MAY/JUNE 2016 VOL.3 NO.4

critical comms

PUBLIC SAFETY | UTILITIES | MINING | TRANSPORT | DEFENCE

If your 5G idea works here...

50,000 soccer fans streaming live-action mobile video. All at once.

Soon it will be reality. A world connected as never before. Always on. Amazingly fast. Massive traffic. Instant information. That's the promise of 5G. New spectrum. New waveforms. Millimeter-waves. Massive MIMO. More. Keysight offers the world's first 5G simulation, design and test environment able to emulate your real-world 5G wireless thesis. With deep expertise to help you tackle 5G risk and complexity. So you can go from 5G ideas to 5G reality faster.

HARDWARE + SOFTWARE + PEOPLE = 5G INSIGHTS

5G Get the latest app notes, white papers and tutorials
www.keysight.com/find/5G-Insights

AUS: 1800 629 485 NZ: 0800 738 378

KEYSIGHT TECHNOLOGIES
Unlocking Measurement Insights

Agilent's Electronic Measurement Group is now **Keysight Technologies.**

comms critical
Formerly Radio Comms Asia-Pacific

Inside

May/June 2016

6 Oilfield comms

14 5G's long and winding road

22 Railway comms

26 Delivering data

30 Comms Connect Sydney 2016

38 Comms Connect Wellington

42 Opera on the radio

45 Coastal control

50 FCC quashes PS band TETRA

54 Towards a new spectrum management framework

ON THE COVER

The release of GME's CM50/60-series commercial mobiles has created the catalyst for the company's Dual Band Solution (DBS). Based on the small footprint of each individual radio, the tethered concept offers installation options to users who must have multiple network access. The DBS achieves this by coupling any choice of CM50 analog radio to any choice of CM60 P25 radio, all controlled by a single head.

Two control options are available — the recently released UIC600xC controller or the familiar RH00x remote head with UM5060 fist microphone. Both controllers enable seamless multiple network access by simply selecting the appropriate network channel.

The UIC control head has a high-contrast/high-visibility OLED screen for fast recognition in all lighting conditions, as well as a 170° viewing angle. It also provides high-power internal audio and a heavy-duty, 2 m stretch curly cord. These features are designed for emergency use by enabling the user to communicate while standing adjacent to a vehicle rather than leaning into the vehicle.

The DBS is offered as a factory-built solution or as a dealer upgrade path for existing CM50/CM60 mount mobiles using the DBSK-5060 conversion kit. This contains all necessary hardware, including a dual split power cable, data interconnect cable, firmware and extended mount bracket. The bracket provides a vertical mount configuration that requires little more space than a single unit installation.

The CM60-DBS represents an immediate solution to organisations needing analog and P25 coverage across multiple frequency bands and network protocols. GME will display the DBS unit on Stand 23 at Comms Connect Sydney in June 2016.

Standard Communications Pty Ltd
www.gme.net.au

Transmit

I'm just back from attending the Comms Connect Wellington conference and exhibition in New Zealand, and what a fabulous event it was. Everyone I spoke with said it was a very successful occasion and a valuable way for New Zealand (and Australian) industry representatives to meet, to share ideas and, in a particular, to hear from some highly respected experts from other parts of the world.

Here are just a few observations (you can read more in the full article elsewhere in this issue).

The communications landscape is changing, faster than ever. While there was a lot of discussion surrounding traditional land mobile radio, there was a real energy around the rapidly approaching world of broadband communications.

Data is king — or at least, it very soon will be. That's the clear conclusion to be drawn from many of the presentations as governments and other entities seek to introduce mobile broadband networks.

An interesting point that was raised during some of the discussions was that although 4G/LTE is seen by many as being the data saviour, it's entirely possible that some enterprises might skip it entirely and aim instead for 5G, the development of which is going ahead in leaps and bounds.

Yet despite the focus on all of the latest high-tech solutions, it was also good to hear of instances of simpler, lower-tech solutions being implemented when the business case supported them — several examples of which were presented in Wellington. Not everybody needs the latest and greatest digital gear.

Jonathan Nally, Editor
cc@wfmedia.com.au

Calendar

June 2016

Comms Connect Sydney
22–23 June
Sydney Olympic Park
www.sydney.comms-connect.com.au

July 2016

Comms Connect Brisbane
27 July
Rydges South Bank
www.brisbane.comms-connect.com.au

August 2016

APCO 2016
13–16 August
Orlando, Florida
www.apco2016.org

Communic Indonesia 2016
31 August–3 September
Jakarta International Expo, Kemayoran
www.communicindonesia.com

September 2016

Comms Connect Adelaide 2016
23 September
National Wine Centre, Adelaide
www.adelaide.comms-connect.com.au

November 2016

Critical Communications Middle East 2016
7–9 November
Jumeirah Beach Hotel, Dubai
www.criticalcommunications-me.com

Comms Connect Melbourne
22–24 November
Melbourne Convention & Exhibition Centre
www.melbourne.comms-connect.com.au

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

wfmedia
connecting industry

Westwick-Farrow Media
A.B.N. 22 152 305 336
www.wfmedia.com.au

Head Office
Cnr. Fox Valley Road & Kiogle Street, (Locked Bag 1289), Wahroonga NSW 2076 Australia
Ph +61 2 9487 2700 Fax +61 2 9489 1265

Editor: Jonathan Nally
cc@wfmedia.com.au

Chief Editor: Janette Woodhouse

Managing Director: Geoff Hird

Group Publisher: Martin Sinclair

Art Director/Production Manager:
Julie Wright

Art/Production: Tanya Barac, Colleen Sam

Circulation Manager: Lora Tomova
circulation@wfmedia.com.au

Copy Control: Mitchie Mullins
copy@wfmedia.com.au

Advertising Sales

Liz Wilson Ph 0403 528 558
lwilson@wfmedia.com.au

Lachlan Rainey Ph 0402 157 167
lrainey@wfmedia.com.au

Mark Ryu Ph 0404 803 356
mryu@wfmedia.com.au

Gemma Burr Ph 0413 220 178
gburr@wfmedia.com.au

If you have any queries regarding our privacy policy please email privacy@wfmedia.com.au
Subscriptions: For unregistered readers, price on application

Audited Media Association of Australia
cab

September 2015 total CAB Audited Circulation 3,654 (84% personally requested)

Print Post Approved PP100007393
ISSN No. 2202-882X
Printed and bound by SOS Print + Media
+61 2 9549 2119

Can you tell what DMR radio he's using? Neither can we. And that's fine.

The hardware specifics don't matter to us because we're focused on open protocol networks. We're proud to be partnering with vendors like Tait, Hytera, Simoco and many more in the future to give you and your customers as much choice as possible when it comes to DMR migration.

We've just completed phase two of our **national DMR Tier III network**, the first of its kind in Australia.

Learn more by visiting us at Comms Connect or visiting **www.vertel.com.au/dmr**

Above and beyond

vertel™

OILFIELD COMMS

SELECTING THE BEST SYSTEM ARCHITECTURE

Oil and gas companies face daunting communications challenges, particularly when it comes to ever-increasing data requirements.

For decades, oil companies have attempted to rejig their entire value chain, harnessing technological advances in IT, communications and engineering.

The 1960s practice of manual logging of offshore operational data has evolved into digitisation of data and transmission via satellite. Now, those companies must embark on a sophisticated and ambitious program to integrate (and increasingly automate) every stage of company operations.

With the baseline cost of leasing a single deep water rig approaching US$600K each day, minimising project times alone can substantially bring down costs. Better communications and workflow automation can dramatically improve safety and avoid expensive disasters:

- In 1988, the Piper Alpha explosion on a North Sea production platform operated by Occidental Petroleum killed 167 workers and cost US$3.4 billion. Failure to communicate between work shifts had led to a gas leak through pipework that should have been closed with a safety seal. A safety workflow generated out of the knowledge of each shift's work program could have corrected this oversight.
- In 2010, British Petroleum's Deepwater Horizon blowout killed 11 workers on a Gulf of Mexico platform, caused an ongoing environmental (and PR) catastrophe and cost US$18.7 billion. Analysis of the disaster concluded that had the blowout protection on the wellhead been fitted with remote-controlled or acoustically triggered actuators, the well could have been cut off and disaster possibly avoided.

Lessons from these disasters tell us that automated and remote monitoring of production facilities and wellheads together with distributed control systems prove their worth. The communications investment that has brought extensive data on oil reservoirs has paid off over their lifetime, showing more accurately where resources should be deployed. Thus the Digital Oilfield (DOF) program has demonstrated in pilots and a few fields how to deliver more revenue and minimise non-productive time. However, the overall investment remains to be completed, industry-wide.

Evolving along with technology

Implementing the Digital Oilfield (also referred to as Smart Field, Intelligent Oil Field, or i-Field) began in the upstream Exploration and Production (E&P) sector. This is where costs and risks are highest, because prospecting is always something of a gamble.

DOF technology has evolved incrementally:

1. Prior to 1980, data from multiple wells and fields was digitised, collated and entered into spreadsheets, enabling basic but faster and more consistent production analyses for an entire field.
2. Adding instrumentation at wellheads, automatic data capture and feeding the results into SCADA systems compelled companies to upgrade their communications systems. This not only improved the quality and delivery of data, but also reduced the on-site staff overhead.
3. In the 1980s, the explosion of data generated by 3D seismic surveys demanded a further boost in communications capabilities.
4. Engineering and embedded system developments took advantage of improved communications, using digital control systems, where remotely actuated equipment controls surface operations over great distances.
5. As field equipment intelligence increased, so did the potential to fully automate operations. Permanent gauges and automatic flow controls for continuous remote monitoring and automatic interaction combine with extensive downhole communication so wells become mostly self-managing.
6. As 'easy oil' opportunities ran dry in the 1990s, companies pursued unconventional drilling operations (eg, horizontal drilling) in less accessible locations under sea and on land.

7. Since 2004, time lapse (4D) seismic surveys have generated petabytes of data that must be transmitted over very high bandwidth connections, then processed and stored, creating considerably more accurate and dynamic monitoring of oil reservoirs.

Although these new capabilities have undoubtedly added to the complexity of modern E&P operations, they offer huge benefits. With the possibility of real-time monitoring and control, vast quantities of data pouring in and with the big picture of the company's assets, operations and market suddenly visible, it is possible to adjust business operations dynamically and interactively. As machine-to-machine communication improves, more and more of the physical plant and facilities will run completely automatically, adjusting and repairing itself as necessary.

Implementing a DOF

Communications — and data communications in particular — lie right at the heart of the DOF concept. While oil company communications design can become complicated very quickly, a basic starting point for the designer is to understand the data requirements of each operational unit. The overall communications architecture must then integrate each unit's requirements with the technical options for supporting them, to form the company's total communications system plan.

Although companies vary (since some companies are strictly midstream or strictly upstream), a generalised picture of a company that embraces all three sectors might include corporate centres, oilfields and refineries — including oil terminals (tank farms), port/rail facilities and pipeline systems.

From a communications perspective, onshore and offshore fields have a great deal in common — streams of sensor data from drilling and other equipment transmit to metering, processing and control stations:

- Surveillance, video and camera feeds.
- Staff communicate via voice and data, usually via radio.
- Field and seismic data continuously transmit to an onshore network operations centre (NOC).
- The onshore NOC remotely monitors and controls platform equipment.
- A broadband campus communications system for platform staff supports voice, PSTN access, internet, email, videoconferencing, IPTV, video surveillance and security.

Onshore fields

An onshore fields comprises a number of drilling rigs with instrumentation over each wellhead that includes sensors and triggered actuators for remote monitoring and control of valves, drill heads and other equipment. Each rig feeds data — often wirelessly through a remote terminal unit (RTU) or programmable automation controller (PAC) — into either:

- a metering station,
- supervisory control and data acquisition (SCADA) system, or
- a distributed control system (DCS).

This can automatically log sensor data when monitoring oil and gas levels from the well. Rigs are also connected to a control panel so that valves can be closed or opened manually or remotely.

The metering station transmits production data and alarm notifications through a fast (eg, fibre) connection to a process station which processes crude oil to remove gas, water, solids and other non-saleable components. IP video surveillance and instrumentation in the metering and process stations and pipelines can be transmitted to a central control room, which, in turn, connects to the production management centre.

Through this data path geologists can 'see' into the oilfield reservoir, and engineers can use portable devices (eg, laptops, tablets and even smartphones) to remotely monitor, perform diagnostics and control oilfield equipment. Integrating multiple DCSs extends control across multiple oilfields from a single point.

However, this degree of automation does not eliminate the need for personnel at the sites. During exploration, work crews will construct, maintain and move drilling sites. Drilling can be controlled remotely, but fixing faults generally requires human intervention.

A substantial proportion of E&P project costs is in non-productive time (measured in lost rig days) while drilling is halted by equipment failures, stuck pipes and loss of circulation. Crews working in dangerous environments must resolve drilling issues quickly, so communications are essential for a speedy problem resolution and for enhancing worker safety.

Sensor data from exploratory drilling and current video footage can be analysed by experts (who may be hundreds, even thousands, of kilometres away) to identify the cause of failure and to recommend a corrective course of action. The field office (or 'forward operations office') is the communications contact between the field network which generates and transports the data and the enterprise network which receives, stores and analyses field intelligence.

Field network workers typically use intrinsically safe (C1D2) portable radios for voice communications. More powerful vehicular radios and vehicle area networks (VANETs) add range, flexibility and mobility to the portable coverage, and can include cab-mounted IP cameras and better mobile data.

Digital radio usually supports location services and man-down safety features. Location tracking is critical in field operations, for locating personnel during emergencies and asset management, logistics, situating construction material, and establishing the position and status of monitored equipment. Technologies such as RFID can automate location tracking, streamlining workflows and improving situational awareness and safety.

Since oilfields tend to be in remote — even hostile — locations, robust and resilient communications act as a lifeline. Forward-operating campuses provide accommodation, security and communications for field staff. Data and communications that carry voice, PSTN access, internet, email, videoconferencing, IPTV, video surveillance and security systems must be set up from scratch.

A three-way comms dialogue between offshore platforms, floating storage and offloading vessels, and onshore facilities is essential.

continued ➡

Enabling Wireless Everywhere

WirelessTech commits to provide latest and innovative wireless products, networking technologies and tailored services in pursuit of supporting Australian System Integrators.

- Licensed and Unlicensed Wireless Point-to-Point
- Licensed and Unlicensed Wireless Point-to-Multipoint
- Wireless Mesh Technology
- Wireless Hotspot and Outdoor Wi-Fi
- Multi-WAN Load Balance Routers with VPN Bandwidth Bonding
- Multi-Cellular Mobile Routers
- IP Cameras, NVR, Video Encoders & Decoders
- Enterprise Switches, IP SAN & NAS Storage
- Antennas, POEs, Lightning Surge Protectors
- Customised Network and RF Cable Assemblies
- Touch Monitors

Public Safety

Service Provider

Industrial/Mining

Transportation

WirelessTech

sales@wirelesstech.com.au
www.wirelesstech.com.au
+61 2 8741 5080

Offshore fields

Land-based oilfields are difficult enough to operate and maintain, but offshore fields add a new level of complexity and cost. Conditions are often harsh and unforgiving — they may be far from land and operating in depths up to 2000 metres. (A deepwater mobile offshore drilling unit (MODU) — basically a submarine driller — can go to 3000 metres.)

The familiar image of an offshore platform is a self-contained man-made island, fixed or tethered in deep water, with everything needed to drill, extract and process hydrocarbons, and store them until they can be transported to shore by undersea pipeline. Where pipelines are not viable, specialised floating storage and offloading (FSO) vessels provide storage and processing. Manned platforms are also offshore hotels, with accommodation, cafeteria, medical and recreational facilities for personnel who will live there for weeks at a time. Supply ships keep the platforms equipped and helicopters ferry staff to shore.

From a communications perspective, there are significant differences from the onshore oilfield. An offshore platform is far more cramped, exposed and dangerous than an onshore field. (Fatalities offshore far exceed those on land.) Space limitations impose physical constraints on workers' movements, where equipment can be located, work processes and even on what equipment can be accommodated.

Communication with supply ships and FSOs is critical for offshore platforms. To pass accurate production information, a three-way dialogue between platforms, FSOs and onshore facilities is essential. Even under the worst of conditions, contact with supply ships is vital for maintenance and for the safety and support of platform staff.

To transmit real-time field data onshore and to support remote monitoring and control of field equipment depends on a very fast, high-capacity link between platforms, and between platform and shore. The standard method has been to use VSAT (very small aperture terminal) satellite communications. However, real-time data acquisition, monitoring and control are not feasible via satellite, due to limited bandwidth, delay (latency) associated with transmitting to satellite and down to the destination, together with vulnerability to bad weather. If the platforms are neither too far apart nor too distant from shore, submarine fibre-optic cable is an attractive alternative. It offers much higher bandwidth, low latencies (20 to 50 ms) and relative immunity from weather-related interference. If laying down fibre is not possible, then VSAT or microwave must be considered.

For oilfields in remote locations, robust and resilient communications act as a lifeline.

Refineries

Oil refining applies physical and chemical processes to crude oil to remove impurities and distils from it saleable products such as gasoline, diesel, kerosene, LPG and tar. Often, a refinery has tank farms for storing incoming crude and outgoing refined products near an oil terminal or port.

The refining process is extremely involved, highly polluting and extremely dangerous as steam, chemical additives (acids and strong alkalis), high temperatures and pressures create potentially explosive mixtures of liquid and gas. Each aspect of refinery operations — bringing in crude, storing it, piping it into refining units, transporting refined products to storage and distribution — generates a constant stream of interlocking data production data, sensor data, equipment status, work plans, maintenance schedules and so on. Voice communications, usually over radio systems, keep refinery workers in touch.

To better manage this complexity, it makes sense to integrate communications with IT systems, thus automating processes and workflows as much as possible. Technologies such as RFID, intelligent sensors and programmable automation controllers have already removed some less responsive manual processes. Integrating these technologies more closely with workflows can reduce non-productive time, safety risks and environmental impact. At the same time, automated monitoring and control means that companies have a highly accurate picture of production, optimise refining operations, anticipate problems before they arise and vitally, improve safety.

> COMMUNICATIONS — AND DATA COMMUNICATIONS IN PARTICULAR — LIE RIGHT AT THE HEART OF THE DIGITAL OILFIELD CONCEPT.

Tying it all together

While on the face of it, the data communications requirements of oil and companies resemble the challenges other industries face, these are amplified by the scale of their global reach, complexity of operations and the immense commercial, human and environmental risk.

So for this industry, more than most, communications must be:

- totally reliable (must not lose service);
- resilient (must recover from failure quickly);
- robust (must work in harsh environments) and long lasting;
- secure (communications and data must be protected from loss, damage or intrusion);
- safe (may require intrinsic safety in some environments);
- integrated (many processes seamlessly).

A variety of communications technologies is available, including:

- VSAT satellite, a mainstay of oil and gas communications, has excellent coverage, is fast and relatively inexpensive to set up but has limited bandwidth and latency problems. VSAT options offering higher bandwidth are available, but may be prohibitively costly. In rough seas, communication with ships can be disrupted as they struggle to keep aligned with the satellite.
- Radio — the standard for voice communications — has excellent coverage, lower latency than VSAT, but takes time and resources to deploy and offers limited data bandwidth.
- WiMax and LTE can provide both data and voice communications with very low latency and high bandwidth, but coverage, which is more limited than radio, dynamically depends on bandwidth usage.

No single technology can adequately serve all the communications needs of an oil and gas company. Each has its strengths and weaknesses. But whichever technology is chosen, it must take into account the fact that the industry has already entered the era of big data where terabyte and petabyte volumes of data from numerous sources stream in daily. Faced with shrinking revenues and rising costs, the value of using that data effectively is a matter of survival. Faster, more accurate decision-making is the key to making the oil and gas business work, and that depends on reliable communications.

This is an edited summary of two white papers issued by Tait Communications, used with permission. You can find them at go.taitradio.com/communicating-in-the-digital-oilfield-part-2.html.

Tait Communications
www.taitradio.com

CRS Accessories' compact Six Bay Universal Charger now has a Mini Me...

LITTLE BRO'S GOT A LITTLE BRO!

CRS-USBC

Like our old mate here, CRS Accessories' popular Compact Six Bay Universal Charger has a baby brother, and it's priced to please.

Our reliable, high quality Single Bay Universal Charger fits most popular 2-way radio brands.

And with CRS' custom-made Chargers your 2-way fleet is future proofed. Changing your radio? No problem! Simply swap out the pocket and keep charging for years.

Charger suitable for

ICOM

Vertex Standard

MOTOROLA

KENWOOD

Features

- Tri-Chemistry – able to charge Ni-Cad, Ni-MH and Li-ion batteries.
- Well priced.
- 1 year warranty.

Power up!
***Insist* on CRS.**

Phone 1300 307 334
www.crsaccessories.com.au

CRS ACCESSORIES

News

FLEET XPRESS FOR 'SMART SHIPPING'

Just weeks after Inmarsat's next-generation high-speed broadband solution Fleet Xpress was officially launched, Cobham SATCOM and Inmarsat have announced that their partner, Beijing Marine Communication & Navigation Company (MCN), has won the largest Fleet Xpress installation project to date. The project is with Nanjing Tanker Corporation of China (NTC) and will see MCN manage the rollout of Cobham's SAILOR 100 GX and SAILOR 60 GX antenna systems that will bring high-speed broadband connectivity to approximately 70 ships. The 1 m SAILOR 100 GX is based on Cobham SATCOM's SAILOR VSAT Technology platform, designed to simplify installation and operation while delivering high-quality radio performance. The 60 cm SAILOR 60 GX leverages a compact, lightweight carbon-fibre composites/ aluminium design.

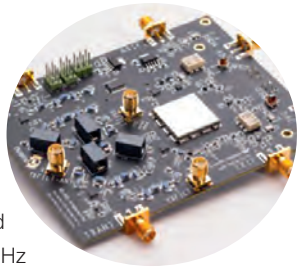
More info: bit.ly/1SEkglG

SEPURA'S NEW MELBOURNE OFFICE

Sepura has opened new offices in both Malaysia and Australia, with each office providing training and conference facilities, a demonstration area and workspaces for visitors. The company says the new Australian office, based in Melbourne (Unit 17, 270 Ferntree Gully Rd, Notting Hill), will enable it to stock and ship its DMR products from within the region, improving availability and speed of supply for local partners. "Our operations in the region have tripled in size over the last five years," commented Terence Ledger, Sepura's sales director for APAC. "That growth is reflected in these new premises, which demonstrate our long-term commitment to the Asia-Pacific area."

More info: bit.ly/1qL74Sr

Handheld software defined radio



The Nuand bladeRF is a fully bus-powered USB 3.0 SuperSpeed Software Defined Radio that does not need to be plugged into an outlet for normal operation. Measuring 5 by 3.5″, the device is a portable handheld form factor that has an RF frequency range of 300 MHz to 3.8 GHz.

Featuring independent RX/TX programmability with 12-bit 40 MSPS quadrature sampling, the product is capable of achieving full-duplex 28 MHz channels while the onboard 200 MHz ARM9 with 512 KB embedded SRAM (JTAG port available) provides good flexibility. The product is 2x2 MIMO configurable with SMB cable, expandable up to 4x4, and has a modular expansion board design for adding GPIO, Ethernet, 1PPS sync signal, and expanding frequency range (through an available transverter board) and power limits.

The system is supported by stable Linux, Windows, Mac and GNURadio software packages. The hardware is capable of operating as a spectrum analyser, vector signal analyser and vector signal generator as well as simple FM audio or 4G LTE standard.

Silvertone Electronics

www.silvertone.com.au

Cloud-based PTT communications

Motorola Solutions Australia has released WAVE Cloud Connect, a cloud-based application that delivers broadband-based PTT and connects LMR systems with cellular networks.

The company says WAVE Cloud Connect will enhance collaboration and productivity for enterprises and government agencies by enabling Apple or Android smartphones and tablets to securely connect directly with LMR radios, for workforce groups of up to 3000 users.

The service will deliver real-time voice and data communications securely over any IP network, connecting teams and individuals both inside and outside of their existing communication systems. The service connects users carrying any communications device, from two-way radios to smartphones, laptops and rugged handheld devices.

WAVE Cloud Connect can also be used as a standalone broadband service without radio network integration. Key features include a visual mapping tool to pinpoint the location of users in the field and a secure text messaging service.

The solution is part of Motorola Solutions' Next Generation Mobile Intelligence suite, a mix of technologies including mobile broadband-based solutions that place information into the hands of users across a choice of devices, applications and networks.

Motorola Solutions Aust Pty Ltd

www.motorolasolutions.com.au

From 50 MHz to 4 GHz:
Powerful oscilloscopes from the T&M expert.

HD 16 bit

Multi Domain

Fast operation, easy to use, precise measurements.

R&S®RTO2000: Turn your signals into success. (Bandwidths: 600 MHz to 4 GHz)
R&S®RTE: Easy. Powerful. (Bandwidths: 200 MHz to 2 GHz)
R&S®RTM2000: Turn on. Measure. (Bandwidths: 200 MHz to 1 GHz)
R&S®HMO3000: Your everyday scope. (Bandwidths: 300 MHz to 500 MHz)
R&S®HMO Compact: Great Value. (Bandwidths: 70 MHz to 200 MHz)
R&S®HMO 1002: Great Value. (Bandwidths: 50 MHz to 100 MHz)
R&S®Scope Rider: 2 minutes to be sure. (Bandwidths: 60 MHz to 500 MHz)

All Rohde & Schwarz oscilloscopes incorporate time domain, logic, protocol and frequency analysis in a single device.

Take the dive at www.scope-of-the-art.com/ad/all

ROHDE&SCHWARZ

5G'S LONG AND WINDING ROAD

© Stock.Adobe.com/au/kantver

The transition to mobile broadband communications.

On the eve of Comms Connect Wellington, we spoke with Quixoticity's Peter Clemons to dig into his vision for the future of public safety and the critical communications sector. Clemons' keynote presentation, 'Critical communications at the edge — can we leap from 2G to 5G in as few steps as possible?' covered a broad range of technologies that are set to shake up our industry.

Critical Comms: How do you see the current situation of public safety and critical communications around the world?

Peter Clemons: Over the past decade or so, our industry has moved onto digital platforms to deliver mission-critical communications to professional users. This has been an important step forwards that has helped network integration, interoperability and the emergence of new services and applications beyond the traditional push-to-talk group call functionality of the past.

We must now build on this important step by providing more advanced capabilities without giving up all the great features offered by TETRA, in particular, but also P25 and DMR, depending on the geographical location and user requirements. The status quo is no longer an option as we prepare for the most radical transformation of daily life, societies and economies during the 2020s.

CC: Are standards such as TETRA and P25 now reaching end-of-life? Can LTE replace them for mission-critical operations?

PC: As we start taking a much closer look at emerging standards such as LTE, Wi-Fi and the next generation of so-called convergent 5G standards, it is important to remember that today, and probably for many years to come, TETRA and P25 will remain the best possible options for delivering mission-critical voice and data applications. However, having said that, it is becoming more and more important to reduce the operational costs of digital PMR networks and start preparing control rooms, ICT systems and transmission networks for future applications.

CC: How can traditional manufacturers remain relevant when global suppliers and large commercial operators have access to much greater resources and the ability to deploy solutions for the mass market?

PC: It is imperative for the critical communications industry to participate in the various global standardisation processes such as 3GPP and IEEE in order to make sure that mission-critical services and applications are included in future releases. We have spent about the past five years or so trying to influence 3GPP LTE, particularly Releases 12 and 13, and we have been very successful, although there is always more work to be done.

The public safety community has been very active in the standards process and a new group has even been created within 3GPP — SA6 — to focus on delivering a mission-critical PTT (MCPTT) standard that can be adopted by governments that are moving towards public safety LTE (PS-LTE) solutions.

I firmly believe that the so-called 5G, Smart/Safe City and Internet of Things (IoT) requirements can only be met by placing privacy, public safety and network security/integrity (ie, critical communications) at the very core of next-generation networks.

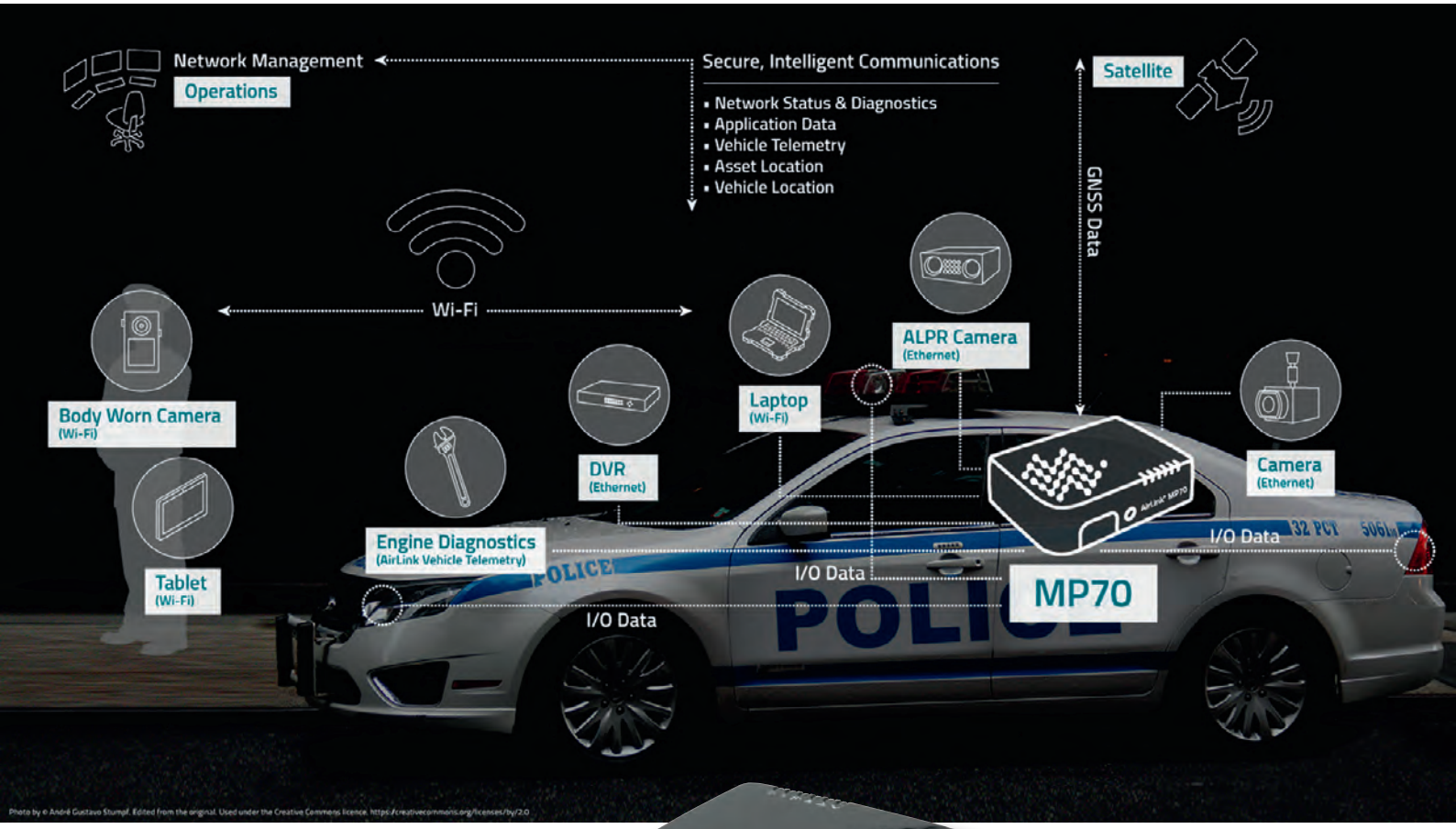
CC: Commercial operators are starting to play a much larger role in public safety networks. Do you see this as a positive development?

PC: I believe that it is still the role of strong, security-conscious governments to set the rules for public safety communications, to listen closely to what first responders require to carry out their daily routines as well as being able to respond when disaster strikes. Governments must find new ways of funding highly reliable, redundant, resilient mission-critical networks that offer adequate service to officers all the way to the edge of the network.

Clearly, in today's hyper-connected world, commercial operators connect and provide a valuable service to millions of subscribers,

continued ➡

Further, Faster @ 700MHz



Airlink MP70 with Wi-Fi

The AirLink® MP70 is a high performance, LTE-Advanced vehicle router developed specifically for mission critical applications in public safety, transit and field services.

Offering high power, long range Gigabit Wi-Fi and Gigabit Ethernet, and up to 300 Mbps downlink speeds over LTE-Advanced, the AirLink MP70 unites the fleet with the enterprise network and enables a complete portfolio of broadband mission critical applications to work simultaneously, further and faster from the vehicle than ever before.

- Supports all Australian 4G/3G bands including Band 28 (700MHz)
- Dual SIM cards for automatic network failover
- Dual band 2.4/5Ghz 802.11ac Wi-Fi as AP/Client/ WAN mode (can be supplied without Wi-Fi)
- 4 port Gigabit Ethernet switch
- High performance GNSS - GPS, GLONASS, Galileo, Beidou
- -30 to +70°C Operation
- Rugged MIL810-G, IP64 Rated

Contact us:

Melbourne
Phone: 03 8669 1210

Sydney
Phone: 02 8090 7383

Adelaide
Phone: 08 8113 5399

Email: sales@tekdis.com.au

Tekdis

www.tekdis.com.au

> CRITICAL NETWORKS NEED TO COVER THE ENTIRE POPULATION AND THE VAST MAJORITY OF THE LANDMASS OF THE GLOBE.

but there must be a clear division between commercial and public safety networks in terms of both spectrum, network capacity and applications.

I believe that when 5G becomes a reality, we will see lots of new business and operational models for metropolitan, suburban and rural areas that will provide much more resilience than is currently possible with highly centralised, best-effort commercial LTE networks.

CC: What will this future 5G world look like and how might it change the critical communications landscape?

PC: Since the introduction of the iPhone under 9 years ago, the global mobile industry has seen increased innovation and disruption. We see industries that were previously totally separated from each other converging at a startling pace. The mobile internet is now a reality as most people on this planet now access online content via a smartphone, rather than a desktop or laptop computer.

We see advances in virtual reality (VR) and augmented reality (AR) that will change the way we perceive the world, leading to specific applications within public safety. The Internet of Things (IoT) is still searching for a global standard and a global vision to bring out its full potential, and I believe critical communications will play a part in this global vision.

The banking sector is on the cusp of massive disruption, with crypto-currencies and blockchain technology set to slash the time and costs of transferring money, funding projects and doing business around the world. The public safety sector can teach and learn from this mission-critical sector as well.

Of course, 5G also requires massive amounts of spectrum, promises to deliver millisecond latency for automated services such as robotics, remote control, the tactile internet and self-driving vehicles. This new environment will undoubtedly have a profound effect on our lives and change the very definition of what it means to be human.

CC: When do you think such solutions might be widely deployed? Are you optimistic or pessimistic about the future?

PC: I do not believe in immediate nationwide deployments of 4G or 5G technologies for critical communications. The processes that are currently underway in USA (FirstNet) and UK (ESMCP/ESN) are doomed to fail if the respective governments do not adjust their business models and rollout plans. New technologies must always be tested properly first before committing to wide-area deployments.

By their very nature, public safety networks are rightly conservative and risk-averse. We should let the private sector succeed or fail first and then learn from their mistakes when deploying similar technology adapted to public safety needs. This means that public safety LTE networks are unlikely to be deployed to the edge before 2025 or perhaps even later. This means that we will need to manage at least two separate mission-critical networks at different stages of development and maturity for a decade or more.

Critical networks need to cover the entire population and the vast majority of the landmass of the globe. Portable base stations and satellite solutions will need to work on a plug-and-play basis, integrating with terrestrial networks. Only governments and international cooperation can guarantee capacity, availability and relevant services when a disaster strikes in a remote location. We will need to totally rethink capacity and coverage issues in order to deliver advanced solutions to the edge.

I remain optimistic about the future as I believe that the younger generations will find a better way of organising the global society and economy over the coming decades. However, there are a large number of shorter-term risks as we transition from the old, hierarchical, natural resource-intensive way of producing goods and services to a newer, smarter, more agile, decentralised, resource-optimising way of delivering value and wellbeing to stabilising, increasingly homogeneous populations.

CC: Finally, what sort of initiatives are Quixoticity currently working on?

PC: Our focus at the moment is on two major initiatives that will develop during the course of 2016. I am in the early stages of setting up a Global Critical Alliance that will focus on bringing together some of the world's major suppliers of next-generation critical communications equipment to provide the best possible vision, advice and solutions for mission-critical users around the globe.

Quixoticity is also developing a Global Index that will rank public safety authorities and providers according to a number of relevant criteria as we move from a 2G world towards a long-term future 5G vision. Those authorities that embrace smarter, sustainable, sensible, best-practice strategies will score higher in the Index; those authorities that fail to listen to user requirements, select inappropriate technologies and solutions, and waste valuable time and resources will score poorly. I believe that there is nothing like this anywhere in the market and it will be a valuable source of information for a wide range of actors in the global critical communications space.

Peter Clemons is the founder and Managing Director of consultancy, Quixoticity Ltd in the UK.

GME COMMERCIAL

PORTABLE REPEATER SYSTEM

when every second counts

Emergency Response Fast Deployment Communications Network

1300 463 463 gme.net.au

CR017B

Portable oscilloscope

Available to rent from TechRentals, the Fluke 190 Series II ScopeMeter is a portable 200 MHz oscilloscope designed for engineers in the field who require a lightweight device for electronics testing in harsh industrial environments.

The product comes with four floating, isolated input channels and a range of operational features including digital persistence mode, roll mode (30,000 points/channel for low frequency signal analysis), TrendPlot paperless recording and Connect-and-View triggering. Other features include: 10,000 points per trace waveform capture (scope mode); sample rate 2.5 GS/s; independently insulated inputs with IP51 dust and drip-water proof rating; automatic capture and replay of 100 screens; and USB host port for direct data storage. The product also comes with a CAT III 1000 V/CAT IV 600 V safety rating.

TechRentals

www.techrentals.com.au

Audio analyser with Bluetooth

Keysight Technologies has introduced the enhanced U8903B audio analyser with Bluetooth audio measurement capabilities, suitable for performing audio testing for R&D, quality assurance and production tests in the consumer and professional audio and wireless communication industries.

The device operates with Bluetooth 4.0 and supports AGHSP/HSP 1.2, AGHFP/HFP 1.6, A2DP and AVRCP profiles. It can transmit a maximum output power of 5 dBm, ensuring that engineers can connect to, and accurately test, equipment such as headsets, smart devices and automotive head units.

To monitor the quality of the Bluetooth link and troubleshoot connection issues, the product comes with the received power indicator and bit error rate measurement. It also offers local loopback capability to provide accurate loopback testing of Bluetooth chipsets, modules and devices. This allows the device to simulate a Bluetooth transceiver to receive a Bluetooth audio signal from the DUT and loopback the same signal to the DUT.

The product comes with configurable options and offers speech and voice quality measurements, expandable bandwidth and digital audio interfaces, enabling engineers to accurately test wireless communication, component and integrated circuit audio applications.

Keysight Technologies Aust Pty Ltd

www.keysight.com

3D in-building coverage mapping solution

Anritsu has introduced the MA8100A Series TRX NEON Signal Mapper, a 3D in-building coverage mapping solution for use with Anritsu handheld instruments including the LMR Master, Spectrum Master, Site Master, BTS/Cell Master and VNA Master.

Where GPS is unavailable, the product delivers real-time 3D location information for indoor test and measurement applications. Available with one-, three- and five-year licences, it consists of a TRX Systems NEON Tracking Unit, NEON Signal Mapper Software for Android devices, NEON Command Software and TRX Cloud Service. The NEON Tracking Unit supports collection and processing of sensor data that delivers 3D location information, while the NEON Signal Mapper Application provides an intuitive Android user interface enabling lightly trained users to map signal and sensor information within buildings. Users can initialise their location, start/stop mapping and upload/download mapping data to/from the cloud. The NEON Command Software enables the creation and visualisation of 3D building maps and provides centralised access to the NEON Cloud Service to access stored maps and measurement data.

The series allows users to collect actionable data in all parts of a building easily and efficiently. Areas like stairwells and lifts, traditionally difficult to address with 2D manual mapping solutions, can now be mapped with ease. The series also provides end users with centralised access to all of the location information that has been logged via the included Cloud Service. Users can access previously saved building maps and measurement results anywhere with internet access.

Anritsu Pty Ltd

www.anritsu.com

Managed Service Radio Solution

2015 AUSTRALIAN RADIO PARTNER OF THE YEAR
MOTOROLA SOLUTIONS 2015 CHANNEL PARTNER AWARDS

TR hirecom
www.trhirecom.com.au

Ensure your radio communications are operating to their full potential with state-of-the-art Motorola Solutions' two way radios.

A Managed Service with TR Hirecom includes the following:

✓ Ongoing Service and Maintenance

- All equipment is tested and programmed by trained, professional personnel before it is sent out

✓ Battery Maintenance and Replacement Program

- A battery maintenance program is provided throughout the managed service period
- Periodic and/or as required testing and reconditioning, with immediate replacement of faulty batteries

✓ Product Training and Support

- TR Hirecom will develop and present a training package to ensure all of your staff are confident and familiar with their new assets
- This training package will be delivered by experienced TR Hirecom staff in a 'train the trainer' style so key personnel can pass this on to their relevant staff

✓ Radio Support Program

- Trained and experienced staff are available to assist you with any queries, training requirements and/or troubleshooting you may have

✓ Immediate replacement of faulty radios

- We aim to have any faulty equipment replaced in a time critical manner so on-site disruptions are minimised

✓ Account Processing Minimisation

- No Capex account process required

Equipment Upgrade Pathway

As your two way radio needs change, TR Hirecom will work closely with you in evaluating your radio communications. With the ability to upgrade your fleet and avoid obsolescence at the end of your rental period, you can be assured that your communications systems will always be operational, with the very latest in two way radio technology.

Read about Adelaide Brighton Cement's upgrade to digital two way radios, and how a Managed Service transformed their onsite communications!

For more information, contact us today:

1800 222 327 | rent@trhirecom.com.au | www.trhirecom.com.au

BR0511

News

ZETRON, TAIT PARTNER FOR TRACKING

Zetron has announced a partnership with Tait Communications to develop a Digital Mobile Radio (DMR) Tier III-based Location Services solution that will enable the tracking of vehicles and workers through a user's radio communications networks and Zetron's MAX Dispatch. Zetron said the solution will greatly improve the ease and agility with which users can track their vehicles and workforce during dispatch scenarios, aiding their situational awareness and reducing response times. The company also said the solution also improves a dispatcher's ability to monitor and manage events by simply clicking a mapped resource to answer an incoming call or initiate an outgoing individual call.
More info: bit.ly/1SEk2et

FUJITSU'S TASSIE DISPATCH CONTRACT

Fujitsu has been awarded the contract with the Tasmanian Department of Police, Fire and Emergency Management for the implementation of a new computer-aided dispatch (CAD) system, the first unified system for the state's emergency services. Fujitsu's Emergency Services Computer Aided Dispatch (ESCAD) system will be leveraged across Tasmania's emergency services to better coordinate critical responses between fire, ambulance, SES and police organisations. The Tasmanian Government revealed last July it would invest over $15 million to deliver an integrated emergency response system for the state. The contract requires Fujitsu to also provide support and maintenance for five years following the implementation of the system.
More info: bit.ly/1pxjvAv

HF portable radio pack

Codan Radio Communications has launched the Patrol Manpack, a high-frequency (HF) 'manportable' radio that builds on the 2110 Manpack series, suitable for military and critical communications missions.

The pack, which is comfortable to carry and suitable for all types of terrain and weather conditions, includes a rugged smart handset and waveform upgrades to provide good voice clarity comparable to cellular phones. It is available in two models: the standard Patrol 2110 designed for long range communications for humanitarian and public safety organisations and the Patrol 2110M with high-grade frequency hopping and advanced encryption.

The addition of the smart handset enables full radio control along with increased flexibility to locate the transceiver wherever it suits the operation. The handset is designed to meet user requirements for functionality and aesthetics while being built from high-impact plastics, capable of withstanding immersion to a depth of 1 m. The lightweight product offers a long battery life and is also equipped with 3G ALE for quicker linking and secure data messaging, as well as Digital Voice for clear communications.

Codan Limited
www.codan.com.au

Current waveform analyser

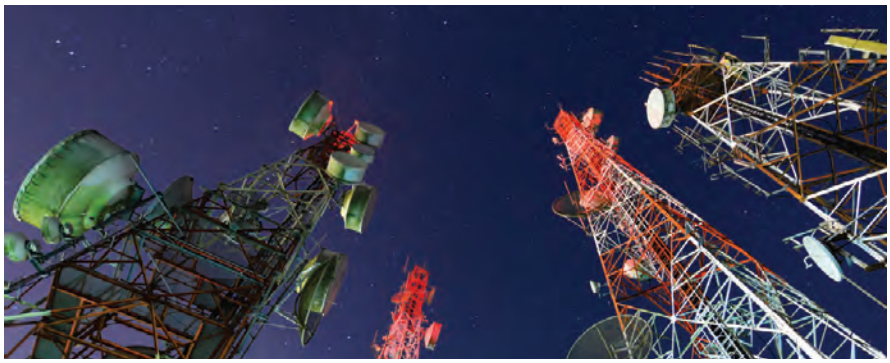
The Keysight CX3300 Series Device Current Waveform Analyzer is suitable for researchers struggling with high-speed transient current measurements during advanced device characterisation, as well as engineers working to reduce power/current consumption in low-power devices. The company claims it is the first analyser enabling a minimum of 100 pA level dynamic current measurements with a maximum of 200 MHz bandwidth, 1 GSa/s sampling rate and 14- or 16-bit wide dynamic range.

Characterising advanced devices and evaluating low-power devices are challenging tasks and often require engineers to measure high-speed (over 1 MHz) and low-level dynamic current (below 1 μA). However, the existing methodology for this measurement is plagued by issues such as large noise, voltage drop, limited dynamic range and bandwidth. As a result, low-level dynamic current often goes undetected and unmeasured. The device overcomes this by enabling the simultaneous measurement of wideband and low-level current waveforms. By providing a 14- or 16-bit wide dynamic measurement range, a single instrument can meet various measurement requirements without using multiple instruments.

A graphical user interface on a WXGA 14.1″ multitouch display, and measurement and analysis software, makes previously difficult low-level current waveform measurements and analyses more efficient and easier to make. Users can measure transient current even if the pulse width is very narrow (less than 100 ns). This capability is particularly beneficial for device engineers developing semiconductor or advanced memory devices, as it allows them to visualise previously unmeasurable waveforms.

Keysight Technologies Aust Pty Ltd
www.keysight.com

Cambium Networks™



Cambium Networks PTP 820 series licensed microwave radio

Customers deploying wireless backhaul often turn to licensed microwave systems to ensure critical data is delivered reliably. Cambium Networks complements that principle with the most reliable, highest performing microwave radio available. With the PTP 820, Cambium Networks continues its reputation for industry leading solutions, with unparalleled service and support, enabling the quickest Return on Investment.

PTP 820 offers

- Single core and dual core all-outdoor Ethernet links
- 2048 QAM, 80MHz channels and compression support multi Gigabit throughput
- Easy design, verification and BOM creation with LINKPlanner tool

Image courtesy Brookfield Rail

RAILWAY COMMS

New consoles are helping Brookfield Rail oversee its vast rail infrastructure effectively and efficiently.

Brookfield Rail is responsible for the safe, efficient and reliable operation of one of Western Australia's most vital elements of transportation — its 5500-kilometre, multiuser, rail-freight network. The rail infrastructure extends across the southern half of Western Australia, spanning an area twice the size of Great Britain.

As the only rail-freight network in the southern half of Western Australia, it provides access to the eastern states of Australia and also serves as an important link to six government ports that connect to markets overseas. In 2015 alone, freight carried over the rail system exceeded 74 million tonnes.

The responsibilities required to ensure the 24/7 operation of such a network are many and varied. They include everything from managing track access, train control and signalling, to overseeing communication systems, rail construction and maintenance.

That's why Brookfield Rail recently installed Zetron's AcomEVO to update its centralised communications equipment. The solution, which includes three separate but linked systems, has already improved the quality and reliability of Brookfield Rail's communications. What's more, it is based on updated technology that will be able to support their evolving operations well into the future.

Owned by global asset management company Brookfield Infrastructure Partners L.P., Brookfield Rail is one of the few independent rail-infrastructure providers in the world. It uses train control centres in Midland, Avon and Picton (a suburb of Bunbury) to coordinate and control its diverse operations. These include the daily movement of over 180 trains across the rail network, and making sure the network runs efficiently and is maintained to meet all safety and compliance standards.

Upgrade needed

According to Zetron Australasia Technical Operations Engineer Matthew Essex, Brookfield Rail had decided the time had come to update its communication equipment.

"The Zetron Acom system they'd been using in two of their three centres had performed very well for many years," he said. "But a newer version of the system, AcomEVO, offered updated technology and functionality that would better support their activities and plans. They also wanted to install the same type of system at all three sites and expand to include additional train-control desks."

According to Essex, Zetron's AcomEVO was chosen for the project because, for one thing, it would fully meet the project's considerable list of requirements. Brookfield Rail's past positive experiences with Zetron and satisfaction with their previous Acom system also was a key determinant.

"The upgrade to an improved version of an excellent system from a tried-and-proven partner was the most attractive and logical choice," he said.

Three centres, three systems

The project involved installing one AcomEVO controller and seven consoles at Midland; one controller and four consoles at Avon; and one controller and four consoles at the Picton site in Bunbury.

This was conducted in two phases, with the Picton and Midland installations taking place in early May of 2015, and the Avon installation a month later. Hardware component upgrades had to be completed before the installations could get underway. But overall, challenges during the project were minimal.

Each system was designed and set up so any console would be able to log into and use any of the three systems. This was done to provide additional layers of redundancy to an already highly redundant solution. In addition, the screens used by the train controllers were configured to have a consistent look and feel across all three centres. So if one centre were to go down, the controllers would be able go to any of the other locations, sit down, log in and continue operations without missing a beat.

No training was required at the two locations where Acom had been used previously because operators at those sites were already

continued ➡

HARRIS®

TECHNOLOGY TO CONNECT,
INFORM AND PROTECT™

Switch*plusIP*
provides unsurpassed integration
of disparate mission critical
communications

THE FUTURE OF INTEGRATED COMMUNICATIONS IS CRYSTAL CLEAR

Switch***plusIP*** from Harris provides vendor independent integration between all of your communications systems. This allows control room operators to communicate between rail, road, maritime, aircraft, bulk loading and emergency services through a single headset providing crystal clear audio.

Harris Corporation is a leading technology innovator, solving our customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports customers in more than 125 countries, has approximately $8 billion in annual revenue and 22,000 employees worldwide. Learn more at our website.

harris.com | #harriscorp

Image courtesy Brookfield Rail

familiar with that system, and the screens on the new systems were designed to resemble those of the earlier version.

The operators at Picton were new to the Acom platform, however. They received training at the company's offices in Perth prior to the upgrade, and then on-site once the system had been installed. The screens were designed to be easy to learn and use, and those operators who were new to the system caught onto it quickly.

Beneficial outcomes

Brookfield Rail's three-site AcomEVO solution is now delivering the features and functionality for which the system was originally chosen — and a few more besides.

Image courtesy Daryl Phillips, Flickr/CC.

Brookfield Rail needs to maintain comms across an area of Western Australia equivalent to twice the size of Britain.

> THIS FUNCTIONALITY… ENSURES THE CONTINUITY OF BROOKFIELD RAIL'S OPERATIONS IF A SITE EVER HAS TO BE EVACUATED.

For one thing, not only is the equipment fully supported, but the Brookfield Communications Group is trained and equipped to provide first-line maintenance if and when it's needed.

Another important benefit is the ability to log on to any of the systems from consoles at any of the three sites. "This functionality is crucial," said Essex. "It ensures the continuity of Brookfield Rail's operations if a site ever has to be evacuated or a fault condition occurs."

AcomEVO also removes a layer of complexity from the set-up. Previously, Brookfield's equipment's dual-tone multifrequency signalling had been provided by third-party equipment. But because AcomEVO is able to connect directly to the radio through the telephone infrastructure, third-party equipment was no longer need to make the connection. This direct connection eliminates a possible point of failure.

The updated solution is also designed to support telephone integration into the consoles. "They are planning to implement ISDN phone integration as soon as funding permits," said Essex. "Brookfield Rail is indeed happy with the results of the overall project," he added. "AcomEVO has met and even exceeded their expectations."

"We are delighted Brookfield Rail has recognised the high performance Acom offers, as well as the exceptional support provided by the Zetron team," Zetron Australasia Vice President and General Manager Ranjan Bhagat said. "Acom is an effective platform for organisations such as Brookfield Rail, whose control centre solutions must be able to meet current and evolving requirements."

Zetron Australasia
www.zetron.com

ICS Industries
an EnerSys Company

EVERYTHING YOU NEED TO STAY CONNECTED

ICS Communication Trailers now incorporate world-class Reserve Energy in our turnkey trailer solutions, ensuring vital communications remain connected.

- ✓ Ideal for harsh environments
- ✓ Fast recharge capability
- ✓ Highest energy density
- ✓ Up to 2 years shelf life
- ✓ 15 years design life
- ✓ Vibration resilient
- ✓ High reliability

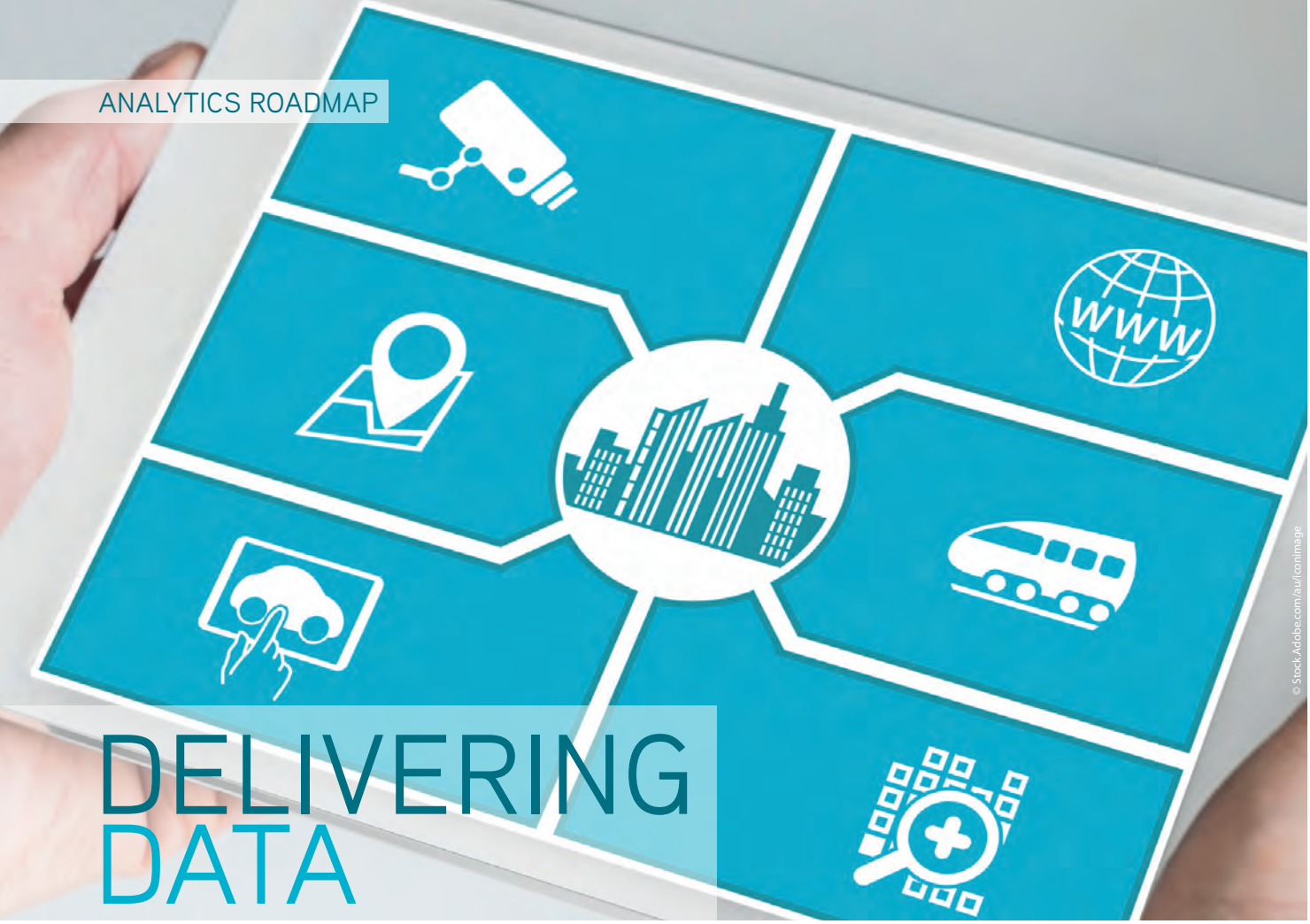
EnerSys
Power/Full Solutions

1800 010 027

www.icsindustries.com.au
www.enersys.com

Contact us for more information on our Battery and Trailer Solutions

LEARN MORE



DELIVERING DATA

A new US government report outlines the steps needed to enhance information analysis in public safety.

The US Department of Commerce has issued a Public Safety Analytics R&D Roadmap, which will guide planning for public safety communications research, including how to allocate the US$300 million the US National Institutes of Standards and Technology (NIST) is to receive from the 2015 AWS-3 spectrum auction.

The report, developed by NIST, "evaluates software, network and device technologies that could improve public safety response, communications and operations over the next 20 years" and "outlines opportunities to spur innovation and improve public safety by making data more accessible and useful for police, firefighters, emergency medical services and other first responders".

"First responders are gaining access to large amounts of new data from diverse sources, and we need to be able to process it without overwhelming public safety," said US Deputy Secretary of Commerce Bruce Andrews.

"This roadmap allows NIST to begin to chart an R&D course to ensure that new data constructively transforms the way first responders carry out their missions."

This is the second roadmap developed in NIST's effort to identify research needed to support advances in public safety communications systems, including LMR and LTE. NIST published a Location-Based Services roadmap last year.

The new analytics roadmap suggests how data collection, processing, analysis and visualisation techniques could generate valuable intelligence for public safety in the short term (0 to 5 years), medium term (5 to 10 years) and long term (10 to 20+ years).

Trends affecting the future of public safety include shrinking government budgets, regionalisation of emergency response, growing demands for ubiquitous data, richer software features and device capabilities, and the public's changing role through social media, mobile apps, citizen reporting and scrutiny of data use. The report also stresses the need to address security and privacy issues. Analytics will be used to manage large amounts of previously inaccessible data, to help the public safety community plan for, respond to and recover from natural disasters, disease outbreaks and terrorist attacks. But there is a need to standardise data for use by public safety agencies. For example, the Internet of Things is creating huge data streams but the public safety community is struggling to gain access to and use it.

The rise of smart cities, smart buildings and smart utilities will drive the growth of big data from which the public safety community will need to derive meaning and value. Responder-worn devices will also generate big data from sensors to capture biometric and weather data, perhaps test air quality and levels of carbon monoxide and propane during fire rescue, and incorporate tools such as geolocation positioning chips.

The growing potential for cyber attacks combined with physical attacks will demand real-time situational awareness. Response will require coordinated analytics of both the cyber and physical worlds. Data will need to be rerouted over a backup path if the primary path is attacked or down.The roadmap identifies a number of technology gaps such as:

- **Software:** The public safety community lacks software that can aggregate, filter, transform and process unstructured data and lacks sufficient bandwidth to download and upload data streams from the Internet of Things and sensors. Public safety also relies on proprietary rather than open-source software and has limited access to non-public safety camera feeds and other data. Threat detection systems need to become more sophisticated.
- **Devices:** Today's sensors are costly and limited in processing power and the ability to match images. Charging and battery technologies need to be more efficient. Data standards are needed for on-body sensor readings.

continued ➡

NATIONAL INSTRUMENTS

INNOVATE FASTER

WITH FIELD-DEPLOYED 5G PROOF-OF-CONCEPT SYSTEMS

In the race to design next-generation wireless technologies, research teams must rely on platforms and tools that accelerate their productivity. Using the NI software defined radio platform and LabVIEW Communications, leading researchers are innovating faster and building 5G proof-of-concept systems to demonstrate new technologies first.

Accelerate your innovation at ni.com/5g

LabVIEW Communications System Design Software, USRP-2943R SDR Hardware

NI ASEAN and NI ANZ

Singapore (65) 6226 5886
Philippines (632) 659 1722
Other ASEAN Countries (65) 6226 5886
asean@ni.com

Malaysia (603) 7948 2000
Vietnam (84) 8 3911 3150
Australia 1800 300 800
info.australia@ni.com

Thailand (662) 298 4800
Indonesia (62) 21 2924 1911
New Zealand 0800 553 322
info.newzealand@ni.com

Images courtesy West Midlands Police under CC.

- **Network:** Resilience in the face of attacks will depend on networks' ability to self-diagnose, self-configure in real time without human intervention and self-heal/restore. They will also need to analyse traffic patterns to discover potential attacks.

The roadmap outlines a number of recommended R&D opportunities to address these gaps:

- **Software:** Develop a public safety information sharing and analysis centre similar to www.data.gov; define IoT data standards and processing models for public safety; and partner with social media analytics companies to design tools to analyse physical attributes and biometrics in images.
- **Devices:** Define requirements for on-device recording and storing of communications transcripts; develop an analytics framework for integrating disparate data sources across public safety devices and sensors; define data standards and exchange protocols for responder-worn sensors.
- **Networks:** Develop resiliency and prioritisation services to analyse mission-critical data when the network goes down or is overloaded; develop a network-based element to discover and deliver critical content; and create a standard and/or usage scenario that indicates what information or analytical capabilities are needed during specific situations such as fires, floods and vehicle crashes.

Smartphone PTT app

Tait Communications has released the UnifyVoice smartphone PTT app, which connects users who don't normally carry a radio, such as back-office administrative users, to P25 or DMR radio networks.

UnifyVoice operates on Android and iOS devices with communication over cellular (3G or 4G LTE) or Wi-Fi networks. The connection can happen from anywhere in the world as long as the user has internet access.

With the app, managers can create and control groups and set privacy settings so that whoever is in that instant group can only hear what people in that group are saying. Managers can also control who has access to the app.

The app also provides secure 256-bit AES encryption, text messaging, real-time mapping of user location and the ability to transfer images to groups of users. It is suitable for users such as security at major events, forensic officers, ambulance staff, utility workers and so on.

Tait Communications

www.taitradio.com

Arbitrary waveform generator

Keysight Technologies has enhanced its M8195A 65 GSa/s arbitrary waveform generator with increased analog bandwidth from 20 to 25 GHz, ensuring improved signal quality with up to four fully synchronised channels. With increased memory capabilities to 16 GSa/ch for a playtime of 250 ms at maximum sample rate, engineers can create longer test signal scenarios with the generator's sequencer option.

By adding the M8085A software plug-in, engineers can also have a compact multilane MIPI C-PHY and D-PHY receiver test application. The D-PHY test application includes a payload pattern and pattern sequence editor. Standard conformant calibration and test procedures are also part of the application for C-PHY and D-PHY. A standard conformant test increases the efficiency of users in charge of qualifying C-PHY or D-PHY interfaces.

The 81195A optical modulation generator software is also available, which features a real-time option allowing engineers to change the signal properties and impairments at runtime. The device also comes with one, two or four differential channels per 1-slot high AXIe module. The number of channels is software upgradeable.

Keysight Technologies Aust Pty Ltd

www.keysight.com

KENWOOD

P25 DIGITAL WIRELESS · SANS FIL NUMÉRIQUE · INALÁMBRICO DIGITAL ™

NEXEDGE™

Designed for the Toughest Conditions

www.nexedge.kenwood.com/special/nx_5000/

COMMS CONNECT SYDNEY 2016

22–23 JUNE, SYDNEY SHOWGROUND, OLYMPIC PARK

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

Now in its 10th year, Comms Connect is established as Australasia's leading conference and exhibition for communications users and industry. This year sees the return of Comms Connect to Sydney, following on from the highly successful events held in 2014 and 2015. The venue, at Sydney Olympic Park in the geographic and demographic heart of the greater Sydney region, is well served by public transport, plus there's plenty of on-site parking.

Comms Connect sees hundreds of like-minded professionals — from government, the resources sector, first responders, transportation, utilities, enterprise and other sectors that use critical communications — gather to ensure that they have access to the very latest information and technology solutions.

Speaker sessions

Comms Connect always attracts a first-class list of speakers from industry, government and academia. This year's line-up will be no exception, with experts from home and abroad coming together to share their knowledge and insights. The following partial list of topics gives you an idea of what to expect and reflects just how rapidly the critical communications field is changing:

- Using biometrics to keep emergency responders safe
- The use of long-range digital radio in rural and remote areas
- Maritime radio in NSW — the birth of a state-wide network
- Security challenges in narrowband SCADA networks
- Optimising LMR networks for enhanced capability and interoperability
- The role of two-way radios in big data and analytics
- Developments in LMR and PTT
- Putting mission-critical intelligence into the hands of decision-makers
- Public safety and critical infrastructure protection
- Powering intelligent transportation systems with next-generation remote energy solutions
- Building carrier-class FWB networks to support ITS applications
- GRN backhaul evolution — from PDH to IP/MPLS
- Building the IoT's infrastructure: fog computing and network gateway intelligence

The full list of speakers and topics can be viewed on the Comms Connect website at sydney.comms-connect.com.au/conference-program.

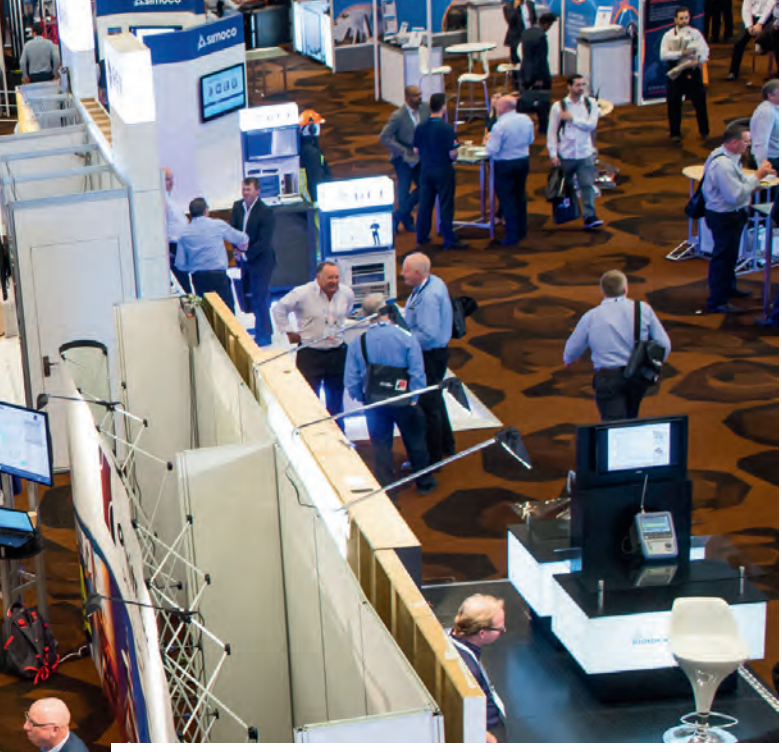
Workshops

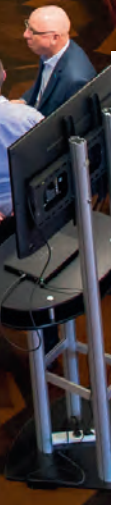
Comms Connect workshops are always popular. This year there will be four workshops, held after the lunch break on the first day of the event.

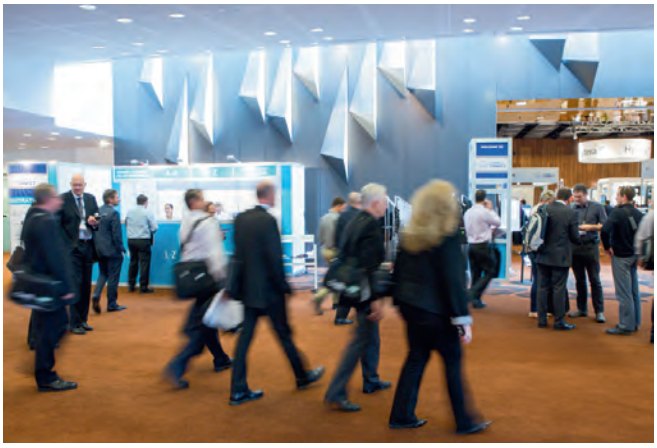
Workshop 1: *Dispelling the myths of microwave radio*, led by Trevor Manning, Managing Director, TMC Global. This workshop will cover new technologies, new spectrum ranges, avoiding weather issues, achieving 'five nines' reliability, and more.

Workshop 2: *Fleet management, cradle to grave, utilising over-the-air programming*, led by Andrew Smith, Engineering Solutions Manager, Tait Communications. This discussion will cover the migration from analog to digital using real-life examples, and will include design principles and a demonstration of fleet configuration and management tools.

Workshop 3: *Public safety information management: challenges and opportunities*, led by Lance Valcour, Canadian Association







Comms Connect Sydney at a glance

Conference:	Wednesday 22 June (9.00 am–5.00 pm) and Thursday 23 June (9.00 am–4.00 pm)
Exhibition:	Wednesday 22 June (9.00 am–5.00 pm) and Thursday 23 June (9.00 am–3.30 pm)
Where:	Hall 5, Southee Complex, Sydney Showground, Olympic Park
Who:	500+ attendees, 40+ speakers and 40+ exhibitors
Web:	www.sydney.comms-connect.com.au

of Chiefs of Police; Charles Emer, CIO, NSW State Emergency Service; and Matthew Smith, CIO, NSW Rural Fire Service. This important workshop will cover a diverse range of technologies, such as the Internet of Things, cloud computing, alerting, digital mobile radio, location-based services, deployable broadband and advanced analytics.

Workshop 4: *Building a radio network from the ground up*, led by Chris Stevens, Communications Advisor, Surf Life Saving Australia. This non-vendor specific workshop is aimed squarely at local government, small NGOs, businesses and independent groups that are looking to build and deliver a small, two-way, LMR network.

Exhibitors

One of the best parts of Comms Connect is the opportunity to meet and greet with exhibitors. In particular, it's a great chance for equipment users and suppliers/manufacturers 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.

Among the many exhibitors you'll get to meet in Sydney will be: 4RF, Amtex, Anritsu, ARCIA, ATDI, ATCCF, Benelec, BFDX (Fujian Beifeng Telecom Technology) BelFone, Critical Comms, Emona Instruments, Friendcom, Gencom, GME, Icom, Innovatel, Keysight Technologies, Mastercom, Omnitronics, Polar Electronic Industries, RF Technology, Sepura, Silvertone, Spectrum Engineering, Tait Communications, Vertel, Wireless Tech, ZCG Scalar and Zetron Australasia. You can see the full list of exhibitors at sydney.comms-connect.com.au/whos-exhibiting.

If you haven't already booked your company's exhibition space, it might not be too late — phone the Comms Connect team on 02 9487 2700 or email Paul Davis for details.

Panel sessions

Comms Connect Sydney 2016 will feature two panel sessions that will be of great interest to everyone in the industry.

The first, at 9.30 am on the second day (Thursday 23 June), will be *Next-Generation 000 — the road ahead*. This important session will see a blue ribbon panel of Australasian experts outline the history, current state and desired future state of NG000. This session will be of keen interest to industry, government, academic and related delegates as all will be required to ensure the transition from 000 to NG000 is successful.

The second panel session will the final session of the whole event, at 3.30 pm on the Thursday. Entitled *Industry and public safety: working together to improve community safety*, this not-to-be-missed facilitated session will give public safety and industry officials a chance to engage in an open dialogue on a number of issues, such as capability gaps, ideas for potential joint research and opportunities to change the dialogue from traditional procurement models to faster and more agile ones such as problem-orientated procurement.

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!

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

continued ➡

COMMS 2016 CONNECT

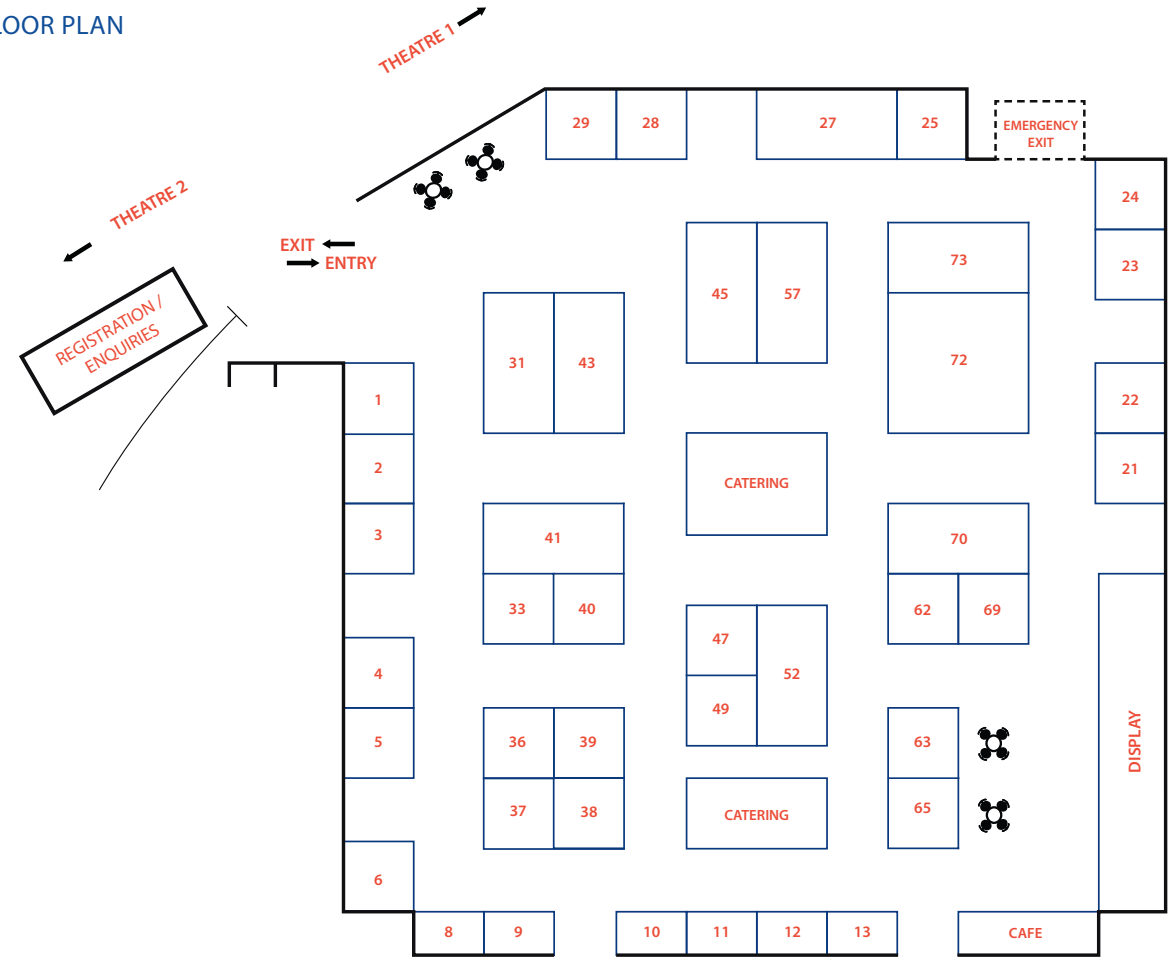
22-23 JUNE 2016

SOUTHEE COMPLEX,
SYDNEY SHOWGROUND,
SYDNEY, AUSTRALIA

More Comms Connect events in 2016

WF Media (publisher of *Critical Comms*) and ARCIA have been holding a series of very successful, one-day 'mini' Comms Connect conferences in several capital cities. The next events will be in Brisbane on 27 July and Adelaide on 23 September. They'll be followed, of course, by the main Comms Connect Melbourne conference and exhibition on 22–24 November. Full details of all these events are available at comms-connect.com.au.

FLOOR PLAN



Exhibitor	Stand No
4RF Australia	38
A	
Anritsu	13
ARCIA	3
ATDI South Pacific	22
Australasian TETRA + Critical Communications Forum	6
B	
Benelec	43
C	
Critical Comms	5
E	
Emona Instruments	37
G	
Gencom Wireless Solutions	57
GME	23
GMG Solutions	47
F	
Fujian Beifeng Telecom Technology	73
H	
Helios Power Solutions	33

Exhibitor	Stand No
Hytera	62
I	
Icom Australia	52
Innovatel	21
IPMobileNet	45
J	
JVCKenwood	72
K	
Keysight Technologies	29
L	
Logic Wireless	24
M	
Mastercom	27
Metwide Communications	69
Midland	11
O	
Omnitronics	28
P	
Polar Electronic Industries	10
R	
RFI	1

Exhibitor	Stand No
RF Technology	45
S	
Sepura	70
Shenzhen Friendcom Technology Development	39
Silvertone Electronics	25
Spectrum Engineering Australia	8
T	
Tait Communications	41
U	
Unicom	49
V	
Vertel	4
Vicom	63
Visionstream	40
W	
WirelessTech (Australia) Pty Ltd	9
Z	
ZCG Scalar	36
Zetron	31

Exhibitor list correct as at time of printing

Technical expertise, trust, resilience, reliability.

Innovators of loud and clear radio communication solutions.

Visible, Connected, Reliable.

Fleet and personnel radio technologies for emergency response.

Helping industry flow from pit to port.

Digital radio and data integration solutions for logistics management.

Mobilising productivity, visibility and efficiency with two-way radio.

Digital voice and data solutions for fleet management.

We are innovators of loud and clear radio communication solutions. Specialists in digital and analogue two way radio technologies, two-way radio networks and data application integration - we make industry flow – mobilising productivity and visibility through two way radio communications and infrastructure.

Our longevity is testimony to our success; we've been designing, building and commissioning custom communication systems in Sydney for more than 45 years and are proud to lead innovation in the Australian two way radio industry.

136 Railway Parade, Granville NSW 2142
T:: +61 2 8821 9555
www.mastercom.com.au

MASTERCOM
LOUD AND CLEAR

News

CODAN'S US$3.2M US GOVT WIN

Codan Radio Communications has won a US$3.2 million order to supply MT-4E repeater systems to the US Department of Agriculture's Forest Service. The equipment will be used throughout all nine designated forest regions within the US. The Service operates in some of the harshest terrain and remotest locations within the country to ensure the maintenance of day-to-day operations and the safety of service personnel and co-operators. Its radio systems provide critical communications during emergency situations including wildfires and law enforcement. "Our MT-4E repeater platform was developed specifically to operate in the harshest conditions to provide reliable communications for all situations, including emergencies and mission-critical applications," said Codan's Ben Pearce.

More info: bit.ly/1rbL1VM

MOTOROLA'S APP DEVELOPER OFFER

Motorola Solutions is inviting application developers to join its Convergence Suite Developer Program with the aim of improving workgroup communications, where teams need to share data between smartphones, radios and other networked devices. Motorola will give developers free access to APIs and other tools they need to develop and integrate applications running over coexisting LMR and broadband systems as well as LTE-only networks. Partners can use those APIs to create new products or improve current ones, as well as capitalise on the company's Intelligent Middleware services that share voice and data over different networks and on different devices. They can also integrate Motorola's messaging and mapping to their applications.

More info: bit.ly/1VNuJ2n

Camera probe

The JDSU/Viavi LCD display, camera probe and USB adapter, available to rent from TechRentals, is a lightweight and versatile device that provides fibre end-face image analysis and capture.

The JDSU probe microscope inspects both bulkhead (female) and patch cord (male) sides of fibre interconnect. Additional features include a patch cord microscope and a visual fault locator to detect damaged fibres.

Precautionary fibre inspection and cleaning can prevent weak signal performance, damage to equipment and network downtime. This fibre inspection kit includes software and various probe tips and can cut inspection time by more than 50%.

The product comes with a high-resolution 3.5″ TFT LCD display that can detect 1 μm particles and scratches. The probe includes 200/400x quick dual magnification with the focus control located on the probe, and is compatible with over 250 FBPT precision tips and adapters. The product comes with FiberChek software as well as a PC/laptop for one-button capture and easy analysis of fibre end-faces.

TechRentals

www.techrentals.com.au

Cloud-based test management application

Anritsu has introduced a new version of its SkyBridge Tools cloud-based test management tool, reducing the time associated with testing and verifying distributed antenna systems (DAS) by as much as 90%.

With enhanced features, the product can serve as a DAS test management tool that automatically creates detailed test plans based on easily imported test criteria to simplify installation and commissioning of in-building wireless systems. Built on Microsoft architecture, the updated version accepts information from iBwave Design, Excel and customer-supplied test criteria. It automatically processes this data to create test plans that enable test sequencing, job progress tracking, trace judgement and report generation. An easyTest feature is also included that allows a set of one-button instrument control scripts to be created from a test plan.

Necessary tests and accurate instrument set-ups, limit lines and required file names for the resulting traces are included in the script, which greatly reduces test time, miscommunications and errors. Reports can also be generated in various formats with users able to choose from PDFs, zipped files or CSV format, with one row per test.

The tool can also be used with different Anritsu field solutions and can be integrated with the Site Master 'L' and 'E' series handheld cable and antenna analysers, PIM Master MW82119B portable PIM analyser, Cell Master 'E' series base station analysers, and BTS Master MT8220T. It can also be used with Anritsu fibre field solutions, including Network Master MT9090A, the ACCESS Master series and the CMA multilayer network test and measurement platform.

Anritsu Pty Ltd

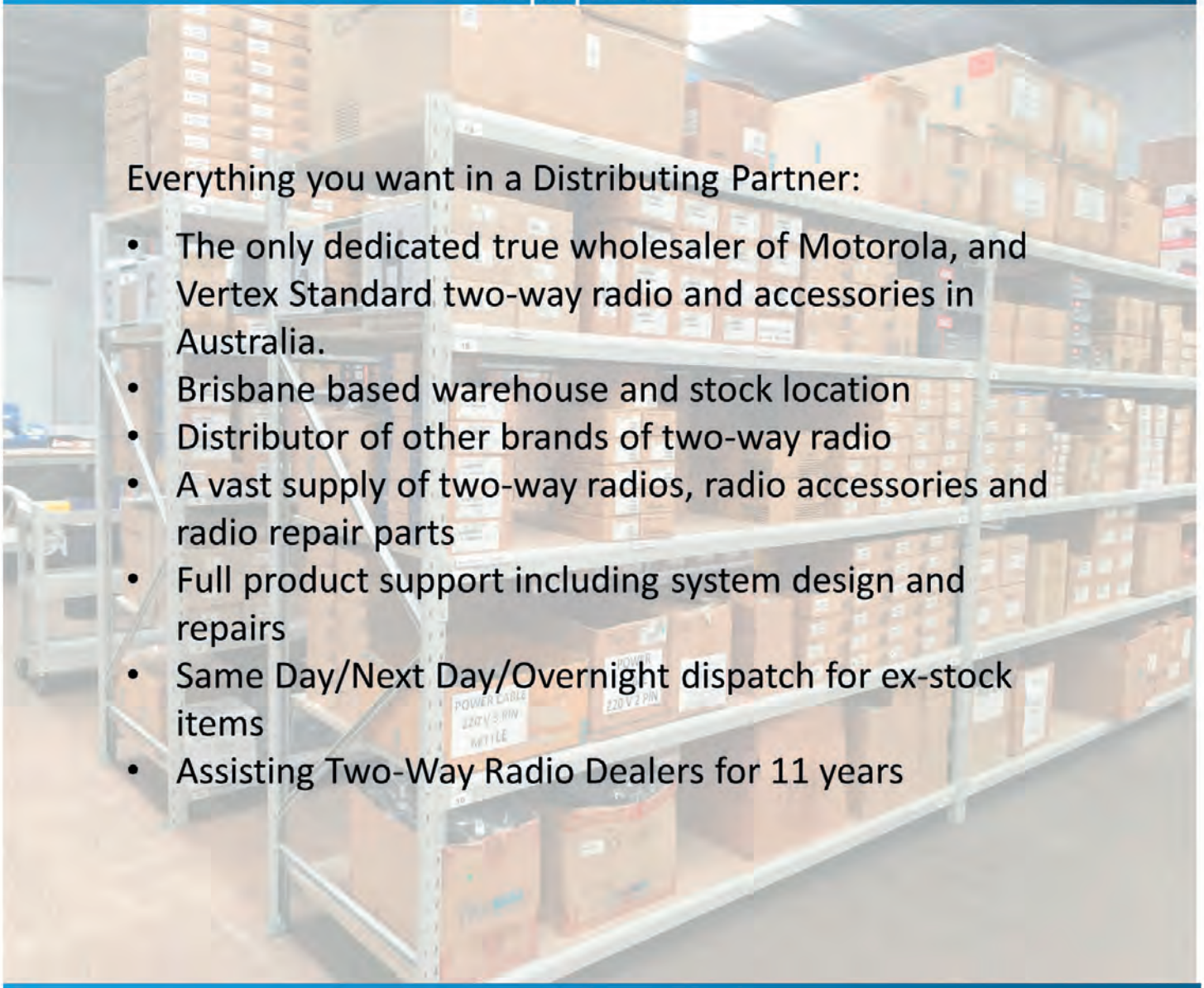
www.anritsu.com

Ace Communication Distributors Pty Ltd

2/60 Alexandra Place, Murarrie, 4172
Tel: 07-3821-4111 Email: sales@acecomms.com.au

Ace Communications GENUINE — EXPECT NOTHING LESS THAN GENUINE AND ORIGINAL PRODUCTS

Ace Communications has recently been appointed as National Distributors of Motorola and Vertex Standard two-way radio equipment



Everything you want in a Distributing Partner:

- The only dedicated true wholesaler of Motorola, and Vertex Standard two-way radio and accessories in Australia.
- Brisbane based warehouse and stock location
- Distributor of other brands of two-way radio
- A vast supply of two-way radios, radio accessories and radio repair parts
- Full product support including system design and repairs
- Same Day/Next Day/Overnight dispatch for ex-stock items
- Assisting Two-Way Radio Dealers for 11 years

'We do not compete with Dealers'

Vertex Standard
Authorised Distributor

MOTOROLA SOLUTIONS
Value Added Distributor

ARCIA — Australian Radio Communications Industry Association
Silver Partner

News

SIMOCO'S NEW LOCAL CEO

Simoco Group has appointed Brett McInnes as CEO of Simoco Australasia. Based at the company's Melbourne headquarters, he will be responsible for business growth and will oversee all management, sales and marketing activity, as well as national and multinational product management and development. McInnes comes to the job with more than 20 years of experience working at CEO and director level, most recently from unified communications distributors Samsung Communications and CommsPlus Distribution, where he also held the position of CEO. In addition to those roles, McInnes has worked as a director of the communications products division at Panasonic Australia and as a senior consultant for Ovum.

More info: bit.ly/26nHq73

FIRSTNET'S VEHICLE VISION

The FirstNet CTO Devices Team has published a blog entry on the US comms agency's "vision for the Vehicle Network System (VNS) role in incident deployment and coverage extension options ... and aims to clarify both the nomenclature and the differences between the VNS and traditional deployables." A VNS is a set of radio access and other technologies that enable a first responder's vehicle to act as a virtual cell site for Band 14 LTE devices. It can be equipped with satellite connectivity for remote locations and provides network features from within the vehicle when the VNS cannot reach FirstNet's terrestrial network.

More info: bit.ly/1Wllt40

Compact oscilloscope

Rohde & Schwarz has launched the R&S RTO2000, a compact lab oscilloscope for multidomain applications. The product has a 12.1″ capacitive touchscreen with gesture support and colour-coded controls, enabling users to easily configure the instrument for any measurement task.

Via the analog input channels, the user simultaneously sees the signal in the time and frequency domain, and if desired, the spectrogram. Other functions such as peak list, max. hold detectors and the logarithmic display make frequency analysis even more efficient.

The new zone trigger enables the graphical separation of events in the time and frequency domain. Users can define up to eight zones of any shape. A trigger signal is activated when a signal either intersects or does not intersect the zone, making it easy to detect disturbances in the spectrum during EMI debugging or to separate read/write cycles of storage media in the time domain.

The oscilloscope offers a memory of up to 2 Gsample, useful for the history function, which provides access to previously acquired waveforms. The high-definition mode increases the vertical resolution to up to 16 bits, making signal details visible, and activates configurable lowpass filtering of the signal after the A/D converter. The product also offers one million waveforms/s, allowing users to quickly detect sporadic signal faults.

The product is available as a two- or four-channel model with a bandwidth of 600 MHz, 1 GHz, 2 GHz, 3 GHz or 4 GHz.

Rohde & Schwarz (Australia) Pty Ltd

www.rohde-schwarz.com

Intelligence software

Motorola Solutions has released CommandCentral software for public safety agencies, including CommandCentral Aware and CommandCentral Inform.

The software helps mission-critical customers improve outcomes with a real-time operational view unified onto a single command centre screen. The intelligence-led public safety solution can enhance investments in computer-aided dispatch (CAD) and integrated communication control systems (ICCS), ensuring emergency resources are rapidly allocated where needed most.

As more datasets feed into public safety, it becomes increasingly difficult to follow everything that is happening within operations and the wider community. Multiple applications and sign-ons, and limited mobile availability of data sources, present challenges for staff to see a single view of operations in the field. One of the benefits of CommandCentral Aware is that it links customers' existing data applications, which are typically separated or siloed, and integrates those, giving personnel faster access to data and therefore enhancing operational response.

When CommandCentral Aware is combined with CommandCentral Inform, the enhanced situational awareness is extended for improved decision-making on the ground. Web-based Inform can be used on nearly any device, operating system or network, providing a common operating picture in the field. Officers can apply or remove layers of information from the geospatial map, including the location of personnel, resources, events, alerts and analytics, in real time. This information can then be shared with other services for better coordination and rapid collaboration to improve safety.

Motorola Solutions Aust Pty Ltd

www.motorolasolutions.com.au

Base station/repeater

Codan Radio Communications has launched the Cyclone, a drop-in replacement platform for existing conventional core radio repeaters and base stations.

Available in VHF, UHF and 700/800/900 MHz, and using the rugged MT-4E repeater design as well as Avtec's RIC-M technology, the product is a dependable solution for existing legacy repeaters that rely on the v24 interface into existing core networks. Leveraging a full P25 DFSI (Digital Fixed Station Interface), it enables future migration to a P25 standards-based network and backhaul over ethernet, reducing the need for costly leased lines and T1 connections.

The product will allow customers to extend the life of their existing core networks. It is designed with a 5RU footprint, which fits the exact dimensions of existing legacy stations. Replacement of the legacy stations can be made by a simple disconnection of the RF, power and backhaul (v24) connections, physically removing the legacy product, inserting the Cyclone and reconnecting. With power on, the device will provide the same capability as the legacy product.

Codan Limited

www.codan.com.au

Digital mobile radio test set

Cobham has added the 8800SX Digital Radio Test Set to its 8800 Series family for testing land mobile radio systems.

The device features software for testing a variety of Motorola and other OEM radio systems which can provide automated test and alignment, antenna and cable tests as well as advanced digital LMR radio analysis. It also features an external 10 MHz reference designed to ensure the equipment used by land mobile radio end users is operating at the highest standard.

The product supports MOTOTRBO (DMR), P25 Phase 1 and Phase 2 Systems, NXDN, dPMR and Positive Train Control Radios. The addition of the 10 MHz external reference port provides accurate RF frequency measurements. It also comes with Cobham's latest DMR repeater test option that provides the synchronised transmitter protocol messaging to activate a DMR repeater base station, without the need for special control software for parametric testing.

The test set has been reviewed and approved by Motorola for maintaining all Motorola technologies including GTR8000 P25 Phase 2 and LSM systems.

Cobham AvComm

www.aeroflex.com/ats

COMMS CONNECT WELLINGTON

COMMS 2016 CONNECT

Jonathan Nally

Industry members recently gathered in the New Zealand capital to absorb the latest information and technologies.

The first Comms Connect Wellington wrapped up on 15 April to universal praise, after two days of fascinating presentations and a bustling exhibition hall. Held in association with the Radio Frequency Users Association of New Zealand (RFUANZ), it brought together industry experts, vendors, government representatives and communications users from across New Zealand, Australia and further afield.

It was my first time back in New Zealand after more than 25 years, and I have to say I found Wellington to be a fabulous place. It has a great mix of history and modernity, reminding me very much of Melbourne or Hobart. I (and the rest of the Comms Connect team) stayed at the funky Museum Art Hotel, right across the road from the conference venue — Te Papa, the Museum of New Zealand.

Te Papa is a great place: extremely modern, very easy to get around in and with lots of helpful staff... and plenty of incredible natural history and anthropological exhibitions, including an internationally renowned World War I exhibition. (The queue was too long when I tried to get in; I'll try again next year.)

The Comms Connect exhibition was packed with displays from vendors from New Zealand and Australia. All the usual major names were there, plus quite a few that would have been new to many attendees. All the exhibitors with whom I spoke said that the event had gone very well for them.

Due to the nature of modern conferences, where concurrent streams are the name of the game, it wasn't possible for me to attend every presentation. There were a number of lectures and panel discussions that I didn't manage to see, and it seems invidious of me to have to leave them out, but the following is a summary of the sessions I was able to attend. (Most of the presentations are available for viewing at comms-connect.co.nz/conference-program/)

Official duties

Comms Connect Wellington was opened by a presentation from the Hon Amy Adams, Minister for Communications, who announced a number of policy decisions in relation to the future regulation of the telecommunications sector.

"Digital technologies are transforming the way New Zealanders live, work and do business," she said. "To help reach our 2025 broadband target and to keep our economy growing, we need the right laws in place to make sure high-quality and affordable communication services are available for consumers and businesses.

"The communications sector is vastly different to the market in 2001 when the Telecommunications Act was introduced, and it's time for our laws to catch up," the Minister added.

The Minister also announced that from 2020, "the government will move to a framework for regulating copper and fibre services that is similar to the one used for utilities like electricity lines".

"These high-level policy decisions build on the discussion document 'Regulating Communications for the Future', released last year as part of the Convergence work program," she said. "In coming months, we will continue the conversation with an options paper on the detailed design and implementation of the new framework."

The Minister's address was followed by an open Q&A session with two representatives from Radio Spectrum Management: Chris Brennan, compliance manager; and Fiona Johnson, senior policy advisor in the Radio Spectrum Policy & Planning Unit. Johnson observed that both New Zealand and Australia are undertaking major reviews of radio communications legislation. She noted that the New Zealand framework — which might be considered less prescriptive than Australia's — is looking to move more towards the Australian model, while the Australian model is perhaps going to move more towards the New Zealand model. It'll be interesting to see where they both end up.

The modern world

Michael Hallowes, director, Government, Enterprise & Emergency Management for the Early Warning Network, gave a fascinating insight into his company's services. Hallowes spent 30 years in UK policing before becoming the Emergency Services Commissioner for the state of Victoria and then national director of Australia's Emergency Alert Programme.

The Early Warning Network provides weather and natural disaster warnings and other information to governments and private industry, enabling them prepare for, or work through, such emergencies.

Hallowes gave a very interesting demonstration of how footage captured by drones and vehicle-mounted cameras can be used to assess the aftermath of natural disasters, with a view to recovery operations… and also for forensic purposes.

There's a lot more to the Early Warning Network: check out the company's website for more information.

Superintendent Jevon McSkimming, national manager, mobility and innovation, NZ Police, gave an overview of the results of the rollout of mobile broadband devices to every member of the police force. Specifically, they have been given thousands of iPads and iPhone 6+s. These devices, and the wealth of information they make available at the user's fingertips, along with the efficiencies gained by using voice recognition, have enabled officers to become far more productive, saving up to 30 minutes per officer, per shift. McSkimming also noted that officers had found the iPads to awkward to carry around and had almost universally chosen to rely solely upon the iPhones. "What we're doing is making more of the desktop environment mobile," Superintendent McSkimming told the audience.

Caroline Milligan, associate director of Emergency Management, Crest Advisory, gave a very impressive presentation on the use of social media channels by emergency services authorities to acquire and disseminate real-time information during natural disasters and other emergency events. She gave many examples of how emergency services organisations have been able to vastly improve the flow of information through simple — and, in many cases, free — off-the-shelf social media tools.

Keeping it simple

Two presentations demonstrated how some use cases do not require all the bells and whistles but are best suited to more traditional solutions, albeit with the latest technology involved. Justin Lewis, technical manager at Icom NZ, gave a presentation on the evolution of radio comms at a major New Zealand car racetrack and, in particular, how the latest Icom IDAS radios with digital noise cancellation are providing vastly improved comms to the racetrack operators. Of particular benefit are the 6.25 KHz FDMA channel spacing and the operational security that digital radio provides.

Simon Coles — Motorola Solutions' channel manager for NZ, the Pacific Islands and PNG — gave a very interesting presentation on how timber firm Dennis Hayes Logging has improved worker safety through the introduction of a new Simplex radio system. Safety is a very important issue in logging operations, with serious implications if things aren't done the right way. Coles noted that in 2013, 10 forestry workers died in New Zealand and the country's first forestry related manslaughter charges were laid.

Technicalities

John Yaldwyn, CTO and director of 4RF, a company that has sold radio gear into 140 countries, spoke at length of the lessons learned from data gleaned from operations of major utilities operations in the US. In particular, he spoke on managing the connection of broadband networks and IP networks to relatively narrowband radio systems, and gave many examples of how it can be done.

"In the past, narrowband radio in a way has had to apologise to the broadband system for its lack of capacity. But that's now changing," he said. But even though it's changing, "it's very important that we are aware of some of the things we need to do to systems that run on IP networks, in terms of security but most particularly in terms the actual information to be transmitted".

Chris Blunt, Axenic's director/consulting partner, and Ahmed ElAshmawy, the company's senior consultant, gave an interesting presentation on securing SCADA networks from attacks, pointing out the various attack vectors and what can be done to fix them.

The bigger picture

Roger Kane, managing director of Vicom, spoke of some of the seismic changes that are occurring in the industry, especially the changing nature of technology and the kind of people involved.

"I'm guessing that, being kind, the average of the people in this room is 45," he said. "Hopefully at the end of [my] presentation, you'll be as convinced as I am that in five years' time, the average age will be 35. We've seen, I think, quite a significant change in our industry, which is going to change the kind of people who are involved in it and significantly increase the number of younger people involved."

continued ➡

Radio Spectrum Management's Chris Brennan, compliance manager, and Fiona Johnson, senior policy advisor in the Radio Spectrum Policy & Planning Unit.

Ross Spearman, CTO of Tait Communications — and until recently the CTO for Ericsson in the US — spoke of how recent standardisation work, and public/private broadband initiatives, are rapidly advancing the capabilities of broadband LTE networks to serve the critical communication sector.

"People have been predicting the demise of LMR for a long time — 10, 15 years," Spearman told the assembled audience. "With LTE, you now have another round of predictions for LMR is going to go away. I'm not going to make a prediction one way or another… I'm just going to talk about what's going on around the world, what's the status of standards, and really, given where we are today, what is a sensible path forward."

As mentioned above, most of the presentations, including Spearman's, are available on the Comms Connect Wellington website.

Peter Clemons, founder and managing director of Quixoticity, gave a very thought-provoking presentation on the evolution of mobile communications and looked at where 4G and 5G technologies are heading. See the separate article elsewhere in this issue for a full run-down on Clemons' presentation.

RFUANZ

The RFUANZ annual dinner was held on the evening of the first day and was a fun event. A local comedian and magician, Brendan Dooley, provided the entertainment and MC duties, and put on a great show. The crowd needed some warming up and Dooley had to work hard to get them going, but with a bit of help from some punters who 'volunteered' to go up on stage and participate in his magic routines, he soon managed to break the ice and had the room in stitches. (I won't name the volunteers, but I hope you're still enjoying your balloon animals.)

The new RFUANZ committee had been chosen earlier that day, and outgoing president David Thomson introduced the new team, including new president Corey Weir, who is joint owner of Outback Communications in Christchurch. Weir trained as a mechatronics engineer and also completed a master's degree in engineering management. He has five years' project management experience and has been working in the radio communications field since 2010.

Overall, Comms Connect Wellington was very well attended — both the speaker sessions and the exhibition — had a great line-up of local and international speakers, and had a really great vibe to it. I look forward to being there again next year.

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

Industry Talking

2016 has kicked off and already a number of meetings and events have taken place. Our website had been showing its age, so the website subcommittee has been very active in making changes to the ARCIA website with a view to making information more visible for the benefit of members. We need to provide information on topics that concern everyone who uses communications equipment — those who are directly employed in the industry, as well as general users.

The white paper on ANZEX Intrinsic Safety devices has been published and is available from the ARCIA website. (You will also find presentations on this topic at Comms Connect events.) ARCIA is preparing other white papers and guidelines for publication this year, such as the use of CB radios in industrial sectors such as construction.

The association took the decision last year to support the Comms Connect events around Australia for the benefit of our members, and we will continue that support this year. We felt that we needed to provide more content and give people more reasons to give up work for the day and get involved. With the impact the decline of mining is having on some businesses, we need to collaborate more to demonstrate the value of communications across many industry sectors. Comms Connect and ARCIA events are the places where the whole industry comes together, so make sure you make note of the dates for events in your state. The next event will be Comms Connect Sydney on 22–23 June, with the ARCIA gala industry dinner event to be held at the Novatel Hotel in Homebush on the evening of the 22nd.

It is pleasing to report that the relationship between ARCIA and the ACMA is continuing to build and that we are collaborating on a number of issues. ARCIA has also responded to the Department of Communications' call for submissions on reform of the Radiocommunications Act. There is the potential for far-reaching changes in spectrum policy, which is why ARCIA is participating to ensure that the needs of our members and customers are considered.

At this time of year ARCIA renews its Promotional Partnerships, and we wish to thank our existing Partners — their support enables us to provide better services for our members and the industry in general. If you would like to become an ARCIA Partner, please contact us and get a copy of our Partnership Prospectus.

The ARCIA AGM is coming up fast, so now's the time to consider how you can become a part of our vibrant and active association. The AGM will be held in Brisbane on 28 July (the day after the Brisbane Comms Connect mini-conference and ARCIA industry dinner) at the premises of Queensland Comms. Full details will be available soon.

Hamish Duff, President
Australian Radio Communications Industry Association

Digital repeater

Icom New Zealand has launched the IC-FR5200H Series digital repeater, which is compatible with both analog FM mode and IDAS conventional, and NXDN Type-D trunking mode. Digital and/or analog FM modes can be programmed per channel, while the mixed mode operation allows users to receive both analog FM and IDAS conventional modes, and to transmit either mode depending on the received signal.

The product employs a high-performance power amplifier and solid heatsink built into the chassis, providing 100% duty cycle operation at 50 W output. It also features a 12-digit dot-matrix display, five programmable buttons, 32 memory channels and an internal speaker, allowing users to operate the repeater as a simple base station or to check repeater activity.

The Type-D multisite trunking/conventional functions are integrated in the repeater, while the IP network capability extends communication coverage and enables users to remotely control the repeater settings. It also comes with a programmable D-Sub 25-pin accessory connector for connecting external remote control devices.

Other features include: CW ID transmission; ±0.5 ppm high frequency stability (digital mode); 2U low profile for 19″ rack mount; digital voice scrambler provides 15-bit key (about 32,000 codes); built-in inversion voice scrambler and built-in audio compander (analog mode); PTT priority setting (Local Mic., external PTT or repeater operation); 5-Tone and DTMF encoder/decoder (analog mode); and low-voltage alert (analog mode).

Icom New Zealand

www.icom.co.nz

OPERA ON THE RADIO

The Sydney Opera House needed a new rebroadcast system installed in time for New Year's Eve.

The Sydney Opera House is one of the world's most famous landmarks and performing arts complexes. With thousands of performances and more than eight million people visiting the precinct every year, the building requires a robust radio communications system capable of handling significant operational and public safety challenges.

RFI was tasked with updating an ageing rebroadcast system to provide consistent, reliable critical communications coverage for Opera House staff and security, as well as ambulance and fire services, in an iconic and challenging building. The company was asked to integrate the new system into the existing infrastructure, adding to the complexity of the design.

The radio system's ultimate goal was to ensure consistent and reliable coverage throughout the entire building and to eliminate the potential for coverage blackspots. In addition to aesthetic requirements, the installation also had a very tight deadline, as the system needed to be commissioned prior to Sydney's world-famous New Year's Eve celebrations. Work had to be organised around numerous performances and noise-sensitive concerts, with only 40 days spent on-site.

RFI delivered a flexible and feature-rich rebroadcast system that included bidirectional amplifiers with RFOF capability; UHF DAS, including coupling solutions and high-performance radiating cable; a comprehensive discreet antenna system featuring TLA600 low-profile antennas and SMD base station antennas; and more than 600 m of radiating cables throughout the entire Opera House, including theatres, concert halls, corridors, basements, service alleys and plant rooms. Due to the unique architectural design of the Opera House, there were limited opportunities to mount on ceilings and walls; thus, the discreet solution was designed to maintain building aesthetics. EME and RF signal testing was performed in 80 internal test points and met the required -90 dBm receive signal strength each time. The company measured RSSI and BER (a maximum of 3%) in approximately 80 internal test points, meeting the required -90 dBm receive signal strength at the nominated locations throughout the entire Opera House. A further 20 test points external to the Opera House were used to test edge of coverage and ensure the internal system did not bleed into the far surrounding of the area and affect radio affiliation with the macro network. The project was rolled out and completed with zero incidents and zero lost-time injuries, in line with RFI's stringent OH&S policies. All work was completed ahead of schedule.

RFI delivered an on-time, robust radio communications system compatible with the existing UHF GRN and capable of handling the extensive operational and public safety requirements in and around the Sydney Opera House.

RFI
www.rfi.com.au

Spectrum analyser

Rigol has added the DSA832 and DSA875 models to its DSA800 series of spectrum analysers, which offer a bandwidth range from 9 kHz–32 GHz (DSA832) and 9 kHz–7.5 GHz (DSA875). The series features a widescreen display, compact design and simple-to-use interface and operations, making it suitable for benchtop or field apps in RF and wireless testing and production. Using Rigol's digital IF filter technology, the series can measure smaller signals. The device enables users to distinguish between small signals by frequency on the smallest bandwidth setting, making it possible to discern signals with a frequency difference of only 10 Hz.

The technology almost eliminates the errors generated by filter switching, reference level uncertainty and scale distortion, as well as errors produced in the process of switching between logarithmic and linear display of amplitude when using a traditional analog IF design. Compared to these designs, the digital IF reduces the complexity of the hardware, the system instability caused by channel ageing and the temperature sensitivity that can contribute to parts failure.

Using digital IF technology also improves the bandwidth precision and selectivity of the filter in the devices, thereby minimising the scanning time and improving the speed of measurements. The models also feature RBW that is settable down to 10 Hz and a DANL (displayed average noise level) down to -161 dBm (typical). An EMI filter, quasi-peak detector kit and tracking generator are also available for these models.

Emona Instruments Pty Ltd
www.emona.com.au

Portable digital radio terminals

The MOTOTRBO E-series mobile and portable digital radio terminals from Motorola feature Wi-Fi for easy software updates and GNSS GPS/GLONASS for outdoor tracking.

The radios come with Bluetooth Low Energy for indoor tracking, an integrated accelerometer, text to speech and a silent alert. With enhanced durability and clearer audio than previous models, the radios offer users longer range capabilities. Also included is improved hazardous location certification and up to 28 h battery life for the portables.

These features can be combined with applications that provide operators with visibility of their radio users, tools for WH&S compliance, simplification of workflow processes, job ticketing, event recording and over-the-air management, enabling users to closely link operational needs with the capabilities inherent in MOTOTRBO terminals.

Master Communications & Electronics Pty Ltd
www.mastercom.com.au

Data modem radios

Icom NZ has introduced the IC-F5122DD series of data modem radios which will allow businesses and organisations to send data/information over a radio network. It is suitable for a range of applications such as vehicle management, traffic monitoring and remote system management for utilities (eg, water plants, electricity meters) and oil (eg, pipelines, well drilling).

The 'data transceiver' allows point-to-point and point-to-multipoint communication. One radio can communicate with another radio or multiple units with individual, groups and all data calls. The radio may also be useful for telemetry and low-speed supervisory control and data acquisition (SCADA).

The series uses licensed VHF/UHF bands and delivers 25 W of high output power from a MIL-STD rugged chassis. This general-purpose transparent data modem also features serial and Ethernet interfaces for greater flexibility, a data encryption function (500 codes) and 128 channels. Other features include: 9600 bps (at 12.5 kHz) and 4800 bps (at 6.25 kHz) data mode programmable; RS232 and RS232 + Ethernet versions; fast data transfer using 4-level FSK modulation, suitable for real-time data monitoring; BNC antenna connector; as well as optional CS-F5120DD, programming software and OPC-2218LU, USB type programming cable.

Icom New Zealand
www.icom.co.nz

Enclosed Yagi

The LPY698-2700 from ZCG Scalar is a fully enclosed log-periodic Yagi. It covers the entire 4G, 3G, GSM and LTE mobile phone networks in the UHF 698–960 MHz and 1710–2700 MHz frequency range.

The product comes with an N-type female fitted to a 200 mm cable tail exiting from the rear of the antenna and a maximum power rating of 250 W. It delivers good performance with 11 dBi within an enclosed radome, protecting the radiating elements from environmental damage.

The enclosed Yagi is recommended for fringe areas where an external antenna is required and is suitable for the home or office. It is simple to install and comes with all necessary mounting hardware, consisting of an anodised aluminium mount bracket attached and two 50 mm-diameter U-bolts.

The product can be used as a single unit or in a pair; however, a phasing harness and cable assemblies will need to be purchased separately.

ZCG Scalar
www.zcg.com.au

COASTAL CONTROL

Gone are the days of 'octopus operators', as Geraldton's Volunteer Marine Rescue station upgrades its radio control.

The Geraldton Volunteer Marine Rescue station. Image courtesy Don Pugh/Flickr/CC.

For recreational boaties, getting out on the water is largely a relaxing endeavour. But in the event of trouble, whether that be engine failure or something more serious, having reliable communications with rescue authorities ashore is one of the most important things.

A number of different organisations in Australia provide emergency communications for mariners. In the Western Australian city of Geraldton, it is the Geraldton Volunteer Marine Rescue (VMR).

The Geraldton VMR has recently transformed its operations, going from an outdated set-up where operators almost needed octopus-like tentacles to operate eight separate radios to a much-improved solution in the form of a dispatch console.

Ian Beard, communications and media officer for Geraldton VMR, said that simplifying the dispatch system has revolutionised his facility.

"Before changing systems we had eight radios, each with their own microphones," he said. "That included four monitoring marine VHF channels, two monitoring the 27 MHz marine channels, one monitoring HF SSB and one monitoring the UHF CB emergency channel. It was very complicated to operate."

Amazingly, all eight consoles were usually monitored by a single operator, said Beard.

"One of the problems we had was keeping track of which radio was going off — you had to be paying absolute attention," he added.

"Often on the marine VHF we'd have a call coming in on channel 16 for someone to log on, while somebody else would be wanting to call for information on another frequency, and it could be very difficult."

To have the ability to conduct rescue or recovery missions effectively, Beard and his team realised that something had to be done to make their communications more efficient. And that led them to a RediTALK RoIP system from Omnitronics.

"Things are way better with RediTALK, it combines everything into one console," said Beard. "When we moved to the RoIP system we bought three laptops and put the software on them, and now we can monitor from basically anywhere there is a decent internet connection." The challenge involved with keeping track of which radio was broadcasting on which frequency is now a thing of the past, thanks to the simple, all-in-one solution.

"RediTALK has a follow active function, so if somebody calls in then a button on the console is activated and locks on — so you know at a glance which frequency you're operating on," said Beard. "Plus it's already in the mode for transmission, which makes it a lot easier."

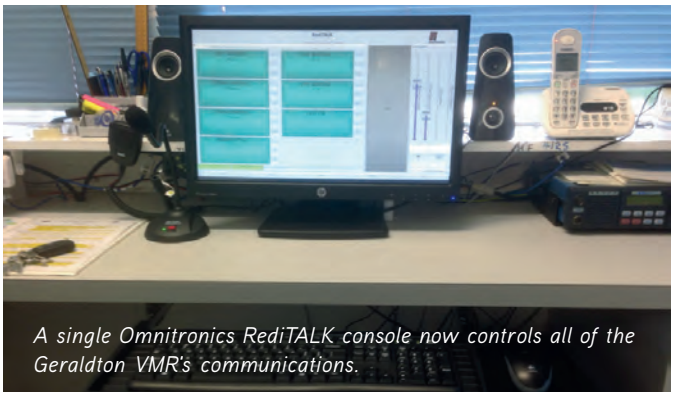
Being a volunteer organisation, Geraldton VMR has a reasonably regular stream of new operators circulating through, all of whom need to be brought up to speed on the communications system. Whereas training previously was a time-consuming and sometimes overwhelming chore, with RediTALK it's easy to get new personnel ready to go.

"The complexity of the old system was a huge inhibiting factor, and we had a few eager volunteers who couldn't deal with

continued

> BEFORE CHANGING SYSTEMS WE HAD EIGHT RADIOS, EACH WITH THEIR OWN MICROPHONES.

Prior to the RediTALK RoIP upgrade, operators had to manhandle up to 8 separate radios.



A single Omnitronics RediTALK console now controls all of the Geraldton VMR's communications.

it," said Beard. "RediTALK has made that training process a lot easier. We have 15–20 trained operators at the moment, and the flexibility of the system means out-of-hours monitoring can be handled much easier, shared around rather than it all landing in the lap of one person."

Beard hopes similar stations on his network will soon jump on board.

"The Marine Rescue Association of WA is trying to get RediTALK installed across the whole network, and the more people using it the better," he said.

Geraldton VMR is just one of many marine organisations using Omnitronics' dispatch solutions. Others include Surf Life Saving Australia and New Zealand, ports in Sydney, Port Hedland and Antwerp, and other sea rescue organisations throughout Australia, New Zealand and Canada.

Omnitronics Pty Ltd
www.omnitronics.com.au

Remote spectrum monitoring system

The DS1620 SpectrumPROFILER remote spectrum monitoring system from Deviser Instruments is designed to reduce the time, cost and complexity associated with the standard approach of detecting, identifying and removing interference signals originating from licensed or unlicensed communications systems.

The device enables mission-critical operators such as defence, antiterrorism units or law enforcement to eliminate signal interference in hours, while simultaneously improving overall service reliability. Designed with high performance in mind, the product can sweep the wireless spectrum at rates of up to 30 GHz/s to detect signals with periodic, transient or short 'bursty' transmission signatures. With an average noise level of -158 dBm and a spectral purity of -95 dBc/Hz at 10 kHz, problematic signals are quickly detected, identified and processed as they manifest in real time.

Configured in a compact, rack-mountable form factor, the spectrum monitoring system can be deployed as a single functional unit or configured as a unified networked solution spanning any region. It offers auto-positioning sensors that extend the built-in features of the base DS1620 monitor, while true geolocation functionality enhances the system with powerful signal triangulation technology that can precisely pinpoint any signal of interest. Once a signal is identified, the product provides operators with simple and secure remote access options that include TCP/IP Ethernet over VPN capability and integrated web services.

Deviser Instruments

www.deviserinstruments.com

Magnetic microphone holder

The Magnetic Mic microphone holder from Innovative Products is designed as an alternative to the conventional hang-up clip to help users stay focused on the road when picking up and returning their radio microphone to its holder.

Consisting of a magnetic base piece for a vehicle's dash or console, the product comes with a disk-shaped universal adaptor which slots over the back of the microphone, allowing it to attach to the base when in a holding position. Users only need to get the microphone up close and let go, as the strong magnetic pull will securely return the radio microphone to its holder.

The conversion kit features a sleek unibody construction made from aerospace-grade materials and is highly durable. Users can install the product anywhere within reach, and not necessarily in sight, while still enhancing safety by reducing distracted driving.

RFI

www.rfi.com.au

Software platform for mobile network optimisation

R&S NORA, jointly developed by Rohde & Schwarz and SwissQual AG, is a software platform for mobile network optimisation that enables users to design more efficient and productive drive tests.

During drive tests, smartphones and scanners are used to collect exact positioning data and high-resolution coverage data for multiple technologies.The tool is therefore suitable for mobile network operators, infrastructure vendors and their service providers, and regulators. It helps users measure, analyse and report the performance of mobile networks and the offered mobile services.

Several software packages available include: the basic package, which enables users to define measurement scenarios in the office and replay recorded drive tests on their PC; the measurement package, which allows users to perform the actual measurements in the field; and the data investigation package, which enables users to post-process, analyse and report results from multiple files.

The software platform offers several options that cover a range of analysis tasks for optimising, verifying and troubleshooting mobile networks. The software detects problem spots by providing detailed statistics; for instance, on download speed or dropped calls. Network operators are able to accurately measure the real end-user experience, while measurement results are summarised in a PDF report. A flexible licensing solution allows combinations of permanent, portable and time-limited analysis and measurement licences to meet various needs.

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

Trunked radio system

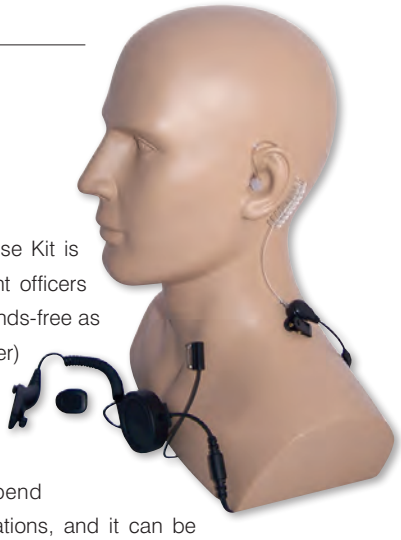
The MOTOTRBO Capacity Max trunked radio system from Motorola is built on a distributed architecture for voice and data to deliver a scalable communications solution that maximises the benefits that DMR technology provides.

Fully compliant with the ETSI DMR Tier III mode of operation, the system's architecture is optimised for high performance, high efficiency and scalability. Management tools help network operators manage network configuration and fault conditions, and over-the-air programming ensures administrators can reach every radio without disrupting operations. These features also lower the cost of ownership, particularly for operators that need to cover wide areas.

The network has layers of redundancy, with optional servers, switches and repeaters available. Security is a priority throughout the system — all voice, data and control traffic within the IP network is encrypted, and all radios are securely authenticated. The product takes advantage of next-generation terminals and third-party applications to provide an entire communications ecosystem.

Master Communications & Electronics Pty Ltd
www.mastercom.com.au

Tactical response wireless PTT



The Wireless PTT Tactical Response Kit is designed to allow law enforcement officers or other critical personnel to be hands-free as the Wireless PTT button (transmitter) can be hidden in a pocket, secured to a forward pistol grip or secured to the steering wheel of a vehicle.

Law enforcement officers depend on fast two-way radio communications, and it can be dangerous for them to remove their hands, or their attention, away from the situation at hand. The tactical response design features a long cable from radio to a large, positive-action chest-mounted PTT, and a short cable from the large PTT to earpiece. There is no need to charge batteries, as the product has been designed to be pressed 100,000 times (over approximately two years) before the button needs replacing.

The device is also IP67 rated and waterproof. Any CRS Accessories earpiece option can be used with the custom harness, while users operating a portable radio can secure the product to the steering wheel in order to go hands-free.

CRS Accessories
www.crsaccessories.com.au

Hearing protector headset with two-way communications

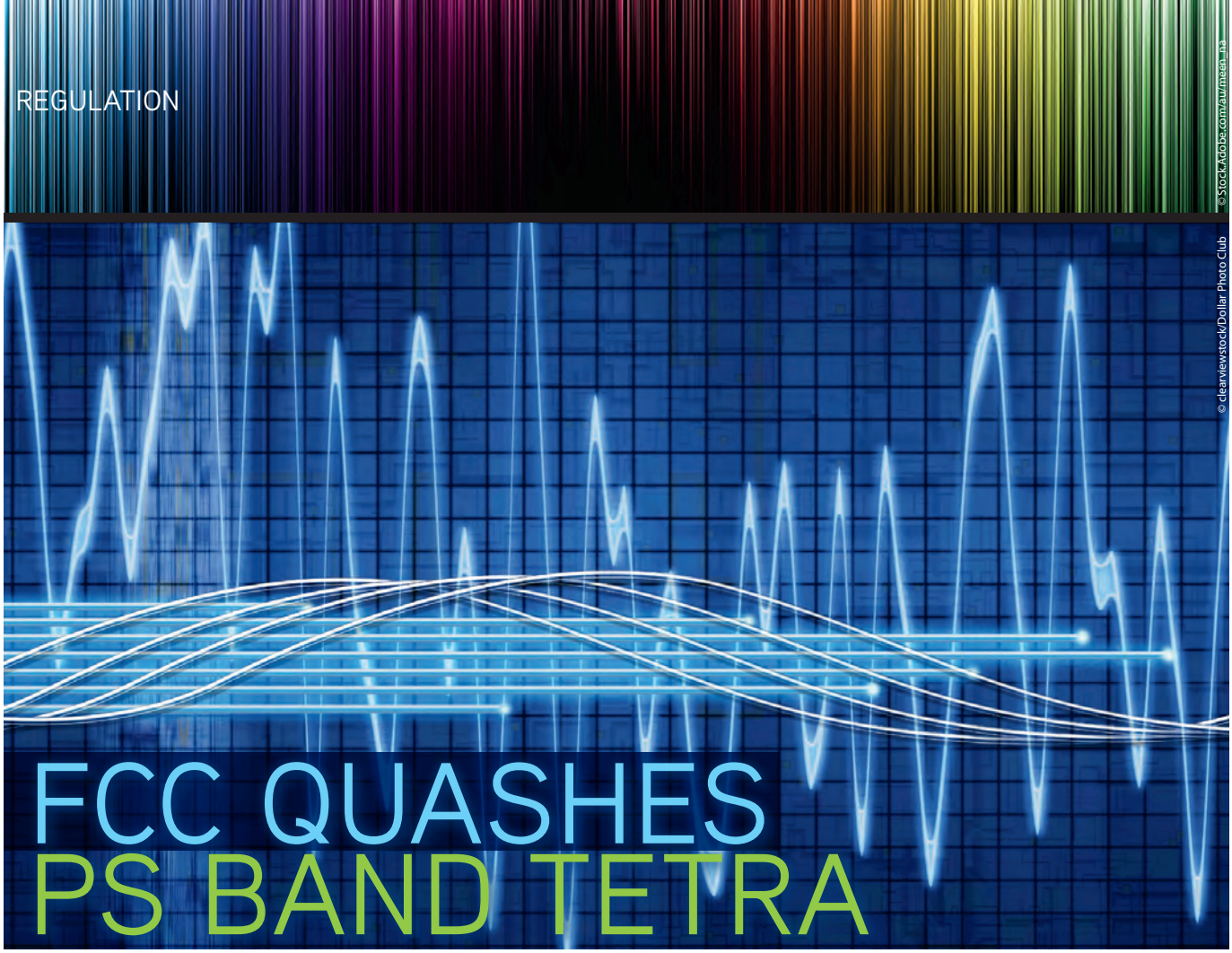
The 3M PELTOR LiteCom Pro II Headset is a hearing protector with built-in programmable two-way communication radio, a level-dependent function and an external audio input.

The noise-attenuating headset provides hearing protection in environments with potentially hazardous noise and is approved for use in potentially explosive atmospheres, according to ATEX/IECEx. It features voice-operated transmission (VOX), facilitating hands-free operation; up to 30 programmable radio channels in the 450–520 MHz frequency; an outdoor range with maximum output power up to 3 km; an operating time of up to 17 h using the 3M Peltor ACK08 Battery; and four conveniently positioned function keys and voice-guided menus to handle all modes and settings.

The headset offers headset-to-headset communication and can be integrated with similar professional radio communication systems. The level-dependent function helps users hear important sounds in their surroundings and to communicate with people standing close by in noisy environments, without compromising hearing protection. In addition, the selective squelch function with CTCSS tones or DCS digital codes allows multiple users to work on the same channel without listening to each other's communication. An accessory cable with a PTT button is available separately, enabling remote PTT control of the built-in radio.

RFI

www.rfi.com.au



FCC QUASHES PS BAND TETRA

TETRA community stunned by FCC ruling on public safety bands.

The Federal Communications Commission (FCC) has effectively prohibited the use of TETRA systems in the US on National Public Safety Planning Advisory Committee (NPSPAC) frequencies in the 800 and 700 MHz bands, according to a ruling issued on 25 April.

TETRA is widely used around the world, but has only recently begun to gain a foothold in the USA, using non-public safety spectrum.

"In this Report and Order, we adopt rules that guard against interference to critical public safety communications in the 800 MHz National Public Safety Planning Advisory Committee (NPSPAC) Federal Communications Commission FCC 16-48 2 band1 (806-809/851-854 MHz) by confirming the emission mask applicable to digital transmissions in the NPSPAC band," the order states.

"In so doing, we lessen the possibility that first responders will encounter harmful interference in the NPSPAC band and provide certainty to manufacturers concerning the capabilities required of radios used for interoperable communications."

"The commission also declined to permit TETRA on the narrowband portion of the 700 MHz public safety band, noting that TETRA does not conform to the interoperability standard for the 700 MHz narrowband public safety band interoperability channels," the order added.

As well as the TETRA ruling, the FCC order stipulates that public safety radios must "have analog FM capability when operating on 800 MHz, VHF and UHF public safety mutual aid and interoperability channels".

FCC Commissioner Michael O'Rielly issued a statement in which he said that he agrees with the majority of the ruling but does not support the analog-FM section.

"I largely oppose any type of technology mandate," O'Rielly said in his statement. "Today's item requires that all public safety radios operating on the 800 MHz, VHF and UHF mutual aid and interoperability bands must have analog FM capability. While I understand the pursuit of interoperability on interoperability channels, industry — despite not having a technology requirement — has adopted FM analog as the de facto standard in these bands.

"Therefore, this requirement seems unnecessary. In fact, what happened here is the preferable approach — industry determined the best means to produce interoperability. Once a technology is set in regulatory stone, innovation and investment may be deterred or, if a better technology is or becomes available, it could take years to update our rules to reflect such advancements. And, frankly, it seems ridiculous in today's digital world to be requiring that devices have less-efficient, analog technology."

The TETRA ruling follows on from earlier orders, which the FCC said left some ambiguity over which radio technologies could be used on public safety spectrum. It was Harris Corporation that had filed the petition with the FCC seeking a ruling on the issue, which led to the latest order.

"The FCC's decision on this matter delivers an important victory for public safety, and Harris applauds the commission for taking swift action that will both protect public safety communications from interference and promote interoperability," said Dennis Martinez, CTO for Harris Public Safety and Professional Communications, in a statement.

"Upon observing the imminent risks posed by low-power TETRA technology in the NPSPAC band that would have subjected public safety communications to interference, Harris Corporation brought its challenge to the commission.

"Harris engineers argued a strong case based on highly technical and practical merits and are pleased that the commission has sided with public safety."

You can read more about the FCC's ruling here, including toing and froing with potentially affected vendors such as PowerTrunk, which has TETRA contracts with New Jersey Transit and New York's Metropolitan Transportation Authority.

Test and alignment software applications

Cobham has released two automated test and alignment software applications to support the Motorola APX 8000 Radios. The two software applications are available as options to both the 3920B Series Analog and Digital Radio Test Platform and the 8800 Series Digital Radio Test Set. Both applications fully automate APX 8000 radio testing and alignment. It also ensures optimum radio performance in less time while minimising service and support costs for end users and dealers.

The 3920B, with its low phase-noise RF signal generator, is the primary radio test system approved by Motorola for automated testing and alignment of the APX series of radios. The 3920B has undergone extensive testing and approval by the Motorola Continuing Product Engineering (CPE) group for the APX radio. The 8800S also offers APX testing and alignment capabilities while providing 'pick up and go' capabilities for field test applications.

Cobham AvComm

www.aeroflex.com/ats

Dual-input headset

The Dual Input Heavy Duty Headset from CRS Accessories goes over the head and enables users to connect one headset to two different two-way radios. The product is suitable for all industry types, including critical communications, manufacturing and production.

There is a separate PTT for each radio (one red and one black PTT on each earmuff), while there is also a 'listen only' aux input jack for receiving audio from a third device, such as a scanner or MP3, if required. The boom microphone comes with an Amplified Dynamic microphone for high-noise environments, while there is an option to be fitted with an Electret or Standard Dynamic microphone. Users can choose PTT inline cable, PTT earmuff cable or a combination of both options. If the PTT inline option is chosen, the PTT earmuff still operates.

The product features an NRR 24 dB rating and has been manufactured with added strain relief, meaning that all the pressure is placed on the Kevlar-reinforced cable. If the cable gets caught, eg, in machinery, the strain-relief mechanism prevents damage occurring to the earmuff, which can be expensive to repair or replace.

An Interchangeable Radio Interface Cable allows one headset to suit different model radios. The device also comes with foam ear pads; however, gel ear pads for added comfort are also available.

CRS Accessories

www.crsaccessories.com.au

REGISTER TODAY FOR YOUR

FREE SUBSCRIPTION

If you live in Australia or New Zealand† and your job title matches those on this form, we will deliver you 6 complimentary issues a year!

FOUR QUICK WAYS TO REGISTER

- WWW.CRITICALCOMMS.COM.AU/SUBSCRIBE
- EMAIL CIRCULATION@WFMEDIA.COM.AU
- FAX THIS COMPLETED FORM TO (02) 9489 1265
- MAIL THIS COMPLETED FORM TO LOCKED BAG 1289 WAHROONGA NSW 2076

Wrapper number: (if known) | | | | | | |

*All fields required to subscribe to your FREE magazine

NAME*

JOB TITLE*

ORGANISATION NAME*

ADDRESS*

POSTCODE* COUNTRY*

PHONE CONTACT* WORK MOBILE

EMAIL*

SIGNATURE* DATE*

TO COMPLETE YOUR FREE SUBSCRIPTION PLEASE TICK ONE BOX ONLY IN EACH OF THE THREE SECTIONS TO THE RIGHT >

PRIVACY POLICY AVAILABLE ONLINE AT WWW.CRITICALCOMMS.COM.AU/PRIVACY

OPTIONS

I WOULD LIKE TO RECEIVE THIS MAGAZINE ☐ DIGITAL ☐ PRINT ☐ BOTH

ALL MAGAZINE SUBSCRIBERS RECEIVE A COMPLIMENTARY ENEWSLETTER SUBSCRIPTION

† For industry professionals outside Australia or New Zealand, the digital magazine and eNewsletters are available FREE of charge. If you would like the print magazine, contact circulation@wfmedia.com.au for subscription prices in your region.

JOB FUNCTION

(please tick one only)

- ☐ Management - Director/C-level
- ☐ Management - Specialist
- ☐ Analyst
- ☐ Business Owner
- ☐ Comms Tech/Engineer
- ☐ Consultant
- ☐ Contractor/Tradesperson
- ☐ Education/Training
- ☐ Engineer - Electrical
- ☐ Engineer - Electronics
- ☐ Engineer - Process
- ☐ Engineer - Project
- ☐ OHS/EHS
- ☐ Purchasing/Procurement
- ☐ Quality Assurance
- ☐ R&D/Product development
- ☐ Sales/Marketing
- ☐ Student-Undergraduate/Apprentice
- ☐ Technical Officer
- ☐ Technician - IT
- ☐ Technician - Maintenance/Service

INDUSTRY

(please tick one only)

- ☐ Agriculture/Rural
- ☐ Building/Construction
- ☐ Chemicals/Allied Products
- ☐ Communications Systems
- ☐ Consulting/Contracting
- ☐ Defence/Military
- ☐ Education/Training
- ☐ Electrical
- ☐ Emergency Services/Law Enforcement/ Security
- ☐ Engineering Services
- ☐ Environmental Services
- ☐ Finance/Banking/Insurance/Legal
- ☐ Government
- ☐ Health/Medical
- ☐ Hospitality
- ☐ Information Technology
- ☐ Instrumentalities (eg CSIRO)
- ☐ IT - Networking
- ☐ IT - Security
- ☐ IT - Storage
- ☐ IT - Wireless
- ☐ Logistics/Transport/Warehouse
- ☐ Manufacturing
- ☐ Mining
- ☐ Oil/Gas/Coal
- ☐ Retail/Wholesale/Hire
- ☐ Service/Maintenance
- ☐ Telecommunication
- ☐ Testing/Certification (eg NATA)
- ☐ Travel/Tourism
- ☐ Utilities

COMPANY SIZE

(please tick one only)

- ☐ Under 100
- ☐ 100 – 250
- ☐ 251 – 500
- ☐ Over 500

CC

COMMS 2016 CONNECT

Sydney

22-23 June 2016

Sydney Showground

FREE exhibition entry

Utilities | Government | Enterprise | Transportation | Resources | Public Safety

Speakers include:

STATION OFFICER GRAHAM TAIT
Operational Communications Systems Officer
FIRE & RESCUE NSW

ROSS SPEARMAN
CTO
TAIT COMMUNICATIONS

CHARLES EMER
Chief Information Officer/Director Information and Communications Technology
NSW STATE EMERGENCY SERVICE

BIDAR HOMSEY
Principal Consultant, Public Safety & Security, Global Industry & Society
ERICSSON

PHILLIP KING
Acting Managing Director
NSW TELCO AUTHORITY

PLUS

An exhibition with dozens of local and international manufacturers and distributors will have their experts on hand to help you find the solutions you're looking for.

FOUR Training Workshops included

Platinum Sponsors

sepura

Gold Sponsors

rftechnology · tait communications · GMG Solutions · ZETRON

Silver Sponsors

ICOM · visionstream · KENWOOD Listen to the Future

Supporting associations & media organisations

TCCA · DMR · TETRA APPLICATIONS · DMR · LTE APPLICATIONS · IWCE · RFUANZ · dPMR digital · RadioResource INTERNATIONAL

Digital Partner

IT'S HOW WE CONNECT

Delegate Bag Sponsor

MINGARA

Magazine Partner

comms critical
www.CriticalComms.com.au

Association Partner

ARCIA

In conjunction with
THE ARCIA INDUSTRY GALA DINNER
22 June 2016
Novotel, Sydney Olympic Park

Visit www.arcia.org.au to book your tickets

www.comms-connect.com.au

follow us on

Backhaul

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

25 YEARS AGO. The cover of the June/July 1991 issue of *What's New in Radio Communications* featured the Maxon SP 2000 series of VHF and UHF handheld transceivers, which featured surface-mount technology and mil-spec manufacturing standards. GPT-Sepac was reported as winning a contract to supply more than 1000 mobile radios to the Silvertop Taxi Company in Melbourne, while Philips won a $1m-plus contract from the Queensland Government for mobile radios, base stations and other gear for the state's emergency services. OTC launched the OTC Fleetcoms mobile radio service, featuring a network of linked base stations covering each major metropolitan area. We also reported on an Australian world first — a successful test of satellite communications from a light aircraft.

10 YEARS AGO. The cover of the May/June 2006 issue of *Radio Comms Asia-Pacific* featured the Rohde & Schwarz FSH handheld spectrum analyser, which came in 3 and 6 GHz models. In this issue we also reported on Perth's RF Innovations winning a $1m contract to supply digital multimode 100 W paging transmitters for the Victorian Government's statewide Emergency Alerting System. Also in Victoria, the government was embarking on a project to install wireless networks at more than 100 ambulance stations using 802.11a and Bluetooth technologies. Richardson Electronics was reported as opening a sales office in Nanjing, China, and Tait Radio had been signed up as official radio supplier to the Emirates New Zealand America's Cup syndicate. We also reported on what was thought at the time to be the world's longest broadband wireless link — an 86 km-long hop — connecting the Ballarat and Geelong branches of radiology company Lake Imaging. EM Solutions and MIMP were involved, installing a 40 Mbps full-duplex link, with a 2.4 m dish mounted at the 70 m mark of a 122 m-high tower belonging to Geelong radio station KRock.

Spectrum

Towards a new spectrum management framework

From superfast broadband to driverless vehicles, a new generation of satellites to the fast-approaching introduction of 5G, and the Internet of Things (IoT) to smart cities, the RadComms 2016 conference was centred on discovery, disruption and demand — fitting for its theme, Spectrum Reform: Enabling Innovation.

That might sound a bit banal, but the fact is that innovations enabled by wireless communications we have previously only imagined — and maybe were beginning to think might never happen — are now simply a matter of time.

As an example, I showed delegates an extraordinary video clip of the newest Atlas robot from Boston Dynamics. I could have shown a clip of a Google car or a Rio Tinto autonomous truck in the Pilbara. What would they have had in common? Impossible without radiocommunications. Of course, it also illustrates true disruption, and the foundation for this phenomenon was very familiar to everyone at RadComms — broadband connectivity and mobility.

The IoT is an exciting area of growth with the potential for billions of everyday objects to send and receive data through connected networks. Spectrum opportunities and risks for the IoT were discussed at RadComms, including the identification of approaches that could be used to minimise interference from non-compliant equipment. These included the default adoption of 'lowest common denominator' frequency ranges by manufacturers of IoT devices (such as 915–928 MHz for devices operating in the 900 MHz band), as well as the development of low-cost techniques to enable devices to automatically self-configure to frequency ranges suitable for the country of operation.

This discussion built on changes proposed by the ACMA late last year to provide easier access to spectrum for low-power wide area networks that support machine-to-machine communications in the IoT.

The ACMA is also driving innovation in the way essential and emergency services are delivered in the 400 MHz band. These services rely heavily on radiocommunications. The provision of harmonised spectrum for government use in this band has enabled the adoption of new and more effective technologies, able to deliver additional information through data, more robust voice communications and increased levels of interoperability among related services.

Importantly, the federal government aims to further enhance the innovative potential of spectrum through implementing the recommendations of its Spectrum Review. Senator the Hon. Mitch Fifield, Minister for Communications, in a keynote address, spoke about the government's response to the review producing "a more flexible and responsive spectrum management framework".

The Department of Communications and the Arts conducted the review with the ACMA. The review reported in May last year and the government's response was announced in August.

In his speech, Minister Fifield released the government's Legislative Proposals Consultation Paper for the Radiocommunications Bill 2016. It is the next step before the development of an Exposure Draft of new legislation to make Australia's spectrum framework simpler, more efficient and flexible.

The ACMA is working closely with the Department of Communications and the Arts on the implementation of the review, including the supplementary reviews the department is conducting into spectrum pricing and Commonwealth government spectrum use. The implementation of the Spectrum Review provides great opportunities — opportunities we relish — for the ACMA to develop a more efficient and effective spectrum management framework to benefit spectrum users and the Australian community more generally.

Richard Bean was appointed Deputy Chairman of the ACMA in 2010 for a five-year term, subsequently extended until October 2017. He has been Acting Chairman since February 2016. RadComms 2016 presentations, speaker bios and photos are available at bit.ly/1pfHN1Q.

Making Production Safe and Efficient

Hytera Oil & Gas Solutions

Exploration

- Advanced Telecom Solution
- Fast Deployment Solution

Production

- Digital Oilfield Solution

Refinery

- Intelligent Communication
- Smart Work Order System
- Intelligent Indoor Positioning

Transportation

- Digital Pipeline Solution
- Intrinsically Safe Solution

PD702(UL913) PD782(UL913) PD792 EX PT580H UL913 PT790 EX

IECEx FM APPROVED MIL-STD 810G SGS DMR TETRA

Hytera

Get Connected. Stay Connected.

Zetron Integrated Command-and-Control Systems

The success of your operations depends on the success of your connections—between people, between equipment, and between your organization's current and future needs. Zetron's integrated command-and-control systems help you make and keep these vital connections by providing:

Support for more radio, telephony and data interfaces than any other vendor. Supported interfaces include: LTE, TETRA, P25 CSSI and DFSI, DMR, and more!

Redundancy you can count on. Zetron's end-to-end redundant network architecture keeps your communications up and running, even if a fault condition occurs.

A streamlined, easy-to-use GUI that cuts response times.

Support for remote, mobile, and backup operations—with all the functionality of the control room.

ZETRON®

Everything for the Control Room!

IP-based Dispatch • Voice Logging • Video Surveillance and Security • IP Fire Station Alerting • CAD • Mapping • AVL

Zetron Australasia: +61 7 3856 4888 | ausales @zetron.com | www.zetron.com