MAY/JUN 2018 Vol.5 No.4

comms critical

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Inside

May/Jun 2018

ON THE COVER

XPT (Extended Pseudo Trunk) is a scalable digital trunking solution that allows you to increase the capacity of an existing conventional DMR system by simply upgrading the current RD982S repeater and DMR radios. XPT connects a large number of users with voice and data, turning your conventional DMR system into a virtual trunking system. XPT allows faster access to the system for multiple users from various departments. This can increase productivity, enhance customer service and provide better dispatching to security personnel responding to emergencies.

XPT allows the radio to scan time slots on multiple repeaters and dynamically choose an open time slot to initiate a call. Less wait time is used than those who are fixed to a specific time slot. In typical conventional systems, it is common that some repeaters are always busy while others remain unused, this is where XPT Digital Trunking comes into action. The XPT system broadcasts the availability of channels throughout every repeater ensuring the users will have a guaranteed channel to initiate a call.

Within the XPT system, groups of radios will be allocated to a "home repeater". When the home repeater is idle, all calls will be made through this repeater. When the home repeater is busy, the XPT system will automatically and dynamically assign a "free repeater", which temporarily provides available channels to initiate a call. Once the home repeater has an available resource, the groups of radios will switch back to it.

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

Transmit

The world of business- and mission-critical communications is a very broad church, from public safety to backhaul, 5G to IoT and everything in between. In this issue we canvass just about every aspect of the communications sector, demonstrating the breadth of work being done in Australasia and around the globe.

Whoever it was who said that wireless communication was a thing of the past should surely eat their words. Wireless is no longer restricted to traditional two-way radio — and hasn't been for a long time, of course — with all manner of other modalities becoming vitally important to the operation of our modern cities, such as Wi-Fi and mobile broadband and the IT systems that operate unseen in the background. And the pace is accelerating — witness FirstNet about to take off in the US, with the AT&T backbone now in place. And Spark's new IoT networking covering almost all of New Zealand.

All of these topics and more will be discussed and debated at Comms Connect Sydney, coming up in just a few weeks (14–15 June) at a new venue, Rosehill Gardens near Parramatta. The event will feature a packed agenda of fascinating presentations and panel sessions that are not to be missed. And don't forget the associated ARCIA industry dinner and networking event, which is always a great occasion for networking and renewing acquaintanceships. Make sure you get your registrations in, and see you there!

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

May 2018

Australian and New Zealand Disaster and Emergency Management Conference 2018
21–22 May
The Star, Gold Coast
anzdmc.com.au

June 2018

Mission Critical Technologies 2018
13–14 June
Excel, London
tmt.knect365.com/mission-critical-technologies

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

August 2018

APCO18
5–8 August
Las Vegas
apco2018.org

September 2018

AFAC18
5–8 September
Perth Convention & Exhibition Centre
afacconference.com.au

November 2018

MilCIS 2018
13–15 November
Canberra
milcis.com.au

Comms Connect Melbourne
20-22 November
MCEC, Melbourne
melbourne.comms-connect.com.au

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

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GME RELEASES THE CM60 DIGITAL SERIES

GME releases the CM60 Digital Series

The CM60 extended control is P25-ready with a full keypad control and OLED screen.

Incremental software keys are available for Trunked and AES-256/DES encryption with optional FIPS 140-2 and publicly listed APIs for third-party integration.

Available as dedicated P25 data / telemetry models using an AT terminal interface, the CM60 complies to AS/NZS 4295, AS/NZS 4365 (UHF), FCC 90/15 and TIA-102 Standards.

GME PROFESSIONAL www.gmeprofessional.com

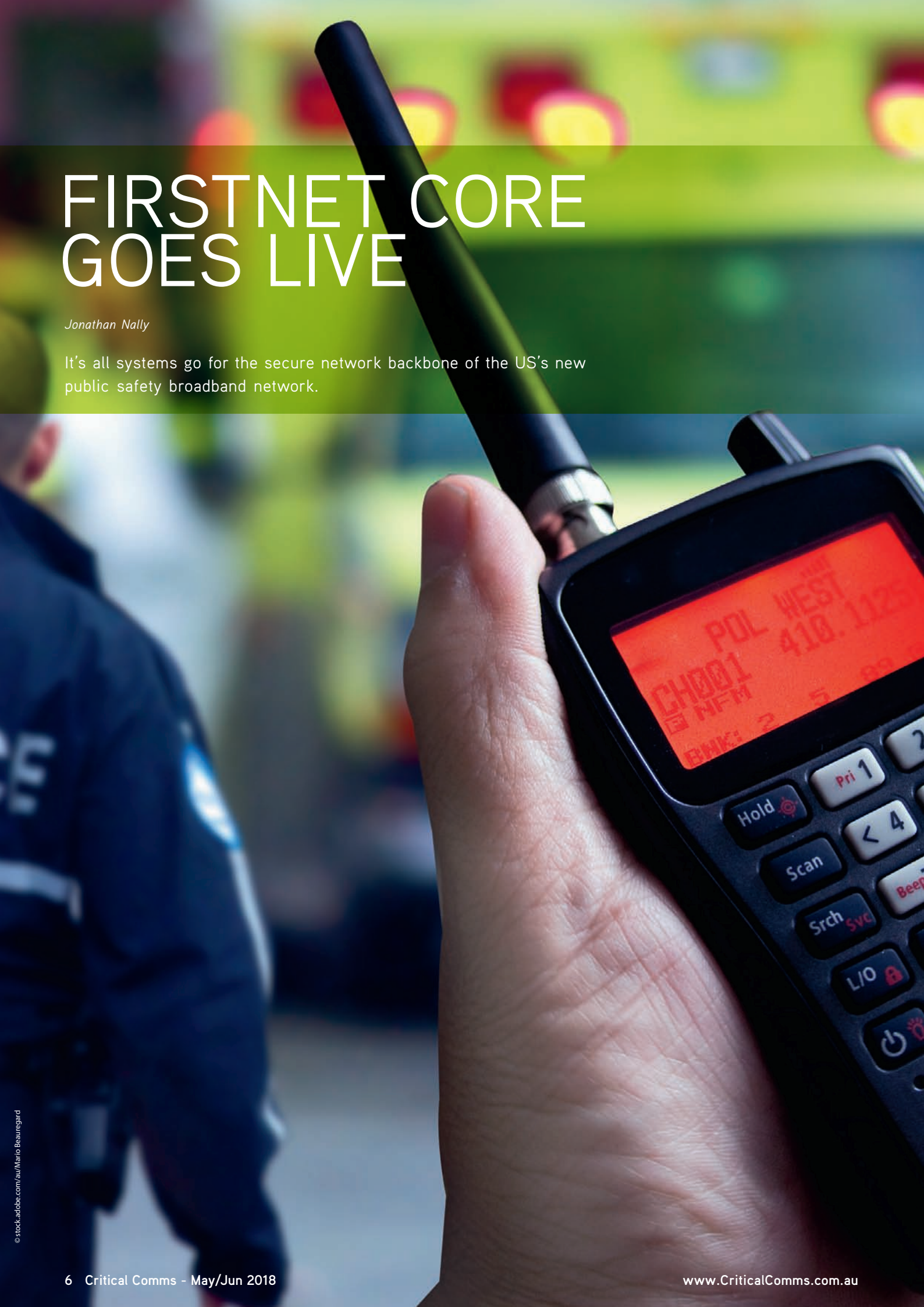
AUSTRALIAN MADE

P25

FIRSTNET CORE GOES LIVE

Jonathan Nally

It's all systems go for the secure network backbone of the US's new public safety broadband network.



FirstNet and its partner contractor, AT&T, have announced the go-live of the public safety communication system's network core.

One year ago this week, following a rigorous procurement process, we formed a public–private partnership with AT&T to execute on public safety's vision for this network," said Jeff Bratcher, FirstNet's chief technology officer and operations director.

"The input and feedback we received from public safety has come to life with this core," he added.

"It's been a non-stop 12 months. And we're proud of the quick progress we've made in this short time frame, consistently delivering on or ahead of schedule," said Chris Sambar, senior vice president, AT&T–FirstNet.

In a statement, AT&T said it has put hundreds of millions of dollars into the core, which is built on physically separate hardware — only FirstNet traffic will move through it.

The core is designed with a defence-in-depth approach that helps maintain security at every level, which will be monitored 24/7 by a dedicated security operations centre.

AT&T expects more than 197 PB of data to cross the network on an average business day.

"This is what public safety has spent years advocating for," said Scott Edson, executive director, Los Angeles Regional Interoperable Communication System (LA-RICS). "We at LA-RICS look forward to connecting our sites to the FirstNet network core."

First responders can access First Priority which, according to AT&T, turns "always-on access to priority and pre-emption up a notch", giving first responders two more priority levels.

There is also an Incident Management Portal, which enables public safety agencies to uplift critical users to the highest priority levels in near real time. Agencies can also temporarily uplift other non-first responder users, such as utilities or transportation authorities.

"Outdated communications capabilities are a threat to public safety. We've seen it repeatedly when disasters strike – from September 11, the Boston Marathon and Parkland," added Ed Davis, former Boston police commissioner.

"We've been advocating for the future of communications to bring us a modern solution that will empower us with next-generation tools. And with FirstNet, that future is here, giving us an experience we can't get on any commercial network," he added.

"Those on the front lines can now evolve the way we communicate, using mission-critical text and data on top of voice to ensure we are connected to as much information as possible to achieve our missions. Because the more connected we can be, the more protected we can be."

Users will have dedicated FirstNet SIM cards. FirstNet-ready devices already on the market include the Samsung Galaxy S9/S9+ and the NETGEAR Nighthawk M1 mobile hotspot router. Support for rugged devices such as the Sonim XP8 and XP5s will be coming soon. Firmware updates might be needed for other devices.

Testing and deployment

"To ensure the network delivers the performance and integrity public safety demands, the FirstNet core will continue to undergo validation and testing with the First Responder Network Authority," said Bratcher.

"Alongside AT&T, we will exercise the functionality of the public safety features, measure redundancy under a variety of conditions, and validate the overall performance and resiliency of network components," Bratcher added.

"With the results of these tests, the First Responder Network Authority and AT&T will validate that the network will be there when public safety needs it."

Bratcher also noted, "While we are moving to expedite this process, we will not sacrifice delivering a robust, first class, secure broadband experience to our public safety users," adding that the final phase of testing and validation is expected to be completed in the April/May time frame.

"In the meantime, FirstNet users can begin moving to the core as part of a controlled introduction by AT&T. Once this phase of testing and validation is completed, more FirstNet users will move to the core," he said.

"We've been transitioning to FirstNet ... [and] we've already seen the tremendous difference FirstNet can make in helping us cut through the clutter and get access to the vital information we need to keep ourselves and those we protect out of harm's way," said Brazos County Sheriff Chris Kirk.

"That was before the launch of the FirstNet network core. So we're expecting it to only get better from here, which we believe will continue to improve our operations."

VERIZON UNVEILS PUBLIC SAFETY PRIVATE CORE

Jonathan Nally

Contender for US public safety broadband establishes a competing communications backbone.

Verizon has announced that its public safety private core will be generally available across the US on 29 March 2018.

In a statement issued in March, the company said the announcement follows through on the commitment it made to the public safety market last year.

The private core is at the heart of Verizon's 4G LTE network public safety offering, and according to the company provides key features such as:

- traffic segmentation,
- priority and pre-emption,
- improved security, and
- enhanced service management and control.

The core is connected to Verizon's Radio Access Network, which uses spectrum in the 700 MHz, 800 MHz Cellular, 1.9 GHz PCS and 1.7/2.1 GHz AWS bands.

The core will separate the data traffic of public safety mobile users from commercial users across Verizon's 4G LTE network.

Public safety users will have their data immediately recognised with priority access at the tower and through the network.

"Public safety answers the call when we need them most," said John Stratton, Verizon executive vice president and president of global operations.

"We remain committed to providing them innovative communications solutions that help them help us, and we are honoured by the trust they put in Verizon every day."

Verizon said its public safety customers will also have access to Mobile Broadband Priority (MBP) and Pre-emption Services at no additional charge.

At times of heavy commercial network congestion, MBP users will receive priority over commercial users. It is aimed at public safety officials using applications on smartphones or tablets, transmitting data from vehicles or video from surveillance cameras.

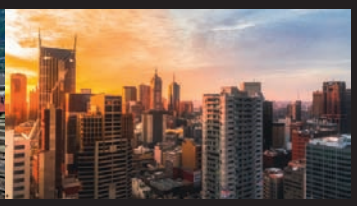
Pre-emption will enable Verizon to automatically reallocate network resources from commercial data/internet users to first responders "in the unlikely event network capacity is reached".

"Our public safety network will provide a comprehensive and cost-effective solution for public safety, and we'll continue working to ensure first responders get the network reliability and access to innovative services they need to keep our communities safe," said Michael Maiorana, senior vice president, public sector for Verizon.

Enabling Wireless Everywhere

Wireless Tech commits to provide the latest innovative wireless products, networking technologies and tailored services in pursuit of supporting System Integrators and Enterprise Customers



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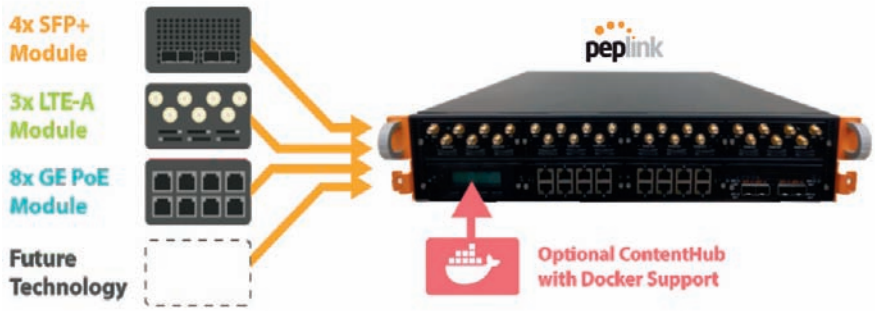
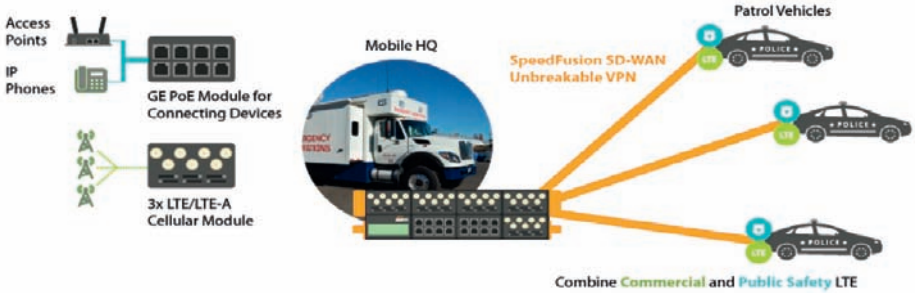
- **Wireless mesh technology**
- **Wireless hotspot and outdoor Wi-Fi**
- **Multi-WAN load balance routers, multi-cellular mobile routers, SpeedFusion bandwidth bonding routers**
- **Application level products: IP cameras, video decoders & encoders, IP SAN & NAS storage, enterprise SD switches, antennas, POEs, lightning surge protectors, customised network and RF cable assemblies, touch monitors etc.**

INDUSTRY'S HIGHEST PERFORMING SD-WAN PLATFORM : EPX



The EPX is a rapidly deployable, powerful, and versatile SD-WAN router that connects a wide range of WAN options from LTE-A, satellite modems, to fixed line networks. At a 19" 2U rack mountable form factor, it can combine up to 18x LTE-A connections for absolute connection reliability.

Rapidly deployable, scalable, unbreakable connectivity for mobile command



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FIRMS TEAM FOR TONGAN COMMS

Aviat Networks has selected CommScope's microwave antenna solutions to furnish wireless coverage and to increase capacity across the Kingdom of Tonga. Tonga has 100,000 residents spread across 36 islands, spanning 1.8 million square kilometres of the South Pacific. The Kingdom's growing population has been relying on limited satellite communications and unreliable wireless coverage. To address this, the companies have built a microwave link with a repeater site located on Kao Island, home to an ancient volcano. "Turning a dormant volcano island into an active mobile communication link was a significant challenge due to geographical restrictions and extreme weather conditions," said Aaron Prior, senior sales engineer and regional manager, Aviat Networks.

More info: bit.ly/2qWbgRH

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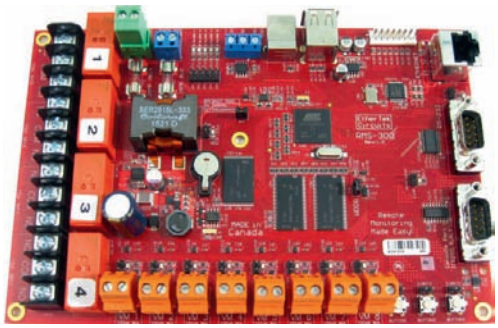
VIC ENHANCES RAIL COVERAGE

Regional Victorian rail passengers will receive improved mobile coverage with the rollout of the Regional Rail Connectivity Project (RRCP). About a quarter of V/Line's Vlocity trains are now fitted with mobile signal boosters, with more trains set to roll out each week until the entire Vlocity fleet is connected by the end of 2018. The Victorian Government is working with Telstra, Vodafone and Optus to deliver the $18 million RRCP, which also includes the construction of 35 new mobile towers that will combine with the boosters to increase mobile coverage for passengers along the Traralgon, Geelong, Ballarat, Bendigo and Seymour lines.

More info: bit.ly/2Hmtab3



Remote monitoring

The RMS Series is a remote voltage monitoring, data acquisition and control device specifically designed for use with battery-powered wireless internet repeater sites, or other AC- and DC-powered remote equipment.

No matter how remote a site's location may be, as long as there is internet connectivity the RMS Series allows users to monitor their site.

The RMS can control generators, pumps and lights, and turn devices on or off. It enables the measurement of battery voltage and charging, as well as amperage measurement through a shunt. It provides measurement of wind turbine and solar panel output, plus detection of A/C power, presence or absence. It also has door and window contact monitoring and fuel tank level monitoring with email and SMS alerts.

On the RMS300, features include: low noise switching power supplies accept 8–60 VDC input and can be powered directly from 12, 24 or 48 V battery banks; battery backed up, real-time clock; one onboard temperature sensor –25 to +100°C; eight 24-bit isolated voltmeters (±100 VDC). Each voltmeter has its own 24-bit Delta Sigma ADC; four latching relays for devices using 1–240 V, 16 A AC/DC current; three programmable push-buttons; six general-purpose I/O pins; power output port, 5.0 VDC (500 mA); power output port, 3.3 VDC (500 mA); one full serial port for controlling cell phones, modems, etc; one console serial port; 1-Wire interface for external temperature sensors; and two USB 2.0 ports for cameras, wireless clients, extra Ethernet.

Helios Power Solutions

www.heliosps.com.au

Mission test system

The Cobham 8800SX mission test system provides end users with a fast automated test for radios. It ensures that in critical situations, the radio will operate as expected.

The system combines the digital radio test set with an RF shield case to ensure radiofrequency interference is not an issue during the test. It also comes loaded with the radio's specific auto-test application. The end user just needs to hook the radio up, close the case lid and push a button. Within 60 s, or less, the system will register a 'pass' or 'fail'.

It allows police officers, firefighters, emergency medical personnel or anyone who carries a two-way radio to do a quick operational check on the radio before they start their shift so they know their radio will work when needed.

The product comes with a large touch-screen and auto-test applications to assist with speed, accuracy and reliability.

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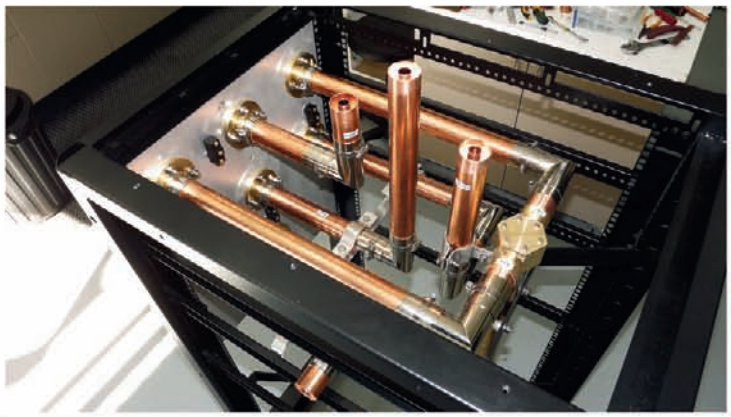

www.zcg.com.au

News

MINETEC WINS SAFETY CONTRACT

Swedish miner Boliden has awarded a contract to Western Australia-based Minetec (a member of the Codan group of companies) for a non-GPS reliant surface mining proximity detection system. Minetec's proximity detection solution, SafeDetect, will be first deployed at the Boliden Kevitsa Mine in northern Finland, with other sites to follow. SafeDetect is a peer-to-peer, off-network solution that uses Wi-Fi ranging technology, known as WASP (wireless ad hoc system for positioning). It is non-intrusive and is easily installed on vehicles, autonomous or manned, and can detect personnel on foot.

More info: bit.ly/2qWdEYp

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MOTOROLA FINALISES AVIGILON ACQUISITION

The acquisition of Avigilon by Motorola Solutions has now been completed, bringing advanced video surveillance and analytics to Motorola Solutions' public safety, government and commercial customers. Avigilon designs, develops and manufactures advanced security surveillance solutions, including video analytics, network video management software and hardware, surveillance cameras and access control solutions used by commercial and government customers. It holds more than 750 US and international patents and manufactures its products in the US and Canada. Motorola Solutions has acquired all of Avigilon's issued and outstanding shares for C$27 per share. The enterprise value of the transaction is approximately US$1 billion.

More info: bit.ly/2HTomXL

Fibre-optic OTDR

The AFL Flexscan fibre-optic OTDR comes with SmartAuto and LinkMap. FlexScan PON OTDRs test FTTH PONs up to 1:64 while still detecting and measuring events only metres apart.

It can be used for PON or point-to-point network verification or troubleshooting, and has the ability to carry out OTDR testing plus insertion loss and power measurements; locate faults exceeding industry or user pass/fail thresholds; and visually pinpoint location of macro-bends or breaks.

Main features include fast, accurate OTDR network characterisation or fault location; test up to 1:64 PON with 20 m PON dead zone; easy-to-understand LinkMap results with pass/fail indications; 1310/1550/1650 nm PON OTDR (in- or out-of-service testing); 1310/1550 nm versions for complete network characterisation; 1550 and 1650 nm versions for cost-effective troubleshooting; integrated source, power meter, VFL (visual fault locator); compatible with FOCIS Flex connector inspection system; rugged, lightweight, handheld for field use; large, bright touchscreen display easily viewed indoors and out; and internal/external data storage via USB, Bluetooth or Wi-Fi.

AFL Telecommunications Pty Ltd

www.aflglobal.com/au

Dual-channel time domain reflectometer

The Megger TDR2000-3P is a highly portable, high-resolution, compact dual-channel time domain reflectometer (TDR). With a large colour screen, it is suitable for locating faults on paired metallic cables in applications as diverse as street lighting, telephony and CATV. It is available to rent from TechRentals.

The product has a minimum resolution of 0.1 m and a 20 km maximum range depending on the velocity factor selected and the cable type. Five output impedances are available, including 25, 50, 75, 100 and 125Ω. The fault locator comes with an auto impedance matching feature and a velocity factor between 0.2 and 0.99 to meet any cable test requirements.

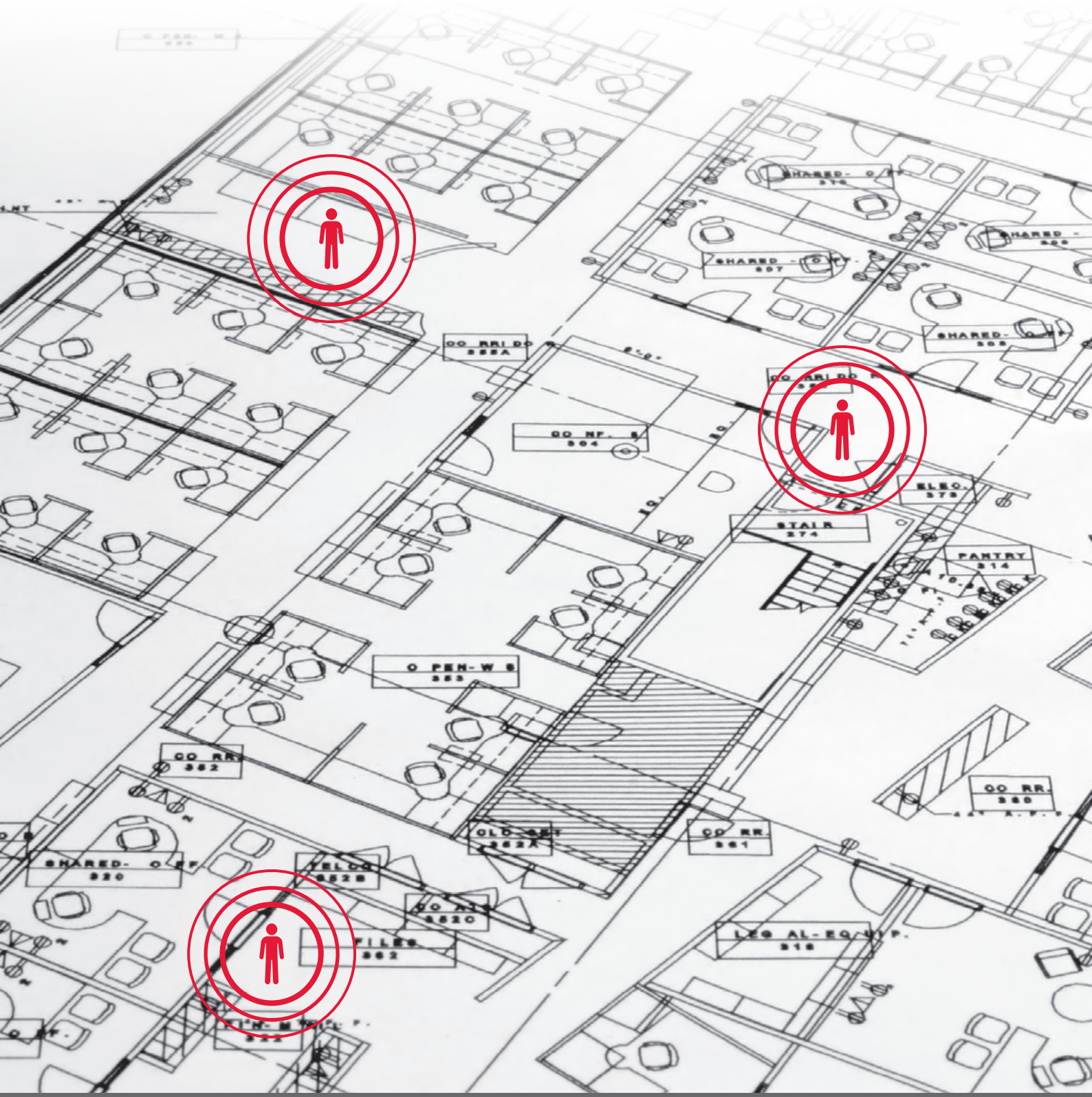
Powered by Li-ion rechargeable batteries, the unit is dustproof and showerproof to IP54. It can test powered cables and comes complete with two pairs of fused test leads.

Features include ultrafast pulse for near-end fault identification; comprehensive dual-channel capability; auto set-up mode for instant use; and Xpert guidance to potential fault.

TechRentals

www.techrentals.com.au

DO YOU KNOW WHERE YOUR PEOPLE ARE?



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COMMS 2018 CONNECT SYDNEY

COMMS CONNECT SYDNEY 2018

14 –15 JUNE, ROSEHILL GARDENS, ROSEHILL

Jonathan Nally

Comms Connect returns to Sydney in June, this time at a new venue — Rosehill Gardens, very close to Parramatta in the geographic and demographic heart of the greater Sydney region, and one of the fastest growing areas in the nation. The conference and exhibition are always great opportunities for those in the business- and mission-critical communications sector in Sydney and beyond to come together and share and learn from one another, so make sure you register today (sydney.comms-connect.com.au) to guarantee your participation.

Speaker sessions

The Sydney event always attracts a first-class list of speakers from industry and government, and this year's line-up will be no exception, with experts from home and abroad coming together to share their knowledge and insights.

The first day will begin with an opening keynote address by Bill Schrier, senior advisor to FirstNet in the United States. He will provide an overview of how FirstNet will enable smarter public safety services through the use of new technologies. His presentation will be followed by a plenary address by Luke Brown, assistant secretary with Emergency Management Australia, which will provide the audience with a much-awaited update on the status of Australia's forthcoming public safety mobile broadband system. Not to be missed.

The second day's plenary address will be given by Giles Tanner, general manager of the ACMA's Communications Infrastructure Division. He will speak about the challenges facing spectrum regulators in the new technology environment.

The other speaker sessions will be broken into three streams across the two days. In the public safety stream, the presentations will include:

- Supporting day-to-day mission-critical operations of public safety networks (Sohan Domingo, Nokia)
- Designing reliable fixed wireless networks for public safety and IoT applications (Eddie Stephanou, Cambium Networks)
- Using PTT to extend mission-critical LMR networks (Station Officer Graham Tait, Fire & Rescue NSW)
- Victorian marine boating public safety infrastructure (Marcus Grinblat ESM, Victoria State Council)
- Next-generation networks for mission-critical services case study (Nilesh Joshi, CommTel Network Solutions)
- Mobile broadband applications: innovations for business- and mission-critical users (James Reed, Titan ICT Consultants)

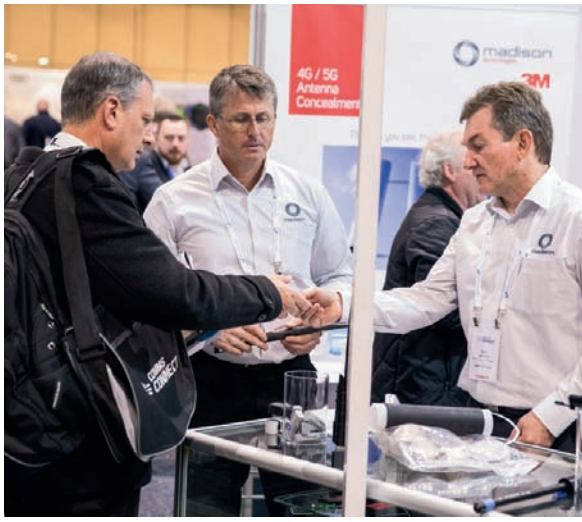
The technology stream will include the following presentations:

- Li-Fi: mobility for the 2020s (Lawrence McKenna, Wood & Grieve Engineers)
- What's it all about — 5G? (Roger Kane, Vicom)
- 5G roadmap: pipe dream to reality (Dale Stacey, SAT Pty)
- A 'smart world' — so what? (William Heapy, Axicom)
- LPWAB connectivity options as the backbone for Industrial IoT (Loic Barancourt, Thinxtra)
- Rethinking two-way radio intrinsic safety (Paul Barnes, Fire & Rescue NSW)

Sydney's premier critical communications event — don't miss it!

COMMS CONNECT SYDNEY

Conference: 14 June (8.50 am–5.00 pm), 15 June (9.00 am–3.30 pm)
Exhibition: 14 June (9.00 am–5.00 pm), 15 June (9.00 am–3.30 pm)
Where: Sydney Showground, Sydney Olympic Park
Who: More than 500 delegates and 25-plus exhibitors
Web: sydney.comms-connect.com.au



- Enhancing safe work at heights near radio sites (Tony Paul, PicoNet Consulting)

And in the industry stream, the topics and speakers will be:

- Evolution from narrowband to mobile broadband (Anton Abrahams, ATCCF)
- Utility sector case study (Glen Norris, Orion Network, and Steven Oliver, Jemena)
- Digital wireless evolution in train communications (Doug Bowden, ATCCF/Sepura)
- The value of a strong industry association (Hamish Duff, ARCIA)
- Customer-driven outcomes on a multifunction platform (John Graham, Tait Communications)

Workshops and panel session

There will be four workshops on the first day of the conference:

- Radio spectrum management — what's trending in 2018
- Control rooms — trends and developments
- The Internet of Things for public safety
- Critical messaging in the modern world

The second day will conclude with a panel session on the topic of 'Public safety mobile broadband: the way forward for critical communications in Australia'. The session — to be led by Bill Schrier (FirstNet) and Ian Miller (ARCIA) — will canvass possible outcomes for Australia's PSMB ecosystem, using the example of other countries' experiences as a guide.

Exhibition

Comms Connect is your best opportunity to meet and greet with multiple suppliers/manufacturers in the one place, to compare notes, give feedback, get up-to-date information on the latest technologies (including, often, pre-release or developmental details) and generally build connections within the industry. More than 25 companies, large and small, are booked in as exhibitors… so make sure you come along to meet and greet and create some sales opportunities.

ARCIA industry dinner

One of the best parts of events such as these is the opportunity to catch up with colleagues old and new, from near and far, and share knowledge and experiences. While this can be done all throughout the event, there will be two special opportunities for networking and socialising. First will be the networking drinks, from 5–6 pm on the first day. And this will be followed by the ARCIA Industry Dinner and Networking Event, to be held from 6 pm that same day at Rydges Parramatta, just across the road from the Comms Connect venue. Make sure you book for the ARCIA event, at arcia.org.au/news-events/industry-events.html.

Comms Connect Sydney is a golden opportunity for you to hear from the experts, discuss your requirements with leading vendors and suppliers, and share the challenges faced by industry colleagues and professionals who use communications technology in their working environments. See you there!

NEW YORK'S SECURE WI-FI

Jonathan Nally

Free smartphone app and new security for public Wi-Fi networks will aim to protect citizens online.

New York aims to become the first city in the world to provide free, highly secure Wi-Fi services to all residents and visitors free of charge.

Announcing the initiative — called NYC Secure — New York's Mayor, Bill de Blasio, said the aim is to protect citizens from malicious cyber activity on mobile devices, across public Wi-Fi networks and beyond.

As the first step in an evolving suite of solutions, NYC Secure will include a free smartphone app that will issue warnings to users when suspicious activity is detected on their mobile devices.

There will also be a new layer of protection for the city's public Wi-Fi networks.

"Our streets are already the safest of any big city in the country — now we're bringing that same commitment to protecting New Yorkers into cyberspace," said Mayor de Blasio.

"New Yorkers manage so much of their lives online, from paying bills, to applying for jobs, to engaging with government.

The effort will be led by NYC Cyber Command (NYC3), which is in charge of citywide cyber defence and incident responses, mitigation of cyber threats and provision of guidance to the Mayor and City agencies.

Taking advantage of public-private partnerships, NYC Cyber Command works with more than 100 agencies and offices to protect, detect, respond and recover from threats. It also sets information security policies and standards.

"NYC Secure will ensure that we're applying the best and most effective protection efforts to help New Yorkers defend themselves online," said Mayor de Blasio.

Geoff Brown, the city's chief information security officer and head of NYC3, said, "In order to stay a step ahead of cybercriminals that are continuously finding new ways to hack devices, we must invest in the safety of the digital lives of our residents.

"While no individual is immune to cybersecurity threats, this program will add an extra layer of security to personal devices that often house a huge amount of sensitive data," he added.

The smartphone app, which will be available in the middle of the year, will identify malicious attacks and warn users of attempts to compromise their device.

Users will receive recommendations such as disconnecting from a malicious Wi-Fi network, navigating away from a compromised website or uninstalling a malicious app.

The app will not take actions on the phone by itself. It will operate according to a strict privacy policy with layers of technical controls to ensure user privacy is respected, and it will not collect or transmit any private data.

The City will reinforce its Wi-Fi networks by adding a new layer of security to protect users from downloading malicious software such as ransomware or from accessing phishing websites.

NYC3 has mandated the deployment of the technology across all 'guest' and public Wi-Fi networks provided by New York agencies and related entities by the end of the year.

Eighteen agencies and offices already use the protection on their internal networks, with the remainder of internal networks due to deploy it by the end of 2018.

The technology will also be used on the LinkNYC network, which has 1400 free Wi-Fi kiosks and millions of users.

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DMR on the docks

Hytera digital radios are keeping operations safe on New Zealand's waterfront.

ISO Limited (ISO) is one of New Zealand's largest nationwide, waterfront cargo logistics companies. The firm has worked hard over the past decade to ensure that health and safety remains a core company value, taking a comprehensive systems approach to manage key risk areas within the business.

And it is a risky business. The company handles over 700,000 tonnes per year of log exports out of almost every port facility in the country, as well as bulk materials, containerised transport and New Zealand's famous kiwifruit. These activities require staff to work with heavy, dangerous machinery, usually within tight time and space constraints.

Customer requirements

Log marshalling and loading is an unforgiving business. Big machines, massive suspended tonnages and a slippery, difficult product being loaded under strict time limits all demand reliable, clear communications between crew members performing risky tasks.


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> Good communications on the channel between crane operator, tally man, slinging crew and load operator are crucial to ensure a rapid, safe load operation.

Two years ago ISO's business shifted up a couple of gears after it was awarded a major log marshalling and loading contract out of Tauranga. It was a significant addition to the business, and it meant there would need to be better communications between more crews. ISO's conventional analog communications channels used were becoming increasingly congested with cross channel 'chatter' and were picking up interference, resulting in loss of voice clarity. The problem had increased to almost saturation level, so the company made a conscious decision to move away from analog for its radio communications.

Solution

Casting around for digital handheld radio options, ISO examined options put up by multiple brands and found Hytera DMR to be the most suitable solution. The company opted for the PD602 model as the basic 'pool' use radio, while supervisors have the PD782 model with scan channel capabilities, enabling them to roam across multiple communications zones and channels.

The ability of the digital Hytera sets to designate specific communications zones within the spectrum was a key feature that made them well suited to ISO's use, particularly for crews marshalling and loading logs onto ships. Good communications on the channel between crane operator, tally man, slinging crew and load operator are crucial to ensure a rapid, safe load operation.

Once logs are bunkered, tallied and slung for the crane lift, the crane operator requires clear communications to the loader operator who may be below deck under the ship's coaming and well out of his line of sight.

Clearer, more distinct voice instructions being received are a simple, but potentially lifesaving, benefit of the digital technology, says Matthew Thorne, ISO's IT operations manager.

"It is proving to be quality kit that we can rely upon which is backed up by very good service. It is a no-brainer that we will ultimately have Hytera equipment as our standard equipment as we retire our old analogue equipment," said Thorne.

The Hytera equipment brings with it a number of benefits. The simple, robust design has face buttons capable of being screened off, providing simple and 'one twist' channel selection. The 24-hour battery life provides more than sufficient capacity for standard 8-hour shifts. And the ability to assign zones to ship berths, and channels to each crane crew, ensures separation of crews, zero cross channel confusion, and direct and 'siloed' communications.

Hytera

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

Industry Talking

Congratulations to the ARCIA Perth team for hosting the first industry dinner for 2018. A new venue overlooking the Optus stadium was a great success. Members and guests enjoyed a great night and the buzz in the room was tremendous. Our guest speaker, Myriota's Dr Alex Grant, gave a fantastic insight into satellite-based IoT technology his company is pioneering; it is always tremendous to see people innovating.

I had the opportunity to attend IWCE in Orlando this year and, of course, there was a lot of new information and products for FirstNet. Clearly there will be an incredible effort by the public safety community, vendors and industry supporters to embrace new technology options that LTE provides. However, it is interesting to note there is also an upswing in investment in LMR in many markets. The challenge for us all in the critical communications world is the diverse range of geographies, spectrum, governance, coverage, security and user requirements that exist. In my view, trying to fit all of this into one technology platform does not make sense.

So we think associations have an important part to play in bringing users and vendors together. In addition to running all the normal events in 2018, ARCIA will continue to work with the ACMA on spectrum and legislative matters, but we will also advocate on behalf of our public safety members and users on public safety mobile broadband. You will see these key themes throughout 2018 and I welcome feedback from members on these important discussions.

Our event season now moves east to Auckland and Sydney, and I am sure there will be many members attending our sister organisation's RFUANZ dinner in Auckland. It is great to see that FirstNet is sending representatives to both the Auckland and Sydney Comms Connect events. Sharing information and lessons learned, and, importantly, developing standards for the benefit of all in the public safety arena are key to success. The direction and leadership shown by FirstNet and its willingness to work on standards, the application ecosystem and certification programs will have global implications. So I do hope everyone involved in these markets makes the time to attend Comms Connect, the RFUANZ and ARCIA events.

ARCIA continues to work with the ACMA. The draft legislation to replace the Radio Communications Act is out for comment. We understand the government plans to have this into parliament by the end of 2018. The real work will begin with the implementation of the new Act, and this is where our relationship with the ACMA will become very important. There will be many opportunities to improve many areas of the industry.

Finally, a quick reminder. Our regular Brisbane event will be held on Thursday, 26 July, again at the Rydges Hotel in South Brisbane, with Comms Connect during the day and our dinner in the spectacular rooftop venue that evening. With this noted in your diary, it is also time for you to think about nominations for the Industry Professional of the Year for Queensland. Nominations can be made through the ARCIA email, info@arcia.org.au.

Hamish Duff, President, Australian Radio Communications Industry Association

Fully rugged detachable notebook

The Panasonic Toughbook CF-20 is a fully rugged detachable notebook that provides versatility for mobile business computing.

The notebook can be used in six different modes to meet business needs.

With its glove-enabled touchscreen, up to 20 h hot-swappable battery life and purpose-built vehicle mount and desktop port replicator, the product is a rugged mobile business tool.

This lightweight laptop easily detaches to become a 10.1″ tablet. The detachable laptop has a magnesium alloy chassis and is also MIL-STD-810G and IP65 certified, so that it can take the day-to-day use across many different vertical markets.

At 1.7 kg, this 2-in-1 machine is good to use on the go, with a built-in handle that also functions as a kickstand to assist with on-the-job flexibility.

The optional bridge battery allows hot-swap battery replacement without disruption. The gloved multitouch display is sunlight-viewable, making this hybrid laptop suitable for rugged outdoor environments.

Panasonic Australia Pty Limited
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Cavity filters

ZCG all-Australian manufactured cavity filters are suitable for low- to medium-powered broadcast and communications applications within FM 87.5–108 MHz; air band 118–136 MHz; VHF 148–174 MHz; and UHF 400–520 MHz.

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ZCG's range of cavity filters has the added ability of being able to be easily re-tuned if the frequency requirement changes.

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W60

W65


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INTEGRATED SYSTEMS FOR MAJOR PROJECTS

Modern, large-scale infrastructure projects demand next-generation communications solutions.

As the scale of infrastructure projects grows in Australia, there is an integral need to ensure critical communications remain reliable between vastly spread out job sites and teams, above and below ground.

Some of Australia's biggest-ever public transport projects are currently happening in New South Wales, with the NSW Government spending billions of dollars to create the '30-minute city'. The scale of these projects requires next-generation, secure and innovative communications networks that can transcend traditional ground-level barriers.

The mining industry has used holistic technology for years to keep its surface and traverse teams in check. What we haven't seen in Australia, until recently, is a complete radio system integration during an infrastructure construction project, allowing for a central point of command to be able to view and track its entire fleet, no matter where they are.

Undisrupted workflows and meeting delivery timelines are essential elements to successful tendering for infrastructure companies. Those not in the radio industry will never know that the background thread which keeps our society moving is a virtual, two-way radio one — Where are my staff? What is happening on job site A? Did the delivery make it on time? Have we evacuated everyone?

The safety of contractors relies heavily on reliable, undisrupted communications between site supervisors and central command stations. For many years there has been a discontinuity in the system, holding back the fluid nature of what total fleet communications should be. When separate communications channels have been used between above- and below-ground sites, or inexpensive or faulty radios have been sourced, there have been massive financial and reputational implications for construction companies.

Not only that, accountability was a throwaway term as no tracking was available below ground.

So, how can Australian infrastructure companies take control of their entire fleet?

Australian-based solutions provider Mastercom has recently been brought in by the contracting group for one of Australia's largest infrastructure projects to solve this problem.

"We were approached by the contractors for a multibillion-dollar infrastructure project and asked to supply and install a reliable, centrally controlled communications system," said Mastercom's Sales Manager Robert Glover.

Mastercom's technical team made the innovative decision to integrate Motorola's MOTOTRBO Capacity Max to solve this problem.

"Mastercom is the first company to integrate Capacity Max above and below ground on a large-scale transport project," said Glover.

"We've taken the initiative to use beacons in the tunnels so command can see exactly where their people are. This kind of data is integral to fleet management, allowing for monitoring and activation from one point, rather than segmenting project communications."

"Segmented communications creates disharmony within the communications chain, and also disallows a central point to make quick and efficient decisions which keep the project moving," added Mastercom Technical Manager Spiro Mavroidis.

Mastercom chose the Capacity Max trunked radio system due to its multiple redundancy layers, centralised system management software, encrypted IP network and radio authentication, and user ability to command infrastructure, devices and talk groups.

The way Mastercom integrated Capacity Max on such a large scale is indicative of the company's forward-thinking approach. The company will later this year celebrate 50 years of service to the Australian radio industry.

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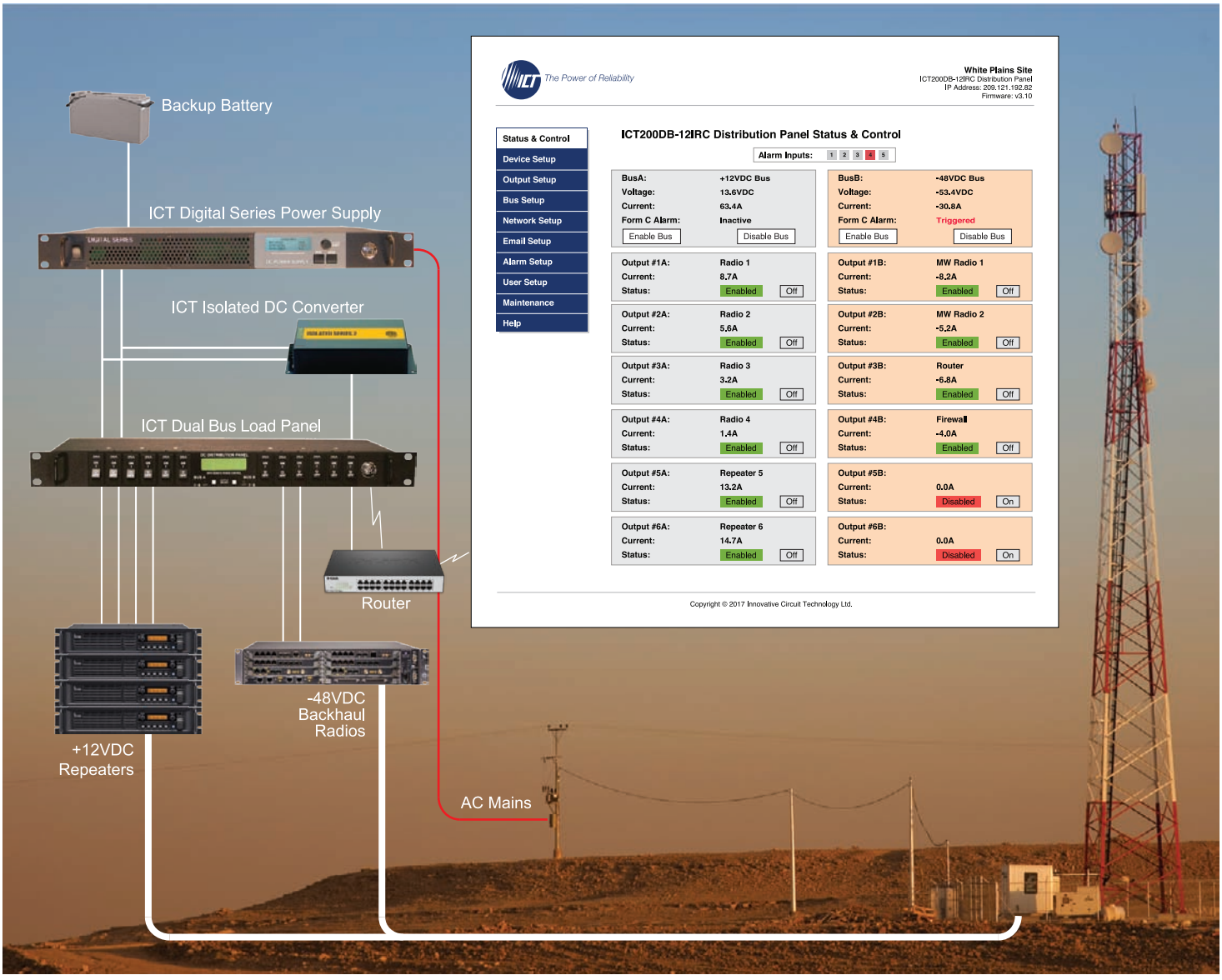

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I.C.T. TO THE RESCUE

Image courtesy DFES Incident Photographer Evan Collis

Western Australia is leveraging new technology to share data between first responders and incident controllers.

The Western Australia Department of Fire and Emergency Services (DFES) works in collaboration with Western Australian communities and other government agencies to prevent and respond to incidents such as fires, cyclones and floods.

First responders depend on clear communications to maintain the flow of information during such emergencies, and to deliver real-time situational awareness out in the field.

In this digital age, sharing real-time, location-specific data and information between first responders and incident controllers (with 000 call centre dispatchers who have access to other government agency relevant data) will significantly improve the coordination and safety of first responders, reduce response times and provide better outcomes for community safety.

In order to start leveraging new technology, DFES is currently improving and expanding its base ICT infrastructure capabilities by implementing GovNext-ICT network and telephony services.

DFES will also be improving business continuity and solution availability by adopting cloud solutions.

By moving to GovNext-ICT network services, DFES will improve bandwidth capacity particularly in regional Western Australia, enabling enhanced consumption of common cloud services, and establishing the plumbing necessary to support future innovative business capabilities, including:

- the ability to supply first responders with mobile-based data and information including comprehensive real-time situational awareness for local incident control, real-time secure incident response event logging and messaging, automated incident escalation, access to a wide range of location specific information held on corporate databases; and
- better sharing of digital information with other government departments to improve situational awareness and incident response efficiency.

Lessons learned

To implement these innovations, DFES needed to first develop its digital transformation strategy and define an ICT service model to support the strategy.

Delivering digital transformation within DFES took a 'people first' approach, using the Skills Framework for the Information Age (SFIA).

The recently SFIA-aligned ICT service model is still maturing and being embedded, but has already enabled DFES ICT staff to engage in the transformation and develop their capabilities in line with DFES digital transformation requirements.

The benefits realised so far include:

- improved situational awareness for first responders
- improved data sharing between agencies
- cost reduction under GovNext of approximately 20% on network and telephony services
- network bandwidth needs of the organisation met
- elimination of ageing infrastructure
- a shift to a managed service to implement a 24/7 telephony service.

Next steps

DFES is working with WA Police to deliver a co-tenanted, computer-aided dispatch system and will then evaluate how to enhance the existing emergency 000 service and radio networks to improve interoperability, standardise platforms and improve operational support.

It will also explore emerging technologies that will further expand the reach of mobility solutions beyond existing broadband network limits.

"The core value of a fire and emergency services department is the ability to effectively and safely respond to emergencies," said Richard Burnell, director, Information and Communication Technology, Department of Fire and Emergency Services.

"Cloud computing will allow us to leverage shared data to better assist our first responders during times of emergency."

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GOING BEYOND 5G FOR SMARTER CITIES

To meet the communications needs of tomorrow's cities, researchers are already working on what will come after 5G.

The US National Science Foundation (NSF) has reached an important milestone in its Platforms for Advanced Wireless Research (PAWR) effort, with the deployment of the first two PAWR research platforms.

The platforms, in Salt Lake City and New York City, will power research motivated by real-world challenges on experimental, next-generation wireless testbeds at the scale of cities and communities. The goal is to advance the state of the art for wireless technology beyond today's 4G, LTE and emerging 5G capabilities.

The platforms "will enable cutting-edge research in living laboratories across the country, which is a new and important milestone for advancing wireless capabilities„" said Jim Kurose, head of the Computer and Information Science and Engineering directorate at NSF.

PAWR is funded by the NSF and a Wireless Industry Consortium of 30 networking companies and associations. The PAWR Project Office (PPO) is managing the US$100 million public-private partnership to deploy and manage four city-scale research testbeds.

The PAWR platforms will enable early-stage research that will push forward robust, new wireless devices, techniques, protocols and services. In addition, these research platforms will allow promising technologies to move quickly to market, provide hands-on practical training to a new generation of students, increase job opportunities and support overall US economic vitality.

The PPO is run through US Ignite and Northeastern University, and works closely with NSF and the PAWR Industry Consortium to manage the public-private partnership. NSF has committed US$50 million towards the research platforms over the next seven years and expects to announce the development and deployment of additional platforms next year.

University of Utah School of Computing Associate Professor Kobus Van der Merwe, who will lead the POWDER-RENEW testbed in Salt Lake City. Credit: Dan Hixson/University of Utah College of Engineering.

First two testbeds

The Salt Lake City testbed is known as POWDER-RENEW (Platform for Open Wireless Data-driven Experimental Research with Massive MIMO Capabilities) and is being led by the University of Utah and Rice University.

A collaboration with municipal and state leadership from Salt Lake City and Utah, POWDER-RENEW will create an advanced wireless research platform that will cover six square kilometres of the University of Utah campus, three square kilometres of downtown Salt Lake City and a three-kilometre corridor in between, reaching a potential population of 40,000 people.

While it will enable wireless research across many technical areas, the research platform will offer unique and specialised capabilities for dynamic spectrum sharing and advanced wireless antenna technologies.

"Mobile and wireless is where it's at," said University of Utah School of Computing Associate Professor Kobus Van der Merwe, who is leading the team that will build and operate the Salt Lake City platform.

"We have 5G coming. We have multiple radio technologies and different applications coming. All of those things need platforms to experiment on, to prototype on, to explore."

The second testbed is in New York City. Known as COSMOS (Cloud Enhanced Open Software Defined Mobile Wireless Testbed for City-Scale Deployment), it is being led by Rutgers University, Columbia University and New York University.

COSMOS is partnering with New York City, Silicon Harlem, City College of New York, University of Arizona and IBM to bring this advanced wireless testbed to life in New York City. The testbed will cover 2.5 square kilometres of a densely populated neighbourhood in West Harlem.

The technical focus of the COSMOS platform is on ultra-high-bandwidth and low-latency wireless communications, with tightly coupled edge computing, a type of cloud computing enabling data processing at the edge of the network.

COSMOS will pursue millimeter-wave radiocommunications and dynamic optical switching technologies. This new wireless research platform will allow for experimentation at a scale that could not be achieved previously, thereby enabling new services and applications to benefit the entire community.

Expected benefits

The PAWR Industry Consortium, consisting of equipment vendors, device manufacturers and wireless carriers, has committed US$50 million in cash and in-kind contributions that include equipment, expertise and human resources.

Benefits from this research may include:

- enabling first responders and surgeons to share real-time data during emergencies;
- training entry-level workers via immersive, virtual reality systems;
- providing seamless communication between vehicles and roadway infrastructure to reduce traffic congestion.

NSF's investment in the PAWR program is part of a broader strategy to support smart cities and communities. These research platforms will help to shape the future of wireless networks that will serve as the foundation for critical applications and services in neighbourhoods and municipalities.

KIRISUN REJOINS THE MARKET

Jonathan Nally

With a range of low-cost DMR and PTToC devices, Kirisun aims to snare a larger share of the Australian market.

Although the large, well-known, traditional radio device manufacturers still dominate the LMR market in Australia, there are always new entrants coming along — particularly in the more recent modalities such as press-to-talk over cellular (PTToC). One such manufacturer is Kirisun, a long-established Chinese company that has had some exposure in the Australian market for the past five years or so, but which hopes to flourish with new vigour through its local distributor, Wireless Data Solutions (WDS).

To find out more about the company and its products, we spoke with WDS's Matt Kelly.

Critical Comms: Kirisun is perhaps not the best known brand in Australia. What can you tell us about the company and its product range?

Matt Kelly: Kirisun has been marketed in Australia for four to five years, but previously by companies that purchased analog products for their own use and not for distribution to the wider radiocommunications industry. This led to poor support and the brand name suffered as a result.

Kirisun manufactures a range of UHF and VHF analog handheld and in-vehicle two-way radios, and ETSI-compliant handheld, mobile and repeater base station DMR Tier II and Tier III equipment and associated dispatching applications.

The company also produces a range of PTToC and Wi-Fi handheld and mobile terminals that have a traditional two-way radio form factor, as well as PTToC applications that can be downloaded for use on Android and iOS mobile phones, a Windows dispatcher and a PTToC-to-two-way radio gateway.

CC: Is there a particular niche for which the devices are best suited?

MK: Kirisun products are aimed at users who require the KISS principle. The products are great value for money and suit low- to mid-tier users as well as some single- and multi-site Tier III requirements.

CC: Is the equipment vendor agnostic? Can it be used with other vendors' systems?

MK: Kirisun produces DMR equipment in accordance with ETSI standards so it is interoperable with other DMR radios made to the same standard.

CC: How would you sum up the company's philosophy?

MK: Kirisun believes that PTToC technology will enhance radiocommunications solutions and enable dealers to supply systems that were previously difficult or cost prohibitive. The form factor of its products has improved so that they are now considered equal to any radio produced by other manufacturers. Kirisun has a simple and condensed range of products that cover the vast majority of radio requirements in just two or three products and their accessory range is also simple. The company produces a simple and cost-effective dispatch application that enables users to cover off needs such as OH&S without having to deploy large complex solutions.

Having established offices in the UK and North America and with distributors in other major countries, Kirisun has a vision to be a major supplier of radio and PTToC solutions in the Asia–Pacific region, which it aims to achieve through quality manufacturing and realistic pricing policies.

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Mobile test case for surge protection devices

Phoenix Contact has released Checkmaster 2, a mobile test case that lets technicians quickly test all Phoenix Contact pluggable surge protection devices to prevent unexpected failures and avoid unnecessary service calls.

The system features a convenient, integrated hand scanner that reads and identifies the surge protection device by its barcode. The test object is then inserted into the associated test adapter and the test process started via the touch panel screen. The surge protection device is electrically tested in an automatic test process that compares the current electrical parameters of the components with the specified reference values.

All of the installed protective elements of the surge protection device are electrically tested in a single cycle. These include triggered spark gaps, gas-filled surge protectors, varistors and suppressor diodes.

The results are easy to see and read on a colour display, and three status levels inform the technician of the current quality of the device. The three status levels are OK: Test passed, Warning: Tolerance limit reached, and Defect: Replacement required. These help the technician make informed decisions about the device to ensure the ongoing availability of systems.

The tests undertaken by the product conform with the requirements of IEC 62305-3 and are performed using a high voltage generator. For user convenience, the device documents and saves all test results to its internal memory. A USB port lets technicians transfer data for further processing as well as update software.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au

Managed gigabit switch

The EKI-9600 switch from Advantech is an L3 Managed Gigabit Switch that supports static routing and network address translation (NAT) features.

It is designed to address the issue of growing network bandwidth requirements by providing mission-critical capabilities to help users build proper network segmentation to achieve better network performance at a lower cost.

The EKI-9600 can provide routing between different segmented networks, which not only helps prevent network traffic overflooding but also maximises the performance of each network. In addition, with NAT capability, users can better manage their IP resources, increase IP management efficiency and further ensure network security.

The EKI-9600 switch is available in two models: the EKI-9612G and the EKI-9628G. The EKI-9612G is a DIN-rail L3 managed switch that comes with eight gigabit ports and four SFP (mini-GBIC) ports. The EKI-9628G is a rackmount L3 managed switch, offering up to 24 gigabit ports and four gigabit combo ports. Both models are equipped with Advantech's Gigabit X-Ring Pro redundancy technology, which offers an ultra-high-speed recovery time of less than 20 ms.

Advantech Australia Pty Ltd

www.advantech.net.au

Open interface integrated antenna

The CommScope integrated antenna solution is based on xRAN open interface specifications. The open interface allows wireless operators to mix and match radio access network (RAN) hardware from multiple vendors to more flexibly address varying requirements.

The 5G radio/antenna solution supports millimeter-wave spectrum and works on a completely virtualised baseband with an open interface. It integrates a beamforming active antenna array operating at 28 GHz.

Wireless operators can use commercial off-the-shelf servers to trial virtualised network functions for fixed wireless access applications.

The product includes a base station antenna with full 120° beam-steering of four independent MIMO (multiple input/multiple output) ports, using a 256-element antenna array; and an integrated remote radio unit with isotropic radiated power (EIRP) in a compact enclosure of less than 10 L volume, passively cooled and optimised to fit within concealment solutions.

CommScope Solutions Australia Pty Ltd

www.commscope.com

TEST'S 5G PARADIGM SHIFT

James Kimery

The complexity of proposed 5G standards means we must transform the way 5G systems are designed, developed and tested.

5G signifies a generational transformation that will profoundly impact businesses and consumers across the globe. It promises a revolutionary untethered experience with much faster data, shorter network response times (lower latency), instant access anywhere and everywhere, and the capacity for billions of devices.

We're not just talking about being able to download a video to your phone faster. Unlike 3G and 4G, 5G looks to expand far beyond our mobile devices and into applications that touch all facets of our lives. From enabling the Industrial Internet of Things to ensuring the safety of autonomous vehicles, 5G will change our lives in ways that are hard to even imagine.

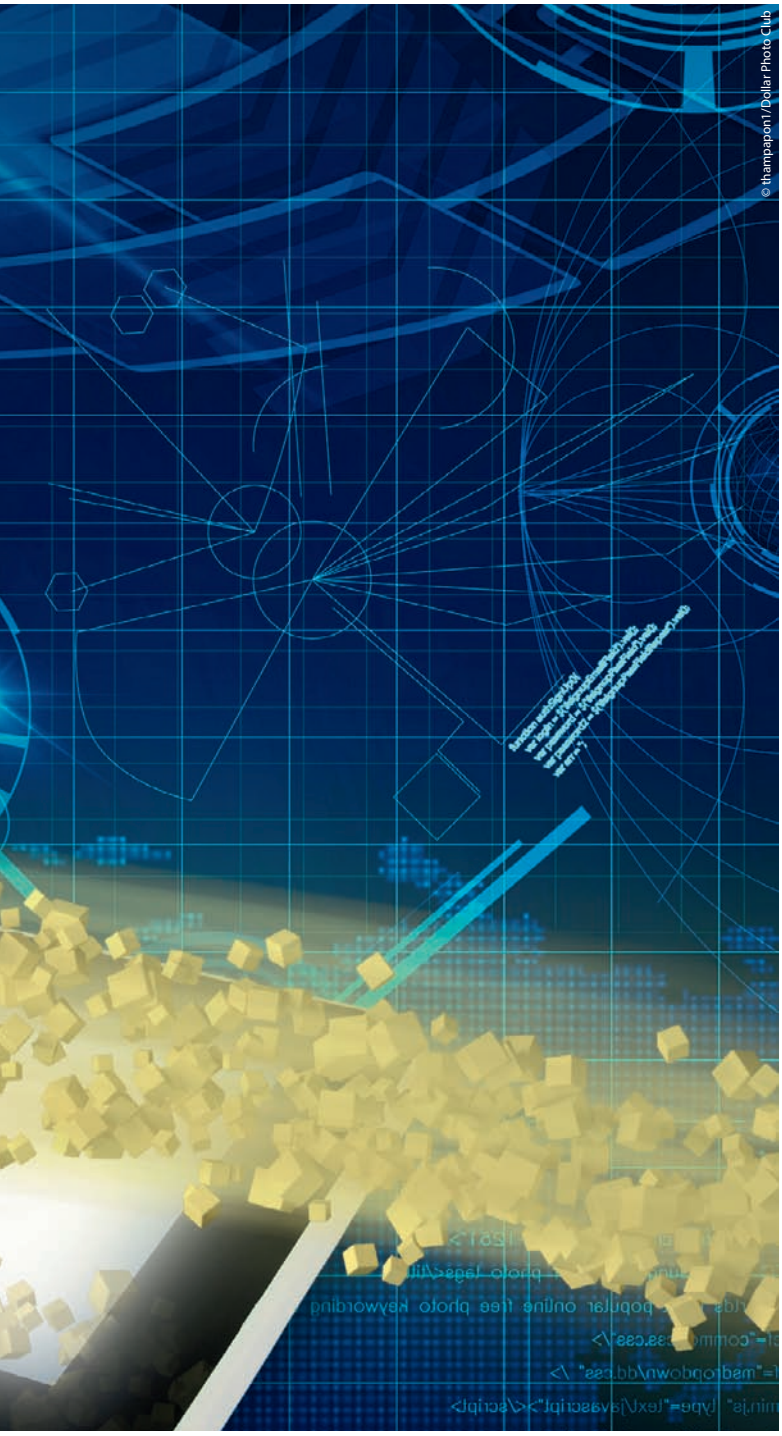
According to Patrick Moorhead, president and principal analyst at Moor Insights & Strategy, "Ten years from now, we're going to look back and say that 5G was one of the most important pieces of technology ever. It enables everything we see today that's emerging, whether it's self-driving cars that talk to each other or just having the most amazing video experience."

The road to 5G

The 3GPP standardisation body is furiously marching towards defining 5G, but the real work is just beginning. Companies specialising in semiconductor, network infrastructure, cloud, software, manufacturing and test technologies must now design, develop, test and deliver solutions that take advantage of these new wireless capabilities. This is no easy task.

5G features new technologies such as Massive MIMO and mmWave. Both technologies use multiple antennas and beamforming, which is a huge departure from current and previous wireless architectures. 5G also includes new wireless control mechanisms that split the control and data to facilitate the concept of network slicing, which scales the level of service to an individual user device.

In addition, the standards proposed for 5G are far more complex than those of 3G and 4G. 5G will transform our networks, so the industry must transform the way these systems are designed, developed and tested.



For algorithm design, simply modelling systems without any real-world validation has not been enough for an idea to advance from concept to production.

For test, traditional methods that focus on an individual component will not be able to account for the overall impact to the system.

A platform-based approach

Wireless researchers across the world quickly discovered that the only path to success is via a platform-based approach to 5G with software at the core. Nokia introduced the first mmWave 5G prototype at 73 GHz and broke the record for mobile access data rates using mmWave spectrum. Lund University developed the first Massive MIMO prototype, and researchers at the University of Bristol and Facebook extended their Massive MIMO prototypes to achieve unprecedented spectrum efficiency milestones.

These system prototypes have already played an important part in the 5G technology evolution. The platform-based design approach used in these examples takes full advantage of software defined radios (SDRs) to tackle system challenges and reduce time to results.

SDRs for design and prototyping will continue to evolve as the software changes. We can even envision more capable SDRs with software extending beyond the physical layer to leverage the vast ecosystem of open source software. This will enable researchers to address both the upper layers and the network to further decrease time to adoption and shatter the siloed approach to design.

Innovation doesn't stop at design

Test and measurement solutions will be key in the commercialisation cycle. Test systems must expand beyond the physical layer to quickly and cost-efficiently test these new multi-antenna technologies with controllable/steerable beams. Additionally, these systems must address the new mmWave-capable devices with extremely wide bandwidths. These test solutions must not only be able to test the important parameters of a device but also be cost effective for 5G to reach its potential and achieve widespread adoption.

With these characteristics, 5G requires a different approach to test for wireless devices and systems. For example, system-level over-the-air (OTA) test must become standard in the 5G ecosystem. OTA test presents several challenges, but perhaps the most daunting pertains to the environment in which the test equipment and the device under test must coexist. Air is an unpredictable medium, and the channel itself varies over time and environmental conditions. Wireless test engineers must isolate the channel in the OTA scenario and control the device on a per beam basis to effectively 'test' the device.

In addition, companies such as Intel have introduced early phased-array antenna modules featuring an antenna attached directly to the RF front end to minimise system losses. Because access to the device is limited, the test equipment must step up in frequency to the mmWave bands and characterise key performance metrics beam by beam.

Finally, whereas bandwidth is a familiar test challenge, the tested bandwidth of 5G is expected to increase by 50x over a standard LTE channel. At these bandwidths, test systems must not only generate and acquire wider bandwidth waveforms but also process all that data in real time.

What's next?

Wireless researchers have embraced a platform design approach using SDRs to expedite the early research phase of 5G, and they have delivered. Now, test solution providers must do the same.

5G presents a paradigm shift the likes of which we've never seen before, and a platform-based approach that is flexible and software configurable will be essential to the development of this ecosystem.

James Kimery is Director of Wireless Research & SDR for National Instruments.

National Instruments Australia Pty Ltd
www.ni.com

CRITICAL FACTORS FOR VOICE LOGGING SOLUTIONS

*Nicholas McLean**

The voice logging recorder (VLR) is a central component in any critical communications environment, interfacing with myriad telephony, radio, console, intercom, public address and other sources of audio.

The key word to remember when selecting a VLR is 'flexibility'... in the diversity of potential recording inputs, the tailored capabilities of the control and management software, the available platforms for the recorder and, of course, in the after-sales service and support.

Support for diverse recording inputs is probably one of the most important technical considerations. Even if your current audio recording requirement is fairly basic — for example, plain-old analog telephone lines and radios — there is a good chance that your communications systems will be changing to IP within the lifetime of your VLR.

You should therefore ensure that your chosen recording system can support a wide range of interfaces, covering analog, digital and especially IP communications, with the option to easily upgrade systems with different recording channel types in the future. A wide range of integrations and easy upgrade potential will ensure that your investment in a recording solution is protected long into the future.

Flexible control and management software is imperative for both the security of your VLR and adding maximum value to your implementation. From a security perspective, you need to ensure that users can have finely tuned access to (and availability of) various features based on operational requirements.

For example, it is often desirable to provide users with access only to calls involving their own telephone extension or to restrict access to recorder configuration to technical staff. Highly configurable, per-user software access is an essential consideration in any VLR implementation.

Of course, it is also essential to give serious consideration to the range of functions that the software provides. For some users it is sufficient to have basic functions like single-channel call monitoring, call search and replay, and basic configuration.

For others, more advanced features such as multichannel event reconstruction, multichannel monitoring, advanced network archive functions and/or system management can add significant value to the VLR solution, streamlining business processes and providing insights from the enormous volumes of call and audio data captured by the system.

The availability of flexible platforms for call/audio capture is a frequently overlooked aspect of the VLR selection process, especially in the critical communications market. Traditional recording solutions are dedicated (physical) servers installed on the client's premises. This still has its place, and is indeed required by law for some clients.

However, the rapidly evolving technological landscape has provided new and innovative solutions for clients who are willing to look beyond the traditional server 'box'. For those who wish to retain physical ownership of the recording hardware (on-premises recording), virtual machine recording solutions provide an interesting and cost-effective option.

Users who are open to software-as-a-service can take advantage of 100% hosted and managed cloud recording solutions, which offer easy monthly subscriptions and hands-off installation, configuration and management.

Find yourself a manufacturer/developer who offers all of the above options and who can advise you on the solutions that are best matched to your specific needs.

Finally, it is critical to consider after-sales service and support.

The type of support that your organisation will require depends on your mission and focus. A large organisation with dedicated technical staff may be able to undertake a large proportion of service activities in-house, and only require very basic manufacturer support.

Smaller organisations, or those whose mission is not technical/communications related, may wish to have access to extended support services, or to extend the manufacturer's warranty for longer periods.

A wide range of service and support capabilities ensures that your VLR solution will be maintained in accordance with your current needs, and — more importantly — can grow and develop in step with your evolving requirements.

**Nicholas McLean is business development manager for VLR specialists Total Recall VR/Prolancer Pty Ltd.*

Mission-critical LTE device

The Motorola Solutions LEX L11 mission-critical LTE device is built for global broadband networks. It is designed specifically for the demanding environments experienced by first responders. The product enables first responders to access secure apps for increased situational awareness.

The product can also be paired with an APX two-way portable radio, combining the mission-critical ASTRO 25 LMR network with public safety broadband.

Suitable for officers who need to remain discreet, this pairing allows them to communicate covertly on their radio while using the LTE device. Together, these technologies help improve the safety of first responders and the people they protect.

Motorola Solutions Australia Pty Ltd
www.motorolasolutions.com.au

Fire station alerting system

Zetron's MAX Fire Station Alerting is a purpose-built system designed to integrate with standard CAD systems, delivered as a simple solution and enabling dispatching from a central site. The system enables activation of the station alerting system to turn on lights, open doors, turn on fans, turn off stove, connect to a PA for alert tones and dispatcher voice, and sense other inputs (monitor station equipment and tyre switches).

Core product features are: support for both CAD- and operator-controlled operations; multiple zone lighting control; alerts with ramp-up tones; pre-recorded voice announcements; live voice announcements; multiple audio zones; garage bay door controls and sensors; entry door controls and sensors; power controls for kitchen appliances; and additional relay controls for unique functions.

Additional MAX Fire Station Alerting features include: availability of multi-function buttons; day-night operations; CAD API available; system redundancies; hot standby; dual network connections; voice logger interface; multiple audio streams; and a scripting interface for flexible control and operations.

Zetron Australasia Pty Ltd
www.zetron.com

PTToC apps for Android, iOS

ToooAir has released phone apps for Android and iOS devices that enable access and full integration to the ToooAir communication platform.

PTT Radio transceivers can now seamlessly communicate with an iOS or Android phone running the ToooAir application. The software not only offers PTT voice communication but full mapping integration so fleet users can have quick and easy visibility of all other users across the fleet. Track logs of individual users can also be displayed on the map interface page.

Users can switch groups, establish individual calls, visually see and track other users in the fleet and stun radios if required. All features described above are granted as permissions and can be enabled or disabled by the user.

Text messaging is also included on the phone app to facilitate messaging, and like voice communication, can be directed back to the dispatcher, any individual user, group or the entire fleet.

SOS emergency with configurable key or screen button will send an alert with GPS location directly to the dispatcher and set up an individual call. The dispatch software will immediately sound an alarm and 'zoom' into the phone's location, displaying its position on a map.

Tooo Air Pty Ltd

www.toooair.com.au

Lithium batteries

The Sentry Lithium range, available from RFI, is a premium range of batteries consisting of lithium iron phosphate ($LiFePO_4$) composition.

$LiFePO_4$ has been selected for the Sentry range due to its convenient cell voltage, high energy density and cycle life, and due to it being one of the safest lithium technologies available.

The Sentry Lithium range comes in standard 12 V Sealed Lead Acid (SLA) case sizes for easy replacement. With up to 8 times the cycle life of standard SLA technology, Sentry Lithium will lower the total cost of ownership.

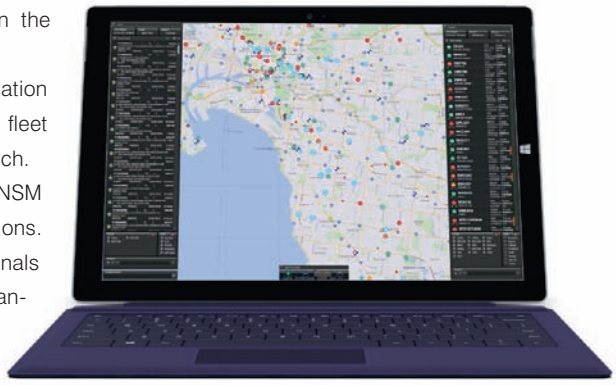
RFI Technology Solutions

www.rfi.com.au

Control centre

Whatever the mobile network, the Mtechnology Services NSM control centre enables users to monitor, track and manage their mobile enterprise, from a single clear and modern user interface that they can take anywhere.

The NSM framework leverages the latest functionality in user interface controls, popular standards for client server web sockets and open REST API interfaces to provide a seamless user experience that performs in the office or on the road.



With an easy-to-deploy, click-once web client installation and instant replay, use NSM in operations from simple fleet monitoring to critical emergency call taking and dispatch.

Built for public safety resilience, scale and security, NSM is suitable for both enterprise and government fleet solutions.

Whether it is radios, smartphones, mobile data terminals or any other mobile device, NSM will monitor, track, manage and report on it.

Mtechnology Services Pty Ltd

www.mtechs.com.au

Multimode fibre-optic light source and meter

The FTK1000 Multimode Fibre Optic Light Source, used in conjunction with the SimpliFiber Pro power meter, effectively measures power and loss across fibre-optic networks. Collaboratively using these devices enables technicians to conduct fast optical fibre cabling and installation. It is available to rent from Tech-Rentals.

Wavelengths are automatically detected and transmitted simultaneously in 850 and 1300 nm with the light source. The power meter has 850/1300 nm in multimode and 1310/1550 nm in single mode. Users can manage results and print reports with ease via power meter memory, PC and supplied software.

Key advantages of the device include: single-person operation; measurements taken at both wavelengths are saved into one record; and the four-button intuitive design makes the device simple to use.

TechRentals

www.techrentals.com.au

SBAS SEA AND SKY TRIAL

Satellite-Based Augmentation System trial is enabling the safe travel of ocean liners and regional aircraft.

Australia's Satellite-Based Augmentation System (SBAS) trial is already showing results in the aviation and maritime sectors, with real-world use cases demonstrating the potential benefits for the nation.

The improved positioning accuracy and integrity of the satellite technology will potentially benefit a wide range of industries, including agriculture, mining, transport, construction and utilities.

The aim is for civilian operators to be able to pinpoint location to an accuracy of 10 centimetres or better, as opposed to 10 metres at present.

On the water

The SBAS has been under test with maritime vessels, with the giant ocean liner *Ovation of the Seas* using the system to dock at Sydney's Circular Quay. The trial was conducted by Acoustic Imaging in consultation with the Port Authority of New South Wales.

Acoustic Imaging's lead scientist for maritime programs, Nicole Bergersen, said the docking of *Ovation of the Seas*, which is more than 330 metres long and too tall to fit beneath the Sydney Harbour Bridge, was an opportunity to test how the use of SBAS could potentially benefit operations on Sydney Harbour.

"The berth box inside Circular Quay is marginally smaller than the *Ovation of the Seas*, so the *Ovation of the Seas* is actually parking with nose protruding out in front of that parking spot. We're on a level where metres matter, and centimetres matter," Bergersen said.

"What SBAS is allowing us to do is have the pilot rely just on the information on the computer screen and if we can enable instrument navigation, then the pilot no longer needs visibility to be able to steer a ship.

"That's going to allow the Port Authority of New South Wales to bring in more ships, more frequently and in adverse conditions.

The Chief Operating Officer of Port Authority of New South Wales and Harbour Master, Philip Holliday, said the authority was keen to ensure it is at the forefront of highly accurate positioning technology and involved as much as possible in the SBAS trial.

"Sydney is extremely busy during the cruise season; we have enormous cruise ships coming in virtually every day and intermingled into all of that is ferry and recreation traffic. It's a busy working harbour," he said.

In the air

Meanwhile, Airservices Australia is leading a project to guide aircraft to an accuracy of a few metres, with the aim of improving safety and efficiency in our skies.

Airservices' CEO Jason Harfield said the technology will greatly benefit regional carriers such as REX, QantasLink and the Royal Flying Doctor Service.

"This trial will test three new technologies: first-generation SBAS, second-generation SBAS and what's known as Precise Point Positioning," Harfield said.

"SBAS-assisted approaches are eight times safer than those which use ground-based navigation aids.

"This extraordinary new technology, which provides improved navigation and timing over GPS, will also decrease the likelihood of 'go arounds' and cancellations or diversions due to variable weather," he added.

First in the world

Geoscience Australia's SBAS Project Manager, Dr John Dawson, said while many countries already use first-generation SBAS technology, which improves positioning accuracy to within half a metre, in 2017, Australia became the first country to test second-generation SBAS with integrated Precise Point Positioning corrections.

"Standalone GPS positioning is giving you 5- to 10-metre level positioning. This is the first time we have been able to broadcast corrections at the 10-centimetre level to the entire country, in fact to the entire region, so it's quite new.

"We're touching all the major transport sectors. We have intelligent and automated vehicle trials going on land, we have some rail projects and, of course, the aviation sector is very interested in SBAS technology," he added.

"We also have projects improving the navigation of pedestrians, particularly those pedestrians with visual impairments."

The SBAS trial is being funded with $12 million from the Australian Government and a further $2 million from the New Zealand Government. It is managed by Geoscience Australia in partnership with GMV, Inmarsat and Lockheed Martin.

The Cooperative Research Centre for Spatial Information (CRCSI) is managing the industry projects, which will test, evaluate and report on the benefits and applications of SBAS for their particular businesses and sectors.

VHF and UHF digital transceiver radios

The Icom IC-F52D/F62D series VHF and UHF digital transceiver radios have the added benefit of being both analog and digital capable.

The product has multiple operating modes including Analog FM, IDAS NXDN Conventional, and upgradable to NXDN Type-D trunking.

Main features include full dot-matrix display, rotary channel and volume knob for simple everyday operation; built-in Bluetooth, voice recording, active noise-cancelling functions; motion/stationary detection, man down and lone worker functions; OTAP (over-the-air programming) function easily reconfigures in-the-field radios; and intelligent battery management helps to extend the battery life.

Digital functions (voice and data) include direct mode communication; individual, group and all call; late entry for group call; status call and polling; short data messages; call alert (NXDN); GPS position data (optional HM-233GP required); transparent data mode; AMBE+2 vocoder; and over-the-air programming (OTAP) function (OTAP manager CS-OTPM1 required).

Analog functions include CTCSS and DTCS tone; 2-Tone and 5-Tone; MDC functions (depending on version); BIIS 1200 (MSK); LTR trunking (depending on version); and DTMF autodial.

Icom Australia Pty Ltd

www.icom.net.au

Mobile terminal analogue/digital radio

The TPL Systèmes mobile terminal DM3G Analogue/Digital radio uses spectrum efficient TDMA technology designed by TPL Systèmes. Capable of operating in analogue and digital eDMR networks, it offers versatility. The design includes an increase in output power from 25 to 50 W, which can also be stepped down as low as 5 W if required.

The Mobile DM3G is equipped with a user-friendly, ergonomic MCE keypad loudspeaker/microphone built around a large-size backlit alphanumeric display, suitable for the transmission and reception of short data messages and various call modes. The wireless MCE (also available in its cable version) incorporates a Bluetooth module with rechargeable battery that provides several hours of operations and guarantees the user cable- and movement-free operating conditions similar to a hand portable, over a distance of about 100 m (line of sight) from the vehicle.

A built-in GPS receiver stores GPS data for retrieval or retransmission over the radio network or through the terminal's outputs. DM3G can also easily be used only for data transmission as a modem.

All TPL Systèmes products are designed and manufactured in France and available in all VHF frequency bands (30–50, 68–88 and 146–174 MHz). The products are professional radio devices designed to be used in harsh conditions and environments. A large range of accessories, different antennas, power supply and speaker mics is available for radio terminals.

TPL Systems Asia-Pacific Pty Ltd

www.tplsystems.com.au

Mobile camera app

The Motorola Solutions Capture mobile camera app enables first responders to easily capture image, video and audio evidence with the LEX L11 or Android and iOS-based smartphones. All content is securely uploaded to the CommandCentral Vault digital evidence management system for storage and later use.

From the moment of capture, evidence is protected from tampering, and the chain of custody is verifiable so devices do not need to be subpoenaed. Metadata is also added automatically to organise evidence within CommandCentral Vault.

Motorola Solutions Australia Pty Ltd

www.motorolasolutions.com.au

Software platform

The Keysight Technologies PathWave software platform integrates design, test, measurement and analysis.

It enables users to accelerate innovation and product development from concept through manufacturing and deployment.

The product ensures consistency, accuracy and measurement integrity. It offers flexible and immediate access to the design and test tools that users need. The interoperability of the design and test tools and advanced data management significantly speeds the product development cycle, eliminating the need to recreate individual measurements and test plans at each discrete stage of the process.

The product is an open, scalable and predictive software platform that integrates hardware and software at every stage in the product development workflow. It combines design software, instrument control and application-specific test software in an open development environment allowing users to create high-performance solutions fast.

It provides open APIs which allow for simplified and rapid customisation; easily integrates best-in-class technology, including third-party software and hardware; quickly connects compatible hardware to speed test workflows and enhance productivity; operates locally, in the cloud or both to accelerate design and test computations; processes test data across the workflow, locally or in the cloud; saves transition time between development phases in the design and test workflow; quickly delivers comprehensive data analytics to identify trends and troubleshoot issues; monitors the utilisation and health of each test resource for improved productivity and scheduling; and captures and analyses big data for faster, more effective workflow processes.

Keysight Technologies Australia Pty Ltd
www.keysight.com

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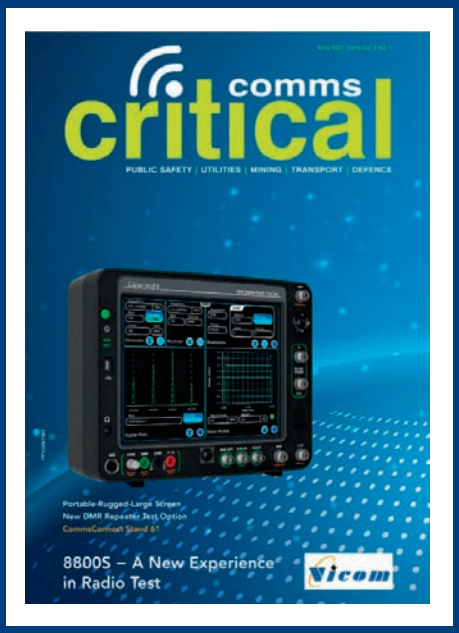

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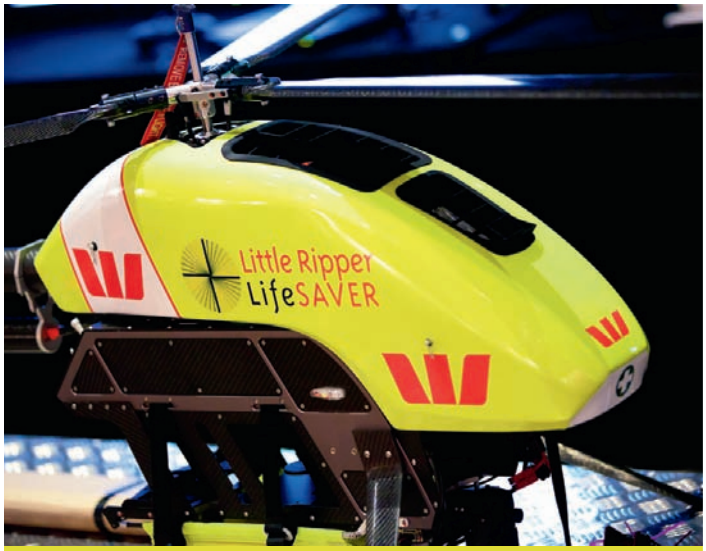

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The **7th Australian & New Zealand Disaster & Emergency Management (ANZDEM) Conference** continues to grow in both size and reputation, evolving into the premium event of its type. The conference program has been designed to facilitate professional development and the exchange of current ideas and practices between emergency and disaster management practitioners from Australia, New Zealand and further afield.

With the ever-increasing nature of large-scale disasters and emergencies affecting our communities and a renewed focus on planning for catastrophes, the ANZDEM Conference has become one of the most significant calendar events for the disaster and emergency community.

As an added benefit, the ANZDEM Conference will be held in conjunction with the **Australian & New Zealand Search & Rescue (ANZSAR) Conference** on 23 May. This partnership offers attendees the opportunity to extend their learnings on the evolution and future direction of search and rescue in the region, and explore the new developments in technology that are challenging traditional assumptions of how search and rescue is conducted.

With the theme 'Resilience in Search and Rescue', the ANZSAR Conference will: highlight case studies and lessons learned, focusing on issues faced by SAR personnel; promote the sharing of new ideas and concepts; and review the latest innovations in training methodology.

With an emphasis on discussion, debate and ideas exchange, the two programs will include presentations from over 100 specialist feature speakers and session speakers on a range of topics and issues impacting the sector, as well as latest industry updates and products showcased in the Exhibition.

For more information, contact the Conference Secretariat.
Email: conference@anzdmc.com.au
Phone: 07 5502 2068
http://anzdmc.com.au
https://sar.anzdmc.com.au

FIRE & RESCUE NSW INTEGRATES PTT

Fire & Rescue New South Wales, Australia's largest urban fire service and the fourth largest in the world, has integrated PTT technology developed by Cobham SATCOM and its partner Wireless Innovation into its communications network.

By combining satellite and LMR into a single network, the new technology significantly extends the reach of data and voice communication across the 880,000 square kilometres that the service is responsible for.

Cobham SATCOM's EXPLORER PTT solution combines global L-band satellite technology and least-cost routing for automatic switching between satcom, LTE and LMR without user intervention.

By combining all bearers available, the system significantly extends communications reach for the service, providing voice and data coverage across the state, including in radio blackspots.

The system uses a single handheld microphone, making it user-friendly for firefighters who can just pick up and talk without thinking about which service the conversation is being transmitted on.

Additionally, the least-cost routing ensures costs are kept to a minimum, making it a suitable solution for public funded services.

"While existing coverage in cities and urban areas is fine, providing full, reliable communications across New South Wales' entire fringe and rural land mass with high-quality voice and data is incredibly challenging," said Fire & Rescue New South Wales Operational Communications Systems Officer Graham Tait.

"PTT is a vital aspect to our urban search and rescue operations as it ensures we have full coverage even when infrastructure is taken out due to flooding, cyclones or earthquakes, but the system will help us to deliver coverage throughout the state on fire trucks also.

"Ultimately, PTT is acting as a catalyst towards a proposed broadband public safety network."

The EXPLORER 325 PTT solution for Fire & Rescue New South Wales was developed in conjunction with Wireless Innovation, a Sydney-based company that provides hosted and fully managed PTT solutions to airtime providers and end users with the ability to manage global networks of any scale.

Wireless Innovation provides the front-end management of the EXPLORER PTT solution for Fire & Rescue New South Wales.

"The EXPLORER PTT solution meets a specific need for delivering reliable communications for first responders in large rural areas, especially where LMR coverage is lacking," said Wireless Innovation Managing Director Neil Jamieson.

"Delivering a fast, organised response in an area the size of New South Wales is incredibly challenging, but based on our experience of integrating PTT on ambulances and police vehicles in Queensland, we have been able to deliver a low-cost solution for Fire & Rescue New South Wales that will improve safety and logistics, allowing the service to address emergencies even more effectively."

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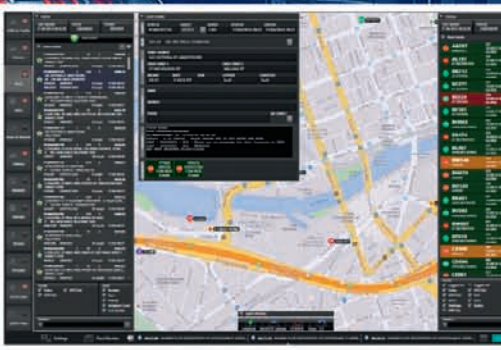

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Warship image courtesy US Navy

SPECTRUM SHARING

US agencies trial the sharing of a 150 MHz-wide portion of the 3.5 GHz 'Innovation Band'.

The US Federal Communications Commission (FCC), with help from the US National Institute of Standards and Technology (NIST) and other agencies, will soon make it possible for a 150 MHz-wide section of the RF spectrum to be shared.

"This will be the first time that commercial broadband users share spectrum dynamically with government users, and if it works, the FCC may allocate other currently protected RF bands for shared use," said Michael Souryal, lead for the spectrum sharing support project within NIST's Communications Technology Laboratory.

"More spectrum sharing could provide less-congested wireless channels for densely populated areas and more reliable connections for advanced communications needs such as 5G wireless and internet of things applications."

Since 2015, FCC rules have been in place that pave the way for commercial wireless users to employ the commonly called 3.5 GHz, or 'Innovation Band', when not needed for its current primary use, offshore radar operations by the US Navy.

LTE vendors and service providers such as AT&T, Google, Nokia, Qualcomm, Sony and Verizon have been eager to access this band (between 3550 and 3700 MHz) because it will expand product markets and give end users better coverage and higher data rate speeds in a variety of environments where service is traditionally weak.

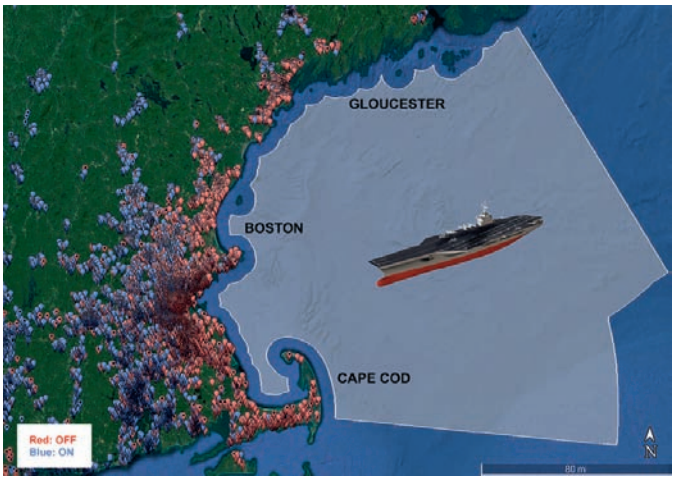
Under the rules of the FCC-regulated 3.5 GHz Citizens Broadband Radio Service (CBRS), the Navy maintains first right to the band and private use only occurs during its downtimes.

Providers and other organisations will be granted access using a three-tier priority allocation structure:

1. Incumbent users such as the US Navy.
2. LTE providers and other organisations that pay licence fees for the right to share.
3. General users.

NIST has played a major role in the development of standards, test procedures and certification tools that will allow service providers and other potential users to prove that they can operate in the 3.5 GHz band under FCC regulations and assure the Navy that the band can be successfully shared without RF interference.

Recently, the Wireless Innovation Forum Spectrum Sharing Committee (WINNF SSC) — the public-private standards body for the CBRS — approved 10 standards for operating the service, including the algorithm for protecting military incumbent users. A NIST-designed computer reference model of that algorithm will be an integral part of the certification process.



NIST simulation showing wireless users of shared RF spectrum in the Boston to Cape Cod, Massachusetts, region. Coloured markers identify users that can continue operating (blue) or must be shut off (red) to accommodate the priority need for the wireless band by naval vessels within the offshore 'designated protection area' (grey). Credit: Michael Souryal/NIST (using Google Earth map of Massachusetts coast).

One example of the NIST model simulates 45,000 LTE small cells using the 3.5 GHz band in the north-eastern United States. In response to a simulated need for the band by an offshore Navy vessel, the model calculates which small cells must be shut down and which can continue transmitting.

These simulations, along with others modelling wireless networks in other US coastal regions, will enable the FCC to test and evaluate how effectively a commercial LTE provider can share the band with the Navy.

"Dynamic spectrum sharing is poised to revolutionise the industry by unleashing wireless capabilities and performance that have not been possible in conventional licensed or unlicensed spectrum bands," said Kurt Schaubach, chief technology officer for Federated Wireless.

"The efforts of our company, NIST and the other members of the WINNF SSC to establish standards, testing and certification for spectrum sharing are setting the stage for improving wireless service indoors, expanding broadband services to rural areas and providing private wireless capabilities for industrial users," he added.

"It's an outstanding example of public-private collaboration."

The ship Wahine sinking in Wellington Harbour. Taken by an unidentified Evening Post staff photographer. Courtesy National Library of New Zealand.

THE DAY THE *WAHINE* SANK

Morse code was the only available method of communication on the day the TEV *Wahine* sank in Wellington harbour.

When the TEV *Wahine* sank in Wellington Harbour on 10 April 1968 — New Zealand's worst maritime disaster in modern times — Murray Lambert was working as a radio technician for the Post Office, keeping the Morse code and voice transmitters and receivers running at the radio station ZLW on Tinakori Hill. A weather front had Wellington in its thrall and created chaos over four days, including knocking out the local power grid.

Lambert remembers it being "very wet, very windy and frightening with pine trees crashing over and tearing apart the station power cables".

Meanwhile, the radio technicians had to power the receiving equipment with only a small petrol generator sitting outside in the rain with plastic bags over the power plugs to stop them shorting out.

The Post Office Radio Operators were receiving messages from the stricken *Wahine*, but couldn't see the drama on the harbour due to the heavy rain and cloud.

Maritime Operations Centre Manager Brendon Comerford (left), and former Radio Technician Murray Lambert. Courtesy Maritime New Zealand.

"The messages were all in Morse code — as the *Wahine* was beyond the range of coastal voice transmitters," said Lambert.

Voice transmissions were exchanged by the ship with Beacon Hill Harbour Radio as the situation developed.

After the *Wahine*'s crew relayed they were sinking and would abandon ship, Lambert said the ship started transmitting a continuous SOS signal, which stopped only when the ferry toppled over.

Morse code messages were broadcast on the 500 KHz international frequency, still in use in New Zealand up until 1993, when the Maritime Operation Centre (Maritime Radio Service) began operations.

Brendon Comerford, Maritime Operations Centre Manager, said that communications technology has come a long way since the *Wahine*. In 1968, New Zealand did not have national operations centres to coordinate a maritime response and maritime radio communications.

Maritime NZ now provides the Rescue Coordination Centre NZ (RCCNZ) and the Maritime Radio Service. RCCNZ coordinates response to all distress beacon alerts and major search and rescue operations in New Zealand's search and rescue region. The Maritime Radio Service operates the national maritime radio operations centre.

Both operate round the clock and are located next to each other in Lower Hutt.

"The most significant thing is the speed of communications these days," said Comerford. "The main difference between 1968 and now is you have multiple ways to raise the alert if you get into trouble. EPIRBs, VHF radios, cellphones and personal locator beacons are just a few examples."

However, what hasn't changed is that every rescue situation has its own challenges.

"You have to remember there were multiple factors on the day the *Wahine* sank — most notably that it happened during the strongest storm Wellington's ever seen!" said Comerford.

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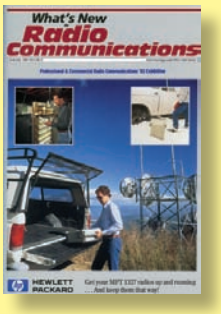
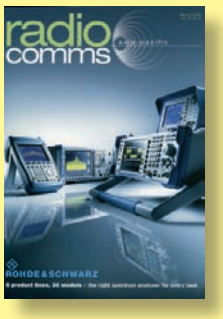
Backhaul

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



25 YEARS AGO. The cover of the June/July 1993 issue of *What's New in Radio Communications* featured the Hewlett-Packard 11807A option 012 radio test software which, when used with the HP 8920 RF communications test set, enabled the user to quickly diagnose faulty radios. Inside the magazine, we reported on Telecom and Motorola Australia (in conjunction with Pacific Star Communications) being awarded the contract to integrate, build and manage a mobile radio network for the NSW Government. Using Motorola's Smart Zone technology, the network was to be the largest in the Southern Hemisphere, linking 15,000 vehicles, offices and portable radios. We also reported on Optus Communications working with Scientifica-Atlanta to carry out a number of live satellite tests and demonstrations in the lead-up to the advent of satellite Pay TV the following year. At the time, it was expected that households could rent a 60 cm-diameter dish and receiver/decoder for just 50 cents per day!

10 YEARS AGO. The cover of the May/June 2008 issue of *Radio Comms Asia-Pacific* featured the Rohde & Schwarz range of spectrum analysers, including the then latest lightweight FSL models with WiMAX and WCDMA capabilities. Inside the magazine we reported on ARCIA opening applications for its industry-wide accreditation program, with two suppliers already having begun the process. We also published a case study on the upgrading of Airservices' ageing Aviation Rescue and Fire Fighting radio network — Vertel was the system integrator, with Tait P25 radios and ICOM airband equipment also part of the deal. The ACMA brought us up to date with the requirements of low-interference potential devices (LIPD) compliance, and Teltronic's Oscar Louro gave a primer on TETRA and TEDS. And we reported on Internode's rollout of a region-wide, WiMAX service on the Yorke Peninsula, which was achieving transmission speeds of 6 Mbps at up to 30 kilometres from the tower.



Spectrum

The united states of FirstNet

The First Responder network has burst upon the public safety scene in the United States. Dedicated spectrum for such a first responder mobile data network was first proposed in 1997. The idea morphed into a private network offering first responder priority in 2007 following a proposal by Morgan O'Brien of Cyren Call Communications. In 2009, APCO International launched an initiative to allocate the 'D Block' of spectrum and mobilised its thousands of public safety officials to that end. Eventually the idea was endorsed by Vice President Joseph Biden.

The First Responder Network Authority (FirstNet) was established in 2012, with an RFP seeking a private partner to deploy the network issued in 2016 and a contract awarded in March 2017 to AT&T to deploy it. The governors of every US state and territory (56 in total) agreed to allow AT&T to proceed (rather than build a network in their state on their own) by the end of 2017. In a real sense, by the time Comms Connect Sydney convenes in June 2017, the real FirstNet network will only be five months old.

In many ways, the FirstNet network is significantly different from the visions of public safety officials prior to March 2017. First Responder agencies who use FirstNet today have priority on not just the 20 MHz of 700 MHz spectrum allocated by Congress to FirstNet, but all of the current LTE commercial spectrum currently deployed by AT&T. Depending on the market, this could be 100 MHz, 120 MHz or more — a vast capacity which today supports more than 100 million users.

FirstNet has a dedicated 24x7 customer care centre and a dedicated 24x7 security operations centre with over 100 professionals. These centres provide support and security never before enjoyed by public safety. And AT&T is building 72 deployables (cell-on-light-truck and cell-on-wheels) that will rapidly restore networks after disasters or bring LTE networks to remote locations during wildfires and similar events.

The deployment of FirstNet has also uncovered new challenges and opportunities. For a start, competition has been fierce. Other US carriers have announced programs to try to match many of the features of FirstNet. While competition often results in lower prices and better products, these competitors do not have to meet the stringent requirements of a 25-year contract with the federal government.

Contracting has been an unexpected roadblock. State contracting agencies have balked at just accepting and using nationwide contracts. This makes it harder for many public safety agencies to get FirstNet today. Nevertheless, 650 public safety agencies in 48 states and territories have signed up for FirstNet service.

And applications have been slow to migrate. Of 450-plus public safety applications in the US, 300 do not have a mobile app on the Apple or Google Play stores. The rest are Windows applications or are mobile (responsive designed) websites. FirstNet and AT&T have stringent security requirements for apps, and many small companies have not yet budgeted for that expense.

FirstNet is a bold initiative, blazing new ground for law enforcement, fire-and-rescue, emergency medical services and emergency management worldwide. We are only at the very beginning — the first few months — of a 25-year journey. Hang on to your hats, the excitement and innovation of this powerful new tool for first responders is only beginning to emerge.

Bill Schrier is senior adviser to FirstNet, where he leads the Authority's IoT work on smart, safe communities. He will be speaking at Comms Connect Sydney in June.

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