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## H SERIES



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HR1062

HP702

HP782

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## ON THE COVER



Be heard above all else in any environment or situation with next-level noise cancellation, loudness and clarity. MOTOTRBO R7 is a digital portable radio offering game-changing audio capabilities in a rugged build, future-ready design.

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Features of the MOTOTRBO R7 include a 2.4 inch, 320 x 240 pixel QVGA display for easy navigation, along with front and back microphones for advanced noise cancelling. The powerful forward-facing speaker, positioned behind the keypad, delivers loud and clear audio of 102 phons. Simple connectivity comes from its 2.4 GHz and 5 GHz Wi-Fi plus Bluetooth 5.1.

It has a slim, long-lasting battery for more talk time with a large emergency button with optimised ergonomic design. Factory-installed device certificates authenticate devices on your network to protect against IP attacks and secure onboard processors to guard against unauthorised firmware.

The Motorola Solutions MOTOTRBO R7 provides the onramp to connect with our technology ecosystem: Safety Reimagined, which unifies voice, video, data and analytics onto a single platform, enabling enterprises to work together in powerful connected ways.

With R7, you are ready to go beyond connecting your streamline critical communications and collaborate seamlessly with video security systems, sensors and more.

*Motorola Solutions Australia Pty Ltd*  
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As I write, we are halfway through a federal election campaign. Here is hoping everyone considers their vote carefully and intelligently with full regard to what is best for the nation as a whole as well as what is best for them, plus their electorate.

We appear to be concentrating on the election as a popularity contest and I have always tried to disregard which politician promises what and focus on what their party offers in the way of policies. Difficult to do given the blanket coverage delivered over all media platforms, but if you can, it becomes clearer as to which parties are offering ridiculous carrots they cannot possibly deliver and therefore should be disregarded, even though their rhetoric may strike an emotional chord.

The more difficult part comes in overcoming past preferences. The two major parties appear to be so similar nowadays that it is too easy to just vote with the heart, which may not necessarily be the best option.

As far as our industry is concerned, the piece by the president of ARCIA on page 18 highlights a disturbing move from AMCA with regard to private networks and broadband capabilities. The conversation ARCIA has been conducting has gone on for five years — bureaucracy moves slowly but its decisions can also be long-lasting.

We also have a couple of interesting articles written by people in the industry with regard to our country's response to natural disasters. It has been an incredible few years across a broad band of calamities and it appears there has been a lack of proper, coordinated response across all relevant agencies involved. Spectrum, on the last page, proposes an interesting way that critical communications can fix a major part of

the problem. Check it out plus the article beginning page 30.

All in all I hope your business is moving towards a successful end of financial year and we keep communication together to progress the industry as a whole.



**Phillip Ross, Editor**  
cc@wfmedia.com.au

## June

### Fire and Climate Conference

6–10 June 2022

Pullman Melbourne, Albert Park

<https://fireandclimateconference.com/melbourne>

### International Critical Communications Awards 2022

21 June 2022

Kursalon, Vienna, Austria

<https://www.critical-communications-world.com/iccas>

### Critical Communications World 2022

21–23 June 2022

Messe Wien, Vienna, Austria

<https://www.critical-communications-world.com/>

### Comms Connect New Zealand 2022

22–23 June 2022

Te Pae Convention Centre, Christchurch

[www.comms-connect.co.nz](http://www.comms-connect.co.nz)

## July

### Disaster & Emergency Management Conference

25–26 July 2022

Royal Pines Resort, Gold Coast

<https://anzdmc.com.au>

## August

### APCO 2022

7–10 August 2022

Anaheim Convention Centre

[www.apco2022.org](http://www.apco2022.org)

## September

### ACRNA 2022 Conference

6–7 September 2022

Novotel, Brighton le-Sands

<https://acrna.org/>

## October

### Comms Connect Melbourne 2022

18–20 October 2022

Melbourne Convention & Exhibition Centre

[melbourne.comms-connect.com.au](http://melbourne.comms-connect.com.au)

## December

### Natural Disasters Expo Asia

7–8 December 2022

Singapore Expo, Singapore

[www.naturaldisastersshowasia.com](http://www.naturaldisastersshowasia.com)

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# DRONES AND CONNECTIVITY

## BENEFITING FROM COMMERCIAL DRONE OPERATIONS

*Yoav Amitai, Chief Executive Officer, Elsieht*





Drones are increasingly replacing unsafe jobs in a myriad of industries.

It is no secret that drones are increasingly showing up in places from which they were frequently absent. From videography to inspections to heavy industry, drones are finding more and more real-world applications and their versatility is enabling them to take on more and more missions.

We will take a look at the advantages drones present in the areas in which they are appearing and then we'll look at some of the case studies showing the real-life applications of drones in use.

Before we begin, however, we should take a minute to discuss just how these drones will operate: beyond the visual line of sight (BVLOS) is an extension of line of sight (LOS) and extended line of sight (ELOS) operation.

BVLOS drone operations do not require that the operator be within eye contact of the drone he is operating. Quite the contrary, in the near future we predict that drones will not exist in a 1:1 drone/operator relationship, but we envision large regional drone network operation centres (DNOC) controlling hundreds of drones spread across a region that is hundreds or thousands of square miles in area.

What this means for drone operation is that scalability is a key point in how drones will be used. It may well be commonplace in several years to see a swarm of drones inspecting miles of powerlines, or seeing drones performing surveying and mapping at a large quarry. When the only thing limiting the operation of the drone is battery power and connectivity, the possibilities are vast.

### Advantages

Drones come with several inherent advantages.

Drones are small, which also means that everything related to them is small, from the number of people required to operate one to their carbon footprint and everything in between. Moreover, drones have a positive size/weight to benefit ratio: small drones can complete large missions, far above what you would expect from a drone that weighs under 25 kilograms.

Even the most expensive drones come with a price tag that is a fraction of what it would cost to purchase the crewed vehicles required to complete the same mission, in





... SMALL DRONES CAN COMPLETE LARGE MISSIONS, FAR ABOVE WHAT YOU WOULD EXPECT FROM A DRONE THAT WEIGHS UNDER 25 KILOGRAMS.

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many cases a utility vehicle or a helicopter, plus the expense of a highly trained team of operators. Further costs come in the operation of the drone, which, again, come at a fraction of the cost of a crewed mission.

By operating drones instead of crewed vehicles, especially for missions that are hazardous in their nature, the risks of a technical or other form of mission failure are greatly reduced and limited. The loss of a drone, while inconvenient and involving the cost of purchasing a replacement, is nothing compared to the costs of an unfortunate incident involving injuries or fatalities. By their nature of being uncrewed, drones can be deployed to areas which are hazardous or hostile to humans, such as a chemical spill, a radiation leak or any of numerous other instances where it is imperative to get eyes on an area quickly to get a status update without endangering lives.

The same drone can be used for several different missions and mission profiles, based on requirements. As a result, drones provide great flexibility for their operators.

## Use cases

### Mining

There are approximately 46,000 mines spread across the globe, with almost a third of them in the United States and another third in the Asia-Pacific region. Drones are already being deployed and used in many of these mines. Some of the main tasks performed by the drones at the mines include surveying and mapping and stockpile management.

Drones are able to capture high-quality images of entire mining operations and can do this faster and more economically than the other prevalent methods used today. Mine operators can then increase profits by using this photography to identify valuable pockets of minerals and elements and schedule them for digging.

Drones are also being used for underground surveys, in many cases being done completely autonomously in areas which are too deep or too dangerous for humans to enter.

As for stockpile management, routine volumetric measurements help operators keep track of inventory, plan shipments and

prevent theft. Using drones and utilising terrain models of inventory levels allows the mining companies to track stockpile changes and movements, which then further allows the companies to easily validate financial statements and other transactions.

### Oil and gas

Drones are used in the oil and gas industry to inspect refineries, pipelines and onshore and offshore platforms. Drones are used to monitor both offshore and onshore assets for safety reasons as well as for regulatory compliance purposes. In addition, drones can be used to detect spills, track gas emissions and even inspect flare stacks.

Additional inspection use cases include offshore inspections of oil rigs: cranes, derricks and other hard to access areas; booms and flare tips to better plan for replacement/maintenance; splash areas to look for corrosion.

Onshore refineries can use drones to inspect: chimneys for cracks and anomalies; storage tanks for corrosion and leaks.

### Utilities

The challenge presented by the necessity to inspect an ever-increasing number of powerlines, towers and wind turbines forms a prime opportunity for drone usage, proving the value they create.

Utility companies are using drones to transform the manner in which maintenance and inspection personnel perform their jobs. By distributing highly customisable drones and their command-and-control technology to tower climbers and line crews, surveyors and environmentalists, utility companies are embracing the flexibility provided by drones.

As drone applications evolve beyond the experimental and pilot stages, utility companies are projected to outsource a large part of their standard operating tasks to inspection service providers. These companies then have the option to choose to retain only those internal company-specific and specialised functions.

With an estimation of at least 250,000 communications towers in the United States alone (and with that number expected to grow as 5G rollout continues across the country), routine inspection on an average

of approximately once every three years will require that utilities companies find a new way to drastically increase their productivity. By using BVLOS drones outfitted with high-definition cameras, the need for climbers to scale towers occurs only when repairs are required.

Using drones decreases the need for climbers to perform the work, increasing safety and efficiency. The same holds true for wind turbines.

In the case of powerline inspections, this comes into even sharper focus when looking at the costs associated with the inspections: per mile, helicopter inspection of powerlines can cost anywhere from 5–8 times the cost of using a drone for the same inspections (US\$200–\$300/mile for a drone, versus \$1200–\$1600/mile for helicopter inspections).

## Conclusion

As I mentioned at the beginning of the article, it is clear to see that drones are taking a larger part of the pie when it comes to taking over from humans or assisting companies in ways that were not possible before, either due to costs, complexity or safety issues. The selection of use cases, outlined here, showed how companies in all areas of life are currently, plus in the future will be, successfully making use of drones. The other industries outlined which we did not explore are also taking advantage of the capabilities offered by the drones.

The benefits of BVLOS drone operations are here to stay — it is now up to the various companies and industries to implement them successfully.



*Yoav Amitai is the Chief Executive Officer of El-sight. Their proprietary bonding technology incorporates both software and hardware elements to deliver reliable, secure, high-*

*bandwidth, real-time connectivity — even in the most challenging areas — for stationary, portable or actively mobile situational requirements.*

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## REMOTE MONITORING

- ▶ Monitor and control via easy-to-use and intuitive graphical user interface
- ▶ Monitor AC mains status, battery voltage, output status, output voltage, and system and load currents
- ▶ Battery state of charge and runtime remaining
- ▶ Circuit breaker status
- ▶ Alarm reporting via email

## BENEFITS

- ▶ Resolve power issues remotely, reducing timely and costly maintenance calls to the site
- ▶ Reduce time to resolution, reducing network downtime and increasing your network quality of service
- ▶ Gain visibility to DC power conditions at a site (30-day logging of historical events)
- ▶ N+1 design provides peace of mind for critical sites

## POWER CONTROL

- ▶ Adjustable output voltage and low voltage disconnect setpoints
- ▶ Remotely toggle load distribution module DC outputs on an off, rebooting connected DC devices



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## SATELLITES OVERCOME RUSSIAN INTERFERENCE IN UKRAINIAN COMMS

Technology billionaire Elon Musk's company SpaceX has launched the Starlink satellite broadband service in war-hit Ukraine. The latest development highlights the significance and future potential of low earth orbit satellites (LEOs) across key applications, says GlobalData, a data and analytics company.

Reportedly, Starlink terminals receive internet from SpaceX's 2000 satellites to allow users to get online even if their service has been disconnected.

GlobalData's FutureTech Series report, 'Internet from Sky: Can LEO Satellites Transform the Future of Connectivity?', reveals that the growing deployment of a large group of LEOs, often dubbed LEO mega constellations, could herald the next era of connectivity with their potential to address the gaps in internet adoption and infrastructure access in remote areas that are not served by terrestrial and traditional satellite networks.

LEOs are touted to play a key role in connecting millions of IoT-backed devices and sensors, managing the boom in internet users and minimising the digital divide to strengthen community resilience. At present, LEO projects such as Amazon's Kuiper, SpaceX's Starlink and OneWeb are aiming to bridge the digital divide and offer internet services with low latency and high-speed broadband connectivity to remote and unserved communities globally.

## WA POLICE AND MOTOROLA DELIVER APPLE CARPLAY MOBILE APP

Motorola Solutions and Western Australia Police have delivered a public safety mobile application that operates within Apple CarPlay.

The integration extends the use of WA Police's OneForce Core application, enabling frontline officers to manage key operational workflows from within their police vehicles through CarPlay. Drivers can also use voice control features for safe operation while staying focused on the road.

The technology is based on Motorola Solutions' PSCore public safety mobile application that integrates critical operational information from multiple WA Police systems, presenting it through a single interface.

The mobile application helps more than 5000 of WA Police's frontline officers to work more safely and efficiently every day. It is already assisting the agency's transition to digital traffic infringement notices, removing the need to process up to 180,000 handwritten infringement notices every year.



## Wireless earbuds

Sennheiser's CX Plus SE earbuds have a brushed matte surface and include active noise cancellation. The compact earbuds securely fit in the ear canal, so they stay in place when listening on the move for fatigue-free all-day use.

The German-engineered TrueResponse transducer delivers high-fidelity stereo sound with deep basses, natural mids and clear, detailed treble. The active noise cancellation function ensures that listeners experience clarity and detail, in noisy environments.

The Transparent Mode feature makes it easy to focus on external sounds when desired without the need to remove the earbuds. This feature is particularly useful in letting outside sound in, so users are more aware of their surroundings.

Users can tailor bespoke commands to ensure that controlling audio, calls and accessing voice assistants is both convenient and intuitive. Each earbud is equipped with a pair of dual mics that optimise speech for calls and voice assistant access to provide clear voice pick-up. The independent earbud use allows the right and left earbuds to be used individually or as a pair.

The buds are rated IPX4 splash resistance and come with a long-lasting battery and portable charging case, providing 24 h of playback time.

**Sennheiser Australia Pty Ltd**  
[en-au.sennheiser.com](http://en-au.sennheiser.com)

## Automotive multi-antenna

With the critical communications landscape in mind, the automotive OEM-style Dual Sharkee is engineered to accommodate up to 15 antennas in a single housing. Suitable for both the US FirstNet and ESN, UK.

Using only a 19 mm (3/4") hole fixing, the 4x4 MiMo 4G/5G antenna covers 617 to 6000 MHz. As an option there are up to 4x GPS/GNSS antenna modules and up to 6x6 MiMo WiFi 6e 2.4/5.0-7.2 GHz.

It is IP69K rated and UN ECE R118.03 compliant. The GPSD version can be fitted with a comms whip.

The 15-in-1 combination antenna solution has available accessories such as the ribbed roof mounting kit, which allows fitment on SUVs and panel vans; plus the magnetic mount adapter for temporary and quick mounting.

**Panorama Antennas Pty Ltd**  
[www.panorama-antennas.com](http://www.panorama-antennas.com)





## 5 Watt Portable UHF Radio

The CP50 is an Australian designed and manufactured Professional 5 watt UHF radio.

Encompassing cutting-edge Digital Signal Processing circuitry, the CP50 delivers a future-proof platform for advanced features and value-added software functionality.

The CP50's unique selectable 5W, 1W and 100mW low power transmit mode coupled with the 2600mAh Lithium-ion battery pack offers extended operational hours.

The CP50 provides a range of features including MDC1200 Compatibility, RSSI and Busy Voting and Man Down and Lone Worker alerts to meet the needs of any work site.

Encased in a compact and rugged design which meets both IP67 and MIL-STD-810G ratings the CP50 provides exceptional durability and coupled with loud and clear 1500mW of Audio Output it ensures reliable communication, even under the harshest conditions.





## EMERGENCY SERVICES TO BE BOOSTED FOLLOWING BUDGET ANNOUNCEMENT

AFAC, the National Council for fire and emergency services, welcomed the federal Budget announcement committing \$1.7 million to the National Resource Sharing Centre (NRSC), made by Minister for Emergency Management and National Recovery and Resilience Senator the Hon Bridget McKenzie. The NRSC, operated by AFAC with state and territory fire and emergency services, facilitates the sharing of resources in Australia and internationally in response to a disaster event.

The NRSC was responsible for moving hundreds of specialised personnel from across the country to Queensland and NSW in February including swift water rescue technicians and flood boat crews, incident management specialists, field crews, command and administration staff, storm crews and community liaison officers. The NRSC has recently re-activated, with more than 20 personnel currently in NSW, including fleet technicians, in-water teams, jurisdictional liaison officers and deployment managers.

The investment will be used to better plan, prepare and deploy resources in Australia and overseas, while keeping in close contact with the Australian Government's National Situation Room.



## CSIRO OFFERS PROGRAM TO PREPARE R&D OPPORTUNITIES WITH DEFENCE

Applications are open for the upcoming Innovate to Grow: NSW Defence Industry program. This is a free, ten-week program for small to medium enterprises in NSW to investigate research and development (R&D) opportunities related to defence solutions.

This program starts Tuesday, 26 April 2022 and applications have been extended until Tuesday, 19 April 2022.

The Innovate to Grow program is a self-paced and virtually delivered program to boost innovation performance of SMEs in high-priority sectors. The course will provide tools and information to better understand what is involved with R&D and key things to consider at each step of the process.

Attendees will be exposed to R&D opportunities and industry knowledge, and will hear from innovation and industry experts and work with a sector or R&D mentor.

This program is open to NSW SMEs (fewer than 200 employees) working in defence from the subsectors: integrated intelligence, surveillance and reconnaissance; enhanced human performance; medical countermeasures; advanced materials; advanced sensors or quantum technologies; autonomous systems. CSIRO notes that they also include participants from a variety of industry subsectors and regions.

<https://www.csiro.au>



## Team management platform

Logic Connect is a multi-bearer, cloud-based team management platform developed by Logic Wireless to allow organisations to take full advantage of the capabilities of modern radio, cellular and Wi-Fi technologies.

Reliability and flexibility are key attributes organisations are looking for in their communications systems and Logic Connect's ability to operate across cellular, land mobile radio, satellite and IoT devices allows users to select the number and type of connections to meet their operational requirements.

The Logic Connect team management platform can be used to: track the location of staff and assets indoors, even in multi-level buildings, and out in the field; receive live emergency notifications; monitor the safety of staff working alone or in high-risk environments; monitor driver performance and behaviour; set service reminders for vehicles and other assets; track the amount of time machinery spends idling to improve efficiency; record voice calls for auditing and training purposes; and produce proof of service reports for maintenance and other activities.

Logic Connect was first launched in 2019, following 18 months of research and development, and is now used by a diverse range of organisations in New Zealand, Australia and the UK. Since launching, additional features have been added to the Logic Connect system and development work is ongoing.

Logic Connect is available on a flexible monthly or annual subscription. The system is hosted within a Microsoft Azure cloud and has full redundancy.

**Logic Wireless Limited**

[www.logicwireless.com.au](http://www.logicwireless.com.au)





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# PTT AS COMMS TOOL IN HOSPITAL EMERGENCY DEPARTMENTS

## STUDY CONDUCTED FOR BETTER COVID-19 PROTECTIONS

*Osama Kentab, Khaled Soliman, Ahmad AAl Ibrahim, Abdulaziz Alresseeni, Khalid Aljohani and Muna Aljahany*

A Saudi Arabian study found a quicker and safer method to inform all hospital staff during the pandemic.

A study was recently conducted during the COVID-19 pandemic to assess the effects of using a smartphone-based push-to-talk (PTT) application on communication, safety and clinical performance of emergency department (ED) workers during the COVID-19 outbreak.

Titled 'A Push-to-Talk Application as an Inter-Professional Communication Tool in an Emergency Department During the COVID-19 Pandemic', the resulting paper was published by Dove Press. The authors were: Osama

Kentab, Khaled Soliman, Ahmad AAl Ibrahim, Abdulaziz Alresseeni, Khalid Aljohani and Muna Aljahany. The first five worked at the emergency department of King Abdullah Bin Abdulaziz University Hospital, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia. The last author is at Clinical Sciences Department, College of Medicine, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia. The paper was accepted in April 2022.

Following is an approved summary of the paper approved by the publisher Dove Press.



provide promising solutions for healthcare professionals.

Instant voice messages sent via push-to-talk (PTT) applications installed on smartphones offer network-based rapid alarm systems that facilitate communication. PTT applications provide instant connectivity as there is no need to dial specific numbers to contact others. They also provide real-time group contact and most of them are affordable: free of charge or cheap.

For these purposes, the use of a voice messaging PTT application on smartphones was mandated at King Abdullah bin Abdulaziz University Hospital (KAAUH), Riyadh, Saudi Arabia, during the COVID-19 outbreak. KAAUH belongs to the Princess Norah bint Abdulrahman University campus.

Participants were invited to fill out an online questionnaire 30 days after using a PTT application for sharing instant voice messages during the COVID-19 outbreak. Ultimately, there were 128 eligible participants.

### The use of the PTT application at the ED

The PTT application (Zello 4.96.3 PTT Walkie Talkie, Zello Inc.) was used to create a specific channel as a radio platform for information sharing and communication among ED staff. Instant voice messages sent via the PTT application installed on smartphones offered rapid alarm systems that facilitated direct and clear communications.

All doctors and nurses were added to the channel and they were trained to use the application without sharing personal data, such as patients' names and medical record numbers. The personal smartphones were packed in specimen bags in a clean area before entering the respiratory zone to limit their contamination.

All staff were instructed to share notifications and emergency information about the patients upon presentation, such as the triage category and the respiratory severity score. Registration officers were also added to the same channel to register patients' data into the ED system after receiving information over their smartphones. All hospital staff subscribed to the PTT channel were regularly notified about patients referred for admission in internal wards or intensive care units, such that they could get prepared and equipped with PPE.

### Study design

An observational, cross-sectional study was conducted at an emergency department (ED) in an academic medical centre. All ED staff members, including physicians such as consultants, specialists, residents, and interns, plus nurses, emergency medical services staff, technicians (X-ray) and administration employees, were involved.

Because of distinct and unique challenges in EDs, where overcrowding in unrestricted-access areas is evident on a 24-hour basis, it is crucial to implement an

effective inter-professional communication and take infection control measures. Communicative disruption in EDs may become more significant with the opening of new isolation areas, which are remote from EDs.

As such, there was a need to improve communication via instant messaging among ED staff to take the relevant precautionary infection control measures upon receiving a suspected patient. An efficient alarm system relies on rapid, secure and non-disruptive tools. Instant messaging through mobile phone applications may





### Effects on communication, infection control measures and job-related stress

After 30 days of using the PTT application, ED staff reported general improvements in all domains of communication and taking precautionary measures during the epidemic within the department.

The highest levels of agreement regarding the impact of the PTT on the performance at the ED was concerning the improvements in preparedness, followed by patient assessment time, and the effects on the overall performance. In total, 94 of the 128 participants recommend the use of the PTT application in other non-COVID-19 areas.

Significant low proportions of the participants agreed that they received fake alerts, voice messages were annoying or they experienced delays in real-time notifications.

### Principal findings

The intradepartmental, inter-professional use of a PTT smartphone application for one month led to significant improvements in communication as perceived by approximately three-quarters of the participants. Additionally, the safety of the staff and the time required to implement preventive measures improved after exchanging the

instant voice alarms through the application. These were reflected in both clinical performance and preparedness.

The novel system ensures quick communication among the staff in the isolation area and those working in the ED in a single press of a button without the need to make phone calls, emails, etc. The results of our analysis can widen the applicability of the alarming system to other isolation areas and the concerned hospital departments, such as infectious disease departments, internal medicine, microbiology and intensive care units.

With the use of the PTT application, our recent findings during the COVID-19 outbreak indicate that various aspects of communication have improved, which include the efforts needed to communicate, improved access to other medical and nonmedical HCWs and improved responses to notifications. Since patient transfer to the isolation area would take approximately three to five minutes, the notified nurses and physicians would have enough time to get prepared and wear PPE. Furthermore, administrative issues would have been resolved since the employees on the same PTT channel would be notified (even while being at home) to intervene immediately, especially when there are no available beds for admission.

### Conclusion

In conclusion, the use of a PTT application in the ED, KAAUH, Saudi Arabia, was associated with self-reported improvements in all aspects of intradepartmental communication regarding instant notifications of receiving suspected patients with COVID-19. This included reduced efforts to communicate, improved staff responses and improved access to other staff members. This was reflected in the safety of staff members via reducing the time required to implement infection control protective measures and giving sufficient time to HCWs to wear PPE before the arrival of the suspected patient.

In addition, the clinical performance improved owing to improved preparedness and reduced patient assessment time. Future large-sized, multidepartmental studies are needed to corroborate the applicability and usability of the promising PTT system.

The assessed PTT application can be generalised to other departments and hospitals dealing with patients with COVID-19 to optimise staff safety and institutional preparedness.

*'Open Access Emergency Medicine 2021 13 189-199' Originally published by and used with permission from Dove Medical Press Ltd.*

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# Industry Talking

It's mid-2022 and the ARCIA committee has been working hard to get things moving again despite the many challenges we are all seeing. The industry continues to work through supply chain issues. Demand in many sectors is strong; however, uncertain delivery schedules are creating an extra layer of cost and complexity.

Events for ARCIA will have started by the time this is published with Sun-downers in Perth and Melbourne; however, main events for Sydney, Brisbane and Melbourne are all set to kick off from July. Comms Connect in both New Zealand and Australia will also make a welcome return. Keep an eye on the ARCIA website for event dates and make sure you come along and engage with your industry peers.

The ARCIA Learning Management System is really taking shape and we hope to have meaningful content available soon. Once released we will be working with members to try the system and of course running free and paid courses for the benefit of members. New content is being made including some new ideas that will be interesting to have feedback on.

One of the activities of the committee and especially executive of the association is to advocate for spectrum. Over the last five years, that role has widened for all kinds of technology including broadband. ARCIA believes that all spectrum should be used to maximise the productivity of the country. That is a simple sentence that tries to encapsulate a very complex regulatory process to manage competing industries, international standards and market needs. The LMR industry has been providing private networks for many different market sectors for over 70 years. As far as ARCIA is concerned, the reasons that people invest in private networks remains the same and new technology options are welcome.

Therefore, ARCIA has been consulting widely and putting our views on this matter to the ACMA. We have made it clear that broadband technologies are not the sole domain of public carriers or wide area licences. As other countries have shown, demand for private networks remains strong with spectrum and innovation a key ingredient. Over COVID our federal government has spoken a lot about local manufacturing capabilities and indeed highlighted telecommunications as a key sector for local manufacturing.

So you would think there is a clear logic for spectrum to be made available for a wider benefit, especially with regard to wireless broadband and the economic potential offered by all types of applications. Regrettably, the approach continually encouraged by the ACMA leads to spectrum being prioritised for the public carriers over other types of services!

Finally, ARCIA has spent a lot of time considering our role in the marketplace and work that a lot of people have put into the association. No-one has more work into ARCIA over the last 10 years than Ian Miller. When we recognised that we needed a paid position, ARCIA had to face up to what we wanted to achieve. We found a way to fund it and although Ian has been an extremely effective advocate for our industry, we need to now take the next step to guarantee the ongoing viability of our industry into the future.

We are at the next inflection point in the history of the association. If you consider the technology and spectrum changes as well as the willingness of industry to embrace innovation, ARCIA must get more active across the entire industry. If we include manufacturers, service providers, critical industries, public safety and all the associated technologies involved there is a lot to cover.

Based on this the committee has decided that we should move the Executive Officer part-time role to a full-time CEO role. Of course, there is a huge amount of work to make this happen, to ensure that our industry is represented appropriately and in a fashion that is sustainable financially.

But now is the time to make it happen.



**Hamish Duff, President**  
Australian Radio Communications  
Industry Association



## Interworking function MCX

Etherstack launched its carrier grade MCX IWF (InterWorking Function) recently at IWCE 2022 in Las Vegas.

The MCX IWF is a telco network element that bridges traditional public safety land mobile radio (LMR) networks with next generation MCPTX (mission-critical push-to-talk) services that carriers are beginning to deploy for public safety agencies globally.

Standards-based migration from existing LMR networks to carrier 4G/LTE and 5G MCX networks requires the use of an MCX IWF to enable secure and robust interoperability between the LMR and MCX domains.

According to Etherstack these hybrid LMR and MCX networks will be commonplace for at least another decade as traditional LMR users migrate to MCX.

The Etherstack MCX IWF directly supports a wide range of P25, TETRA and DMR IWF standards-based protocols including the P25 ISSI, CSSI, DFSI and DMR AIS, as well as RoIP and analogue interfacing capabilities via certified customer premise equipment located at public safety agencies' premises.

The Etherstack MCX IWF additionally supports both LMR network homed subscribers as well as carrier MCX homed subscriber architectures. Other key features include local and geo-redundancy capability, high availability link support and a wide range of LMR-centric supplementary services and call types across the interworking link.

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# HOW RUGGED DEVICES CAN HELP MAKE PUBLIC SAFETY SAFER

Frank Baldrighi, Business Development Manager, Getac\*

To ensure public safety, technology needs to become more rugged to get the job done.

**T**he digital era has seen a great unshackling of technology. Devices essential to business operations have become more portable and seamless in internet connectivity, no longer chained to the traditional office set-up. Administrative tasks that would ordinarily require a dedicated monitor and hard drive set-up can now be completed from anywhere thanks to Wi-Fi accessibility and more efficient data processing.

This renaissance, however, has not been exploited equally. Emergency services and first responders, as well as other operators in the public safety sector, still rely on consumer-grade equipment or, in some cases, handwritten records to manage critical information. This is particularly concerning considering that first responders need to communicate and coordinate effectively during a crisis: quick, accurate and efficient processes are key to saving lives.

The public safety sector can benefit from the digital age by adopting rugged technology. This is a solution that can help these organisations introduce online capabilities into frontline operations while ensuring physical devices are capable of withstanding tough conditions. Rugged technology has been developed to provide unprecedented degrees of communication, coordination and efficiency, enhancing overall public safety.

For members of the public safety sector to operate at peak performance and help keep people safe, the status quo for current operations technology desperately needs to change. Fortunately, rugged technology options are available to make that transition as seamless as possible.

Connectivity is one of the fastest-growing pain points for the public safety sector. Today's rugged devices solve that challenge. They are developed with the ability to establish strong connections with a range of networks, including Wi-Fi, 4G LTE, 5G and built-in GPS. This makes it easy and reliable to conduct real-time information transfers such as patient information or location details in an emergency situation, without the risk of connection dropouts or low connection speeds at critical moments.

From criminal records to patient information and personal backgrounds, members of the public safety sector also deal with mountains of sensitive data. This presents the risk of hacking and information theft, which has serious implications for operators and the people they serve. However, the current crop of largely consumer-grade devices used in emergency situations offers rudimentary security that can be easily hacked.

Rugged technology is designed with security in mind and includes stronger measures to protect sensitive information. This might include the OPAL 2.0 SSD self-encryption technology Trusted Platform Module (TPM) 2.0 and protection from physical tampering with options such as fingerprint scanners, smart cards or RFID readers.

Rugged technology is also manufactured for accountability and user protection. Video documentation and record keeping are essential to ensure emergency responders are protected and future operators can be trained with real-world scenarios. Rugged devices can address these needs with solutions such as body-worn cameras that capture a wide-angle 165° diagonal view in 1080p full HD resolution or compact HD cameras that provide high-definition video quality even in the lowest of light conditions.

Physical durability is an essential factor in public safety sector devices. Consumer-grade devices can be too fragile in intense situations, leading to cracked screens and casings or exposure to the elements. This damage ultimately causes greater logistical setbacks for emergency responders who require constant replacement devices that take time for programming, data uploads and calibration.

Rugged devices are tested to military standards (MIL-STD) and must pass stringent requirements for ruggedness and the ability to withstand shocks, water, drops, dust and moisture. Rugged technology also incorporates greater battery life, so devices can perform for longer periods without the risk of battery failure at critical moments. This provides emergency responders with reliable devices in times of crisis.

Portable, wireless connected devices have revolutionised how organisations operate, letting them streamline administrative processes and increase overall efficiency.

Considering the vital — yet dangerous and often thankless — job performed by operators in the public safety sector, it is high time they had the tools to ensure their duties become safer and more efficient.

*\*Frank Baldrighi is a Business Development Manager at Getac, responsible for managing key relationships in Australia and New Zealand. After joining the rugged device experts at Getac in 2018, Frank has worked to build brand awareness and provide rugged technology across some of the most demanding professional environments including mining, public service, defence and more. Frank has more than 15 years' experience working in multinational companies across multiple geographies.*

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# Radio Matters

It has to be said a lot has changed since the start of the year: a camp-in of protestors on the lawns of parliament; Eastern Europe erupting into war; the cost of living going through the roof; housing prices up in some areas by more than 400%, taking rental accommodation availability to an all-time low; floods up north, drought down south and all with COVID throughout the country: and that is just in little ole New Zealand.

For or against, it is ultra-polarising.

I feel it is time for a radio frequency safety warning. What happens when you wrap a potato in tin foil and add energy?

Among the community of anti-mandate protestors, aluminium helmets served as the protective measure of choice against invasive radio signals. At best this may produce a Faraday cage for your cranium, protecting you from RF or, at worst, produce a passive aerial acting as a parabolic reflector concentrating RF directly into the brain.

The professional radio industry is aware of the dangers of RF and what it can be used for; a little look into the theory is required. Luckily, the hard work has been done.

In 2005 the Massachusetts Institute of Technology (MIT) investigated the efficacy of tin foil helmets. The receiver antenna was placed at various places on the cranium of four different subjects with three different helmet designs and a control volunteer with no helmet. The test frequency swept from 10 KHz to 3 GHz.

Regardless of the position of the antenna on the cranium, all helmets showed the same results: 1. 30 db amplification at 2.6 GHz. 2. 20 db amplification at 1.2 GHz. 3. 20 db attenuation at around 1.5 GHz. 4. No significant attenuation beyond 10 db anywhere else.

In conclusion, the helmets attenuate some invasive radio frequencies but certain frequencies are greatly amplified. These amplified frequencies coincide with radio bands reserved for government and telecommunication companies. So, if there was such a thing as the government's invasive mind-reading and control capabilities, statistical evidence suggests the use of helmets may in fact enhance these.

Some have even gone so far as to suggest that governments may in fact have started the tin foil helmet craze for this exact reason.

On to more serious matters, the Radio Spectrum Management Group, Radio Register of Frequencies (RRF) will soon launch their much needed and updated licensing register. We are also excited that our annual gala dinner and industry awards evening, although now postponed until 22 June, will now be able to host more than 100 people and include overseas guests.



**John Laughton**  
Chairman

*Radio Frequency Users Association New Zealand*

We have waited a long time for this, so please make sure you book early. Partnership opportunities are still available, please see our website for more information and book your dinner tickets on the RFUANZ website.



## UHF radio

The CP50 is an Australian designed and manufactured professional 5 W UHF radio.

Encompassing digital signal processing circuitry, the CP50 delivers a platform for advanced features and software functionality.

The CP50's selectable 5 W, 1 W and 100 mW low power transmit mode, coupled with the 2600 mAh lithium-ion battery pack, offers long operational hours.

The CP50 provides a range of features including MDC1200 compatibility, RSSI and Busy Voting and Man Down and Lone Worker alerts to meet the needs of any worksite.

Encased in a compact and rugged design, which meets both IP67 and MIL-STD-810G ratings, the CP50 provides durability and, coupled with loud and clear 1500 mW of audio output, it has been designed to provide reliable communication, even under harsh conditions.

**GME Pty Ltd**

[www.gme.net.au/au-pro/](http://www.gme.net.au/au-pro/)

## Broadband to LTE communications

The Simoco Wireless Solutions Velocity offers customers connectivity with smart edge computing and access to a range of communication protocols in a single converged platform.

It is designed to handle any critical situation and provide organisations always-on availability expected from a mission-critical business tool. The devices are built for demanding mission-critical requirements in the field, in vehicles and in fixed harsh environments.

A range of products have been introduced and they include: Velocity EC-810 hub providing customers with access to high-speed internet connectivity and voice communications via Ethernet, 4G/5G LTE and Wi-Fi. Additionally Bluetooth 5.1 provides linkage to accessories and NodeRED allows organisations to develop smart workflow management.

Velocity EC-830 provides customers with the functionality in the EC-810 as well as allowing organisations to roam between LMR and LTE using enterprise push-to-talk services.

Velocity Remote Manager is an end-to-end management solution to support the centralised management of remote devices using 4G/5G LTE and /or Wi-Fi.

Velocity is designed for a number of industry sectors including: utilities and mining, transportation, public safety and government.

**Simoco Wireless Solutions Pty Ltd**

[www.simocowirelessolutions.com](http://www.simocowirelessolutions.com)

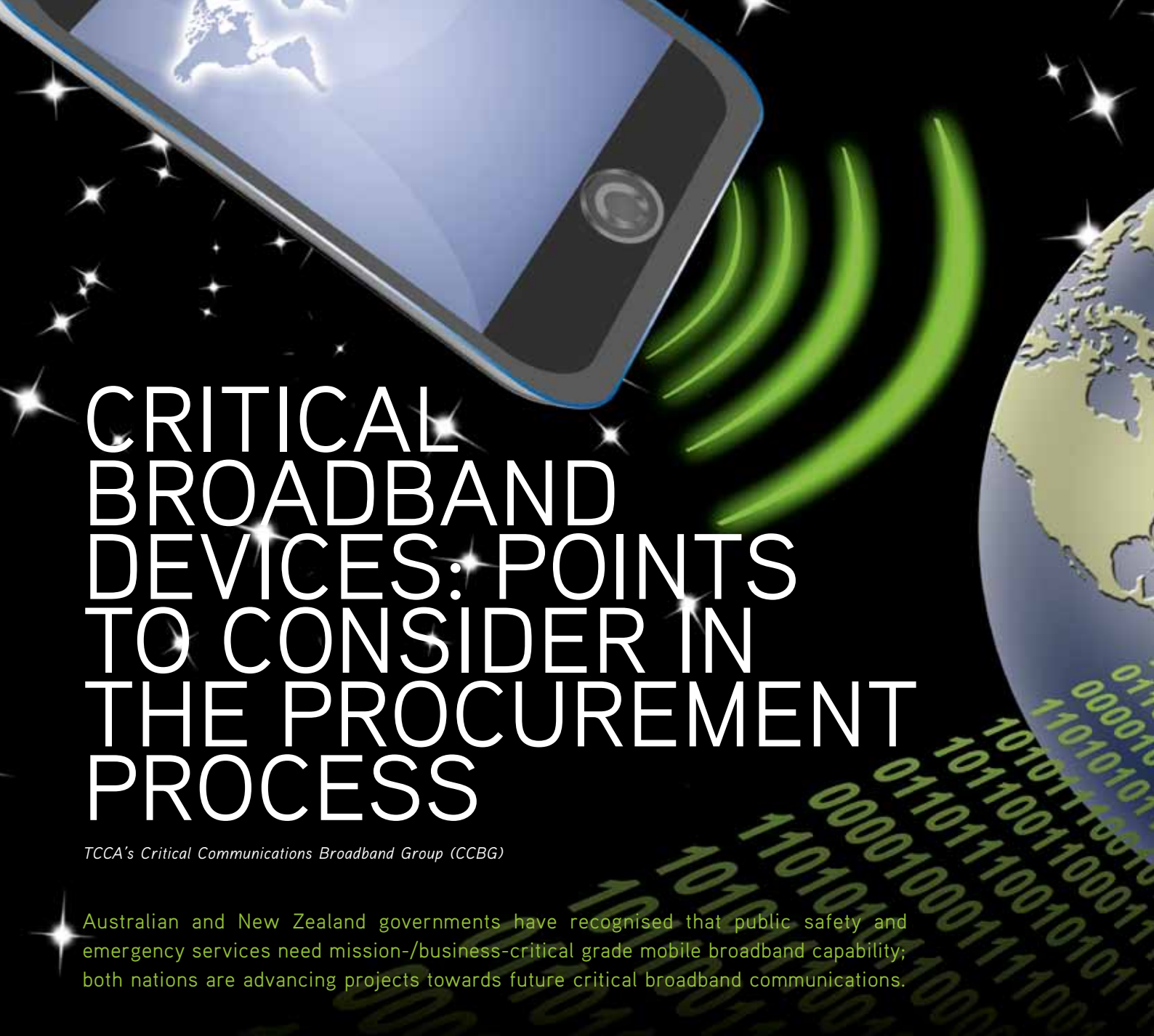




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  - Cloud Based PTT Voice and Video Group Communications within shared environment
  - On Site PTT servers for the dedicated use with a Video broadcasting
  - Push – To – Talk (PoC) portable, car mounted, and highly durable devices
- 
- Machine vision with artificial intelligence and analytics
  - Agriculture monitoring, Animal control, Transport tracking, Face Recognition





# CRITICAL BROADBAND DEVICES: POINTS TO CONSIDER IN THE PROCUREMENT PROCESS

*TCCA's Critical Communications Broadband Group (CCBG)*

Australian and New Zealand governments have recognised that public safety and emergency services need mission-/business-critical grade mobile broadband capability; both nations are advancing projects towards future critical broadband communications.

Today's public protection and disaster relief (PPDR) end-user devices are still mostly built on narrowband technologies, providing mission-critical voice and short messaging services. These services are often available within nationwide PPDR network coverage, utilising dedicated frequency bands.

The narrowband PPDR device ecosystem is well established, including infrastructure and terminal suppliers, system integrators, service providers and resellers. From a device procurement perspective, there are existing frame agreements in place. The solution costs are well known, device lifecycles are long and there are no major changes in the product specifications. For TETRA users, TCCA's interoperability (IOP) process allows for trusted multi-vendor procurement.

The critical communications landscape is, however, beginning to transition to a new era with the adoption of 4G and 5G broadband for mission- and business-critical services. Bringing devices to market that support these new technologies and meet demanding user requirements will require investments by the vendors, as well as commitment from customers in terms of, for example, development support, minimum order quantities, user testing and acceptance.

Many current procurement models (for non-critical use) in user organisations allow device purchases from a range of sources. User organisations can run their own procurements, broadband devices can be leased from IT service companies, or even purchased by individual employees: 'bring your own device' (BYOD).

Device and operating system/software lifecycles of today's broadband devices are short compared to those of LMR radios, even though vendors are doing their best to extend them. The current procurement, testing, certification and approval processes required for PPDR usage therefore need to be adapted accordingly.

Critical broadband devices must meet the demanding requirements of PPDR users — COTS devices will not provide mission-critical capability. For example, devices must be rugged, have dedicated PTT buttons, deliver exceptional voice quality and support long battery life. In addition, to ensure the devices are interoperable and enable true mission-critical services they must support various 3GPP features, such as the mission-critical QCs.





THE CRITICAL COMMUNICATIONS LANDSCAPE IS, HOWEVER, BEGINNING TO TRANSITION TO A NEW ERA WITH THE ADOPTION OF 4G AND 5G BROADBAND FOR MISSION-AND BUSINESS-CRITICAL SERVICES.

When describing their use cases and requirements it is important that the user groups look ahead to how the new broadband technology will transform and enhance their operations. Functionality delivered by existing LMR systems is the reference, but users should not just focus on replicating the voice and messaging functionality and reliability of their existing narrowband system. The evolution from a voice-centric to a data-dominated working environment requires considerable investment in business process redesign, so it is essential that each group fully describes their use cases.

Analysis of use cases could include also other segments beyond PPDR such as transport, utilities and manufacturing. As the underlying technology becomes more affordable more user groups will start using it. For example, one may need to consider the mobility requirements in high-speed train and aircraft (AGA: air-ground-air) communications, which are likely to impact network and device specifications.

Purchasing organisations should detail their specific local operational requirements. For example, the requirement to combine a PTT and phone call so that during a phone call it is possible to listen to the PTT conversation simultaneously. The device should support flexibility to decide the priority of phone calls/PTT calls. In practice this priority will be determined by PPDR policy: for example, in the UK the ESN policy is to prioritise PTT calls over phone calls.

The available spectrum will significantly impact device availability, choice and pricing. It is recommended that those PPDR organisations requiring devices which support unusual bands (eg, B31) consolidate their requirements to drive supplier investment.

Proven compliance with industry standards is key to an interoperable, multi-vendor device ecosystem. It is recommended that PPDR procurers demand compliance with 3GPP Release 12 as a minimum. Currently the 3GPP standards do not define off-network solutions suitable for PPDR use cases; it is recommended that standards-based LMR technologies are used to provide mission-critical off-network communications for the mid-term until the 3GPP D2D ProSe specification matures.

Cybersecurity is an essential requirement for the PPDR market. The potential ven-

dors must be asked to provide information about their device security implementation, cryptographic compliance and possible certifications.

### Test, test and try before you buy

End user testing and user acceptance is needed in every procurement process.

Is the device fit for purpose? After all, end users need to have confidence in the product. It will be difficult to specify every requirement and to document every behaviour.

At what point will the end user be satisfied with the results? When will his/her needs be fulfilled and will he/she be able to take the device into use? If this moment is not well timed it is possible that certain shortcomings/defects will damage confidence in the product/service.

One option to streamline the implementations and the workload that comes with the testing of the available solutions is to allow user testing on an operator-controlled list of devices. This list should contain enough devices to allow the user to fulfil his/her operational needs and allow the operator the control the lifecycles of the devices.

Users should be involved in an intermediate stage of the complete testing process. This way the users would get hands-on experience of existing devices and see the capabilities and potential issues: 'try before you buy'.

The users, however, must be made aware of the technical implementation of the devices. Devices must for example use the designated mission-critical bearers and not be based on best-effort service through over-the-top (OTT) connections. Only then will the functionalities of the device/implementation be judged effectively.

The world of mission-critical smart devices is still developing and not yet fully mature. The ecosystem compared to standard smartphones is still small. It is therefore very important that PPDR organisations, manufacturers, standardisation and testing bodies cooperate to stimulate the growth and development of the mission-critical device market.

This article is based on TCCA's white paper: Mission-Critical Broadband Device Procurement.

*The Critical Communications Association (TCCA)*  
<https://tcca.info>

Vendors must be able to provide information on their existing capabilities and present a roadmap that shows how they plan to meet evolving customer needs and requirements throughout the contract period.

### Understanding user needs

An essential part of creating a mission-critical device procurement specification is to fully understand the user needs. The user community will consist of multiple groups, each with its specific requirements and operational processes.

Once these distinct groups have been identified, close engagement will be necessary to fully understand their use cases and device requirements. This may be achieved via interviews, questionnaires, workshops, etc. It is likely that the diverse needs can be grouped to simplify analysis.



## DC distribution panel

Helios Power Solutions has released the ICT dual-bus, 20-output, GMT-fuse DC distribution panel to its distribution Series 3 line of intelligent DC distribution panels.

The 1RU, 200 A, dual-bus, GMT-fuse DC distribution panel is designed for +24 and  $\pm 48$  VDC installations and supports 100 A per bus, each with 10 GMT fuse-protected outputs supporting GMT fuses rated up to 20 A.

The DISTICT200DF-20BRC includes TCP/IP for remote monitoring and power control of individual outputs, with HTML, SNMP v1/v2c/v3 and email alarms. There are also five digital input contacts for site monitoring sensors, such as door, smoke and fire alarms etc.

Features include: front-mounted fuses, reporting of total system current, individual load current, system voltage, fuse status, alarm reporting via text or email notification, remote individual output power toggling, automatic load shedding disconnects non-critical loads when on battery power. A network watchdog automatically reboots routers or switches when no response is received.

**Helios Power Solutions**

[www.heliosps.com.au](http://www.heliosps.com.au)



## Security gateway

D-Link has launched the Nuclias cloud-managed DBG-2000 SD-WAN security gateway, which offers centralised control to deploy, secure and manage network and internet traffic for all types of businesses or remote workers.

The security gateway is an addition to the Nuclias Cloud range, suitable for managed service providers to offer a cloud-managed SD-WAN security gateway with features including a firewall, VPN connectivity, intrusion prevention (IPS), application control and content filtering.

The gateway provides 1.8 Gbps of firewall throughput and features policy management for users to execute policies across the network for consistency and protection. VPN connectivity enables the decentralised workforce.

The IPS shields the network from modern day threats such as DDoS attacks, brute force attacks or vulnerability exploits, as well as alerting administrators to any irregularities on the network. Dynamic Content Filtering categorises and controls accessible sites to safeguard against malicious websites without requiring additional licences.

**D-Link Australia Pty Ltd**

[www.dlink.com.au](http://www.dlink.com.au)

## Battery storage communications

Battery energy storage systems (BESS) are made up of battery cells that can be combined to make up battery parks the size of several football fields. Such large battery parks need a lot of communication capabilities in order to work. HMS has communication solutions that cater for this application area.

In networking, the protection of components is crucial, both from external sources like lightning strikes and from system-related issues, such as AC/DC noise. BESS often combine a variety of different equipment from different industries within a single application: batteries, BMS, PLCs, fire detection units or air conditioning. To combine different equipment, it is necessary to interconnect various protocols and network standards. CAN, Modbus, BACnet, KNX and other protocols can be linked via gateways from HMS, which handle the all-important data exchange while also enabling centralised control. In addition, these gateways can selectively filter, map and, if necessary, compute the data.

Smart grid gateways enable centralised control as well as remote access for predictive maintenance, logging or data visualisation. The SG gateways also provide cybersecurity features.

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## Impedance frequency range meters

With its supported frequency range from 4 to 10 MHz, the LCX is suitable not only for the vast majority of devices operating at conventional 50 or 60 Hz domestic power frequencies or 400 Hz for aircraft, but also for everything from low-frequency seismic sensors to high-power communication circuits operating at several megahertz.

For engineers selecting suitable capacitors, inductances, resistors and analog filters to match the device application, the meters are designed to provide precision impedance values with accuracy. Higher speed measurements at production-use accuracy for quality control and monitoring are also supported. All the software and hardware required for production environments is available, including remote control and result logging, as well as rack mounting for the instrument and a full range of test fixtures for handling components.

The auto-balancing bridge technology used by the meters supports conventional impedance measurements by measuring the AC voltage and current for the device under test, including the phase shift. This is then used to calculate complex impedance at any given operational point.

As a general-purpose LCR meter, the LCX covers many applications, such as the measurement of equivalent series resistance and equivalent series inductance of electrolytic capacitors and DC-link capacitors. Users can test transformers and measure DC resistance in addition to the full range of impedance measurements.

The range includes two models: the LCX100 covers a frequency range from 4 Hz to 300 kHz, the LCX200 a basic frequency range from 4 Hz to 500 kHz with options to cover all frequencies up to 10 MHz. Both models feature a large capacitive touchscreen and virtual keyboard to support tap-and-test for all main measurements.

Alternatively, voltage, current and frequency values can be set using the rotary knob. Less frequently used functions are menu-operated. Settings, results and statistics can be displayed on the screen or output for automated post-processing. Up to four measurements can be selected and plotted versus time, with minimum and maximum values included in the display for at-a-glance pass/fail analysis.

**Rohde & Schwarz (Australia) Pty Ltd**

[www.rohde-schwarz.com.au](http://www.rohde-schwarz.com.au)

## Dual-band radio

Nokia showcased the UBT-T XP dual band radio, from its Wavence product family, at Mobile World Congress 2022. Designed to support mobile operators and enterprises, the outdoor unit delivers capacity and dual-carrier functionality with claimed system gain available in an outdoor package.

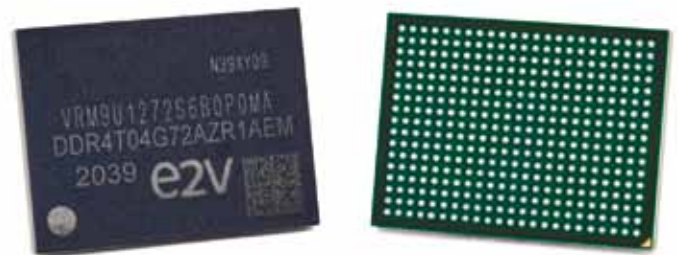
It supports the low-frequency spectrum bands 6 to 11 GHz and is suited for full outdoor or split-mount configurations. Its 6/11 dual-band feature provides flexibility for interference mitigation and spectrum efficiency and delivers high path performance and capacity. The UBT-T XP will be available from Q3 2022.

The dual-band radio provides a channel at 6 GHz and a channel at 11 GHz in a single outdoor unit. It supports multifrequency carrier aggregation with mixed channel sizes and high modulation schemes that can carry 2.5 Gbps over the air.

Nokia offers 4+0, 6+0 and 8+0 configurations using the Outdoor Combining Module with Nokia's adjacent channels filters, providing flexibility for frequency selection and spectrum efficiency. The unit is also integrated into the Nokia Network Services Platform for common management for full end-to-end management of the network.

**Nokia Solutions and Networks Singapore Pte Ltd**

[www.nokia.com/networks/](http://www.nokia.com/networks/)



## DDR4 semiconductors

Teledyne e2v is moving into the mass production phase of its space-grade, radiation-tolerant, DDR4 semiconductors.

With a 4 GB storage capacity and dimensions of 15 x 20 x 1.92 mm, Teledyne e2v's DDR4s possess high storage density but take up only half the PCB footprint, while delivering data transfer speeds of 2.4 GT/s.

Supplied in a multi-chip package format, each Teledyne e2v DDR4 memory features expansive bus capabilities, where 64 bits are assigned to data transfer and an additional 8 bits for error correction.

Radiation testing showed that their single event latch-up threshold is greater than 60 MeV.cm<sup>2</sup>/mg. Their single event upset and single event function interrupt data also exceeds 60 MeV.cm<sup>2</sup>/mg, and they have demonstrated resilience to 100 krad total ionising dose.

The units can be ordered in both industrial temperature range (-40 to 105°C) and military temperature range (-55 to 125°C), and up to NASA Level 1 (based on NASA EEE-INST-002 - Section M4 - PEMs). This will mean that a greater breadth of potential applications can be addressed.

**Teledyne e2v Asia Pacific Limited**

[www.teledyne-e2v.com](http://www.teledyne-e2v.com)





Tim Evans, Regional Sales Manager, Australia, Cradlepoint

**L**aw enforcement agencies all over the world are increasingly investing in new, cloud-based technologies that enable real-time data analysis, faster response times, and increased productivity. In Australia, police departments today are already using facial recognition, automatic number plate reading and virtual reality. In an IDG Research\* study commissioned by Cradlepoint in 2021, 76 percent of organisations globally expect to see the number of connected vehicles increase within the next three years, which is up from 58% in 2020. In Australia, 65 percent of organisations expect to see the number of connected vehicles increase within the next three years. In addition, 38 percent of Australian organisations said that network downtime was a current network challenge in their vehicles and 61 percent of Australian organisations said they need multi-carrier failover in their fleet vehicles. Many Australian law enforcement agencies are looking to their counterparts overseas at ways to simplify and automate capabilities both within police stations and in the field. In the United States, the Seattle Police Department (SPD) provides its more than 1,400 officers with digital tools to enable effective police work, improve operational efficiency, and help keep officers and residents safe. To this end, each cruiser had been upfitted with an array of essential technology including an in-vehicle video system, a mobile data terminal (MDT), and a router for offloading files when in the proximity of stations — all of which depended on wireless connectivity. Administrators recognised the need to implement a new, more scalable wireless networking solution to address some key challenges.

#### Before

Previously, when an incident occurred that required a supervisor's review of footage from the in-vehicle

video system, officers had to go off patrol and return to the precinct. Video would start offloading only when in range of station-based fixed Wi-Fi access points, adding to operational overhead and decreasing time on the streets.

When legacy networking equipment failed or required support, cruisers had to be taken out of service for the SPD's IT team to identify and fix the issue. The result was that officers often had to wait for another vehicle to become available or for the repair to be completed — keeping officers in the station instead of the field even longer.

As critical applications became more advanced and data-hungry features were added, including those requiring location-based data from GPS, the police fleet's existing wireless networking solution was no longer powerful enough, lacking the key capabilities for scalability in the future.

To keep the latest safety-oriented technologies connected 24x7, Seattle Police upgraded cruisers with Cradlepoint's NetCloud Service for Mobile and ruggedised routers, featuring a built-in Gigabit-Class LTE modem, space for a second modem, GPS, and robust Wi-Fi that extends far outside each vehicle. This comprehensive solution includes centralised cloud management, integrated and scalable security features, and support for national public safety networks. The cruisers also now leverage Axon's Fleet 2 video camera system.

#### After

When an incident requires instant supervisor review, video can now begin uploading over cellular broadband the moment recording stops, allowing command staff to analyse events while officers are in transit — and without taking them off the beat. In the event of an officer-involved shooting, teams tasked with investigating the incident can review video evidence before arriving on scene.

This upgraded in-vehicle networking system offers more bandwidth and better data transfer

# Law enforcement agencies' pressing emergency: reliable, high bandwidth connectivity

performance than SPD has ever had, as well as the processing power to support next-generation video platforms for the foreseeable future, including those from Axon and other partners.

When in range of a precinct, Cradlepoint routers can be configured to automatically and instantly switch from a cellular connection to utilise the Wi-Fi-as-WAN feature which is especially beneficial for uploading large video files and avoiding expensive data overages.

Now, using NetCloud Manager, the SPD's IT team can support the whole fleet's routers and connected devices from anywhere — without bringing vehicles back to headquarters. The ability to address connection issues and complete software updates enhances the operational efficiency of the IT team.

Cradlepoint's in-vehicle Wireless WAN solutions also enable dual SIM connectivity, which allows switching between various carriers for always-on connectivity. This is a crucial feature for uninterrupted connectivity in a moving vehicle that could lose service in one area but be covered by another carrier in that area. This guarantees that vehicles always have the best connection possible. As Australian Law Enforcement agencies replace older technologies and look to the latest tools to provide seamless connectivity at permanent locations and on the road, wireless WAN solutions will provide the speed, bandwidth, security and agility required to improve response times and organisational efficiencies.

For more, visit: <https://cradlepoint.com/solutions/for-public-safety/law-enforcement/>.

*\*State of the Wireless WAN, IDG Research, 2022*



**Cradlepoint Australia Pty Ltd**

**<https://cradlepoint.com/solutions/for-public-safety/law-enforcement/>**

# WEATHER FORECASTING WON'T SAVE US ANYMORE

James Boddam-Whetham, CEO

## STRONG PROTOCOLS ARE REQUIRED TO PREPARE FOR FLOODS

Just-in-time forecasting and mass notification systems are not enough to achieve resilience or preparedness.

**T**his country has faced several catastrophic flooding events this year, with inundated areas of eastern Australia not quite out of the clear yet. How bad has the damage been thus far?

Sydney is well on its way to the wettest start to any year. The Warragamba Dam is over capacity, recently prompting nearby residents to evacuate.

Across the state, nearly 30,000 people were subject to evacuation orders. Six thousand homes went without power as residents faced their second major clean-up in just a month.

Meanwhile, in Queensland, the state suffered one of its worst recorded flood disasters, so soon after the 2010–11 floods devastated the state. Many of the state's major cities, like Brisbane, recorded peak heights in flooding just shy of those recorded a decade ago.

The economic costs have been immense. Insured losses easily exceed \$2 billion. Uninsured losses are greater still. The federal government is projecting \$6 billion over the next four years for flood recovery in just those two states.

### A wet summer was expected

The tragedy of it all is that a wet summer was expected. Indeed, these exact La Niña conditions were confirmed in November 2021.

Experts have also been warning that climate change will increase the number and intensity of severe weather events. Gone are the days of one-in-every-100-year weather events.

According to environmental historian Margaret Cook, climate modelling suggests that in many areas, a 1-in-20-year annual maximum 24-hour precipitation rate is likely to become a 1-in-5 to 1-in-15-year event.

What can we do to build resiliency, protect communities and avoid a repeat of these tragic events?

### Short-term solutions will not pre-empt severe weather impacts

We must start by pre-empting severe weather (and other critical) events sooner. We will not do that with either short-term weather models or mass notification systems.

Around-the-clock weather forecasts simply cannot project the arrival and behaviour of extreme weather events. These events just arrive too quickly and change too dramatically.

By the time the forecasts pick up on them, it is often too late. Emergency responses based on just-in-time forecasts are destined to fail.

The same goes for mass notification systems. Governments pay big bucks for early-warning systems that alert residents to the possibility of disaster conditions: often the same information they get from watching local news.

Sure, these solutions might have a role, but they do not come close to addressing root causes.

### A much-needed change in focus

Indeed, our public dollars would be better spent elsewhere; for instance, on longer-term mitigation measures.

Though flood vulnerability is a fact of nature, it has been greatly exacerbated by longstanding social and political processes. That is the argument of experts like climatologist Friederike Otto, who notes that, in urban areas, natural hazards will often become disasters due to poor, non-risk-informed, urban planning:

*"The results are inadequate infrastructure, a lack of social support systems that could reduce impacts or help with recovery from past disasters, and processes that push the most vulnerable groups of people to live in hazardous areas. This causes disproportionate impacts (visible and invisible loss and damage), especially where there are multiple hazards at the same time."*

The antidote, here, is for governments to begin addressing human-caused social and physical vulnerabilities. That requires a shift away from defensive action and short-term-





focused technologies and towards proactive risk management.

To that end, the government introduced the National Resilience and Climate Adaptation Strategy 2021–2025. The strategy recognises that adaptation is a shared responsibility that requires sustained and ongoing action. It further details objectives, such as driving investment, improving climate information and services and assessing progress over time, to enable more effective adaptation.

### Best practices on flood prevention, protection and mitigation

At Noggin, we believe the Strategy is a good start. However, more must be done sooner to improve flood prevention, protection and mitigation. Consulting international best practice in other areas, such as the European Union, which have dealt with catastrophic flooding, we put forth a set of potential strategies that governments and communities in this country can take to achieve flood resilience.

Take a river basin approach: effective measures for flood prevention and protection should be taken at the level of river basins, accounting for the interdependence and interaction of effects of individual measures implemented along the same water course. More specifically, water management systems, forecasting, flood defence measures and crisis management must be

organised on a river basin basis, cutting across regional boundaries.

This should also be done in cooperation with the relevant organisations in the fields of hydrology and meteorology, mitigation planning, river control, civil protection, as well as crisis management.

Or, take an integrated approach: effective flood mitigation also requires structural measures, to limit human activity in known flood plains to the best extent practicable. Those measures include building codes and legislation to keep structures away from flood-prone areas and appropriate land-use policies for vulnerable areas.

In some cases, even relocation of extremely endangered activities and buildings may be advisable. When not possible, governments must bolster efforts to prepare populations on how to act during floods with correct risk communication and early-warning systems.

Floodplains themselves should be adequately designed, with effective flood-control structures. What will it take?

Preliminary flood protection strategies should be developed considering associated costs, technical feasibility and environmental impact assessments, as well as social acceptability.

However, taking such a river-basin integrated and long-term view requires interdisciplinary cooperation at all government and local levels for a coordination of sectoral policies regarding environmental

protection, physical planning, land use planning, agriculture, transport and urban development; plus a coordination regarding all phases of risk management: from risk assessment to mitigation planning and implementation of measures.

A holistic approach is necessary throughout the river basin, facilitated by increased knowledge about responsibility, function and capacity of the concerned parties, plus better understanding and a better support for decision-making. Such a proposed expansion of water management policy will necessarily demand new knowledge, so that societal, administrative and technological solutions can be investigated in advance.

### Create an integrated and comprehensive action plan

Finally, these measures should eventually be compiled in a comprehensive action plan for reducing flood damage. The action plan will accomplish the following:

- Draw long-term conclusions for preventive action in water management, land use, settlement policy and finance.
- Define the scope of responsibilities in the flood protection system at levels of the government and local administration, responsibilities of the public: individuals and businesses.
- Ensure permanent and integrated planning of functions and use of the river basin.
- Specify principles for its organisation and coordinate investment activities and other activities affecting the river basin. It should also form conditions for ensuring permanent harmony of all natural, civilisation and cultural functions in the basin.

Finally, flooding is a part of nature. But human interference into the processes of nature often serve to exacerbate risk.

Defensive in nature, short-term solutions, such as just-in-time forecasting and public warning, do little to address that factor. Therefore, to the extent practicable, government must proactively change focus to mitigation activities, promoting the co-ordinated development and management of actions regarding water, land and related resources to achieve resilience.



*James Boddam-Whetham, CEO of Noggin, an Australian integrated security, safety, crisis & emergency management and business continuity provider.*

Noggin Pty Ltd  
www.noggin.io

## Smartphones and tablet

pei tel Communications offers the PT-B800 and PT-C600 smartphones and the PT-Q810 tablet, all of which are broadband devices that feature a shockproof, water-proof casing.

Models are equipped with the Android operating system and are LTE-capable. They can also connect to the internet at any time via Wi-Fi.

In addition to the rugged design, the three devices feature a built-in push-to-talk button. In conjunction with an optional software solution, this means it is possible to communicate securely with any number of participants.

The PT-B800 smartphone is compact and it has a 2.4" screen and 8 GB of built-in memory. The PT-C600 has a 4.7" screen and comes with 16 GB of built-in memory. Both smartphones are shockproof and waterproof with an IP68 protection rating.

The compact PT-Q810 tablet features an 8" screen and 64 GB of memory. It is dustproof and protected with an IP65 protection rating.

In all models, the built-in memory can be expanded by as much as 64 GB using a MicroSD card.

While the PT-B800 and PT-C600 smartphones are designed to be worn or carried on a person's body, the PT-Q810 tablet is also suitable for use in vehicles with a quick-release bracket.

**pei tel Communications**

<https://www.peitel.com/en/>



## Commercial business radio

Motorola Solutions launched its Curve Wi-Fi enhanced business radio with voice assistance capabilities designed to support retail, hospitality and restaurant operations.

The business radio will allow retail associates to receive alerts when customers arrive for kerbside pickups or press in-store call buttons for assistance. In the future, additional technologies will be integrated through the Indyme platform, including video security and body-worn camera systems. This will help to improve customer service, loss prevention and threat response, as retail employees will be able to receive audio messages when customers are lingering near merchandise, or team members activate the record buttons on their body-worn cameras.

**Motorola Solutions Australia Pty Ltd**

[www.motorolasolutions.com.au](http://www.motorolasolutions.com.au)

## Server-on-modules

congatec celebrates the premiere for x86 based COM-HPC server modules by announcing the availability of three new server-on-module families parallel to the launch of the Intel Xeon D processor family, formerly codenamed Ice Lake D.

The COM-HPC server modules in size E and size D, as well as the COM Express Type 7 modules, will accelerate real-time micro-server workloads in rugged environments and extended temperature ranges. Improvements include up to 20 cores, RAM to up to 1 TB, double throughput per PCIe lanes to Gen 4 speed, as well as up to 100GbE connectivity and TCC/TSN support.

Target applications range from industrial workload consolidation servers for automation, robotics and medical backend imaging to outdoor servers for utilities and critical infrastructures — such as smart grids for oil, gas and electricity as well as rail and communication networks — and also includes vision-enabled applications such as autonomous vehicles and video infrastructures for safety and security.

Besides the bandwidth and performance improvements, congatec's three new server-on-module families could extend the lifecycle of rugged edge server designs as long-term availability of up to 10 years is planned. For mission-critical designs, they offer hardware security features including Intel Boot Guard, Intel Total Memory Encryption – Multi-Tenant (Intel TME-MT) and Intel Software Guard Extensions (Intel SGX).

All applications benefit from built-in hardware acceleration including AVX-512 and VNNI. For RAS capabilities, the processor modules integrate the Intel Resource Director Technology (Intel RDT) and support remote hardware management features such as IPMI and redfish.

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## Intelsat collaborates with Microsoft to demonstrate private network to military



As defence organisations continue to respond to new threats and changing strategic circumstances, it is crucial that they have access to the best possible technology for modernised military capabilities and high-performance operations. One of the biggest challenges is the ability to access and share increasingly large volumes of data from remote locations quickly and securely, then analyse the data to inform real-time decision-making.

To help meet these demanding requirements, Microsoft, SES and Nokia have successfully demonstrated secure access to the Azure cloud platform over private 5G and satellite communication (SATCOM) networks, enabling the use of cloud services anytime and anywhere, including remote and austere environments.

### Remote access

Nokia established a secure, private 5G network using the Nokia Digital Automation Cloud solution. This streamlined, plug-and-play connectivity provides access to ultra-low latency, high-capacity networking.

During the demonstration, users accessed an SAP maintenance environment hosted in Microsoft Azure, using laptops connected to the private 5G network. This proof of concept shows the ability for defence personnel in the field to access and update an enterprise resource planning (ERP) solution without waiting to return to a primary facility or base. Data from vehicles can also be accessed and analysed in the field, with results synced to the ERP platform.

Through real-time ERP updates in the field, logisticians and commanders located at headquarter sites can make decisions based on the most up-to-date tactical data on vehicle fleets.

### Vehicle data transfer

Both raw and processed data can be sent from vehicles in the field to enterprise systems over SATCOM when the operational situation allows, increasing commanders' awareness of deployed assets. Improved access to data also opens opportunities for automation and optimisation of back-end processes, such as predictive maintenance, stock management, fleet management and operational budget forecasting.

For the demonstration, SES, an Azure orbital ground station as a service partner, showcased the potential for high-volume data

transfers by accessing its O3b satellite constellation via transportable terminal antennas. Orbiting at approximately 8000 kilometres above Earth's surface in medium earth orbit (MEO), the O3b system delivers low-latency, high-performance connectivity. SES's upcoming second-generation MEO system — O3b mPOWER — represents a step change in capabilities for satellite-based networking.

When scaled, the system can provision throughputs up to multiple gigabits per second per service, providing resilient cloud and edge connectivity. In this demonstration, download and upload speeds reached 348 Mbps and 67 Mbps respectively. With O3b mPOWER, the bandwidth can be scaled from 100 Mbps to a gigabit depending on the requirements of the mission.

### Vehicle data analysis

Azure services can be used to display live position and analytical data on a dashboard in the field. During the demonstration, the Microsoft Azure Stack Edge Mini R — a portable, rugged edge computing device — was used for computing and analysis onsite, enabling advanced cloud analytics and visualisation in both connected and disconnected environments.

Using 5G and SATCOM connectivity, data analysis can also take place in the Azure hyper-scale cloud compute platform. For instance, predictive maintenance analysis could be used to automatically send alerts and notifications and feed relevant data to ERP maintenance modules, which would enable maintenance orders to be scheduled, stock inventory to be checked and personnel requirements to be automated.

### Remaining smart and connected

By unlocking the power of SATCOM, 5G and cloud computing, defence organisations can remain connected in remote locations, share data quickly and securely to enhance strategic awareness and perform deep analysis of data to improve decision-making.

The reference architecture established by this defence demonstration is readily transferred to other sectors where remote connectivity and data analysis are required, including agriculture, health care, mining and resources, transport and logistics.

Microsoft Pty Ltd  
[www.microsoft.com.au](http://www.microsoft.com.au)

## Continual disasters are costing lives: here is a simple solution for emergency response

No government, in recent history, has had to deal with a catastrophic event like COVID. The entire global population has been affected.

Along with the pandemic, Australia has been plagued with a higher-than-normal number of natural disasters including the recent Lismore floods, which were repeated weeks after the initial deluge, as well as bushfires and cyclones.

The Australian people have increasingly turned to their governments to be 'rescued' and managed. Some disasters have resulted in a Royal Commission and, despite many recommendations, few if any changes have been implemented.

Australia is not alone when it comes to managing disasters; the same problem exists around the globe. The spotlight is on the need for fast, accurate communication and stronger, national/global crisis preparedness, to protect and save lives.

Fast, accurate communication is the single most critical issue when managing a crisis.

### Solution

Regardless of disaster, a tool offering a single source of true national collaboration with interoperability and bilateral sharing of real-time data between every emergency service agency is needed now. The use of disparate solutions is costing lives.

The solution also needs to provide the ability for the lead agency to communicate one-way with the public, so they know there is one source for all information regardless of the disaster. They should not be left wondering which TV or radio channel to tune into, which emergency service website or social media platforms should they know about or be following, which possible fake news sites they may have relied upon, or which weather app is best.

It is time to remove the disconnect and frustration for everyone. It would be a win for every level of government.

As recommended in the 2020 Black Summer Bushfire Royal Commission, our proven software solution BART was implemented by the NSW Rural Bushfire Service in 2021 under the name of 'RFS Activ.' BART integrates seamlessly with existing internal government systems providing real-time information for the 74,000+ members.

Our mission-critical solutions are used by more than 90,000 customers across Australia, including ambulance, paramedics, RFS/CFA, SES, coast guard, police, firefighters, rescue groups, utility and mining operators.

Australia has one of the highest rates of mobile phone use in the world. According to a report on digital and mobile trends, the total number of mobile connections in Australia reached nearly 31.9 million in 2022.

This is more mobile device connections than our entire population, signifying the most widely used tool for communication is mobile phones.

It's time to make our own, familiar mobile phone handset part of our go-to safety kit with the peace of mind knowing the information received during a disaster is real-time, from a trusted source, that could save your life.

*Kenny has over 25 years' experience in starting, running and exiting businesses in varied commercial sectors, including specialist emergency service software solutions. Since 2010 her primary focus has been on scoping/specification and analysis, through to rollout of a scalable mission-critical app and integrated software platform used by different levels of government and first responders to manage bushfires, cyclones/hurricanes, floods, terrorism and, most recently, the COVID-19 pandemic.*



*Kathleen Kenny,  
Director,  
Bart Solutions.*



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