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critical comms

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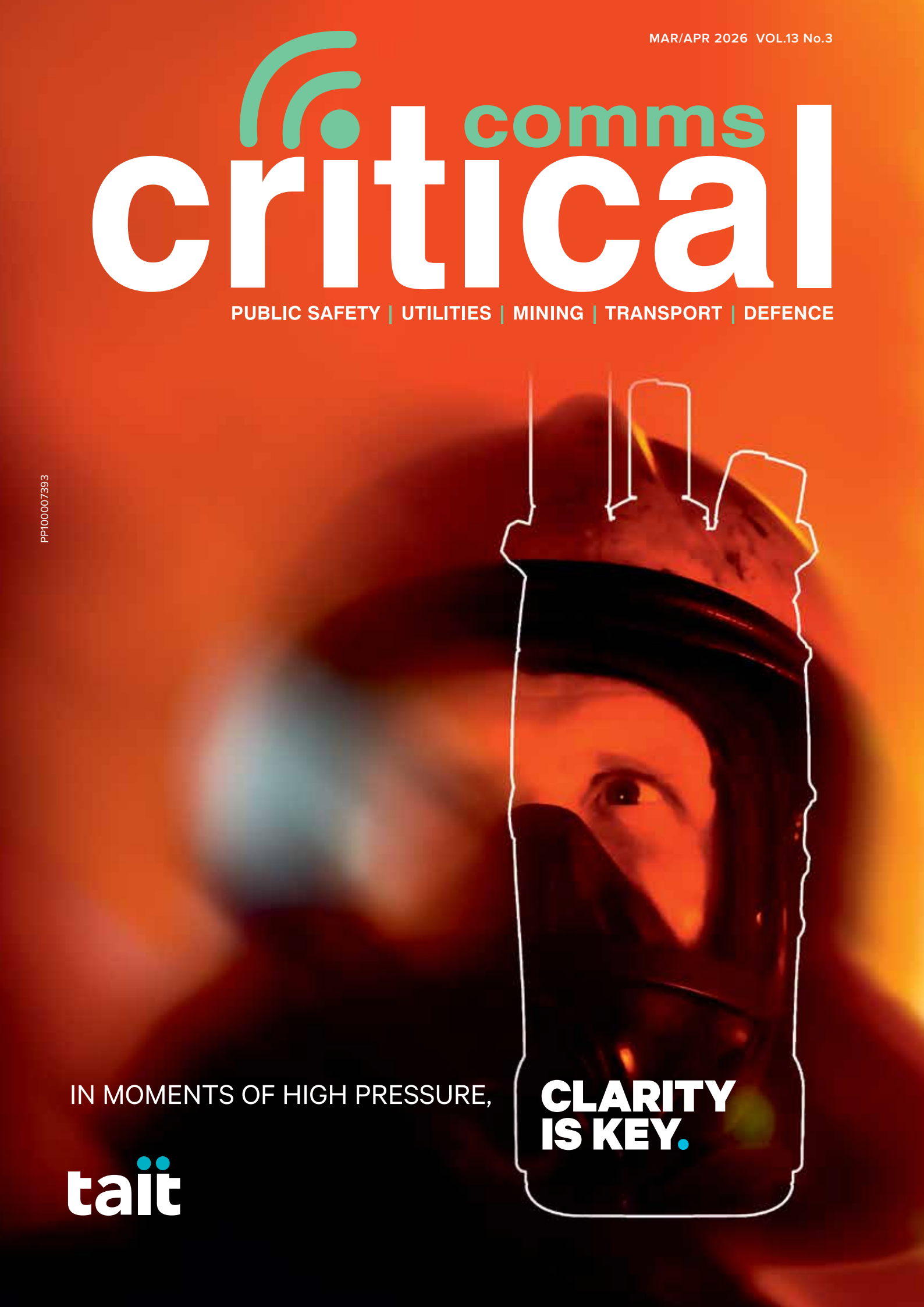

comms critical

Inside

March/April 2026

ON THE COVER

Pressure doesn't announce itself — it builds in the background, in busy control rooms, on the frontline, and in the moments when quick decisions matter most. In these environments, communication isn't just a tool or a system: it's what keeps the people protecting our lives and livelihoods aligned, informed and ready to act.

For the teams who rely on communication every day, it needs to feel effortless. It should be clear, dependable and work without distraction, allowing those on the frontline to focus on what matters: the mission.

Tait Tough radios are designed with this reality in mind, supporting those working in demanding environments with clear audio and trusted performance. By helping ensure messages are heard and understood the first time, they support safer, more coordinated responses across teams and operations.

Built on trusted open standards, Tait's solutions help organisations stay connected across agencies and technologies while giving them the flexibility to adapt as their needs change over time. As part of a broader communications ecosystem, they help create a clearer picture across operations, enabling information to move smoothly between the field and the control room and supporting faster, more confident decision-making.

At its heart, it's about supporting the people behind every call, every response, and every decision — helping them stay connected when it matters most.

When every second carries weight, clarity is mission-critical.

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Do you read me?

Public safety communications are entering a period of rapid transformation, driven by resilience, intelligence and spectrum innovation.

One of the most significant developments is the emergence of non-terrestrial networks (NTN) for mission-critical communications. By integrating satellite connectivity with terrestrial systems, NTN will extend coverage to remote, disaster-affected and infrastructure-poor regions. This hybrid approach ensures continuity of service when ground networks fail, strengthening operational readiness for emergency responders.

Intelligent drones are also having a significant impact, reshaping frontline response. No longer limited to aerial observation, today's platforms combine AI-driven analytics, real-time video streaming and autonomous navigation. Equipped with thermal imaging, object recognition and edge processing, drones are becoming force multipliers for police, fire and search-and-rescue teams — reducing risk to personnel while accelerating situational awareness.

At the same time, the critical communications industry and standards bodies like 3GPP are accelerating the shift from legacy narrowband systems to broadband LTE and 5G networks. Dedicated and priority-enabled public safety broadband is beginning to enable not only push-to-talk functionality, but other high-bandwidth applications including live video and data feeds to support first responders. 5G's ultra-low latency and network slicing promise further gains in reliability and responsiveness.

However, today we depend like never before on satellite navigation — a system that is increasingly indispensable across all aspects of critical communications, public safety and defence. Today the increasing use of GPS jamming and spoofing threatens operational integrity across emergency services, aviation, defence and critical infrastructure. Countermeasures — from multi-constellation GNSS receivers to signal authentication and resilient PNT (positioning, navigation and timing) architectures — are becoming essential components of modern mission-critical ecosystems.

These topics along with industry news, case studies and new product information are all features of the March/April 2026 edition of *Critical Comms* — my first edition as Interim Editor, filling in for Lauren Davis while she is on maternity leave. I hope you enjoy it.

As always more detailed daily news and new products can be found on criticalcomms.com.au, and by subscribing to our weekly email newsletter.

Glenn Johnson, Interim Editor
cc@wfmedia.com.au

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

Interim Editor: Glenn Johnson
cc@wfmedia.com.au

Publishing Director/MD:
Janice Williams

Art Director/Production Manager:
Linda Klobusiak

Art/Production:
Kate Atkinson

Circulation: Alex Dalland
circulation@wfmedia.com.au

Copy Control: Ashna Mehta
copy@wfmedia.com.au

Advertising Sales

Tim Thompson Ph 0421 623 958
tthompson@wfmedia.com.au

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

Head Office
Unit 5, 6-8 Byfield Street, North Ryde
Locked Bag 2226,
North Ryde BC NSW 1670
Ph: +61 2 9168 2500

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Calendar

April

EENA Conference & Exhibition 2026
15–17 April 2026
Radisson Blu Latvija Conference & Spa Hotel, Latvia
eenaconference.org

Critical Communications Asia
22–23 April 2026
Kowloon Shangri-La, Hong Kong
critical-communications-asia.com

May

NSW Critical Communications Conference and State Networking Dinner
13–14 May 2026
NSW Teachers Federation Conference Centre
arcia.org.au/events/critical-communications-conference-sydney-2026

Comms Connect New Zealand 2026
27–28 May 2026
Tākina Wellington Convention and Exhibition Centre
comms-connect.co.nz

June

2026 EuCNC & 6G Summit
2–5 June 2026
FYCMA, Spain
eucnc.eu

Critical Communications World 2026
16–18 June 2026
Excel London, UK
critical-communications-world.com

July

Qld Critical Communications Conference and State Networking Dinner
29–30 July 2026
Rydges South Bank Brisbane
arcia.org.au/events/critical-communications-conference-brisbane-2026

September

SA Critical Communications Conference and State Networking Dinner
16–17 September 2026
National Wine Centre of Australia
arcia.org.au/events/critical-communications-conference-adelaide-2026

October

Comms Connect Melbourne 2026
14–15 October 2026
Melbourne Convention & Exhibition Centre
melbourne.comms-connect.com.au

Further event information can be found at criticalcomms.com.au/events

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NTN FOR MISSION-CRITICAL COMMUNICATIONS

Ericsson Mission Critical Networks

Currently used as backhaul for wide area networks, NTNs are set to evolve to direct-to-device solutions that will extend directly to users.

Non-terrestrial networks (NTNs) play a crucial role in mission-critical networks (MCNs) by providing reliable, resilient and ubiquitous connectivity that complements traditional ground-based networks.

Today, mission-critical systems use NTNs to provide backhaul for wide area networks or deployable network assets. As NTNs evolve, direct-to-device solutions will extend coverage to these users. This synergy between terrestrial and non-terrestrial networks ensures extensive coverage, enabling uninterrupted communication during emergencies, thus bolstering the effectiveness of mission-critical operations worldwide.

Different satellite systems have been used for many years to provide services such as TV broadcasting, navigation, communications, surveillance and weather forecasting. These satellites orbit Earth in three primary configurations: geostationary (GEO), medium earth orbit (MEO) and low earth orbit (LEO).

GEO satellites, positioned at an altitude of approximately 36,000 km, offer a wide field of view, making them ideal for satellite television broadcasting, business-to-business data services and government communications. However, their significant distance results in high latency and limited data rates. MEO satellites, typically orbiting at altitudes ranging from 8000 to 20,000 km, are primarily used for navigation systems like Galileo, GPS and GLONASS. Some MEO constellations also provide communication services, offering lower latency and higher data rates compared to GEO satellites.

LEO satellites, operating at altitudes ranging from 400 to 2000 km, provide the lowest latency and highest data rates compared to other satellites. Their smaller footprint necessitates larger constellations for

> NTNS ARE SET TO PLAY A CRUCIAL ROLE IN THE FUTURE OF MCNS BY PROVIDING RELIABLE, RESILIENT, AND UBIQUITOUS CONNECTIVITY, SEAMLESSLY COMPLEMENTING TRADITIONAL GROUND-BASED NETWORKS.

global coverage. These satellites are well-suited for mobile broadband (MBB) and Internet of Things (IoT) applications.

3GPP has been actively working to integrate satellite communication into 5G NR, NB-IoT and LTE-M standards. Integrating NTN into 3GPP technology allows chipset and device vendors to target mass-market solutions by ensuring standardisation across terrestrial and non-terrestrial networks. This promotes economies of scale, lowering costs and accelerating development, while enabling widespread adoption of NTN-compliant devices across diverse markets.

MCNs defined

MCN systems are essential for the operation and safety of critical services, where any failure or delay can lead to serious and potentially catastrophic consequences. These communications are integral to sectors like defence, emergency services (police, fire and ambulance), utilities, railways and digital airspace.

Many government authorities are modernising their existing mobile communication networks, many of which are based on legacy narrowband technologies. The mission-critical market is now witnessing a widespread adoption of open 3GPP standards and rich, multivendor ecosystems. This facilitates the interoperability of communications, enhances cross-agency collaboration and unlocks important intelligence through secure and reliable networks.

Non-terrestrial networks (NTNs) play a pivotal role in MCNs across sectors like public protection and disaster relief (PPDR), critical infrastructure, defence, and government agencies. As data-driven operations expand, NTNs offer resilient, scalable and reliable connectivity by complementing terrestrial networks. They ensure seamless communication in remote, underserved or disaster-affected areas, enhancing operational efficiency and supporting modern communication infrastructures.

The key benefits of 3GPP-based NTNs for MCN users are:

- **Extending coverage:** NTNs expand network coverage where traditional infrastructure is unavailable or compromised.
- **Facilitating ubiquitous connectivity:** NTNs play a critical role in achieving ubiquitous connectivity by ensuring seamless transitions between terrestrial and non-terrestrial networks.
- **Unified access and seamless service continuity:** 3GPP 5G NTNs empower the development of unified devices capable of operating seamlessly across terrestrial and non-terrestrial networks, eliminating the need for separate hardware systems.
- **Critical interoperability for mission-critical situations:** Interoperability is at the heart of NTNs' functionality, allowing various agencies to communicate and collaborate effortlessly across network and organisational boundaries.

The NTN market

The global NTN market is experiencing significant growth, driven by advancements in satellite technology and the rising demand for ubiquitous connectivity. Various market analyses indicate that the 5G NTN market is projected to be US$20–30 billion by 2030, reflecting a compound annual growth rate (CAGR) of 20.4%. The government, defence and public safety sectors are expected to account for a substantial portion, with estimates indicating they will make up over 35% of the total market by 2030.

This growth is further supported by government initiatives in collaboration with satellite operators to modernise communication infrastructures.

Requirements and challenges for NTN mission-critical networks

In addition to offering numerous opportunities, 3GPP 5G NTNs introduce unique requirements and challenges in meeting the strict demands of mission-critical users.

There are a number of key technical and operational challenges that 5G NTNs face in addressing the needs of mission-critical environments. »

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Coverage availability and performance

Coverage is influenced by several factors, including the number and position of satellites in orbit, the accuracy of antenna pointing, the frequency bands used, and physical obstacles like tall buildings or geographic features such as valleys. Effective communication networks must be designed to ensure wide and consistent coverage, even in areas with potential signal obstructions. Uninterrupted and stable coverage across all areas of operation is essential for an effective MCN.

These networks can still face challenges such as congestion-related slowdowns, which can impact their reliability and effectiveness, as well as restricted indoor coverage, which is yet to be analysed. To enhance connectivity in indoor environments, complementary technologies, such as hybrid terrestrial–satellite solutions or repeaters might be required.

Interference risks might also arise when terrestrial and satellite systems share the same spectrum. Careful spectrum management and coordination remain essential to ensure seamless coexistence.

Security

Transmission of sensitive and potentially classified information is a fundamental aspect of MCNs. Ensuring the security of these communications is paramount to protect against unauthorised access and potential cyberthreats, and requires robust encryption and secure transmission protocols to maintain the confidentiality, integrity and availability of the information being exchanged. Satellite beams often cover areas beyond national borders, increasing the risk of unintended signal capture by foreign monitoring stations.

An illustrative example is the European IRIS2 Satellite Constellation, which emphasises improved security by utilising quantum cryptography through the European Quantum Communication Infrastructure (EuroQCI) initiative and enhancing cybersecurity through a secure-by-design approach.

Bandwidth and latency

Beyond basic voice communications, mission-critical scenarios demand capabilities such as live video feeds, data transfer and real-time coordination. The bandwidth must be sufficient to support these data-intensive applications, while latency needs to be minimised to ensure real-time communication.

Latency is also a key factor in an NTN and is influenced by multiple factors, including propagation delay, transmission delay, processing time, queuing and other network-related delays. LEO systems typically offer latencies in the tens of milliseconds, while GEO systems experience latencies of several hundred milliseconds. The performance also remains heavily dependent on the capabilities of the satellite antenna.

Interoperability

Seamless communication across various agencies, departments and segments (air, sea, land) is essential in mission-critical situations to enhance coordination and efficiency. Interoperability ensures that different systems can work together, allowing federal, state and local agencies to communicate effectively without technical barriers. This capability is vital to avoid duplication of efforts, reduce response times and improve overall coordination during emergencies.

Developing and implementing 3GPP communication standards and protocols for NTN is essential for enabling seamless interoperability between terrestrial and non-terrestrial networks.

Ecosystem availability and mobility

The environments in which mission-critical actors operate are often unpredictable and demanding. This requires communication equipment to be highly durable and capable of withstanding extreme conditions such as temperature fluctuations, moisture, dust and physical shocks — and the mobility of the equipment is also crucial.

Cost

The financial aspect of implementing and maintaining MCN systems is a significant consideration. It involves evaluating the initial capital expenditure and the ongoing operational costs. These costs include not only the equipment but also airtime fees, maintenance, training for users and technical support. Effective budgeting must account for the total cost of ownership over the equipment's lifecycle to ensure sustainability and continuous operational capability without unexpected financial strain.

Lastly, it is important to highlight mission-critical feature parity. Achieving feature parity between terrestrial and satellite networks is crucial. Mission-critical applications such as push-to-talk, push-to-video, mission-critical data and QPP (quality of service, priority and pre-emption) must perform reliably across NTNs without compromising the capabilities available in terrestrial networks.

Conclusion

NTNs are set to play a crucial role in the future of MCNs by providing reliable, resilient and ubiquitous connectivity, seamlessly complementing traditional ground-based networks. They deliver uninterrupted communication in remote, hostile or infrastructure-limited environments, enabling real-time situational awareness, enhanced operational efficiency and robust disaster response.

However, to fully harness their potential, further improvements are necessary for seamless integration with terrestrial networks, enhanced spectrum utilisation and ecosystem readiness. 5G has initiated the process of integrating NTNs with TNs, aiming to provide comprehensive coverage for users. As NTNs evolve, they will be a vital component of 6G standards.

QUANTUM-INSPIRED WIRELESS TECH TO BOOST 6G PERFORMANCE

Researchers at Monash University and The University of Melbourne have developed a quantum-inspired approach to optical wireless communication that could make 6G networks faster, more reliable and energy-efficient.

As the world moves towards 6G, devices and networks will need to handle more data, faster, and in smaller spaces than before.

The research findings, published in *IEEE Communications Letters*, address a key hurdle for next-generation wireless networks — enabling seamless connections not just between phones and laptops, but also among the chiplets inside computers, smart devices in offices and data centres.

Professor Malin Premaratne, from the Department of Electrical and Computer Systems Engineering at Monash University, is one of the researchers responsible for a method that enables reliable, high-speed connections in crowded spaces, bringing wireless performance closer to "fibre-like" speeds in indoor networks.

Premaratne said that in these environments, conventional wireless signals face serious limitations. "Interference can slow connections, reliability drops in crowded or complex settings, energy consumption and heat restrict performance, and scaling networks requires complex wiring," Premaratne said.

"It's about making the next generation of devices and networks actually deliver on the promise of 6G — speed, reliability and energy efficiency — so people notice the difference in their everyday lives. This is a crucial step toward making 6G networks practical for everyday devices and future computing systems."

This research could enable faster and more reliable 6G wireless in homes, offices and public spaces, while powering smarter devices that run cooler and use less energy.

Professor Thas Nirmalathas, from The University of Melbourne, said the team's innovation uses modular optical phased arrays inspired by principles from quantum physics.

"The research combines quantum-inspired design with optical wireless innovation to tackle key challenges in the design of next-generation ultra broadband wireless systems," Nirmalathas said.

"Networks built this way can also adapt and grow with future technology demands. Building networks from flexible, reconfigurable blocks allows wireless systems to focus signals precisely where they are needed, reduce interference through polarisation control, improve energy efficiency, and scale easily without redesigning entire networks."

This research collaboration was supported through an ARC Discovery program.

"In quantum devices, coherence and collective effects like superradiance allow many small sources to behave like one powerful, directed emitter. Our quantum-inspired optical phased-array approach brings that 'many-as-one' principle to optical wireless, enabling scalable beamforming — and more reliable, energy-efficient links — as networks get denser toward 6G," Premaratne said.

SIMOCO AND STANDBY GROUP ANNOUNCE STRATEGIC COLLABORATION

Simoco and Standby Group have announced a strategic collaboration in the Asia–Pacific region that brings together their complementary technologies. By combining Simoco's expertise in mission-critical radio and broadband solutions with Standby Group's specialist hardware and vehicle integration capabilities, the two companies aim to deliver enhanced solutions for blue light and amber light users.

The collaboration is focused on meeting both current and future public safety and critical infrastructure requirements, including readiness for next-generation broadband networks and ESN-aligned environments.

"It is an exciting time to be working with Standby Group," said Rocco Mancusi, Chief Sales Officer at Simoco. "Our technologies are highly complementary, and together we are well positioned to address the evolving needs of critical communications users. We are looking forward to working closely across the APAC region, where there is strong demand for robust and future-ready solutions."

"We are very much looking forward to working with Simoco; from very early in our relationship it was clear we had a lot of synergy to provide the end user with a full wraparound solution," said James Marsden, Export Sales Manager at Standby Group. "This collaboration allows us to jointly take our complementary solutions to a wider audience, delivering greater value to customers who require reliable and integrated critical communications capabilities."

Simoco says the collaboration is intended to establish a strong early market presence while providing the companies' customers with a more cohesive and seamless pathway for designing and deploying end-to-end communications and control and warning systems.

MOTOROLA LAUNCHES ROLE-BASED AI FOR FIRST RESPONDERS

Motorola Solutions has announced the launch of Assist Suites, a portfolio of role-based AI for public safety solutions that the company says is designed to deliver the right intelligence to the right person at the right time.

Motorola says that Assist Suites synthesises multiple sources of data from across an agency — 911/000 audio, body and in-car camera footage, radio transcripts and other sources — into a unified thread of intelligence to help accelerate emergency response times, enhance safety and transparently support the highest levels of operational and reporting accuracy.

The Dispatcher Assist Suite helps streamline information intake and emergency dispatch and coordination, and the Responder Assist Suite helps enhance field officer safety and reduce the administrative burden of report writing.

The suite's report-writing tool, Narrative Assist, cross-references an officer's first-hand account with multiple sources of incident data to build a police report grounded by verified intelligence. Assist highlights discrepancies for the officer's review to maintain human-led oversight and retains a clear audit log of all AI suggestions.

Research reveals that nearly half of a call handler's time on emergency calls is spent verifying information, while officers spend approximately 40% of their shift behind a keyboard rather than in the community. Assist Suites are designed to address challenges driven by the dual crises agencies face: a massive influx of data and a critical shortage of public safety personnel.

"In public safety, time can be the difference between a successful outcome and a tragedy," said Mahesh Saptharishi, executive vice president and chief technology officer, Motorola Solutions. "Assist saves time and time saves lives. We're focused on delivering the real value of AI through personalised suites that support the specific needs of each emergency responder.

"Assist seamlessly transitions intelligence from one person to the next to improve accuracy, speed and safety."

The role-based suites recognise that AI's value can vary significantly between the command centre and a patrol car or emergency vehicle. More suites will follow this year to support additional public safety and enterprise security roles.

Every second counts when someone dials 000, and research shows that 40% of these calls suffer from the inefficient exchange of information between roles. The Dispatcher Assist Suite provides real-time call transcription and translation to address language barriers that can add an average of 70 seconds to the call. Assist can highlight keywords like 'gun' or 'heart attack' and suggest immediate actions that allow call handlers to focus on faster and safer responses versus data entry. Additionally, Assist can automate triage of non-emergency call traffic, which can account for 65% of call handlers' workloads in some regions.

50% of officers also report that the incident details they receive en route frequently differ from what they encounter on scene. The Responder Assist Suite helps give first responders a verified picture of the situation before they arrive. On scene, Assist enables voice-activated queries of an agency's data for eyes-up situational awareness and safety.

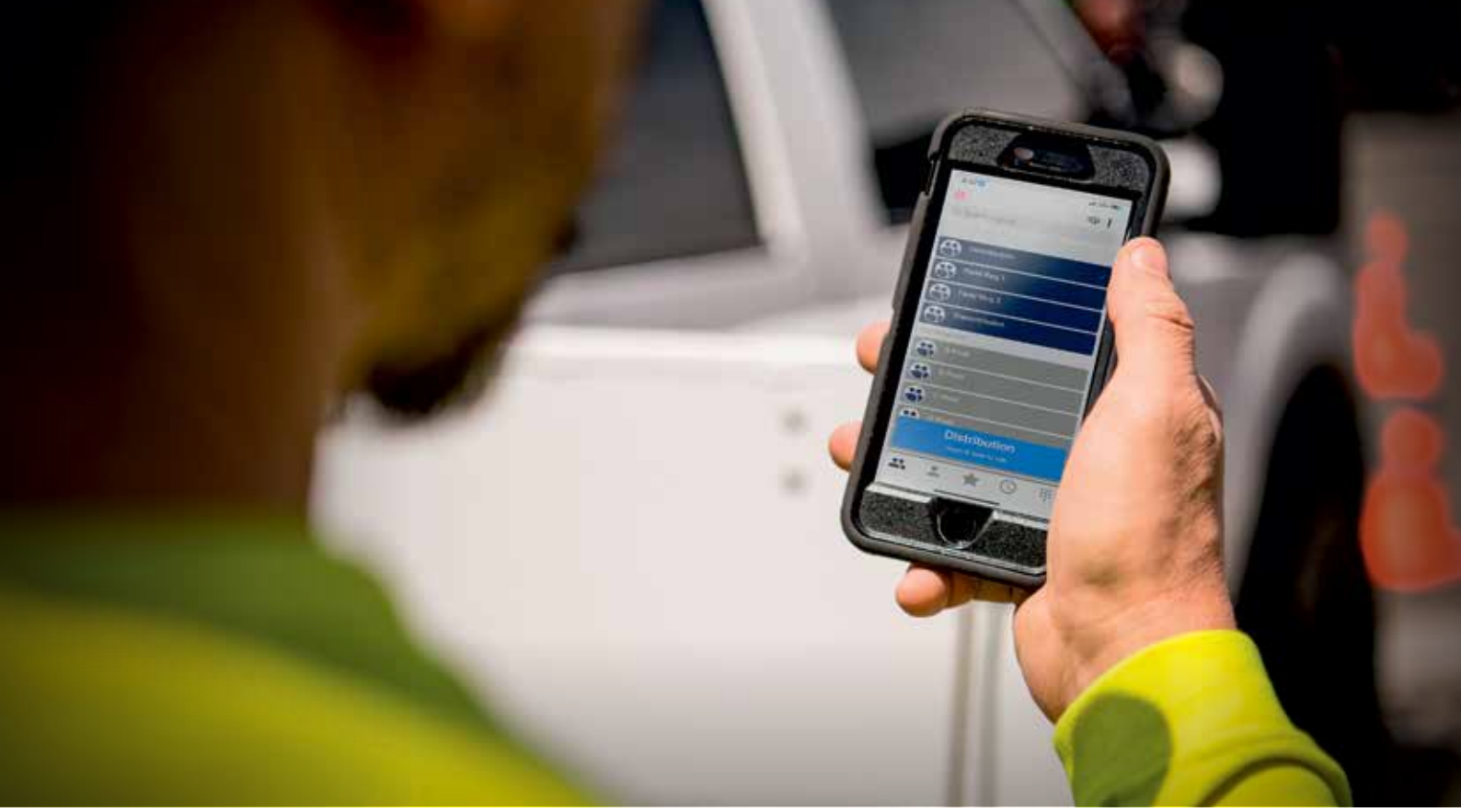
COMMS CONNECT WELLINGTON CALL FOR PAPERS OPENS, EXHIBITION ALMOST FULL

The 2026 edition of Comms Connect New Zealand will be held at the new Tākina Wellington Convention & Exhibition Centre on 27–28 May. The move to Wellington has met with strong industry support, with just three stands remaining on an expanded exhibition floor.

Gold Sponsors for the 2026 event are Broadtech, Cable Ways, Complete-Coms, Pivotel, Tait Communications and Zetron. They will be joined by over 40 more critical comms and public safety sector suppliers and manufacturers on the expo floor.

Once again Comms Connect NZ will bring together the best industry experts in critical comms and public safety technology, and the conference aims to deliver the latest technologies, applications and case studies on subjects such as satellite comms, DMR Tier 3, PTT over cellular, professional LTE, AR/VR, IoT, private networks, disaster response and more.

The Call for Papers for the two-day conference is now open, and the organisers are seeking local and international case studies, technical presentations and panel discussion submissions. Details and submission criteria can be found on the event website: https://comms-connect.co.nz.



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News

GEOTAB UNVEILS LATEST AI-POWERED TELEMATICS FOR AUSTRALIAN FLEETS

Geotab has announced its telematics roadmap for Australian fleets at its Geotab Connect event in Las Vegas. The company has announced it is introducing AI-powered video safety tools, next-generation vehicle hardware, and ruggedised tracking solutions for visibility beyond traditional coverage.

The company says that for Australia and New Zealand, the focus is on transitioning telematics from simple tracking to an 'operational brain' that handles complex data to drive safety, efficiency and asset visibility.

"Australian and New Zealand fleets operate in some of the most demanding conditions in the world," said David Brown, Associate Vice President, APAC, Geotab. "This next wave of innovation is about turning connected vehicle data into near real-time intelligence that fleets can actually use to prevent incidents, sharpen decision-making and maintain visibility across vehicles and critical assets, even in hard-to-reach areas."

Upcoming priorities for Australia in 2026 include a number of new technologies, including:

- **Go Focus Pro**, an AI-powered expansion to the GO Focus range of video telematics designed to deliver 360-degree visibility and predictive risk detection, and combining surround video coverage with in-cab AI alerts to help identify potential issues before incidents occur.
- **Re-engineered GO and GO Plus telematics devices**, built on a new architecture designed for faster AI processing and higher-integrity data, while supporting the latest vehicle platforms.
- **GO Anywhere and Go Anywhere Plus** range of ruggedised asset-tracking solutions for trailers, heavy equipment and non-powered assets, with GO Anywhere Plus asset tracker introducing the potential for satellite connectivity in Australia.

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IN-VEHICLE 5G ROUTER OFFERS FAST FAILOVER AND EDGE AI

Ericsson has announced the launch of a new in-vehicle 5G router designed to deliver reliable, intelligent connectivity for public safety, mass transit, and fleet operations. The Ericsson Cradlepoint R2400, along with an extensible RC1250 modem, is designed to provide resilient, intelligent connectivity for vehicles and mobile field teams, combining ultra-fast failover, precise location services and edge computing.

With Dual SIM/Dual Standby, centimetre-level positioning, Wi-Fi 7 and built-in edge AI, the R2400 is designed to support real-time, mission-critical applications such as live video, connected vehicles and autonomous systems.

Compatible with public safety networks and new network slicing services, the R2400 leverages the latest in 5G standalone Release 17 technology to support new capabilities across public safety, mass transit and private fleet networks.

Ericsson says Dual-SIM/Dual Standby (DSDS) on a single modem enables carrier switchover roughly 10 times faster than previous approaches, keeping voice, video and data flowing during critical missions and transit routes, and Real-Time Kinematics (RTK) combined with dead-reckoning improves positioning from 1–3 m down to approximately 1 cm, enabling lane-level vehicle identification and precise real-time tracking of personnel, assets and drones.

Up to five simultaneous cellular plus multiple low-Earth-orbit (LEO) satellite connections maximise throughput and availability, even in rural or low-coverage areas, and the embedded 4x4 software-defined Wi-Fi 7 access point delivers approximately 2-4 times faster Wi-Fi speeds for passenger and operational communications across mass transit and public safety.

"Ericsson's Cradlepoint R2400 raises ruggedised edge networking to the next level," said Luke Wadeson, CEO at Australian Ericsson Enterprise Wireless Solutions partner Exceed ICT. "The R2400 is purpose-built for always-on operations across public safety, utilities, construction, mass transit, and fleet operators. For Australian organisations working across vast, harsh environments, the R2400 enables real-time video, connected vehicle services, advanced telemetry, and AI-enabled network management without operational disruption.

"We're very confident deploying the R2400 in our IVA (Intelligent Vehicle Access) solutions to help customers boost productivity, safety and compliance at scale."

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THE EVOLUTION OF INTELLIGENT DRONES

ESSENTIAL INFRASTRUCTURE IN MULTIPLE DOMAINS

Emenyeonu Ogadimma, University of Sharjah

Drone technology is set to reshape disaster response, health care, environmental management, farming and cybersecurity.

Intelligent drones and unmanned aerial systems (UAS) are rapidly evolving from experimental prototypes into essential infrastructure across disaster response, healthcare delivery, agriculture, logistics, archaeology, environmental monitoring and numerous other fields vital to human development, scientists say in new research.

The study, published in the *International Journal of Cognitive Computing in Engineering,* notes that "drone technology is poised for remarkable advancements across multiple domains", with the potential to significantly improve quality of life worldwide.

According to the authors, next-generation drones are expected to have far greater endurance, with longer flight ranges, extended operational duty cycles and enhanced resilience. These improvements will enable drones to support long-duration missions, such as long-distance medical or commercial deliveries, and wide-area surveillance in both densely populated urban zones and forest environments.

Current progress in artificial intelligence and machine learning is further accelerating this transformation, with AI enabling drones to perform complex tasks autonomously. The latest advancements have made it easy for drones to recognise objects, plan their path and avoid obstacles.

"Drones will become more adept at perceiving their surroundings as sensor technology advances, such as LiDAR, multispectral cameras and sophisticated IMUs, making drones useful tools for mapping, surveying and agriculture," the researchers write.

Mapping the future of autonomous drone navigation

The study adopts a three-stage research framework to assess the current state of drone technology and chart a pathway towards the advancements expected in a sector that has become essential in an era defined by digitisation, artificial intelligence and machine learning.

To balance theoretical rigour with real-world applicability, the authors, affiliated with the University of Sharjah in the United Arab Emirates, Algeria's Université Constantine 2 and Malaysia's Taylor's University, focused on mathematical models that underpin autonomous navigation in unmanned aerial vehicles (UAVs).

They introduce "optimization-based path loss models incorporating terrain and environmental constraints" and compare them with the existing "state-of-the-art approaches to assess their effectiveness and performance".

Meanwhile, the study highlights the fundamental principles and mathematical foundations of autonomous navigation, proposes an optimisation model for path-loss prediction, offers a comparative assessment of contemporary models, and outlines the most advanced algorithms and techniques in UAV research.

Image credit: iStock.com/zf

> WITH DRONE TECHNOLOGY EXPECTED TO ADVANCE RAPIDLY, COUNTRIES WILL NEED TO UPDATE AND STRENGTHEN THE REGULATORY FRAMEWORKS GOVERNING DRONE APPLICATIONS

It evaluates a broad spectrum of optimisation methods, including genetic algorithms, particle swarm optimisation, colony optimisation and reinforcement learning, that enable drones to compute efficient flight routes, reduce energy consumption and avoid obstacles that could delay or compromise mission objectives.

The research underscores how recent advancements in unmanned aerial systems and artificial intelligence have "accelerated research in a variety of fields, including human–drone interaction, autonomous navigation, security, object detection, urban air mobility, energy-efficient design, environmental monitoring, archaeological research, wildlife conservation, medical supply delivery, disaster response, and precision agriculture".

Call for stronger regulations and ethical safeguards

With drone technology expected to advance rapidly, countries will need to update and strengthen the regulatory frameworks governing drone applications, the authors add, noting that "concerns such as privacy alongside airspace management are expected to be addressed by regulatory bodies as they improve and adapt regulations to ensure reliable and accountable drone operations".

The researchers anticipate that future innovation will increasingly focus on "designing specialised drones to meet … industries' demands. Drone flights will go up due to improvements in battery technology and energy efficiency, which reduce recharge frequency, making them more useful for long-duration missions".

Looking ahead, the authors emphasise that nations must devote greater attention to drone security and counter-drone technologies. These areas are becoming increasingly crucial as drone use grows, increasing the need "to prevent illegal or harmful drone activities". In densely populated areas, "drone sustainability, such as noise and emission reduction, should garner more attention".

They write, "Drones will have a significant role in the worldwide Internet of Things (IoT) ecosystem with the aid of 5G and 6G networks for immediate data transfer and communication. Growing public interest in UAM, which uses passenger drones for transportation, has sparked efforts to develop safe and efficient UAM systems."

However, the authors raise concerns about the ethical challenges that accompany these technological leaps. Advanced drones, equipped with high-quality cameras and sensitive sensors, can collect personal or confidential data without consent, posing risks to fundamental ethical standards.

They are also quick to note that the use of UAS is not without environmental consequences. "Drones' flight may disturb wildlife, especially bird habitats, and they may change their migration and nesting behaviours. Another aspect of wildlife disruption is noise pollution.

"Regarding environmental sustainability, the need for high production of lithium batteries for drones causes electronic waste. Consequently, we suggest a balance of technological advancements and ecological maintenance to ensure biodiversity and environmental sustainability."

Linking theory to practice

The study makes a substantial contribution to drone research by helping bridge the divide between "theoretical path loss models and practical UAV applications". In doing so, it lays important groundwork for real-world deployment for future models in domains such as wildlife monitoring, disaster management and precision agriculture. "Future drones will have longer ranges and more endurance, expanding their application across various industries," the authors note.

The authors further argue that continued technological progress will lead to the development of specialised drones specifically designed to meet distinct industrial needs, which are largely unattainable by current models. Technological advancements are expected in both commercial and industrial drone applications.

Looking to the future, the study highlights the design of energy-efficient drones that "will increase flight times, and security precautions will prevent unapproved drone activities. Quieter and greener drones will be used more frequently, especially in urban areas. While the idea of UAM gets closer to reality, integration with IoT and 5G networks will enable real-time data exchange".

Overall, the authors conclude that the future of drone technology will be "characterised by automation, versatility, safety, and environmental consciousness. As drones redefine industries and transform everyday life, their evolution remains closely intertwined with technological progress and societal needs".

CASE STUDY

SAPOL engages RFI for in-vehicle repeater upgrade

South Australia Police rely on clear, consistent UHF radio communications to ensure officer safety, support rapid response, and maintain public safety. Their existing in-vehicle repeater systems had reached end-of-life, requiring modernisation to maintain performance and reliability, and so an upgrade was required.

In-vehicle repeaters are a critical technology that extends UHF radio coverage for police officers operating across South Australia's diverse regional environments.

The upgrade presented a few challenges, not least of which was ensuring a seamless, faultless transition from the older generation repeaters to improved technology, and maintaining continuity of communications during installation across a large and diverse vehicle fleet.

The new technology also needed to meet operational expectations for range, reliability, and coverage, especially because of their use in regional and remote areas.

Building on a long-standing relationship spanning many years, RFI was chosen to support the rollout of new in-vehicle repeaters.

RFI supplied the Pyramid Guardian Vehicle repeater system as the technology foundation for the upgrade. The robust in-vehicle solution is designed to enhance the range and clarity of UHF communications, delivering a stronger platform for operational safety.

The project is being implemented in collaboration with the SA Police Radio & Technology Support Unit, who are responsible for fitting the new technology across the fleet. Approximately 10–12 personnel are supporting the rollout.

The first batch of upgraded in-vehicle repeater (IVR) systems is already being installed in SA Police vehicles, although the full upgrade program will span approximately two years, so that eventually every operational vehicle will benefit from the enhanced system.

RFI is providing ongoing support and partnership throughout the process, ensuring technical continuity and performance assurance.

The new IVR system introduces meaningful enhancements that strengthen communication reliability across the fleet.

Improved UHF radio performance across regional and remote areas of South Australia means increased officer safety, with more reliable communications during critical operations.

It will also mean enhanced operational efficiency, helping SA Police personnel carry out duties confidently and effectively, and will provide a stronger, more resilient communications network that benefits both police officers and the broader South Australian community.

"The Pyramid IVR is an important piece of communication equipment for SAPOL officers in regional areas," said Simon Roocke, Technical Officer, GRN Radio Systems, South Australia Police. "The SAGRN has excellent coverage, but there are some regional locations where the vehicle-based mobile radio has coverage, but the portable radio does not.

"The IVR allows the officer to use the portable radio when outside the vehicle to communicate through the vehicle's mobile radio. Without the IVR in these locations, there would be limited or no communication when outside the vehicle."

RFI has supported the SA Police with RF communications solutions for many years. This upgrade continues to deepen the partnership, reaffirming RFI's commitment to delivering reliable, high-performance technologies to Australia's public safety agencies.

RFI Technology Solutions
www.rfi.com.au

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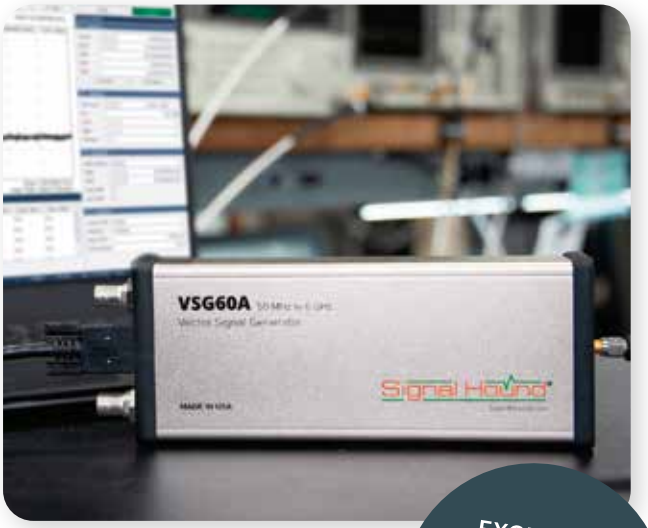

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FULL SPECIFICATIONS ON OUR WEBSITE.

UHF CB radio for agricultural environments

Whether working the back paddock or operating machinery kilometres from reception, reliable communication is essential for safety on the farm. With this in mind, GME has launched a product built specifically for rural and agricultural conditions: the XRS-390CAG UTV Pack. Built for use in UTVs and agriculture machinery, the product combines the features of GME's XRS-390C with its AE4200 lightweight antennas.

The UHF CB radio features a built-in GPS receiver, offering true location awareness without relying on a smartphone to provide GPS location data. This capability is particularly useful in commercial applications where location tracking of users is required for workplace safety.

Featuring IP67 protection and a MIL-STD810G rating, the device is designed to be tough and durable. Both the hideaway main unit and the rugged OLED speaker microphone are dust- and waterproof, for good performance in tough environments.

The radio has been designed and engineered to suit specific applications including UTVs and agricultural machinery, bringing GME's full suite of XRS Connect features to a different segment of the UHF CB market. The AE4201 and AE4202 have meanwhile been developed as modern, robust antennas with interchangeable whips to provide either 2.1 or 4 dBi gain to suit the user's application or terrain.

GME Pty Ltd

www.gme.net.au

3D laser velocity sensor

Advanced Navigation has launched Chimera Land, a 3D laser velocity sensor (LVS) specifically designed to solve the primary challenge of maintaining precise vehicle positioning for underground mining in deep, dark and unmapped environments where GPS cannot reach.

In underground mining, knowing exactly where a vehicle is located is mission-critical. Traditional navigation relies on GPS signals, which disappear the moment a vehicle enters a portal or adit. To compensate, mines often install fixed infrastructure, such as Wi-Fi beacons or radio tags, which can be time-consuming and costly as they must be regularly maintained to keep up with the rapidly advancing mine face.

When fused with an Advanced Navigation inertial navigation system (INS), Chimera Land allows underground vehicles to maintain stable navigation over extended distances and time. Instead of needing to 'ask' an external beacon or satellite for its location, the sensor uses specialised lasers to measure a vehicle's ground-relative 3D velocity with high accuracy. By feeding this data into the vehicle's INS, the sensor eliminates the inherent drift that typically comes with standalone INS.

Chimera Land has been tested in what is said to be Europe's deepest underground mine, a 1.4 km-deep mine operated by BHP. When integrated with Advanced Navigation's Boreas D90 INS, the solution achieved a position accuracy of 99.9% of distance travelled, the company said. Crucially, this performance was maintained without relying on any fixed positioning infrastructure, pre-existing maps or external aiding.

Advanced Navigation

www.advancednavigation.com

Industry Talking

Long-life satellite asset tracker

Satellite IoT connectivity company Myriota has announced AssetHawk, a rugged, long-life asset tracker that is designed to provide global visibility beyond the reach of traditional cellular networks.

The company says AssetHawk is a ready-to-use device that installs in minutes and integrates seamlessly with third-party visualisation and analytics platforms. Its compact, low-profile design and flexible mounting options, including magnetic mounting, make it suitable for rotating fleets and temporary assets. An IP68-rated enclosure aims to ensure reliable operation in harsh conditions, including submersion, dust, impact and extreme temperatures commonly encountered in mining, agriculture and heavy industry.

Utilising Myriota's HyperPulse 5G Non-Terrestrial Network (NTN) satellite connectivity, AssetHawk supports scalable tracking of trailers, containers, pallets, vehicles and unpowered assets across vast geographies. This allows operators to verify delivery milestones, reduce asset loss, improve utilisation, lower operating costs and improve margins as fleets and deployments scale.

Low-power hardware delivers up to 10 years of battery life on two AA batteries, while intelligent firmware automatically increases location update frequency when movement is detected in order to provide improved insights while optimising power consumption and operational costs.

Myriota

www.myriota.com

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This February saw the association executive and committee members gather in Brisbane for our annual planning day, setting the scene for the year head, enabling the association to maximise our efforts by focusing on what's important to our members. Attendance was again high, demonstrating the commitment our committee and their organisations have to the association, and we're very grateful to them for this.

Being in a healthy financial position, with growth in revenue in recent years, as presented during the day, the association is able to invest in numerous areas for the benefit of our members and the wider community. This includes creating learning and collaboration opportunities, and ensuring our members' position on available spectrum is heard. Given the number that we are now delivering per year around the country, both face-to-face and online, we are pleased with how activities continue to track, and we thank our members and partners for all their support, which helps these to take place.

Given the above, our training team continues to make good progress, developing and delivering new content, with more in the pipeline for the year ahead. In addition, the team is looking at how we can align ARCIA training with the government's National Microcredentials Framework, with the view to creating the all-important pathways required by both those new to the sector, as well as for those who have made professional communications their career of choice, ensuring long-term benefits for all members participating in professional development.

After a couple of years of discussions, Tasmania was added to our calendar in 2025, and continues to be included this year, ensuring the state is not left out. Whilst at the planning day, along with the discussion around the possibility of a Victoria State Dinner — in line with our other state dinners, smaller and more state-focused than our Gala Dinner — it was agreed that the association should also work with the local market to present a State Professional of the Year Award, offering recognition to outstanding individuals in the radio and critical communications community in Tasmania.

The association is also reviewing our spectrum advocacy role. Over the years, and given our roots, we very much focused on the role of land mobile radio technology, with our focus then shifting to include the consideration for a Public Safety Mobile Broadband network and what that meant for all stakeholders. However, with technology advancements, it is again important to reframe and include all private spectrum holders, regardless of the technology being used, and advocate for economic reform for the productivity of the nation.

Finally, it was great to see the Spurious Challenge Regatta 2026 take place in February, allowing industry professionals to come together to raise much-needed funds for a very worthy cause, the Black Dog Institute, with around $20,000 being raised on the day. Thank you to our RFI for organising such a fabulous day, which I am pleased to report, came to a close with line honours going to our very own ARCIA boat, helmed by our committee members and CEO.

Hamish Duff
President (Hon),
ARCIA – Australia's Radio & Critical Communications Association

In-vehicle WWAN solutions: redefining connectivity for emergency services

Tim Karamitos, Major Account Manager ANZ,
Ericsson Enterprise Wireless Solutions

How Ericsson in-vehicle WWAN solutions and Intelligent Link Bonding are redefining connectivity for emergency services.

Emergency services operate where seconds and data matter. Today's first responders must stream incident video, share large sensor data files, maintain secure voice and data channels, and run location aware analytics — often from moving vehicles and in unpredictable environments.

Consider a situation where flooding or a bushfire is active. Command centre personnel must know the location of all emergency vehicles, field workers must be able to communicate with each other and command centre teams, and any IoT connected devices — like drone cameras, firehoses, water level and flow sensors — must be able to send data back to command centre.

To meet these demands, resilient, intelligent connectivity is no longer optional.

Ericsson's Intelligent Link Bonding or alternatively, Smart WAN Selection gives emergency services two practical options to multi-WAN and always-on operations. Ericsson's new Cradlepoint R2400 vehicle router brings these capabilities together in the most advanced in-vehicle platform to date.

What is Smart WAN Selection?

Smart WAN Selection (SWANS) keeps mission-critical communications online by continuously assessing link health and automatically picking the best link based on preconfigured criteria across fixed links, 5G/LTE, or LEO satellite. During incidents, Computer-Aided Dispatch, pushâ€'toâ€'talk, AVL/telematics, and live video for example are moved to the best performing link based on the set criteria, which is latency, jitter, data usage and signal strength.

What Intelligent Link Bonding is, and why it matters

Intelligent Link Bonding combines multiple WAN links (cellular, satellite, wired) into a single logical connection for availability and performance. Features include flow duplication (for high resiliency), flow balancing (for optimisation/cost), and bandwidth aggregation (for more throughput), resulting in uninterrupted telemetry or dashboard camera video delivery, even in challenging mobile conditions. It can spread traffic across links for speed, combine bandwidth for big uploads and streams, or duplicate critical traffic on two links at once so it arrives even if one path has problems.

SD-WAN and Link Bonding

SD-WAN is the overlay control and policy engine that continuously measures the quality of those links (fibre, 5G, satellite, etc) for speed reduction or failure and steers application traffic onto the best paths. Used together, SD-WAN decides 'how' to use links; Intelligent Link Bonding decides 'how many' and 'in what pattern'. This pairing delivers higher availability, better performance, and smoother user experience across wired, cellular, and satellite connections. If a link degrades or fails, SD-WAN shifts flows while bonding can keep packets flowing across alternate links, preserving sessions and app quality.

In high-stakes scenarios like emergency events, SD-WAN plus Intelligent Link Bonding can deliver real-time telemetry and live video by optimising and combining available WANs.

Securing network traffic

Security for mobile public safety environments must be comprehensive yet lightweight. In practice that means encrypted tunnels end-to-end, device and user authentication, micro-segmentation (zero trust) to isolate critical systems, and consistent policy enforcement whether a team is in the field or connected to a command centre. Integrated with SD-WAN, security policies follow the application and device — preventing data leakage, protecting live incident footage, and keeping critical command channels secure.

On top of network controls, edge compute can allow applications to be installed and run at the edge and local security features can perform local inspection, threat detection and rapid response actions before malicious activity traverses the wider network, minimising exposure when connectivity is intermittent.

What does fast mobile connectivity look like today?

There is no shortage of features and promises made by technology vendors today. What field emergency services personnel need are solutions that don't leave anything to chance or

guesstimation. Ericsson's new Cradlepoint R2400 is the first ruggedised router designed to eliminate connectivity gaps, not just survive them. Enabling five carrier connections monitored plus LEO satellite in real time, location accuracy down to the centimetre, Wi-Fi 7 speeds, and failover measured in seconds, not minutes — this solution is built to perform in real-life conditions where emergency services operate.

Key capabilities that matter to emergency services are:

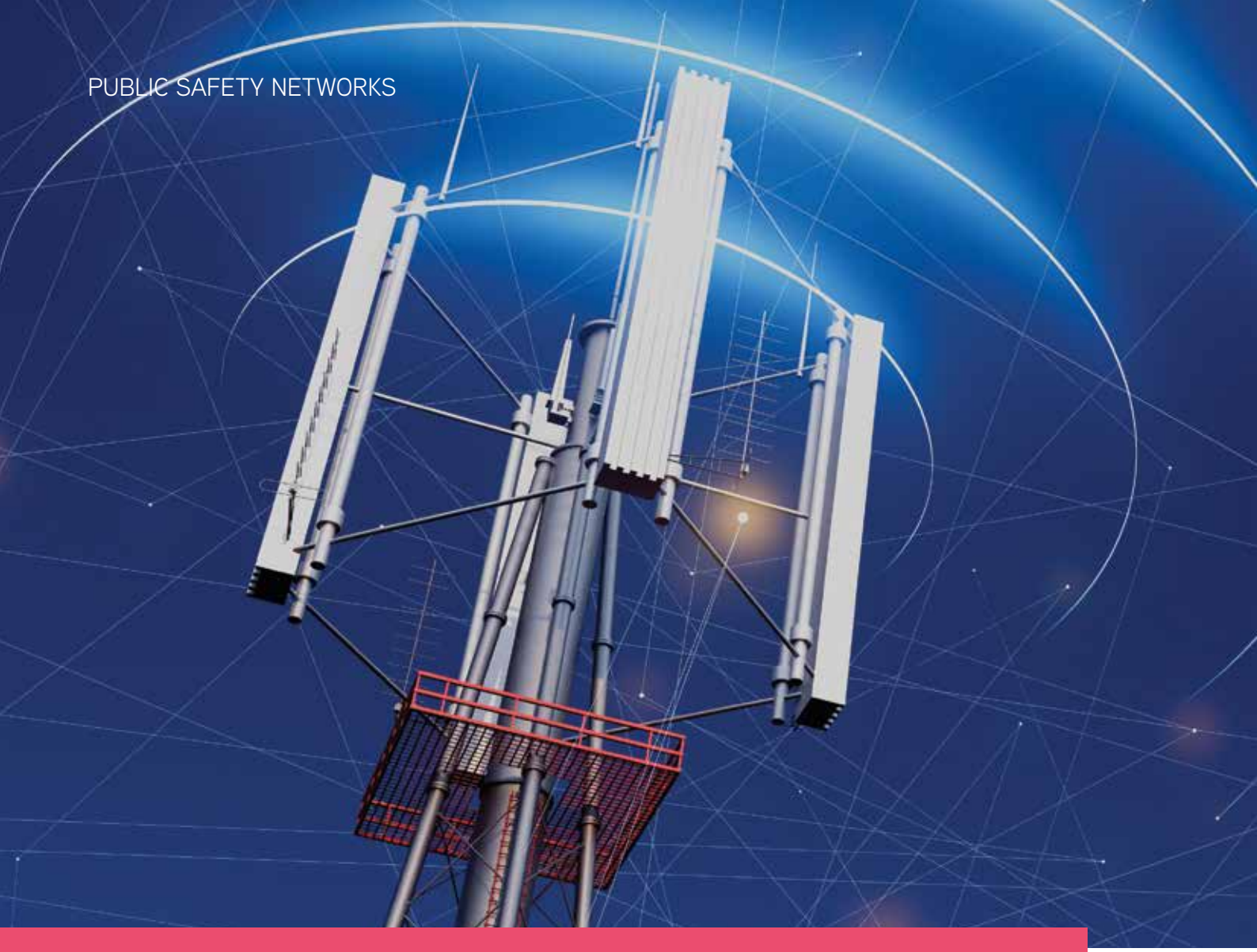
- Industry-first Dual SIM / Dual Standby (DSDS) on a single modem, enabling carrier failover roughly 10 times faster than prior approaches, ensuring voice, video and telemetry stay live during handoffs or network degradation. Failover happens in seconds, compared to minutes with other solutions.
- SD-WAN orchestrates traffic across modems based on performance and traffic steering switches to LEO only when needed to avoid unnecessary cost or lower performance, compared to other solutions where latency-sensitive apps can't rely on optimal paths because there's no application-based traffic steering. Other solutions also make it harder to control WAN without traffic steering to preferred or lower cost SIMs and links.
- As emergency response fleets add video analytics, environmental sensors, and AI-driven applications, traditional vehicle routers can't keep up — many lack local processing power and must send data to the cloud despite latency and backhaul limits. The R2400 delivers 2.5 times more processing power than its predecessor, enabling in-vehicle AI inference (video analytics, computer vision, people counting) and containerised applications to reduce delays, save bandwidth, and deliver faster insights.
- Easily connect with existing emergency services systems, supporting smoother deployments and consistent performance across varied fleets. It also supports network slicing, so critical traffic — dispatch, video, safety alerts — stays separate from everything else and important data gets priority automatically.

Modern emergency response requires networks that are resilient, intelligent, and secure. Ericsson has been powering emergency services fleets worldwide with ruggedised in-vehicle Cradlepoint routers designed for always-on mobile connectivity for many years. Ericsson's Intelligent Link Bonding, when paired with SD-WAN orchestration and robust security controls, or alternatively, Ericsson's Smart WAN Selection (when delivered through the Cradlepoint R2400 platform) equips emergency services with the most advanced in-vehicle connectivity stack to date — keeping mission-critical applications running, protecting sensitive data, and giving teams the real-time insights they need to save lives and stay safe.

Built to solve real problems in real environments, the ruggedised R2400 delivers reliable connectivity in the most unpredictable conditions.

ERICSSON

Ericsson Enterprise Wireless Solutions Australia Pty Ltd
www.cradlepoint.com/au



THE SHIFT TOWARDS LTE AND 5G IN PUBLIC SAFETY

SNS Telecom & IT

Spending on LTE and 5G NR-based public safety broadband is continuing to increase according to a recent global survey.

According to market research, annual spending on LTE and 5G NR-based public safety broadband infrastructure and devices will exceed US$6.3 billion globally by the end of 2028. The market's upward trajectory is coupled with realistic prospects of migration from land mobile radio (LMR) systems to 3GPP broadband technology across multiple national markets in the coming years.

SNS Telecom & IT's 'Public Safety LTE & 5G Market: 2025–2030' report estimates that annual investments in public safety LTE/5G infrastructure and devices reached US$5 billion in 2025, driven by both new projects and the expansion of existing dedicated, hybrid government–commercial, and secure MVNO/MOCN networks. The market will further grow at a CAGR of approximately 8% over the next three years, eventually accounting for more than US$6.3 billion by the end of 2028 as nationwide mission-critical broadband deployments move from concept to delivery.

Western and Northern European countries, including the United Kingdom, France, Finland and Sweden, are moving ahead with plans to migrate all public safety users from TETRA and Tetrapol systems to nationwide mission-critical 3GPP networks between 2028 and 2031. South Korea is an outlier, having carried out its transition much earlier due to the previous lack of a digital LMR network with nationwide coverage.

Transitions aside, a host of national-scale public safety broadband deployments are either operational or moving into the

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delivery phase. One of the largest projects that recently emerged from secrecy is Saudi Arabia's US$8.7 billion mission-critical broadband network for the Kingdom's defence, law enforcement and intelligence agencies. Another new addition is the Hong Kong Police Force's US$250 million 5G-based NGCS project, which is comparable to national programs in smaller countries and follows a very different approach from mainland China.

Other programs extend from high-profile initiatives such as the United States' FirstNet, South Korea's Safe-Net, Great Britain's ESN, France's RRF, Sweden's SWEN and Finland's VIRVE 2 to New Zealand's PSN, Royal Thai Police's LTE network and Japan's PSMS, among many others.

3GPP-compliant MCX services are a foundational component of nationwide public safety broadband networks, and multiple contracts have recently been awarded for both gateway-enabled interoperability solutions and standards-based IWF technology. Other key focus areas include in-building coverage enhancement, 5G NR sidelink, hybrid LMR-broadband terminals and other alternatives for off-network communications, rapidly deployable network assets, satellite direct-to-device connectivity, and the integration of NG911, live video, geolocation services, AI analytics and situational awareness.

Beyond state-funded national programs, public mobile operators in some countries are pitching network slicing over their recently launched standalone 5G cores as an alternative to dedicated networks. In the United States, both Verizon and T-Mobile have launched first responder network slices to rival the AT&T-operated FirstNet national public safety broadband network.

Independent small- to medium-scale private 5G networks are also being deployed to address specific operational needs, with examples being Mexico City Police and Madrid City Council.

Australia and New Zealand

In the Australian market, limited progress has been made so far on Australia's national PSMB (Public Safety Mobile Broadband) initiative despite an RFI in 2024 to prequalify vendors for a future procurement, according to the report. Telstra has carried out demonstrations of MCX services, LMR-3GPP interworking, and prioritised access at its Gold Coast PSEC (Public Safety Experience Centre) to build its case to serve as the primary carrier for PSMB. The NSW Telco Authority is leading advocacy efforts to secure suitable spectrum for emergency services and impose enforceable licence conditions on commercial mobile operators to guarantee priority, pre-emption, national roaming and public-safety-grade resilience.

As part of New Zealand's PSN (Public Safety Network) program led by cross-agency entity NGCC (Next-Generation Critical Communications), over 25,000 public safety subscribers rely on a multi-network cellular roaming service for broadband communications. Priority and pre-emption are operational for more than 80% of these users to ensure first responders stay connected even when the Spark and One New Zealand cellular networks are congested or degraded. In addition, compact rapid deployables are also being procured to provide temporary cellular coverage during major emergencies or incidents. They will be stored across the country in strategically selected geographic locations, ready for deployment as required.

Multiprotocol antennas

Leankon has announced a line of Wi-Fi 7, Wi-Fi 6E and Bluetooth integrated antennas designed for OEMs, IoT innovators, and developers of smart tech.

Modern devices demand seamless wireless performance across various standards — from ultra-fast Wi-Fi 7 to low-energy Bluetooth and IoT protocols like Zigbee, Matter and Thread. Leankon says its antennas support these widely used standards in a single component, making it easier to build multi-protocol wireless solutions without sacrificing performance or footprint.

Key products in the range include an SMD Bluetooth/Wi-Fi 7 corner mount antenna (LK1810101) with omnidirectional coverage, and compatibility from Wi-Fi 6 to Wi-Fi 7; and the Flex Wi-Fi 6E Antenna (LK1810601), an ultra-compact FPC design suitable for small devices that require robust Wi-Fi 7 and Bluetooth connectivity in limited space.

Leankon says each antenna is designed to offer high efficiencies and optimal radiation patterns tailored for challenging wireless environments.

Leankon provides complimentary evaluation boards and samples so engineers can test designs. This accelerates time to market and helps development teams to optimise antenna performance early in the process.

Leankon

www.leankon.com

Smart PoC radio

The P50E — a smart push-to-talk over cellular (PoC) radio from Hytera — features a compact 0.96″ screen and a keyboard-free design. It is designed to simplify patrol operations with built-in NFC, allowing fast check-ins.

Integrated with the Hytera HyTalk platform, the radio enables teams to log routes, verify checkpoints and receive real-time task updates. This makes it suitable for the private security and property management sectors.

Safety is central to the P50E, which is equipped with lone worker and man down functions. These enable the device to provide automated monitoring for personnel working alone or in high-risk environments, triggering immediate alerts during emergencies or periods of inactivity.

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

VHF and UHF digital handheld transceiver series

Icom's IC-F3600D/F4600D VHF and UHF digital handheld transceiver series has been built with IP68 and MIL-STD-810G durability. The series features a 1.8″ colour display supporting multiple languages, plus advanced connectivity with smart functionality featuring Bluetooth Classic and Bluetooth LE.

Other features include powerful battery options (4920 mAh) for long-lasting performance and USB Type-C for fast charging. The built-in GNSS receiver provides multi-constellation support (GPS/GLONASS/Galileo/BDS/QZSS).

Icom Australia Pty Ltd
www.icom.net.au

Tactical hearing protection headset

Savox Communications has launched the Noise-COM 200^{x2} tactical hearing protection and communications headset. Built for dismounted, mounted and training environments, the company says it delivers improved audio clarity, ruggedness and seamless integration across the Savox tactical range.

The Noise-COM 200^{x2} has a modular cable architecture, harsh environment durability and advanced audio system that aims to provide superior speech intelligibility even in the toughest conditions.

Seamlessly integrated with the Savox dismounted soldier platform, it enables unified voice and data connectivity that boosts situational awareness and reduces cognitive load. The headset also interoperates effortlessly with Savox PackCOM wireless team communication systems — supporting uninterrupted communications as operators move from on-foot to in-vehicle operations.

An enhanced user interface offers improved controls for reliable gloved operation, and the comfort-optimised design with upgraded headband, backplates and ear seals is designed to reduce fatigue during extended missions. An upgraded microphone connector and protective cap improves resistance to water ingress and humidity.

An ultra-low power architecture enables up to 500 hours of operation in hear-through mode with standardised, off-the-shelf AA battery compatibility that simplifies logistics and avoids proprietary power dependencies.

A quick-change communication cable enables rapid switching between hearing protection and full communications configurations, and a dual-side microphone slot supports left or right placement for user preference and compatibility with integrated head protection systems. An extended interconnection cable supports flexible helmet-mounted and headband use.

AceComms
www.acecomms.com.au

BEATING THE JAMMERS

AUSTRALIAN TECHNOLOGY GIVES WARFIGHTERS PRECISION IN GPS BLACKOUTS

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Advanced Navigation's inertial-centric intelligence has succeeded in achieving navigation in GNSS-denied environment tests.

Australian company Advanced Navigation has successfully demonstrated its inertial-centric intelligent navigation as part of the US Army's All-Domain Persistent Experiment (APEX), showing the company's technology has the ability to provide reliable, high-accuracy navigation in GNSS-degraded and -denied conditions.

Designed for the DDIL (Degraded, Denied, Intermittent and Low-bandwidth), APEX provided Advanced Navigation with an operationally relevant testbed to evaluate the performance of its Boreas D90 Fibre-Optic Gyroscope (FOG) Inertial Navigation System (INS) when fused with complementary aiding sensors, including the Laser Velocity Sensor (LVS) and a wheel speed encoder.

During APEX, Boreas D90 with AdNav Intelligence was integrated with both an LVS and a wheel speed encoder aboard a four-wheel-drive vehicle. The demonstration was conducted during night operations at a site in rural New Mexico, USA, at which the organisers created an environment of complex and emerging electronic warfare threats by conducting GNSS jamming.

For operations requiring extreme accuracy and dynamic performance, Boreas D90 was fused with LVS, Advanced Navigation's infrared laser sensor that measures ground-relative 3D velocity with high precision. LVS performs reliably on both ground and airborne platforms regardless of environmental conditions or the availability of visual references, as long as it maintains a clear line of sight to the ground or a stationary surface. By providing direct, drift-free velocity measurements, LVS helps ensure continuous, high-precision mobility and enhances navigation resilience even in the most extreme contested GNSS environments.

Unlike conventional systems reliant on GNSS or magnetic compasses, Boreas D90 determines true north through gyrocompassing, using ultra-sensitive fibre-optic gyroscopes to detect the Earth's rotation. This enables independent, high-confidence navigation, even when external GNSS signals are compromised.

"In today's contested environment, the adversary will deny, degrade and spoof GNSS signals. Relying on a single technology for navigation is a mission-ending vulnerability," said Chris Shaw, Advanced Navigation CEO, "Assured PNT is non-negotiable. The only path to operational advantage is an intelligent, multi-sensor fusion anchored by a resilient inertial core. We deliver this with our sophisticated AdNav Intelligence software."

AdNav Intelligence software is designed to adapt in real time and to respond to incoming threats. It dynamically weighs the input from each sensor, making real-time adjustments on which sensor to rely on based on their reliability scores, environmental conditions and operational context. By applying a software-defined hardware philosophy, the solutions ensure continuous, high-confidence state estimation even when signals are disrupted, degraded or denied.

The configuration demonstrated best-in-class dead-reckoning accuracy, achieving a 0.012% error per distance travelled (7.5 m over 65 km) in the same contested conditions.

When paired with a wheel speed encoder, Boreas D90 delivered reliable dead-reckoning performance suitable for platforms operating in predictable or structured environments. Across the demonstration, the Boreas D90–wheel encoder configuration maintained strong navigation continuity, achieving a 0.018% error per distance travelled (11.7 m over 65 km), without reliance on GNSS, even under deliberate jamming.

"Now in our third year participating in this US Army program, APEX continues to challenge our systems under realistic electronic warfare conditions. We're honoured to collaborate with the US Army to help better prepare warfighters' mission readiness for complex multi-domain operations," Shaw said.

Next steps

For Advanced Navigation, the results from APEX show significant potential for a range of current and future defence applications. The technologies exceeded the team's expectations, demonstrating the level of accuracy and operational reliability required for successful navigation under GNSS-denied and -degraded conditions.

Continued investment in research and development — particularly in integrating inertial navigation systems with next-generation photonics — promises to further advance capability, resilience and adaptability on the battlefield.

Advanced Navigation said the next experiment will include partners within the United States Air Force's 746th Test Squadron and the Joint Navigation Warfare Center, US Army Combat Capabilities Development Command, and the Army Test and Evaluation Command. Advanced Navigation looks forward to returning in 2026.

Radio Matters

For 35 years, the Radio Frequency Users Association of New Zealand (RFUANZ) has played a central role in supporting the country's radio frequency sector. Now, celebrating our 35th anniversary, the association stands as both a reflection of the industry's evolution and a key contributor to its future resilience.

Officially incorporated in 1991 as the New Zealand Federation of Radio Telephone Users (NZFRTU) — with a rebrand in 1997 to RFUANZ — we emerged during a period of rapid change in New Zealand's communications landscape. Radio networks were expanding beyond traditional land mobile applications into increasingly complex environments supporting emergency services, aviation, utilities, transport and other nationally significant infrastructure. From the outset RFUANZ was created to represent RF users, promote best practice and provide a unified voice within a highly technical industry.

Over the past three and a half decades, the sector has transformed dramatically — moving from analog systems to trunked radio, digital platforms and mission-critical communications. Yet, through every wave of innovation, the fundamentals have remained constant. Spectrum is a national asset, communications must be reliable, and the industry depends on skilled professionals maintaining high standards.

Today, RFUANZ occupies a unique and trusted position within New Zealand's RF ecosystem. We are more than a membership organisation, serving as a forum where regulators, engineers, suppliers, operators and end users connect. The Association contributes meaningfully to industry discussions around spectrum policy, licensing framework, interference mitigation and technical compliance.

At the heart of RFUANZ's success is its community. For 35 years, we have brought together the people who keep New Zealand connected when it matters most. With networking events, technical workshops, certifications, conferences and our annual Industry Awards Gala Dinner, RFUANZ has helped foster both capability and pride within the sector.

Our longstanding engagement with Radio Spectrum Management (RSM), communications ministers, similar associations (like ARCIA and WISPA) and our support of professional certification pathways demonstrate RFUANZ's commitment to maintaining excellence across the sector.

RFUANZ has identified clear priorities for the years ahead. These include strengthening workforce pathways through partnerships with training leaders such as E-TEC and ETITCISB (Electrotechnology Industry Skills Board), continuing strong advocacy on spectrum and regulatory matters, modernising engagement for the next generation of professionals, and expanding collaboration across the Tasman.

At 35, RFUANZ represents both continuity and progress — an organisation grounded in technical credibility, industry connection, and service to a sector essential for national safety and resilience. As we enter our next chapter, RFUANZ remains committed to championing best practice, supporting skilled professionals and ensuring New Zealand's communication networks remain robust for decades to come.

To mark this milestone year, we encourage the industry to take an active role in celebrating the people and organisations that exemplify excellence in our sector. Award nominations are now open and close on 17 April — a valuable opportunity to recognise innovation, leadership and service across our RF community. We look forward to celebrating this with you at our 2026 Industry Awards Gala Dinner and Comms Connect New Zealand in Wellington this May.

Radio Frequency Users Association of New Zealand (RFUANZ)

Multimode connectivity for MCX users

Airbus Public Safety and Security (PSS) has announced the launch of Agnet Direct, a multimode solution that allows mission-critical applications (MCX) users, such as public safety forces and emergency services, to stay connected to team members even when broadband (4G/5G) networks are not available.

The system includes a smartphone with the Agnet mobile application and an accessory (a smart remote speaker microphone — RSM) connected to the smartphone via Bluetooth or cable. It offers four modes, to be chosen and activated before any operation depending on the environment's complexity.

In 'network mode', as part of everyday operations and when 4G/5G is fully available, all MCX features can be used normally while the RSM accessory amplifies sound quality for users in the field. When 4G/5G is partially or fully degraded, the 'direct mode' provides local narrowband connectivity, maintaining device-to-device communications between users in the field via a direct-mode communication channel and their RSMs.

With the 'dual mode' (network mode and direct mode combined), the operation chief has access to both 4G/5G talk groups and the direct-mode channel, and may use them simultaneously or separately. This way, the operation chief is always connected to the control room via the talk groups on the one hand and to his team in case it loses 4G/5G coverage via the direct-mode channel.

When 4G/5G is not available to users in the field and the control room needs to listen to what's going during an operation, the 'gateway mode' can be useful. One user positioned near the scene, with full access to 4G/5G, can activate a gateway that bridges a 4G/5G talk group and the direct-mode channel.

The easy-to-use system thus provides network resilience, off-network coverage and local incident scene communications for end users. The direct mode is especially useful in scenarios such as natural disasters, major fires, underground rescues, wildland firefighting, tactical operations, and network outages/overloads.

Airbus Public Safety and Security
criticalcommunications.airbus.com/en

CASE STUDY

Wireless water monitoring for Port Kembla

Remote monitoring specialist Omniflex has helped New South Wales Ports improve its ability to track water usage by installing remote monitoring to 38 water meters at its Port Kembla site, sending the data to the NSWPorts web portal. The system provided uses LoRaWAN transmitters on each meter and a LoRaWAN gateway at the management office to allow port management to conduct daily consumption analysis. Port management will now benefit from early detection of leaks and system failures, more accurate cost-tracking for individual sites across the port and improved ability to report on environmental, social and governance (ESG) issues.

Port Kembla spans about 50 km and is a multi-use port, including fertiliser plants, grain silos, wind turbine blades and automobiles, making it a critical port for the region. As the port is tenanted and water usage can vary drastically depending on a tenant's application, accurate water usage monitoring will significantly improve cost-tracking and improve the port's ESG reporting capabilities.

Various water meters, depending on age and manufacturer, track usage to varying degrees of accuracy and measure over different time periods. To monitor and report on site-wide water consumption, Omniflex had to adapt 12 different types of water meter of various ages, from decades-old to brand new, and arrange data pick-ups for them as well as check all data pulse calibrations to determine the litres per pulse.

The LoRa-based system that Omniflex provided for New South Wales ports allows port managers to collect data from new and old water meters alike. Furthermore, by using Omniflex's Data2Desktop software, the system makes data output as easy to access as possible while effectively managing incoming data to ensure managers get the right information from the right meter.

"As well as technical challenges associated with creating a system that effectively tracks and reports usage from water meters of very different makes and ages, there were also practical challenges to consider for a job like this," explained David Celine, managing director of Omniflex. "With some water meters being 20 to 30 years old, they were often found to be very dirty — often bordering on unreadable — adding time needed to identify its type and how it works before it could be connected correctly.

"These kinds of practical challenges, while not always immediately apparent, are an important consideration for utilities-monitoring jobs like this and, fortunately, our team is experienced and well-equipped to handle them."

"The new data has already proven useful as our sustainability team is now better equipped to monitor water consumption across various sites," said Mark Jafar, Asset Management Engineer at New South Wales Ports. "This insight may help identify opportunities for stormwater tank installations, where appropriate."

Omniflex (Australia) Pty Ltd
www.omniflex.com.au

Caesium-free primary reference clock

VIAVI Solutions has launched a caesium-free primary reference time clock to safeguard at-risk critical power grids, transportation, aviation and public safety systems, 5G mobile networks and AI data centre infrastructure against the increased threat of GNSS timing disruptions. The company says its ePRTC360+ holdover solution is the only alternative to caesium clocks to meet ITU-T G.8272.1 standards.

The international ITU-T G.8272.1 standard stipulates that Enhanced Primary Reference Time Clock (ePRTC) holdover must have short-term drift of less than 30 ns when entering into holdover and a long-term drift of less than 100 ns over 14 days, all traceable to UTC. Previously achieved only by caesium atomic clocks, VIAVI's ePRTC360+ now also meets this standard.

The ePRTC360+ has been tested across a range of live-sky defence and commercial jamming/spoofing environments, and has been integrated into VIAVI's SecurePNT 6200 product series. The technology can maintain 100 ns accuracy during GNSS-denied threats through the resilient altGNSS GEO-L service with no time limit. It also combines an augmented VIAVI SecureTime GEO anti-jamming antenna and an enhanced GNSS anti-spoofing antenna that also receive eGNSS GEO service with GPS/GNSS-NMA authentication for spoofing detection and mitigation.

VIAVI's GNSS-independent GEO-L service leverages encrypted and highly directional L-band signals transmitted from geostationary satellites. Coupled with the VIAVI SecureTime GEO antenna, the altGNSS GEO-L service provides enhanced anti-jamming protection and a resilient timing reference for the ePRTC360+'s internal rubidium holdover oscillator, and enables smooth multi-orbit source switchover, even when primary GNSS frequencies are jammed, spoofed or subject to sophisticated meaconing attacks.

VIAVI Solutions Inc
www.viavisolutions.com.au

44 GHz spectrum analyser

The Rohde & Schwarz FPL1044 is the company's latest spectrum analyser, offering a frequency range of 10 Hz to 44 GHz.

The FPL1044 is also the only model in the FPL range to offer a DC coupling option, expanding the measurable frequency range starting from as low as 10 Hz. This feature provides greater versatility for analysing signals from extremely low frequencies up to the critical Ka band. It maintains the compact, lightweight dimensions and robust design of the FPL range for portability and efficient use of bench space, and features a standard 2.92 mm male input connector for reliable high-frequency measurements.

Launched simultaneously with the FPL1044 is the new FPL1-K41R 40 MHz real-time spectrum analysis option, allowing all FPL analysers to capture and analyse short events with a Probability of Intercept (POI) time as low as 4.2 μs. This means 40 MHz real-time frequency analysis is now available up to 44 GHz.

The frequency range of 26.5–44 GHz is vital for the aerospace and defence industry, as well as the components industry and for research. It is used for satellite links, radar, radio navigation, earth observation and radio astronomy. Key applications for the FPL1044 are testing satellite and radar systems and components, production quality control of high-frequency components (eg, filters, amplifiers, travelling-wave tubes) as well as onsite repair and maintenance.

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

Coaxial cable

Following customer requests for a more cost-effective alternative to LMR-400, ZCG Scalar has launched an updated version of its RU400 coaxial cable. Suitable for longer cable runs and operation in higher frequency ranges, the 50Ω cable delivers low attenuation performance with specifications near identical to LMR-400.

The product includes a solid copper-clad aluminium centre conductor for good electrical performance, with lighter overall weight compared to solid copper equivalents. It is available in 100, 300 and 500 m rolls, delivering optimal performance on runs beyond 5 m where signal integrity matters most.

The cable is suitable for high-frequency communications, as it maintains strong signal strength across VHF, UHF and microwave bands. It can also be used in commercial and field deployments, as it is engineered for solid performance in outdoor base stations and remote installations. It can also be made into cable sets, and with a range of cable accessories and antennas.

ZCG
www.zcg.com.au

CASE STUDY

NZ Defence Force deploys high-capacity radios for voice communications

A nationwide analog to digital upgrade of the New Zealand Defence Force's (NZDF) voice communication links has provided a large boost to network throughput, supporting a greater number of dedicated voice channels.

While initiation of the project began eight years ago, disruption throughout the pandemic years meant the NZDF was only finally able to start deploying MimoLink Tornado radios from Ubiik from 2022. NZDF's Waiouru site was chosen as a trial location, other NZDF sites across New Zealand followed, and the final site was completed in 2024.

Providing high-capacity voice backhaul links at NZDF camps and bases, the links are used for unclassified (unrestricted) voice communications for range safety, emergency services, security guards and general non-encrypted base communications. The priority traffic at each location is range control (ie, ensuring firing stops to maintain personnel safety) with each range now having its own dedicated channel.

"With our old analog system, our personnel had to share channels, which wasn't ideal," said Dennis Judd, High Frequency Platform Owner, Information Command at NZDF. "The upgraded system has provided greater network capacity, which means our teams can have their own dedicated channel for voice communications while also making room for nationwide channels for New Zealand's Civil Defence service."

Given the remote locations of some of the NZDF's sites, terrain and climate challenges were considered during the RF design phase. Two of the NZDF sites are in the mountainous central regions of both the North and South Islands, which means snow and ice are a regular winter feature and the links needed to be designed to cope with environment. During deployment in July 2023, for example, the temperature was –8˚C in the South Island location.

In addition to the requirement for rugged equipment, another key consideration was power draw. While most of the NZDF locations are mains-powered sites with battery back-up, some are solar-powered and therefore the lower power consumption of the Tornado radios was a key aspect contributing to their selection.

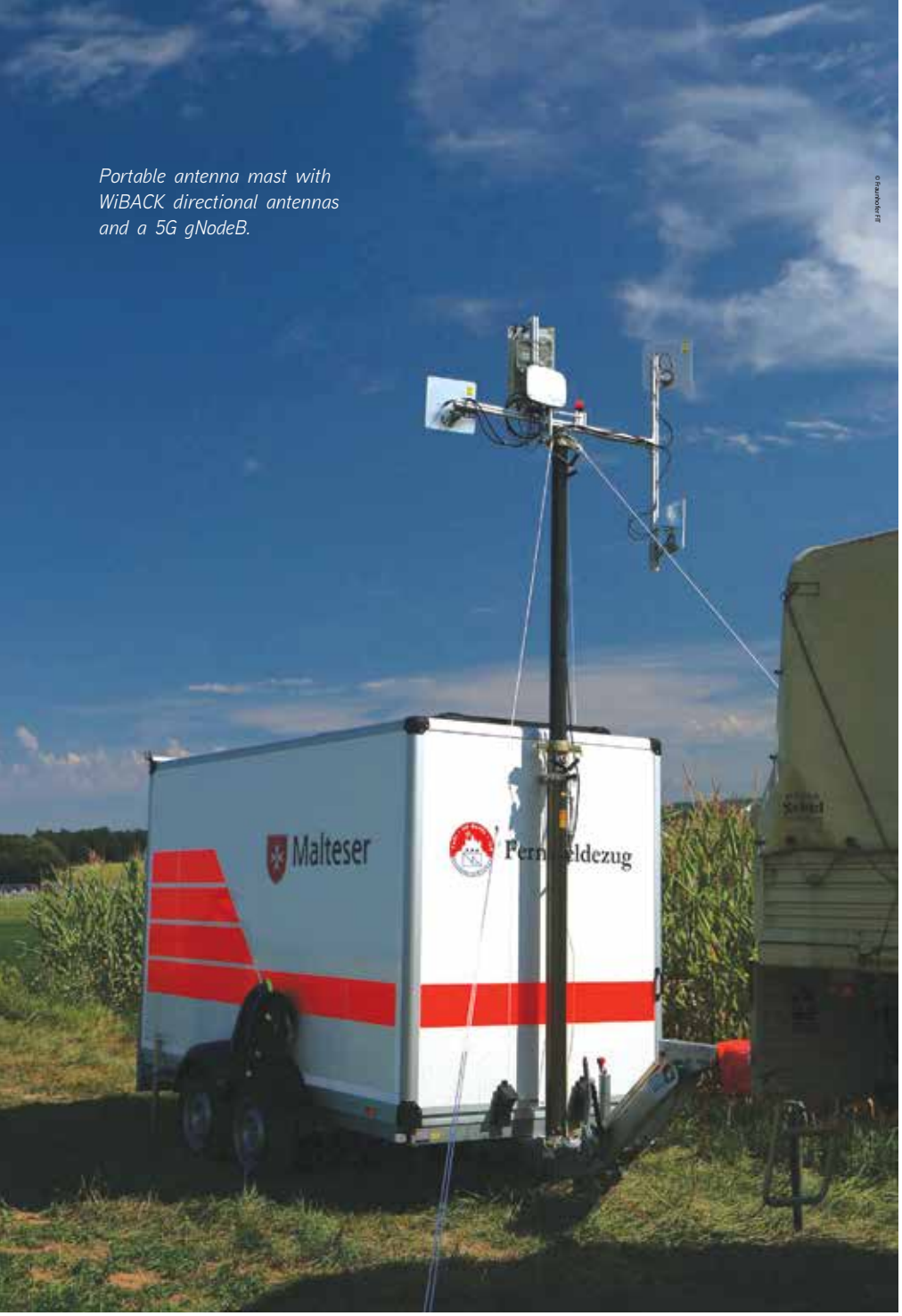
Engineered to meet the exacting standards of critical voice backhaul, the Tornado radios are designed for low latency in addition to very stable jitter and asymmetry. The use of MIMO also assists in boosting reliability for RF paths across difficult terrain, including mountains, dense tree cover or paths over water.

"Sub 1 GHz communication technologies, like the Tornado family of radios, have also been proven to offer greater resilience in the face of weather events," said Clément Dieudonné, VP Sales EMEA & APAC at Ubiik. "We have several customers whose microwave networks have struggled with fading during heavy rain episodes and whose fibre has been damaged by land movement or flash flooding, yet their narrowband Tornado network has operated with few, if any, errors."

"I don't believe we have had a single failure of the Tornado radios, to date," Judd said. "The system upgrade has been very well received and the benefit of having extra channels has increased the number of users, helping our camps and bases to operate smoothly."

This article originally appeared on www.ubiikmimomax.com.

Ubiik
www.ubiikmimomax.com



Portable antenna mast with WiBACK directional antennas and a 5G gNodeB.

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RELIABLE COMMUNICATIONS FOR PUBLIC SAFETY AND DISASTER RELIEF

Fraunhofer Institute for Applied Information Technology FIT

How can we ensure reliable communication during a disaster when mobile networks are congested?

Researchers at the Fraunhofer Institute for Applied Information Technology FIT believe they have found an answer to the question of how we can ensure reliable communication during a disaster when mobile networks are congested.

In a disaster, there are often massive network outages. When the Ahr, a small river in Rhineland-Palatinate, burst its banks in July 2021, the entire telephone and mobile network quickly collapsed as the floodwaters and mud destroyed many exchanges. For emergencies like this, researchers at Fraunhofer FIT have developed smart communication solutions for civil protection and disaster relief to address the congestion of public networks.

In the 5G Opportunity project, they joined forces with Friedrich-Alexander-Universität Erlangen-Nürnberg and Hochschule Bonn-Rhein-Sieg University of Applied Sciences to develop and test a software-based, wireless and ad-hoc-capable communication system for emergency services.

The mobile, self-organising communication network, based on Fraunhofer WiBACK (wireless backhaul) technology, enables emergency services to connect with each other, the incident command and the internet. The WiBACK communication network uses 5G/Open RAN (radio access network) and Wi-Fi for smartphone access and multi-hop routing for backhaul.

"A WiBACK network can be set up in a very short time and be operated immediately in compliance with regulations," said Mathias Kretschmer, a research scientist at Fraunhofer FIT. "The hardware consists of self-sufficient, portable components. All you need to do is connect the batteries, align the antennas, and the network is ready to go."

The foundations for WiBACK technology were established 10 years ago to connect rural areas with limited or no internet connection to remote network infrastructure. At its core, WiBACK is a self-organising, self-sufficient multi-hop routing technology. The cost-effective, wireless backhaul solution comprises small, solar-powered radios equipped with a motherboard, an antenna and a solar-powered charge controller, which connect the emergency vehicles. The portable radio nodes configure themselves, eliminating the need for IT specialists or network technicians. This makes them ideal for use in disaster-stricken areas, where relief organisation staff must quickly establish an alternative communication network in chaotic situations.

Bypassing congested public networks with private 5G cells

"Multi-hop routing is a method for extending the range of radio relay links," Kretschmer said. "It uses several intermediate nodes (hops) to exchange data between distant points. Once a hop or radio receives a signal, it bundles it and then transmits it to the next node, eliminating the need for a direct line of sight and allowing greater distances to be covered.

"We connect the smartphones through our own small 5G cells and use WiBACK for the vehicles."

Metal festival as a test environment

The project partners and Malteser Hilfsdienst e. V. successfully tested the innovative communication solution at the Summer Breeze Open Air 2024 metal festival. A 5G campus network was set up to enable network access at the festival site. The use of this frequency band can be applied for in order to operate a private 5G network. These frequencies are currently underused and could be made available to the emergency services in the event of a disaster. The radio and network nodes at the festival were reliably powered with solar panels and batteries, highlighting the potential for energy-self-sufficient communication networks in disaster-stricken areas.

The future of crisis communication

In the meantime, the follow-up project HiLeit has already been launched. It is coordinated by Fraunhofer FIT and involves Hochschule Bonn-Rhein-Sieg University of Applied Sciences, Malteser Hilfsdienst e. V. and Deutsche Funktechnik UG (DeFuTech).

Plans call for HiLeit to use modular network nodes to enable rapid deployment and adaptation of communication according to the situation at hand. The researchers want to expand the WiBACK architecture to include a LEO (low earth orbit) satellite interface for internet connectivity. In HiLeit, the project partners aim to combine several technologies, including public communication networks, fibre optics, LEO/IRIS2 terminals, field cables and Wi-Fi radio-relay systems to create a flexible, highly available network that can be configured according to the location and requirements.

"The focus here is on intuitive operation so that emergency services can quickly put the system into operation without in-depth technical knowledge," Kretschmer said.

Fully rugged tablets

Getac Technology Corporation (Getac) has launched its next-generation UX10 and UX10-IP fully rugged tablets. The UX10 is aimed at professionals in the defence, manufacturing, utilities, public safety, and transportation and logistics industries, who need versatile devices that are designed for a range of challenging operational scenarios. The UX10-IP is purpose-built for emergency healthcare and public safety professionals, featuring a sealed design that enables the device to be repeatedly cleaned and disinfected.

The tablets are the latest Getac devices to meet Microsoft's Copilot+ PC criteria. Both new devices are powered by an Intel Core Ultra 200V series processor and Intel AI Boost neural processor unit (NPU) with up to 48 TOPS, which can accelerate AI-driven tasks and enhance real-time analytics. Other Copilot+ PC key features include up to 32 GB LPDDR5X memory, up to 2 TB PCIe NVMe SSD storage, and Windows Hello face authentication (an optional fingerprint reader is also available).

The tablets also include a range of further upgrades over the previous generation. These include improved power efficiency for longer runtime between charges, a slimmer and lighter bridge battery (optional) for enhanced overall mobility, Wi-Fi 7 for seamless connectivity, and two Thunderbolt 4 Type-C ports for ultra-high-speed data transfer.

The devices are also MIL-STD-810H and IP66 certified, vibration- and 1.8 m drop-resistant and feature an operating temperature range of -29 to 63°C. Despite all this, they weigh just 1.15 kg, making them suitable for all-day use in the field.

Getac Technology Corp

www.getac.com

CASE STUDY

Large Area Wi-Fi validated with real-world deployment

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Pivotel, in partnership with the Connectivity Innovation Network (CIN), recently deployed a novel Large Area Wi-Fi Solution (LAWIFI) at the NSW Surf Life Saving Country Championships in South West Rocks NSW, delivering a single, secure, wide-area wireless network to support safety-critical operations, event systems and media communications across the beach precinct.

This system is currently in the final stages of development, supported by the Telecommunications Disaster Resilience Innovation Grant (TDRI), and builds on the earlier success of the CIN's Rapidly Deployable Large Area Wi-Fi project delivered by the University of Technology Sydney, the University of Sydney and Pivotel. Key advances include a fully integrated, all-in-one rapidly deployable LAWIFI system, featuring a more compact 360-degree antenna and an upgraded access point combined with a ruggedised, flexible Pivotel backhaul solution.

The Championships involved more than 1100 competitors, supported by officials, safety teams and event staff across multiple surf and beach events over the course of the weekend. This temporary surge in population placed significant pressure on terrestrial mobile networks in the small regional township, which are typically engineered for everyday community usage rather than large, short-duration events. To maintain reliable communications during peak periods, LAWIFI was deployed to provide consistent, high-availability connectivity across the entire beach footprint.

For the Championships, LAWIFI aimed to deliver a secure, wide-area Wi-Fi network spanning approximately 1.5 km of beachfront, from the dunes to the waterline, providing continuous, high-performance coverage from a single, centrally managed deployment in a challenging coastal environment. The architecture integrated resilient satellite backhaul with cellular failover to maintain consistent performance during periods of local network congestion.

The network supported all core operational systems on a single platform, including event operations, safety services, RFID scanning and competitor tracking, broadcast systems, media communications and event technology platforms. This unified approach removed the need for the patchwork of temporary connections, mobile hotspots

and mesh systems that have, at past events, resulted in coverage gaps, inconsistent performance and significant operational complexity.

This enabled event officials to manage safety oversight and event operations across the entire beach precinct using one operational network, improving situational awareness, response times and overall operational efficiency. The deployment also supported the use of four UAVs to provide real-time aerial visibility across the surrounding waters and competition zones, strengthening on-water safety and operational coordination, including targeted monitoring in response to recent shark activity along Australia's east coast.

The event provided an opportunity to validate the performance of the new LAWIFI system in a demanding, real-world operational environment. The deployment delivered continuous coverage across a 2.2 km coastal footprint, supporting more than 100 concurrent users, while achieving sustained throughput in excess of 100 Mbps at distances of up to one kilometre from the primary access point.

In comparative testing, this performance significantly exceeded that of conventional off-the-shelf Wi-Fi, cellular and temporary event networking solutions, which typically experience rapid signal degradation, capacity constraints and inconsistent reliability over similar distances and user loads. The results demonstrated LAWIFI's ability to deliver carrier-grade, wide-area wireless connectivity at scale, under live operational conditions and peak demand.

By extending enterprise-grade connectivity into a challenging coastal setting, the deployment demonstrated how modern digital infrastructure can enhance major events while directly supporting safety, efficiency and operational resilience.

"Operating the Championships on a single, secure network across the entire beach made a significant difference to how we managed safety, event operations and technology systems," said Matthew Ingersole, Chief Information Officer, Surf Life Saving NSW. "LAWIFI supported RFID tracking, broadcast and media communications, giving our teams greater visibility, situational awareness and confidence throughout the event."

"Surf Life Saving NSW operates in some of the most demanding environments for communications. Delivering reliable Large Area Wi-Fi across a complex coastal footprint, under high operational load and peak demand, demonstrates how this capability can support safety-critical operations, major events and regional communities," said Darren Cooley, Head of Enterprise & Government, Pivotel. "As a result of our TDRI development, the consortium has delivered an innovative, resilient and deployable connectivity solution delivering real-world outcomes at scale."

"The deployment at South West Rocks demonstrated how collaborative research can be translated into a working, wide-area communications capability for a live, safety-critical event," said Genie Tan, Chief Operating Officer, Connectivity Innovation Network (CIN). "It reflects CIN's role in bringing together industry, academia and government to apply innovative connectivity solutions in real operational environments."

Pivotel Satellite Pty Ltd

www.pivotel.com.au

Cabinet cable seal platform

Cable and pipe seal provider Roxtec has launched the Roxtec CSP multi-cable transits, which are designed to be area-efficient, adaptable to cables of different sizes and quick and easy to install in cabinets and enclosures with high cable density.

Roxtec CSP transits are compact sealing solutions that help design engineers and electrical installers manage high cable density in a reduced footprint. They are designed for harsh environments and can either include Roxtec standard sealing modules, which protect against water, dust, sand and dirt; or Roxtec CM BG (bonding and grounding) modules to add an electrical safety feature for sealing of armoured cables.

The transits are quick to install in cabinets and enclosures because they have integrated compression and very few components — only the acid-proof stainless-steel frame and the sealing modules with Roxtec Multidiameter, based on removable rubber layers and providing a tight fit for cables of many different sizes.

Available in two different sizes, it is possible to seal up to 16 or up to 32 cables in a single cut-out. The design allows installers to pass through pre-terminated cables without cutting the connector.

Built-in spare capacity enables early planning for upgrades or expansion with additional cables, without any need for drilling or punching new holes. It is possible to add cables in the field without making new openings or adding more sealing material.

Roxtec Australia

www.roxtec.com

iStock.com/adamdodd

The MCX puzzle: the pieces are falling into place

For decades, mission-critical voice has been synonymous with dedicated land mobile radio (LMR) technologies such as TETRA, P25 and DMR. These systems were purpose-built to deliver highly resilient, low-latency group communications for public safety and other critical users. Broadband, by contrast, was originally engineered for consumer data.

Mission Critical Services (MCX), standardised by 3GPP, represent the first time that broadband technology has been formally specified to meet the stringent requirements of mission-critical group communications. That distinction matters. It explains both the excitement surrounding MCX — and the deliberate pace at which it is being adopted worldwide.

Today, the picture is changing. The pieces are starting to fall in place.

From concept to capability

The 3GPP MCX framework — encompassing Mission Critical Push-to-Talk (MCPTT), Mission Critical Video (MCVideo) and Mission Critical Data (MCData) — has matured significantly over recent releases. What began as a standards ambition is now a deployable ecosystem supported by network vendors, device manufacturers, application developers and operators.

Through this process, the industry has learned that matching LMR behaviour in a broadband environment is complex. Cellular networks are optimised for high-throughput data and individual sessions — not for deterministic, many-to-many group communications with sub-second call setup times. Delivering mission-critical performance over LTE — and increasingly 5G — has required architectural evolution: quality-of-service mechanisms, network slicing, cloud computing, mission-critical core elements and hardened device ecosystems.

Why progress has been measured

Observers sometimes ask why MCX has not displaced LMR more quickly. The answer lies in the magnitude of what is being attempted.

Parity with LMR is the baseline requirement. Coverage, resilience, direct mode capability, security, device ruggedness, battery endurance and operational simplicity all matter deeply. Agencies cannot accept regression in any of these areas.

At the same time, broadband introduces entirely new variables: dependency on commercial infrastructure, spectrum policy considerations, cybersecurity exposure and integration complexity with legacy dispatch and control room systems.

Given these realities, the measured pace of adoption is evidence of due diligence.

A different kind of value proposition

What makes MCX compelling is not that it replaces LMR voice. It is that ubiquitous broadband enables capabilities LMR was never designed to deliver.

Such capabilities include real-time video from incident scenes; drone feeds integrated into command workflows; automatic vehicle location with dynamic mapping overlays; biometric telemetry from frontline personnel; database access in the field; multimedia evidence capture and sharing; and AI-assisted situational analysis at the edge.

These are not incremental upgrades to push-to-talk. They represent a significant change in operational awareness and decision making. Agencies are not simply swapping radios; they are rethinking workflows, training regimes, data governance models and inter-agency collaboration frameworks.

Transformation of that scale cannot happen overnight.

MCX global momentum builds

Around the world, MCX momentum is becoming tangible.

In North America, nationwide public safety broadband initiatives have demonstrated large-scale deployment of MCX services integrated into dedicated LTE infrastructure. In Europe, hybrid models combining TETRA and MCX are becoming increasingly common.

In Asia-Pacific, governments are actively evaluating spectrum strategies and deployment architectures that balance sovereign capability with commercial partnership models.

Importantly, interoperability testing between vendors has accelerated. Multi-vendor ETSI plugtests and GCF certification programs are strengthening confidence that MCX will avoid the fragmentation pitfalls that affected earlier proprietary broadband push-to-talk solutions.

Coexistence before replacement

A realistic assessment suggests that coexistence will define the next decade. LMR networks represent significant national investments and continue to provide unmatched narrowband voice resilience. Broadband MCX, meanwhile, delivers data-rich capability and operational flexibility.

Rather than a binary replacement narrative, the industry is embracing integration. Interworking gateways, converged devices and shared control room environments are allowing agencies to adopt broadband at their own pace while safeguarding continuity.

The pieces align

The trajectory is now clear. Standards maturity, ecosystem depth, field validation and 5G advancement are converging. What once appeared as isolated puzzle pieces — spectrum policy, device capability, QoS enforcement, interworking, cybersecurity — are increasingly fitting together into a coherent framework.

For public safety and other critical communications users, the future will not be defined by voice alone. It will be shaped by integrated, data-driven operations delivered over resilient broadband platforms engineered to mission-critical standards.

Anatoli Levine is Director of Products and Standards for Softil, Ltd., responsible for developing strategy and product roadmap for Softil's portfolio of enabling products for developers, including technologies such as Mission Critical Communications (MCX) over LTE and 5G, WebRTC, VoLTE/ViLTE/RCS, SIP, IMS and many others.

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