerr (Project Manager – Frontline Integration, Public Safety Business Agency) and Steven Tsikaris (Executive Manager, Infrastructure Commercial Contracting, Commercial Division, Department of Treasury and Finance). This coincided with a press release issued by the federal Minister for Communications, Mitch Fifield, giving the

government's long-awaited response to the Productivity Commission's report into the provision of public safety mobile broadband for Australia's emergency services and other agencies. There were a record number of vendors in the exhibition area, partly disguised by a floor space that was much larger than last year. A star of the show was a specially fitted-out incident command vehicle, designed by UK company Excelerate, which arranged to have one of its vehicles on hand — borrowed for the occasion from the Victorian Country Fire Authority — and it's fair to say it was a big hit with the attendees.

"This year saw the 10th anniversary of Comms Connect and it was fitting that we made the move down in to the exhibition halls," said Davis. "There was a real buzz about the place, partly due to having the three lecture theatres in the hall with us, but mainly due to the large number of delegates, visitors and exhibitors.

"Feedback has been great and we're looking forward to returning in 2017, when we will again run everything together in the Exhibition Centre."

Comms Connect in 2017

Comms Connect Wellington
Held in association with the RFUANZ
11–12 April
Te Papa Museum, Wellington
www.comms-connect.co.nz

Comms Connect Sydney
7–8 June
Sydney Olympic Park
sydney.comms-connect.com.au

Comms Connect Melbourne
21–23 November
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brisbane.comms-connect.com.au
Adelaide — venue and date TBA (usually September)
adelaide.comms-connect.com.au

METRO RADIO — THE FUTURE IS NOW

Sam Lister, Senior Systems Engineer & Project Manager, MCS Digital Project Team

The groundbreaking Sydney Metro Northwest rail project will be served by an equally groundbreaking TETRA radio system.

Late in 2015, MCS Digital, in collaboration with Teltronic (a subsidiary of the Sepura Group), was awarded the contract to integrate a radiocommunications system for Sydney Metro Northwest, Stage 1 of Sydney Metro — Australia's largest public transport infrastructure project.

Sydney Metro Northwest will greatly improve the quality of life for Sydney's north-western communities. The technical highlight is that it will be the first fully automated train system used in a metro rail project in Australia. With this comes some exciting challenges and a need for innovation.

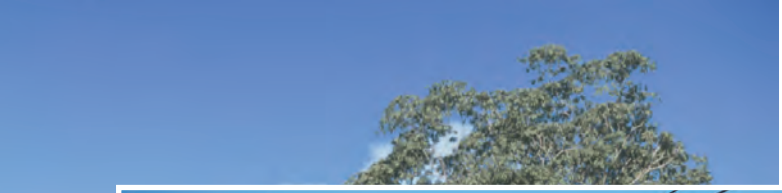
With a range of new stations as well as the conversion of the existing Epping-Chatswood section, the new line will be a 'turn up and go' service, with no need to check timetables and a train departing every four minutes during peak periods. Anyone who's commuted on such a system in major cities around the world, including London, Shanghai or Berlin, will know it's a fantastic experience. With a single deck design and three double doors per carriage, passenger movement should be much improved, further enhancing the speed and efficiency of getting people to their destinations.

From a communications perspective, what challenges does this raise?

Sydney Metro Northwest will not share tracks with any of Sydney's existing trains, and it will be a fully automated system, ie, without drivers. So not only are the requirements different to those previously experienced in Australia, but because it's going to operate as a standalone system there's also no need to stick with what currently exists.

This gave MCS Digital, in collaboration with Teltronic and Sepura, the opportunity to take a step back and consider "How are we going to fulfil the requirements for the communications that we need?" and "Which radios will best suit the system?" Even as a network intended for fully automated train operation, Sydney Metro Northwest will still need both operational and maintenance staff, who will require the ability to communicate effectively throughout the network for routine operations. Also, in the event of an emergency situation, communication will be vital for a quick response. And in addition to voice communications, there's also a range of data requirements.

Existing railway radio systems in Australia largely use GSM-R technology; however, the solution chosen for Sydney Metro Northwest is the feature-rich Teltronic Nebula TETRA system, which will be installed as part of the operations and maintenance communication system. Both TETRA and GSM-R were developed in Europe and are



Images courtesy TfNSW

widespread in use. TETRA's time division multiple access means it can include four different timeslots inside the one frequency. This enables the network to have different communications going over each frequency and, on top of that, the ability to use multiple frequencies together inside each base station and increase capacity for communications depending on requirements. Data information can also be provided through various methods.

Above, below and beyond

Sydney Metro Northwest will have above-ground sections where trains travel along an elevated 'skytrain' viaduct and at-grade sections, both of which require TETRA coverage. Customer service attendants will move through the system and there will also be a depot, which will have perhaps one of the most concentrated areas of radio users within the TETRA coverage.

The Teltronic TETRA system will have a central core of equipment that will be in communication with all of the base stations within the network. This will enable all voice and data communications to be routed to where they need to go. The base stations for outdoor coverage areas will be provided with antenna systems to ensure coverage to fulfil the project requirements.

Sydney Metro Northwest will also have underground sections. Just as with the outdoor coverage areas, TETRA base stations will provide coverage, this time with leaky feeder cables through the tunnels for reception both within the trains and inside the stations.

From the radio subscriber point of view, MCS Digital's partnership with Teltronic and Sepura provides a fantastic opportunity for utilisation of world-class radio equipment and terminals, such as the Sepura SC2020, one of the newest radios on the global market.

Inside the trains, it will be a different story. Although the trains are fully automated, expert train controllers from the new state-of-the-art Operations Control Centre will, of course, still need to have radiocommunications with the trains. The Teltronic RTP-603 train radio control head will enable users to operate the radio system, though not in the usual fashion that you might find. Often, standard radio terminals are integrated into packages for use in transportation, but the Teltronic radio control head has been designed specifically for the transport sector. The device is extremely resistant to damage by external forces, ensuring continued operation and maximised safety, which is particularly important in a metro transport environment. As a public transport system, it's important for Sydney Metro Northwest to have redundancy, backup and as much safety as possible.

The control head is connected to the radio system in the train, which is interfaced with other on-train systems. This system gathers data and information required and sends it to a central control room or any other place where communication is required.

In the event that a train stops somewhere or there is an emergency situation, it's extremely important that communications are maintained so that announcements can be broadcast to customers. These communications are mission critical and must be transmitted and received through the radio system with absolute reliability.

The Teltronic control centre infrastructure has been developed over a number of decades and provides the operator, who's dealing with not only the radio system but a number of other systems simultaneously, with the ability to control and work with the radio network. The interface gives the control centre operator direct access to the TETRA system to monitor what is happening with routine rail work, as well as to be able to see if there are any problems and intervene as required. Customer safety remains the highest priority in this radiocommunications project.

Sydney Metro Northwest is a perfect example of how modern technology projects are conceived, implemented and operated. Looking to the future as an innovative integrator, MCS Digital, along with Teltronic and Sepura, will continue to explore ways in which communication systems can be further advanced to provide state-of-the-art solutions to the transport sector.

MCS Digital
www.mcsdigital.com.au

Courtesy Gobierno de Canarias

MISSION-CRITICAL LTE GOES LIVE

Jonathan Nally

What is being touted as Europe's first mission-critical LTE network has gone live in the Canary Islands — an autonomous archipelagic region of Spain located off the coast of Morocco. The network was installed by Teltronic (now part of the Sepura Group) in partnership with Técnicas Competitivas.

The Canary Islands has had a Teltronic NEBULA-based TETRA network, called RESCAN, for about five years, which is used by many government agencies. The new LTE network operates side-by-side with RESCAN and provides broadband connectivity.

The LTE solution uses an eNEBULA system deployed as a hybrid TETRA-LTE network, plus the MVC-6000 — a vehicular system capable of integrating different wireless technologies such as TETRA and LTE. The system is rounded out with rugged commercial LTE handheld units.

The new LTE system provides capabilities such as real-time, field-to-control video transmission, internet and intranet access, and customised applications.

"We are very excited with this new project. A wide variety of opportunities is opened up for the public safety PMR users with the LTE technology. The integration of both technologies … in a unique and integrated network is one of the main benefits of Teltronic's proposal, since it allows our existing customers to optimise and protect their investments, evolving the systems to the new broadband services," said Miguel Aladrén, the then VP of sales for Teltronic (Spain and LATAM) at the beginning of the project in early 2015.

The solution has been designed to comply with strenuous mission-critical requirements, such as:

- high availability
- security
- high data transmission rates
- low latency in call establishment and data transmission
- an integrated network management system for both TETRA and LTE radio access; and
- functions such as group calls, emergency calls or priority management.

Spain's spectrum regulations for public safety users and broadband services (laid out in the country's National Table of Frequency Allocations) has meant that the system has been established in frequency bands below 1 GHz, which has brought improved radio propagation and indoor coverage.

"A hybrid TETRA-LTE network expands the range of services available to PMR users, protecting their investment while maintaining the same levels of security, reliability and resilience," said Juan Ferro, Sepura's vice president of systems.

"This revolutionary deployment represents a significant milestone in mission-critical communications and provides a clear path for the evolution of existing TETRA systems."

RESCAN

The extant TETRA system, RESCAN, arose from a competitive tender issued in 2009, for which Teltronic successfully bid for the system design and installation as well as for a maintenance contract. The system was installed and deployed in 2010 by Técnicas Competitivas and provides coverage for the seven main islands of the archipelago.

RESCAN has two central nodes, more than 70 base stations, a control centre and a network management system, with the capacity to provide services to more than 7000 terminals over more than 500 communications groups.

As well as the standard voice call functionalities, RESCAN takes advantage of TETRA's data capabilities for Short Data Service (SDS) and Short Message Service (SMS) functions, AVL and database queries (eg, number plates, insurance checks).

The system is used by the departments of Security and Emergency, Environment, Public Works and Infrastructure, municipal police and fire departments, and civil protection, maintenance and construction authorities. It's also used by the main Canary Islands Police, the 112 Emergency Co-ordination Centre and the Canary Islands Health Service (which operates hospitals and ambulances).

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2016 INDUSTRY EXCELLENCE AWARDS

Jonathan Nally

Nine individuals took home awards in categories ranging from New Talent to Professional Sales at ARCIA's annual ceremony in Melbourne.

The 2016 ARCIA Gala Industry Dinner and annual Industry Awards night was once again a great success. As with previous years, the venue was Melbourne's Convention & Exhibition Centre, which not only supplied the venue, but first-class food and wine too. The occasion was arranged by Zealous Communications (with photography by Ari Adar Photography) and entertainment was provided by comedian and music guru Brian Nankervis, best known for his role in SBS TV's *RockWiz* program (but for older readers, also remembered for his unforgettable 'Days by the Ocean' poem on Hey Hey It's Saturday in 1986). Nankervis got the audience involved — including having a visiting US dignitary on stage pretending to push a shopping trolley and another audience member dancing to 'Nutbush City Limits'.

The highlight of the evening was the presentation of eight Industry Excellence Awards and the prestigious Jonathan Livingston Award.

The **Professional Sales Award** was given to Jane Perton of MCS Digital. An industry veteran of 20 years, Perton led the company's business development and contract management to achieve outstanding results in 2016, strengthening relationships with leading technology suppliers and local customer relationships.

The **Engineering Elegance Award** went to Scott Andrew, the manager of Simoco Australasia's Melbourne-based R&D team, who helped Simoco win a significant rail contract in Queensland. The customised DMR development was a team effort, but Andrew's work ethic and continuous drive helped deliver the solution on time against a very optimistic schedule.

The **Customer Service Award** was given to Steve Hunt of RF Industries. Hunt is, for many, the face of the company, and his commitment to providing the highest level of customer service is legendary in the industry.

Aldo Antolini from Motorola Solutions Australia was honoured with the **Technical Excellence Award**. Antolini's knowledge and experience are underpinned by his passion for the technology, helping to ensure the company's channel partners are fully across upcoming updates and enabling them to use and test new technologies as soon as they are available.

The **New Talent Award** was given to Jason Shaw of ICOM Australia. According to ICOM, the company "is extremely privileged in having Jason in our team over this past year. His commitment, enthusiasm and dedication to the radio industry can be appreci-

The award winners: 1) Jane Perton (Professional Sales; award accepted on her behalf by Amber Ward); 2) Scott Andrew (Engineering Elegance; award accepted on his behalf by Mike Norfield); 3) Steve Hunt (Customer Service); 4) Aldo Antolini (Technical Elegance); 5) Jason Shaw (New Talent); 6) Harley Gibson (Apprentice or Trainee); 7) Mark Carter (Community Service); 8) Tony Biddiscombe (Peter Wallace Industry Professional of the Year); 9) Martin McLeod (Jonathan Livingston Award).

ated by all in the business and we are very happy for Jason to be recognised as our industry's best new talent."

Harley Gibson of AA Radio Services took out the **Apprentice or Trainee Award**. Gibson is an accomplished third-year apprentice who "has applied himself to learning his trade efficiently", while also mentoring the company's younger work placement student.

The **Community Service Award** was given to Mark Carter of Simoco Australasia. Carter is a professional engineer who offers help to his peers, family, friends and other people in need, including his Scout group. He always sponsors charitable causes such as kids with cancer or men's health.

The **Peter Wallace Industry Professional of the Year Award** was given to Tony Biddiscombe of CommSite Integrated Communications. Having been established just four years ago, CommSite now employs 33 people. The business's focus on professional services has seen it win major maintenance contracts with many of Victoria's manufacturing and utility organisations. In its commendation, ARCIA said that CommSite Integrated Communications' professionalism and its successful outlook, the employment of two apprentices and its location in a regional area of Victoria made Biddiscombe a worthy winner.

The final award of the night, the **Jonathan Livingston Award**, was presented to a teary-eyed Martin McLeod, a very popular recipient. McLeod as gone from being a member of the Westlakes Amateur Radio Club in the early 1970s to playing a significant role in the development of Gencom, one of NSW's largest radiocommunications companies. In the 1980s, McLeod was an account executive at Motorola — which he claims was an excellent training ground in all facets of business — and also held the position of vice president of ARCIA for six years from 2009. As Managing Director of Gencom, a director of The Orion Network and one of the most respected communications professionals in New South Wales, McLeod is best known for his inherent desire to understand how he can add value to his client's operations through the application of new technologies.

Driven by a genuine wish to contribute to the development of Australia's communications industry — as witnessed by his campaign against unfair site rental charges in NSW — he is committed to local employment in the Hunter Valley and is an active lobbyist for the overall radiocommunications industry in NSW.

Critical Comms adds its congratulations to all winners of the 2016 ARCIA Industry Excellence Awards.

News

MELBOURNE TRAIN COMMS UPGRADE

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The Victorian Government will consider an upgrade to telecommunications on the Melbourne train system. A market-led proposal is suggesting the implementation of 4G technology on the metropolitan train network, which would offer improved maintenance alerts, greater accuracy for arrival times and high-capacity signalling. The proposal by Nokia and Vodafone has moved to stage four of the Market Led Proposal assessment process. If approved, rollout of the upgrade is expected to take about six months with no disruptions to commuters. The government has already undertaken improvements to the train system, including the introduction of mobile coverage in the city loop and real-time passenger information across Melbourne's trains, trams and buses.

More info: bit.ly/2gXU342

UNAUTHORISED RADIO USE

©Clearviewstock/Dollar Photo Club

Poor-quality radio equipment that is not authorised to operate on certain frequencies in Australia can easily be purchased online, as previously reported by Critical Comms. In particular, walkie-talkies are typically sold cheaply from overseas with a range of preprogrammed frequencies. However, while it may seem to operate properly, the user may actually be preventing a critical service from doing its job. ACMA field officers have found a number of Baofeng BF-888S and Baofeng BF-888S Plus two-way radios operating in the harmonised government spectrum (HGS). This frequency is primarily used by state and territory governments for law enforcement, emergency services and public safety communications.

More info: bit.ly/2gJ3Zkj

Compact electromagnetic radiation monitor

The Wavecontrol cMonitEM compact electromagnetic radiation monitor is a permanent continuous monitoring system.

It allows ongoing scrutiny of the emission levels from sources of electromagnetic radiation from mobile telephone base station or Wi-Fi antennas. It verifies that the emissions meet the safety standards established by the competent authorities and regulators. The measurements taken can also be published directly via the internet to the various interested stakeholders and communities.

The product is a durable, lightweight and compact unit that can be mounted either indoors or outdoors. Its housing is rated to IP66 for outdoor installation. The system is available in two versions: either mobile to monitor EMF radiation from mobile telephone antennas or Wi-Fi to monitor EMF radiation generated by 2.4 GHz Wi-Fi networks. Each version is fitted with an isotropic, true RMS measurement sensor, which has a measurement range of 0.04 to 65 V/m. The unit may be powered by either mains or 12 VDC and wirelessly transfers data to the remote control centre.

EMC and RF Solutions

www.emcrf.com.au

Signal tester

The Dewesoft SIRIUS signal tester offers configuration possibilities from 4-channel 200 kS/ch distributed USB to high-speed 128-channel standalone with internal PC and display.

The instruments can be configured with a range of amplifiers to acquire data from virtually any kind of sensor source.

With the available amplifiers the instruments can support almost any kind of signal and sensor, including analog up to ±1000 V, accelerometers, charge sensors, strain gauges, load cells, pressure sensors, thermocouples RTS and more. Each amplifier channel is galvanically isolated unless otherwise specified.

The product has modular, fanless, boxed, R2DB, R2D, R5, R3, R&D, R8DB and mini form factors. If a standalone instrument with built-in display or just USB DAQ device is required for a laptop, the product provides possibilities for any application.

The product offers USB or EtherCAT connection to the PC. There are a range of options, extensions and accessories for the instruments, including SBOX, the powerful and rugged PC option; analog out, with eight analog output channels added to the slice; and display, battery and mount accessories.

Different systems can be combined and synchronised together to expand the overall channel count of the system.

The system is capable of 160 dB dynamic range. The measurement precision is good and can measure an entire signal range without loss of data. The signal will not be clipped due to overload.

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Industry Talking

Thank you to everyone who supported ARCIA over 2016 — it certainly felt like a very busy year. I hope that over the festive season all members had an excellent break with family and friends. We finished off 2016 on a high with our annual gala dinner at the Melbourne Convention Centre attended by 525 guests. The evening brought together ARCIA members from all over Australia and some special guests from overseas to celebrate the industry. The MC for the evening, Brian Nankervis, provided fantastic entertainment and his *RocKwiz* theme kept the audience on its toes. During the evening we recognised the efforts of some special people in our industry and they are all to be congratulated for the work they do every day. On a special note the annual Jonathan Livingston award was presented to Martin McLeod of General Communications. Martin is a stalwart of the communications industry, having worked in it for more than 30 years. He is a true professional and he received a fantastic reception on the surprise announcement, the ultimate peer recognition that we can provide.

This year will see ARCIA celebrate 10 years of operating as the association, so make sure you come along to local events and help the association mark this special milestone. It would be easy to sit back and congratulate ourselves on a job well done for the last 10 years. While there is no doubt that we have met many of the criteria that we set for ourselves, there is still a huge amount of work to do. The market is changing before our eyes and we, as an industry, need to play our part as new technology emerges and eventually has the potential to replace what has been the status quo for decades. I make no predictions of the demise of two-way radios — we have been hearing that for decades — however, the underlying technologies that provide critical communication options are changing.

New technology options and regulations present opportunities as well as risks, and ARCIA sees its role as an industry association to bring together the industry, users and regulators to try an understand what is the best path forward for Australia. This is no small task, if you consider that our industry represents thousands of private networks that have diverse reasons for the existence. ARCIA continues to promote (through the ACMA and Department of Communications) the important role that private networks play, and that technology options must be made available through the allocation of suitable spectrum for the good of the overall economy.

During 2017 ARCIA wishes to continue state-based events in conjunction with Comms Connect, and to do this we really need your support. Keep an eye out for these events and make sure you get behind them. The first event for the year is in Perth with our local version of Comms Connect followed by the industry dinner that evening — watch out for details but remember the date, Thursday, 16 March. As in past years, we will have our annual committee planning day in early February, followed by our partners' meeting. These events give the association the chance to plan ahead and give a set of goals for the coming year, and both are valuable opportunities to review what we have done and to include new items that are applicable to our survival and that of our industry.

Hamish Duff, President
Australian Radio Communications Industry Association

Images courtesy DNK and MSB

SCANDINAVIAN SYNERGY

Jonathan Nally

Swedish and Norwegian emergency services personnel can now communicate across each other's national TETRA networks.

In a demonstration of the way in which positive international cooperation can be achieved, the national emergency radio networks of Sweden and Norway have been made cross-border interoperable through the implementation of a TETRA Inter-System Interface (ISI) system.

The EU-funded effort, known as the Inter-System Interoperability for TETRA-TETRApol Networks (ISITEP) project, means that operators on the Sweden's Rakel and Norway's Nødnett TETRA networks can communicate with each other along the two countries' 1619 km-long land border.

The ISI project began almost three years ago and culminated in several tests during 2016, including a final one on 16 November. In the latter trial, emergency services operators gathered in the towns of Meråker (Norway) and Storlien (Sweden) to put the system to the test.

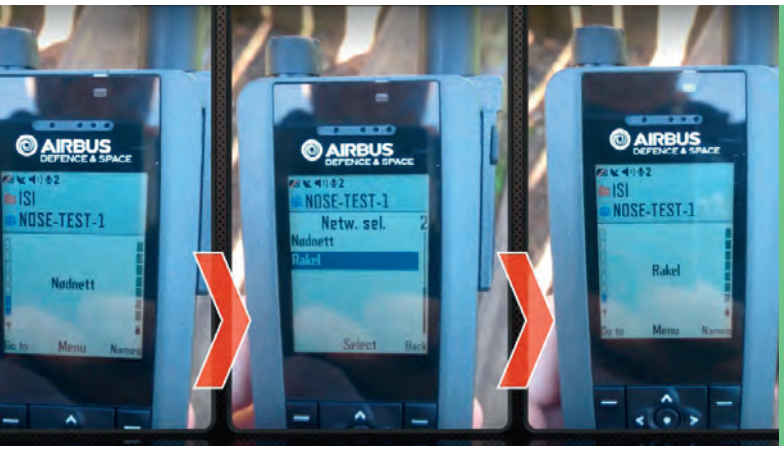
During development, the ISITEP group comprised 15 companies and academic institutions from 10 countries, with additional involvement from the TETRA and Critical Communications Association. The EU provided €10 million in funding.

The project has involved considering and delivering:

- legal aspects and templates for agreements
- performance requirements linked to scenarios and collaboration
- voice group structure and numbering
- analysis and preparation of methods for collaboration
- training and instruction
- planning and implementation of exercises
- production of handbooks/guidelines for cross-border collaboration.

Now that the testing phase has been completed and all technical requirements have been met, the system will be ready for binational operational use in early 2017 with the following functionalities:

- Terminals can be registered and function in both networks.
- Group calls can be made with participants from both countries.
- International voice groups can be created.
- One-to-one calls can be made across national borders.
- Individual and group SDS (text messages) can be sent across national borders.
- Emergency calls can be made across national borders.
- Complete authentication and encryption will be assured.
- Calls can be made to the telephone network, irrespective of country.



A clear demonstration of migrating from one network to another.

Nødnett equipment inside a Norwegian emergency vehicle.

The system's users are enthusiastic about its possibilities. "ISI is expected to contribute to better collaboration and communication where different actors need to be involved in a cross-border response," said Mikael Abbemo, project leader at Sweden's National Board of Health and Welfare. "We want to act both more rapidly and more effectively."

"We look forward to use our own technical equipment in one another's network," added Teith Kyrre Dalsrud of the Norwegian National Police Directorate. "This will significantly facilitate collaboration."

"As owner of Nødnett, DNK is proud to take part in the work towards a standard solution for future ISI projects," said Tor Helge Lyngstøl, director of DNK. "We have considered cross-border functionality as a natural part of Nødnett for a long time. This project is exciting as it involves not only the technical challenges, but also the alignment of two nations' and three agencies' routines and procedures in our two countries."

Images courtesy DNK and MSB

"We have understood that from a European perspective our working method is unique. Instead of focusing on the technology, we identify the real communication needs that the actors on behalf of the stakeholders perceive in their day-to-day work in our border districts," added Marianne Storrøsten, DNK's project manager.

"One great success factor in the whole project is that we have involved the end users from the start in several work groups during the whole process," said Minna Nyman, head of the Rakel department at MSB. "We focus on user requirements in everyday situations, as well as preparing for crisis situations, and strive towards making sure not only that the technology is in place but also methods and terminology."

History of Rakel and Nødnett

Rakel, Sweden's national TETRA digital communications system, is used by the country's emergency services, civil protection and other public safety agencies, medical and healthcare services, local authorities, coastguard, customs, armed forces and utilities.

The decision to build the network was made in 2003 by the Swedish parliament, with the aim of replacing more than 200 separate radio systems. The network covers the country's entire landmass and is based on Airbus Defence and Space infrastructure. Operated by the Swedish Civil Contingencies Agency (MSB), it has more than 67,000 users among almost 500 organisations. The system has been fully operational since 2011.

Nødnett is Norway's national TETRA digital communications system and is used by the country's emergency, civil defence and search and rescue authorities. The network is based on Motorola Solutions' technology and is operated by the Norwegian Directorate for Emergency Communication (DNK). It has replaced almost 300 separate radio systems.

The contract for Nødnett was awarded to Nokia Siemens Networks in 2006 but the company was unable to complete the project, whereupon Motorola took over in 2012. Its project partners were Frequentis, Telenor and Broadnet.

Operational in mainland Norway since December 2015, the network has 330 emergency call centres connected by 2170 base stations. It is used by more than 45,000 users and required 20,000 km of new microwave backhaul. Its coverage includes 310 road tunnels spanning more than 750 km.

The ISI system was put to the test during a cross-border exercise on 16 November.

In mid-2015, the DNK also awarded Motorola a contract to supply its WAVE PTT platform for a six-month test using smartphones/tablets and commercial carriers.

"Weather events and challenges to public safety do not recognise national borders," said Manuel Torres, senior vice president and general manager for Europe, Africa, Latin America and Caribbean region, Motorola Solutions. "As the prime contractor for Nødnett, Norway's nationwide TETRA network, Motorola Solutions continues to provide its experience, expertise and commitment to equipping public safety agencies with the very best in interoperable, standards-based, mission-critical communications, regardless of whatever country they call home."

"We are delighted to have worked intensively for the cross-border communication solutions between Sweden and Norway," said Hans Holmberg, CEO of Airbus Defence and Space Oy.

"Interest in authority organisation cooperation across borders in clearly increasing in Europe and even globally, and the solution being implemented between Sweden and Norway serves as a great milestone in this evolution. Through this project we have gained significant insight on the specific requirements of user organisations matters in setting up a sophisticated cross-border communication solution, and we're able to develop even more advanced solutions in the future."

FLEET COMMS

ComfortDelGro Cabcharge has made a significant investment in digital voice and data infrastructure to ensure better safety and operational efficiencies.

ComfortDelGro Cabcharge (CDC) is one of the largest private bus operators in Australia, with a fleet of 1900 vehicles covering the Hunter Valley, Sydney, Canberra, Melbourne and Ballarat. Following the opening of a new operations and customer centre (OCC) in Sydney, CDC required a new communications infrastructure that would enhance customer experience, improve security on buses and create further efficiencies in service delivery.

That solution was the Orion Network, Australia's largest digital commercial two-way radio platform, powered by Motorola Solutions' MOTOTRBO Connect Plus DMR technology. The network facilitates integrated digital voice and data communications between the OCC, depots and drivers. The upgrade also included MOTOTRBO two-way radios and TRBOnet, a fleet management application designed specifically to support dispatch centre operations, with direct access to the Orion Network via Motorola Solutions XRT9000 voice and data gateways.

The solution has provided a range of benefits and improvements for the organisation.

Improved driver safety. Installation of a custom duress function enables drivers to call for help and instigates an automated email broadcast (which includes the bus location map) to a response group. Full voice recording functionality enhances the emergency response, with the ability for OCC operators to open an individual radio microphone and listen to what is occurring. The OCC now has continuous visibility of all vehicles once they leave the depot, and drivers can instigate an emergency response via text, email or voice command. The system extends interstate to include Melbourne, Ballarat and Geelong, so that even small weekend services in rural Victoria can be monitored, greatly improving driver safety.

Better communication. Multiple talk paths provide flexible, rapid communication options to OCC operators, drivers, depots, supervisors and mechanics. Street-level network coverage across challenging CBD environments, and voice clarity, have improved. Automated text messaging has significantly improved communication efficiency between drivers and the OCC, reducing lag time for drivers requiring assistance. Establishment of predefined voice and text messages enables drivers to provide real-time status notifications to the OCC including 'bus full' or 'behind schedule' updates.

Enhanced customer service. Buses can be re-routed based on traffic status via an automated control centre message. Direct visibility of bus location, speed and status enables proactive

Images courtesy CDC

> "WE SET DOWN EARLY WHAT WE WANTED AND FOUND WE HAD A SHARED VISION OF AND SIMILAR PASSION ABOUT WHAT COMMUNICATIONS SHOULD BE LIKE IN THE PUBLIC TRANSPORT SPACE." — NICHOLAS YAP, CDC

management of services, and dramatic improvements in response time have been reported through the ability to provide real-time information to customers seeking service updates.

Efficiency gains. The ability to remotely reprogram and upgrade radio terminal software reduces downtime and eliminates the need to return vehicles to the workshop for system updates.

Reporting capability. Automation of critical data collection supports the reporting requirements of Sydney Metropolitan Bus Service Contracts (SMBSC). CDC can now measure performance against new benchmarks established by SMBSC, and in compliance with the standards of the Transport for NSW Customer Commitment Charter. Geofences enable recording of bus arrival and departure times, allowing detailed reporting of bus activities.

Scalability for events. As an example of the system's flexibility, CDC provided buses for the shuttle service for the 2016 Avalon Airshow, during which the CDC radios were switched to an event channel and made available to all marshals, thereby ensuring that all buses from various depots could communicate seamlessly.

Fixed communication costs. Certainty is provided for budgeting for future operations — with no additional charges for variable talk times or volume of traffic.

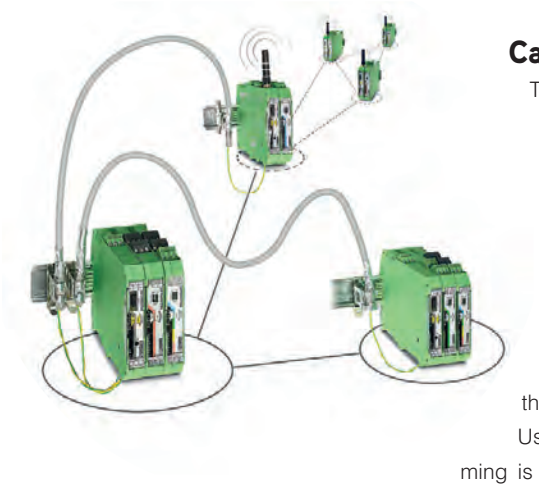
Future capacity. Future features include informing customers of changes to services via text message and onboard displays/announcements.

The partnership with Mastercom went very well, according to Nicholas Yap, deputy CEO of CDC.

"We set down early what we wanted and found we had a shared vision of and similar passion about what communications should be like in the public transport space," said Yap. "And we're very happy. Mastercom delivered on the outcome, which was cutting edge initially, and the solution has capacity for the long term."

"This partnership was critical to the success of the project," said Hamish Duff, managing director at Mastercom and director of the Orion Network. "The Mastercom team worked closely with CDC operations to understand how the business issues faced by CDC every day could be best handled by the integrated digital communications network.

"Government policy is aimed at increasing public transport patronage, so improved service delivery and customer satisfaction are critical to the success of long-term transport planning. We are now working with the CDC team as part of the next-generation DMR transport solution using Capacity Max technology. This will bring new technology platforms that will allow CDC to meet further rising public transport demands."



Cable-based stations

The Phoenix Contact Radioline RAD-RS485-IFS cable-based stations accommodate both wireless and cable-based modules to deliver flexibility and choice for users.

The product's combined cable-based and wireless operation delivers simple and flexible distribution of I/O signals between all devices. Digital, analog and temperature signals can be transmitted reliably and securely throughout the network.

In addition to a mixed operation with a wireless system, the product's communication modules can be operated as a multipoint multiplexer through a dual-wire RS485 connection or as a standalone application in a Modbus/RTU master.

It also has an extended operating temperature range from -40 to +70°C, making the system suitable for use in harsh industrial conditions where robustness is a must.

Users can assign inputs and outputs by turning the thumbwheel. No software programming is required and information is distributed at a single touch via I/O mapping. Modules can be replaced quickly, while the system can be expanded at will.

The system transmits across the licence-free frequency range of 2.4 GHz to ensure reliable communication and to support flexible network structures and various operating modes. This also allows for the reliable implementation of large networks with up to 250 stations and distances of several kilometres between adjacent devices.

The product includes built-in safeguards against data manipulation. These include package authentication, a proprietary protocol and optional AES data encryption.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au

MOBILE DATA FOR PUBLIC SAFETY

Eugene Brink, Principal Consultant, SMS Management and Technology

Government agencies are building a case for mobile communications and data in public safety and emergency management.

The digital transformation wave shaping all aspects of society offers vast new opportunities for Australia's government bodies to interact with citizens. Just over a year ago, the Australian Government created the Digital Transformation Office — now itself transformed into the Digital Transformation Agency — in order to help departments and agencies to ensure better government services. This effort highlights the government's increasing emphasis on digital service delivery.

A recent Gartner report labelled 2016 as the "year for digital tenacity" for CEOs and CIOs. The report also indicated that half of all CEOs either expect to see "substantial digital transformation" in their industries or for their industries to be "almost unrecognisable within five years".

By 2019, Gartner expects that changes will be reflected in new customer perception of the value that digital interactions provide as a portion of government services — predicted to increase from 30% now to 46%.

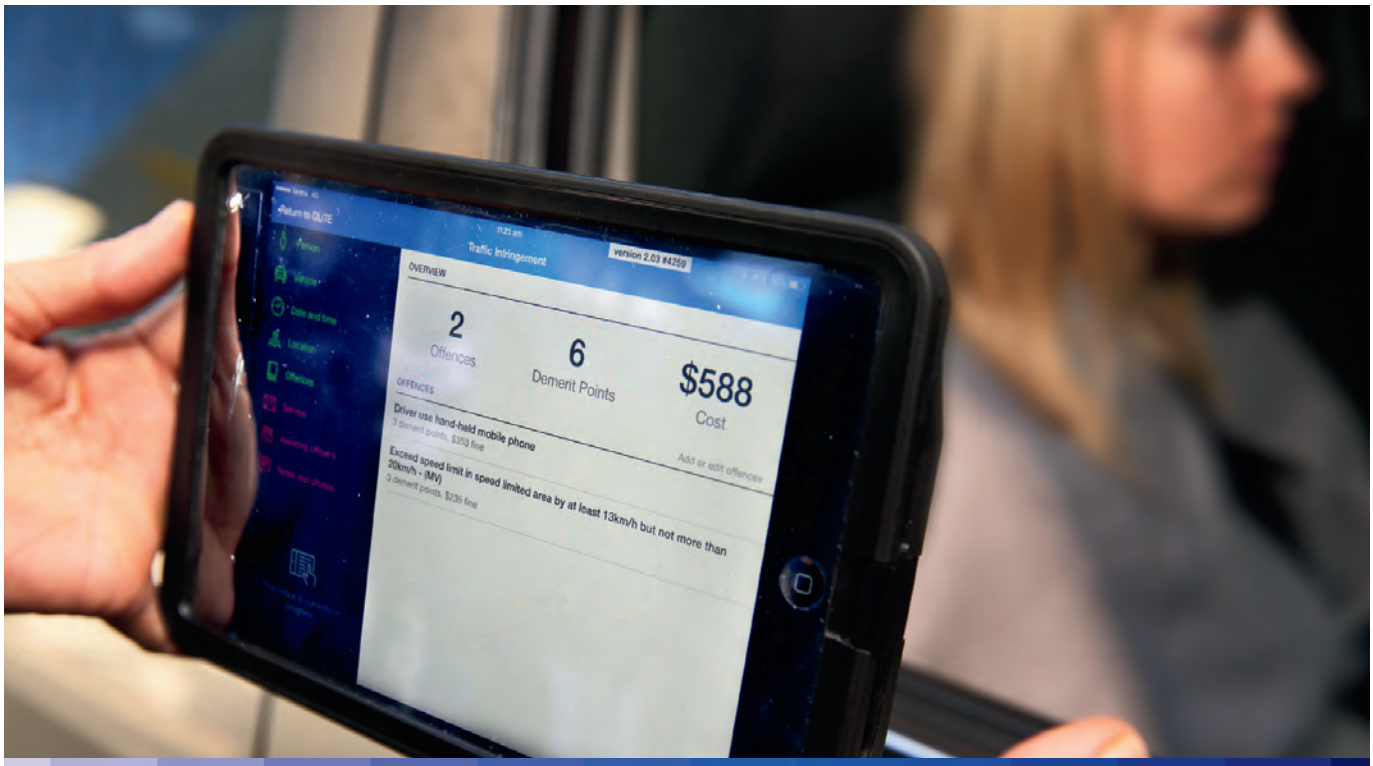
As part of the digital transformation trend, emergency services and government agencies are embracing the digital approaches to ensure public safety. Australian public safety agencies and emergency services are increasingly investing in mobility and digital strategies.

For public safety agencies, mobility solutions can offer a significant range of benefits, including the ability to streamline operations, as well as ensure that in the event of an emergency, communities are provided with real-time information and resources, and field officers are kept in the field.

Successful examples

Through the use of mobile applications and websites, critical information can be put in both officers' and the public's fingertips. For example, Emergency Management Victoria (EMV) recently released a new website that will help communities around the state better prepare for potential threats, notify citizens of incidents and issue warnings, while also providing vital relief and recovery information. The initiative was aided by SMS Management and Technology, which developed the new version of the VicEmergency website that functions across desktop, mobile and tablets.

One of the main benefits for the EMV's app and website users is that the map-based and mobile-responsive features can help pull information from a broader range of sources and offers much greater functionality. EMV collates the data sources in the cloud, running on Amazon Web Services to ensure high availability and provide fast performance, as well as rapid scalability in emergency situations. Having scale is critical as it enables a website to continue functioning at optimal levels during the large spikes in traffic that occur during a major disaster.



Critical updates on the EMV website are delivered by push notifications through a mobile application linked to the website, while more generic information is distributed by email. This means that agencies and state or federal departments can share information more easily before, during and after an emergency.

Having this kind of situational or contextual awareness through digital technology will no doubt guarantee field officers can work more efficiently and that the public gain better and real-time access to critical information, in the face of increasing pressures to reduce costs and resources. However, more importantly, taking advantage of the big data available via public services can help public safety agencies to better predict the likelihood of certain events happening and create plans to help prepare in case of an emergency.

Queensland Police Service

Another successful example was the Queensland Police Service (QPS) in preparing for the 2014 G20 Summit in Brisbane. The QPS intelligently used its own data to predict events and generate situational awareness to ensure public safety and mitigate potential threats. The project, conducted in conjunction with SMS, used the existing enterprise Geographic Information System to improve operational planning and situational awareness during the biggest peacetime security operation on Australian soil in the nation's history.

To secure the city of Brisbane as well as the world leaders and the community, QPS needed to have complete visibility at all times. This included a view of the locations of all 6400 assets, including every delegate, police officer, vehicle and aircraft, as well as potential hazards before they arose and the ability to quickly make changes to mitigate them.

The system boasted synchronisations with both the Department of Traffic and Main Roads (TMR) and the Bureau of Meteorology (BOM) to ensure real-time weather and traffic updates throughout the week-long, live operation. These needed to plug seamlessly into the secure QPS environment, while limiting access yet making it highly available to police resources.

Leveraging aggregated and relevant data that is accessible for both safety officials and the public via mobile will ultimately enable public safety agencies to better predict events, mitigate potential threats and disasters, and provide the best resources and real-time information.

The Queensland Police Service's Acting Chief Superintendent David Johnson (left) and Acting Inspector Gavin Raison, holding mobile devices.

SMS Management & Technology
www.smsmt.com

Field cable and antenna analyser

The Anritsu Site Master S331P field cable and antenna analyser provides wireless operators and contractors, DAS installers, public safety network installers and maintenance professionals with a pocket-sized headless cable and antenna analyser.

There are two available models covering 150 kHz to 4 GHz and 150 kHz to 6 GHz. With a sweep speed of 500 μs/data point, the product provides efficient testing. It offers field technicians and engineers easy operation, even in the most challenging field environments.

The product features an integrated help function to aid users in making measurements, as well as a classic mode of operation that simplifies performing tests. An advanced mode has a GUI with a modern button layout and functionality that allows users to recall regularly used set-ups, making operation easier and more efficient.

Optimised for field use, the product comes standard with an N(m) connector for easy direct connection to N(f) devices, eliminating the need for phase stable cables. The product is highly durable and reliable, featuring a housing that is impact, dust and splash resistant. It is externally controlled and powered via USB from a user-supplied Windows tablet or laptop, eliminating the need for a battery.

The analyser provides users with access to a suite of software applications, including Line Sweep Tools (LST), Handheld Software tools (HHST), easyTest Tools and the SkyBridge Tools cloud-based trace management software. Users can view a fast preview of stored sweeps, as well as edit, rename and archive sweeps. They can also quickly generate PDF or HTML reports using LST software. The product uses the standard *.dat sweep file format and is compatible with HHST, which is widely used by mobile operators, making the product compatible with most standard workflow procedures.

Anritsu Pty Ltd

www.anritsu.com

Long-range RF transceiver

The Microchip Sigfox FCC-certified long-range RF transceiver has a connectivity development kit for IoT applications.

The kit contains an FCC-certified board that allows developers to easily connect to the company's long-range, two-way global IoT network. This provides low-cost, low-power, device-to-cloud connectivity.

The product is suitable for IoT applications ranging from logistics to agriculture, smart cities and other machine to machine (M2M) sectors.

The product is available in two versions. It is available as a standalone kit, designed primarily to test the technology, or as a kit combined with an Xplained PRO board, for system-design purposes. The product comes with a library, modulation, ID and PAC code, and a security key enabling IoT developers to quickly get their design to market.

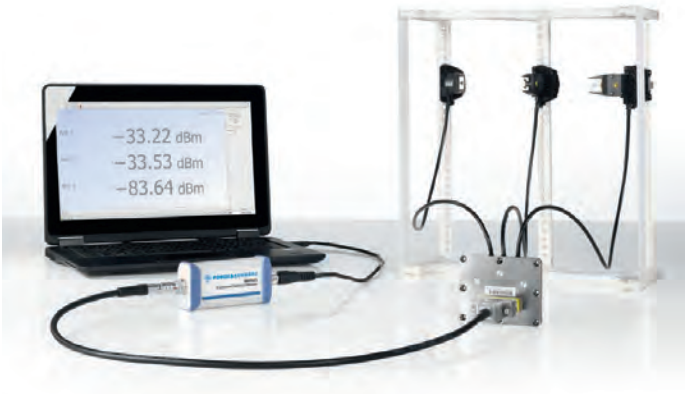
Microchip Technology Australia
www.microchip.com

Handheld digital mobile radio

The Hytera BD Series digital mobile radio is an entry-level series of handheld radios.There are four models — BD30X, BD35X, BD50X and BD55X — which adopt two-slot TDMA technology and provide output power from 2 to 5 W and capacity up to 256 channels, with a compact and lightweight design.

Working in either analog or digital mode, this product is suitable for users who simply need voice communications or need to replace their ageing analog radios due to local mandates, as well as for users who want to access better communications tools with limited budget and spectrum resources.

Hytera Communications Co. Ltd
www.hytera.com.au



Power measurement for 5G and wireless gigabit components

The Rohde & Schwarz NRPM OTA power measurement product for 5G and wireless gigabit components is designed for measuring transmit power over-the-air interface.

The product enables users working in development and production to calibrate the output power of the antenna on a DUT and to test the DUT's beamforming function.

The product works in the frequency range from 27.5 to 75 GHz and therefore covers the 28 GHz band currently being discussed for 5G, as well as the frequency range from 55 to 66 GHz for WLAN in line with IEEE 802.11ad and frequencies above 66 GHz in line with IEEE 802.11ay.

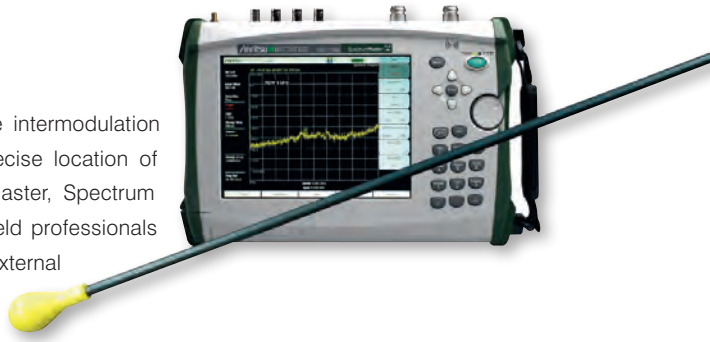
The antenna module is a simple, polarised Vivaldi antenna with an integrated diode detector for power measurements. It measures the relative power with a measurement accuracy better than 0.2 dB. Because the power is measured directly on the antenna, the user does not need any additional RF cables, which also eliminates complex compensation for cable loss.

The three-channel sensor module processes measurements from up to three antenna modules. If more than three antennas are needed for a test set-up, users can operate any number of sensor modules in parallel. The additional measurement points increase the measurement resolution during beamforming tests.

Power Viewer Plus PC software is available for evaluating and processing the measurement data. It can be used to visually monitor measurements on up to 12 channels and determine the average power.

Rohde & Schwarz (Australia) Pty Ltd
www.rohde-schwarz.com

Test probe



Anritsu expands its field test portfolio with the PIM Hunter, a passive intermodulation test probe that helps field technicians more quickly discover the precise location of external PIM sources at cell sites. Designed for use with the PIM Master, Spectrum Master and BTS Master handheld analysers, the test probe enables field professionals to use traditional interference hunting techniques to accurately locate external PIM sources for optimum wireless network performance.

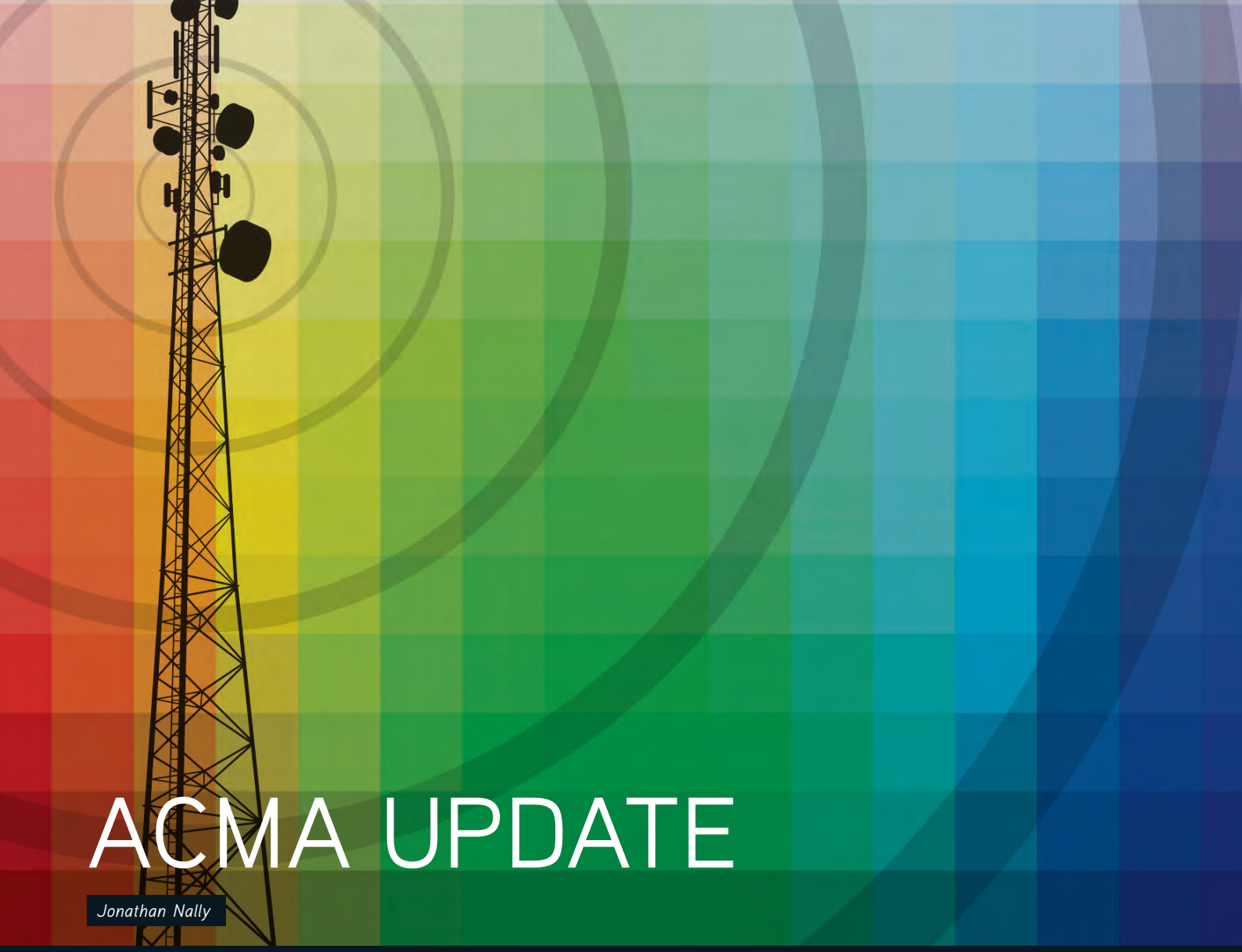
The probe provides a simple, efficient method of addressing a growing concern for mobile operators. It complements the company's Distance-to-PIM (DTP) technology that determines the distance between the antenna and external PIM. A technician can walk along the arc of that distance with the product to detect the exact source of the external PIM. Integrating the product with any of the compatible handheld analysers featuring burst detect sweep mode creates the tool set required to precisely identify external PIM sources for faster site repair. It is especially useful for detecting PIM on rooftops, the most common location for network densification in urban environments.

PIM Hunter has been custom designed to support external PIM identification over the 600 to 2700 MHz frequency range. With the test probe connected to a spectrum analyser in burst detect mode and an appropriate band-pass filter installed, technicians can track and locate IM3 signal sources that cause PIM. When the probe tip comes in close proximity to a source, the PIM value increases by as much as 30 dB, indicating the precise location of the interferer.

Unlike traditional near field probes, the product utilises patent-pending technology to return a consistent signal level regardless of probe orientation with respect to the PIM source. Accuracy is further assured because the probe is manufactured using low PIM construction techniques, so the probe does not act as a PIM source. A 90 cm extension shaft allows the test operator to remain a safe distance away from antennas under test.

Anritsu Pty Ltd

www.anritsu.com



ACMA UPDATE

Jonathan Nally

We caught up with the ACMA's Mark Loney to get an overview of the regulator's activities and priorities.

There's no doubt that efficient spectrum management is a top priority for all branches of telecommunications, and especially so for the business- and mission-critical sectors. And the ACMA, as the spectrum regulator, is right in the thick of things when it comes to spectrum planning and compliance matters.

The ACMA was present in force at Comms Connect Melbourne in November. A workshop — entitled 'Keeping the spectrum clean: ACMA activities and compliance priorities' — was presented by Mark Loney – Executive Manager, Operations, Services and Technologies Branch; Chris Fosten – Manager, Compliance and Field Operations; Mark McGregor – Manager, Economics Advisory Section; and Mark Tell – Assistant Manager, Compliance and Field Operations. Loney also gave a presentation on '400 MHz implementation progress and outcomes of the 803–960 MHz review'.

We had a chance to catch up with him to get and update of these and other topics.

What is the status of the 400 MHz band reforms?

The ACMA started a two-year review of arrangements in the 400 MHz band in 2008. Through research, analysis and extensive consultation, the ACMA identified that overall benefit to users of the band could be significantly increased through a number of reforms that were announced in 2010. The objectives of these reforms were to:

- Reduce congestion in the band. One reform to achieve this objective was to increase technical efficiency of the band. This was largely achieved by narrowbanding channels from 25 kHz to 12.5 kHz and 6.25 kHz (with associated transition arrangements to reduce the impact of transition to the end users). In addition to the cost benefits of narrowbanding, this transition process also created more channels for use in most segments of the band to address congestion.
- Establish harmonised government spectrum segments. To achieve this objective, the ACMA consolidated government security, law enforcement and public safety operations into harmonised government segments within the 400 MHz band. This was to improve radiocommunications interoperability between federal, state and territory agencies. This would result in spectrum efficiency dividends that will benefit all users of the band, including non-government users.
- Support new technologies in the band. As well as transitioning to narrowband technology, the transition to a 10 MHz Split (450–470 MHz) will provide for a wider range of technologies and equipment available to users, increasing flexibility and value of the spectrum to the end user.

Most users have successfully transitioned into these new arrangements, but there are still some users that are in the process of transition. The ACMA continues to support these agencies in transition where possible.

The ACMA's Mark Loney.

What is 'milestone 3' of those reforms?

Milestone 3 is the final milestone of the 400 MHz transition process and refers to the relocation of services in or out of government, rail and non-government spectrum, as appropriate. It is a key milestone for interoperability of the band, which was an important objective to achieve for the band, identified early in the 400 MHz project.

What was the purpose of the 803–960 MHz band review and what is its status?

The ACMA finalised its review of the 803–960 MHz band in November 2015. The purpose of the review was, in general, to undertake a sort of 'defragmentation' that would enable the band to be put to its highest-value, most-efficient use. Another key driver was the residual component of the digital TV switch-off, which included a clearance of 17 MHz of spectrum in the lower part of the 800 MHz band that is now not being used. Some of the outcomes of the review were the decision to release 2 x 15 MHz of 4G-standardised spectrum for mobile broadband and up to 7 MHz for new and innovative machine-to-machine applications and networks supporting the Internet of Things (IoT).

To make way for those new provisions, spectrum available for older technologies such as narrowband fixed links and trunked land mobile networks will be reduced and/or moved to new frequencies over the course of the 8-year implementation timetable. An implementation team is currently being established to oversee the transition arrangements that have been put in place. The implementation phase has already begun and we are less than two years away from the conclusion of the first milestone.

Can you give us a sneak peak of what the Online Customer Self Service capability is all about?

Online Customer Self Service (OCSS) is still at a very early stage. Accredited Persons (APs) are now able to submit a request via online web forms to amend the details of a client record or to surrender a licence; however, the ACMA is working towards providing this functionality to licensees. At this stage the online forms only create a request which an ACMA officer then has to action. However, the idea is that these actions will eventually occur without ACMA officer intervention. Our intention is to progressively roll out additional functionality to a broader group, including licensees, as part of a larger ACMA project to facilitate online interactions with stakeholders.

What are some top-of-the-list concerns for the ACMA at the moment?

Regarding mission-critical communications, and again tying in with the 803–960 MHz review, some parts of the band are used by emergency services for things like narrowband backhaul, and in some cases (eg. Tasmania) for primary mobile air interface. So a communications strategy to ensure operators are made aware of the changes that have resulted from the band review that might affect them will be a high property. A decisions paper exists which is a good starting point for those in industry.

From a pricing aspect, the ACMA is progressively implementing opportunity cost-based licence tax rates in the high-density areas (HDAs) of the 400 MHz band; staged over five increases each of 15%. Two increases have been implemented in August 2012 and April 2016, and the ACMA is now considering whether to introduce the third increment. As part of its consideration, the ACMA is utilising a framework specifically developed to monitor demand for spectrum in the HDAs of the 400 MHz band. The framework takes into account the feedback provided by stakeholders such as ARCIA as part of earlier considerations related to the second price increment. The consultation paper can be found at acma.gov.au/theACMA/managing-spectrum-in-the-400-mhz-band-further-steps.

From a compliance aspect, the Priority Compliance Area (PCA) program is centred on a risk-based methodology and takes a strategic approach to combating high-risk compliance issues in a coordinated manner. We set our PCAs for technical compliance after gathering intelligence about compliance issues and assessing the level of risk. It is through this analysis that the systemic compliance issues requiring a robust compliance response are identified. This approach enables us to effectively focus our resources on higher-risk issues while continuing to monitor and appropriately respond to lower-risk matters.

In 2016–17, our PCA program is focused on three areas:

1. Compliance in the Harmonised Government Spectrum (HGS) within the 400 MHz band.
2. Customer cabling.
3. Interference management.

More information about the PCA program is available from the ACMA website at acma.gov.au/Industry/Suppliers/Product-supply-and-compliance/Priority-compliance-areas/priority-compliance-areas-2016-17

Oscilloscope probe

The Rohde & Schwarz RT-ZP1X passive 1:1 oscilloscope probe is low noise, making it suitable for measuring the smallest of signals down to 1 mV/div.

The probe is matched to RTE (up to 2 GHz) and RTO1000/2000 (up to 4 GHz) oscilloscopes. The oscilloscope's low-noise front end keeps the noise floor under 650 μVpp (1 mV/div and 200 MHz bandwidth), even for a 1 MΩ input impedance. With an acquisition rate of up to 1 million wfms/s, users can obtain meaningful measurement results, complete with a histogram and all signal components. In the zoom view in 16-bit HD mode, even the smallest of signal details can be analysed and triggered. The oscilloscopes offer a hardware-based fast Fourier transform (FFT) that delivers the spectrum display practically in real time. This makes it possible to identify 10 MHz signals coupled to an adjacent clock line at a glance.Another feature is the zone trigger that can be used to graphically separate events such as out-of-limit conditions in the time and frequency domain. The probe is also suitable for the RTM (up to 1 GHz) and HMO (70 MHz to 500 MHz) oscilloscopes.

Rohde & Schwarz (Australia) Pty Ltd

www.rohde-schwarz.com

Handheld wireless tester

The NetScout AirCheck G2 handheld wireless tester provides users with a simple and quick means of resolving wireless-related issues. Available to rent from TechRentals, the device is designed to assist frontline IT personnel who receive complaints about Wi-Fi and internet operation. It can conduct channel scanning, interference detection and connectivity tests with ease.

The tester allows for instant access to detailed information and provides quick troubleshooting for the most common Wi-Fi problems. These include coverage problems, overloaded networks or channels, channel interference, connectivity problems, failed access points and rogue access points.

The product supports the latest Wi-Fi technologies, including 802.11a/b/g/n/ac, and allows for quick AP backhaul and wiring verification. It also features Ethernet connectivity testing and has a one-button auto test.

TechRentals

www.techrentals.com.au

Image courtesy of Inmarsat.

SATCOMS FOR BORDER BOATS

The Department of Immigration and Border Protection (DIBP) has signed a five-year deal with Inmarsat, which will provide border protection vessels with high-speed mobile satellite broadband connectivity.

The $7 million contract will see Inmarsat's Global Xpress (GX) constellation deliver broadband connectivity at satellite communication (satcom) terminals and on a fleet of eight Cape Class vessels.

Inmarsat worked with Australian satellite specialists EM Solutions to develop a terminal that met DIBP's unique needs.

DIBP Commander, Air and Marine Dave Luhrs said Inmarsat's technology enhances border protection operations and equips staff and crew with better access to back-office applications and potential welfare communications while they are on patrol.

"At the operational level, the ability to switch between satellite systems enables our crew to prioritise their communications and ensures they are 'always on', which is of paramount importance when protecting our borders," said Luhrs.

Each vessel has been fitted with the EM Solutions Cobra terminal, complemented by Inmarsat's L-band FleetBroadband service. The larger support vessels have been fitted with commercial GX terminals. Cape Class vessels are considerably larger than the platforms previously used by DIBP and carry approximately 22 crew, compared to just eight on the previous vessels. DIBP therefore required a satcom solution that was capable of handling significantly larger data capacities for crew and operational communications, and that offered high reliability.

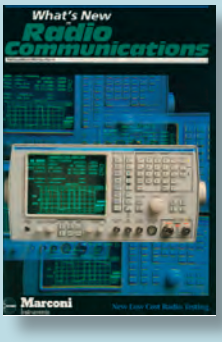
Following the tender issued by DIBP, the Inmarsat solution was chosen as it delivered a single terminal to each vessel that provided the flexibility to choose between commercial and military satellite systems, while still maintaining the prerequisite reliability and communications coverage.

"This contract ensures the Department of Immigration and Border Protection remains at the forefront of communications technology while allowing it to continue to leverage its existing government-owned communications satellites," Inmarsat Global Government President Andy Start said.

"Our broadband services and terminals augment and enhance what is possible for Australia's border protection crews in order to keep them connected at all times."

Backhaul

Backhaul takes you on a trip down memory lane as we look at what was happening in the comms field of yesteryear.



25 YEARS AGO. The cover of the February/March 1992 issue of *What's New in Radio Communications* featured the Marconi 2955B radio test set family, with a feature set that improved on the earlier 2955A and R test sets. Inside the magazine we reported on Radio Frequency Systems winning a $30m contract from Telecom to supply antenna technology for the Jindalee over-the-horizon radar; OTC was advertising its Fleetcoms Business Radio Network, and was also set to introduce the Global Maritime Distress and Safety System to Australia (served by coastal radio stations in Sydney, Melbourne, Perth, Darwin and Townsville). The British Approvals Board for Telecommunications was reported as approving for use, Ericsson Australia's ACP1000 Automatic Call Distributor system. Mobile One Australia and Exicom were collaborating to produce noise environment headsets to suit the Midland range of transceivers. And we also published articles from Tait and McLean Automation/Adolon Computer Services on choosing the right technology for telemetry systems.

10 YEARS AGO. The cover of the January/February 2007 issue of *Radio Comms Asia-Pacific* featured the radPro2 advanced EME modelling software from ICOMMS Australia — making a break from hardware on the cover. In fact, it's interesting to see how things had developed since 1992, with many more mentions of the word 'digital' throughout this issue. Stealth also gets a mention, with The Bridge Networks becoming the exclusive agent for Stealth Concealment Solutions. The ACMA announced it would auction a 10 MHz lot and a 5 MHz lot between 2010 and 2025 MHz for wireless broadband. The ACMA also announced that it had commissioned SpectrumWise Radiocommunications Consulting to provide an independent review of government spectrum holdings — "We need to be forever mindful that spectrum access is emerging worldwide as a 'key enabler' for information economy," said Chris Chapman, introducing two more of those fancy new terms.

Spectrum

Canberra doesn't have a plan for emergency comms

Amid the wrangling over the backpacker tax, industrial relations legislation and day-to-day senate shenanigans, the federal government released its response to the Productivity Commission's report into Public Safety Mobile Broadband (PSMB). You could be forgiven for not noticing. Its response was lacklustre and spineless.

By announcing that it has chosen to "support(s) in principle the Commission's findings and recommendations" and "establish a committee of Commonwealth, State and Territory officials to consider fully scoped proposals and report to the Council of Australian Governments in 2017", the government has shown us that it does not have a plan for public safety.

For years, the Police Federation of Australia (PFA) has argued that part of the unallocated 700 MHz of spectrum should be set aside for a dedicated PSMB capability. There have been inquiries and investigations. First there was the Public Safety Mobile Broadband Steering Committee (PSMBC) jointly chaired by the Attorney General's Department and the Department of Communications. Then there was the Senate Committee, the Joint Parliamentary Committee and the Productivity Commission report. And now it's back to a committee.

To date not one recommendation from any of the committees has been actioned. This includes:

The PSMBC recommendation that 2 x 5 MHz of spectrum be set aside for public safety mobile broadband, while acknowledging that during critical incidents additional spectrum would be needed from commercial carriers.

Former Attorney General, Nicola Roxon advised the states and territories that the then government had decided to allocate 2 x 5 MHz in the 800 MHz band.

The Australian Communications and Media Authority (ACMA) set aside 2 x 5 MHz from the 800 MHz band. Unanimous endorsement by the Senate Committee for the allocation of sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR).

The Parliamentary Joint Committee on Law Enforcement recommended that 2 x 10 MHz be allocated for public safety from the 700 or 800 MHz bands. (This committee comprised heavy hitters such as former Attorney General Robert McClelland; current Deputy Leader of the National Party Senator Fiona Nash; current Justice Minister Michael Keenan; and current President of the Senate Senator Stephen Parry.)

The government is sending a frightening message when agreeing to the commission's view that "commercial mobile networks are the most efficient, effective and economical way of delivering a public safety mobile broadband capability".

Flashback to mid-2016 when Telstra outages occurred. In July one such outage affected businesses, Medibank, the Department of Finance and even political parties on the eve of an election, on the all-important final day of the financial year.

And that's in the cities. In rural and regional Australia, a dedicated PSMB is even more vital. Relying on commercial carriers in times of crisis has proven to be unreliable. Inquests have found that lives have been lost because of poor communication capabilities. You only need to read the final report of the royal commission into the 2009 Victorian bushfires, in which 173 people died. It says: "Communications systems on 7 February were also hindered by poor coverage, lack of interoperability between emergency services agencies, and insufficient investment in new technologies. For example, the transmission speed of the paging system had been reduced in order to expand reception coverage, and this caused serious delays in other than the most urgent messaging... Further, radio 'black spots' meant that reception was poor or non-existent in some areas."

What is disappointing is that this government is prepared to play with the lives of Australians, rather than provide a PSMB dedicated to the emergency services. It is, without doubt, all about money. The government's announcement to auction the remaining 700 MHz serves to illustrate the real agenda. It is just a shame that this government is putting dollars before safety.

Mark Burgess is CEO of the Police Federation of Australia. He has a Bachelor of Social Science (Justice Studies) from Newcastle University and a Master of Public Policy and Administration from Charles Sturt University. He was awarded the Australia Police Medal in the 2007 Queens Birthday Honours list.

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Mobile thermal transfer printers

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