JAN/FEB 2019 Vol.6 No.2

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Hytera LTE-PMR Convergence Solution

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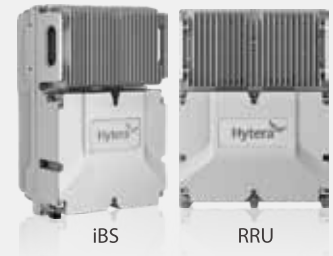

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RRU

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iMesh P

LTE Rapid Deployment System

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Inside

Jan/Feb 2019

ON THE COVER

Zetron's Integrated Command and Control Systems are deployed in numerous public safety, defence, transportation, utilities and resource markets in all corners of the globe. With more than 35,000 operator positions installed worldwide, Zetron's experience and expertise in mission-critical control room communications is second to none.

Zetron's ACOM Command & Control provides control centre operators 'the power to respond,' bringing both voice and data communication to enable enhanced situational awareness and rapid emergency response. The company's command and control solutions are designed at their core to support the multiple connection standards, manufacturers and devices of today and tomorrow, ensuring readiness for mobile devices, the Internet of Things, social media and other data apps that are becoming more mainstream.

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Zetron Australasia Pty Ltd
www.zetron.com

Transmit

By near-universal acclamation, last November's Comms Connect Melbourne was definitely the best ever. The speaker, workshop and panel program was a huge success, and the exhibition floor was absolutely buzzing, particularly on the first day. There were many international guests, including a large contingent from Finland making up the first ever Comms Connect foreign country pavilion. I had a great time as usual, getting around and meeting lots of industry experts from both near and far. I look to catching up with them again at the next Melbourne event (26–28 November), and also in Auckland (1–2 May), Sydney (12–13 June), Perth (28 March) and Brisbane (July).

By the time you read this, hopefully there should be have been some more information released about plans for an Australian PSMB network. Not much was revealed at Comms Connect Melbourne, other than to 'watch this space' around the beginning of the new year. PSMB will be such a vital and important part of Australia's national critical infrastructure, and we can only hope that — as we have been assured — the nation's governments are taking it very seriously and are working together to achieve the best possible outcome.

Meanwhile, other countries are proceeding at speed with their own public safety mobile broadband networks. They are all at various stages of development, with the USA's FirstNet a clear leader. Have a read of Peter Clemons's article in this issue, as he presents the second annual iteration of the Quixoticity Index of international communications readiness. It makes for very interesting reading, particularly the way certain countries have risen or fallen in the ranks among their peers.

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

March

Critical Communications Europe 2019
12–13 March
Ricoh Arena, UK
critical-communications-world.com

May

Comms Connect Auckland 2019
1–2 May
SKYCITY Auckland
comms-connect.co.nz

Critical Communications World 2019
18–20 May
Kuala Lumpur, Malaysia
critical-communications-world.com

June

Australian and New Zealand Disaster and Emergency Management Conference 2019
12–13 June
RACV Royal Pines Resort, Gold Coast
anzdmc.com.au

Comms Connect Sydney 2019
14–15 June
Rosehill Gardens, Rosehill
comms-connect.com.au

August

AFAC19
27–30 August
MCEC, Melbourne
afacconference.com.au/afac19-powered-by-interschutz/

November

Comms Connect Melbourne 2019
20–22 November
Melbourne Convention & Exhibition Centre
comms-connect.com.au

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

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NANOSATS TO CONNECT THE GLOBE

Fleet Space Technologies' Chief Executive, Flavia Tata Nardini.

Australian and foreign firms are racing to launch fleets of satellites that will provide global connectivity for the IoT age.

On the afternoon of 11 November 2018, an Electron launch vehicle, built by space industry start-up Rocket Lab, lifted off from Launch Complex 1 on New Zealand's Mahia Peninsula. Aboard were seven CubeSats, including two owned by Fleet Space Technologies that will form the foundation of a global IoT communications constellation.

The two 'Proxima' satellites are intended to be the first of a fleet of small, low-cost satellites that will provide internet connectivity for millions of sensor devices based in remote locations.

Proxima I and II were designed and built by Fleet, an Australian company, and mark the first commercial tests of the firm's software-defined radios, which will enable it to transmit data efficiently across both S-band and L-band frequencies in space.

The CubeSats will ultimately help form the beginning of a constellation of more than 100 nanosatellites that, together, will act as a dedicated IoT space network. Fleet's larger Centauri satellites are set to be launched aboard other launch vehicles at later dates.

"To see our first commercial CubeSats launched is an incredibly important milestone for us as a business, and it sets us on the path to achieving our goal of connecting Australia, and the world, in ways like never before," said Fleet Space Technologies' Chief Executive, Flavia Tata Nardini.

The ACMA has licensed Fleet to perform satellite telemetry, tracking and command, and payload data reception across S-band and L-band frequencies. The launches of Proxima I and II also enable the company to test longwave and shortwave band frequencies.

When combined with Fleet's ground terminal, the Portal, Fleet's constellation will enable satellite connectivity in remote industries where cellular networks are not present.

The Portal enables businesses to connect up to 1000 devices to private, secure LP-WANs anywhere around the world, at a fraction of the cost of traditional satellite systems. According to Fleet, unlike other IoT gateways, the Portal goes beyond simple data collection and uses embedded edge computing-based software to analyse and select key, targeted data for secure transmission over an array of satellite service options, including Fleet's own satellites. The company says that this approach means the use of IoT in remote industries is now more achievable, enabling data-driven decisions that improve productivity and efficiency across a range of industries, including mining, logistics and agriculture.

Fleet was founded in South Australia in 2015 by Nardini and fellow aerospace engineers Dr Matthew Tetlow and Matt Pearson. The company is backed by Blackbird Ventures, Mike Cannon-Brookes' Grok Ventures, Horizon Partners and the South Australian Government.

Equatorial constellation

In related news, Sky and Space Global Ltd, a UK company listed on the Australian Stock Exchange, has completed the critical design review (CDR) of its Pearls nanosatellite design and is now proceeding with assembly and integration.

The company aims to deploy a constellation of 200 nanosatellites over Earth's equatorial belt. The network will provide around-the-clock affordable voice, data, instant messaging, M2M and IoT communications.

Images courtesy Fleet Space Technologies and Rocket Lab.

A Rocket Lab Electron launch vehicle on the launch pad at Launch Complex 1 on New Zealand's Mahia Peninsula.

AUSTRALIAN AND FOREIGN FIRMS ARE RACING TO LAUNCH FLEETS OF SATELLITES THAT WILL PROVIDE GLOBAL CONNECTIVITY FOR THE IoT AGE.

The first launch remains on track for 2019, with the entire constellation to be in orbit in 2020.

According to SAS, its services will bring to the equatorial region a wide range of life-saving and other services, including search and rescue, disaster management, emergency response, security alarms and recreational tracking. This is in addition to many other services including mobile phone applications; offshore communications; smart farming; interactive TV; aircraft, vessel and animal tracking; water and electric metering; and grid monitoring.

The CDR process assesses all technical components including schedule, overall design, altitude control performance and system budgets (mass, power and link) to ensure each part is of the highest quality and meets the required standard to progress to the construction phase.

Satellite broadband

Not to be outdone, Elon Musk's SpaceX has received approval to expand its planned constellation of low- and mid-Earth orbit broadband communications satellites. In March 2018, the Federal Communications Commission (FCC) gave approval for SpaceX to "construct, deploy, and operate a constellation of 4425 non-geostationary orbit ('NGSO') satellites using Ku- and Ka-band spectrum". Subsequently, the company applied for and was granted permission to change the proposed orbits of 1584 satellites of the satellites from an altitude of 1150 kilometres down to 550 kilometres.

Then, on 15 November 2018, SpaceX was granted approval by the FCC to increase the number of satellites by 7518, for a total of 11,943. The Commission also granted the company's request to add the 37.5–42.0 GHz, and 47.2–50.2 GHz frequency bands to its previous authorisation.

"The company will utilise key elements from its experimental satellites, such as its sophisticated phased-array antennas and its advanced Hall-effect thrusters, as the foundation of a more efficient and cost-effective architecture that can rapidly accelerate deployment for the overall constellation while optimising space safety," SpaceX said in a filing with the FCC. "This architecture will support commencement of service as soon as possible, allowing SpaceX to quickly employ valuable spectrum and orbital resources for meaningful services."

At the same time, the FCC approved requests by Kepler Communications (140 satellites), Telesat Canada (117) and LeoSat (78) to "access the United States market to provide broadband services using satellite technology that holds promise to expand Internet access, particularly in remote and rural areas across the country".

"With today's actions, the FCC has granted 13 market access requests and satellite applications to nine companies for NGSO FSS constellations seeking authority to provide next-generation connectivity across the country in the past 18 months. The Commission continues to process additional requests," an FCC statement said.

Commenting on the proposals, the FCC's Chairman, Ajit Pai, said that "what they all have in common is the promise of variety in the burgeoning field of non-geostationary satellite services and innovative solutions to bridging the digital divide".

"From providing high-speed broadband services in remote areas to offering global connectivity to the Internet of Things through 'routers in space' for data backhaul, I'm excited to see what services these proposed constellations have to offer. Our approach to these applications reflects this Commission's fundamental approach: encourage the private sector to invest and innovate…" he added.

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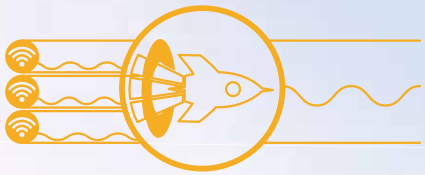

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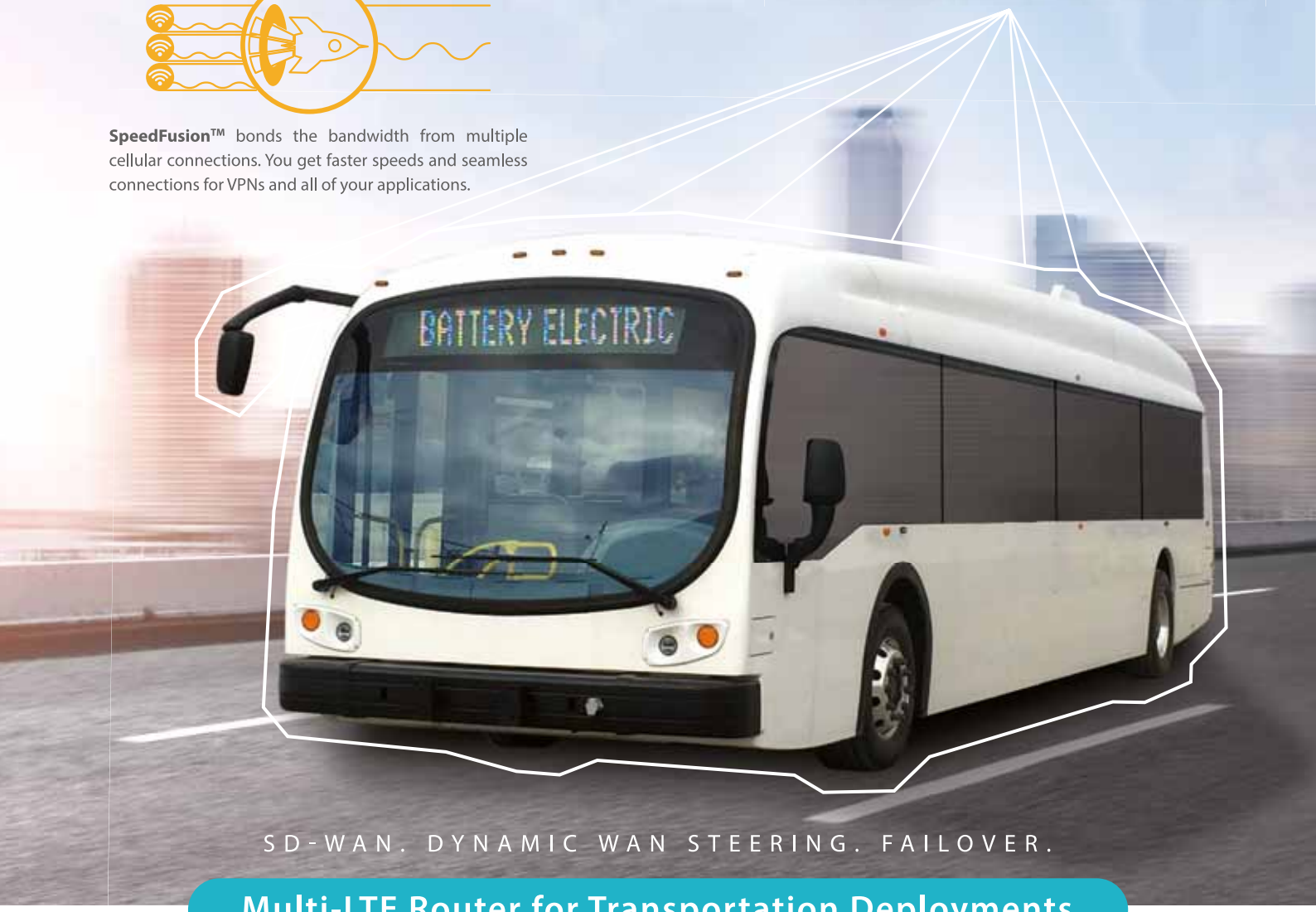

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News

ONESKY HITS KEY MILESTONES

Air traffic management (ATM) service facilities in Sydney, Melbourne and Perth have switched over to the civil military ATM (CMATS) voice communication system. "The new CMATS voice communications system enables greater efficiency of our air traffic resources, enhances safety outcomes and minimises service disruptions," said Airservices Chief Executive Officer Jason Harfield. "These benefits will be experienced by all users of Australian airspace, from the major airlines and their passengers

right through to the smallest ultralight aircraft." The Airservices and Defence project team worked with operational staff and industry partners Thales Australia and Frequentis to ensure a seamless transition to the system.
More info: bit.ly/2Gbmyft

UPGRADED EMERGENCY COMMS FOR RNSH

A government radio network site has been installed at Royal North Shore Hospital by the NSW Telco Authority. NSW Telco Authority Managing Director Kate Foy said network coverage had been impacted over time due to the expansion of the hospital and the growth of the North Sydney CBD nearby. "These improvements deliver significantly enhanced coverage for emergency service users both in-building and outside the hospital." The project is part of the NSW Telco Authority's Critical Communications Enhancement Program that is boosting government radio network coverage and capacity across the state.
More info: bit.ly/2rxx9qR

5G TO REACH 40% OF WORLD BY 2024

It is forecast that 5G will reach over 40% of the world's population by the end of 2024. North America and North East Asia are expected to lead the 5G uptake. In North America, 5G subscriptions are forecast to account for 55% of mobile subscriptions by the end of 2024. In North East Asia, the corresponding forecast figure is more than 43%. In Western Europe, 5G is forecast to account for some 30% of mobile subscriptions in the region by end of 2024. The uptake of NB-IoT and Cat-M1 technologies is driving growth in the number of cellular IoT connections worldwide. Of the 4.1 billion cellular IoT connections forecast for 2024, North East Asia is expected to account for 2.7 billion.
More info: bit.ly/2rtSCRN

FASTER HELP FOR NZ EMERGENCIES

Help will soon be available more quickly for people making emergency calls from mobile phones in New Zealand, with Broadcasting, Communications and Digital Media Minister Kris Faafoi announcing enhancements to the Emergency Caller Location Information service, which was introduced to New Zealand in May 2017. "These changes are rolling out now, and will be completed in mid-2020 — by then we will see location to within 50 metres for 95% of all 111 calls from smartphones. Lower-precision location is also being enhanced and will be available for the remaining 5% of smartphones and other mobile phones, in most cases between 50 metres and 2000 metres," said the Minister.
More info: bit.ly/2zRlpUZ

TRENDS IN NEXT-GEN CONTROL ROOM SOLUTIONS

At the recent Australasian Critical Communications Forum (ACCF) Workshop held as part of Comms Connect in Melbourne, Ranjan Bhagat, Vice President and General Manager, Zetron Australasia, made a presentation about next-gen control room solutions.

His presentation highlighted global trends in control room solutions — standards, market forces and operational requirements driving convergence of voice and data.

Bhagat said the focus was on a customer- and solutions-focused approach while ensuring interoperability and bridging for end users as they gradually transition from LMR to an LTE world.

"In Australia there is no one-size-fits-all communication solution due to the size and population distribution of our country," Bhagat said. "We have an opportunity to do what makes sense for us here so that our first responders and our community get practical affordable solutions that provide them actionable information to ensure optimum situational awareness and emergency response times."

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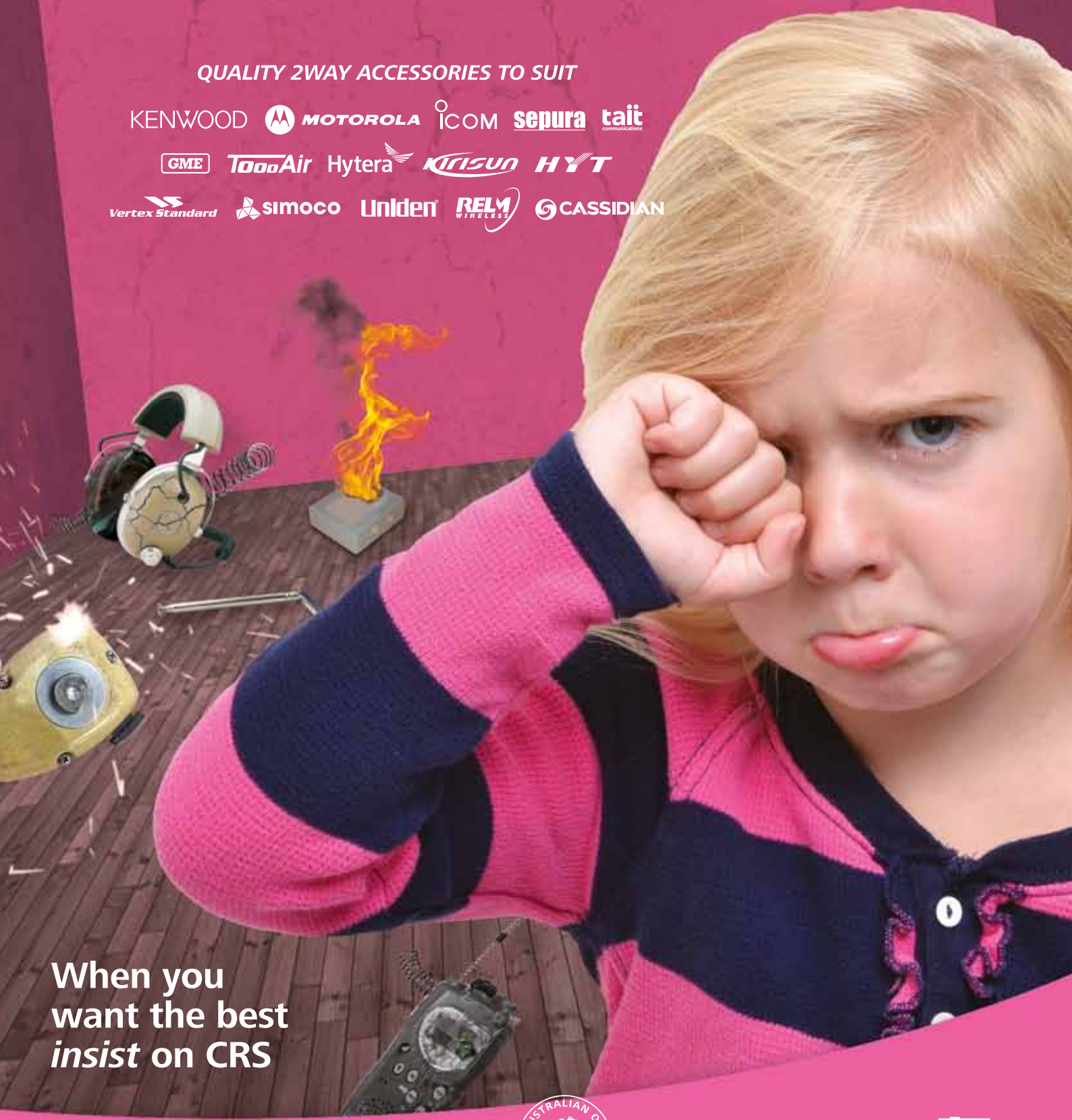

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Industry Talking

Welcome to 2019! It seems the years do go faster and faster; it feels like only a short while ago that we had the 2018 planning days, and now we are starting a fresh new year. Last year ended with a bang — the Annual Gala Dinner was well attended, with more than 500 people enjoying the atmosphere and celebrating the winners of our industry awards. Our regular networking events all over Australia are effectively our shopfront, and are a great way for members to meet, discuss the industry and catch up with old friends. Over the years we have also had some excellent guest speakers who often provide insights into new technologies. So for 2019 make sure you keep an eye on your local state event and save the date in your calendar.

We also tried a new ARCIA-led workshop on multi-coupling as part of Comms Connect Melbourne. We had 34 participants, each of whom will receive an ARCIA certificate of completion. For 2019 we really want to have something similar in conjunction with each Comms Connect or ARCIA event, and we encourage all members to send their staff for industry lead training. We hope that over time we will have a number of short courses that are focused on segments of the industry that are useful to our members, and which extend the capabilities of staff. So please let our committee know what you would like to have training on, and get involved. ARCIA thanks RFI Technology Solutions for presenting the multi-coupling workshop; their long-term staff members really made a difference.

One of the items we have also discussed over time, is finding senior members of the association who may be in a position to lead training sessions on areas they are passionate about or expert in. Passing on generations of knowledge can be very rewarding and can be an excellent way to give back to the industry. Again, let your local state committee members know if that sounds like something you are interested in doing.

Sometime in 2019 we expect that the much-anticipated new Radcomms Act will arrive and come into law. There will no doubt be a lot of work required to bring this into operation, and ARCIA expects to work with the ACMA on behalf of members and all apparatus licence holders to make the transition as smooth as possible. ARCIA will also engage with the ACMA on other items such as the application of frequency re-use and adjacent channel licensing. New digital equipment now common in the marketplace have different emission masks compared to analog standards. The industry needs to find a sensible solution that protects users from interference and also ensures that adequate spectrum is available in high-density locations.

We're also delighted to announce that ARCIA has signed a memorandum of understanding to share information with the Public Safety Communications–Europe (PSCE) organisation. This step will extend the ability for ARCIA to bring international news and public safety information to our members and industry.

ARCIA will begin 2019 with a two-day planning meeting in Brisbane for members and partners. One of the key discussion points will be the retirement of our executive director, Ian Miller, and finding someone who can take on key administration tasks. What can we say about Ian? — passionate, dedicated, knowledgeable and respected are just the start. Ian has put so much into this industry and we all owe him a great deal. As we move forward, he will maintain his work on spectrum matters; however, we will be looking for a new executive administrator — so if that is of interest to you, please get in touch.

Hamish Duff, President
Australian Radio Communications Industry Association

ARCIA, PSCE SIGN INFORMATION-SHARING MoU

ARCIA and PSCE have agreed to share information with the aim of supporting their policy and advocacy roles in public safety communications.

Public Safety Communications–Europe (PSCE) and the Australian Radio and Communications Industry Association (ARCIA) have today formalised a memorandum of understanding to share information regarding the development and use of wireless and associated communications technologies by public safety agencies and other users in the public safety sector.

The agreement results from the recognition that developments in the technologies are now becoming more common globally than in previous times. The existing dialogue between ARCIA and PSCE has highlighted the benefits of sharing information that will support the development of policy positions and active advocacy on behalf of their respective memberships.

Through the agreement, the two bodies will have the ability to exchange on common issues in the global wireless industry. The underlying aim is to share information that delivers products and services crucial to the safety and quality of life of people and communities as the world becomes ever more connected on a daily basis.

While representing the needs of the greater European Union, the PSCE is primarily concerned with those sectors involved with first responder groups.

Over recent years, ARCIA has also offered support to government users in Australia, including being a resource for information on public safety mobile broadband and offering advice to the regulator across many industry sectors.

ARCIA Executive Officer Ian Miller signed the agreement at the recent Comms Connect conference in Melbourne, witnessed by Dr David Lund, a board member of PSCE. Harold Linke, President of PSCE, countersigned the agreement at the PSCE Conference in Bled on 12 December 2018.


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INDUSTRY DEVELOPMENTS ON SHOW

Jonathan Nally

Record attendance and a packed program ensured 2018's Comms Connect Melbourne event was the best ever.

November's Comms Connect Melbourne conference and exhibition has been rightly hailed as being the best, busiest and most bustling occasion of its kind staged so far in Australia. Delegate figures were way up on last year's event, with all speaker sessions well attended and the exhibition floor buzzing (in fact, almost overflowing with people on the first day). This was clearly a response to the excellent speaker, panel and workshop program, as well as a packed expo with lots of new exhibitors for 2018.

There was a very large contingent of overseas visitors, with many leading members of the TCCA in attendance and a range of exhibitors on show at the Finland pavilion. This was the first time such a country pavilion had been tried at Comms Connect, and it was a wild success. Expect to see more of this in the years to come.

I tried to take in as much as I could, but of course with parallel sessions it was impossible to be everywhere at once. So what follows are some thoughts and impressions from some of sessions I did manage to attend.

If ever there was a practical example of the ways in which communications systems need to improve, the sad tale of the death of TJ Kennedy's father in 2015 would have to be it. Kennedy's father was exercising on a treadmill in the basement of his home, with his family members upstairs, when he suffered a cardiac event. Found breathless and pulseless by his wife, she called 911 and the emergency services responded. As Kennedy pointed out, those services were still using the same communications methods they had been using 30 years earlier. Although his father couldn't be revived by the time emergency services arrived only minutes later, Kennedy pointed out that in 2018 his father could have been wear-

> SOMETIMES IT'S REALLY IMPORTANT TO SIMPLIFY WHAT YOU'RE DOING SO YOU CAN MOVE QUICKLY AND DO IT WELL.
>
> — TJ KENNEDY

ing a smartwatch "which would have notified emergency services that he was having a heart arrhythmia before he had the heart attack. It certainly would have told them, with fall detection, that he was down and needed help."

This personal experience and many more throughout Kennedy's career in public safety is what energised him during his time in charge at FirstNet, and contributed to how he and his team stayed focused on the main task at hand in order to expedite the network's delivery. "My team will tell you that for about two years we only did two things at FirstNet — we conducted consultation with public safety and industry, and we created a procurement [plan] and executed on it," he said. "Sometimes it's really important to simplify what you're doing so you can move quickly and do it well."

NSW Ambulance's Geoff Waterhouse — the service's Senior Project Manager for the Telecommunications Capital Works Infrastructure Upgrade Programme — gave a very interesting and heartfelt presentation on the value of network building, interjurisdictional cooperation and information sharing, as he related his experiences building ties with his interstate colleagues. "Keep your mind open, keep talking, don't forget to discuss what others are doing, and just never, ever forget about asking those questions … because whoever you get to know, might have the answers to those questions," he said.

Public safety mobile broadband was top of the bill for many of the presentations, with updates on the local situation given by Luke Brown (Emergency Management Australia, Department of Home Affairs) and European developments showcased by David Lund (Public Safety Communications–Europe).

EF Johnson's Rudy Torres gave a particularly compelling insight into disaster recovery and communications resilience, as he recounted his company's response to the devastation wrought by Hurricane Maria on the tiny island of Puerto Rico. He gave a comprehensive overview of the damage caused to elements of the island's communications systems — some parts were wiped out, others were impaired, and others remained standing. The challenge was to rebuild in such as a way as to provide the most comms the most quickly — often in inhospitable terrain — while designing for more robust comms for the future. He particularly pointed out the importance of vendors being ready, willing and able to go above and beyond the normal call of duty to respond when need arises, which is precisely what EF Johnson (a JVCKENWOOD company), under Torres' leadership, did.

A highlight of the conference was the concluding panel discussion and Q&A session, which featured TJ Kennedy, Peter Clemons (Quixoticity), David Lund, Tero Pesonen (TCCA) and Duncan Swan (Mason Advisory). It is a testament to the quality and experience of the panel members, and the fields they represent, that the room was full for this very last session late in the afternoon of the final day. A wide-ranging discussion was held, with questions given over to the floor (in ABC *Q&A* style) and covering many public safety and technology issues. All present agreed that it was a very worthwhile discussion.

With Melbourne finished for another year, attention now turns to next year's Comms Connect events: Perth (28 March 2019), Auckland (1–2 May), Sydney (12–13 June), Brisbane (July) and Melbourne (26–28 November). Don't miss them.

Comms Connect Perth, 28 March 2019

In conjunction with ARCIA, Comms Connect returns to Perth in 2019 with a great line-up of speakers and panel sessions. At the time of writing, the program had yet to be finalised, but keep an eye on the Comms Connect website (perth.comms-connect.com.au) for more details and sign up to the newsletter for regular updates.

CCEP WORK GATHERS PACE

NEC Australia has secured a contract to deliver the next phase of the NSW Telco Authority's Critical Communication Enhancement Program (CCEP). The company will provide microwave backhaul, network management systems and ongoing support as part of the agreement.

The NSW Government CCEP will enhance the government radio network (GRN) across the state as part of its Operational Communications Strategy, which seeks to provide better coverage and better service to public safety and essential service agencies.

NEC Australia is one of a number of suppliers who will carry out work for CCEP under the ITS 2573 Operational Telecommunications Equipment, Infrastructure and Services Prequalification Scheme. NEC's agreement includes 24/7 help-desk support and advanced logistics services from its Australian technical service centres.

NEC's contribution is part of the CCEP's rollout on the NSW North Coast, involving approximately 87 sites as well as an additional 40 priority sites, using the company's iPASOLINK VR ultra-compact microwave communications system and network management system, to facilitate interconnectivity of P25 sites.

"The new contract with the NSW Telco Authority, under the ITS 2573 scheme, builds on NEC's work with the Authority and the successful delivery of a pilot project in the state's north-west and reaffirms NEC's leadership and expertise to provide reliable, carrier-grade, mission-critical wireless solutions that will enable the NSW Government to build a secure and resilient critical communication infrastructure for emergency services," said Krisztian Som, Business Manager Radio Solutions at NEC Australia.

"At NEC we believe technology is key to enhance public safety, and we are proud to be part of the ongoing initiatives to provide first responders improved and more cost effective communication."

Project delivery

Telecommunications service provider Amalgamotion Pty Ltd has entered into a three-year contract with the NSW Telco Authority to provide project and delivery services for the CCEP.

Amalgamotion's Managing Director, Gareth Rumbelow, said the company is delighted to be working with the Authority.

"We are committed to supporting the NSW Telco Authority on a program that further enables the work of public safety agencies to serve and protect communities," he said.

"The CCEP is one of the most significant infrastructure programs in NSW. I look forward to working with the Telco Authority on expanding and enhancing the state's public safety network," added the company's Program Director, Steven Bush.

Amalgamotion's CCEP delivery will be supported by strategic partners GQI Consulting and 460 degrees.

Amalgamotion describes itself as a specialist service provider of delivery management, strategic consultancy and advisory services predominantly serving the IT and telecommunications Industry... "Typically operating as an agnostic third party in complex, multi-party projects or operating models, [it] utilises its extensive industry experience and capability to support organisations to establish enduring, high performance business partnerships that enable the effective delivery of mission critical project outcomes."

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LMR'S LONG HISTORY IN AUSTRALIA

David Cox

A new book has been launched telling the story of more than 50 years of innovation in LMR in Australia.

The idea of telling the story of the Australian radiocommunications industry began in 2007 at the first ARCIA annual dinner. It was clear from the response in the room that night that we had captured an energy and spirit that went beyond brands and products. We were all connected — a national industry.

The project to publish a book about the history of LMR in Australia kicked off at the 2012 ARCIA dinner, with a call for tales, memoirs, photos and recollections going back to the 1950s. That started the journey to the publication of *Land Mobile Radio Australia: The making of an industry*, which was officially released at the ARCIA annual dinner in Melbourne in November 2018.

The book would not have come about without the efforts of my co-author, Connie Taylor. Connie's drive and focus on results really made the book happen. She is respected and admired by the members of our industry, and her contributions have made the industry a better place. It was a privilege to work with her on this project.

The 1950s was a time of excitement, innovation and discovery, and a lot of it was happening right here in Australia. We designed, developed and manufactured in this country. There were more jobs than people, and more buyers than goods. It was an amazing period of prosperity and growth.

Yet although our industry's story is about a technology journey, the real story is about the people who made and built our industry. There is a unique spirit in the industry — energy, passion — and it has mastery, intelligence and purpose.

The book focuses on the commercial growth of LMR and on three of our industry's founders. First up is Ian Hyde, who put two-way radios into the hands of officials at the 1956 Olympic Games as a result of a handshake deal in a pub — the 1950s equivalent of social media. He helped build Pye and then Philips in Australia, and was the originator of ARCIA's Jonathan Livingstone Award. He was also the creator of TARA, the first telephone-LMR interface.

And there is Stan Goodwin, who started a small radio business in Sydney with not much except courage, belief and a vision that would sustain, inspire and grow a company. That company, now called Mastercom, has just celebrated its 50 birthday.

And Maurie Ryan, Motorola's first Australian employee, who met a big talker in a bar in Arizona with a big story, and suggested maybe that radio might go okay in Australia. Maurie took a risk, trusted his gut, began as an agent and created the genesis of what has become Motorola Solutions Australia today.

They represent this industry's spirit, and created legacies that span across generations today. They are pioneers who led from the front, who built teams, took technology and business risks, convinced customers and delivered with integrity.

The real power of the industry is not measured in watts and decibels, but in its people and their values. This common spirit of leadership, courage and energy drove this industry then, and still does today.

Every innovation — from AM to FM, crystals to synthesisers, conventional to trunking, analog to digital — has been matched with human stories and acts of generosity, selflessness and support for users and each other. Keeping a customer's system operational at any cost is something that is common to everyone.

To all those who provided input, stories, images and ideas for the book, I thank you. Particularly Stan Goodwin, Ian Hyde, Maurie Ryan and Peter Mill, OAM.

At the turn of the 20th century Marconi said, "In the new era, thought itself will be transmitted by radio." He was right. Today, with artificial intelligence, cloud storage and fast wireless, decisions are made automatically, surpassing human thoughts and even human intervention.

It all started with a spark and Morse code. And it has led to an industry that we can all be proud of.

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P25

CONTROL ROOM EXPERTS SHARE THEIR INSIGHTS

Geoff McKernan, President, ACRNA

The Australian Control Room Network Association's recent conference has solidified the sector's vision for the future.

In 2013, a number of Australian control room stakeholders attended a control room design and operation conference in Sydney. It was unique and important and filled a room with 80 people. It was a forum that included operators, managers, designers, and human factors and ergonomics experts. It held the interest of representatives from oil, gas, electrical generation and distribution, market operators, transport, tunnels, mining and infrastructure, educators, researchers, consultants and trade vendors. It was a forum of a kind that had not previously been convened in Australia.

The event was held again in Sydney in 2014 — same success on the day, but no longevity. Something happened in 2015, too — control room folks came together again, in Melbourne, but it was evident from the networking sessions that delegates wanted participation and representation, an organisation that would continue to provide and manage a forum to support the control room industry.

Following the 2015 conference a few individuals decided to make it happen and created the Australian Control Rooms Network — a LinkedIn group. It was, as can be the case with social media, strong by virtue of its membership but a bit hidden away inside the bigger machine. The organisers designed and produced OZCORONET 2016, the group's three-day conference in Brisbane. This conference was organised and facilitated by the industry, not by a 'conference organiser'. Not only was the content professional and unusual, but the vitality and networking were exciting outcomes. The presentations included live theatre in safety training, with actors; eight control room industry case studies; and eight control room site visits, followed by an insights and lessons-learned panel session back at the conference with the site visit hosts. The Brisbane conference closed with the 73 registered participants voting to sustain the forum and to formalise it.

In mid-2017 a number of attendees from the 2016 conference met and commenced the legal process to formally establish the not-for-profit Australian Control Room Network Association (ACRNA), and on 9 November 2017 the Association was registered with ASIC. A committee was established with the main aims to seek corporate membership and to hold a conference in mid- to late-2018. Two corporate memberships were established with Jemena (platinum) and Transurban (gold).

That 2018 conference was held at the Mantra Parramatta over three days in late November. Approximately 55 people attended from various industries (electrical distribution, gas, ports, rail and road, and support industries such as control room design, fatigue management, health and wellbeing), with a common goal to share and improve their knowledge of control room operation and design.

A number of case studies were presented, which were used to facilitate group participation and interaction. The conference dinner guest speaker was Arnold Dix, who is well versed in control room operations from a legal and investigation perspective. His talk, about the responsibilities and obligations of people who manage and work in control rooms, was both entertaining and educational.

The last day of the conference was the Association's AGM. A new committee was elected and a clear vision was established for the future role and activities of the Association. The journey has started and we know where we are going.

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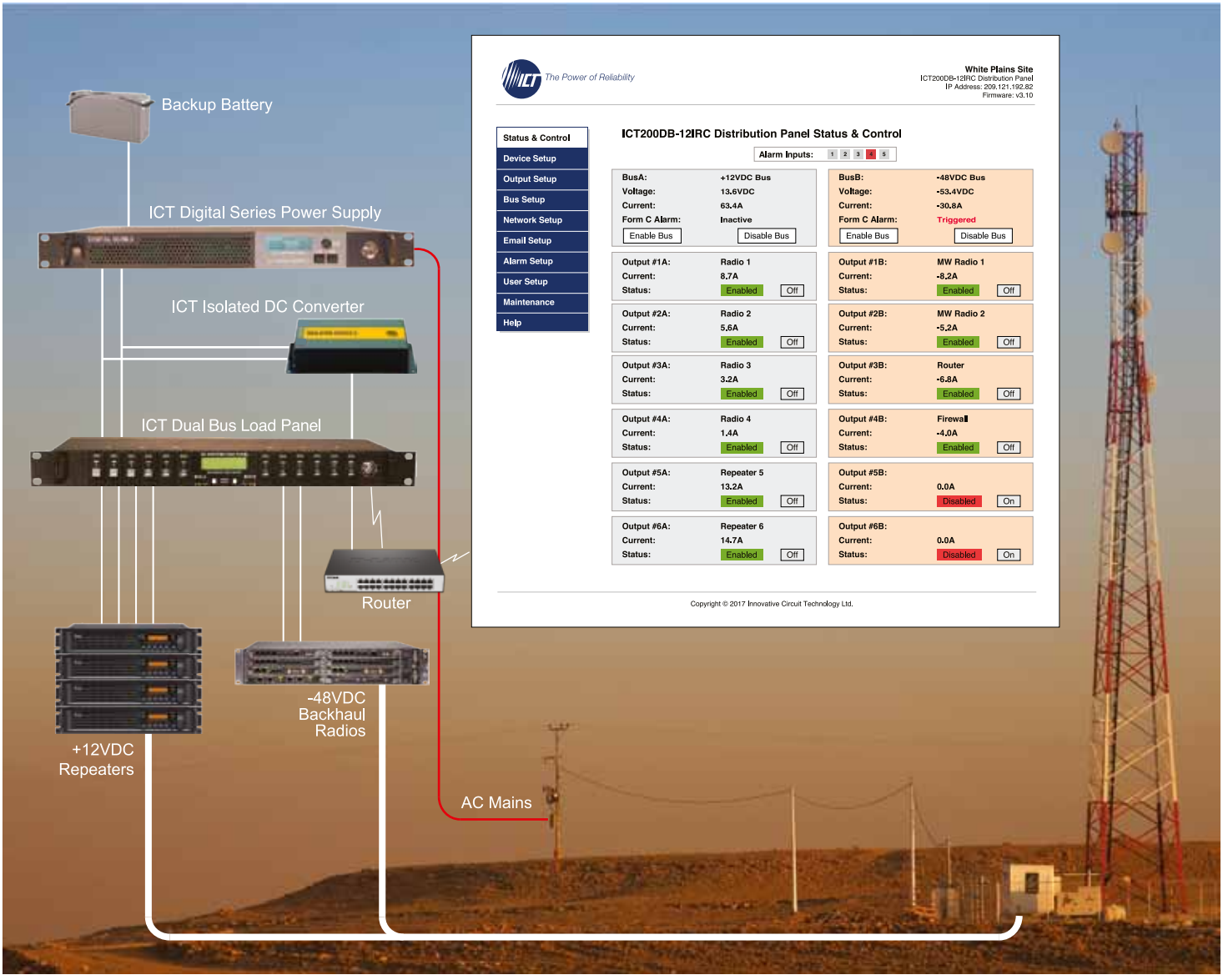

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Multifunction analyser

The Anritsu S412E LMR Master with DMR Analyzer, Option 591, is designed to test and verify the performance of DMR radio systems. The DMR Analyzer supports measurement of time-slotted DMR transmitted signals while directly connected to the transmitter (through a power attenuator) or over the air with an antenna. The signal analyser input has the sensitivity to measure DMR signals down to –115 dBm, allowing transmitter problems to be analysed and verified miles away. Separate demodulators are available for Base Station (BS) and Mobile Station (MS) systems. Receive test patterns include the DMR standard 1031 Hz BER pattern, the O.153 PN9 BER pattern, a proprietary voice pattern that estimates BER from audio transmissions.

The built-in DMR signal generator offers over 10 DMR test patterns including the standard 1031 Hz voice-framed BER pattern and the O.153 PN9 BER pattern. The generator power level can be controlled over a 130 dB range from 0 to –130 dBm to support receiver sensitivity measurements. The 0 dBm signal level supports amplification to higher levels with an external amplifier for use as a temporary BER test transmitter for coverage assessment. The frequency of the DMR signal generator can be either locked to or controlled independently from the DMR Analyzer frequency.

Supported RF measurements include received channel power, frequency error, channel spectrum, eye diagram, constellation, linear constellation and power profile.

Anritsu Pty Ltd

www.anritsu.com

SPECTRUM AUCTION CLEARS WAY FOR 5G

Dylan Bushell-Embling

Telstra, Optus, Vodafone, TPG and UK-based Dense Air have paid a combined $853 million for spectrum in a key 5G band.

The federal government has raised around $853 million through the auction of valuable 5G-compatible spectrum. Telstra, Optus, Vodafone, TPG and UK-based Dense Air have all secured spectrum in the auction, which is aimed at facilitating the early launch of 5G services.

Telstra bid the lion's share of $386 million for 143 lots of spectrum across 13 of the 14 regions. According to the company, combined with its existing spectrum holdings, it now has 60 MHz of contiguous 5G spectrum across all major capital cities, and 50 to 80 MHz of contiguous spectrum in all regional areas. Telstra plans to have activated 200 5G sites by the end of the year.

"Securing this spectrum dramatically increases the speeds we will be able to offer and puts us in a competitive position in all markets, including Sydney and Melbourne, with site rollout to extend to these cities as soon as access to the new spectrum is available," Telstra CEO Andy Penn said in a blog post.

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Meanwhile, a joint venture established between units of Vodafone Hutchison Australia and TPG Telecom won 131 lots of spectrum for a combined $263.3 million. The venture secured licences in every available area — concentrated in Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra. The arrangement was established to participate in the auction pending the regulatory approval of the proposed merger between VHA and TPG.

Optus Mobile's participation was limited by the terms of the auction. The company won 47 lots in the auction for a total of $185.1 million, with coverage focused on regional areas. The areas covered by the licences span regional areas of NSW, Victoria, Queensland, South Australia and Tasmania.

Optus said the new holdings in regional parts of the country will add to its existing extensive holdings of metropolitan 3.4 GHz spectrum, and allow it to extend its planned 5G-based fixed wireless access services to regional areas as well. Due to its 3.4 GHz holdings, bid limits imposed by the government prohibited the company from vying for spectrum in metropolitan areas.

Finally, Dense Air Australia, a subsidiary of UK-based Dense Air, bid $18.5 million for 29 lots of spectrum across Adelaide, Brisbane, Canberra, Melbourne, Sydney and Perth. The company plans to use its spectrum holdings to offer managed services to mobile operators aimed at helping them extend 5G coverage and capacity while lowering rollout costs.

Dense Air Australia has developed a new technology and business model involving allowing multiple mobile operators to share the same physical 5G small cell or femtocell — devices designed to extend coverage of radio access networks without the need to deploy an additional tower. It plans to provide network densification extensions to both enterprise and residential consumers, helping extend 5G coverage and capacity in hard-to-reach outdoor and indoor locations.

"Our spectrum enables us to offer a completely new type of wholesale service to 5G network operators. Dense Air will complement planned 5G deployments, by allowing much greater densification than can be achieved with macro cells alone," Dense Air CEO Paul Senior said.

While the new spectrum licences are not scheduled to come into effect until March 2020, telecoms regulator ACMA said it is working with the winners to enable early access to the spectrum, on the condition that this does not interfere with the operations of existing spectrum licensees.

The government is set to reap a significant windfall from the auction. But opinions are divided as to whether the auction prices were too high.

VHA CEO Iñaki Berroeta claimed in a statement that the government's handling of the auction had the result of artificially inflating prices.

> OPTUS SAID THE NEW HOLDINGS IN REGIONAL PARTS OF THE COUNTRY WILL ADD TO ITS EXISTING EXTENSIVE HOLDINGS OF METROPOLITAN 3.4 GHZ SPECTRUM, AND ALLOW IT TO EXTEND ITS PLANNED 5G-BASED FIXED WIRELESS ACCESS SERVICES TO REGIONAL AREAS AS WELL.

"While we are pleased to have secured spectrum licences in every available area, robust competition for artificially limited supply saw the companies participating in the auction pay some of the highest prices for 5G spectrum in the world so far [in terms of price per megahertz per population], with an average price of 29c/MHz/pop," he said.

"It's clear there is high demand for 5G spectrum, and more suitable spectrum needs to be made available by government."

But telecoms analyst Paul Budde believes the final result was limited in part by the imposition of the cap on spectrum holdings in metropolitan areas, which he said had also prevented nbn co from participating in the auction.

The planned VHA-TPG merger also served to inhibit competition in the auction, Budde said. Without these impediments, he estimates that the auction could have cleared over $1 billion.

"But the government correctly went for a more balanced approach," Budde wrote.

"Smaller players known as mobile virtual network operators (MVNOs) were disappointed that the government hadn't gone a bit further and included a requirement in the spectrum auction to also make mobile network capacity available on a wholesale basis, this would have further stimulated mobile competition, especially as after the Vodafone/TPG merger competition will be reduced."

But high 5G spectrum prices will only be the start of the additional costs imposed on telecoms operators by the requirement to roll out 5G, Budde said.

"Users are very happy with their current 4G service and for them there would not be a reason to pay extra money to switch over to 5G," Budde said.

"The only thing that is in it for the operators is a more efficient infrastructure, while important, the question is if that is worth the large investment? On top of the spectrum they just bought, billions of dollars will need to be invested in 5G infrastructure."

Budde said there is the potential for operators to unlock new revenue streams with 5G in IoT-based areas such as autonomous vehicles, smart cities and e-health, but this will require additional investment and will not eventuate until 5–10 years down the track.

Fibre tester

The Viavi/JDSU FibreComplete 2 fully automates all the fundamental fibre-qualification tests including bidirectional insertion loss, optical return loss and optical time domain reflectometry (OTDR) with one module from one optical port. It offers a complete fibre testing solution for quick and easy use in characterising point-to-point or point-to-multipoint passive-optical networks. It is available to rent from TechRentals.

The MTS-2000 will cut down test times and simplify troubleshooting due to fewer connections and disconnections.

This advanced system comes with a power meter, fibre inspection probe and OTDR module. The MTS-2000 will measure optical return loss (ORL) and simplify troubleshooting in FaultFinder mode. This instrument has onboard automated nbn test sequences. It tests 1310, 1550 and 1625 nm wavelengths (λ) at 37, 35 and 35 dB dynamic ranges respectively.

TechRentals

www.techrentals.com.au

Satellite push-to-talk communications radio

The Icom satellite push-to-talk (PTT) communications radio is designed for the Iridium satellite communication network. It enables users to communicate wherever they are on the earth.

This system enables real-time, one-to-many communication throughout the world with only a push of a PTT (transmit) button. In addition, Iridium's interconnected satellite architecture ensures stable and reliable communication even if large-scale disasters occur on earth and terrestrial networks are compromised.

Icom Australia Pty Ltd

www.icom.net.au

Handheld device

The Panasonic Toughbook FZ-T1 handheld device is a slimline, rugged model designed for mobile workforces seeking an all-in-one solution.

The 5″ Android device will suit the mobile needs of industries such as retail and hospitality, emergency services, manufacturing, and transport and logistics.

With its voice and data capabilities, integrated barcode scanner and wide range of functionality and accessories, the Toughbook FZ-T1's balance of mobility and durability is set to improve workforce productivity and the ease and efficiency of business operations across Australia.

The Toughbook FZ-T1 handheld will be available in a 4G model, with voice and data capabilities. Built for the needs of the modern mobile worker, the high-performance device has the Android 8.1 Oreo operating system, a Qualcomm Snapdragon quad-core CPU, 16 GB Flash and 2 GB Ram storage.

Light and slim, the Toughbook FZ-T1 weighs under 240 g. It is designed for military standard 810G, dust and water resistant to IP68, tumble tested and capable of withstanding drops of up to 1.5 m, and operating within a temperature range of -10 to +50°C.

With an easy viewing 5″ display, the Toughbook FZ-T1 has 10-finger input, daylight-readable screen, is capable of operating in the rain and can be used with gloved hands or an optional passive pen.

It has an enterprise-class, straight-line barcode reader built in with two trigger buttons (either side of the device) to make it easy for left- and right-handed operators. These accessories are suitable for operators scanning regularly, or needing to scan at a distance in warehouses or while operating forklifts.

Designed to operate a full shift, the Toughbook FZ-T1 comes with a 12 h battery life and warm swappable functionality, allowing the user to switch their own batteries without interrupting work.

For clear communication in busy work environments up to construction site noise levels, the Toughbook FZ-T1 is equipped with noise suppression technology and loudspeaker. It also has an 8 MP rear camera for easy document capture.

Panasonic Australia Pty Limited
www.panasonic.com.au

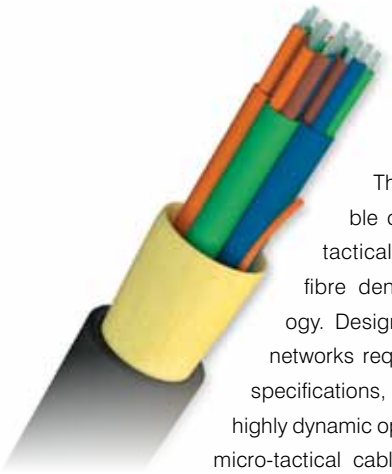
Rack mount remote monitoring system

The Helios Power Solutions RM-RMS-300 19″ rack mount Remote Monitoring System is suitable for data acquisition. The control device is designed for use with wireless internet repeater sites or other AC or DC powered remote equipment. The RM-RMS-300-AC has ultra-low power consumption (6 W).

The RM-RMS-300 uses embedded Ethernet technology for internet data acquisition and remote voltage monitoring, enabling the user to monitor voltage at remote sites. It uses the LINUX operating system for versatility, stability and security.

Features include input voltage: 10–160 VDC or 90–260 VAC; power consumption <6 W; 8 x analog inputs; alarm inputs 5 x digital inputs; 4 x relays outputs; and optional display/touch screen interface for local control.

Helios Power Solutions
www.heliosps.com.au



Micro-tactical fibre optic cable

The AFL Micro-Tactical Fibre Optic Cable combines the ruggedness of military tactical cable designs with the ultra-high fibre density of AFL's micro-cable technology. Designed for rapid deployment in optical networks requiring high mechanical performance specifications, extreme environmental exposure and highly dynamic operating conditions, the military-grade micro-tactical cable is able to withstand high tensile loads, severe crushing forces, repeated impacts and extreme temperatures.

With AFL's selection of tactical cable jacket materials, the cable can be used in applications requiring exposure to UV, moisture, industrial chemicals or confined spaces. The military-grade tactical cable has fibre counts up to 96. It is used in areas such as broadcast, military, mining, rail and petrochemical.

Main features include high fibre density allowing for longer deployment lengths; ruggedised tactical cable design for operating in harsh conditions; highly flexible for rapid deployment and ease of installation; longer assembly lengths reduce number of optical connections and enhance network performance; and supportive of all fibre types for high-speed optical networking.

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COMPETITION IN THE 5G AGE

Jonathan Nally

Competition is the only way in which Australians will continue to enjoy high standards of mobile services, says the ACCC's Rod Sims.

In a sign of how seriously regulators are taking the provision of communications in the modern world, ACCC Chairman Rod Sims took to the stage to address delegates at the ACMA's recent RadComms 2018 conference to outline his views on competition issues and the 5G spectrum.

"5G will need a diverse range of spectrum to support its different use cases: low, high and very high band frequencies to provide coverage, high speeds, low latency and to carry large amounts of data along the network," he said.

"Along with this greater demand for spectrum comes significant implications for competition. One of the challenges will be making sure that those who need spectrum get enough of it to be effective competitors in retail markets," Sims added.

Sims said there is a lot of preparation happening across the industry and government to make sure networks are ready to support the transition and 5G compatible devices.

"This includes work for the ACCC to make sure our regulatory settings are fit for purpose and flexible enough to support the transition to 5G," he said.

The importance of competition

"We know that 5G is going to lower the cost of delivering data, but those changes will be accompanied by large capital and operating costs; operators will need to acquire new spectrum, densify their networks by building more mobile towers and make sure their

> THERE MAY BE BENEFITS TO 5G ACTIVE NETWORK SHARING, PARTICULARLY WHERE IT ENCOURAGES SMALLER PLAYERS TO INVEST AND ROLL OUT NEW SERVICES.
> — ROD SIMS, ACCC CHAIRMAN

transmission can support delivery of new services," Sims said. "So what is going to drive this investment? Competition of course.

"Australia has some of the best mobile networks in the world. Why? Because competition created the environment that led to these services being developed and delivered to the Australian consumer," he added.

"As the competition regulator, we want to make sure markets are working for consumers, now and in the future. Part of this is about preserving the competitive environment so that it is attractive for investment. One way we do this is by seeking to minimise regulatory risks and barriers for entry for existing and new operators."

Sims said that the ACCC looked very closely at the relationship between competition and investment in its regional mobile roaming declaration inquiry.

"We found that the declaration of access to a mobile roaming service would be likely to distort the incentives for Telstra, Optus and Vodafone to make continuing efficient investments to strengthen and expand network coverage."


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Sims added that "if we want to see more competitors in mobiles we need to think carefully about how to best achieve sustainable competition and minimise barriers to entry".

"We expect calls to share network infrastructure are likely to increase in a 5G world because of the capability offered by 5G to allow greater independence to operators who may share a radio access network, and the costs and difficulties involved in rolling out a dense mobile network, particularly in the cities."

Network sharing

Sims pointed out that there is a degree of passive network sharing in Australia, where operators share mobile towers, or other assets, and that this is regulated to an extent under a Facilities Access Code. "As we move into a 5G world, the need to densify networks, particularly in highly populated areas, may encourage more tower sharing," he said.

Sims also said that with 4G LTE technology, radio access network (RAN) sharing has become more sophisticated, and operators are more able to distinguish between and maintain control over their respective services and offerings. He said that bilateral RAN sharing arrangements have the potential to save operators from 20% to 40% on network costs.

Some countries have been looking at fundamentally altering the structure of their mobiles market, moving from multiple competing mobile networks to a shared wholesale network where operators simply buy capacity from one or two network providers.

"I do not think that we will see this in Australia to any great extent but there may be benefits to 5G active network sharing, particularly where it encourages smaller players to invest and roll out new services while also enabling them to keep control over and differentiate their services, and so be active independent competitors," Sims said.

Sims said that while there are many potential benefits of network sharing — including more efficient asset utilisation and lower costs for operators, faster and wider deployment of new technologies, and greater spectral efficiency — there are also adverse consequences for competition and consumer outcomes if, for example, "we end up with a sluggish, ill-managed monopoly network provider that stifles service competition. Where smaller players are sharing networks there is also a greater risk of tacit collusion depending on the extent of sharing and a stifling of investment.

"We need to ensure our regulatory framework is flexible enough to facilitate the potential evolution of competition, and new innovative services/technology that might develop, while mitigating against any potential anti-competitive behaviour. This includes ensuring operators have access to network infrastructure (either through some active or passive sharing) and competitive backhaul is available," he said.

"Ultimately, we want to see consumers benefit and we want to see network owners incentivised to invest, which is why we will take a close examination of any proposals for active network sharing."

Sims concluded his presentation by saying that if there was one thing he wanted delegates to take away from the conference, it would be "competition, competition, competition".

"If Australians are to keep the high standards of mobile services that they currently enjoy, competition is the only way to achieve that. We cannot become complacent."

This is an edited version of a speech given by Rod Sims at the ACMA RadComms 2018 conference. The full speech can be found on the ACCC website.

Dual band PoC/ UHF/UHF CB

The ToooAir TA-680 is a fully featured PTToC (Push to Talk over Cellular) two-way radio with a unified analog UHF capability. It offers 40 pre-programmable commercial channels and 80 Channel CB. A further 78 channels are user-programmable receive-only frequencies and can be added to the scan group.

The twin antenna design helps performance across the UHF, Cellular and integrated GPS technologies. Approved to standards AS/NZS 4295 and AS/NZS 4365, the TA-680 is suited to the construction and mining industries that require staff to be in contact with their head office or dispatcher (anywhere in Australia) and also establish communications with the local area UHF site.

The ToooAir platform offers GPS tracking, group call, individual call, dynamic group allocation over air, radio stun, SOS, loan worker, GEO fencing, text messaging and voice/track recording.

The 400 to 480 MHz UHF section offers CTCSS/ DCS, 5 W/1 W switchable power, selectable channel scan and direct channel select via the numeric keypad.

Furthermore, the TA-680 comes with a desktop drop-in charger and can be charged directly from a supplied USB cable or cigarette lighter adaptor.

Tooo Air Pty Ltd

www.toooair.com.au

Smart signal repeater

The Cel-Fi GO smart signal repeater is a carrier-class mobile cellular coverage solution that features system gain (70 dB for the mobile version and 100 dB for the stationary version). It is the only device approved for use on the Telstra network. RFI has bundled the Cel-Fi GO with its Meander antenna range to boost its performance.

The Cel-Fi GO leverages artificial intelligence and signal processing capability to deliver voice and data wireless performance for mobile subscribers. The Cel-Fi GO is IP54 rated (weather resistant) and does not interfere with other wireless devices.

The stationary solution is suitable for use in commercial properties, government buildings, agricultural settings, small manufacturing operations, rural areas, businesses and large homes. The mobile solution is suitable for trucks, vehicles, RVs and boats.

RFI Technology Solutions

www.rfi.com.au

OTDR

The Fluke Optifiber Pro Quad is an optical time domain reflectometer (OTDR) designed for testing, troubleshooting and certifying multi- and single-mode fibre-optic networks. It is designed to increase the reliability and availability of data centre and storage area networks. It is available to rent from TechRentals.

The Optifiber Pro Quad accelerates fibre certification with trace times as short as 2 s in Quick Test mode. Featuring a smartphone user interface, it is designed for all skill levels and enables users to perform expert fibre troubleshooting and certification. Operator efficiency is maximised with task-focused usability, fast trace times and one-button set-ups. Users can select, scroll and magnify on screen using their fingertips (via the smartphone user interface) with a capacitive touchscreen rather than a legacy touchscreen, eliminating recalibration.

The Optifiber Pro Quad is supplied with LinkWare software which enables users to download recorded data and generate detailed and standard-compliant reports.

TechRentals

www.techrentals.com.au

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CONNECTED IN THE CANYON

Images courtesy Cohda.

With V2X communications and infrastructure, self-driving vehicles will be safer than cars controlled by people.

Cohda Wireless has successfully demonstrated its connected autonomous vehicle technology in a live trial on the streets of the city of Adelaide. The trial proved the potential for connected self-driven vehicles to make our streets much safer than they are and that Cohda's technology is effective even in the most challenging of environments — the so-called 'urban canyons' of a typical city.

In an area covering two city blocks just east of Adelaide's iconic Victoria Square, the demonstration replicated a scenario that is a daily occurrence on the streets of cities all over the world.

Two vehicles approach a four-way intersection at right angles to each other. Car 2, driven by a human, fails to adhere to the red-light signal and approaches the intersection at speed, intending to 'skip' the red light. Car 1, a connected autonomous vehicle, is approaching the intersection from another direction and intends to proceed through the intersection on the green light.

In a real-life scenario, there would be a risk of a collision as human drivers will invariably approach the intersection when the light is green, fully confident that all other road users will obey the traffic signals. In an instance where Car 2 disobeyed the traffic signal and Car 1 was unable to see the approaching danger, due to visibility being obstructed by buildings or other infrastructure, a collision would be especially likely.

But according to Cohda Wireless's Chief Technical Officer, Professor Paul Alexander, if the vehicles were connected using Cohda's V2X (Vehicle-To-Everything) technology, a potential collision situation would be detected and avoided well in advance of it actually happening.

"We demonstrated that when vehicles are connected to each other using our smart V2X technology, Car 1, the connected autonomous vehicle, would detect that Car 2 is approaching the red light at

speed and is probably not going to stop," Professor Alexander said.

"This allows the connected autonomous vehicle to pre-emptively identify and respond to the threat by slowing down and stopping.

"Cohda's V2X technology allows vehicles to 'speak to each other' to extend their perception horizon," he added.

According to Professor Alexander, the technology provides the vehicle with an awareness of its environment and risk factors associated with it, consistently and accurately up to 10 times per second, enabling it to make decisions that a human being would not be capable of making as the driver of the vehicle.

Cohda's Smart Cars Smart City initiative was funded by the South Australian Department of Transport and Infrastructure's Future Mobility Lab Fund.

Demonstration

In June this year, Cohda Wireless took ownership of two specially modified vehicles from the USA, which it is using in advanced trials of its V2X technology. The two Lincoln MKZ sedans were fitted with the ADAS (Advanced Driver Assistance Systems), ROS (Robot Operating System) various sensors including lidar, radar, cameras, GPS as well as in-vehicle compute platform and Cohda's Global Navigation Satellite Systems (GNSS)-independent positioning technology.

The fusion and cooperation of the various sensors and Cohda's V2X technology augment the vehicles' perception capability and make the autonomous vehicles features more practical, to include threat detection, the dangers associated with blind intersections and vulnerable road users.

"Our goal ... was not only to demonstrate the efficacy of our technology in enabling self-driven vehicles to communicate with each other but also to do so in a city environment where so-called urban canyons significantly affect the ability of systems reliant on ... GNSS ... to achieve accurate positioning," Professor Alexander said.

"The area in the city of Adelaide in which the trial was conducted was one such urban canyon where positioning through GNSS can be off by up to 40 metres, but with our V2X Locate technology positioning accuracy is improved to within a metre."

Cohda Wireless demonstrated the efficacy and accuracy of its V2X-Locate system in a 2017 trial in New York City where it repeatedly demonstrated sub-metre accuracy while driving along Sixth Avenue, which has the tallest buildings in the Big Apple. Comparably tested GPS-based systems were as much as tens of metres off-course, at times showing cars driving through buildings.

Cohda's V2X technology underpins and complements other technology used by autonomous vehicles such as cameras, sensors, radars and lidars by enabling cooperative perception.

"The role of technology in making our roads safer is probably not generally understood but we hope that this demonstration has helped to prove that with the appropriate technology and infrastructure, connected self-driving vehicles are safer to have on our roads than vehicles controlled entirely by human beings," Professor Alexander said.

ALIGNING WITH GLOBAL STANDARDS

Jonathan Nally

The Australasian TETRA and Critical Communications Forum has become the Australasian Critical Communications Forum.

The 17th AGM and dinner of the Australasian TETRA and Critical Communications Forum was held coincident with Comms Connect Melbourne last week, at which a name change was approved — the organisation is now the Australasian Critical Communications Forum (ACCF). The name change was unanimously supported by the organisation's membership, and is based on an updated charter to support all global open standards.

Those standards continue to include digital LMR standard TETRA, but now also encompass DMR, P25 and all the 3GPP/ETSI broadband and mission-critical broadband standards (LTE/4G and 5G).

The move therefore recognises the technology expertise and investment of the ACCF's members in support of mission-critical non-proprietary, international 'open' wireless communication standards. It also enables the ACCF and its members to drive and support technology developments, particularly with relation to the development of open standards for mission-critical broadband.

The AGM saw the re-election of the extant board of directors, and two additional board members/directors were confirmed — Sohan Domingo (Nokia) and Roger Kane (Vicom). The ACCF also recently welcomed Nokia as a member and Radlink Communications was confirmed as the first corporate sponsor.

Many ACCF and TCCA members were in attendance at Comms Connect Melbourne, including international leaders Tony Gray (TCCA CEO) and Tero Pesonen (Chairman of TCCA Critical Communications Broadband Working Group).

A number of Finnish TCCA members were also present and participated in several speaker sessions and a panel. Their presence came in conjunction with Comms Connect's first-ever country pavilion. Around a dozen companies from Finland were present, with the country's ambassador to Australia in attendance.

"The ACCF board and members commend the WFevents organising team on an excellent Comms Connect conference," said Kevin Graham, ACCF Director and Secretary. "The event grows bigger and better each year and the local and international line-up was outstanding this year.

"The ACCF workshop and 3GPP update was well attended and ACCF appreciated the interest from all delegates and their proactive engagement during these sessions."

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OUTBACK RADIO IS A LIFESAVER

Ian Miller

From pedal power to modern HF, the Royal Flying Doctor Service has long relied on radio to help it provide essential medical care.

The National Wine Centre was once again the venue for the annual Adelaide ARCIA networking dinner on Thursday, 4 October 2018, with more than 60 people taking the opportunity to network with their peers and colleagues at one of Adelaide's premier venues. But a highlight of the event was an outline of the long-standing link between the radiocommunications industry and the Royal Flying Doctor Service (RFDS), which provides medical and associated health services to the population in remote areas of Australia. The radiocommunications industry in South Australia has a long and interesting history of support for and engagement with the RFDS.

Back in the early 20th century, the Reverend Dr John Flynn worked with settlers in outback Australia on behalf of his church. One of the concerns he had was that people on remote properties had little or no real medical support available to them; road travel to the nearest medical facilities could often take days. Flynn had a vision of providing a service to these remote locations using aircraft, and in 1928 the pre-cursor to the RFDS was founded in Cloncurry in Queensland, with one plane on loan from the fledgling Queensland and Northern Territory Aerial Services (now Qantas). Back in those days the medical service had a patient contact rate of three patients every two days.

Having started the service, Flynn then realised that the next problem was providing a means for people in these remote locations to summon the air ambulance or seek advice for urgent medical situations. Flynn contacted Alf Traeger in Adelaide and outlined the problem. HF radio obviously was a solution, but most of the remote locations did not have reliable electric power. So Traeger designed the 'pedal wireless' — a set of bicycle pedals connected to a generator — which the operator would use to power the radio. Suddenly, there was a viable solution to the tyranny of distance.

Comms connections

At the Adelaide dinner, Alf Traeger's daughter, Anne Smallwood, gave an interesting talk on her memories of her father's development of the pedal wireless and its relationship with the RFDS. It was very interesting to learn about the development of this 'wireless solution' and the part it played in opening up the outback. It also appears that Alf was well ahead of his time in many ways as he was also looking at developing desalination plants to turn salt water into fresh water, plus other climate-related inventions.

Alf Traeger with a pedal-powered radio, circa 1934–39.

The Reverend Dr John Flynn, founder of the Royal Flying Doctor Service.

Anthea Rice from the Adelaide-based RFDS Central Division (which serves South Australia and the Northern Territory) gave an outline of the development of the RFDS's unique and much-valued medical support service and the importance of the radiocommunications in its development. Once RFDS medical staff were able to communicate directly with remote locations, a system of 'medical chests' was set up at the remote locations. The radio operators could be directed by RFDS doctors to take a medicine or piece of equipment from the chest and apply it to the patient. The medical chest solution is still operating in some of the more remote settlements, enabling patients to be stabilised while the RFDS support staff are in transit.

In the early days, landing strips were often simply open paddocks or sections of straight roads, so the pilots became very experienced at negotiating the perils of 'bush flying' — from rogue cattle and wild kangaroos, to the lack of lighting at virtually every landing site. From the days of a single aircraft, the RFDS has now grown to 69 aircraft and more than 300,000 patient contacts every year. There is no doubt that as far as modern paramedical services go, the RFDS services one of the largest operational areas in the world.

Interestingly, Anthea mentioned that by far the largest number of clients they have each year come from metropolitan postcode areas — so be good to the RFDS, as it might one day be called to support you or your loved ones.

A vital service

From an industry point of view, there are still links to the pedal wireless and Alf Traeger. Justin Salisbury of CRS Accessories/ComWide Services in Adelaide is Alf Traeger's grandson, and therefore continues the Traeger family link with wireless communications. In addition, Adelaide-based HF radio manufacturer Codan Radio Communications celebrated its 60th anniversary in 2018; the company was founded on manufacturing and supplying transceivers for the RFDS network. Even today, the bulk of the fixed HF radio equipment used by the RFDS is manufactured by Codan.

At the final stage of the dinner, each table was encouraged to make a donation, with the highest total — provided by CSE Tetracom — rewarded with a twin-pack of wine provided by the National Wine Centre. This fundraising effort generated close to $1400, which was donated to the RFDS.

ARCIA is very proud to be associated with the RFDS, even in such a small way, as we recognise that thousands of people have been touched by the RFDS over the 90-odd years of its operation.

The modern-day RFDS uses a combination of communications types, including ruggedised smartphones.

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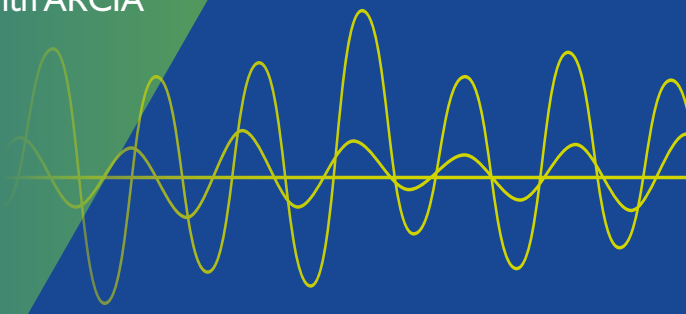
PERTH 28 MARCH 2019
One day conference | In association with ARCIA

BRISBANE JULY 2019
One day conference | In association with ARCIA



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WORLDWIDE PSMB DEVELOPMENTS

Peter Clemons, Founder, Quixoticity

Many countries are moving ahead with public safety mobile broadband, but Australia still has some catching up to do.

A lot has happened over the past 12 months in the critical communications world. The critical communications industry and community is on a long journey from the ultra-reliable, low-latency voice and short data-centric solutions of 2010 towards the fully developed 5G URLLC solutions of 2030. The challenge our relatively niche community faces is to make sure our full needs and requirements and those of our wider societies are included in the 5G roadmap.

At the recent Comms Connect conference in Melbourne I presented some of the findings from the latest research conducted for the Quixoticity Index.

Finland once again has emerged as a prime example of best practice in critical communications. The country has a culture of close cooperation, it understands the importance of public safety and public service, and it has a sensible, pragmatic, multi-stage approach to migration to next-generation services while preserving the best of current systems. The Critical Communications Finland community is also extending its close ties with other countries.

Following closely behind Finland is the United Arab Emirates (UAE). The UAE continues to move forward with its ambitious 5G-ready, next-generation critical communications broadband network following the signing of a comprehensive cooperation agreement between Nedaa and Nokia. Large parts of the network have already been deployed, with extensive testing underway ahead of an imminent launch so that full coverage of Dubai can be achieved in time for Expo 2020.

The UAE prefers dedicated spectrum for both narrowband TETRA services and broadband LTE/5G services. Visionary leadership, unlimited ambition and the desire and willingness to test out innovative new services and applications continue to drive this still-young nation forward as an example for other countries in the region.

Progress has also been rapid in the US, with FirstNet receiving approval of all 56 states and territories in late 2017 and moving forward with deployment of mission-critical services based on Quality of Service, Priority and Preemption (QPP) with partner AT&T, with a dedicated core network enabled during 2018.

Other carriers, including AT&T's main rival, Verizon, have also made positive announcements about prioritising first responders and emergency services, as the US had been hit by a number of natural disasters during 2018. In fact, the remarkable progress made by the US in public safety communications would have led to the country seriously challenging Finland for top spot in the Quixoticity Index 2018 were it not for its sheer size and complexity, and, perhaps a more challenging current social and political environment.

The United Kingdom continues to move forward with its own ambitious Emergency Services Network (ESN). Following several highly publicised setbacks and delays to this program, a full review was undertaken during 2018, leading to a more sensible incremental approach to the launch of services beginning with data, and with a multi-year extension to the TETRA-based Airwave program. Challenges remain for the ESN team, but the program appears to be more aligned now with global best practice.

France and Germany, together with the rest of Europe, continue to move forward with their plans for next-generation services that are urgently required to build upon existing, highly reliable, ubiquitous narrowband networks. Perhaps those countries such as France, Spain and Switzerland, who chose Tetrapol over TETRA for their existing critical communications, feel a more urgent need to move forward.

However, there is a growing consensus across Europe that mission-critical networks based on global 3GPP standards such as LTE and 5G will bring enormous benefits in terms of closer cooperation, greater (inter) operability and more advanced services... perhaps best encapsulated within the European Commission's ambitious pan-European project, BroadWay.

Full, guaranteed, prioritised access to prime spectrum remains a major issue in Europe, with most countries deciding to auction off the 700 MHz coverage layer to commercial network operators, with bands in 400 MHz also under consideration for less bandwidth-intensive operations.

Peter Clemons delivered his latest research at Comms Connect Melbourne in November 2018.

South Korea continues to move forward with its plans for three separate-yet-related public safety LTE networks under the banner of SafeNet — a public safety network, a railway network and a maritime network. Trials and tests are continuing and South Korea remains closely engaged with all global standards and agency cooperation processes.

Although Australia remains in last position in the Index, there have been very promising signs over the past 12 months. The federal government created a new super-ministry, the Department of Home Affairs, with a dedicated Emergency Management Australia team driving forward the public safety mobile broadband network with renewed vigour.

The New South Wales Telco Authority has launched an RFP and a call for a proof of concept. Telstra recently hosted a 3GPP plenary on the Gold Coast and has launched a number of new initiatives building on its LANES offering. We will be watching developments in this space in Australia with great interest over the coming months.

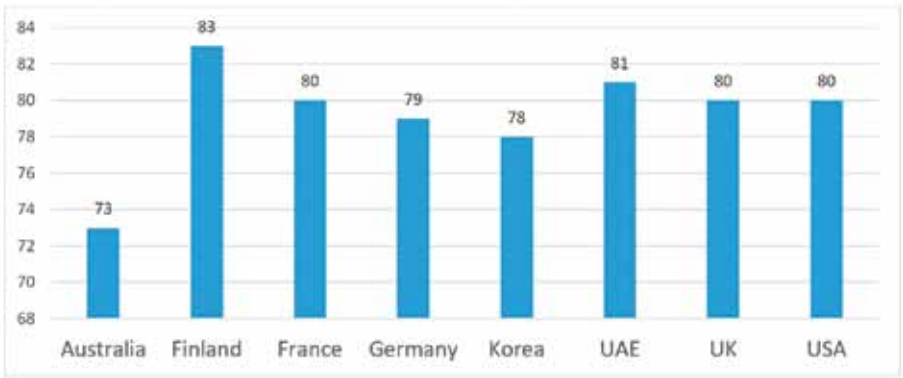
It is, of course, Quixoticity's wish to increase the number of countries included in the Quixoticity Index in 2019, having now established a more stable methodology, model and benchmark during this year's research. We will be making important announcements about new markets to be studied during early 2019.

Quixoticity has also begun to study eight major vendors: four from the traditional PMR space (Airbus, Harris, Hytera, Motorola Solutions) and four from the LTE/5G space (Ericsson, Huawei, Nokia, Samsung). Following research conducted throughout 2018 using publicly available information, we have produced a preliminary report of findings, although we believe that additional primary research needs to be conducted before any full report will be published.

One very positive note is the increased level of trust, understanding and cooperation among all industry vendors over the past 12 months or so. Almost all the companies mentioned above are active members of 3GPP, TCCA and other key bodies dedicated to next-generation critical communications.

It will be interesting to see how the market for products, services and applications develops in time. It will also be interesting to see which other players emerge from within or outside the global ecosystems being built by the major players.

We are at the beginning of a very long journey. The final outcome of this journey is far from certain. Critical communications matters. We must continue to fight for a better, smarter, safer world by 2030. For our children and grandchildren's sake, we cannot fail.



Australia is still bottom of the rankings in the Quixoticity Index.

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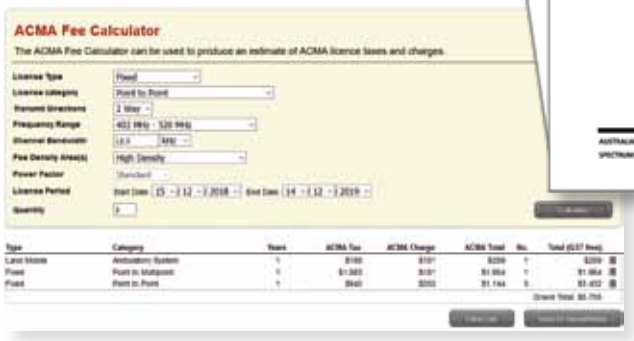

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LTE PoC TAKES HOLD IN NZ

Recent market entrant LTE NZ is riding the wave of interest in PTT-over-cellular services.

LTE NZ manages a national PTT-over-cellular network, utilising the Vodafone and Spark platforms, and has just celebrated its first anniversary. According to the company's Managing Director, Simon Green, "There's been a lack of competition in the New Zealand market for national PTT services, mainly due to both the huge infrastructure investment required and the need for accessible sites across the country.

"We're aiming to reverse the trend of LMR customers migrating to cell phones due to a lack of options in the market, by providing the right kind of product that provides PTT style of use with the coverage of cellular networks," he added.

There are essentially two types of LTE networks — the public shared voice and data networks such as Vodafone and Spark operate, and the closed, dedicated LTE PTT networks that are being built in places such as the UK and USA. "Whilst there are SIMs that will give users priority access to shared networks, these are extremely limited and only available to government organisations, so they aren't really an option for critical services such as air and sea ports," said Green. "For these requirements, a privately owned network is needed, which essentially means having to build your own cellular network for your own use."

According to Green, LTE provides great advantages over lower-tier digital radio sys-

> IT WORKS EXACTLY THE SAME WAY AS A TRADITIONAL LMR DEVICE, SO THERE'S NO NEED TO RETRAIN ON A DIFFERENT SYSTEM.
> — SIMON GREEN, LTE NZ

tems such as DMR, and has features as good as P25 and TETRA. "As long as the private network is built with the same redundancies in place as any other mission-critical project, it makes an excellent option … and over the coming years critical LTE networks will become quite common," he said.

LTE NZ is currently launching a dual-mode LTE/DMR radio to support both LTE and LMR technologies. Green says there are large parts of New Zealand that do not and never will have cellular coverage, meaning traditional LMR is the only practical solution. "The forestry industry is a great example for the requirement of this type of technology mix," he said. "Use the LMR technology when you need access to the private network and then switch to LTE when you need to drive on the main roads. Both technologies operating seamlessly side by side."

As data speeds increase with 5G on the horizon, Green sees more use for video communications being likely. In the same way that traditional telephony saw the emergence of VoIP before Skype came along and took it to the next level, Green sees mobile communications going the same way.

There are essentially two ways that LTE PTT is utilised at the moment. A lot of suppliers are looking to provide an app-based service running on a smart device with a PTT button on the side. "This gives you great options to add a lot of other services, but on the flip side it can be quite complicated to use and you end up paying twice for the service — once for the data and then again for a subscription to the app," said Green.

LTE NZ has taken a different approach. The products supported on its network look and operate in exactly the same way as traditional LMR radio, they just use data on a cellular network to send the digital voice. "For the operator, it works exactly the same way as a traditional LMR device, so there's no need to retrain on a different system and no complicated smart device to work out," said Green. "You just press the button to talk and turn the channel knob to change channel."

Green says that the company's first year has been one giant and very steep learning curve, with some standout lessons learned along the way. "For example, don't give customers the ability to delete devices off your network or you'll find yourself spending your entire Sunday reloading their devices back onto the network," he said.

At first, LTE NZ was reliant on the radio manufacturers providing the network management system on their servers. While this was a very convenient and cost-effective way to operate, the company soon found out that it introduced terrible operational problems.

"If anything needed to be done or fixed, you were dependent on their timescales," said Green. "Most manufacturers operate a good few hours behind us in New Zealand, so when we're trying to fix issues at 8 am, they're not around for another five or six hours, leaving us in the lurch. Also, LTE PTT tends to run into problems if network delays get too big."

Setting up its own servers not only gave the company control on how it maintains and supports its system, it removed the latency issues involved in running through a cloud or overseas server.

"The biggest high for us came when we signed up our first thousand subscribers," said Green. "While it's totally arbitrary, there was something about that number that made it feel like we had made our mark on the industry and had to be taken seriously."

Looking ahead, Green says one of the most exciting new features of LTE NZ's system is the ability to turn the mobile radio into a Wi-Fi hub. "We've only recently started investigating the opportunities this creates, but having the ability to act as a portal for multiple connected devices is very exciting," he said. "We're always open to new ideas, so if anyone out there has any suggestions, we'd love to hear from you."

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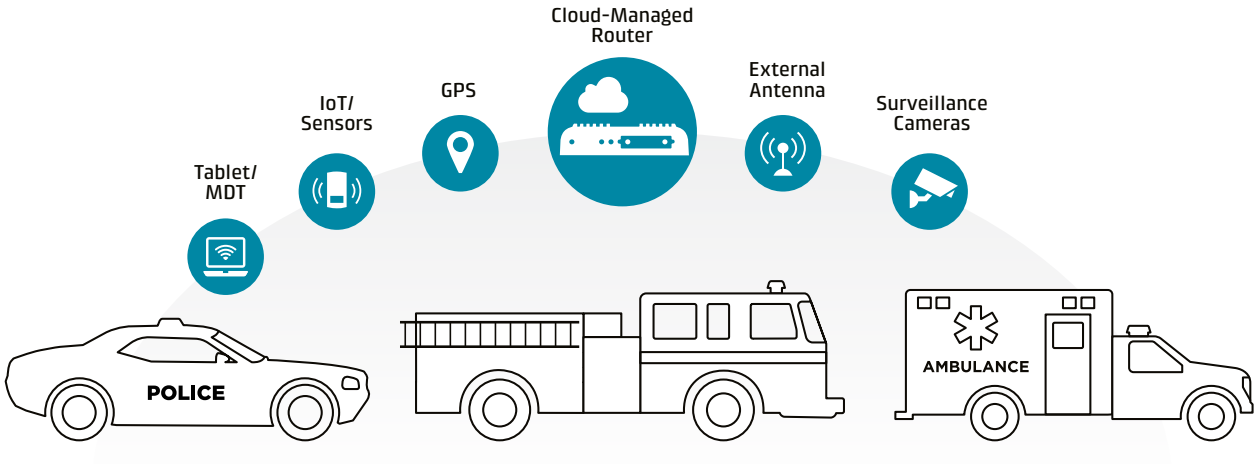

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2018 INDUSTRY AWARDS

Jonathan Nally

The national awards for engineering, technical excellence, sales and customer service were announced in November.

The recipients of the ARCIA 2018 Industry Excellence Awards were announced at the organisation's annual gala dinner on 21 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.

The Professional Sales Award was presented to Malcolm Davies, whose citation read: "Malcolm is always looking to improve customer experience and satisfaction and always willing to share his experience with his colleagues. His after-sales support and customer service goes above and beyond. Malcolm is a worthy winner of the professional sales award; his commitment to his customers sets him apart. Malcolm strives to ensure all customers get exactly what they need, regardless of whether the sale is for one radio or a multi-million dollar project."

The Technical Excellence Award was presented to Paul Burne. Paul's nomination noted that he has had 21 years' experience in the industry and consistently keeps updated with the latest radio technology. During his employment with Harris, Paul has been a valuable and a dedicated employee who possesses exceptional professionalism and enthusiasm for his work. Following a recent project for the Royal Australian Navy with hard stop deadlines, the project manager commented that "Paul should be commended on his hard work and dedication during the system upgrades; his knowledge and professionalism during the activity was exceptional".

The Customer Service Award was presented to Raylene Serrett. Her citation noted that "her commitment to raising the standards and quality of customer service for Simoco has made her a true asset to the business. She has introduced KPIs and an innovative, dedicated scheduling system to the business, establishing a strong foundation of reliability, punctuality and absolute trust for their customers. Her tireless dedication in developing client and partner relations guarantees that her customers receive an excellent level of service."

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 2018 national Industry Professional of the Year Award was presented to Anthony Benbow from Western Australia. Anthony has devoted significant amounts of time to training young people, both in his role with Department of Fire and Emergency Services in WA and also since his move into private industry. He continues to push for better and wider training options to encourage more young people into the communications industry.

The Engineering Elegance Award was presented to David Cook, a senior digital gateway software engineer based at Zetron's Brisbane R&D facility. David led a team of Australian engineers developing a EUROCAE compliant gateway for Zetron's Command and Control systems to support the global aviation and marine operators who

All images copyright Ari Adar Photography.

are adopting the EUROCAE standards for connecting their command and control systems to their radio infrastructure. David's innovative design has resulted in the solution being successfully deployed in the USA and UK.

The New Talent Award was presented to Neal Fernandes-Dodsley, whose employer citation read: "Neal is a gifted accountant who has shown a huge dedication to learning about the industry so that he can support our growth. He has been involved in many change management initiatives and with his support we have greatly improved our quality systems in a short space of time. Finance and operations staff often get overlooked when it comes to accolades and CSE want to ensure that it is acknowledged that Neal is a crucial contributor to our business running smoothly."

The recipient of the Community Service Award was Kevin Graham. Kevin has been in the radio industry for almost 40 years and is well known to most. For more than 10 years Kevin has been the driving force behind the Australasian TETRA and Critical Communications Forum, having served as a director from its inception. Members of the Forum and the industry in general have benefited from Kevin's tireless volunteer work in actively managing the day-to-day activities of the group, liaising with other industry groups and playing a vital role in coordinating various events in which the Forum has been involved... the most recent being the highly successful 3GPP event organised in conjunction with Melbourne University CDMPS, TCCA, ARCIA and VicTrack.

Life membership was granted to Jeff Perry from Adelaide in recognition of his many years of effort as the representative for ARCIA in South Australia. Jeff has always been a passionate ARCIA supporter and keen to ensure the best for his colleagues and peers.

The final formal event of the evening was the presentation of the Jonathan Livingston Award. The recipient this year was Hamish Duff. Hamish has had, and continues to have, a long and distinguished career in radiocommunications. The extraordinary efforts he puts into ARCIA on behalf of the industry; the development of the Orion Network which revitalised several other radio businesses and gave them an incentive to expand and grow in addition to his own business benefits; and the fact that he is a role model and mentor to many people in the industry, make him a very worthy and very popular recipient of this award.

In accepting his award, an emotional Duff spoke of his passion for communications, the industry and encouraging young people to consider a career in communications. He noted that the public is usually completely unaware of the work the radiocommunications industry does to ensure public safety, but "that's okay" he said.

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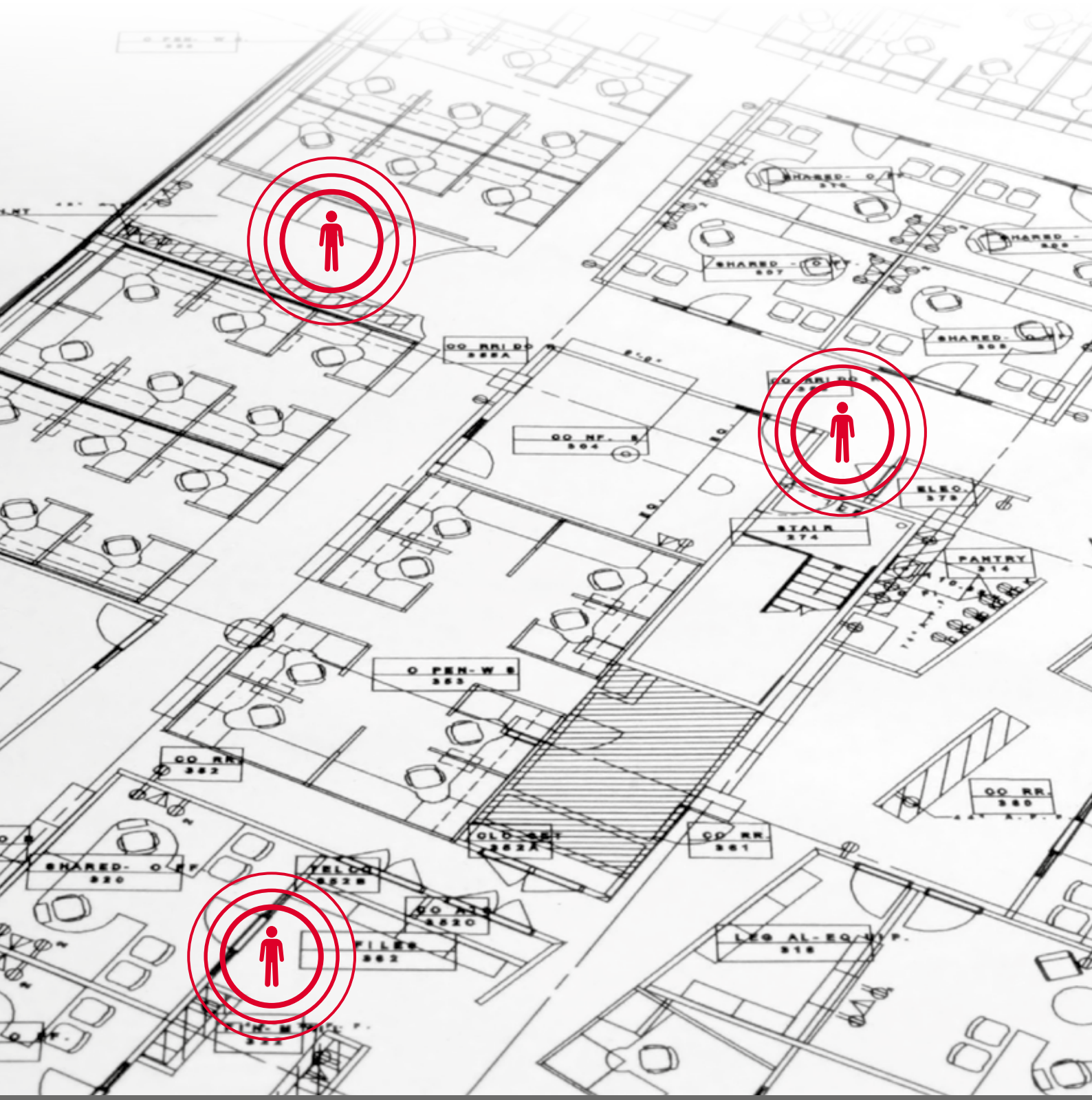

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AHEAD OF THE GAME

Mastercom has celebrated its first 50 years with a glittering event at Star City.

Mastercom, a New South Wales-based provider of mission-critical, two-way radio and networking, marked a half century of innovation with a gala event at Sydney's Star City Event Centre on 24 October.

Two hundred guests, including the Shadow Minister for Small Business, Jenny Aitchison MP; the State Labor Member for Granville, Julia Finn MP; and the NSW Police Deputy Commissioner, Jeff Loy, enjoyed an evening of fine dining, speeches and networking. Comedian and master of ceremonies Seamus McAlary ensured proceedings flowed while musical act Bakky Skank filled the dance floor with its signature rhythm and melody.

From humble beginnings around the back of the Cumberland Cabs (now Premier Cabs) building in Granville in 1968, Mastercom has gone from strength to strength over the years, delivering cutting-edge communications technology that has solidified the company's ability to provide bespoke, scalable two-way-radio network solutions that keep people connected.

The Mastercom team's genuine passion for, and interest in, the capabilities of technology saw the company grow so much that new premises were needed around 1980. The new site is now a hive of activity and a valuable training ground for many of today's digital mobile radio industry specialists.

Under the direction of Managing Director Hamish Duff since 2007, Mastercom has been able to move with the times, innovate with the technology at hand while also looking to the future.

"Mastercom prides itself on the strength of its professional team and ability to develop, manage and grow often complex communications technical infrastructure," said Duff.

"We think outside the square and never shy away from a challenge, which is how we've been able to stay ahead of the game."

Shadow Minister Aitchison praised Mastercom for its longevity and contribution to both the local and state economy.

"Making a small to medium business successful takes skill and dedication, but it also requires a genuine commitment to staff that they will receive not only employment, but ongoing training and mentoring," she said.

"Many of Mastercom's staff have been with the company for decades and are leading the way when it comes to providing technological advances within the sector. Likewise, many customers have relied on the business for decades.

"I congratulate Mastercom, Hamish and the team on reaching this important milestone, and for being a training ground for new recruits in what is a complex industry where learning must be done on the job," she added.

"I began my career with Mastercom in the '80s, so it's with great pride I see the company hit its half-century," said Duff.

"So many people along the way have been instrumental to the company's success — our staff, partners and customers.

"Without their support and loyalty Mastercom would not be what it is today, so to them I offer my heartfelt thanks."

> I CONGRATULATE MASTERCOM, HAMISH AND THE TEAM ON REACHING THIS IMPORTANT MILESTONE. — JENNY AITCHISON, SHADOW MINISTER FOR SMALL BUSINESS

Pictured, top: Managing Director of Mastercom, Hamish Duff; State Labor Member for Granville, Julia Finn MP; and NSW Shadow Minister for Small Business, Jenny Aitchison MP.

News

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DENSE AIR ACQUIRES NZ SPECTRUM

Dense Air has completed acquisition of 2.5 GHz Spectrum Management Rights from Blue Reach and Cayman Wireless in New Zealand. The combined spectrum assets provide 70 MHz spectrum in the 2.5 GHz Band (3GPP Band 7 and Band 41). Dense Air is a wholesale network operator that 'enhances and extends' the coverage and capacity of existing mobile networks and will operate as a 'carrier of carriers' operator, typically on a neutral host basis. The company uses a comprehensive portfolio of 4G and 5G small cells to offer services to mobile operators in licensed spectrum dedicated to small cells for densification/extension deployments.
More info: https://bit.ly/2Puj1ID

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BARRETT SUPPLIES HF TO TAWA

The Tanzania Wildlife Management Authority (TAWA) has chosen Barrett Communications to supply its HF radiocommunications for national parks and conservation areas. The TAWA manages 169,553 km2 comprising game reserves, game controlled areas and open areas across Tanzania. The multiphase project was funded by USAID and included the Barrett 2050 HF base stations and Barrett 2090 HF portable manpacks. The HF system design includes both base station and portable manpacks to enable the park rangers to go out for weeks at a time. "Communications and safety go hand in hand, and the Barrett HF system will give the TAWA and its rangers the field-proven reliability they need," said Andrew Burt, Chief Executive Officer for Barrett Communications.
More info: bit.ly/2EoOlrm

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 Feb/Mar 1994 issue of *What's New in Radio Communications* featured the GME Electrophone TX5200 series of trunked mobile radios, designed to fully comply with MPT1327/1343 specifications but with the ability to use conventional PMR mode with CTCSS for trunking bypass. Inside the magazine we reported on Omnitronics appointing Neil Muller as the exclusive distributor of 9000/9200-series telemetry equipment in South Australia. Omnitronics also featured in the world speed record attempt by Rosco McGlashan in Aussie Invader II, vital telemetry for which was sent over the air using the company's microprocessor and I/O cards. Telstra Maritime Services was reported as releasing an advanced new direct-dial microphone to enhance its growing national Seaphone network. David Cooke (RFS Australia) and Richard Chocolate (Celwave, USA) showed us the long and short (and thin and fat) of choosing antenna subsystems. WA-based Transom International was awarded a $5.7 million contract to install its comms technology in Malaysia's largest long-distance bus fleet, and Auspace had received orders for its GPS Multinav module from customers in India, Thailand, China, Taiwan and Indonesia.

10 YEARS AGO. The cover of the Jan/Feb 2009 issue of *Radio Comms Asia–Pacific* featured the Rohde & Schwarz FSH4 and FSH8, lightweight, battery-powered spectrum analysers (9 kHz to 3.6 or 8 GHz). We reported on C4i winning a $9 million contract to supply its Alarmon system to 20 major and regional airports across Australia, and Benbro Electronics bought 23 GME AccuSat personal locator beacons for use by bushwalkers in the Blue Mountains on a free-loan basis. We also reported on research by a Spanish industrial consortium, led by Teltronic, into combining TETRA's narrowband services with an extension via broadband wireless base stations and mobile devices into a single Ethernet/IP architecture. And our feature article showed how Australia's largest timber plantation company, Melbourne-based HVP, worked with ComGroup to install Simoco radio and GPS equipment to improve worker safety.

Spectrum

Driving transformation through culture

The NSW Telco Authority's mandate is to provide the mission-critical radiocommunications network for NSW. Our role is also to lead and drive reform of the NSW Government's operational communications sector.

Critical Comms readers would know that this is highly technical, with a myriad of interdependencies, against an ever-changing landscape of technology advances. It is constant transformation which demands effective partnerships across the spectrum — with our public safety agencies and private sector suppliers of equipment and services.

We are building a radiocommunications network for NSW Government agencies, including our public safety agencies, which protect the lives and property of more than seven million citizens across our state.

This will be a network that works when all else fails, and goes to the highways, bushland, plains, escarpments and waterways where our emergency services need to operate. The network will expand to cover 80% of NSW. We are working to consolidate around 2600 radio network assets into 700 assets across NSW. This will reduce the myriad of different radio networks into one, so first responders — fire, police, ambulance — can communicate with each other.

We have successfully delivered the pilot in part of the north-west region of NSW, and we are now focusing on the North Coast and Greater Metropolitan Region of Sydney, taking in the Hunter, Blue Mountains, Illawarra and Central Coast.

So how do we deliver an expanding network, operate and manage it through transformation and keep our customers at the heart of what we do? People.

People deliver successful outcomes. We ask our partners to work as one team to serve our customers — paramedics, police officers and firefighters — those men and women on the frontline who work so hard to keep us, our property and communities safe.

My commitment is to the public safety agencies the NSW Telco Authority serves to ensure that we deliver the best, so the front line can do their best.

Transformation is about people. That is why the Telco Authority looks for partners that align with our culture — service, trust, accountability, integrity, respect and safety.

Our behaviours support our culture. We aim to lead by example; we work hard to deliver on our commitments; we are open and honest; we look for solutions; we cultivate diversity; we focus on results. And we ask our partners to be one team with us.

When we look for industry partners, we seek alignment with our culture as well as capability and experience.

We work as one. And the work of the NSW Telco Authority is about people and those who rely on mission-critical communications to keep you and your family safe.

Kate Foy joined the NSW Telco Authority as Managing Director in June 2016. She previously held executive roles in Infrastructure, Planning and Natural Resource, and Transport, with responsibilities for programs such as Opal, customer digital transformation, customer design and wayfinding.

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