SEPTEMBER/OCTOBER 2020 Vol.7 No.6

comms critical

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comms critical

Inside

Sep/Oct 2020

READ ONLINE! *This issue is available to read and download at*
www.criticalcomms.com.au/magazine

ON THE COVER

The IMPULSE Wireless mission-critical portable (MCP5) operates on LMR and LTE. It provides autonomous and seamless operation, automatic bridging and intelligent switching between PTT-over-LTE and DMR Tier II.

The MCP5 has straightforward operation like a normal two-way radio, and autonomously operates on both LTE and LMR to provide mission-critical communications. Failover/mission-critical operation includes direct mode (simplex), DMR repeater operation, automatic voice bridging between DMR and the LTE/4G network, and automatic data bridging for sending GPS and SOS information over DMR back to the GPS tracking system via LTE/4G.

When out of coverage, MCP5s will create a self-organising DMR network to efficiently manage the transfer of voice, GPS and SOS data between each other, and back into the LTE/4G PTT network where possible. In this scenario, devices out of 4G coverage will make use of an MCP5 with LTE/4G coverage to automatically bridge voice and data between DMR and LTE.

A DMR network using one or more repeaters may be employed to cover a larger 4G black-spot if required. The MCP5 can also operate exclusively in DMR mode, providing radio communications and enhanced location tracking, man-down and lone worker protection with no need for a 4G network.

Running Android 9, the MCP5 supports a variety of applications, including most leading push-to-talk applications, with its large PTT and SOS buttons, loud audio and optional wired remote speaker microphone.

IMPULSE Wireless
www.impulsewireless.com.au

Transmit

It is with a heavy heart that we bid farewell to Paul Davis, as he leaves his role of Comms Connect leader extraordinaire and moves on to his next career challenge. Over more than a dozen years, Paul built the Comms Connect conferences and exhibitions from scratch, turning them into premiere events on the world critical communications calendar. His ability to put together a line-up of diverse, talented and respected communications authorities from around the world has helped the spread of knowledge and expertise and brought the sector together in a unique sort of way. Paul, you will be missed, and I'm sure all of Australia's critical communications professionals wish you well in the future.

The show must go on, however, and the Comms Connect crew have put together a schedule of virtual events that will appeal to pretty much everyone within the sector. Some of the short courses have proved so popular that they've had to be run twice. I encourage you to take a look at comms-connect.com.au and see what's on offer in terms of professional development.

Just as this issue was going to press, the official NSW Bushfire Inquiry final report was released by the NSW Government. The report covers many aspects of firefighting, including communications, saying that "There is also a need for improved telecommunications, both to ensure the community can access the information it needs to make timely and appropriate decisions, and to enhance firefighting capability. This varies from improving power backup arrangements, to expanding fire information apps, to improving firefighter access to radio public safety networks." Indeed. You can read the report at https://www.nsw.gov.au/nsw-government/projects-and-initiatives/nsw-bushfire-inquiry.

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

September

IoT Festival 2020
28 September to December
Online sessions
iothub.com.au/iotfestival

October

Radio Communications DC Power Fundamentals
20–27 October
Online sessions
comms-connect.com.au

November

Comms Connect Virtual Conference Series
5–26 November
Online sessions. See article on page 9.
comms-connect.com.au

Digital PMRExpo 2021
24–26 November
Online sessions
pmrexpo.de/en/pmr20/

Critical Conversations for technical people
24–27 November
Online sessions
comms-connect.com.au

December

Radio Communications 101
2–14 December
Online sessions
comms-connect.com.au

February 2021

Managing technical teams
8–12 February
Online sessions
comms-connect.com.au

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

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connecting industry

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HITACHI ABB POWER GRIDS ADDS MOBILE WIRELESS CAPABILITY FOR FULL TROPOS PORTFOLIO

Tropos outdoor mesh routers deliver high reliability and performance in extreme application environments.

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The industrial-grade Tropos portfolio is specifically designed for mission-critical applications in harsh environments such as mining, oil & gas, utilities and smart cities. Products supported include Tropos 6420-XA for extreme outdoor environments including salt fog resistance and ATEX Zone 2 for explosive atmospheres, Tropos 6420 and 1420 for external mounting, and Tropos 2420 for mounting inside a vehicle. All are dualband routers operating at 2.4 and 5GHz, providing an extremely reliable and secure self-healing broadband mesh network.

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Silverwater NSW 2128,
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WirelessTech

BUSHFIRE INQUIRY RECOMMENDS COMMUNICATIONS IMPROVEMENTS

Jonathan Nally

The NSW Bushfire Inquiry has made a range of recommendations for strengthening the state's emergency communications capabilities.

The final report of the NSW Bushfire Inquiry has been released, and it makes numerous recommendations for improving the fighting of bushfires and boosting the technology and resources available to firefighters and emergency management authorities. Many of those recommendations concern communications.

To start with, the Inquiry found that there are several problems with New South Wales' Public Safety Network (PSN) — formerly known as the Government Radio Network — including the well-known issues of coverage, forcing agencies to rely upon PMR networks that cannot provide broadband data services.

The report also states that "despite work to provide connectivity between the PSN and the Queensland Government Wireless Network, there is no multi-state interoperability for wide area communications, and NSW radio must be physically fitted to interstate metropolitan fire fighting vehicles when they arrive in NSW".

The Inquiry was told that there were PSN coverage issues on the NSW North Coast "as interim 'fixes' were put in place" and that the network "was partially activated and agencies had to largely rely on their individual PMR networks".

"A lack of deployable equipment and the vast and mountainous geography of the areas involved meant it was not always possible to establish effective communications networks. This meant that fire agencies deployed communication specialists to use deployable radio repeater equipment to attempt to create 'on the run' interoperability networks to allow for tactical communications between agencies," the report said.

Thus, Recommendation 55 states that the NSW Government should ensure that "all NSW fire authority personnel and vehicles can access and utilise the Public Safety Network (PSN). This should include access to NSW RFS Private Mobile Radio networks where PSN coverage is not yet available." It also says that the NSW Telco Authority should "review cross-border communications availability and planning and advise NSW fire authorities on next steps to enable multi-state interoperability for wide area communications".

Furthermore, the State Emergency Operations Centre (SEOC) does not have its own independent PSN capability due to a lack of hardware and no assigned talk groups or service subscriptions. Recommendation 56 states that the government should provide the SEOC with independent PSN functionality.

The Critical Communications Enhancement Program (CCEP) aims to increase the PSN's land coverage to 85% of the state and 98% of the population. The Inquiry says that it firmly "supports expanding PSN as a priority" and "endorses the continued funding and completion of the CCEP as an immediate priority to enable an effective operational response by ESOs and, pending development and implementation of Public Safety Mobile Broadband, a more sophisticated mission-critical data transfer and communications system that will promote interoperability for NSW agencies and across borders".

Public safety mobile broadband

The benefits that would come from having a national public safety mobile broadband (PSMB) capability are well known. The Inquiry notes that achieving an "interoperable PSMB capability will support cross-border cooperation between public safety agencies during large-scale cross-border disaster and bring Australia in line with international jurisdictions such as the US and UK, which already have this capability".

A PSMB National Project Management Office (NPMO), hosted by NSW and re-

> THE INQUIRY UNDERSTANDS THAT FUNDING ARRANGEMENTS FOR THE NPMO AND THE PROOF OF CONCEPT ARE NOT RESOLVED BETWEEN THE JURISDICTIONS.

sponsible for delivering work streams under the national PSMB Strategic Roadmap, "is in transition to centralised coordination under the Commonwealth", the report says.

"The Inquiry understands that funding arrangements for the NPMO and the proof of concept are not resolved between the jurisdictions, and that this is required for the national PSMB program to proceed."

The Inquiry also notes that the Commonwealth "has set aside 5 + 5 MHZ of spectrum for PSMB and offered this allocation to states and territories at below market value. However, NSW agencies advised the Inquiry that this allocation is only sufficient for business-as-usual public safety activities and would require heavy reliance on supplementation from commercial spectrum."

"NSW agencies support provision of 10 + 10 MHz of dedicated spectrum to reduce reliance on carrier spectrum and allow for streaming of real-time data from multiple, concurrent sources," the report states.

"In addition, given that the PSMB is solely for communications that support community protection and safety, the dedicated spectrum should be provided at no cost to states and territories," the report adds.

Thus, the recommendation is that "in order to ensure emergency response agencies can communicate across state and territory borders, the Commonwealth Government [should] allocate 10 + 10 MHz as a dedicated spectrum for Public Safety Mobile Broadband (PSMB) at no cost to states and territories".

Interoperability

Regarding interoperability between different states and territories, the Inquiry noted that while there are MoUs are in place, "there are differing levels of compatibility between fire agencies".

For instance, ACT RFS vehicles have the NSW RFS code plugs that enable all NSW channels to be available to ACT RFS appliances, but Queensland and NSW operate different radio communication systems that are not directly compatible.

Therefore, Recommendation 58 says that "in order to ensure all agencies have a clear understanding of cross-border communication channels during bush fires, all MoUs between state or territory agencies [should] include an agreed protocol about how agencies will communicate across borders and that these are reflected in Incident Action Plans".

Command and control

Recommendation 59 in the report advises that "in order to improve response times to Triple Zero calls, the NSW RFS implements the integrated dispatch system before the 2020-21 fire season commences".

This is followed by Recommendation 61, which states that "in order to improve cross-agency communication and coordination during bush fires, the NSW RFS [should] review Fire Control Centres (FCCs) in areas that were heavily affected by fire. The results should be combined with the Emergency Operations Centre (EOC) Facilities Review to identify areas that would benefit from a purpose-built FCC, enabling co-location with the EOC."

Other recommendations

Recommendation 30 covers minimising outages and extending coverage during bush fires, and says that the NSW Government should "work directly, or together with other Australian governments and/or their relevant power and telecommunications regulatory, policy and market bodies" to:

- ensure there are sufficient redundancy options available (eg, backup diesel generators, deployed temporary telecommunications facilities);
- facilitate cross-carrier roaming arrangements between carriers and the public for basic text, voice and data during the period of emergency;
- enable NSW RFS to require carriers to provide regular information on the status of outages and areas affected by fire.

This is reinforced by Recommendation 54, which says that mobile generators should be "sourced and distributed on a priority basis during natural disasters, [and that] the EUSFAC [Energy and Utility Services Functional Area Coordinator] work with the NSW Telco Authority, relevant NSW government agencies and commercial stakeholders to develop a mobile asset deployment strategy. The strategy should reduce duplication in purchasing, maintaining and housing mobile generators and improve agility in deployment."

The report also recommends that the NSW RFS accelerates the rollout of Mobile Data Terminals into all fire fighting vehicles to improve delivery of briefings and incident information/intelligence.

It also recommends that "finalisation of the Australian Warning System [should] be prioritised to provide greater consistency in public information and warnings" and that "in order to provide real-time information on evacuation doorknocking during emergency events, Government [should] explore a shared data gateway for NSW agencies based on the NSW State Emergency Service Collector app and a common mapping and analytics platform".

This is just a brief overview of the report's recommendations. You can read the full report at https://www.dpc.nsw.gov.au/publications/categories/nsw-bushfire-inquiry/.

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COMMS CONNECT RETURNS WITH VIRTUAL SERIES IN NOVEMBER

Jonathan Nally

The new Comms Connect Virtual Conference Series is set to deliver a high-quality program of speaker sessions.

Although the physical Comms Connect Melbourne 2020 event has had to be cancelled due to COVID-19, the new Comms Connect Virtual Conference Series is set to deliver a high-quality program of speakers in November.

Each Thursday in November between 10:00 am and midday, a series of online presentations from local and international experts will be held, followed by an interactive Q+A panel session. The sessions will be chaired by Chris Stevens, a highly respected public safety communications expert and Managing Director of CartGIS.

The Comms Connect Virtual Conference Series will be widely marketed across Australia, New Zealand, the Pacific Islands, PNG and South-East Asia — spreading the Comms Connect brand to a broader audience than ever before.

Detailed information will become available on the Comms Connect website (www.comms-connect.com.au) in the coming weeks, but here's a preview of what to expect.

Thursday, 5 November: Cybersecurity and our industry. Cybersecurity threats are a continually evolving risk management issue for the critical communications industry. And as we become more digitised and connected through the internet and integrated topologies, networks will only become more exposed to cybersecurity threats. As network designers, engineers, integrators and managers, we need to have confidence in the ability of our digital infrastructure to stand up to cybersecurity threats. Is the critical communications sector lagging behind others in this regard?

The Comms Connect team has also put together the following series of online masterclasses and courses covering a variety of topics — full details can be found at www.comms-connect.com.au:

Thursday, 12 November: Private LTE — ensuring coverage, capacity and control, from design to implementation. Organisations that can generate the greatest benefit from private LTE have the kind of use cases that are not readily supported by public networks. This session will cover the primary reasons to deploy private networks (coverage, capacity and control), how to need to ensure infrastructure and equipment is cost-effective, fast to deploy and simple to operate, and how a baseline architecture and design for private LTE is the building block of the process.

Thursday, 19 November: Location-based services — practical integration tips. With the rapid development of digital communication networks, location-based services represent a novel challenge both conceptually and technically. Most location-based service applications are part of everyday life, running across LTE (public and private), LMR, IoT and Wi-Fi networks. But providing end users with added value on top of mere location information is a complex task.

Given the variety of possible applications, the basic requirements of location-based services are numerous. To ensure these services maintain relevance in a big data ecosystem it is imperative that they be integrated into operational and analytical systems.

Thursday, 26 November: Next-generation land mobile radio systems — how does the industry keep radio relevant? Although global LMR system sales are expected to exhibit strong growth to 2025, how can the traditional comms industry remain relevant into the future? What opportunities exist for private and public safety LMR users and what strategies are being deployed by the sector to ensure relevance remains?

Critical Conversations for technical people (24–27 November: four, 3-hour sessions), presented by Trevor Manning (Managing Director of TMC Global), will provide a practical framework to have honest conversations while protecting relationships. Suitable for technical managers, specialist engineers and project managers.

Presented by Chris Stevens, the **Radio Communications DC Power Fundamentals** course (20–27 October: three, 2-hour sessions) is for those new to the industry and will cover AC/DC radio power systems and procedures for safe inspection and testing.

The **Radio Communications 101** course (2–14 December: five, 2-hour sessions), also presented by Chris Stevens, will introduce radio principles, including an overview of propagation and antennas.

Managing technical teams (8–12 February: five, 3-hour sessions) will be packed with practical tips and real-world examples. Presented by Trevor Manning, this course is ideal for engineers who have been promoted into management.

Comms Connect (WFevents)
www.comms-connect.com.au

News

BARRETT JOINS C4 EDGE PROGRAM

Barrett Communications is one of 16 Australian companies that have joined Team C4 EDGE (Evolutionary Digital Ground Environment) to scope the development of a sovereign communications environment for the Australian Army. The program will leverage internationally agreed open standards to grow and demonstrate Australian C4 Industry capacity and capability to deliver a battlegroup and below C4 capability. Team C4 EDGE is represented in six Australian states and one territory, and includes 16 Australian C4 subject matter expert companies with 975 employees and combined annual gross turnover of approximately $616 million. Team C4 EDGE intends to deliver a demonstration of Australian industry capability in late 2021.
More info: bit.ly/2YzO2Cg

NSW BACKS TUNNEL GPS SOLUTION

Transport for NSW has made a submission to the ACMA to install and trial retransmission points inside tunnels to simulate GPS satellite signals. Citing GPS signal problems within tunnels, Transport for NSW Deputy Secretary for Greater Sydney Elizabeth Mildwater said that repeaters are banned in tunnels but the ACMA is considering changing the law to let the technology be used. "Our innovative trial will investigate the effect of in-tunnel devices on receivers aboard emergency services vehicles, and other devices such as smartphones and GPS units," she said. "This is an opportunity to further modernise our infrastructure with potential benefits for IT, traffic management and control systems."
More info: bit.ly/3grvni3

P25 radios

KENWOOD P25 Viking radios are used throughout the world by police, fire, paramedics, military and homeland security personnel. The radios are used and certified on P25 radio networks around Australia and are available in every state.

To avoid the user having to purchase not only the radio hardware but all of the software options as well, the KENWOOD subscriber radio perpetual software licence program adds value by extending the life of the software into the user's next hardware platform — the user owns the software option forever and licences are easy to manage with Vault, a cloud-based asset management tool.

Maintaining a fleet of radios and updating radio software is done with Armada, a fleet management and programming software with an intuitive user interface. Armada introduces the concept of templates to fleet management — each user group can develop a single profile for its specific agency and designate it as a template. The template is linked to the selected agency's radio profiles and then, as necessary, Armada will download this information into the Viking radio.

JVCKENWOOD Australia Pty Ltd
www.kenwood.com.au

DC power system

The Eaton Outdoor Pole Solution (OPS2) with energy-saving 5G remote radio capability is a DC power system intended to power telecom 4G and 5G remote radio units, CCTV and industrial IoT equipment.

The OPS2 features full remote monitoring and control using SNMP and Web interfaces, enabling network operators to manage the power usage of their 5G small cell deployments. Third-party Li-ion batteries can be connected to enable small cells to have no-break UPS in critical locations.

The compact and rear-mountable design is IP65 environmentally hardened for placement high on poles, masts, building facades away from street-level gaze, and close to the 5G small cell equipment it powers. A rectifier fan internally circulates air and increases thermal efficiency, producing less heat and requiring less cooling.

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News

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CANBERRA SETS LIMITS FOR 5G AUCTION

The federal government has announced allocation limits of 1 GHz for the next 5G spectrum auction, scheduled to occur in March 2021. The 26 GHz spectrum will enable extremely high-speed, short-range broadband services, and will complement the 3.6 GHz spectrum that Australia's telcos are already using for 5G services. The auction will mark the first time that high-band 5G spectrum will have been made available in Australia. "Australia has been among the world leaders in rolling out 5G networks. To maintain our position we need to make the necessary spectrum available as quickly as possible," said the Minister for Communications, Cyber Safety and the Arts Paul Fletcher.

More info: bit.ly/3jcApRt


Image courtesy ARCIA.

NOMINATIONS OPEN FOR NATIONAL AWARDS

Nominations are now open for the 2020 Industry Excellence Awards, celebrating those who have contributed to the wireless communications industry. Members of the Australian Radio Communications Industry Association (ARCIA) can nominate themselves or others in the following award categories: Professional Sales, Customer Service, Technical Excellence, Engineering Elegance, New Talent and Community Service. The criteria for the awards and the nomination details can be found on the ARCIA website. Nominations will close on 30 September 2020. In addition to these national awards, ARCIA presents a State Industry Advancement Award at its regional events in Perth, Sydney, Brisbane, Adelaide and Melbourne.

More info: bit.ly/2Yx71xy

Inverter

The Helios SR-1600 Plus is a high-power-density rack inverter (1.6 kW per module, 6.4 kW in 2U rack shelf). The compact, lightweight design makes it suitable for remote sites and for most power systems applications in the telecom/datacom, power station, portable power energy, satellite and broadcasting industries. For the control field, it supports multi-control units including LCM Remote, SNMP Ethernet and Modbus Protocol (RS485).

Features include: a simple setting and scalable system capacity that supports up to 32 pcs (51.2 kW); seamless switching between AC and DC sources; 24 or 48 VDC input; wide AC input range, adjustable 150~265 V (230 V system) or 75~132 V (120 V system); high efficiency (~95%); and a power factor of ≥0.99. Advanced protection features include input reverse, undervoltage, overvoltage protection, output short circuit, overload and overtemperature.

Helios Power Solutions

www.heliosps.com.au

Fire station alerting solution

Zetron has released MAX Fire Station Alerting, an integrated communications system designed to provide a wide range of configurable alerting, automation and emergency response management capabilities to public safety agencies of all sizes.

MAX Fire Station Alerting provides features that improve the readiness, response time and situational awareness of emergency services, including: sectional, station and multi-station tone alerts and audio paths for improved bidirectional communication between dispatch and stations; and premium text-to-speech for natural audio voice messaging to complement/augment reader board and other visual communications.

The solution also provides remote Auxiliary I/O capabilities to enable dispatch to see real-time station/engine status and control station peripherals (eg, open/close doors, turn on/off lights and appliances, etc). Preconfigured or on-the-fly stacked actions centrally automate sequential station operations to expedite coordinated single- or multi-station dispatch and deployment.

MAX Fire Station Alerting also provides alerting and status views through existing CAD systems or standalone when CAD is offline or unavailable, and notifications delivered to talk groups including radios and PoC smartphones.

While MAX Fire Station Alerting integrates with third-party dispatch and CAD systems, it's also part of an integrated, end-to-end, mission-critical communications platform that includes MAX Call Taking, MAX Dispatch, MAX CAD and CommandIQ.

Zetron Australasia Pty Ltd

www.zetron.com

GME PROFESSIONAL

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- Voice Channel Announcement

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AUSTRALIAN MADE AND OWNED

NEW ZEALAND APPOINTS NEXT-GEN EMERGENCY COMMS BOARD

The New Zealand government has appointed a Chair and four independent members to the Next Generation Critical Communications (NGCC) Executive Governance Board.

NGCC is the government organisation responsible for replacing the current emergency services critical communications system with a new Public Safety Network for Fire and Emergency New Zealand, New Zealand Police, St John and Wellington Free Ambulance.

"Budget20 confirmed an investment of NZ$47.8m across five years for the Public Safety Network," said the Minister of Police, Stuart Nash.

"It will replace emergency services radio networks that are up to 30 years old and rely heavily on voice communications, with limited national coverage."

Rob Fyfe has been appointed as the NGCC Board Chair. Fyfe was previously CEO of Air New Zealand and "has led or sponsored major and complex ICT investments and programmes in many of the roles he has held", the minister said.

"The role of the Board Chair is vital for maintaining an objective balance between the interests of the participating Emergency Services agencies' and ensuring transparency for the four Ministers with oversight of this project," the minister added.

The four appointed independent members are:

Anthony Royal (Technical Member). Royal has a wide range of experience in both the telecommunications and ICT sectors. He is currently a Board Member of the New Zealand Qualifications Authority, and has served as Chair of the Ministerial Advisory Panel for the Maori Digital Technology Fund, and Chair of the Ministerial Advisory Group for Ultra-Fast Broadband and the Rural Broadband Initiative.

Deborah Battell (Commercial Member). Battell has held a number of senior executive roles in government and industry regulatory bodies. She is currently the Independent Consumer Representative on the Telecommunications Dispute Resolution Scheme, has been both the Director of Fair Trading and the Director of Competition at the Commerce Commission, and was formerly the Banking Ombudsman.

Karen Mitchell (Commercial Member). Mitchell has held senior executive-level positions within the public and private sectors, and has considerable experience in complex, high-profile infrastructure procurement and commercial negotiations involving multi-agency programs. She has been appointed to a number of governance and advisory groups for infrastructure projects.

TJ Kennedy (International Member). Kennedy is an international public safety technologies expert. He was President of FirstNet (the First Responder Network Authority) in the United States responsible for the implementation of a US$40 billion nationwide broadband network used by over 1.5 million first responders today. He has been a leader for a number of large international technology and system integration companies and had experience in implementing or advising on public safety networks in numerous international jurisdictions.

The Board also has senior executive representatives from the emergency services agencies:

- Andrew Coster, Police Commissioner, New Zealand Police
- Rhys Jones, Chief Executive, Fire and Emergency New Zealand
- Carolyn Schwalger, Chief Executive, National Emergency Management Agency
- Peter Bradley, Chief Executive, St John
- Mike Grant, Chief Executive, Wellington Free Ambulance

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- Breaker or fuse models
- Remote monitoring and power cycling of each load over Ethernet

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- Remote monitoring and power cycling of outputs
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RADIO REFORM ON THE AGENDA

Jonathan Nally

Spectrum access, private LTE, standards and compliance, and enforcement issues top ARCIA's list of concerns.

In its response to the consultation paper on the federal government's 2020 Radiocommunications Reform proposals, ARCIA has raised concerns about equitable spectrum access, as well as compliance and enforcement issues.

Noting that it represents around 60,000 holders of LMR apparatus licences and growing interest from its members in spectrum availability for private LTE systems, the Association noted that it had been "consistently pressing the ACMA for higher levels of transparency in all spectrum management areas".

As far as the ACMA's Five Year Spectrum Outlook is concerned, ARCIA said that it concurs "that it is a valuable tool for the regulator to both report to the Minister through the Department, as well as to the users of the spectrum and the public. Although not a perfect document yet it is well on the way to being a highly valuable management tool."

With regard to private LTE, the Association said that it "is going to be a developing market and will lead to the next wave of efficiency and productivity gains for many industry segments, [and] as such there has to be consideration given to the specific needs of spectrum in these markets".

"We are concerned that there has to be a balanced approach regarding equitable access to spectrum as well as providing a level of certainty for licensees who will have invested significant capital into providing services," it added.

Equipment and standards

Equipment rules are another area of concern, with the Association noting that "where the modernised equipment rules are outlined, we welcome the concept and can see benefits in moving away from the rigid standards regime managed by Standards Australia (SA)", adding that "where products are manufactured locally, we can see the need for SA to be involved, but in the modern market where products are sourced from off-shore suppliers the SA regime is no longer viable".

"The weakness in the proposed system will be maintaining access to the relevant equipment rules, as even with the present system there is little information available from the ACMA website that indicates to potential users of the spectrum what the actual equipment standards are," the submission said.

"How can we expect non-technical importers or users to access information if even technical people cannot navigate the supposed source of the data?"

Compliance issues

Compliance and enforcement are two more areas where "we have ongoing concerns … for the longer term," the Association said, noting that "even today it is becoming more difficult to have the ACMA Field Operations staff respond to interference problems in a timely manner in areas outside of the main centres".

"The new Act would seemingly be trying to improve the potential for ensuring compliance and enforcement, yet without some form of protection of the resources to provide these services the Act will be full of 'hollow promises'," the Association said.

"It is our belief that there needs to be some form of link between the funds generated by the enforcement actions of the ACMA Field Operations team and the resources they are provided to continue the work."

Spectrum efficiency

"One of the biggest concern for our members is the risk that poor management of the spectrum will result in loss of efficiency to the many users of the spectrum, and this will inevitably result in a loss of efficiency for our national economy," ARCIA said.

"The proposals under the revised Act will give the ACMA many powers to make the management and regulation of the spectrum a much simpler and easier process, we do not want to see any watering down of the resources or the will of the ACMA to implement and manage these new facilities.

"When we look at the increasing of powers regarding accrediting external bodies to assist with the ACMA workload, maybe consideration should be given to extending some of the powers to enable licensed users of the spectrum to take civil action where their use of the spectrum is being interfered with by others."

Summarising its response, ARCIA said that "we support the proposed changes to the Act and … we feel that maybe the role of the Act is changing and will soon encompass most of that covered by the Telecommunications Act at present".

"This merging of technologies, plus the development of new technologies opens up the risk that unless the Act brings actions as well as words, the electromagnetic spectrum will suffer significant degradation and a valued resource will be compromised."

ARCIA added that the revisions of the Act "are generally positive and we would sincerely hope that they will be embraced by both the regulator and the users in general", adding that "we would trust that the past situation of a high degree of emphasis on the provision of spectrum to one group of users, the public carriers, will be tempered by the need to recognise that other demands exist for spectrum and that grouping large blocks of spectrum to cover large geographic areas is not necessarily the only or best possible solution".

You can read more about the Exposure draft of Radiocommunications Legislation Amendment (Reform and Modernisation) Bill at https://www.communications.gov.au/have-your-say/exposure-draft-radiocommunications-legislation-amendment-reform-and-modernisation-bill.

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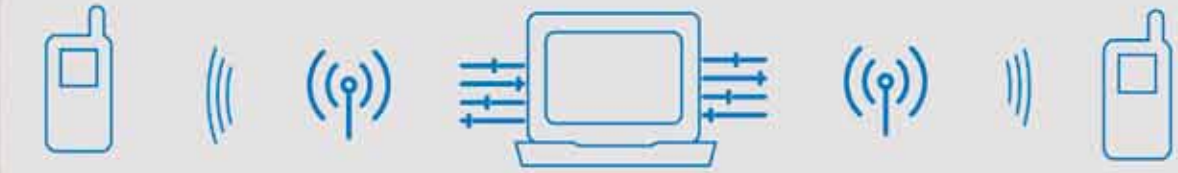

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PUBLIC WARNING SYSTEMS FOR SAFER SOCIETIES

Marta Azevedo Silva

An informed population is a safer population, and public warning systems play their part.

Tsunamis, cyclones, bushfires, terrorist attacks or even the current challenging situation we are experiencing — a pandemic. These are some of the emergency situations where rapid and effective communication with citizens becomes crucial and potentially lifesaving.

How can the authorities alert the population? An effective public warning system (PWS) is the answer.

Public warning systems help to protect the population by allowing for timely management of the emergency and an opportunity to reduce its impact. Using this method, authorities can contact members of the public en masse to notify them and consequently mitigate the impacts of an emergency. However, the paradigm has changed.

In the beginning, the aim was solely to alert people in case of major emergency, like a natural hazard. In recent days, these systems are also being utilised for more localised, day-to-day emergencies, like searching for missing children.

One thing is certain, research has proven that a modern and early public warning system can reduce casualties.

For example, in Hong Kong — a city prone to natural disasters — since the introduction of the Cyclone Warning Service, the death toll has decreased significantly. In 1962, the number of deaths or people missing during a cyclone peaked at more than 180. In more recent years, fewer than 20 people were reported missing or dead.

Different technologies

One of the most valuable features of an alert system is its effectiveness. The effectiveness of public warning systems is reliant on the communication channels that are employed.

There are different means of public warning, from earlier systems — fixed phones, TV, radio, sirens — to more recent ones using mobile phone cell broadcast (CB), location-based SMS (LB-SMS), mobile apps and the internet (web, email, PC notification, social media).

Communication via mobile phones is at the core of a PWS. So, what are the different means of alerting the population by telephony?

Cell Broadcast (CB) is a point-to-multipoint service — one text message sent to many. It is possible to send a message to a specific area (eg, region) or to an entire nation. The Netherlands has been using this system for the few last years. For example, during a large toxic fire in August 2018, the government issued a warning for residents, including security measures.

Location-Based SMS (LB-SMS) combines traditional SMS with cell-based location. This method identifies the list of mobile subscribers in the area and sends an individual SMS to each recipient. In September 2019, the Portuguese Civil Protection agency sent SMSs to citizens who were in the 13 districts where a special Red State Alert was declared due to the risk of wildfire.

App-based solutions do not need the cooperation of mobile network operators. Apps can send location-based alert messages using internet or radio. However, the big challenge is that this requires citizens to install the app. The Chilean app S!E sends messages via RF. In a country where it is difficult to predict risks, Chile's emergency alert system is saving lives.

The effectiveness of a public warning system can be improved by combining several technologies. This technique is called the multi-channel approach. A good example is Singapore.

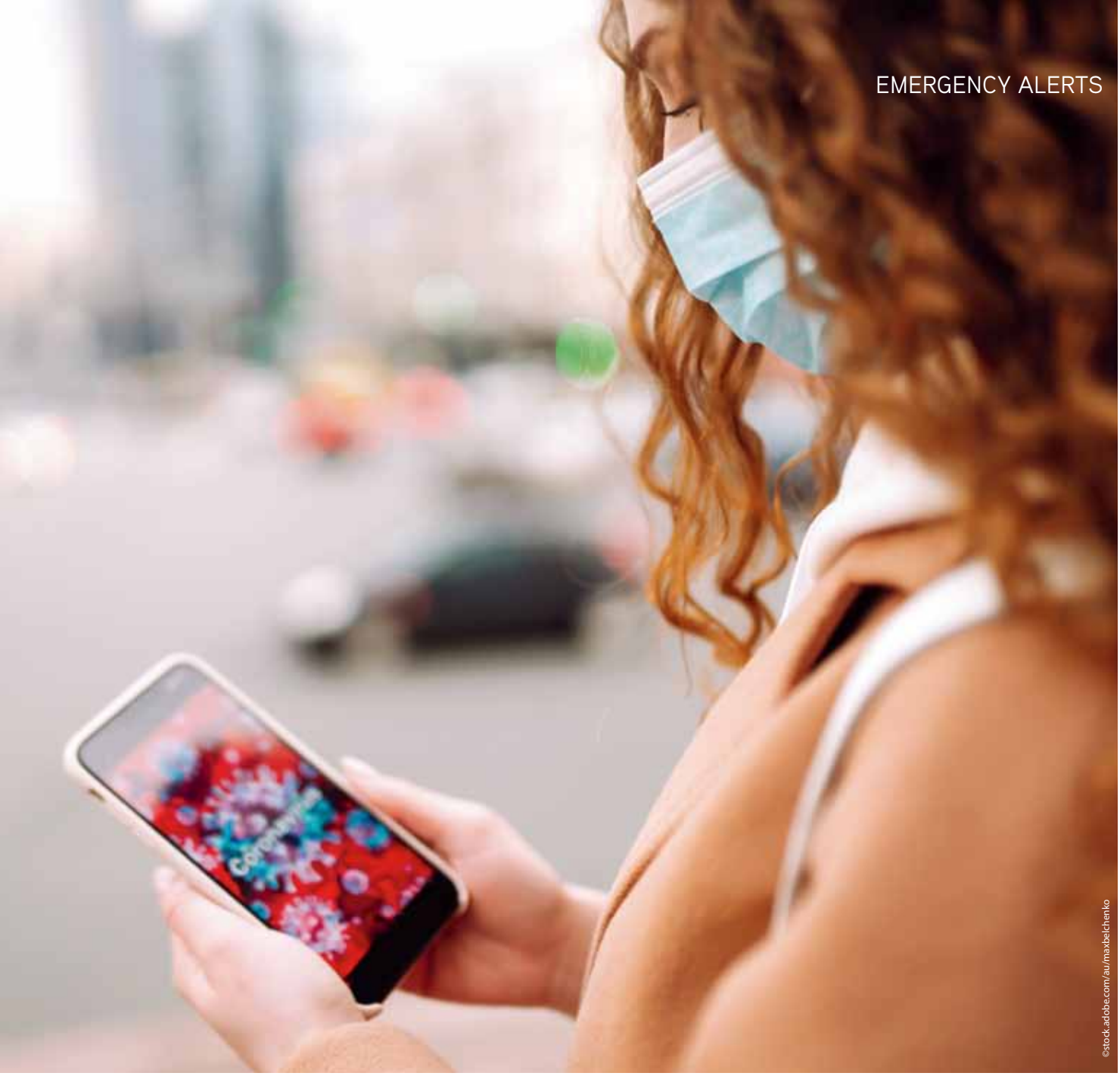
In Singapore, there is a siren system and a smartphone app in place, as well as an advanced location technology using an SMS alert.

Of course, activation of different channels requires attention to interoperability and connectivity issues.

So, what is mandatory for countries at EU level? With the risk of natural and man-made disasters on the rise, protecting the population has become even more critical. In December 2018, the European Parliament and the European Council published a new Directive on the European Electronic Communications Code (EECC). The new article, Article 110, mandates all EU Member States to have an effective telephone-based public warning system in place by June 2022.

The situation in Australia

When looking at the global picture, many countries on different continents already



have well-established public warning systems. This is especially the case in places where emergency situations due to natural disasters are more prominent.

These systems are often put in place during national emergency situations. Australia is one such case: in response to the Black Saturday bushfires in 2009, the Australian Government set up an emergency communications system called Emergency Alert.

Emergency Alert is a national telephony system used to warn the community of an expected or ongoing emergency. The system sends SMS messages or voice messages to mobile telephones when emergency services decide that the nature of the incident requires the activation of this system.

Public warning during the pandemic

The situation that we are all experiencing shows the importance of effective communication with at-risk populations during a critical event. Governments all over the world are using emergency alert systems to communicate and inform populations in order to fight the spread of COVID-19.

Cell broadcast services are being used in countries like Romania, the Netherlands, Greece, South Korea and the USA. In these countries, the government uses the network operators' cell and radio towers to push a message to citizens.

SMSs are being used in countries like Portugal, France, the United Kingdom and Denmark. With this technology, the governments can target people in a specific area, and they can even interact, eg, asking people if they have symptoms of the disease.

Germany and Austria are using mobile applications to communicate with the population.

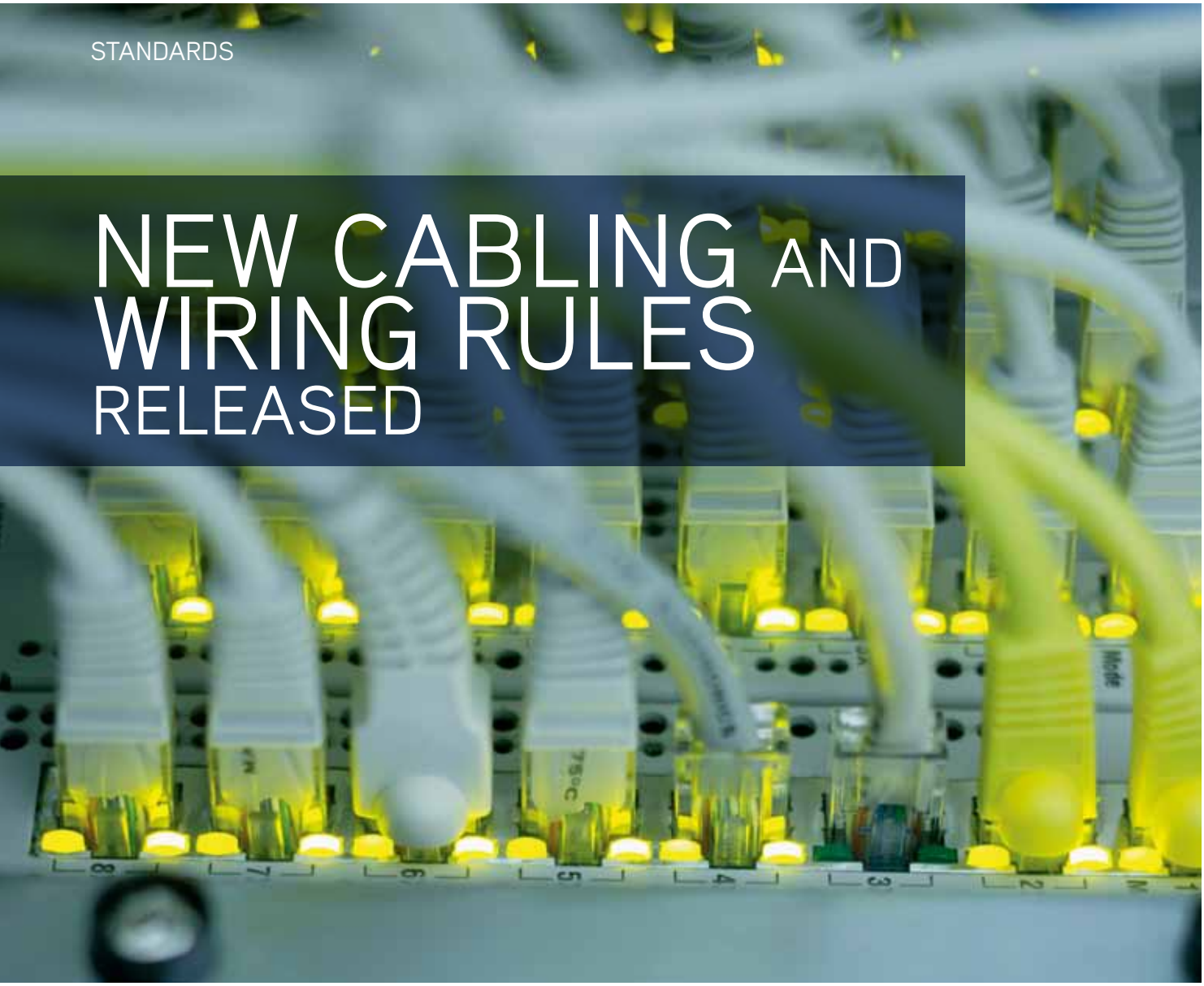
Safety is the priority during an emergency. Public alert systems are an essential tool for direct communication with citizens, whether to alert them regarding evacuation measures or to provide essential information during a pandemic.

In an interconnected world, with technology advancing at the speed of light, it seems difficult to understand how countries are still relying on old systems to warn the population. Let us hope that before the mandatory date imposed by the European Parliament, mass emergency notifications are a reality across all Europe and beyond.

Let us hope that more lives are saved. Because an informed population is a safer population.

Marta Azevedo Silva is Communications & Press Officer for the European Emergency Number Association (EENA).

NEW CABLING AND WIRING RULES RELEASED



New and updated editions of the rules for telecommunications customer premises cabling products and wiring have been published.

Significant revisions to the Standards include safeguards for the distribution of hazardous voltages over communications cabling — an important step, given the growing trend towards communications cables also being used to carry electrical power.

The revised Standards are AS/CS S008 Requirements for Customer Cabling Products and AS/CA S009 Installation Requirements for Customer Cabling (Wiring Rules).

John Stanton, CEO of Communications Alliance, said the review of the Standards was extensive and benefited from expert input from more than 20 stakeholder organisations and individuals across the communications and broader industry.

"The cabling sector touches the lives of every Australian and it is important that Standards remain 'fit for purpose', particularly as new technologies and connected solutions change the face of cabling and networks," Stanton said.

The Working Committee responsible for the revision was chaired by Murray Teale from VTI Services and has drawn on the most currently available cabling industry information to review and update the two Standards.

One of the fundamental aims of the Standards is to prevent the exposure of telecommunications service provider employees, cabling providers, customers or other persons to hazardous voltages.

"New uses of cabling, such as for the Internet of Things, saw the Working Committee address a range of topics," Teale said. "One was a fundamental change to the way the Standards reference new classifications of electrical power."

The updated Standards include new and revised requirements in a number of key areas, including:

- a new three-stage classification system or 'hazards-based standard engineering' approach against potentially increasing risks from rising energy levels in cables, and safeguards between hazardous energy sources and body parts;
- new voltage and amperage limits on electrical circuits that can be carried over generic customer cabling;
- new requirements for communications cables that are also intended to be used to carry electrical power — for example, to remotely powered devices such as wireless access points, surveillance cameras, smart lighting, digital signage, building management controllers and sensors;
- new requirements to assist cablers to select cabling products that are fit for purpose for a particular installation;
- additional rules for optical fibre systems to guard against laser hazards that can be associated with optical fibre systems;
- incorporation of elements of the National Construction Code relating to cable flammability and 'fire-stopping' to help inhibit the propagation of fire; and
- new rules for pit and access hole products, with the aim of improving public safety through a reduction in the number of trip hazards.

The Australian Standards are available free of charge from https://www.commsalliance.com.au/Documents/all/Standards.

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Industry Talking

Many things that we have taken for granted for some time have been upended by the 2020 pandemic. As it stands currently we are all hoping that we can get through 2020 and that 2021 brings a new year and a return to some kind of normal. Many people in our industry have been badly affected by the pandemic, and — while ARCIA has done as much as we can to help our members — the entire economy has been changed.

I would like to congratulate all those members of our industry — the technicians, installers, engineers, administrators, project managers and sales people — who are working on keeping the economy going. Our industry is part of the nation's critical infrastructure, whether it is public safety, mining, utilities, transport or distribution centres. While we're often overlooked, we all know our workforce is out there keeping the lights on.

Events

The 2019 Annual Gala Dinner will have been the Association's last major event for some time. The event was well attended as always, and a great time was had by all. We have been running this event format for some time and we had decided to try something new for 2020. It goes without saying that when we are able to restart our regular networking events it will take some time to reorganise, but this is an opportunity to try some different styles.

For 2020 it is clear we won't be having a major event in Melbourne. Once Comms Connect was cancelled, regardless of the situation in Melbourne the Association felt it would be difficult to get people to travel. At the time of writing the situation in Victoria is worse than anyone imagined and whether it will get better by November it is very unclear. The Association is working on how we can have some kind of national event, even if that means limited state events held on the same night. The industry does seek to recognise members at a state and national level and we know that peer recognition is highly regarded. So we need to find a way of continuing this in 2020.

One of the casualties of the situation has been Paul Davis. I would like to take this opportunity to thank Paul for everything he has done for the industry through Comms Connect; indeed he became part of the industry. With events shut down, people need to make difficult decisions and we will certainly miss Paul's energy. He has been a driving force in helping not only to bring our industry together, but also to help bring information on important issues such as public safety mobile broadband into the knowledge banks of our industry, as well as our first responders and the bureaucrats involved.

Training

Training plans are really taking shape thanks to the work of Chris Stevens. In association with Comms Connect, the Association has now run many training sessions and they have been well attended across the country. Of course, we now need more content and direction to enable a greater number of members and employees to take advantage of industry-based education. While we all understand the program needs to be based on high-quality accepted standards, we all feel we simply cannot wait any longer for government to provide training. With the pandemic in full swing the federal government is trying again to invest in training, and ARCIA (thanks to Ian Miller) has written to the Minister for Employment, Skills and Small Business as well as the Minister for Communications.

ARCIA has developed a skills matrix to provide the framework for moving from apprentice to engineer, so that our members can look at the various skill sets that the industry needs. Over time the Association hopes to fill the gaps in training with content that we develop.

Developments

The ACMA has not stopped working during COVID-19 and there has been a constant flow of papers for comment in many areas of spectrum. Our thanks to Ian, who again put in a huge amount of work responding to the ACMA across the many bands that are being looked at. A consistent theme we have been applying is to ask the ACMA for transparency and for an appreciation that spectrum should be used as a productivity tool for the economy. There are many demands on spectrum and in many cases there are competing industry or government users, which makes balancing the needs of all users a difficult process. As new technology and spectrum-sharing models begin to develop across international markets, ARCIA believes that the benefits need to be shared across the economy. As technology for WISPs, private LTE or IoT transforms the way consumers and industry are able to use spectrum, the wireless industry will thrive.

We also expect to see new spectrum legislation in federal parliament during 2020, and ARCIA has met with the Department of Communications to be briefed on the changes to the Act. This appears to us to be evolution rather than revolution and ARCIA does not perceive any real impacts to our industry with the proposed changes. ARCIA has also met with the ACMA over the last months and has had productive consultations. We have brought matters to the attention of ACMA and they have responded quickly and effectively on all occasions, which is a credit to the ACMA management and also the excellent relationship that Ian Miller has built up over time.

When COVID-19 started to hit our economy and we all went into shutdown, the Association made the decision to extend member and partner renewal dates. We considered this on the basis that our main expenditure item on events would cease and that many of our members would appreciate the removal of even a small financial charge during these uncertain times. The finances of the Association are being maintained at acceptable levels; however, we do expect to recalibrate this decision soon so that we can be ready for 2021.

Hamish Duff, President
Australian Radio Communications Industry Association

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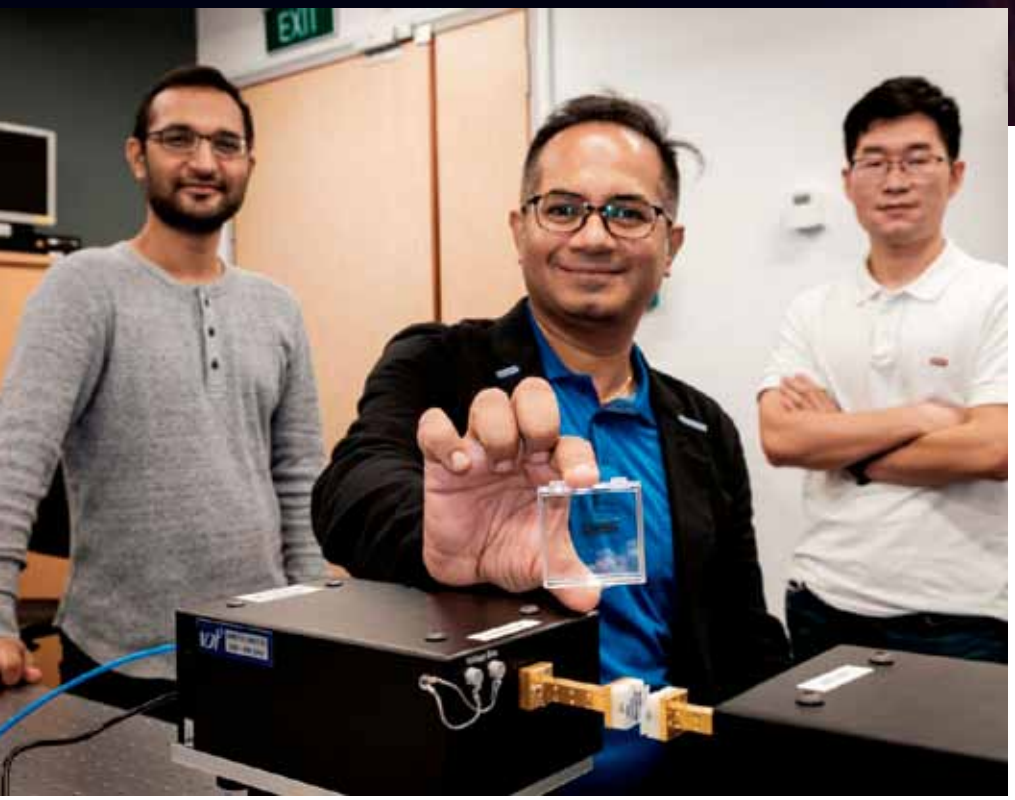
ULTRA-HIGH-SPEED TERAHERTZ WIRELESS CHIP

A breakthrough in electronic design has enabled the cracking of the hitherto theoretical limit of 10 Gbps for 5G wireless communications.



Left to right: NTU PhD student Abhishek Kumar, Associate Professor Ranjan Singh and postdoc Dr Yihao Yang. Dr Singh is holding the photonic topological insulator chip made from silicon, which can transmit terahertz waves at ultrahigh speeds. Credit: NTU Singapore.

To enable data transmission speeds that surpass the 5G standards for telecommunications, scientists from Nanyang Technological University, Singapore (NTU Singapore) and Osaka University in Japan have built a new chip using a concept called photonic topological insulators.

Published recently in *Nature Photonics*, the researchers showed that their chip can transmit terahertz (THz) waves resulting in a data rate of 11 Gbps, which is capable of supporting real-time streaming of 4K high-definition video and exceeds the hitherto theoretical limit of 10 Gbps for 5G wireless communications.

However, fundamental challenges need to be tackled before THz waves could be used reliably in telecommunications. Two of the biggest issues are the material defects and transmission error rates found in conventional waveguides such as crystals or hollow cables.

These issues have been overcome using photonic topological insulators (PTI), which enable light waves to be conducted on the surface and edges of the insulators, akin to a train following railway tracks, rather than through the material.

When light travels along photonic topological insulators, it can be redirected around sharp corners and its flow will resist being disturbed by material imperfections.

By designing a small silicon chip with rows of triangular holes, with small triangles pointing in the opposite direction to larger triangles, light waves become 'topologically protected'.

This all-silicon chip demonstrated it could transmit signals error-free while routing THz waves around 10 sharp corners at a rate of 11 gigabits per second, bypassing any material defects that may have been introduced in the silicon manufacturing process.

The leader of the project, NTU Associate Professor Ranjan Singh, said this was the first time that PTIs have been realised in the terahertz spectral region, which proves the previously theoretical concept is feasible in real life.

Their discovery could pave the way for more PTI THz interconnects — structures that connect various components in a circuit — to be integrated into wireless communication devices, to give the next-generation '6G' communications an unprecedented terabytes-per-second speed (10 to 100 times faster than 5G) in future.

"With the 4th industrial revolution and the rapid adoption of Internet of Things (IoT) equipment, including smart devices, remote cameras and sensors, IoT equipment needs to handle high volumes of data wirelessly, and relies on communication networks to deliver ultra-high speeds and low latency," Assoc Prof Singh explained.

"By employing THz technology, it can potentially boost intra-chip and inter-chip communication to support artificial intelligence and cloud-based technologies, such as interconnected self-driving cars, which will need to transmit data quickly to other nearby cars and infrastructure to navigate better and also to avoid accidents."

This project took the NTU team and their collaborators led by Professor Masayuki Fujita at Osaka University two years of design, fabrication and testing.

Prof Singh believes that by designing and producing a miniaturised platform using current silicon manufacturing processes, their new high-speed THz interconnect chip will be easily integrated into electronic and photonic circuit designs and will help the widespread adoption of THz in future.

Areas of potential application for THz interconnect technology will include data centres, IoT devices, massive multicore CPUs (computing chips) and long-range communications, including telecommunications and wireless communication such as Wi-Fi.

Image courtesy EE.

EE COMPLETES 500TH NEW SITE FOR THE UK'S ESN

EE's rollout of remote radio sites for the UK's Emergency Services Network gathers pace.

EE has announced the build completion of its 500th new site — in Glencoe, Scotland — for the UK's Emergency Services Network (ESN).

Once activated, the Glencoe site will deliver 4G connectivity to more than 65 square kilometres of the Scottish Highlands on an 800 MHz signal.

In addition, EE has continued the extensive network rollout for the ESN in hard-to-reach areas across the UK, including more than 30 sites during June–July alone.

This includes five new sites in England across the Lake District and South Downs National Parks, as well as Devon and Cornwall.

A further five sites in Wales and an additional 18 sites in remote locations across Scotland such as Cairngorm and Loch Lomond National Parks have also been completed.

The company has also upgraded about 19,000 of its existing sites to 4G to make them ready for the ESN.

According to Ofcom, EE already covers 82% of rural geography across the UK and 84% of the UK landmass, which, EE says, is more than any other network.

EE is now working to build more than 100 extra ESN sites in rural areas in the coming months.

In addition to site builds and upgrades, EE has equipped a fleet of 4G rapid response vehicles and cells with satellite backhaul technology to provider further reassurance to emergency services workers that they will be equipped with the mobile coverage and capacity they need.

"With ESN, we are focused on building the coverage where the Emergency Services need it most to ensure they can best protect and serve society. Often this is in rural areas," said Richard Harrap, Managing Director of ESN at EE.

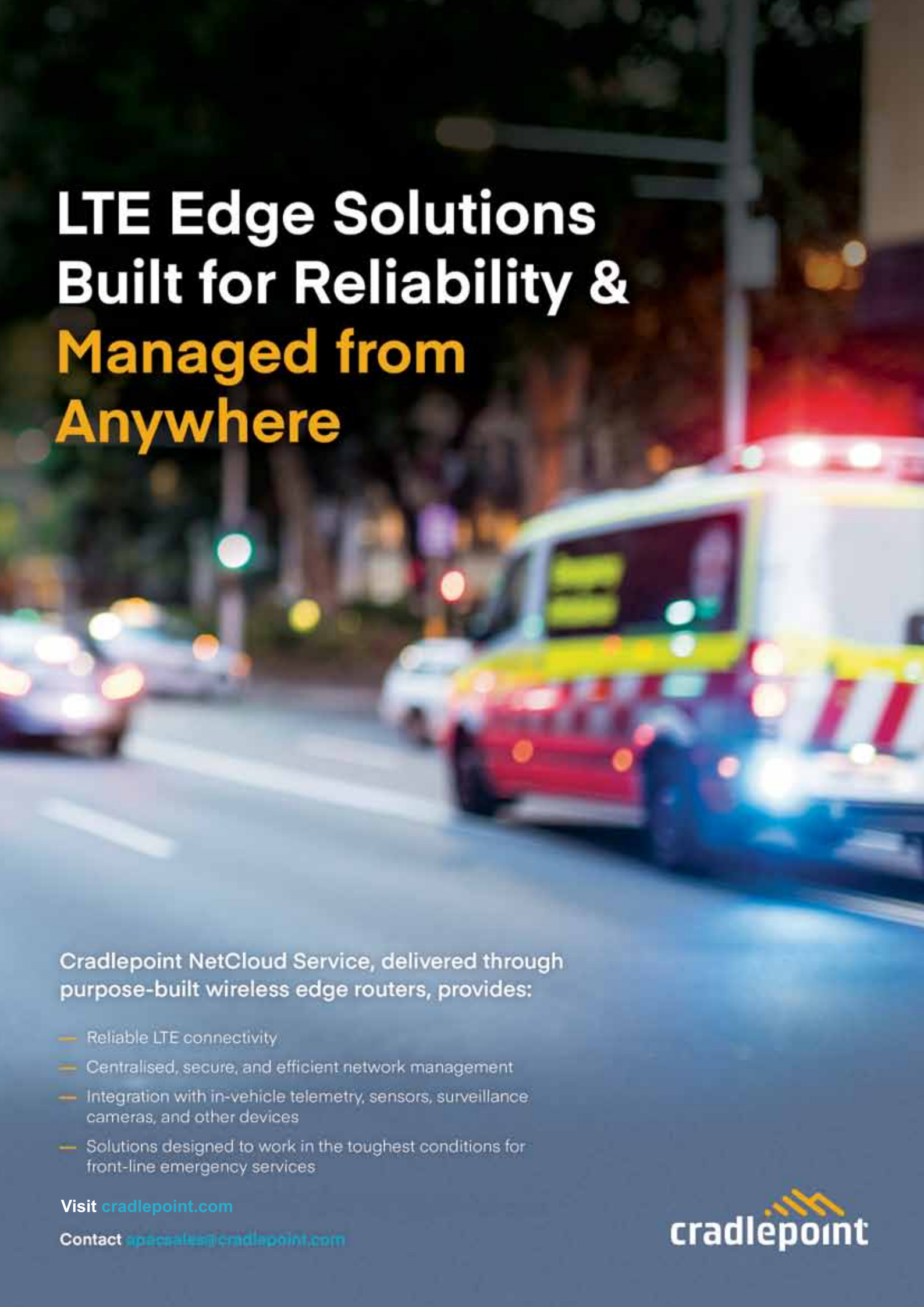
"We're also welcoming other operators to come in and share these sites to reduce the amount of infrastructure on the ground and increase coverage for everyone.

"This is in advance of the UK Government's Shared Rural Network, which will also help us to reach even more hotspots to ensure that everyone benefits from improved coverage and choice," he added.

Minister for Lords, Baroness Susan Williams, said that the "ESN will provide an innovative, mobile-based communications system to transform the response of our emergency services.

"Building increased coverage in rural locations throughout the UK is an essential part of the programme, and this milestone means we are ever closer to ensuring our dedicated police, fire and ambulance crews can communicate across and access some of the most hard-to-reach areas."

"We are also opening up these masts for other mobile companies to use as part of our plans to bring 4G to every corner of the UK by 2025, so people in every part of the country will get good coverage wherever they live, work or travel," added Digital Infrastructure Minister Matt Warman.



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Small cell, big impact: powering 5G deployment

Darren Salter

Innovative technology will be needed to ensure 5G networks not only have access to uninterrupted power but can handle extreme amounts of data processing.

5G deployment is gaining momentum globally, promising ultra-low latency, fast speeds and a mind-bending amount of new connections. This new frontier of telecommunications opens an infinite amount of digital possibilities. However, the relationship between connectivity and power quality is critical to the success of high-speed networks. Put simply, 5G must have power to operate. No power, no 5G.

The cost of powering 5G is one of the biggest challenges for network operators rolling out new networks and if 5G is implemented in a similar way to previous generations, reaching 5G true potential may not be possible for Australia.

While Australia's largest telecommunications companies are already offering 5G capabilities in selected areas connecting consumer 5G handsets, 2021 is going to see an acceleration in network upgrades.

What 4G did for consumer devices, 5G will deliver revolutionary applications in all new markets including industrial, automotive, medical and even defence.

With that, power failures or any network interruptions are not an option. Across the network massive amounts of data processing at the edge in real time is required to support small cells essential to the millimetre wave radio network.

Rolling out 5G is complex and presents a unique challenge for telco providers. Innovative technology and applications will need to be leveraged to ensure the network not only has access to uninterrupted power but can withstand extreme amounts of data processing and demand.

In Australia, Eaton is uniquely positioned with its power management heritage, network operator relationships and technologies designed to flatten the energy curve.

It has been widely reported that a 5G network may consume anyway up to three times as much for a base station that is deploying a mix of radios.

What about energy efficiency?

To meet the needs of telco operators, Eaton have taken traditional designs and shrunk them down into what's called a small cell. Small cells are smaller and cheaper than a cell tower and can be installed in a variety of areas, bringing more base stations closer to the edge.

To accelerate 5G small cell deployment, Eaton has engineered the Outdoor Pole Solution 2 (OPS2) with energy saving highly efficient rectification and remote-control capability enabling network operators to build denser networks, meet performance demands and maintain low energy consumption.

Network densification through small cells is essential for the successful rollout of 5G and will be central to almost all future requirements for digital connectivity.

Eaton has been a major supplier of telecom power to Australia's largest telecom operators — and around the world — in excess of 20 years.

The OPS2 is a 48-volt DC power system with options for battery backup that can be pole mounted to support 4G and 5G remote radio units, as well as potentially support CCTV and industrial IoT equipment.

Traditionally, these power systems were inside a building. Over time, they've moved from buildings to cabinets on kerbsides. Now, at an even smaller point the power system is up a pole or on the side of a building closer to the network equipment that it's supporting.

As you move into a 5G network there can be hundreds of powered devices per square kilometre. A power system like this needs full remote control and remote monitoring so network operation centres have full visibility. Eaton's OPS2 has an inbuilt web server and supports remote operations.

Lighting up a 5G network does not have to mean a massive increase in energy consumption. Eaton's solution allows network operators to build on existing deployments with smart power back-up technology that uses energy-saving hardware and optimising operating site infrastructure.

5G will be the network of the future, and it's being built by engineers today to enhance the world we live in for the better.

Darren Salter is Product Line Manager, Power Quality APAC for Eaton.

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Radio Matters

As Paul Davis leaves us to venture into new areas of marketing, on behalf of the RFUANZ committee and members we would like to thank Paul for his professionalism and attention to detail to ensure the Comms Connect/RFUANZ annual exhibition and gala dinner were so successful over the past five years. Paul, we wish you well in all your future endeavours.

A requirement of the Association is to host an annual general meeting, which is usually held during the annual Comms Connect exhibition. This year, as this was not possible, we will be hosting a special one-hour Zoom meeting on 11 November 2020 between 4:00 and 5:00 pm. Please contact our administrator to register your interest in attending, complete with the preferred email for us to contact you.

The agenda, chairman and treasurer reports will be posted out to all members on 5 October 2020. Nominations for the RFUANZ committee will also be required, as three current members will be standing down. Please consider joining your committee to ensure the protection and preservation of spectrum in the industry.

RFUANZ met with Radio Spectrum Management in July to discuss various matters, including: 60 GHz and 5 GHz GURL licences are being looked at in comparison with other countries with some modifications expected before the end of this year; the memorandum account reserve built up over a number of years from revenue received for licences is reducing with the current balance as at 30 June 2020 being $9.2 million; and RSM and RFUANZ have entered discussions around Level 4 NZQA training and also training pathways for ARC and ARE qualifications.

During this time of COVID-19, the potential to upskill yourself has become much more readily available. Several of our member organisations are offering online learning courses. Tait Radio Academy, Go Wifi, Zetron, Cambium Networks and Electrotest are all offering opportunities to learn. We fully support and encourage you to participate in these online courses.

The RFUANZ is working with interested parties on the development of a Level 4 NZQA certification specific to radio communications. This is part of the overall plan to have a nationally recognised qualification for people entering the radio communications industry. RFUANZ has reached out to WISPA, RSM and a number of ITOs to try to reach industry consensus on what the training needs to cover and the best way to deliver it. RFUANZ would welcome member input into what the industry needs from the training.

Are you thinking of becoming an approved radio engineer? Criteria on how to become an approved radio engineer or certifier can be found on the RSM website at https://www.rsm.govt.nz/engineers-and-examiners/how-to-become-an-approved-radio-engineer-or-certifier/. For more information please contact RSM on info@rsm.govt.nz.

Corey Weir
Chairman, RFUANZ

RFUANZ
Radio Frequency Users Association of New Zealand

Fixed-wireless access point

The Cambium Networks 450 platform makes it easier to connect hard-to-reach subscribers, via an affordable MicroPOP access point. It features ultra-wide band radios (4.9 to 5.925 GHz) capable of up to 300 Mbps aggregate in a 40 MHz channel and onboard GPS to provide synchronisation with a network.

Key features include: software-defined, purpose-built technology; a gigabit Ethernet interface that provides maximum transfer rates; limited to 20 subscribers and 3.2 km range, but can be extended to 238 SMs and maximum range via a licence key; and a system-on-a-chip that enhances packet processing power by more than four times that of the original 450 hardware.

Cambium Networks Ltd
www.cambiumnetworks.com

Network analysers

Keysight Technologies' enhanced PNA and PNA-X network analysers contain a proprietary low-spurious direct digital synthesis (DDS) source, enabling customers to take accurate measurements with less phase noise interference. With the clean source signals, customers can perform two-tone IMD measurements with close tone spacing previously only possible with high-performance analog signal generators.

The analysers' DDS sources also enhance the performance of a wide range of software applications, including modulation distortion, SMC with phase and I/Q converter measurements. A third RF source of up to 13.5 GHz on the PNA-X simplifies measurement set-up by taking the place of an external signal generator to drive local oscillators.

Keysight Technologies Australia Pty Ltd
www.keysight.com

Over-the-air programming

Sepura can now deploy over-the-air programming (OTAP) for TETRA radios, enabling organisations to efficiently program fleets of radios using a trusted, secure Wi-Fi network, while limiting manual handling and reducing the administration burden on programmers.

Using an enhanced version of Radio Manager 2, users can create batch updates for their radio fleets. The familiar deployment process means upgrading is a simple and efficient process that enables downloading of applications to radios via Sepura's AppSPACE applications environment. The system enables sharing of key operational information or amended configurations direct to radios; synchronised fleet upgrades, avoiding out-of-step configurations; and increased visibility of the radio fleet and identification of 'at risk' inactive radios.

Sepura PLC

www.sepura.com

Above and below ground tracking

Waze Bluetooth beacons are now supported by IMPULSE Wireless tracking and safety solutions for underground location tracking, man-down and lone worker protection. The Android-based solution can be deployed on new or existing smartphones, tablets or custom PTT communications devices. Custom PTT devices enable man-down and lone worker safety features, and a physical duress button.

Integration of Waze beacons into IMPULSE Wireless's safety and tracking solution means PTT users' precise location is sent back to the tracking system, where staff location and safety can be monitored and more efficient resource allocation can be made.

While PTT devices typically operate using 4G data networks, they can also send above and below-ground worker location back to base using DMR Tier II, with no need for a 4G network.

IMPULSE Wireless

www.impulsewireless.com.au

Antenna

The Panorama LG-S4-7-38-D24-58 multifunction combination vehicle antenna is designed to address the increasing need for users to have voice and data communications functionality in and around a vehicle.

With a low-profile housing only 45 mm in height, the device is suitable for any mass transit fleet or emergency service vehicle requiring low clearance. The product accommodates up to five, separately fed antenna elements: 450–470 MHz for public safety voice radio communications; 700–3800 MHz for 2G, 3G, 4G and 5G communications across all telecom providers in Australia and New Zealand; a GPS/GNSS antenna; and 2x2 MiMo Wi-Fi in both 2.4 and 5 GHz bands. The antenna is tuned for optimal use on a non-conductive mounting panel and supplied with UN ECE 118-compliant cable assemblies.

The product enables the user to combine the different vehicle radio technologies into a single housing. This should reduce the antenna footprint on the vehicle and reduce installation lead time and costs occurred for withdrawing the vehicle from service.

Panorama Antennas Pty Ltd

www.panorama-antennas.com

MANAGING PORT COMMUNICATIONS ACROSS TASMANIA

TasPorts has installed a new scalable dispatch management system in its two control centres, connecting 15 remote sites across Tasmania.

Tasmanian Ports Corporation Pty Ltd (TasPorts) is responsible for 11 Tasmanian sea ports and the Devonport Airport. It has successfully used Omnitronics equipment in its control centres for decades and has been a longstanding user of the DX64 dispatch system. After making the decision to upgrade the DX64, TasPorts chose the latest generation **omni**core.

The existing Omnitronics system supported 21 repeaters and seven dispatchers across two locations — the Launceston State Operations Centre and Port of Bell Bay. Eventually there would be a need to cater for 28 channels in total, so the company was looking for a solution that is cost-effective and easy to deploy as well as technologically advanced.

TasPorts uses VHF marine analog radio connected via IP. It wanted an easy-to-manage and easy-to-maintain dispatch management system that would instantly update changes from a central location across all consoles in both of its Vessel Traffic Service (VTS) centres. In addition, the new system needed to be mission-critically reliable, as maritime navigation and distress calls are also managed by the operators. Ideally, TasPorts preferred applications that would run on commercial off-the-shelf (COTS) equipment and operating systems.

TasPorts chose the Omnitronics **omni**core Enterprise Dispatch Management System, not only because it meets its needs for current and future functionality, but also because it is based on the proven technology of DX-Altus and RediTALK-Flex radio dispatch. The interface set-up of the previous system was easily replicated and within 20 minutes of **omni**core going live, the operator was able to competently interact with a vessel using the new console.

"I played a bit with the test install before Omnitronics came in to install our new system. It was so easy to set up that when they arrived only 45 min later, I had almost finished," said Ben Stoffelen, IT Network Administrator, Tasmanian Ports.

omnicore dispatch enabled TasPorts to implement its own high-availability solution across two locations and on its own servers as virtual machines (VMs). With two servers, one in the Launceston State Operations Centre and one backup server in Bell Bay, TasPorts is able to communicate to its 15 remote sites scattered across the state from either of their two dispatch locations. Three operator consoles, including one supervisor station, are used at the central Launceston VTS, now upgraded to **omni**core. Another **omni**core system is fully operational at the Bell Bay centre. In addition to server redundancy, **omni**core consoles support high-availability even further, as each console can continue to operate in the unlikely event that both servers are down.

omnicore provides reporting mechanisms and analytics for operational and business needs. For example, where in the past the team had to rely on anecdotal information to know that one geographic region — known for its rough weather — has a higher number of incoming calls than other regions, a supervisor can now quantify these through integrated reporting of relevant metrics… meaning they are able to take early action to manage operator load and other resources.

TasPorts also benefits from the option to utilise Rapid Recall on a choice of one or more channels, where previously only all-channel Rapid Recall was possible. Combined with easy-to-manage and on-the-fly updating using the centralised server system, TasPorts reported a smooth transition with minimal downtime.

The transition to a new high-tech dispatch system was seamless and much of the install was carried out by TasPorts with help from Omnitronics. As the system is COTS VM based, the TasPorts IT team retains a high level of self-sufficiency in supporting its user requirements and expanding for future needs.

Omnitronics Pty Ltd
www.omnitronicsworld.com

ROLLED RF FILTERS PACK A PUNCH

Researchers are on a roll with a new technique to make RF chip filters 10 times smaller than before.

Electronic filters are essential to the inner workings of wireless devices but take up space on the chips that researchers are on a constant quest to make smaller. A new study demonstrates the successful integration of the individual elements that make up electronic filters onto a single component, significantly reducing the amount of space taken up by the device.

Researchers at the University of Illinois, Urbana-Champaign have ditched the conventional 2D on-chip lumped or distributed filter network design — composed of separate inductors and capacitors — for a single, space-saving 3D rolled membrane that contains both independently designed elements.

The results of the study, led by electrical and computer engineering professor Xiuling Li, are published in the journal *Advanced Functional Materials*.

"With the success that our team has had on rolled inductors and capacitors, it makes sense to take advantage of the 2D to 3D self-assembly nature of this fabrication process to integrate these different components onto a single self-rolling and space-saving device," Li said.

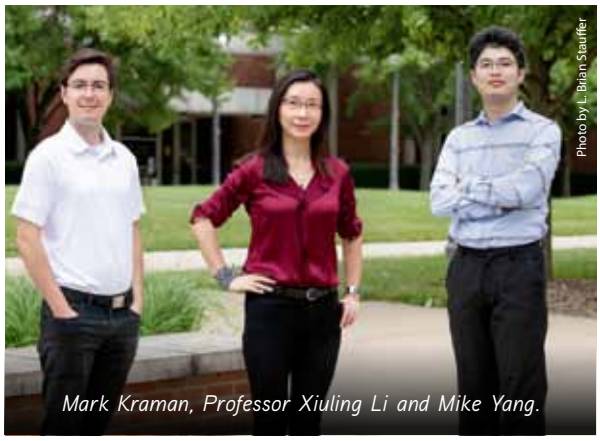


Photo by L. Brian Stauffer

Mark Kraman, Professor Xiuling Li and Mike Yang.

In the lab, the team uses a specialised etching and lithography process to pattern 2D circuitry onto very thin membranes. In the circuit, they join the capacitors and inductors together and with ground or signal lines, all in a single plane. The multilayer membrane can then be rolled into a thin tube and placed onto a chip, the researchers said.

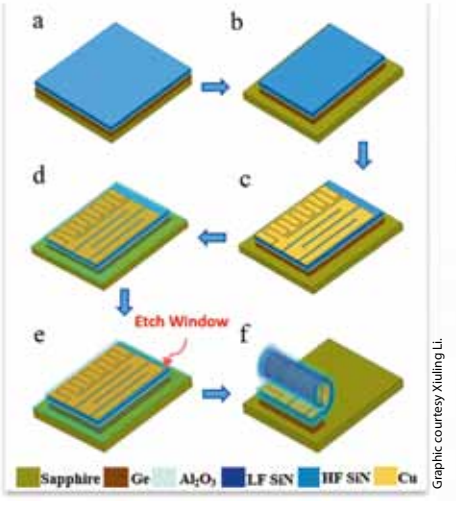
"The patterns, or masks, we use to form the circuitry on the 2D membrane layers can be tuned to achieve whatever kind of electrical interactions we need for a particular device," said graduate student and co-author Mark Kraman.

"Experimenting with different filter designs is relatively simple using this technique because we only need to modify that mask structure when we want to make changes."

The team tested the performance of the rolled components and found that under the current design, the filters were suitable for applications in the 1–10 GHz frequency range, the researchers said. While the designs are targeted for use in radiofrequency communications systems, the team posits that other frequencies, including in the megahertz range, are also possible based on their ability to achieve high-power inductors in past research.

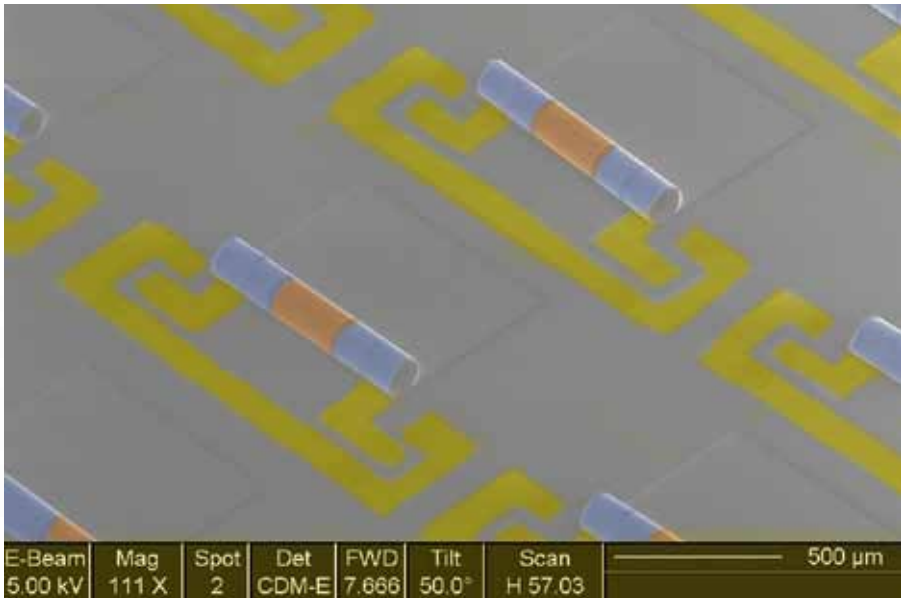
"We worked with several simple filter designs, but theoretically we can make any filter network combination using the same process steps," said graduate student and lead author Mike Yang. "We took what was already out there to provide a new, easier platform to lump these components together closer than ever."

"Our way of integrating inductors and capacitors monolithically could bring passive electronic circuit integration to a whole new level," Li said. "There is practically no limit to the complexity or configuration of circuits that can be made in this manner, all with one mask set."



Graphic courtesy Xiuling Li.

Electron microscope image of an array of new chip components that integrate the inductors (blue) and capacitors (yellow) needed to make the electronic signal filters.



Graphic courtesy Xiuling Li.

The final step of the fabrication process triggers the self-rolling process of the stacked membrane.

Ethernet/Wi-Fi tester

The VIAVI Network and Service Companion (NSC-100) from Vicom is a test solution for Ethernet, enterprise and data centre networks. It combines active Ethernet and Wi-Fi testing capabilities, enabling service activation and troubleshooting tests on all network layers.

The NSC-100 can be used to optimise Wi-Fi coverage and performance and get network improvement recommendations when performance is below expectation. The unit runs active throughput tests (Speedtest, TrueSpeed RFC6349) to identify and prevent service-affecting throughput issues and can validate business services as standalone unit, or as a remote loopback device when combined with the T-BERD/MTS-5800 for Y.1564 and RFC2544 tests.

The product can be configured to support fibre, Ethernet and Wi-Fi in one solution. It features Ethernet test interfaces up to 10G; Ethernet testing up to Layer 4 (TCP/UDP); and a 3x3 Wi-Fi antenna with 2.4 and 5 GHz. For users looking to optimise workflow, it is StrataSync and Mobile Tech enabled.

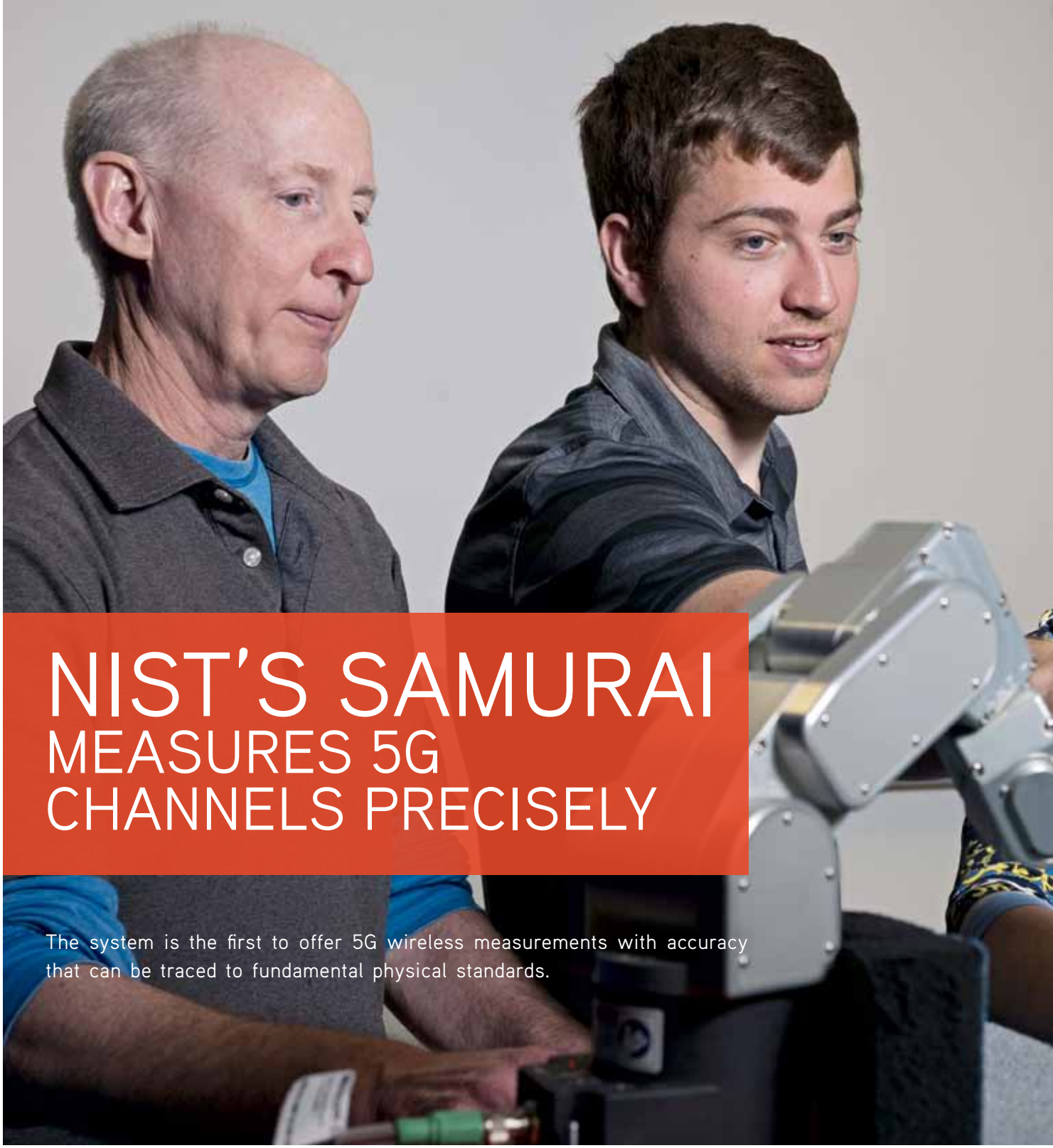
Vicom Australia Pty Ltd
www.vicom.com.au

Base station radio

The Ubiquiti LTU Rocket from Streakwave is a point-to-multi-point (PtMP) base station radio that operates in the 5 GHz band. Spectrally efficient and noise resilient, it is specifically designed for wireless IP data and features 600+ Mbps PtMP performance, up to 64 client connections per AP, 2+ million pps, proprietary RF filtering and GPS sync. Channel width flexibility (10/20/30/40/50 MHz) enables independent TX and RX channel frequency configurations anywhere within the radio band to avoid local interference. A custom co-processor is included for future performance and feature upgrades.

The LTU Rocket has auto power adjustments by default, but the auto output power option enables the device to set the output power (EIRP) to the appropriate level. The base station can use different frequencies for TX and RX to avoid interference and its signal control handles each station's TX output power. A PtMP network can manage signal levels to enhance network stability and achieve optimal wireless performance with the high modulation. There are two management options: the LTU Configuration Interface and the Ubiquiti Network Management System (UNMS). Either option enables the user to manually configure the LTU Rocket. Functions in a PtMP environment use the LTU-LR, LTU-Pro, LTU-Lite for endpoint stations.

Streakwave Pty Ltd
www.streakwave.com.au



NIST'S SAMURAI MEASURES 5G CHANNELS PRECISELY

The system is the first to offer 5G wireless measurements with accuracy that can be traced to fundamental physical standards.

Engineers at the US National Institute of Standards and Technology (NIST) have developed a flexible, portable measurement system to support design and repeatable laboratory testing of 5G wireless communications devices with unprecedented accuracy across a wide range of frequencies and scenarios.

The system is called SAMURAI, short for Synthetic Aperture Measurements of Uncertainty in Angle of Incidence. The system is the first to offer 5G wireless measurements with accuracy that can be traced to fundamental physical standards — a key feature because even tiny errors can produce misleading results. SAMURAI is also small enough to be transported to field tests.

Mobile devices such as mobile phones, consumer Wi-Fi devices and public-safety radios now mostly operate at electromagnetic frequencies below 3 GHz with antennas that radiate equally in all directions. Experts predict 5G technologies could boost data rates a thousandfold by using higher, millimetre-wave frequencies above 24 GHz and highly directional, actively changing antenna patterns. Such active antenna arrays help to overcome losses of these higher-frequency signals during transmission. 5G systems also send signals over multiple paths simultaneously — so-called spatial channels — to increase speed and overcome interference.

Many test instruments can measure some aspects of directional 5G device and channel performance. But most focus on collecting quick snapshots over a limited frequency range to provide a general overview of a channel, whereas SAMURAI provides a detailed portrait. In addition, many instruments are so physically large that they can distort millimetre-wave signal transmissions and reception.

SAMURAI is expected to help resolve many unanswered questions surrounding 5G's use of active antennas, such as what

Rodney Leonhardt, Alec Weiss and Jeanne Quimby with NIST's SAMURAI, a portable measurement system to support design and repeatable laboratory testing of 5G wireless communications devices with unprecedented accuracy. Credit: Hammer/NIST.

happens when high data rates are transmitted across multiple channels at once. The system will help improve theory, hardware and analysis techniques to provide accurate channel models and efficient networks.

"SAMURAI provides a cost-effective way to study many millimetre-wave measurement issues, so the technique will be accessible to academic labs as well as instrumentation metrology labs," NIST electronics engineer Kate Remley said.

"Because of its traceability to standards, users can have confidence in the measurements. The technique will allow better antenna design and performance verification, and support network design."

SAMURAI measures signals across a wide frequency range, currently up to 50 GHz, extending to 75 GHz in the coming year. The system got its name because it measures received signals at many points over a grid or virtual 'synthetic aperture'. This enables reconstruction of incoming energy in three dimensions — including the angles of the arriving signals — which is affected by many factors, such as how the signal's electric field reflects off objects in the transmission path.

SAMURAI can be applied to a variety of tasks from verifying the performance of wireless devices with active antennas to measuring reflective channels in environments where metallic objects scatter signals. NIST researchers are currently using SAMURAI to develop methods for testing Industrial Internet of Things devices at millimetre-wave frequencies.

The basic components are two antennas to transmit and receive signals, instrumentation with precise timing synchronisation to generate radio transmissions and analyse reception, and a six-axis robotic arm that positions the receive antenna to the grid points that form the synthetic aperture. The robot ensures accurate and repeatable antenna positions and traces out a variety of reception patterns in 3D space, such as cylindrical and hemispherical shapes.

A variety of small metallic objects such as flat plates and cylinders can be placed in the test set-up to represent buildings and other real-world impediments to signal transmission. To improve positional accuracy, a system of 10 cameras is also used to track the antennas and measure the locations of objects in the channel that scatter signals.

The system is typically attached to an optical table measuring 1.5 by 4.3 metres. But the equipment is portable enough to be used in mobile field tests and moved to other laboratory settings. Wireless communications research requires a mix of lab tests — which are well controlled to help isolate specific effects and verify system performance — and field tests, which capture the range of realistic conditions.

Measurements can require hours to complete, so all aspects of the (stationary) channel are recorded for later analysis. These values include environmental factors such as temperature and humidity, location of scattering objects and drift in accuracy of the measurement system.

The NIST team developed SAMURAI with collaborators from the Colorado School of Mines in Golden, Colorado. Researchers have verified the basic operation and are now incorporating uncertainty due to unwanted reflections from the robotic arm, position error and antenna patterns into the measurements.

Image credit: Jason Edwards

AUTHENTICATION INVENTION

US military researchers have earned a patent for a secure communications scheme that greatly increases an adversary's difficulty in impersonating an ally.

US Army researchers have been awarded a patent for inventing a practical method for Army wireless devices to covertly authenticate and communicate. Authentication is one of the core pillars of wireless communications security, along with secrecy and privacy. The value of authentication in a military setting is readily apparent and mandatory.

Receivers verify that an incoming transmission did indeed come from an ally and not a malicious adversary, therefore maintaining the integrity of communications. This invention, in particular, greatly increases an adversary's difficulty in impersonating an ally.

The researchers, including Dr Paul Yu and Dr Brian Sadler from the US Army Combat Capabilities Development Command's Army Research Laboratory, and Professor Rick Blum and Dr Jake Perazzone from Lehigh University, have invented a method to perform two tasks simultaneously — verifying the authenticity of wireless communications and communicating secret information.

Typically one or the other is done, but not both.

"In our invention, we take advantage of our wireless authentication capability to enable the covert communication of additional information," Yu said. "There are many uses of this synergistic capability including the maintenance of strong security through the establishment of shared secrets as well as low-rate covert communications."

The invention utilises a shared key to create a secret code book, which is used to achieve authentication and establish an additional secure communications channel, Yu said. An adversary, not knowing the key, is unable to create the code book

> "THE CODE WORD CHOSEN FROM THE SECRET CODE BOOK IS SUPERIMPOSED ON THE PRIMARY MESSAGE WAVEFORM AND IS USED AS AN IDENTIFICATION TAG." — DR BRIAN SADLER

and thus cannot reliably impersonate legitimate parties.

"A secret key is used to generate a low-rate secret code book that is used to provide both authentication of a primary message and side-channel communication of a secure secondary message," Sadler said.

"The code word chosen from the secret code book is superimposed on the primary message waveform and is used as an identification tag so the receiver can securely and privately verify the identity of the source. The additional information is conveyed through the choice of a valid code word."

A previous physical layer authentication patent by the CCDC ARL inventors considers the use of only one valid tag for the sole purpose of authentication. This expanded new scheme allows for a set of valid tags constructed in a way that introduces more uncertainty for an adversary and allows a small secondary message to be sent securely, Yu said. The new patent allows for greater flexibility in implementing the scheme.

Among other purposes, Yu said, the additional secure secondary message can provide a way in which the key can be updated to protect against future attacks. This would directly address the need to periodically change the secret keys shared by legitimate parties.

Authentication in general also holds great importance in the commercial wireless communications sector.

"Key agreement is even harder in commercial settings where there are less obvious backchannels for sharing additional key information, so other computational methods are utilised," Yu said. "The secure secondary message can be used to help communicate new key information to fluidly evolve the key over time to maintain an adversary's confusion."

The patent is based on work published in the Institute of Electrical and Electronics Engineers' Transactions on Information Forensics and Security, and extends an earlier patent.

The invention has been verified via detailed simulations. Earlier experiments using software-defined radios have shown that such a physical layer authentication scheme can be implemented successfully, as patented previously.

This research supports the US Network Army Modernisation Priority by establishing a method for efficient and futureproof secure wireless communications.

"My team is focused on developing technology that is well suited to be put into the hands of the soldier in the not-too-distant future," Yu said. "We are optimistic that by keeping an eye on future threats while exploring the art of the possible, we can help the future Army network be resilient and robust to the future threat environment."

The team is currently looking to prototype the algorithms on software-defined radios as the next step towards transitioning the technology to the soldier.

Credit: RUB, Marquard.

EAVESDROPPING ON MOBILE PHONE CALLS

Researchers have been able to exploit a flaw that some manufacturers had made in implementing base stations.

Calls via the LTE mobile network are encrypted and should therefore be tap-proof. However, researchers from the Horst Görtz Institute for IT Security (HGI) at Ruhr-Universität Bochum, Germany, have shown that this is not always the case. They were able to decrypt the contents of calls if they were in the same radio cell as their target, whose mobile phone they then called immediately following the call they wanted to intercept. They exploit a flaw that some manufacturers had made in implementing the base stations.

The results were published by the HGI team of David Rupprecht, Dr Katharina Kohls and Professor Thorsten Holz from the Chair of Systems Security together with Professor Christina Pöpper from the New York University Abu Dhabi at the 29th Usenix Security Symposium, which took place as an online conference from 12 to 14 August 2020. The providers and manufacturers were contacted prior to the publication; by now the vulnerability should be fixed.

Re-using keys results in security gap

The vulnerability affects Voice over LTE, the telephone standard used for almost all mobile phone calls if they are not made via special messenger services. When two people call each other, a key is generated to encrypt the conversation.

"The problem was that the same key was also re-used for other calls," Rupprecht said.

Accordingly, if an attacker called one of the two people shortly after their conversation and recorded the encrypted traffic from the same cell, he or she would get the same key that secured the previous conversation.

Credit: RUB, Marquard

David Rupprecht (right) collaborated with Bedran Karakoc (left) who developed the app as part of his Bachelor thesis.

"The attacker has to engage the victim in a conversation," Rupprecht explained.

"The longer the attacker talked to the victim, the more content of the previous conversation he or she was able to decrypt."

For example, if attacker and victim spoke for five minutes, the attacker could later decode five minutes of the previous conversation.

Identifying relevant base stations via app

In order to determine how widespread the security gap was, the IT experts tested a number of randomly selected radio cells across Germany. The gap affected 80% of the analysed radio cells. By now, the manufacturers and mobile phone providers have updated the software of the base stations to fix the problem.

Rupprecht gives the all-clear: "We then tested several random radio cells all over Germany and haven't detected any problems since then," he said.

Still, it can't be ruled out that there are radio cells somewhere in the world where the vulnerability occurs.

In order to track them down, the Bochum-based group has developed an app for Android devices. Volunteers can use it to help search worldwide for radio cells that still contain the security gap and report them to the HGI team. The researchers forward the information to the GSMA, which ensures that the base stations are updated.

Additional information is available on the website http://www.revolte-attack.net.

"Voice over LTE has been in use for six years," Rupprecht said. "We're unable to verify whether attackers have exploited the security gap in the past."

He is campaigning for the new mobile phone standard to be modified so that the same problem can't occur again when 5G base stations are set up.

LTE router

The Cradlepoint COR IBR1700 LTE router is designed for the requirements of emergency services, mobile command centres, public and private transit, commercial truck fleets and near-shore vessels. With the available Gigabit-class LTE modem, higher processing power and broader extensibility options, the IBR1700 is designed to provide reliable communications both inside and outside of the vehicle. With vehicles running onboard public Wi-Fi and direct-to-cloud applications, mobile networks require exceptional security. Offering multi-zone firewalls, IDS/IPS, Internet security and FIPS 140-2 certification, Cradlepoint mitigates security risks for mobile networks and users.

COR IBR1700 mobile routers are sold as part of an all-inclusive mobile networking solution in a NetCloud Solution Package, which includes NetCloud software, purpose-built hardware, 24x7 support and limited lifetime warranty.

Cradlepoint NetCloud is a service-based platform that spans from cloud to mobile edge to make deploying, managing and evolving an in-vehicle network easier and less resource-intensive. The user can centrally configure, monitor, visualise, control and troubleshoot their network — WAN to LAN and link to app — from a web console. NetCloud enables routing configuration, security, LTE, SD-WAN and Wi-Fi functionality at the network, rather than appliance level. The service ensures that LTE connections originate in the most appropriate way, persist throughout the duration of the connection and perform with efficient use of bandwidth.

Cradlepoint Australia Pty Ltd

www.cradlepoint.com

PTP 820/850 is a point-to-point licensed microwave backhaul platform that integrates leading networking functionality with the industry's most advanced microwave technologies, creating a superior microwave transport solution.

Supporting licensed frequency bands ranging from 6 to 86 GHz, the PTP 820/850 series delivers a wide range of configurations to offer a tailored solution for any deployment scenario.

PTP 820S 11Ghz, 18Ghz and 23Ghz stocked in Australia

Cambium Networks™ Streakwave

PTP 820/850 Product Series Highlights

· Licensed frequency bands 6-86 GHz

· Up to 4096 QAM, with 12-step hitless and errorless Adaptive Coding & Modulation (ACM) for high reliability

· Multi-gigabit radio capacity with high spectral efficiency

· Integrated Ethernet Switch, MEF Carrier Ethernet 2.0 compliant, MPLS-TP-ready

· Carrier-grade service resiliency (G.8032, MSTP)

· Lowest power consumption with adaptive green mode

· Industry-leading system gain

NOTES: The highlight feature may not apply to all PTP 820/850 platform

PUBLIC SAFETY

TASMANIA TAPS TELSTRA FOR NEW GRN

©stock.adobe.com/au/Benshot

The Tasmanian Government has begun negotiations with Telstra over the building of a new Tasmanian Government Radio Network (TasGRN), which will modernise the state's emergency services and government agency communications.

The TasGRN will replace five existing, separate radio networks to create one unified, digital and interoperable Government Radio Network.

The network will initially be used by eight organisations: Tasmania Police; Tasmania Fire Service; Ambulance Tasmania; State Emergency Service; Sustainable Timber Tasmania; Department of Primary Industries, Parks, Water and Environment; TasNetworks; and Hydro Tasmania.

"Recent events, both here and in other Australian jurisdictions, have shown us how important it is to have fast and secure communications to respond to bushfires, floods, natural disasters and other emergencies," said Minister for Police, Fire and Emergency Management Mark Shelton.

"The new TasGRN will give our emergency services and key government agencies an integrated radio network that is purpose-built for the needs of Tasmania. This delivers on past review recommendations, including the 2013 Tasmanian Bushfires Inquiry into the Dunalley bushfires.

"The TasGRN project is expected to create up to 50 jobs during the three-year construction phase, with additional positions to help run and oversee the network once the network is up and running," the Minister added.

Telstra Enterprise Group Executive Michael Ebeid said the TasGRN would be the largest single project Telstra had ever carried out in Tasmania.

"This will be a brand new government public-safety-grade radio network that will be fit for purpose, meeting the demands of a modern Tasmania and the more than 10,000 employees and volunteers who'll use it," Ebeid said.

Antenna

The WMM4G-6-60 is a high-directional gain 4x4 MIMO antenna for 4G and 5G networks. Incorporating four separately fed wideband elements covering full 617 MHz through to 6 GHz in a single housing, the WMM4G-6-60 is equipped to provide client-side MIMO support for 4G and 5G networks with 6 dBi of peak gain at 617–960 MHz and 9 dBi peak gain at 1710–6000 MHz.

The weather-resistant IP66-rated housing is designed for wall mounting, and wall and mast mount brackets are provided. Supplied with the option of fitted, low-loss, double-shielded cable for cellular/LTE, the WMM4G-6-60 minimises exposed connector joints and simplifies cable management for easy installation. The WMM4G-6-60 is a cost-effective, value-added product for network operators and service providers ensuring a stable link with improved data rates for subscribers, thereby improving satisfaction and retention.

Panorama Antennas Pty Ltd
www.panorama-antennas.com

Monitoring receiver

The Rohde & Schwarz PR200 portable monitoring receiver is engineered for spectrum monitoring and interference hunting tasks. It can detect, analyse and locate signals from 8 kHz to 8 GHz (18 GHz with the R&S HF907DC).

The PR200 offers a balance of RF performance, speed, usability and size, weight and power that addresses challenges in spectrum monitoring and interference hunting. The unit can be used with ITU-compliant measurement tools to verify if analog signal transmission fulfils the technical standards stipulated for licensed operation. It includes a range of tools and functions to handle tasks such as interference hunting, geolocation of transmitters of interest, resolving frequency conflicts onsite and more.

The PR200 offers visualisation modes, a wide range of markers, various recording methods and mapping functions for evaluation and analysis. It delivers simultaneous representation in the time and frequency domain in real time and, with gated measurements in the spectral domain, it can capture transient and time-variant dynamic interference signals in TDD networks that are otherwise hard to detect.

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

Surge protection

Novaris's range of RF surge protection devices, earth clamps and bonding products is made rugged for Australian conditions. RF surge protection devices are available in most configurations, power output, frequency and connector sizes including CEIA flange up to 4.5″.

Installed at the point of entry of the equipment being protected, Novaris RF surge protection will give protection to equipment, reduce downtime and increase equipment life span. All models have replaceable surge components providing ease of maintenance and all models are upgradable to suit transmitter output power. The units can also be tested with the Novaris SPT02, Surge Protection Tester.

Novaris Pty Ltd
www.novaris.com.au

V2X TECH GIVES FIREFIGHTERS THE GREEN LIGHT

Dedicated short-range communications radios systems are now in charge of Ludwigsburg traffic lights.

Vehicle-to-everything (V2X) radio technology developed by Australian company Cohda Wireless has been deployed by the German city of Ludwigsburg to enable fire trucks and rescue service teams to get to accidents and emergencies faster.

In a project led by traffic technology group SWARCO, 114 traffic lights at intersections in Ludwigsburg (located just north of Stuttgart and with a population of 85,000) have been fitted with Cohda MK5 Road-Side Units, which work with the equivalent MK5 On-Board Units in fire trucks and rescue vehicles, to grant them green traffic light passage on their way to emergencies.

The rollout follows a successful pilot project in early 2019.

Cohda's technology enables the traffic lights to exchange information directly with approaching vehicles using standardised dedicated short-range communications radio. The traffic lights' ACTROS control units have been equipped with the necessary programming to automatically prioritise the emergency vehicles as they pass through.

The system works by sending messages relaying position and speed, several times per second, from emergency vehicles to a traffic light controller. There, the signals are processed and compared with the scenarios stored in the programming. If the system detects an approaching emergency vehicle, the programmed signal sequence is started and the traffic light controller switches to the prioritisation program.

Once the vehicles have passed the intersection, the traffic light controller switches back to normal as quickly as possible to minimise impact on road traffic and traffic disturbance.

"V2X technology improves safety on our roads and is usually applied to help reduce injury and death. This initiative demonstrates the versatility of the technology," said Cohda Wireless's CEO, Paul Gray.

"In this instance, it is being applied to support emergency services in responding to incidents and accidents that have already happened, thereby also saving lives.

"Ludwigsburg is setting an example that cities around the world can follow," Gray added.

Ludwigsburg's Mayor, Matthias Knecht, said the fire department prioritisation in his city is the first full practical application of V2X in Germany. He said Ludwigsburg is a showcase city that is already relying on innovative cooperative intelligent transport systems technologies and intelligent traffic lights, thus preparing for its future as a smart city.

"A primary goal of our mobility concept is to optimise the traffic flow. To achieve this, we also rely on intelligent traffic light systems," Knecht said.

"SWARCO's technology for prioritising emergency vehicles of the fire brigade is an excellent example for this — because in an emergency every second counts, of course. Together with the city of Ludwigsburg, SWARCO has developed this innovative technology and brought it to the streets," he added.

Cohda Wireless's technology has been applied in similar ways in other countries. In Estonia and Finland, Cohda's V2X hardware and software features in a smart pedestrian crossing solution that alerts pedestrians and other road-users to danger. And in Norway, Cohda's V2X-Locate vehicle positioning system contributed to a successful location-finding technology trial carried out in the 2.2-kilometre-long Bjørnegård tunnel in Bærum.

According to Cohda Wireless, its software products are being used in more than 60% of all V2X field trials in the world today, working in compliance with US Federal Communications Commission, European Telecommunications Standards Institute and Chinese standards.

Cohda Wireless
www.cohdawireless.com

Image courtesy Cohda Wireless

BROADWAY'S PROTOTYPE PHASE HAS BEGUN

Three consortia have been chosen to build prototypes for the BroadWay pan-European broadband communication system.

In the face of current crises, the need for improved cross-border operations is evident. BroadWay, a European pre-commercial procurement (PCP) project, is working towards that objective. The project will enable European first responders and public safety services to communicate at any time, regardless of their geographical location, by establishing a pan-European interoperable mobile broadband system for public protection and disaster relief (PPDR) users.

Currently, each European country has its own communication system for first responders and public safety services, a situation that has major limitations. Not only is there minimal interoperability between countries — which limits international cooperation — but there is also the widespread use of narrowband technology, which enables the transmission of only voice and short data.

The aim of the BroadWay project is to achieve operational mobility for public safety responders across Europe by linking national mission-critical mobile broadband networks to act as one.

Such a system will enable pan-European national mobility and communication between first responders, providing the highest levels of security and reliability across Europe, at any time, regardless of their location.

Those first responders will benefit from new mission-critical communication capabilities, enabling closer collaboration and saving lives when disasters hit.

Work has already begun in recent months to prepare for BroadNet. BroadNet will procure and operate a live pan-European system, interconnecting national mobile broadband systems after the BroadWay (PCP). Discussions are ongoing on how to structure future pan-European agreements necessary for effective pan-European governance of BroadNet.

The BroadWay Group of Procurers will start up discussions across their national government departments for the support needed. Initial discussions have taken place with the European Commission and the European Investment Bank to explore possible financing options.

Prototype projects

On 6 July 2020, the Solution Prototype Phase (Phase 2) officially began with the signing of contracts by Astrid SA, the Lead Procurer of the BroadWay PCP, and three

successful consortia led by Airbus DS, Frequentis AG and Leonardo S.p.A.

For Phase 2, each consortium has been awarded €1.4 million approximately and their aim is to develop BroadWay prototypes over the next 10 months, including an initial demonstration to the BroadWay Group of Procurers in November 2020.

The Airbus DS consortium includes Airbus itself, plus Belgacom International Carrier Services, Proximus SA and StreamWIDE, along with PentaTech, Proximus Luxemburg and Umlaut.

The Leonardo S.p.A consortium comprises that company, plus Vodafone Portugal, Ubiwhere Lda, Proef Sgps SA, TELESPAZIO SPA, Athonet S.R.L, Sas Telespazio France, Bittium Wireless, Radiolabs Consorzio Universita Industria – Laboratori Di Radiocomunicazione and Alma Mater Studiorum Universita di Bologna, along with subcontractors Iscom and Lancaster University.

The Frequentis consortium members are Frequentis, Crosscall, ETELM, Halys, Municipality of Málaga, Nemergent Solutions SL and Universidad de Málaga, with subcontractors Arico Technologies, Eutelsat SA, PrioCom B.V., Telefónica I+D, T-Mobile Netherlands B.V., and Virtual Fort Knox AG.

The Frequentis or 'BroadPort' prototype will cover subsystems situated in four different countries. The flexible architectural approach should enable future and possibly new network-related multinational deployment options for mission-critical broadband networks for PPDR.

The BroadPort prototype will provide an idea of what is technically possible with operational mobility, including the ability for public safety responders to access and share information from anywhere, with assured confidence in the security, availability and continuity of their services.

Final testing

The final BroadWay prototypes will be tested and evaluated in the northern spring of 2021. A subsequent competition will then be held to award a further €1.5 million to each of the two remaining consortia, which will be tasked with deploying final pilot systems by the northern spring of 2022 for phase 3 (pilot phase) of the BroadWay project.

The evaluation of the prototype solutions — to be carried out by Astrid SA's Group of Procurers — will be supported by the Practitioner Evaluation Team, which is a group of public safety responders representing all disciplines from across Europe and is led by the Bavarian Red Cross.

The BroadWay Group of Procurers includes 11 national ministries or their delegated agency responsible for providing public safety communication capabilities in their country. They currently provide mobile communication services to 1.4 million first responders across Europe. The countries involved in the BroadWay PCP include: Belgium, Czech Republic, Estonia, Finland, France, Greece, Italy, Ireland, The Netherlands, Romania and Spain.

The BroadWay Project has received funding from the European Union's Horizon 2020 research and development program under Grant Agreement No. 786912.

Strike Mounting Solutions for PTT and PTT-enabled Devices

Communication plays a vital role in all industries, whether it's in warehousing, logistics, retail, fleet management or public safety. Instant communication increases productivity and improves management among teams. It plays a crucial role in the field of mission-critical activities. Even the slightest delay can affect the relay of information and execution of emergency procedures in case of an accident.

With the advancement of smartphones and mobile networks, PTT (push-to-talk) communication is now a reliable solution for 2-way communication. Users can download a PTT app or purchase an enterprise-grade device made especially for this purpose. Individuals, teams, and fleets can work together efficiently with the use of these devices.

The mounting of PTT devices is essential for legal and safety purposes. Industries require mounts that can securely hold and protect their device in different work settings. Strike Alpha cradles are designed to keep any device secure whilst on the road and in harsh work environments. With Strike Alpha cradles, users can have easy access to their devices for instant communication and provision of real-time solutions.

Strike designs vehicle mounts for PTT-enabled devices and most enterprise-grade devices including Samsung, Panasonic, Zebra, Motorola, CAT, Sonim, and more. The mounts can be modified according to customer preferences. Strike's vehicle mounts can also accommodate PTT speaker microphones connected to tablets. Strike recently released its own Bluetooth PTT speaker/ microphone, the Strike Bravo.

Strike's cradle solutions boast the features necessary to maintain the usability of the device, especially in mission-critical environments.

The mounts are equipped with fast charging capabilities. The professionally installed cradle charges up to 3 amps and 2.4 amps for the DIY version. Both will keep your device sufficiently charged whilst running on full load. Wireless charging cradles are also available.

Additionally, these cradles are engineered with an internal passive antenna for signal boosting. When paired with a reputable external antenna, the mobile reception is significantly improved for stable connection vital for communication and real-time syncing of data.

In summary, Strike Alpha cradles provide optimum work and driving experience whilst enhancing the utility of any PTT, smartphone, and tablet device. These cradles are continuously improved, with features added depending on the need of industries such as locking mechanisms to prevent theft in public spaces. Select cradles also include an NFC Extender for businesses that require a second scan area.

Other key features of Strike Alpha cradles include:

- Plug 'N Play – Superior and cost-effective design with its replaceable cradle head component.
- Passive antenna is specifically tuned for Australian networks, including Telstra Next G and all 4G.
- Engineered to withstand 25G in crash test standards.
- Compatible with RAM Mounts with its industry-standard AMPS mounting pattern.
- Compatible with Bluetooth car kits.
- With pass-through data connection.

For more information, visit our website www.strike.com.au or email us at critical@strike.com.au.

Strike

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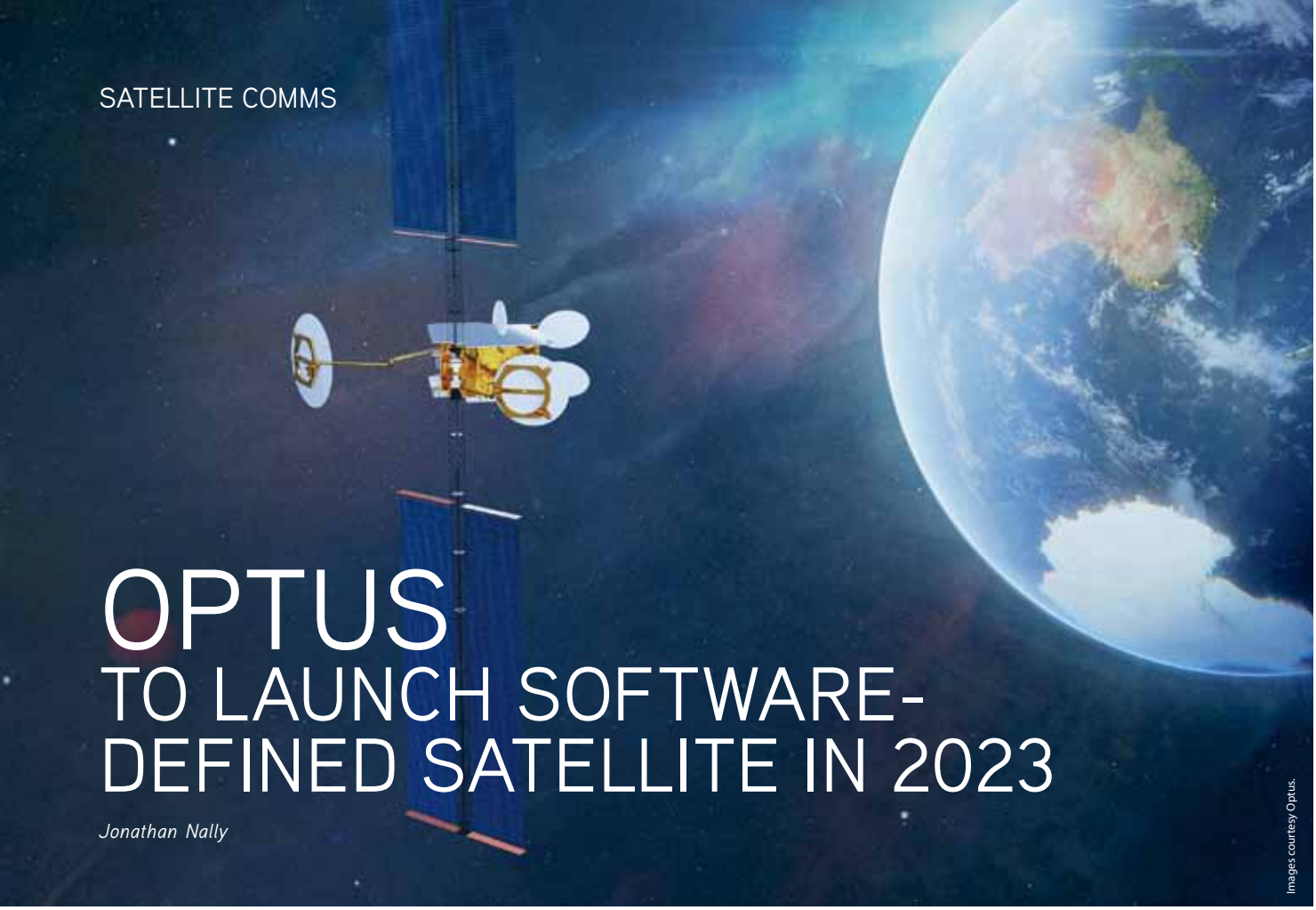

OPTUS TO LAUNCH SOFTWARE-DEFINED SATELLITE IN 2023

Jonathan Nally

Images courtesy Optus.

The Optus 11 satellite will use Ku band spectrum and have a footprint spanning from Antarctica to the Cocos Islands and the Pacific.

Optus has announced that it will launch a new, software-defined geo-stationary communications satellite, to be known as Optus 11, in 2023.

Announcing the contract for the OneSat satellite from Airbus Defence and Space, Optus called the development "a giant leap in its satellite business".

The satellite will cover Australia and New Zealand from the current Optus D1 orbital location of 160° east. Broadcaster Sky New Zealand will be its initial customer.

According to Optus, the company will be "the first satellite operator in Asia Pacific to launch a software-defined satellite that can provide both flexible concurrent broadcast and broadband services via a very high-throughput satellite (VHTS) design".

The satellite will be "fully configurable in space, meaning its location, coverage, bandwidth and capacity can be changed in orbit as customer demands evolve — where traditional satellites are limited by on-ground configurations that cannot be altered after launch".

"Optus 11's software-defined technology marks a paradigm shift in how satellite communication will be delivered across Australia and New Zealand and it will offer unparalleled flexibility for our satellite customers," said Optus Managing Director, Wholesale, Satellite and Strategy, Ben White.

"Telecom markets don't stand still and the ability to reconfigure payloads in-orbit is a game changer. It allows us to adapt to shifting business landscapes and tailor the delivery of services and capacity through dynamic beam-forming technologies."

Optus 11 is also able to carry a satellite-based augmentation system (SBAS) payload. SBAS promises to boost the accuracy and precision of GPS and other positioning systems across the region, enabling the pinpointing of locations to within 10 centimetres.

"Optus 11 will add capacity and resilience to our satellite fleet and its unique capabilities will give our broadcast customers the option to tailor their dynamic video delivery via IP streaming, and our broadband customers can benefit from better performance and higher individual throughputs," White said.

"In addition, it will support the Optus mobile network using satellite backhaul and the government's Mobile Black Spot Programs (MBSP)."

Optus says the new satellite will make the company the first operator in the world to use Ku band (11–14 GHz) spectrum for software-defined VHTS in both broadcast and broadband services.

Optus 11's coverage area will reach from Antarctica in the south to the Cocos Islands in the west, and cover a large portion of the Pacific.

It will also have the ability to provide tracking spot beam coverage for aircraft and vessels within the satellite's footprint.

The launch of Optus 11 will take the number of Optus satellites in orbit to six, which will be the largest in the company's and Australia's history.

UK government buys into OneWeb

In other satellite news, a UK government-led consortium has successfully bid for ownership of satellite company OneWeb. The US$500 million public investment will give the country its first sovereign space capability.

Consortium member Bharti Global is also putting in US$500 million. Through its subsidiary, Bharti Airtel, it is the third-largest mobile operator in the world, with more than 425 million customers and an extensive mobile broadband network.

The deal is subject to US court approval and regulatory clearances and is expected to close before the end of 2020.

"Our access to a global fleet of satellites has the potential to connect millions of people worldwide to broadband, many for the first time, and the deal presents the opportunity to further develop our strong advanced manufacturing base right here in the UK," said the UK government's Business Secretary, Alok Sharma.

Optus Pty Ltd
www.optus.com.au

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Location based services — practical integration tips

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26 November:
Cybersecurity and our industry — lagging behind others?

MORE DETAILS COMING SOON

UPCOMING ONLINE TRAINING WORKSHOPS

15-18 September 2020: Leading up and across — Influencing skills for technical leaders
Presented by Trevor Manning, Managing Director, TMC Global

October 2020: Radio Communications DC Power Fundamentals
Presented by Chris Stevens, Managing Director, CartGIS Pty Ltd

24-27 November 2020: Critical Conversations — For technical people
Presented by Trevor Manning, Managing Director, TMC Global

December 2020: Radio Communications 101
Presented by Chris Stevens, Managing Director, CartGIS Pty Ltd

UPCOMING WEBINARS:

- Turning black spots into bright spots (Part2)

VISIT WWW.COMMS-CONNECT.COM.AU FOR MORE INFORMATION

A new era for Comms Connect

Geoff Hird

As the COVID-19 pandemic continues to sweep the world, entire industry sectors have been dramatically affected and many plans have had to be put on hold. This has extended to the conference and exhibition industry, of course, and you'll be aware that we have had to postpone or cancel our physical Comms Connect conferences and exhibitions for 2020.

One regrettable consequence of this is that the person who has helmed Comms Connect from its inception, Paul Davis, has now moved on to new challenges outside of the conference sector. So I wanted to take this opportunity to thank him on behalf of WF Media — and on behalf of all members of the Australasian critical communications industry — for all the hard work he has put in to make Comms Connect the success it has become, and to remind everyone of just how much Paul and his hardworking team have achieved over the years.

Paul joined WF Media 15 years ago, and we launched Comms Connect Melbourne (known then as Radio Comms Connect) in 2007. That event had just 16 sponsors and exhibitors and 35 conference delegates. By contrast, Comms Connect Melbourne 2019 attracted 90 exhibitors and sponsors, more than 250 official delegates and over 1500 exhibition visitors. That's a pretty remarkable expansion when you consider that for many years it was widely thought that the traditional two-way radio market in Australasia was on the point of collapse.

In order to make this happen, Paul forged strong working alliances with all the local critical communications industry associations (ARCIA, ACCF and RFUANZ) and worked closely with global industry experts to help grow Comms Connect Melbourne into the largest gathering of critical communications and public safety professionals in the Southern Hemisphere, and the equal in quality of any of the major overseas events.

And then in more recent years, Paul worked hard to expand Comms Connect to include major events in Sydney, as well as in New Zealand (in partnership with RFUANZ), and smaller satellite events in Perth, Brisbane and Adelaide (in partnership with ARCIA).

Paul and his team have a remarkable ability to pull together conference programs and exhibition displays that are both varied and vital, ensuring delegates and visitors always come away better informed and better connected with their peers.

Comms Connect has had to transform itself for 2020 — with masterclasses, training courses and seminars now held online — again with great credit to Paul, Lisa, Katherine, Lauretta and Narelle for instigating these innovative delivery methods. The virtual sessions have proven very popular, with a number of them having to be repeated due to popular demand.

While it is everyone's hope — and certainly our aim — that the physical Comms Connect conferences and exhibitions will return in 2021, we will in the meantime continue to develop innovative ways of delivering great content for the critical communications sector. The Comms Connect Virtual Conference Series will be running throughout November — with more details to follow very soon on this exciting project.

None of this could have happened without the foundation that Paul built. We're very sad to see him go, and we wish him well with all his future endeavours. And we know that the reformatted Comms Connect events and programs are in very good hands with the long-standing Comms Connect team and industry partners.

Geoff Hird is Managing Director and Publisher of WF Media and WFevents.

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PRODUCT OVERSET

Antennas

RFI Technology Solutions has begun upgrading all low-PIM base station antennas to 4.3-10 connectors. Designed to provide improved PIM ratings, the 4.3-10 connector provides increased reliability with a compact, easy-to-install connector.

All RFI UHF corporate collinears and exposed dipole array-series antennas will now be shipped with 4.3-10 connectors. Over the coming year, the connector upgrade will be implemented on the UHF Meander range and the VHF and 800 MHz range corporate collinears and dipoles.

RFI also stocks a range of adaptors (DIN and N) and 4.3-10 terminations for most common cables, as well as jumper cables, lightning protection and ASM couplers.

RFI Technology Solutions
www.rfi.com.au

Mini-rack range

METCASE has added 5U as a standard height to its TECHNOMET 19″ range of mini-racks for tabletop instrumentation. They are now available in all heights from 3U to 6U.

The mini-racks are designed for mounting standard 19″ subracks, chassis and front panels. Applications include test and measurement equipment, networking and communications devices, sound and studio systems, laboratory instruments, industrial computers and control systems.

The elegant enclosures consist of two diecast aluminium front and rear bezels, the case body with internal chassis and a removable rear panel. Four snap-on cover trims create a flush-fitting cohesive design with no visible fixing screws.

The front and rear bezels include standard 19″ panel mounts with caged nut apertures for fixing the equipment. The four standard case sizes (3U, 4U, 5U and 6U) are all 400 mm deep. Custom heights and depths can be supplied on request.

The rear and base panels are ventilated to aid cooling. Inside there are two subrack/chassis support rails. All case panels are fitted with M4 threaded pillars for earth connections. ABS side handles are recessed for easy portability. Moulded ABS non-slip feet are also included.

TECHNOMET 19″ is available in two standard colours: anthracite (RAL 7016) and light grey (RAL 7035). Custom colours are available on request. Accessories include (unvented and vented) 19″ front panels and M6 caged nuts and fixing screws.

METCASE can supply the enclosures fully customised. Services include: custom front panels; CNC punching, folding, milling, drilling and tapping; fixings and inserts; painting and finishing; and digital printing of legends and logos.

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www.metcase.com.au

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Notes: