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critical comms

Inside

Jan/Feb 2020

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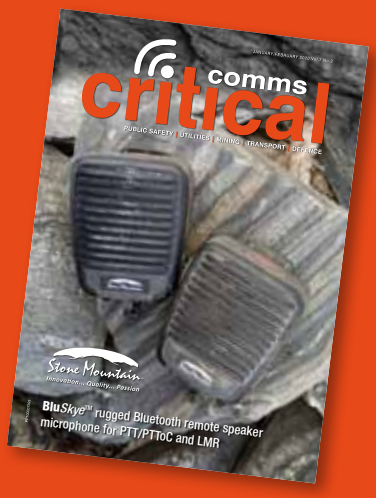
ON THE COVER



Supporting most PTT/PoC platforms, the **Blu*Skye*** ™ Bluetooth remote speaker microphone (RSM) leverages your smart device for two-way communications, whether using PTT on a tablet, smartphone or custom PTT device, or a supported LMR radio.

The Stone Mountain **Blu*Skye*** is rugged, IP68 submersible, and provides loud and clear audio with a built-in volume control on the RSM.

Blu*Skye* RSMs are in use all over Australia as one safe and legal way of using PTT communications in a vehicle, making use of a smartphone's capabilities to provide two-way communications, GPS tracking, job dispatch and more.

Bluetooth connections provide a flexible approach by eliminating wires, enabling communications when outside the vehicle, or in a tight situation such as when working on the vehicle or performing other tasks.

Tru*Dock* ™ rugged cradles and mounting solutions also provide drop-in charging for Stone Mountain RSMs. Single cradles which mount in vehicles securely hold and charge a **Blu*Skye*** RSM. Multi-bay chargers hold up to five RSMs at once for overnight or off-shift charging, and can be grouped to charge up to 30 RSMs simultaneously from one power point.

The **Blu*Skye*** RSM is built in the USA and exclusively distributed in Australia, New Zealand and the Pacific Islands by IMPULSE Wireless, and comes with a two-year warranty.

IMPULSE Wireless
www.impulsewireless.com.au

Transmit

I'm writing this a couple of weeks after Comms Connect Melbourne 2019, and I'm still buzzing from the experience of the event. I know it sounds clichéd, but this definitely was the best Comms Connect ever. The line-up of speakers was superb, the exhibition hall was packed with exhibitors and visitors, and there were plenty of bums on seats, to coin a phrase. It was such a busy conference that I wasn't able to catch up with everyone with whom I had wanted to speak — there just weren't enough hours in the day (or two days, to be precise)!

There was plenty of news about developments in many sectors of the mission-critical communications field, much of which you can read about in this issue of ***Critical Comms***. It was interesting to hear, for instance, that the proof-of-concept trial for an Australian public safety mobile broadband network will be going ahead as planned next year.

One thing that stood out for me was the announcement at the ARCIA Gala Industry Dinner of a sort of roadmap for the future training of RF-qualified professionals… something that is sorely needed. That training could include tertiary and vocational education, as well as traditional apprenticeships. And there could be no more perfect example of the effectiveness of the latter than young Justin Lenkovic, who (along with Mitchell Reid) was presented with an Apprentice Trainee Award. In accepting the award, Justin gave an impassioned plea to the 400-plus people in the audience to support apprenticeships, to appoint apprentices within their own companies, and to spread the word of the benefits such efforts will bring not only to the individuals and companies concerned, but the wider industry as well. He almost got a standing ovation.

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

March

BAPCO Annual Conference and Exhibition 2020
10–11 March
Ricoh Arena, UK
bapco-show.co.uk

IWCE 2020
30 March–3 April
Las Vegas
iwceexpo.com

May

Comms Connect New Zealand 2020
6–7 May
LHEC, Wellington
comms-connect.co.nz

June

Comms Connect Sydney 2020
June
Sydney
comms-connect.com.au

Critical Communications World 2020
17–19 June
IFEMA, Madrid, Spain
critical-communications-world.com

August

APCO 2020
2–5 August
Orlando, Florida
apco2020.org

AFAC20
25–28 August
Adelaide Convention Centre
afacconference.com.au

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

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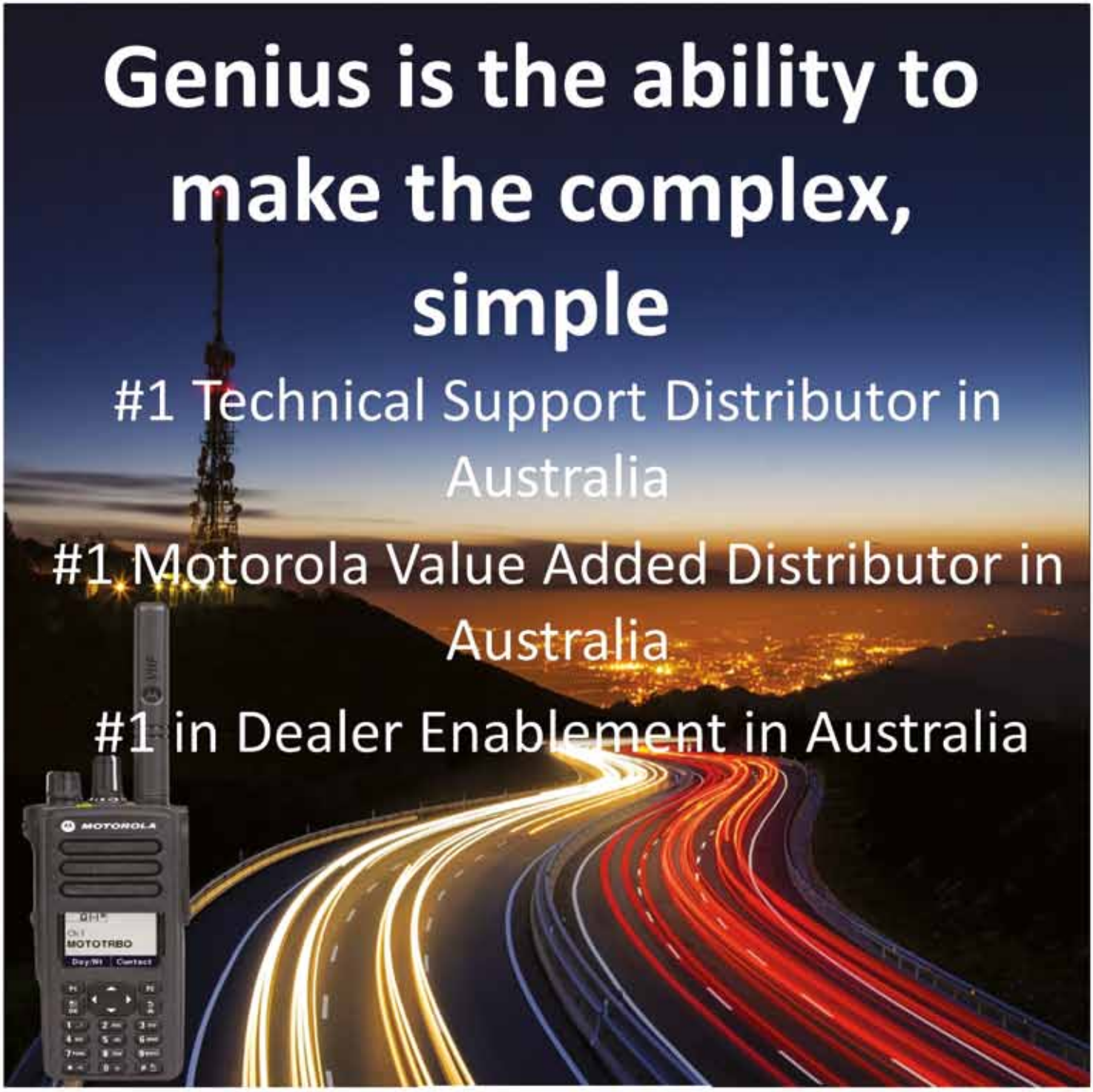

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GIVING FIRST RESPONDERS THE COMMS THEY NEED

Ian Miller

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Is the government leaving first responders out of the equation when it comes to the fundamental communications platforms of the future?

The Minister for Communications, Arts and Cyber Security recently announced that an enquiry will be held into giving permission for mobile phone carriers to put temporary transmission facilities in place during emergency situations (Consultation on proposed temporary facilities and other amendments).

What we should be asking is whether this is being done with the needs of our emergency services in mind. After all, like everything else in the modern world, our first responders are relying more and more on data to enhance their capabilities in the preservation of life and property.

For the past seven years our public safety agencies (PSAs) have been discussing and planning for the introduction of a public safety mobile broadband (PSMB) capability to improve the efficiency and effectiveness of their operations. Back in 2014 the Productivity Commission recommended that a system be established as a common network between all of the various states and agencies. This would facilitate interoperability between those agencies as well as offering the substantial benefits that would accrue from having data access in the field, in addition to the traditional voice communications.

Various jurisdictions have been working away at the necessary planning for such a system and have made a lot of progress. However, there is still more to be done.

Given the Productivity Commission's recommendation that PSMB would most likely be best suited for operation over public carrier networks, then publicly funded improvements to those carrier networks should surely include plans to maximise the benefits for the public through the availability of the PSMB service.

This should encompass not only suggestions for temporary facilities in areas affected by emergencies, but also for facilities being provided as part of the Commonwealth-funded 'Black Spot' programs.

Although it would seem at first that any increase in the service facility of the public carriers would benefit the PSMB network, there are some special considerations required.

As the public carriers have progressively rolled out their network coverage, they have had to consider the commercial sensitivities of their shareholders. So there is always a balance between investment in equipment costs and the return on investment of the funds generated by that equipment — a sound business practice.

From a public safety perspective, emergency situations are not always in the areas with the highest population density. So given that the public carriers design their coverage to suit populations, they each will often have different transmission locations to suit user profiles. This is the primary cause of the Black Spot issues — population density, even on a migratory basis, is not sufficient to justify the investment in equipment.

Given that emergency situations, especially bushfires, floods and cyclones, tend to happen in all types of locations, there is a need for our PSAs to have communications availability in most areas, not just those with a degree of population density. At present there may be coverage in many areas, but often the carriers' network designs mean that in some places the best coverage

> MOST PEOPLE WOULD EXPECT THAT THESE KINDS OF CAPABILITIES WOULD AUTOMATICALLY BE PROVIDED FOR OUR PSAs, YET CONSIDERATION OF THEIR NEEDS STILL TENDS TO BE AN AFTERTHOUGHT.

might come from one carrier, yet a short distance away it might be from another.

Of course this can be solved by giving our PSAs the ability to 'roam' between the carrier networks. Yet for commercial reasons (not technical limitations) the carriers do not offer this facility.

With the proposal for public carriers to be able to locate temporary facilities in areas affected by emergencies, surely the federal government (being the spectrum owner) should be making it a condition for approval of such services that 'network roaming' be made available for first responders.

This would mean that it wouldn't matter which carrier has the best-located equipment; the PSAs would have access to the best possible signal levels. Naturally, the underlying requirement for first responders to have priority access and network pre-emption should also be in place.

Along similar lines, any funds provided by the Commonwealth to enhance the network coverage of a public carrier through the Black Spot program should also stipulate network roaming and priority features enabled for PSMB as a condition of that funding.

Most people would expect that these kinds of capabilities would automatically be provided for our PSAs, yet consideration of their needs still tends to be an afterthought. Too much communications planning in Australia has been done within historical 'silos' of information. In a modern and connected world there must be a broader approach to communications planning — the federal government's focus on maximising revenue from spectrum has meant that public carriers have had too much input and influence in the outcomes.

Part of the problem is that our policymakers rely heavily on those devising and developing the plans for our future, yet in many/most instances the planning groups are working within the confines of specific industry sectors.

As our future depends very heavily on the use of spectrum to increase the efficiency of our food supply chain, perhaps the recent announcement of the combining of Commonwealth Government departments into more consolidated groupings might open up some options. The inclusion of the Communications portfolio into the broad grouping of Infrastructure, Transport, Cities and Regional Development might mean that facilities funded by the Commonwealth under the Black Spot program could open up the planning options a little more. But to be fully effective that planning should also include agriculture and water agencies.

In the context of providing data accessibility for our first responders, we must remain cognisant of the fact that, outside of our major metropolitan areas, much of the first responder support comes from local volunteers — the same people who will gain economic benefit from having broadband data available in their daily lives.

It is time that our first responders' need to have communications at least as good as, if not better than, the general public, is no longer a negotiable item. If we expect the young people of today to still aspire to be police, fire and paramedic heroes, then we owe it to them to give them the very best communications tools to do the job… and not ask them to rely on levels of technology two steps backward from their own personal devices.

It is time to think outside traditional planning silos and apply the best communications solutions for our public safety agencies and the community in general, particularly when we as taxpayers are funding significant portions of the infrastructure.

Ian Miller is the Executive Officer of the Australian Radio Communications Industry Association and a communications professional with decades of experience and perspective under his belt.

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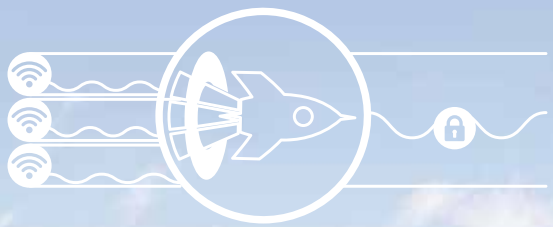

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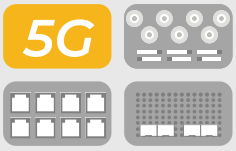
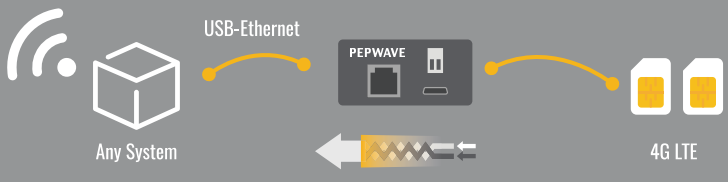


Multiple Module Types



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News

EQUIPMENT STOLEN FROM RFS VEHICLE

The Northern Tablelands Team of the NSW Rural Fire Service has posted pictures on its Facebook page showing that one of its portable radio repeater trailers, deployed to the south-east of Nymboida, has been vandalised. The criminals took off with six tyres, two axles, two jerry cans and radio equipment, rendering the repeater unit inoperable... endangering the fire crews who rely on communications to keep themselves safe, and of course members of the public who rely on the rural firies for their protection. The Team has asked anyone who has any information about the incident to contact Grafton Police on 02 6642 0222.

CANBERRA ANNOUNCES PLANS FOR 5G AUCTION

The federal government has announced that it will auction 2.4 GHz of spectrum in the 26 GHz band to support rollout of 5G. The auction will take place early in 2021 and follows the sale of Australia's first 5G spectrum in the 3.6 GHz band in December 2018. To kick-start the process, the Minister for Communications, Cyber Safety and the Arts, Paul Fletcher, has issued a spectrum reallocation declaration for the 26 GHz band, following advice from the ACMA (which had undertaken industry consultation). The reallocation is part of the ACMA's plan to make spectrum available for 5G through a flexible mix of class, apparatus and spectrum licensing.

Microwave antenna and cable analyser

The Anritsu S820E Site Master is a microwave antenna and cable analyser with a frequency range from 1 to 20 GHz. Available to rent through TechRentals, the device supports coaxial and waveguide system measurements which include 1-port Return Loss, VSWR, Cable Loss, Distance-To-Fault, Smith Chart and phase measurements.

Supplied with K (m) type port (compatible with 3.5 mm and SMA), the device includes Classic Mode, which allows former users of the S8X0D series to increase productivity with minimal additional effort. The unit comes standard with USB interface, Smith chart and software management tools.

The device is designed to be rugged, reliable, lightweight (3.0 kg) and have a long battery operation time, making it suitable for a variety of applications. It has been designed and tested to meet the MIL-28800F Section 4.5.6.3 Explosive Atmosphere requirements for safe usage.

TechRentals

www.techrentals.com.au

Dual-band fixed mount mobile

ToooAir's TA-995 dual-band, push-to-talk over cellular (PTToC), ultrahigh frequency (UHF), fixed mount mobile is suitable for use in the heavy transport, agriculture, mining, construction and service industries.

It features 80-channel CB, 3G/4G/4GX LTE, GPS, SOS, a numeric keypad microphone and dual SIM. It has a large front-facing speaker, 3 W audio amplifier for noisy truck environments and a large LCD display.

The mobile is supplied with an in-vehicle GPS and GSM antenna and mounting kit and is designed to work from 12 to 24 V, negating the need for a voltage reducer.

The unit's dispatch software allows for group and individual calls, call hierarchy, dynamic group reprogramming and radio stun. It also records voice communication and tracklog that can be recalled months later. An IP only version, TA-990, is also available.

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Industry Talking

Well folks we made it; it's 2020. We now all have flying cars, jet packs, robot housekeepers, no more paper and our lives are defined more by leisure than work. Communications is of course now universal, all modes, anytime, anywhere. We are now living the life imagined in *The Jetsons*.

Well, maybe not. Although we see change happening right in front of us, perhaps the pace of change is just not as fast as many people had predicted it would be.

In our communications world there is tremendous buzz around 5G, and with good reason. However, the reality is that there are years of iterative changes still to take place. The same can be said for the LMR landscape. The promise that LTE will transform communications into some new nirvana has been replaced by the realisation that change takes time, plus a lot of financial investment before the full benefits of 5G will be available to everyone.

The LMR industry must evolve with these changes if we are to remain relevant. New and improved technology will transform the way we can deliver services, as I believe the demand for critical communications will not disappear. The way our industry delivers services will change as new technology enters the marketplace; the current trend of data replacing voice will continue and become more prevalent in LMR as well as on other platforms.

ARCIA believes our role as an industry group is to promote the industry widely, especially for access to spectrum. ARCIA continues to prosecute the argument that private networks require access to spectrum, regardless of the chosen technology or location. As we watch other markets introduce new spectrum mechanisms to deal with the need for innovation, it is very disappointing to hear from both government and business in Australia that spectrum sharing is not viable.

Of course people do not want change; they want to protect what they have now. But I think it is rather extraordinary for some to argue that spectrum sharing is not acceptable considering the raft of changes that have occurred to all bands over the last 20 years. Having accepted that broadband is a vital community asset, to then argue that only some entities can be trusted to deliver these services is disingenuous at best. The point of new technology is to open new markets and ultimately to provide community benefit by using wireless technologies to lift productivity for everyone.

While I argue that we need to embrace new technology, we must also have a strong regulator to maintain standards and compliance. The federal government seems to think that reducing costs and capacity within the ACMA is a good idea. I would argue strongly that, considering the benefits that wireless technology brings to Australia, this is an area we should be investing in. Our modern world is underpinned by engineering and data. The array of new wireless technologies based on massive edge computing power is growing and I don't see the ACMA having an ability to keep up with it.

It is high time for the government to recognise the huge growth that will come from technology and the wireless spectrum. With this realisation there should be investment in the resources of our spectrum manager and not continuing pressure to cut costs under the guise of productivity gains. Personally, I am a believer in low regulation and letting market forces apply, but we run the risk in Australia of no regulation... plus we also run the risk of losing the effectiveness and efficiency of our valuable spectrum if it is not managed properly.

ARCIA will commence 2020 with two days of planning in Brisbane, where will bring together the committee and partners to set the tone for this year. No doubt we will again be running all our events and you will read more about those over the course of the year. We are always keen to hear your thoughts on our events; we can only continue to improve them if you give us some feedback, positive or negative, which is valuable to us for our planning.

With the success of the training events in 2019 you can look out for more ARCIA-led training. Please make sure you support these events and send your people along, plus also please continue to support Comms Connect and consider sending your staff members along to at least visit the exhibition. It is the best investment for increasing the knowledge of your staff and letting them realise just how broad our industry really is.

Hamish Duff, President
Australian Radio Communications Industry Association

News

TASMANIA'S ESCAD IMPLEMENTATION COMPLETED

Fujitsu has completed the implementation of an Emergency Services Computer Aided Dispatch (ESCAD) system for Ambulance Tasmania. The milestone see the completion of the integration of emergency systems across all emergency service organisations in Tasmania, including Police, Fire Service, Ambulance and State Emergency Service. ESCAD enables real-time sharing of incident details, resource location, hazards and warnings as well as status tracking between Police, Fire, SES and Ambulance agencies. The expectation is that this will improve operational response time and the safety of frontline responders and the community. This includes reducing or eliminating the need for phone calls to multiple agencies to coordinate a response.

AA RADIO, ZETRON TO PROVIDE ANTARCTIC CONSOLES

Zetron's ACOM Command & Control system has been selected to provide communications solutions to and between Australia's research stations in Antarctica. The contract for integrated radio console systems, equipment and support services was awarded to AA Radio Services, a Melbourne-based Zetron partner and reseller, following a competitive bid process. The contract entails a 12-position ACOM Command & Control system, with consoles at the three Antarctic locations, the station on Macquarie Island and the head office base in Tasmania. "Needless to say, the geography and conditions make communications a challenge," said Chris Reade, Senior Business Development Manager at AA Radio.

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CONNECTED DRONES FOR DISASTER RELIEF

Jonathan Nally

A trial in Japan has used drones connected via a private LTE network to issue tsunami evacuation alerts.

Sendai City, with a population of over 1 million, is the hub of the Tohoku Region in Japan. The area's coastal zone was devastated by the tsunami caused by the Great East Japan Earthquake in 2011.

In the aftermath of the earthquake and tsunami, Sendai has become recognised internationally through the United Nations as an exemplar of disaster risk reduction and reconstruction. In addition, it has been designated as a National Strategic Special Zone by the Japanese government, with a focus on the use of the latest information and communications technology by businesses and communities.

In 2017, Sendai City and Nokia concluded a strategic partnership agreement for improving the safety and security of citizens and supporting local industries through the use of Nokia technology.

To that end, the city and Nokia recently conducted a successful test flight of a Nokia drone controlled via a private LTE network provided by Nokia Digital Automation Cloud. The scenario tested the use of drones during a tsunami or other disasters to help in harm prevention and mitigation efforts.

The test verified that a private LTE network could be used to control and communicate with the drones, potentially making them an effective means for enhancing

image courtesy of Nokia

Optus and Ericsson have tele-operated a drone via a live 5G network, at Optus' Macquarie Park campus in Sydney.

Image courtesy Optus.

situational awareness and communicating with the affected population during a disaster. According to Nokia, this was the first time this type of trial had been conducted anywhere in the world.

For the purpose of the test, it was assumed that a major tsunami warning had been issued for the coastal area near the Minami-Gamo Water Treatment Centre in Miyagino Ward, Sendai City.

Nokia deployed a private LTE network near the Water Treatment Centre using its plug-and-play digital automation cloud technology.

Nokia Drone Networks is a turnkey solution comprising one or more drones equipped with HD and thermal cameras, a private LTE wireless network, a flight command and control centre, and video analysis applications.

According to Nokia, private LTE/4G provides "seamless and secure connectivity, making it more suitable for mission-critical use cases than the mostly Wi-Fi-based technology used in public mobile networks".

During the simulation, the testers used the drone's loudspeakers and cameras to deliver recorded and real-time voice messages to people on the ground, and conducted aerial monitoring using the cameras' images and streaming video.

The testers were able to issue a tsunami warning to evacuees and monitor the tsunami arrival zone and coastal areas using the drone's cameras.

They were also able to guide people on the ground to safe evacuation sites using the drone to convey spoken directions and monitor the movements of evacuees.

The test demonstrated how first responders can provide help during disasters when their own personnel are unable to reach the affected sites, or when it would be unsafe to do so.

"The use of these drones seems to be very effective in ensuring the safety and security of Sendai and its surrounding areas," said Sendai City Mayor Kazuko Kohri.

"The demonstration by Nokia showed that we should be able to respond faster and provide better information to the people in the most affected areas during a potential disaster. We are very hopeful that Nokia Drone Networks will help us to reduce risk for our citizens."

Going forward, the partnership between Sendai City and Nokia will continue to promote the use of Nokia technologies to

Images courtesy Nokia

> "THE USE OF THESE DRONES SEEMS TO BE VERY EFFECTIVE IN ENSURING THE SAFETY AND SECURITY OF SENDAI AND ITS SURROUNDING AREAS." — SENDAI CITY MAYOR KAZUKO KOHRI

help improve the safety and security of citizens, revitalise local industries and promote the technological development of local companies.

"We are very pleased that we have successfully completed this drone flight demonstration with Sendai City, highlighting the effectiveness of using drones and private LTE for disaster prevention and mitigation," said John Harrington, Head of Nokia Japan.

"Nokia Drone Networks has [already] been adopted by the Red Cross in the Philippines as a social infrastructure for disaster relief operations. Based on this demonstration, we hope to contribute to disaster prevention and mitigation for Sendai City and other local governments in Japan."

5G control

In a related development, Optus and Ericsson have conducted a demonstration of what they claim is the first operation in Australia of a tele-operated drone controlled over a live 5G network.

The demonstration flight took place at Optus's Macquarie Park campus in Sydney.

As well as teleoperation of the drone, the drone also transmitted HD video via a 5G handset over the live Optus 5G network as part of a future use case demonstration.

In addition, the test used cloud computing processors to analyse the imagery and intelligently identify and track objects. The ability to communicate with such edge cloud processors will likely enable drones to safely fly beyond visual line of sight in the near future.

The bandwidth and speed of 5G will give drones the capability to conduct video surveillance, real-time streaming and real-time intelligence gathering via remotely located operators, ie, when incidents take place in hazardous, remote or inaccessible areas.

"It's incredibly exciting to be testing this future drone technology on our live 5G network. We already have customers using and benefiting from our 5G network now and showcase provides a glimpse into the future possibilities that 5G will enable," said Dennis Wong, Optus Managing Director Networks.

"As we build out our network and it reaches maturity in around 18–24 months' time, we will start to see these use cases put into action thanks to the ultra-high reliability and low latency provided by 5G, which is critical in supporting these technologies," he added.

"We are pleased to support Optus in this latest 5G technology showcase. 5G represents a key mobile technology evolution, opening up a variety of possibilities and applications," said Martin Wiktorin, Head of Ericsson Singapore, Brunei and Philippines and Global Customer Unit Singtel.

Optus already has more than 290 5G sites installed around Australia, which use both Ericsson and Nokia equipment.

Introducing the CM60 Series

Designed, engineered and manufactured in Australia for the toughest conditions, the CM60 Series provides a robust solution ideal for both the large systems integrator with an extensive network of mobiles, portables and repeaters, or the small operator with a single site.

The CM60 Series provides an analogue solution with optional licensing upgrades for P25 in Conventional, Trunk and AES 256-bit Encryption.

The advanced User Interface Control (UIC 600 Series) features an OLED screen for high-visibility characters, back-lit keypad, powerful front facing speaker and a secure in-vehicle interactive bracket.

All CM60 variants are compliant with AS/NZS 4295 (LMR). UHF variants are compliant with AS/NZS 4365 (CB) and all P25 variants are CAP (Compliance Assessment Program) compliant, conforms to TIA-102 Standards.

GME

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AUSTRALIAN MADE

P25

News

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TELRAD, URSYS COMPLETE 5 GHZ LTE TRIAL

URSYS and Telrad Networks have successfully completed joint testing of 5 GHz technology with a major engineering firm in Newcastle, NSW. According to the companies, the results show that URSYS can bring LTE network functionality to rural areas and outlying regions using Telrad's 5 GHz LTE solution in the unlicensed spectrum. "The testing we have conducted with Telrad's 5 GHz LTE-U solution demonstrated that platform was able to perform extremely well under the toughest NLOS conditions," said URSYS General Manager Roy Ivimey. "The platform's support for Layer 2 and Layer 3 services showed the flexibility and high versatility of the product deployment options."

THALES, RMIT JOIN FOR SATELLITE POSITIONING

Thales and RMIT University are working to define a new generation of high-accuracy precise point positioning (PPP) services under a joint research agreement. The parntership will see the organisations try to define a PPP service channel and standardise a message format for use in the spatial information and positioning business sector, according to RMIT. Thales Australia Director Technical Strategy Michael Clark said, "The work brings together, in Australia, the existing technology base of the Navigation Business Line of Thales Alenia Space with the expertise and experience of RMIT researchers led by Associate Professor Suelynn Choy, in the definition and evaluation of high-accuracy positioning services."

Digital PTT radios

Hytera's PD782 and PD702 handheld, digital, push-to-talk (PTT), two-way radios operate over the VHF band and feature a programmable emergency button, full keypad and screen.

They are IP67 rated for dust and water resistance, have pseudo-trunking and extended pseudo-trunking to help improve capacity usage and allow operators to use limited spectrum more efficiently by assigning channel resources without needing a dedicated control channel.

The radios have priority interrupt and an emergency mode that raises an alarm with user ID to a base station or other radios with pre-programmed emergency mode, as well as a 'Lone Worker' feature that uses a timer in the radio to measure inactivity. If the timer expires, the radio is designed to send a warning and trigger an alarm if there's no response. They also come with optional Bluetooth functionality.

The PD702 comes with optional GPS tracking and positioning and has an optional 'man down' feature that will let users know if it has been tilted past a certain angle, as might occur if a radio user has fallen over or is unconscious or injured. It will trigger an alarm after a warning is issued to the user.

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

Hybrid base station

Airbus's TB4 base station is designed to support TETRA and 4G/5G technology and features dual homing, air interface encryption and base station fallback. It is based on Nokia's AirScale base station platform and designed to provide a longer TETRA lifecycle and help facilitate the transition to wireless broadband.

The unit is intended to help reduce power consumption and improve flexibility due to its network coverage and use of TETRA-adapted mainstream technology. The base station can use the same antenna configuration as the TB3 and will initially be released for a 380 MHz frequency.

Airbus/Secure Land Communications
www.securelandcommunications.com

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News

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NEW HQ FOR S.A. EMERGENCY SERVICES

South Australia's emergency services' incident response capabilities are set to get a boost with the help of a new, purpose-built command centre, according to the state government. The Emergency Services Command Centre — to be built by Axiom Properties — is expected to house the executive and senior management teams of SA's metropolitan and country fire services (MFS and CFS), State Emergency Service (SES) and the South Australian Fire and Emergency Services Commission (SAFECOM), along with more than 300 other employees and volunteers, the SA Government said. It will also serve as a base for the CFS State Operations Support brigade's State Ready Reserve Strike Team.

BARRETT AWARDED US-FUNDED CONTRACT

Barrett Communications has delivered HF and VHF equipment into Egypt as part of a United States-funded program. The project is split over multiple phases and will include equipment for ground, mobile and airborne applications. In the first phase of the program, Barrett is providing PRC-2080+ VHF equipment in the 5 W handheld and PRC-2082+ 50 W vehicle systems. The PRC-2090 is also being supplied as part of the mid- to long-range communications with the PRC-2091 mobile station and PRC-2092 base station systems. "Our HF and VHF systems are already used in this country and this contract will further enhance the existing systems they are using," said Barrett Communications CEO, Andrew Burt.

EMI receiver

Keysight's N9048B PXE electromagnetic interference (EMI) receiver and diagnostic signal analyser is designed to measure unwanted, high-frequency emissions generated by a device under test.

It is CISPR 16-1-1:2019 and MIL-STD-461G (2015) compliant and can support a frequency range of 2 Hz to 44 GHz.

It is designed to detect small signals close to the noise level common in electromagnetic compatibility (EMC) compliant radiated emissions measurements and has time domain scan (TDS) and accelerated TDS capabilities to meet dwell measurement requirements while reducing receiver scan and test time from hours to seconds.

It is also designed to have full signal visibility, where the real-time scan can provide gapless signal capture and analysis in up to 350 MHz bandwidth and simultaneously display the frequency domain, time domain and spectrogram, with three EMC detectors to help users better understand their signals.

Keysight Technologies Australia Pty Ltd
www.keysight.com

Leaky feeder power supply

The Helios Power Systems Leaky feeder power supply is a battery-backed, convection-cooled (no fans) power supply designed for harsh underground mining applications. With an input of 180–300 VAC, the unit is capable of handling transient spikes; it outputs 27.6 VDC for battery charging and 30 VDC for the leaky feeder. It features: battery circuit breakers, meters, remote monitoring via TCP/IP, active relays to turn loads on/off, email alerts and high operating temperature.

Helios' DC systems can be customised with: IP-rated and portable solutions, labelling, special terminations/connections, remote monitoring and control, N+X redundancy level, mounting and form factor, status signals and control, voltage adjustment (knob/pot), special input and multioutput options, and conformal coating.

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TCCA MARKS 25 YEARS OF OPEN STANDARDS WORK

The Critical Communications Association has marked a quarter-century of advancing critical communications through open standards and cooperation.

Twenty-five years ago, a group of stakeholders in critical communications gathered in Copenhagen to create and sign the TETRA Memorandum of Understanding (MoU). Those individuals and their companies became the founder members of the TETRA MoU Association, now known as TCCA, The Critical Communications Association.

Over those 25 years, TCCA has grown to become a global organisation, continuing to drive the development of TETRA technology through its TETRA Industry Group and ETSI, but also catalysing and leading the development of critical broadband 4G/LTE and 5G standards. This takes place through TCCA's Market Representation Partner status in 3GPP, support of the ETSI MCX (Mission Critical voice, data and video) Plugtests, and TCCA's Broadband Industry and Critical Broadband Working Groups (BIG and CCBG).

TCCA's core principle of open standards — the foundation for the success of TETRA — has remained since those first pioneers came together in 1994. The TETRA market was built on the unique Interoperability (IOP) Testing & Certification Process, developed and led by TCCA's Technical Forum (TF).

The first TF meeting was held at the UK Home Office in London in February 1999, and the first IOP certificates were published in November 1999. Twenty years later the TETRA IOP process continues its work in independent certification for critical communications.

TCCA's IOP process was developed to enable a truly open multivendor market for TETRA equipment and systems. This approach gives users clear benefits in terms of a wide portfolio of compatible equipment, competitive pricing and rapid development of new product models.

The IOP process also benefits industry by creating a wider accessible market, faster market take-up and greater potential for investment in new developments. TCCA's IOP testing is witnessed by an independent body, currently by ISCOM, part of the Italian Ministry of Communications.

TCCA is now working with partners such as the Global Certification Forum (GCF) to develop and implement a global MCX interoperability testing and certification regime, and works with an increasingly wide range of industry partners to advance critical communications worldwide.

25 years of excellence

Jeppe Jepsen is TCCA's board vice-chair, the Association's Director of Broadband Spectrum and Director of International Business Relations for Motorola Solutions. He was Director of TETRA at Motorola when the original MoU was signed, and has seen the association and the critical communications market develop first hand since 1994.

"Over these 25 years the association has expanded the market to all parts of the world and all sectors of PMR/LMR. TCCA has developed across the critical communications broadband ecosystem to become the place where user organisations and industry can debate and clarify their common issues, and to be the honest place to obtain and share information," he said.

"Through lobbying of governments and regulators we have gained international agreement on broadband spectrum for PPDR, and we have set out, and continue to drive, technology roadmap agreements across the demand and supply sectors."

Tony Gray, TCCA Chief Executive, underlines the importance of industry and user cooperation and the countless days of work put in by volunteers to develop stringent processes for the development of technical solutions.

"This 25th anniversary is another opportunity to publicly thank all our members, our partners and all supporters of excellence in critical communications," he said. "The impact that such a niche but crucial market has on the world's safety and security cannot be underestimated, and we are proud that TCCA is firmly embedded at the centre of developments."

Locally, the Australasian Critical Communications Forum (ACCF), formerly the Australasian TETRA and Critical Communications Forum is a chapter of TCCA. The ACCF (criticalcommsforum.com.au) advocates on

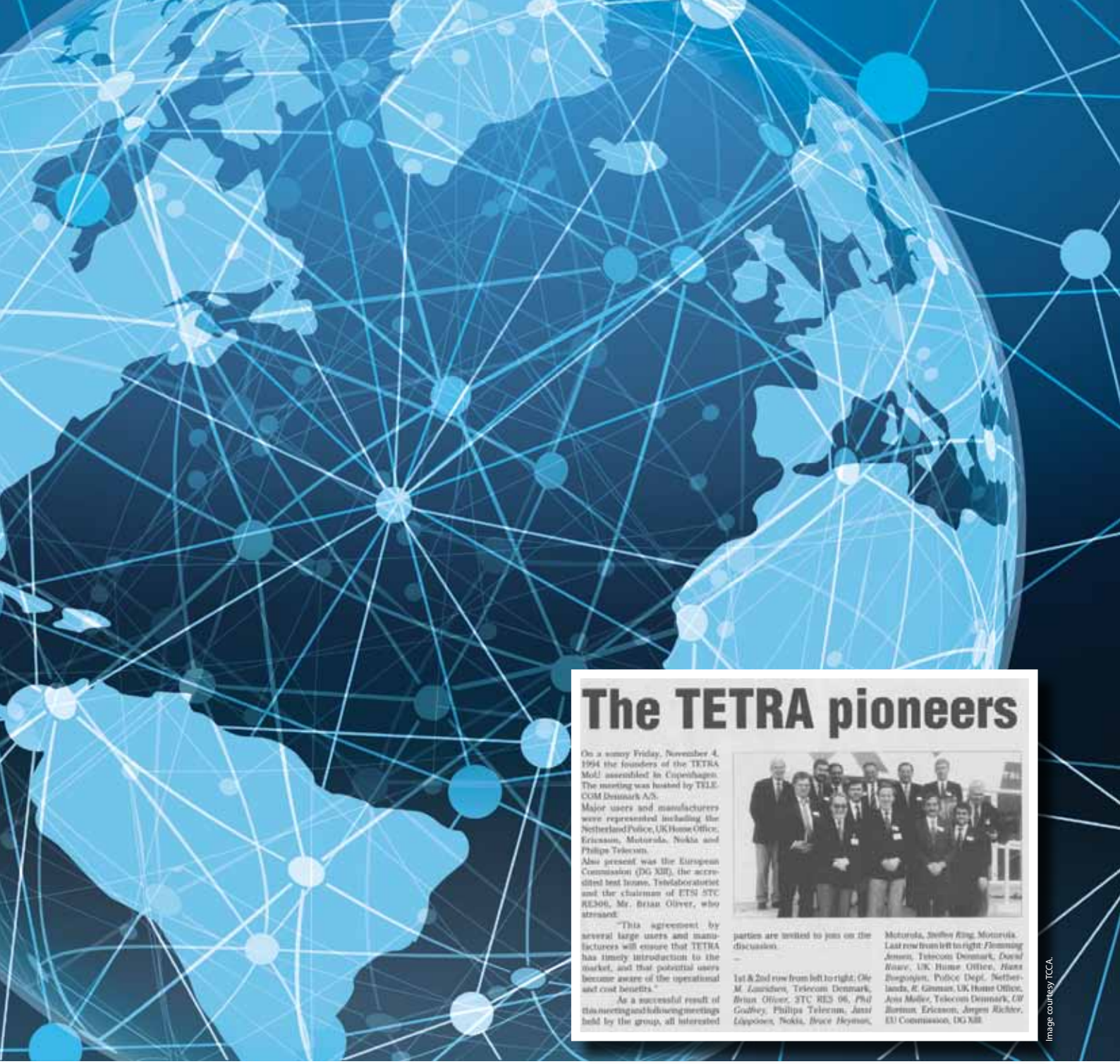

Image courtesy TCCA.

behalf of mission and business critical stakeholders in the Australasian region in respect to the development and establishment of global non-proprietary mission and business critical LMR and LTE Broadband standards, to ensure that stakeholder and professional user requirements are adequately addressed.

The importance of standards

Brian Murgatroyd, Chair of the ETSI TC TCCE (Technical Committee TETRA and Critical Communications Evolution), outlines the reasons why TETRA has been such a long-lasting success and the choice of critical communications users.

"TETRA was conceived at a time when there was a need to provide reliable, secure and inter-operable digital mobile radio services for professional users. This was made a reality by the development of an open standard of really high quality and detail," he said.

That open standard was produced by experts from several mobile radio companies and governments, devoting years of work and who foresaw the possibilities of a modern digital system that would offer many functions and services, said Murgatroyd.

"An open standard has ensured good competition between manufacturers, which has kept prices affordable and, most importantly, has encouraged continuous innovation," said Murgatroyd.

The TETRA standard first developed in the 1990s is still being improved today and is seen as having a long-term future well into the 2030s and beyond, according to Murgatroyd. It now comprises more than 130 separate technical specifications with more than 35 technical reports and guides.

"However, although a good standard is the basis of success, it could not have happened without the cooperation of users, operators and manufacturers, hence what is now called TCCA was conceived and has always had a very close connection to ETSI and the TETRA standard," said Murgatroyd.

"We are still developing the TETRA technology to ensure it will still be fit for purpose for the next 20 years, but we have extended our remit to cover developments of specifications for critical communications broadband services," he added.

"In particular, we are developing new interfaces to ensure successful interworking between TETRA networks and mission-critical broadband systems. We wish TCCA a great future for another 25 years."

The Critical Communications Association
https://tcca.info/

Radio Matters

The ethics of security locking of hardware. Modern LMR equipment allows for security locking of radio hardware with either password protection for reading and/or writing of the programming information, or with a secure encrypted key that prevents unauthorised programming access to the radio.

These are great features for securing a radio to protect programming information. These features can also increase the likelihood of a stolen radio turning up at an authorised agent for 'programming' if the person buying or selling the radio is unable to program it due to it being locked.

However, these features can also be used by radio dealers, service providers and network operators to control configuration of radios they supply, essentially limiting the customer's choices for ongoing service. Essentially, this prevents the owner of the hardware from having the device serviced or programmed by an alternative service agent or supplier (unless the password or security key is shared by the company/person who locked it). This is where the ethics of security locking come into discussion.

Customers purchasing radio terminals should be fully informed of the implications of locking the hardware, and consent should be confirmed as part of the supply. Written policy should also be developed, defining who holds and controls the keys, and how the customer can have their radio hardware unlocked if they do choose to use another supplier in the future. With some brands, if a security key is lost then even the supplier cannot circumvent the security, meaning that future updates or programming changes are not possible and the radio will no longer be serviceable.

Basic radio operation — what customers need to know. Common questions from customers when handling radios for the first time include: How do I use it? What does this button do? How long will the battery last? It's easy when you're in the industry and confronting these sorts of questions to think that people are having a laugh. But the reality is that if it doesn't have a touch screen or a keypad it's just a random piece of plastic, and how can the customer possibly get any value out of it?

The owner/manager or foreperson instantly sees the benefit of this technology; however, the worker potentially just sees the boss getting one over on them. Giving the group only a quick introduction to radios can result in fading out, unhelpful tangents and a belief that a simple thing is way too complex for the average worker.

However, once a user starts to operate the radio and they become comfortable in its operation then a whole new range of problems can arise — a little bit of knowledge and a whole lot of confidence can produce a dangerous situation. This situation is mostly produced by workers who have used radios in a previous role but may not necessarily know what the new system is capable of or how it actually operates.

Perceived coverage problems, operation problems and poor battery management result in the radios not living up to expectations and can result in fruitless hours of fault-finding. So it's well worth spending a few more minutes with the customer to convey some basic understanding of how radios work and the way the system is designed. Here are some of the things that can be covered:

- What is the difference between a simplex repeater and a network?
- What are the possible common problems that can be explained right from the beginning?
- How do the chargers work?
- What's the best way to hold a radio and where do you talk into?

There are a few good courses on the market. The one that instantly comes to mind is a marine radio operator's certificate. But now we're getting way over the top.

If this is sounding all too familiar then please let the RFUANZ Committee know; we may be able to develop a basic commercial radio operation course for users, which in turn will help your business.

Become an approved radio engineer or approved certifier. RFUANZ is very pleased to advise that RSM will be hosting a workshop on 5 May 2020, at the Lower Hutt Convention Centre. This will coincide with the Comms Connect conference and exhibition, being held at the same venue.

The workshop (duration approximately six hours) is designed to encourage RFUANZ members and newcomers into becoming approved radio certifiers. Should you have any questions or need to know more, please contact info@rsm.govt.nz.

Criteria for how to become an approved radio engineer or certifier can be found on the RSM website at https://www.rsm.govt.nz/engineers-and-examiners/how-to-become-an-approved-radio-engineer-or-certifier/

Corey Weir
Chairman, RFUANZ

RFUANZ
Radio Frequency Users Association of New Zealand

OpenRAN controller

Parallel Wireless has released what it says is the world's first All-G OpenRAN controller, providing a full, virtualised RAN controller solution for all technologies — 2G, 3G, 4G and soon, 5G. The carrier-grade, NFV/SDN-based, 3GPP-compliant RAN software delivers orchestration and policy features that manage the radio connection, mobility management, quality of service (QoS) management, edge services and end-user equipment interference management. It hides the underlying RAN complexity of each different technology and provides a simpler, open standard interface towards the respective core networks and radios.

Parallel Wireless has de-coupled the control plane and user plane so that each of the components can be located in different parts of the network, and has added built-in support for the open source Data Plane Development Kit (DPDK). The OpenRAN controller module virtualises vBSC/2G gateway, 3G gateway/vRNC, 4G gateway/X2 gateway and Wi-Fi gateway. The fully virtualised and scalable controller functionality supports the E2 interface and works with multi-vendor RAN.

Parallel Wireless Inc
www.parallelwireless.com

Dual-band antenna

RFI's CD30 series dual-band antenna is designed to support VHF and UHF multi-band radios — now commonplace in modern emergency vehicles.

Its PCB-based matching circuit is housed in a rugged, impact-resistant case and its base is designed to interface with standard SO-239 (MBC) mobile base mounts to facilitate existing installation upgrades on public safety vehicles.

The antenna is designed to be easy to install and comes pre-tuned.

RFI Technology Solutions
www.rfi.com.au

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COOPERATION IN COMMUNICATIONS

Ron Parks

Technology is only part of the communications equation — working together is even more important.

Across Arizona's Phoenix Metropolitan Region, the police, fire, EMS and other municipal services use a well-maintained and highly reliable state-of-the-art P25 trunked radio system. Formed in 2008, the Phoenix area Regional Wireless Cooperative (RWC) supports 19 member agencies, representing the majority of cities, towns and fire districts across the 'Valley of the Sun'. The cooperative provides governance, quality infrastructure and economy of scale, and freely shares interoperability resources with non-members.

Governance

The RWC is a cooperative body formed under intergovernmental agreements, with direction provided by a board of directors made up of one representative from each member and overseen by an executive director and staff. While the City of Phoenix serves as the administrative manager for administration, financial management and staffing, each

Images courtesy Chandler Police Department.

> ONE OF THE KEY ELEMENTS OF SUCCESS ACROSS THE PHOENIX REGION IS THE GOOD RELATIONSHIPS THAT ARE ENJOYED ACROSS AGENCIES BY BOTH MEMBERS AND NON-MEMBERS.

member from the smallest to the largest has an equal vote in the operations and governing of the cooperative.

Membership categories include full members, associate members (such as contracted ambulance services), conditional participants (not yet full members) and interoperability participants. Funding is provided through per-subscriber membership fees that are based on the number of subscribers in the system, assessed on an annual basis.

Interoperability

The RWC has created multiple interoperability talk groups in subscriber zones that are freely shared with both members and non-members for interoperable purposes when working with RWC member agencies.

These wide-area roaming talk groups are part of a standards-based regional plan that includes immediate tactical operations as well as groups reserved for planned-in-advance operations and events. These resources are shared with local, regional, state, federal and tribal entities throughout central Arizona and are in use on a daily basis.

Resources include both unencrypted and encrypted talk groups with interoperable encryption enabled by sharing of a single common AES-256 encryption key. All encryption is managed via over-the-air rekeying (OTAR) from a central server in Phoenix (primarily for members) with the key material also provided to any area system with their own key management server and OTAR capabilities.

Large-scale events such as the NFL Pro Bowl and Super Bowl XLIX in 2015, and the NCAA Final Four in 2017, to daily short-term tactical incidents, have proven the capabilities of both the RWC as well as the regional interoperability processes.

The PSAP intercommunications system

One of the most valuable interoperable resources in the Phoenix region is the public-safety answering point (PSAP) intercommunications system, often referred to as the 'PSAP Channel', which links all dispatch centres across the region (both members and non-members) in a 'party line' fashion.

The PSAP talk group is allowed only in dispatch centres, never for mobile or portable subscribers, and is used on a daily basis to request outside agency resources while also coordinating inter-agency communication and cooperation.

Technical details

The RWC system is a 700 MHz Phase I/FDMA system that is in the process of migrating to Phase II/TDMA. With coverage of more than 20,000 square kilometres and more than 4.5 million citizens (3+ million within the actual member jurisdictions), the system encompasses 15 cities and towns, four fire districts and a community college district, and supports 43 interoperable partners.

The Motorola Astro 25 infrastructure supports primarily Motorola subscribers and consoles in more than 20 dispatch centres, but also allows competitive vendors on the system, especially popular in general government applications.

The system infrastructure comprises 53 tower sites, seven simulcast cells, 975 simulcast channels and more than 200 dispatch consoles.

Currently there are 20,000 subscribers generating more than 73,000 calls per day with an average system availability (lack of 'busies') of 99.95%, with an additional 20,000 subscribers used by the interoperability participants.

In 2018 there were more than 28 million calls with only 131 busies, most of which went through on the second PTT.

Summary

The Phoenix area RWC system is a robust, well-maintained and highly reliable resource for day-to-day, mission-critical, life safety communications. The sharing of interoperability resources, supported by the Phoenix Urban Area Security Initiative (UASI) as a cooperative effort across all public safety entities in the region, continues to play a vital role in interagency cooperation.

One of the key elements of success across the Phoenix Region is the good relationships that are enjoyed across agencies by both members and non-members. While the RWC system embraces state-of-the-art technology, excellent operational and maintenance capabilities, excellent coverage for both local jurisdiction and wide area operations, it is this ability to come to the table and work together that is our most valued resource.

Ron Parks is Radio Communications Analyst with the Chandler Police Department.

NSW TELCO AUTHORITY PROGRAM UPDATE

An enhanced and expanded NSW Government Radio Network has proved itself a crucial tool during the state's bushfire response.

The NSW Telco Authority is a statutory agency within the Department of Customer Service, with a remit to provide communications services to emergency service personnel across the state so that they can work together to ensure community safety.

It is doing this by designing, commissioning and managing operational telecommunications services that support NSW Government agencies and communities, especially the Government Radio Network (GRN).

Six new clients were brought on to the GRN over the six months to December 2019 — St John Ambulance, Joint Military Police Unit, Place Management, Sydney Cricket Ground Trust, Australian Federal Police, and the Newborn and Paediatric Emergency Transport Service.

The Authority is currently involved in four major efforts: the Mobile Black Spot Program, the Regional Digital Connectivity (RDC) program, the Critical Communications Enhancement Program (CCEP) and public safety mobile broadband.

Mobile Black Spot Program

The NSW Government has committed more than $39 million to build at least 183 new or improved mobile base stations throughout the state. The program is delivered in partnership with the Australian Government and mobile network operators.

To date 167 sites have been built with 18,000 premises connected. This includes 650 kilometres of transport coverage across regional and metropolitan NSW. An additional 21 sites are to be completed by June 2021.

Regional Digital Connectivity

The RDC Program is part of the $50 million Connecting Country Communities Fund, which is investing in infrastructure to provide fast and reliable broadband internet access to regional communities in NSW. Delivered in partnership with the Department of Premier and Cabinet, it aims to enable the same digital connectivity in the regions that is available in metropolitan areas of the state.

Approval has been given to trial a proof-of-concept program in southern regional NSW. With an expected completion date of December 2025, more than 3800 premises will have improved connection.

Two preferred suppliers are in final stages of agreement (as of early December 2019) to proceed to the proof of concept. Contract finalisation and execution are expected to take place in the first quarter of 2020.

The funding will result in improved regional digital connectivity in the NSW towns of Royalla, Gundaroo, Collector, Gunning, Bungendore, Murrumbateman, Googong, Carwoola, Tarago, Michelago and Wallaroo.

Public safety mobile broadband

The federal, state and territory governments are working on plans for provision of a national public safety mobile broadband network for use by emergency services organisations and other providers of essential services. Before the system design and network architecture plans can be finalised, a proof of concept will be conducted to test proposed ideas. Following the issuance of an RFP to market, negotiations have begun with the preferred respondent to conduct the trial, which is expected to commence in perhaps the first half of 2020.

Critical Communications Enhancement Program

The CCEP is delivering an enhanced GRN to improve operational communications for law enforcement, emergency services organisations and essential service providers.

CCEP sites have been supporting bushfire efforts since September 2019, when unprecedented weather conditions resulted in widespread fires across northern NSW. This support increased throughout November and following the State of Emergency declared by the NSW Premier on 11 November, with 19 CCEP sites being fast-tracked and made available on 'best effort' capability for emergency services organisations.

In addition, there were 10 mobile cell-on-wheels deployments and six generator deployments.

During this time reliance on the GRN greatly increased, with overall network use up to 30% higher than normal.

As a result of the CCEP rollout to date, Rural Fire Service Operations are currently using the GRN for radiocommunications from Armidale to Forster — the first time this has been possible.

Critical Comms is grateful to the NSW Telco Authority for kindly providing the information conveyed in this update.

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RISING ABOVE THE FLOCK

Jonathan Nally

Connie Taylor is the winner of ARCIA's 2019 Jonathan Livingston Seagull Award.

A number of awards were presented to many worthy recipients during ARCIA's annual Gala Industry Dinner, but none was more of a crowd-pleaser than the presentation of the prestigious Jonathan Livingston Seagull Award to Connie Taylor. The award — which takes its name from the character in Richard Bach's book — recognises those who have 'risen above the flock' and selflessly given back to the community.

Connie has become the first female recipient. Here, we ask her about her career and what the award means to her.

How did you get into the comms industry?
A friend working at Motorola in Melbourne suggested I apply for a job that was internally advertised; in those days over 300 people worked in the factory at Mulgrave manufacturing radios. I joined the company as an admin support in both the Service Department and National Parts Department.

How has your career developed since then?
Fortunately Motorola was in growth mode and expanding, with many opportunities available to advance in the company as the culture was to always try and promote/train and give existing employees the best opportunity. From Service/NPD I moved to admin roles in sales, then marketing and eventually to executive admin, where I worked on major tender submissions whilst supporting the executive team. Working at Vertel after Motorola also played a big role in my career. My current role is with Simoco Wireless Solutions as Business Administrator, also helping with bid submissions!

What do you like most about your work?
The key aspects of my work that I enjoy the most are working with a professional group of people who deliver meaningful projects. Radiocommunications is of great value and makes a difference to those who use the systems. The people I work with make the role enjoyable and there is always something new happening that keeps the work interesting.

Who has helped you along the way?
Along the way I have been helped and supported by many people; each has given me opportunity to work in interesting and rewarding roles. Although there are too

Image courtesy Nigel Welch

Chris Kelly presenting ARCIA's Jonathan Livingston Seagull Award for 2019 to Connie Taylor.

many to name, I would like to thank Craig Ross; the life-long friends I made at Motorola and Vertel; and especially those at Simoco — Mike Norfield and Garry Mettner — who have been so supportive.

Tell us about your charitable work

The Ricky Taylor Foundation I am involved with supports teenagers who are undergoing cancer treatment. This is the in-between age, where the patients are not kids but are certainly not adults yet and require extra care and attention. Helping these young people is a passion I share with many friends and family. The RTF raises funds to provide extra support for the Monash Hospital AYA clinic. Hope to see you at one of our trivia nights soon!

What does it mean to you to receive the award?

Having attended many ARCIA Gala dinners and seeing past deserving recipients of the Jonathan Livingston Seagull Award, I am so honoured and privileged to be part of an elite group who contribute to and who have passion for our great industry.

Do you have any advice for others thinking of getting into the comms industry?

The radiocommunications industry has a unique, more family type culture. As the industry changes and evolves, perhaps the only advice would be to always support your team and treat everyone in your organisation with respect and dignity. From my experience, successful companies have a strong team culture that focuses on customers and meeting their needs. I have been fortunate to have worked with many teams and had fun, and together we have achieved some amazing outcomes.

Australian Radio Communications Industry Association
www.arcia.org.au

Distribution boards

APS Industrial's DB Ultimate distribution boards are designed for use in challenging and heavy-duty environments and for compatibility with Siemens' circuit breakers.

They come in a Rittal IP66/IK08-rated enclosure and feature a removable, one-piece gear tray assembly that can be set up and wired independently of the enclosure.

The distribution boards have removable gland plates and DIN rails at the top and bottom, a three-point locking system and dual earth neutral bars. They also have a removable hinged escutcheon and door, as well as a continuously poured door seal and a semi-flush Rittal swing handle.

APS Industrial

www.apsindustrial.com.au

Critical messaging system

i-keytec's Fusion Pro critical messaging system is a self-contained embedded network device that can operate without external PCs or software.

The device — which comes in a ready-to-install 2RU rack chassis — can monitor on-site systems such as fire and security alarms, programmable logic controllers, toxic gas sensors, building management, access control, patient monitoring and IT networks, and automatically distribute alerts to the appropriate personnel as critical events occur.

The device also has real-time two-way messaging to wired and wireless devices, including smartphone push notifications; 4G text messaging; email; Wi-Fi; digital enhanced cordless telecommunications or walkie-talkie handsets; low-cost pagers; and LED signs.

i-keytec

www.fusionseries.com

FACE OF THE FUTURE WORKFORCE

Jonathan Nally

In an industry desperately in need of new blood, Justin Lenkovic is showing the value of engaging young people through apprenticeships.

Image courtesy Nigel Welch.

One of the highlights of ARCIA's 2019 Gala Industry Dinner and awards night was the presentation of awards to two apprentices, Mitchell Reid and Justin Lenkovic. Mitchell wasn't able to be present on the night but Justin was, and he won everyone's hearts and minds with his enthusiasm and his impassioned plea for all companies in the comms industry to take on apprentices such as himself.

Justin is an apprentice with Karera, a provider and integrator of radiocommunications systems and related infrastructure. In this Q&A, we ask him about his background, his experiences as an apprentice and where he wants to go with his career.

Why did you decide to become an apprentice in the comms industry?

The decision to commence an apprenticeship within the comms industry was the result of a few factors. It began with no interest in radio but a high interest in consumer electronics and advancements in technologies. My interest in comms was then sparked by a well-executed promotion made by ARCIA at a careers expo I attended. I then went on to seek out and complete one week of work experience with Karera, after which an apprenticeship was offered.

Working in the comms industry stood out from a long list of other jobs that seemed to be boring and monotonous with little to no room for true progression or fulfilment. A lot of personal research and my week's work experience at Karera confirmed that comms can indeed offer to a lot of variation, knowledge and both individual and whole industry progression.

Tell us about the kind of work you're doing

I work for Karera Communications at their NSW Central Coast facility, where I work with a team of individuals with knowledge and experiences that cover the many facets of comms and beyond. Each of my co-workers has valuable knowledge that spans a wide range of areas. More importantly, everyone is friendly, approachable and contributes to creating a fun and energetic environment.

My work involves repairing, testing, programming, building and installing all kinds of communications equipment for a plethora of customers, each requiring drastically different implementations of communication networks. I also get the opportunity to work with our rigging team, which does all the 'heavy lifting' at Karera. I am eager to further my involvement throughout the second year of my apprenticeship.

Does your apprenticeship have an academic component?

Yes. I am currently studying a Certificate III in Electronics and Communication with TAFE NSW; I attend TAFE once per week for eight hours of theory and practical training. The typical lesson will focus on theory throughout most of the day, which consists mainly of mathematical calculations and learning what their specific application is for. The practical component of a typical lesson is used to visualise and relate theoretical concepts to real-world applications and to grasp a deeper understanding of what has been learned.

What sort of things have you learned so far?

At TAFE, thus far I have learnt what different components do, their application and how to identify them and their values; leaded and lead-free soldering techniques and applications; and the relationship between components and how their values and their configuration affect voltage, resistance, current, charge, capacitance, time constants and power. I have learned how these rules must be treated differently when alternating current is supplied and how voltage can be further broken down and reactance of components emerge. I've learned about sinusoidal waveforms, their frequencies and wavelengths and their importance in finding the resonance of circuits and in creating filters.

This is an extremely small snippet of the things I have learned, and excludes a huge portion of the skills and concepts I have learned at work.

What do you like most about your work?

The thing I like most would be the variation — the excellent blend of in-the-workshop tasks, out-in-the-field jobs and the constant shift in scale keeps thing fresh and interesting. Variation allows for a shift in mindset with varying levels of mental and physical demands while teaching you to quickly change your main focus.

Do you have a specialist field in mind for the future?

I currently have no specific communication field in mind for my future, nor am I looking for one. I simply focus on outputting a high level of effort in any given tasks and to make sure not to shy away from any new challenges or areas of interest. There are areas that I believe will not be of preference in the future, although it is still early days.

> "WORKING IN THE COMMS INDUSTRY STOOD OUT FROM A LONG LIST OF OTHER JOBS THAT SEEMED TO BE BORING AND MONOTONOUS WITH LITTLE TO NO ROOM FOR TRUE PROGRESSION OR FULFILMENT."
> — JUSTIN LENKOVIC

Who has helped you along the way?

It was my dad in the first place; he insisted we attend the careers night that ultimately introduced me to the comms industry, so I am thankful for that. Many of the staff at Karera have helped me massively along the way both with technical understanding and with overall personal growth. I am shown support through mistakes and am constructively criticised to help hone my skillset. My teacher at TAFE has also helped me to sustain high motivation during study — he is passionate about the industry and pushes his students so they can achieve high results.

What does it mean to be recognised by ARCIA?

It confirms that I am applying my effort successfully at work and I feel a lot of satisfaction and fulfilment to have that recognised. I am also extremely humbled that any of my co-workers would have the inclination to nominate me. I think it is also very impressive that ARCIA is able to successfully bring together such an industry and recognise individuals working within it; recognition is very important and it has only strengthened my enthusiasm and motivation to want to succeed.

Do you have any advice for others who are thinking of getting into the comms industry?

I recommend it. I have had a very positive experience so far and there is no reason for that to change in the future. There is a lot to learn, so the earlier anyone can start in the industry the better. If you are unsure whether this is the right career path for you, seek out some work experience or simply talk directly with industry participants about what's involved. The industry is still young and has plenty of innovation left for the future.

Karera Communications
www.karera.com

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Remote speaker microphone cradle

Stone Mountain TruDock cradles provide rugged mounting and charging applications for BluSkye Bluetooth remote speaker microphones.

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Five-bay charger assemblies are also available, allowing gang charging of up to 30 RSMs from one power point.

BluSkye

www.bluskyersm.com.au

Videoscope

The Olympus IPLEX RT 7.5 Videoscope, available for rent through TechRentals, is designed for the visual inspection of heat exchangers, turbines, gearboxes, automotive parts, aircraft and other industrial machinery. It is lightweight while equipped with a 6.5″ monitor.

The unit offers high resolution with its bright and sharp image quality. The videoscope features the new LED illumination system that is designed to be twice as bright as conventional videoscopes. Together with its PulsarPic, the amount of light is optimised to provide clear and defined results.

Inspectors can operate the unit via the menu icons. Its In-Help Inspection Assist Software is designed to improve work efficiency by streamlining remote visual inspections.

TechRentals

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Antenna arrays

ZCG's omnidirectional air band, VHF or UHF binary and elliptical dipole arrays are engineered and designed for customers who are restricted by physical space but require maximised performance. The range of DVA and DUA dipole arrays is suitable for these conditions.

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The omnidirectional or elliptical dipole arrays are constructed in either corrosion-resistant marine-grade aluminium or 304 stainless steel or, on request, 316 stainless steel.

The product comes in a two-piece design, making it cheaper to freight and less likely to be damaged in transit to remote sites.

ZCG Scalar

www.zcg.com.au

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5G CALL CONNECTS CONTINENTS

Dynamic spectrum sharing was used to test a trans-global data call across commercial 5G networks.

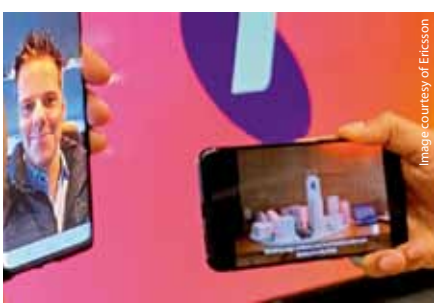


Image courtesy of Ericsson

OPPO devices used to make a 5G data call between Switzerland and Australia.

Ericsson announced the reaching of the next milestone of its Spectrum Sharing technology journey in early December, having added a 5G OPPO smartphone to its 5G ecosystem and testing it via a trans-global 5G data call across live commercial 5G networks, including that of Telstra.

The 29 November data call connected Bern, Switzerland, with Australia's Gold Coast, with Ericsson's Spectrum Sharing deployed in Swisscom and Telstra's commercial 5G networks.

The data call was made using spectrum sharing on a 3GPP FDD band and employed pre-commercial release OPPO 5G smartphones powered by the Qualcomm Snapdragon X55 5G Modem-RF System.

According to Ericsson, OPPO is the first 5G device manufacturer using Ericsson's Spectrum Sharing in its smartphones.

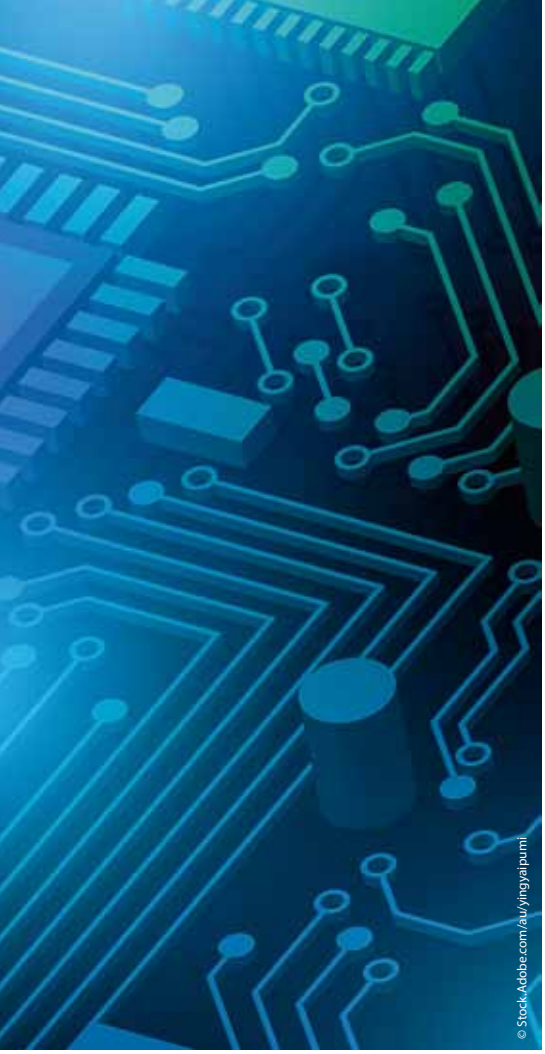
Spectrum Sharing, part of the Ericsson Radio System, is a dynamic spectrum sharing solution based on the 3GPP standard with additional intelligent scheduler algorithms. It enables the deployment of both 4G and 5G in the same band through a software upgrade, and dynamically allocates spectrum based on user demand.

The switch between 4G and 5G carriers happens within milliseconds, minimising spectrum wastage and enabling best possible user performance.

According to Ericsson, the development "will enable service providers to quickly launch 5G services over a wide area and successively expand 5G coverage in a tailored way by re-using existing network infrastructure and taking advantage of previous spectrum investments".

"With this milestone achieved with our 5G ecosystem partners OPPO, Qualcomm Technologies and customers Swisscom and Telstra, we've shown that our unique solution will not only enable service providers to re-use their 4G spectrum assets for 5G but that it will also support all 5G devices," said Fredrik Jejdling, Executive Vice President and Head of Networks Ericsson.

"It is the most economically feasible way to launch 5G on existing bands, enabling nationwide 5G coverage and helping make 5G accessible around the world."



> "THIS COLLECTIVE IMPLEMENTATION IS YET ANOTHER INNOVATIVE EXAMPLE OF HOW 5G TECHNOLOGY CONTINUES TO ADVANCE IN A RAPID FASHION." — CHANNA SENEVIRATNE, TELSTRA

Channa Seneviratne, Network and Engineering Infrastructure Executive, Telstra, said, "This latest collaboration of industry partners is paving the way for the faster rollout of 5G by using existing spectrum holdings to serve the needs of 4G and 5G customers in the same location at the same time.

"This collective implementation is yet another innovative example of how 5G technology continues to advance in a rapid fashion, and at Telstra we are pleased to bring that latest technology to Australians first," he added.

Telstra, with Ericsson as a key network partner, went live with 5G commercial services and four 5G devices in May 2019 on the 3.6 GHz band. Telstra now offers six 5G devices and has some 5G sites in 25 metro and regional cities around Australia, with another 10 cities to be added by 30 June 2020.

"We are very excited to reach yet another 5G milestone with our partners," said Christoph Aeschlimann, Member of the Executive Board and Head of IT, Network & Infrastructure, Swisscom.

"The first international end-to-end Ericsson Dynamic Spectrum Sharing call is the next step in our 5G journey. It was only possible with a well-experienced team of provider, vendor, chipset and handset maker with a proven 5G track record."

Swisscom, with Ericsson as its sole 5G vendor, was the first communications service provider in Europe to launch commercial 5G services in April 2019 on the 3.6 GHz band. Swisscom is targeting 90% population coverage by the end of 2019.

Ericsson Australia Pty Ltd
www.ericsson.com/au

2019 INDUSTRY AWARDS WINNERS

Jonathan Nally

ARCIA President Hamish Duff at the lectern during proceedings.

The recipients of the ARCIA 2019 Industry Awards were announced at the organisation's annual gala dinner in November. Presented every year, the Awards recognise achievements in a number of categories, some relating to recent accomplishments and others acknowledging a lifetime of work. Members of the industry are encouraged to nominate their peers, from which shortlists are devised and final selections are made by a panel of judges.

Hisham Kubaisi

The **Technical Excellence Award** was presented to Hisham Kubaisi of Telechnics, Sydney. As part of the company's projects and systems team, Hisham is often tasked with responding at short notice to complete on-site repairs and work within clients' time constraints, which are often out of hours.

Andrew McGuiness

The **Customer Service Award** was presented to Andrew McGuiness of AA Radio Services, Melbourne. For the past 24 months, Andrew has ensured that all service KPIs and SLAs have been met for Victoria's Emergency Services. He manages a team of six technicians who provide a rapid response and restoration service for the emergency service organisations.

Johan Svean

The **Professional Sales Award** was presented to Johan Svean of STI Engineering, Perth. Johan has spent his entire professional life working for STI Engineering, starting out in marketing and technical support in 2006 after graduating with a master's degree from the University of New South Wales. Johan has wide experience in wireless communications manufacturing for Australian and export markets.

Ranjan Bhagat, accepting Nick Barratt's award on his behalf.

The **Engineering Elegance Award** was presented to Nick Barratt of Zetron Australasia, Brisbane. Nick is a senior digital gateway software engineer based at Zetron's Brisbane R&D facility, who led a team of Australian engineers developing a radio workload manager for Zetron's Command and Control radio dispatch system. Nick's innovative design has resulted in the solution being successfully deployed for customers in the USA.

Images courtesy Nigel Welch

Stephen Bigg

Every year, each of the winners of the five regional Industry Professional of the Year Awards are eligible for the national Industry Professional of the Year Award, also known as the Peter Wallace Award. Peter Wallace was a long-time member of the radio industry in Victoria and worked with every major supplier and user group in developing and extending the use of communications.

The 2019 national **Industry Professional of the Year Award** was presented to Stephen Bigg of the South Australian Ambulance Service, for his work over many years in providing support and planning for the Service's communications needs. Stephen had been awarded South Australian ARCIA Industry Professional of the Year earlier in 2019.

Fraser Hutchinson

The **New Talent Award** was presented to Fraser Hutchinson of Motorola Solutions, Melbourne. Fraser entered the industry last year straight from university via the first Motorola Solutions Sales Graduate program intake. He quickly demonstrated his enthusiasm, passion, drive, presentation skills and ability to deliver, and has been instrumental in helping to launch new products.

David Cox

The recipient of the **Community Service Award** was David Cox. David uses the joy of music to help military veterans struggling with post-traumatic stress disorder, through an organisation he established in 2017 called Guitars for Vets Australia. David collects donated guitars and matches veterans with qualified instructors who donate their time with a 10-lesson plan. David loves music and, being a vet himself, this organisation means a lot to him and to those closest to him.

Justin Lenkovic

There were two presentations of the **Apprentice Trainee Award**, the recipients being Mitchell Reid and Justin Lenkovic.

Mitchell, who wasn't able to be present on the night, has been employed by Telechnics as an apprentice since 2017, and has become a valuable member of the service and systems team. He has completed more than 80% of his Certificate III in Electronics and Communications with an average pass mark of over 90%. He has a very high level of computer skills, which have enabled him to program and configure complex radiocommunication systems with little or no assistance from the senior systems team.

As a first-year apprentice with Karera Pty Ltd, Justin Lenkovic has shown a huge commitment to both his studies and daily work. He is willing and eager to learn various aspects of the industry and he takes on whatever task is thrown at him with a can-do attitude. His assistance at the ARCIA apprentice expo was admirable, as he was willing to talk to students and parents alike to promote the industry. Accepting his award on the night, Justin prompted a resounding round of applause with his plea for every company to take on an apprentice in order to strengthen the industry's talent pool.

Life membership was granted to Anthony Blythe from Tait, a very popular choice. Anthony wasn't able to be at the dinner to accept the honour, so a special presentation will be made at the ARCIA planning day in Brisbane next year.

Connie Taylor

The final formal event of the evening was the presentation of the prestigious **Jonathan Livingston Award**, which recognises, service, loyalty, respect and leadership. The recipient for 2019 was Connie Taylor. Connie, like many in the industry, joined very young and started working in the spare parts department at Motorola Australia in the early 1980s. Connie worked hard and became the executive administrator to senior teams at Motorola. By the early 1990s the idea of government radio networks was taking off, and Connie coordinated Motorola's early bid submissions and became the go-to person for tender responses. She put in long days and nights while never seeking additional compensation, but knowing that her efforts would help change the landscape of the market and the role of radio in Australia.

Joining Vertel, she again took responsibility beyond her role as the centre pin for the company's Victorian sales and service operation. And now she is executive administrator for UK/Australia Simoco operations, a role she has held for nearly 10 years.

Over and above the commitment to her roles and professional approach to the industry, it has been what she has quietly achieved behind the scenes that has set her apart. Connie willingly coordinated ARCIA's first professional response to the ACMA when the Association was just a fledgling, putting together a kind of response never seen before from our industry. The ACMA took notice, seeing a professional, consolidated industry.

What also sets Connie apart is her respect and support for colleagues and her ability to always consider the quiet workers within a company. She would regularly organise BBQs for the technicians and storespeople as a thankyou, often under her own steam, knowing that it is these largely unrecognised team members who work to help customers and get results.

Finally, after hours and on weekends, Connie also manages a not-for-profit organisation that supports teenagers undergoing cancer treatment at the AYA Clinic at the Monash Medical Centre. They have already raised more than $100,000 to pay for carers and aids for the patients.

All of this has made Connie Taylor a most worthy recipient of the Jonathan Livingston Award for 2019.

Australian Radio Communications Industry Association
www.arcia.org.au

Backhaul

Take a trip down memory lane as we look at what was happening in the comms sector of yesteryear.

25 YEARS AGO. The cover of the February/March 1995 issue of *What's New in Radio Communications* featured the Philips PRP80 dual-mode portable radio and the PRM8040 dual-mode alpha head, both of which had been built to work with analog PMR as well as MPT 1327/1343 wide area trunking systems. Inside the magazine we reported on a team comprising GEC-Marconi and Telecom Australia winning a multimillion-dollar contract to refurbish the RAAF's HF network, and separately, Stanilite Electronics winning a $1 million contract to design, supply and install a distributed antenna system for the RAN's receiving station at Shoal Bay in the Northern Territory. Speaking of Stanilite, the company's joint managing director, John Harriss, was quoted in this issue as saying that Australia had the potential to take a leading role in radio and telecommunications, but warned of a "dire shortage" of experienced and creative engineers that could be alleviated by companies taking more responsibility for training. Finally, we had a major feature article on the Jindalee Operational Radar Network, the antenna system for which was beginning to take shape in early 1995.

10 YEARS AGO. The cover of the January/February 2010 issue of *Radio Comms Asia-Pacific* featured Codan's 3040 automatic HF whip antenna which, with a 70% reduction in height from its predecessor (the 9350), made it compliant with Australian Design Rules for vehicle bumper mounting. Inside this issue we reported on "Australia's latest company handling public safety and emergency communications networks", Airwave, which introduced its portfolio of products at the Radio Comms Connect exhibition and conference in Melbourne. We also reported on an RF and microwave electronic engineering course, run by AWR and James Cook University's School of Engineering and Physical Sciences, being made available free of charge to other universities around the world. The course had been developed by Associate Professor Keith Kikkert.

Spectrum

The 5G era must be mission-critical and secure by design

During my 'Critical Communications all the way to the Edge' keynote presentation at November's Comms Connect Melbourne, I didn't really have the opportunity to emphasise the absolutely massive and fundamental role that critical communications will play in the rapidly approaching 5G era, which itself will lead to highly disruptive digital transformation of societies and economies.

The latest generation of cellular architectures are being redesigned to take advantage of rapid advances in global IT data centre, cloud computing and storage facilities — now extended to the networking domain via such foundational frameworks as SDN, NFV and emerging network slicing techniques. This increased complexity leads to larger attack surfaces and new vulnerabilities that need to be dealt with at all stages of the extended 5G value chain.

Due to the diligent, highly professional, dedicated work of hundreds, perhaps thousands of industry experts working closely together for 3GPP and related national, regional and global SDOs, the 5G suite of technologies and solutions incorporate many new network security, confidentiality, integrity and availability procedures into the basic design and implementation phases. However, in the real world, bad actors still roam, networks can still be misconfigured, humans are still vulnerable and prone to errors and not all service activation and monitoring will be able to be fully automated for the foreseeable future.

Governments, equipment vendors, service providers and enterprises are becoming increasingly aware that the success of 5G depends on the development of an enhanced security framework that builds on the efforts of previous generations. They're also learning from the best practices of critical communications providers and users, who joined the 3GPP effort back in Release 11/12, building a mission-critical application layer on top of LTE network infrastructure. Now it is time to build a fully mission-critical, secure-by-design solution that will protect the increasingly valuable assets of a full 5G world.

At the 3GPP Plenary in Spain in December — #86, to move Release 16 (5G Phase 2) towards its completion and start work on Release 17 — there was a heavy focus on mission-critical verticals such as connected/autonomous vehicles, fully automated factories, eHealth and UAVs, as well as further enhancements to mission-critical services used by emergency services, utilities and transport. It is now clear just how far both the commercial and critical communications communities have come on their respective journeys.

In a future where everyone and everything will be connected, and practically all imaginable services will be delivered to some degree over next-generation digital platforms, the enormous value of such services and the dependency of entire sectors, economies and societies on 5G means that it must be mission-critical by nature and secure by design. Attackers will target the weakest link in the network, the lowest priority network slice; poorly configured, legacy interfaces, protocols and APIs that could potentially open up entire nationwide networks to catastrophic attacks.

Such a world will require entirely new value systems; radically new legal, regulatory and financial frameworks; a new social contract. Collaboration on a global scale will become a necessity. Are we ready to take up such an enormous challenge? Only time will tell, but increased, mutual cooperation and collaboration — out of necessity — offer the hope that future generations will find the solutions that have so far evaded us to create a better, smarter, safer world for all. Failure is not an option!

Peter Clemons is Chief Innovator at Quixoticity and a former director and board member of TCCA. His current focus is on 5G through membership of the 3GPP and ETSI.

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