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25 YEARS

Terrorist Attacks in Norway

Communications Put to the Test

Inside

DMR Standards Move Forward

An Australian Utility Case Study

The Latest Advances in Rugged Devices

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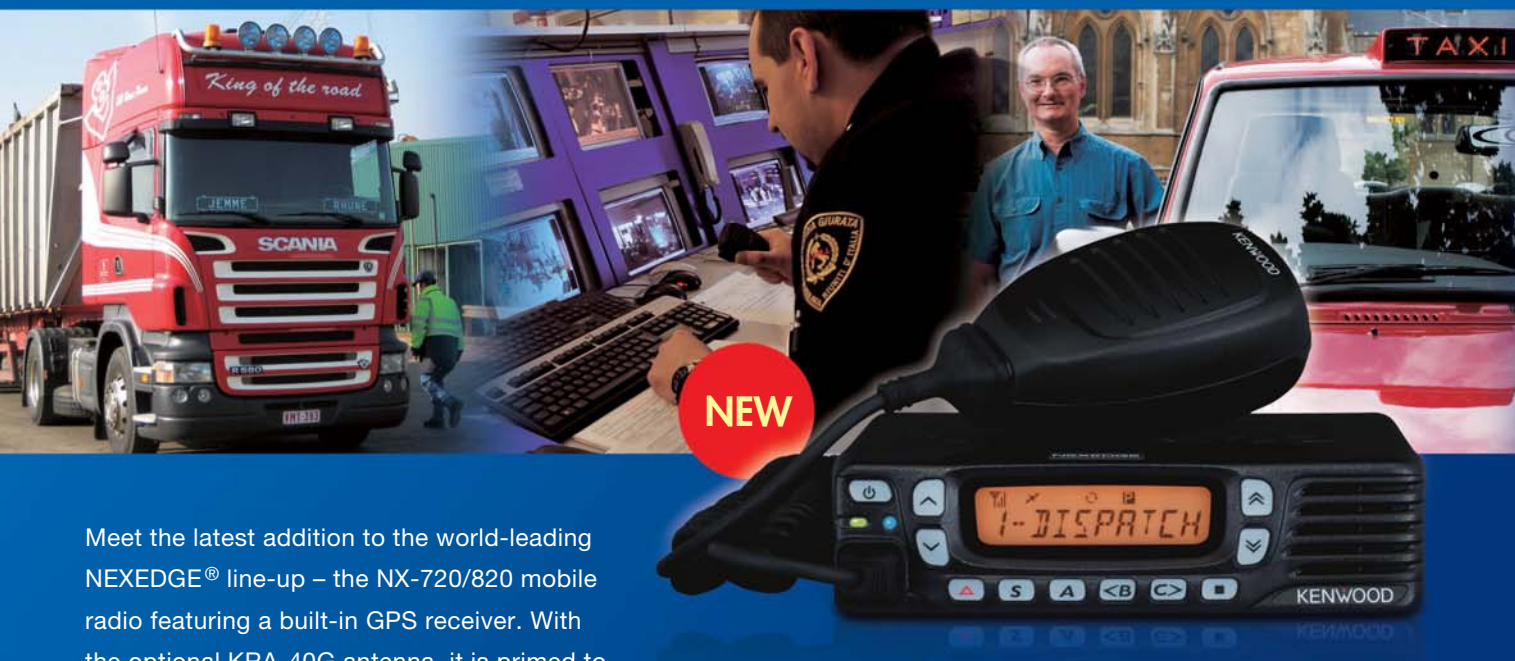

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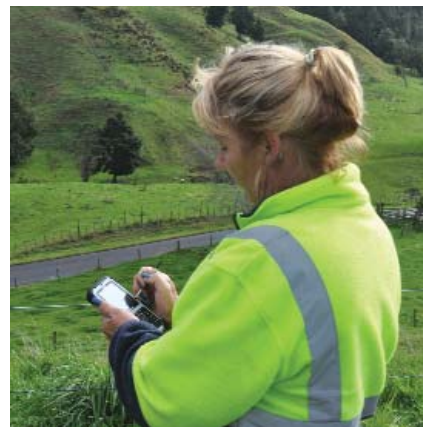
RadioResource INTERNATIONAL

Quarter 4 2012

CONTENTS

Vol. 26, No. 5

20 System Flexibility Meets Utility's Needs
SA Power Networks, a South Australian utility, installed new communications technology in 2005 and oversaw updates to satisfy its increasing needs. *By Tina Blade and John Kitchen*



24 Rugged Devices Foster Mobility
The latest rugged technology provides new features and opportunities for mobile mission-critical communications. *By Dale Kyle*

30 Twin Terror Attacks: Norway's Response
Two terrorist attacks on 22 July, 2011, exposed the strengths of Norway's emergency communications network in Oslo and the importance of expanding the system. *By Maren Bækkelund Ellingsen*

36 DMR Standards Move Forward
The Digital Mobile Radio (DMR) standards body defined five features to enhance user applications. *By Tom Mockridge*

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IN EVERY ISSUE

Dispatch 6
Reader survey helps us target 2013 editorial coverage. *By Sandra Wendelken*

Inbox 8

World News 10

Product Expo: Mobile and Portable Radios 42

New Products 48

Events www.RRImag.com

Global Forum: Russia 54
Digital technologies progress in Russia. *By Marco Morresi*

READER SERVICES

Classifieds 51
Advertiser Index 53
Subscription Form 53

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The Readers Speak Up

We recently asked you to take a reader survey to help us plan our 2013 editorial coverage and highlights. Thank you to all our magazine and online readers who clicked through the email and took the short survey.

In addition to helping us target what topics are most important to you for the upcoming year, it's always fascinating to learn more about the technologies our readers currently use and what they plan to deploy. One question asked readers to designate what types of two-way radio communications technologies they use; they could designate more than one type. More than 70 percent of our readers use analog conventional networks. Digital networks are used by around 60 percent of our readers.

For those readers who don't use digital technologies, 53 percent plan to migrate to digital technology within two years and another 19 percent plan to migrate to digital within five years. Only 16 percent of readers have no digital migration plans.

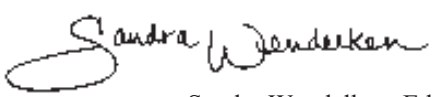
And the digital technologies that readers are interested in ranged from Digital Mobile Radio (DMR) to digital Private Mobile Radio (dPMR) to TETRA and Project 25 (P25) to NXDN. Readers are certainly investigating all their digital options.

Although the economy has not been stellar during the past year, most respondents are optimistic about their business and budget outlooks. 2013 looks to be a pivotal year in terms of the digital evolution, broadband spectrum allocation and continued growth.

Based on your feedback, we will plan articles that cover trunked, conventional and digital radio. You'll also see articles that address coverage, power, mobile data and incident management. Articles that focus on the transit, oil and gas, utility and public-safety vertical markets will be featured in the upcoming year. TETRA and P25, along with other digital technologies, will be discussed as well.

We value your opinions! Please email your feedback to me at swendelken@RRMediaGroup.com.

We are excited about continuing our online and print coverage in the coming year. If you didn't get the chance to take our survey, we would still like to hear from you. Send us your feedback — it will help us deliver content specific to what you need to help you in your duties during 2013. Thank you!



Sandra Wendelken, Editor
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RadioResource INTERNATIONAL

RadioResource International delivers wireless voice and data information for mobile and remote mission-critical operations for professionals who reside or do business outside the United States and Canada. The magazine covers private and trunked mobile radio, wireless data, location technologies, public safety communications, microwave radio, satellite, paging/messaging, remote monitoring, and other wireless applications. Editorial content is international in scope and encompasses emerging technologies, industry reports and trends, innovative applications, product information and comparisons, news, standards, and troubleshooting tips.

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Inbox

Following are comments about news from WORLD NEWS, our monthly e-newsletter. To subscribe, visit RRImag.com.

Spanish Wildfire

Editor:

I read with interest your recent article related to the help of Kenwood technology to firefighting in Spain. The only thing I maybe did not understand properly is if that help was a result of purchasing new equipment only or as a joint result of some donation. It would be good if Kenwood donated some parts of the equipment. Local communities and emergency services always need donations from those who are able to help — either in money and equipment, as well as in free time and technical skills.

Radio amateurs give donations in time and volunteer work to various emergency services, educational institutions and others. Radio amateurs often cooperate with such services by giving lectures in conferences or elsewhere about possible involvements when it is the right time for help.

I will perform a tutorial on the amateur radio communications during a conference in Trivandrum, India. It will include not only theoretical talks but also practical experiments with interconnecting computers by using amateur radio stations (packet radio). It might be the right time to promote VHF/UHF amateur transceivers equipped with terminal node controllers (TNC) by performing tests with such devices at the conference venue.

Miroslav Skoric

Amateur Radio

Editor:

Amateur radio operators are more than useful. Their communications system is already interoperable. They are "technically" minded. If something goes wrong with their radios, they fix it themselves. If a Project 25 (P25) radio goes faulty during a disaster, you must try and get a tech to come out and fix it, and he/she might not be available for days or weeks. If your Long Term Evolution (LTE) network goes down, you are in deep trouble. The radio amateurs can fix theirs immediately — a big advantage.

Countries should establish a nationally accepted identification registration with a governmental agency and give every radio amateur who volunteers an ID. Then there will be no confusion during emergencies.

Leon van der Linde
Global Communications

EXPERIENCE IN THE UTILITY INDUSTRY

In order to minimize disruption of services both in terms of extent and time, Utility companies require reliable radio communication systems which are independent from any public system. ConnecTel's experience with the Utility industry is proven by the recent award of a large radio communication system for CEZ, the power distribution company in the Czech Republic. The system consists of 120 IP connected MOTOTRBO™ repeaters, over 1500 subscriber radios and Supervisory Control and Data Acquisition (SCADA).

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CONNECTEL is an authorized Motorola distributor with over 20 years of know-how in the design, distribution, installation and service of analogue and digital radio communication systems. Ranging from basic analog to digital trunking systems, ConnecTel provides solutions for customers throughout Central and Eastern Europe, the Baltics, Russia, Africa and the Middle East.

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INTERNATIONAL

Codan Buys Daniels for CAD$25M

Australia's Codan acquired Daniels Electronics, a Canadian manufacturer and supplier of two-way radio communications equipment. The acquisition comprised an upfront cash payment of CAD$25 million (US$25.1 million) with the possibility of about CAD$2 million (US$2 million) in additional payments if certain earn-out targets are achieved during the next 18 months. The funding was a mix of debt and equity.

The acquisition delivers on Codan's stated strategy of increasing market share and diversifying its radio communications product offering. Codan manufactures a range of electronic products, with three key business divisions: radio communications, metal detection and mining technology. Daniels manufactures Project 25 (P25) equipment for public-safety and other mission-critical markets.

Daniels will be a wholly owned subsidiary of Codan and continue to operate from its Victoria, British Columbia, office. The firm's 73 employees will all be retained, said Daniels Electronics President and Chief Operating Officer (COO) Robert Small.

"The acquisition of Daniels begins a transition for Codan beyond solely HF systems to a communications solutions provider. Daniels provided the opportunity to enter the LMR market with a competitive and established product line," said Kevin Kane, president and general manager, Codan radio communications division.

"Originally a family owned business, Daniels is very happy to be acquired by an Australian company that shares a similar history and culture and that will continue to grow the opportunities for our LMR products," said Small.

TOKYO — Ten companies joined the NXDN Forum. The new member companies are **ARINC**, **Boeing**, **Catalyst Communications Technologies**, **Exacom**, **Hytera Communications**, **Raven Electronics**, **Swissphone Telecom**, **Twisted Pair Solutions**, **Wavecom Elektronic** and **Zetron**.

The forum now has 29 member companies that further enhance the versatility in NXDN products and services. The opening of the NXDN standards suite will also encourage more companies to look at the technology for next-generation communications, a forum statement said.

LONDON — The Digital Mobile Radio (DMR) Association completed three additional successful DMR interoperability test sessions.

Two sessions were for DMR Tier II (conventional operation) and the third session was for Tier III (trunked operation). The Tier II tests took place between **Motorola Solutions** and **Hytera Communications**, and **Selex Elsag** and **EMC**. The Tier III session took place between Hytera (infrastructure) and **Tait Communications** (terminals).

Ten DMR bilateral test sessions have been completed, and seven radio manufacturers have participated in test sessions. Earlier this year, Tait was awarded the first DMR Tier III interoperability certificate for its infrastructure equipment.

HAREFIELD, Middlesex, United Kingdom — The European Mobile Messaging Association (EMMA) and the Critical Messaging Association (CMA) formed a coalition. The associations will work together to advance the industry and more easily resolve global issues and expand membership outreach and support.

Both associations will now operate under the CMA name with EMMA operating as the Critical Messaging Association Europe (CMA Europe) and the current CMA operating as the Critical Messaging Association Americas (CMA Americas).

The associations will operate autonomously within their own jurisdictions and collaborate on global issues and joint initiatives. A steering group composed of the presiding members of CMA Europe and CMA Americas will oversee the global agenda and governance of the global coalition.

EMMA serves more than 15 operators and vendors from 10 countries. CMA serves more than 65 corporate and individual members located throughout the United States.

MUNICH — Rohde & Schwarz signed an acquisition contract for the **SwissQual** company group. Swiss Qual will be a fully independent Rohde & Schwarz subsidiary. The company headquarters and regional presences will be retained.

"SwissQual will significantly increase the Rohde & Schwarz market share in the drive test segment," said Dietmar Vahldiek, director of the systems and projects subdivision at Rohde & Schwarz.

LONDON — Motorola Solutions agreed to buy all **Psion** shares for 88 pence (US $1.36) in cash. Psion, a London-based maker of ruggedized mobile computing products, has about 830 employees, customers in more than 50 countries and delivered 2011 revenues of about US$273 million.

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The acquisition is expected to close in the fourth quarter. Upon completion, Motorola will combine Psion within Motorola Solutions' Enterprise Mobile Computing (EMC) business, reporting to Girish Rishi, corporate vice president, EMC.

MALAGA, Spain — Agilent Technologies and **AT4 wireless** agreed for Agilent to acquire the assets of AT4 wireless' test systems business. Financial details were not disclosed.

The wireless test portfolio from AT4 wireless will enable Agilent to offer its customers a broader set of test solutions, especially in the Long Term Evolution (LTE) market. In addition, the acquisition will expand Agilent's wireless test footprint by adding near field communication/RF identification (NFC/RFID) and Bluetooth test solutions for conformance and research and development (R&D).

The test systems business includes 130 employees in Malaga, who will transfer to Agilent when the acquisition is final. AT4 wireless' other businesses, testing and certification services and IT services and solutions, are not part of the acquisition.

EUROPE

TARRAGONA, Spain — Zetron and **Kenwood** were at the center of operations to fight a wildfire and evacuate residents from a remote area of Tarragona in northeastern Spain.

The fire broke out in the rural area south of the town of Rasquera. The fire was extinguished after three days of round-the-clock activity by 60 firefighting and civil defense teams supported by aircraft dropping water on the flames. The blaze scorched more than 3,000 hectares of scrubland and pine forest and forced 52 people from their homes.

The state of Cataluña Mobile Civil Emergency Response Center is a specially equipped vehicle with Zetron digital consoles. Operators used the system to coordinate the safe movement of people while continuing to direct the firefighters and aircraft as they tackled the fire.

The Cataluña response vehicle is one of 12 across Spain equipped with the Zetron communications control systems, all under a multimillion-euro contract won by Kenwood Iberica. Each vehicle is on permanent standby, if any of the country's regional governments have to respond to an emergency.

PARIS — Cassidian was selected by the French Ministry of the Interior (MoI) to provide a public warning and information system. The contract includes the development, integration and through-life support of SAIP software, as well as the casing for the warning sirens network. The system will also enable authorized personnel to deliver critical information or instruction via voice and text using multiple means of communications.

AVONBANK, Bristol, United Kingdom — Simoco completed its £5 million (US$7.84 million) upgrade for utilities company Western Power Distribution, providing voice and data communications across a service area of 26,000 square kilometers.

The upgrade, one of the largest utility contracts awarded in the United Kingdom, included Xfin technology, with 372 Xfin blades deployed at 103 sites to serve 1,600 mobile users. The system provides coverage across some of the most diverse terrain in the United Kingdom.

Western Power Distribution has 60 dispatcher positions, distributed across 10 locations.

BERLIN — Motorola Solutions delivered its 100,000th TETRA digital

European Parliament Adopts eCall Resolution

The European Parliament adopted a resolution that aims to ensure that the eCall system will be installed in every new vehicle by 2015. In case of a crash anywhere in the EU, vehicles equipped with the eCall system will automatically dial the European emergency number 1-1-2.

Even if passengers are unable to speak, a "minimum set of data," including the exact location of the crash site, is sent through the system. Therefore, shortly after the accident occurs, the emergency services know where to dispatch resources.

"The message of the European Parliament is a major step toward the complete rollout of eCall in Europe. The European Emergency Number Association (EENA) is committed to support the deployment of eCall, which will have a significant impact on citizens' safety,"

An eCall console in a Brighton, United Kingdom, patrol car

said Olivier Paul-Morandini, president and founder of the EENA.

The eCall system will reduce the emergency services response time and thus save hundreds of lives in the EU every year, officials said. eCall will be dormant most of the time and will not allow vehicle tracking outside emergencies, according to officials.

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radio terminal to German security authorities and organizations. Motorola also said it was the first company to receive the TETRA terminal certification from the German Federal Agency for Digital Radio of Security Authorities and Organizations (BDBOS). The TCR1000 TETRA covert radio was examined in an independent laboratory and fulfills the agency's security standards.

ROME — The U.K. marine business of **Selex Elsag**, a Finmeccanica company, was awarded a contract to supply a communications and safety equipment suite to a jack-up drilling rig operated in the North Sea. The package features Global Maritime Distress Safety System (GMDSS) for both primary and secondary radio rooms.

Helicopter communications, a non-directional heli-beacon and FleetBroadband service complete the communications package. Safety systems also include lifeboat search-and-rescue transponders and emergency position-indicating radio beacons.

ASIA

HONG KONG — The Hong Kong Police Force (HKPF), engaged U.K. consulting firm Analysys Mason to conduct an information and communications technology (ICT) systems strategy review. The multimillion-Hong-Kong-dollar consultancy program, which will take place during the next year, will include an in-depth review of the current business environment of the force.

Changes in the business environment and the advent of new technology has prompted the force to combine the planning for information systems and its communications systems – integrating its approach to IT and telecoms. The new strategy will ensure that the best use is made of ICT to improve policing and to underpin the HKPF strategic direction and the commissioner's operational priorities.

DHAKA, Bangladesh — Dhaka Police of Bangladesh completed the initial phase of upgrading its analog communications system to a Digital Mobile Radio (DMR) network provided by **Hytera Communications**. The Bangladesh police are working to bring all the police stations across the country into the network.

In the first phase, all the superintendents of police and inspectors under the districts were given Hytera DMR handsets. On-duty police officers of each police station were equipped with DMR handsets. More than 2,300 Hytera units, including portables, mobiles and repeaters, were delivered to introduce the system in 15 districts of the Dhaka range.

WELLINGTON, New Zealand — 4RF received an investment from private equity fund Fortissimo Capital. As a result, 4RF will expand its workforce and accelerate the company's product development and sales globally. 4RF manufactures radio equipment for utility, public safety and oil and gas firms.

ZHENGZHOU, China — Cassidian was selected to deliver digital TETRA radio coverage for the first metro line in Zhengzhou, the capital of Henan province. Six metro lines are planned in Zhengzhou with a total length of 189 kilometers. The construction will be divided into three phases. The first phase will build metro line 1, covering a total length of about 35 kilometers and serving 22 stations. This line will enter service in 2013. The radio system for this first metro line in Zhengzhou is to be installed by Cassidian and will be a key element in sharing a single control center with the other five lines scheduled for construction by 2015.

ASTANA, Kazakhstan — ASK NT, a Kazakhstan-based company, awarded a contract to **Hytera Mobilfunk** to supply a TETRA system for the Kazakhstan Temir Zholy, the Kazakstan state railway organization.

The system will be used for voice

Finland Issues Test Radio License for TV White Spaces Trial

Finnish company Fairspectrum deployed its geolocation database in the communications system for Europe's first TV white space geolocation database radio license.

Finnish Communications Regulatory Authority (Ficora) issued a test radio license for cognitive radio devices on the TV white space frequencies for Turku University of Applied Sciences. The license covers the 470 – 790 MHz frequency range and a 40-square-kilometer area surrounding Turku, Finland. The license is valid for one year.

Nearly 300,000 people live in the radio license area. A geolocation database is an essential part of the license. TV white space frequencies are a real-world test of spectrum sharing.

Spectrum sharing is managed with a geolocation database that controls TV white space device frequencies and transmission power so that the devices do not interfere with other wireless communications systems such as terrestrial TV or radio microphones.

Courtesy Suomen Ilmakuva

The issued license will be used in the white space test environment for the WISE consortium, which consists of Nokia, Digita, Fairspectrum, Finnish communications regulatory authority Ficora, Turku University of Applied Sciences, University of Turku and Aalto University. WISE is a Tekes-funded research project in Finland, and it is a part of the Tekes trial program.

The Next Generation

The 3550 Digital Radio Test System is the next generation of Aeroflex's Radio Test Sets.

The 3550 features an industry first 9" touch-screen, color display within a lightweight (8.3 lbs. with internal battery), easy to use, and reliable test system. With its small form factor and ruggedized case, the 3550 is ideal for any field test applications; with typical specifications such as -95 dBc/Hz phase noise and a Spectrum Analzyer DANL of -140 dBm, the 3550 provides the accuracy you need for today's digital technologies.

The 3550 Digital Radio Test System supports AM/FM with options for all of the latest technologies including: P25, NXDN™, DMR (MOTOTRBO™) and dPMR. Along with its ability to fully test any radio transceiver you can also quickly perform Distance to Fault Analysis, VSWR and Return Loss Measurements.

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communications and data applications for train signaling and telemetry data of trains. The infrastructure includes eight base stations, a centralized IP node for switching and connection to applications, the application interface A-CAPI and the comprehensive network management system (NMS) from Hytera. The project rollout is planned for the end of 2012.

QUEENSLAND, Australia — C4i will supply a dispatch system for the Australian Pacific Liquefied Natural Gas (APLNG) project in Queensland, Australia. The project involves C4i's VoIP technology to connect operators in the Brisbane central control room to plant personnel located at coal seam gas extraction sites and at strategic sites along the pipeline.

PERTH, Australia — CalAmp was awarded a more than US$2 million subcontract by **Ansaldo STS** to

Demonstration Connects Tetrapol Networks with Satellite Services

A live demonstration by Cassidian and Astrium Services in Brazil showcased an end-to-end communications solution for border surveillance and demonstrated features that can be added to a Tetrapol network when interconnected via satellite.

The Brazilian federal police department, Departamento de Polícia Federal, uses secure radio communications via Tetrapol networks from Cassidian. Nine regional Tetrapol IP networks ensure reliable coverage from the country's Atlantic coast to the Brazilian borders with 10 other countries.

Tetrapol regional networks are usually interconnected using terrestrial connections. In remote areas, the Astrium Services' SKYWAN technology can enable the interconnection of several networks over satellite with DAMA technology to share bandwidth among all the nodes.

A set of Tetrapol services can be offered with tactical temporary or permanent regional coverage. The satellite link also provides Internet access, video and other applications in parallel to the Tetrapol voice communications to remote locations.

Oriximiná, where the demonstration took place, is a small, remote city chosen to simulate the harsh environmental conditions that border surveillance groups face. The companies exhibited simultaneous voice, video and Internet transmissions to separate handheld devices, all while maintaining network stability and excellent voice quality.

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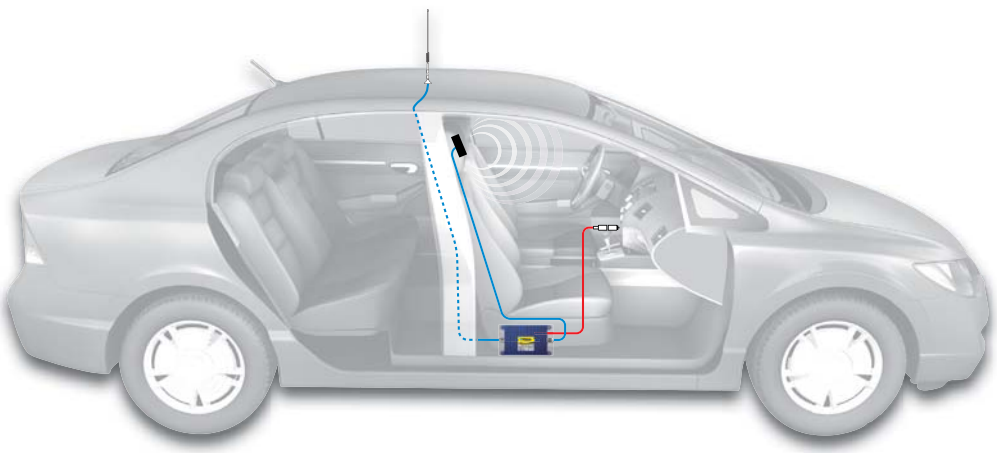

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provide a mobile data communications system for Rio Tinto Iron Ore's (RTIO) AutoHaul project, to be implemented across its 1,500-kilometer private railway system in western Australia.

CalAmp will supply 450 MHz base stations and mobile data radios. Operating on private licensed radio channels, the radios comply with Australian Communications and Media Authority (ACMA) regulations and meet application-specific requirements.

LATIN AMERICA

SAN SALVADOR, El Salvador

— The Council of Mayors of the San Salvador Metropolitan Area (COAMSS) in El Salvador expanded its wireless security project.

Tigo, **RTI International** (RTI) and **Qualcomm** are collaborating with the city on Seguridad Inalambrica with the National Civilian Police (PNC), Corps of Metropolitan Agents (CAM) of participating municipalities and the U.S. government.

The project uses Qualcomm 3G wireless technology to collect and share crime information, enabling several municipalities in El Salvador to analyze patterns and improve crime and violence prevention programs. During the system's first phase, real-time monitoring and analysis of crime patterns were performed.

The project is continuing in Santa Tecla and expanding to additional municipalities in the San Salvador metropolitan area.

BELO HORIZONTE, Brazil — Icom America established Icom Brazil, a subsidiary with headquarters in Belo Horizonte, the capital city of Minas Gerais state. Icom Brazil will focus on the public-safety industry and help existing distributors expand dealer networks nationwide.

"Icom recognizes Brazil's rising potential in the global market," said Muu Yamamoto, Icom marketing manager – Latin America. "We look forward to investing our efforts and resources in this country."

PEOPLE

CAMBRIDGE, United Kingdom

— Guy-Franck Nakach joined **Sepura** as senior vice president, sales and marketing. He previously worked at Psion. In addition, Jonathan Hamill returned to the company as regional director, United Kingdom, Ireland and covert specialist solutions sales. Hamill most recently was sales and marketing director of APD and worked for Sepura from 2007 until 2011.

Nakach

Hamill

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Midian's NEW GPS Speaker Mics

Midian's GPS speaker microphones operate as normal speaker microphones for portable two-way radios, but offer the benefits of GPS location reporting. All of Midian's GPS Speaker Mics offer the following features:

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  - Lone Worker: When the GPS Speaker Mic does not receive user interaction for a period of time the unit will send an Emergency ANI with the GPS coordinates.
- More than 16 million system ID's for system privacy of GPS data.
- Speaker can sound emergency locator tones to aid rescuers in locating users in distress.
- Displays location in Midian's CAD-800 with a Google Earth interface.

The GPS Speaker Mics are available with voice security options. These include the VS-1200-SM1G frequency domain scrambler, VS-115-SM1G, rolling double inversion scrambler, VS-1150-SM1G double inversion scrambler and the VS-1050-SM1G voice inversion scrambler.

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HS02 Medium duty headset
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- Adjustable boom mic
- Stable and Comfortable

H-300 Rubber-sealed speaker microphone
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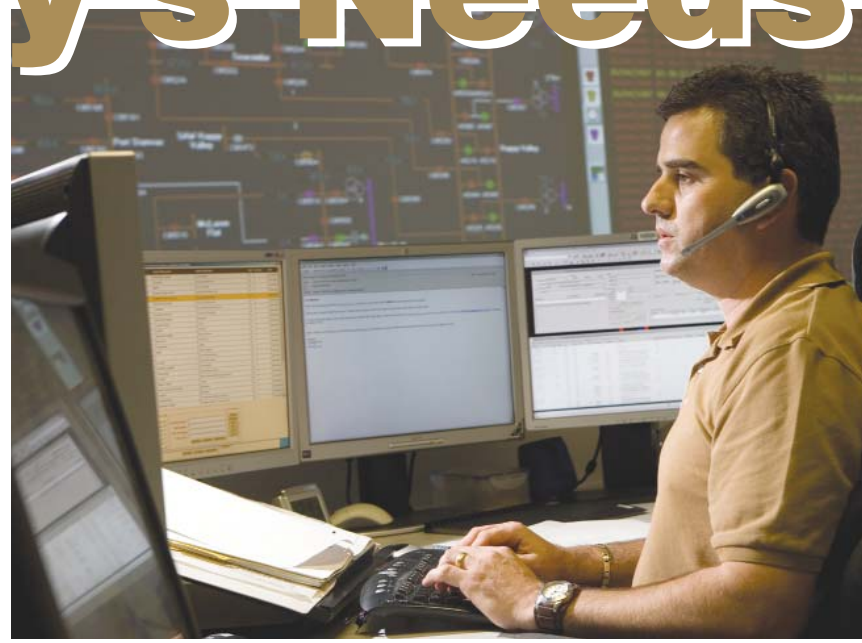
System Flexibility Meets Utility's Needs



Photos courtesy SA Power Networks

SA Power Networks, a South Australian utility, installed new communications technology in 2005 and oversaw updates to satisfy its increasing needs.

By Tina Blade and John Kitchen

The role of communications is important in the coordination and control of a utility's operations. SA Power Networks' (formerly ETSA Utilities) overarching responsibility is to ensure that power is delivered reliably to homes and businesses throughout the state of South Australia. This undertaking involves a host of complex operations that the utility manages through its network operations center (NOC).

The South Australian utility installed a new communications system at the NOC to provide the up-to-date, integrated communications that its operations required in 2005. The system's initial implementation met the utility's requirements, but over time the electricity distributor's needs evolved, requiring upgrades to the system in 2011 and 2012.

SA Power Networks

SA Power Networks manages and maintains a regulated network that provides electricity to about 830,000 customers. Responsibilities include delivering electricity from the high-voltage network through poles and wires to residential and business customers; installing, maintaining and reading meters; maintaining street lighting; and providing an emergency response when an outage occurs. The utility also maintains the reliability of the network, connects new customers, and extends and upgrades the network to meet changing demand.

Several factors first prompted SA Power Networks to seek a new communications system, says Errol Zobel, a project manager with SA Power Networks.

"Our previous equipment was not an integrated system, but consisted of a combination of private automated branch exchange (PABX) extensions and a mobile radio system," he says. "This limited the information that was displayed concerning the origin of a call and did not allow us to prioritize calls to ensure that the most urgent calls would be handled first."

The utility needed to remedy the limitations with a system that would give the users more control and flexibility, as well as the ability to integrate mobile radios and the telephone system into the console to allow operators to move between the two smoothly and seamlessly, he says.

SA Power Networks initiated the process of obtaining a new system by issuing a request for tender. Zetron responded and won the project with its Advanced Communications (Acom) system.

Initial Installation

The initial implementation occurred in 2005 at the headquarters in Adelaide, South Australia, and involved nine console positions. The system included E1 interfaces to the utility's existing MD110 PABX and its private mobile radio system. The interfaces were adaptations that Zetron provided specifically for the network.

The "greenfield installation" — an installation of an entirely new system — went smoothly.

"We encountered very few issues during the cutover to the new system," Zobel says. "One unique aspect of the installation was that it was subject to rescheduling right up until the very last moment so we could ensure that voice telecommunications at the NOC would not be interrupted."

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Disaster Recovery

The project was completed successfully, and during the next few years, the system delivered the improved functionality for which it had been implemented. Then in 2011, the system underwent its first major update and expansion that included both an Acom software upgrade and the addition of a disaster recovery (DR) site about 9 kilometers north of the headquarters.

The DR's purpose is to provide seamless continuity of operations if the main NOC must ever be evacuated or its operations are interrupted.

The update improved the following capabilities:

■ Enhanced functionality that routes callers to the correct operators.

■ Alternate telephony routing to and from the public-switched telephone network (PSTN) through both the primary and DR site to ensure that if one of the PSTN/integrated services digital network (ISDN) links goes down, the system will still be able to receive calls.

An SA Power Networks worker

■ A call stack feature, which improves the visibility of incoming calls and operators' ability to prioritize the calls.

■ The ability to forward incoming calls to a cell phone or other number if the NOC has to be evacuated. Call forwarding can be canceled once the DR is staffed and ready to assume the NOC's operations.

■ Full dynamic call history.

■ Full redundancy at the DR site for the common control equipment.

■ An increase in the total number of consoles from nine to 21.

SA Power Networks' system continues to evolve. Another update is under way and scheduled to be completed by the end of 2012 that involves replacing the main center's console ancillaries with new speakers and desk microphones, and increasing the number of consoles at both the NOC and the DR to a total of 31 positions.

SA Power Networks is satisfied with the system and the ways it supports the operations and allows for flexibility as the utility's needs increase, says Zobel. ■

Tina Blade is a marketing writer at Zetron, a provider of mission-critical communications solutions for customers in public safety, transportation, utilities and manufacturing. She can be reached at tblade@zetron.com.

John Kitchen is a project manager at Zetron Australasia, who worked on the project for SA Power Networks and served as technical consultant for this article. He can be reached at jkitchen@zetron.com

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Rugged Devices Foster Mobility

Photo courtesy King County Energy in New Zealand

The latest rugged technology provides new features and opportunities for mobile mission-critical communications.

By Dale Kyle

New and continually improving technological advancements are opening the doors to a mobile future for the global workforce. While the technological shift has been happening for decades — gone are the clunky mobile devices, wired telephones and dial-up Internet connections of the 20th century — the amount of computing power fit into a few inches of space is mind-boggling. But until recently, some significant obstacles prevented most workplaces from seeing true mobility as more than some nebulous future ideal.

The first obstacle was inaccessible or unaffordable wireless broadband. Without mobile connectivity, even the smartest and best-designed devices are confined to the office. But in recent years mobile device sales have exploded, and mobile operators have responded by discovering ways to expand their networks and increase their capacity to handle data traffic.

The second obstacle was inadequate mobile hardware. For a while, adequate simply meant powerful enough to perform complicated tasks quickly and efficiently. But as the mobile workforce progressed, another critical need became apparent — the need for exceptional performance anywhere and everywhere.

That is because wirelessness, speed and portability don't make for truly usable mobile devices. Just ask the countless field, utility and public service professionals who have dropped cell phones into water, vibrated tablets to death on their dashboards or watched PDA screens shatter as they hit the ground.

Standard computers are not suited for use outdoors and in other hazardous environments such as workshops, warehouses and factories. They can't handle water, dust and shocks, and they break too easily and too often. Breakages do not only cost companies money, they can also mean a loss of productivity as devices are assessed, repaired and replaced. To continue to drive true workforce mobility, data devices need to be compact, connectable, quick and able to withstand whatever they encounter, whether that is a river, sandstorm or warehouse floor.

Ruggedness Standards

Unlike traditional computing hardware, rugged devices are specifically designed to operate reliably in harsh environments. Ruggedness is an essential factor to true mobility for data devices, and it has opened up new worlds of efficiency, accuracy and customer service for laborers. But what makes a computer rugged?

Manufacturers use two main standards for classifying rugged computers: the American military standard for equipment, Mil-Std-810, and the Ingress Protection (IP) scale. Both standards test for and reflect levels of protection against environmental conditions.

Mil-Std-810 includes a battery of 24 laboratory test methods that address various conditions, including low pressure for altitude testing; exposure to high and low

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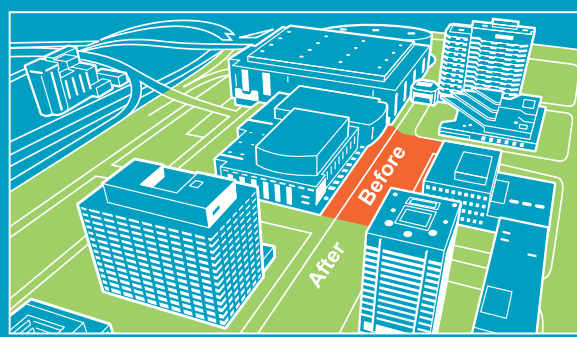

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Manufacturers use two main standards for classifying rugged computers: the American military standard for equipment, Mil-Std-810, and the Ingress Protection (IP) scale.

temperatures plus temperature shock; rain; humidity, fungus and salt fog for rust testing; leakage; vibrations; and sand and dust exposure. The more methods a unit passes, the sturdier it is deemed to be.

The IP scale provides a specific rating for a unit's durability against dust and water exposure. Ratings include two digits, which stand for the level of protection against dust and the level of protection against liquids. For example, an IP67-rated unit is considered completely dustproof and can be immersed in water for at least 30 minutes to a depth of 1 meter.

Evolving Technology

Traditionally, field workers who operate in naturally mobile environments, such as construction, mining, military and forestry, use rugged computers. But rugged technology, including notebooks, tablets and PDAs, is getting smarter, more powerful and easier to use, and the latest rugged computers can comfortably take on the challenges of both the field and the office. Smarter devices are good because job descriptions are becoming more hybridized. It is not unusual for workers to divide their time between office and job sites, and it is important for mobile devices to be as versatile.

Yet even if rugged computers are capable of a wide range of computing tasks, that in itself does not make them desirable to tote around. Great design does matter, and thanks to the recent advancements in design and manufacturing, certifiable sturdiness is no longer the whole story for rugged devices. Manufacturers have learned from the success of attractive, usable and portable products from companies such as Apple and are now offering sleek, rugged notebooks, tablets, smartphones and other intelligently designed, easy-to-use devices.

The devices feature faster processors to offer better and broader use and the ability to bring desktop functionality into the field. There are batteries that can last an entire workday on a single charge, and most are equipped to work on any choice of wireless frequency anywhere in the world. They also have high-quality cameras that allow in-field image capture, along with new screen technology that offers clarity and brightness in any outdoor condition, even direct sunlight.

Overall, rugged mobile computers have become lighter and offer better functionality, including better displays and

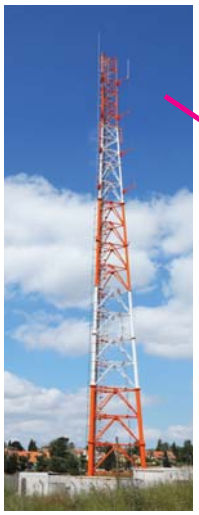

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Photo courtesy SEPA

After switching to rugged tablets for field data collection, the Scottish Environment Protection Agency (SEPA) saved more than 80 percent in labor costs.

improved ergonomic design. All this adds up to a much improved user experience, with the power of a desktop in the convenience of a handheld.

Rugged Applications

Users are finding that work is simpler, faster and more enjoyable with rugged data devices that can sort, synthesize and analyze data, as well as collect it and that can work seamlessly with both worksite machinery and advanced office hardware.

In the public works sector, government agencies and private companies across the world are using rugged technology for a wide range of tracking, monitoring, reporting and scheduling tasks essential to city maintenance, all while saving time and improving the accuracy of their data. For example, GPS-enabled devices can tag along worry free for messy catch-basin cleanup runs and sewer line repairs, and dashboard-mounted tablets with tracking software can simplify data collection on street-sweeping and waste-collection routes, without ill effects from constant road vibrations.

The data collected can be stored, organized, charted, transmitted wirelessly to office locations and formed into customized reports. Simple manual and sensor-based data input reduces human error and increases accuracy for record keeping and important reporting, such as for governmental regulations or grant compliance.

In some cases, a hugely successful mobile solution is as simple as a durable device with a customizable push-button system. Several cities have implemented intuitive rugged computer-based systems for a broad range of data-collection projects, including enforcing snow-removal laws, reporting fire-safety hazards, tracking garbage and recycling collection, monitoring airport perimeters and scheduling maintenance for city-owned assets, with the help of Mack McCarter, partner for LogicConcepts, a developer of geo-centered infrastructure software.

"People see this solution, and the wheels start turning," McCarter says. "They see that they push this button and it tracks this thing, and they start thinking, 'How does this apply to other tasks? We could make this button do that ...' "

Utility companies, surveyors and others in harsh environments — such as karst landscapes in rural New Zealand and offshore crane cabins in Brazil — have also conserved resources and improved outcomes by upgrading from systems supported by paper or fragile devices. In places where systems can't be used reliably, rugged computers can track and report tasks logically and gather data accurately and efficiently.

After switching to a rugged PDA system for an in-depth field data collection project, the Scottish Environment Protection Agency (SEPA) saved more than 80 percent in labor costs, while speeding up its process, and ultimately, environmental improvement. "This concept of paperless field work is applicable to almost everything we do," says Dr. Jonathan Bowes, senior data analyst for SEPA. "Potentially it could revolutionize major parts of SEPA's business."

And rugged devices are earning results for public-safety agencies. By using mapping software to cross-reference multiple forms of location data, including pictures, GPS, mapping and text, agencies can improve the speed and accuracy of responses to emergency situations. Automating this data also saves countless hours of labor and processing time.

Luis Olivieri, a GIS systems specialist who helped implement a college emergency response system that uses geospatial technology and rugged tablet PCs, calls the new system "unimaginably better" than paper data collection.

"In an emergency, time is very important. It could be the difference between life and death," Olivieri says. "We are putting together the data required for emergency personnel to act in the fastest possible way. Typically emergency responders get to the scene and start asking: Who has the floor plans, can we get class lists, what resources do we have? With this system, it is like going there the day before something happens — you already know what you are going to find when you get there."

Rugged technology and the software it enables provide an exciting new direction for mission-critical communications, allowing public-safety agencies, utility companies, oil and gas firms and others to communicate easily and instantaneously for faster, better outcomes, ultimately providing better products and services. To make the most of this connectedness, people all across the globe are figuring out how to use rugged technology to form creative, intuitive and sustainable solutions for their communities. And that means true mobility is becoming a reality. ■

Dale Kyle is the president and CEO of Handheld US. Prior to coming to Handheld, he spent five years with Tripod Data Systems (TDS) as the marketing product manager for the company's line of rugged handhelds. Prior to TDS, Kyle worked for 15 years in the field of GPS at several firms including Glenayre Electronics, Thales Navigation, Magellan and Ashtech.

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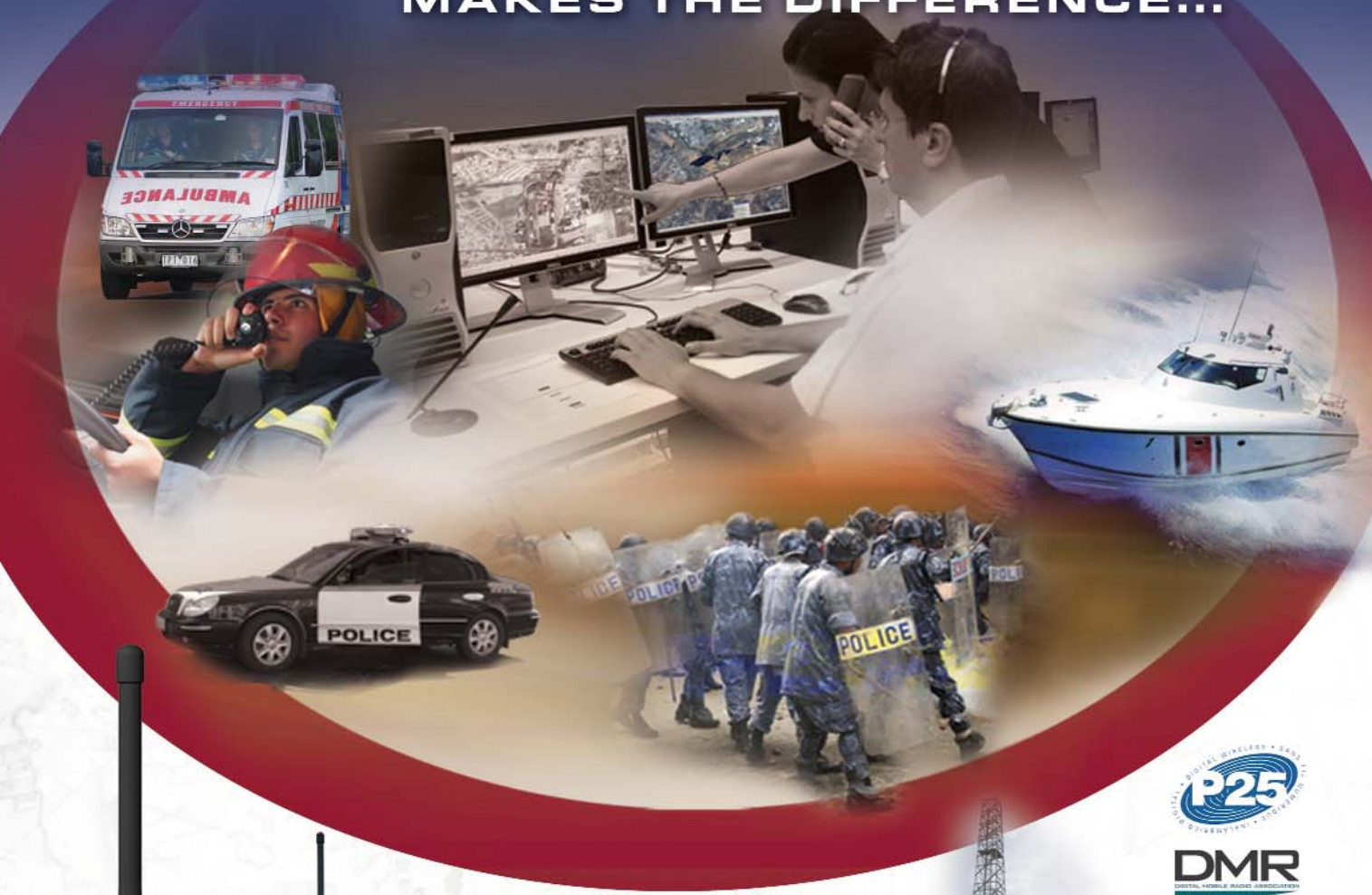

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Twin Terror Attacks: Norway's Response

Photos by the Norwegian Directorate for Emergency Communications (DNK)

Two terrorist attacks 22 July, 2011, exposed the strengths of Norway's emergency communications network in Oslo, as well as the importance of expanding the system to the entire country.

By Maren Bækkelund Ellingsen

Seventy-seven people died in the twin terror attacks in Norway — the worst peacetime massacre in the country's modern history. A massive bomb blast shattered buildings in the capital city of Oslo, killing eight people and injuring another 209. Then a gunman rampaged through an island youth camp run by the ruling Labour Party, killing 69 people and wounding 33 others.
— BBC News

Norway did not operate a single, integrated emergency network for its rescue services until recently with the creation of Nødnett (Norwegian for emergency network), a TETRA digital radio communications network for rescue and emergency response services in the country. Previously, Norway's emergency services used separate analog communications systems without common logging of traffic data.

The new network is primarily a voice system for group communications. The prime users are the three emergency services — the fire, police and health services. With Nødnett, traffic data from all users of the network is available. The network is under construction and is expected to be completed in 2015.

Nødnett Background

The Norwegian emergency network is based on the TETRA standard, developed to meet the critical communications needs of emergency services. The specifications for the Norwegian digital emergency network were for technology neutrality. There was no requirement for any one particular technology to ensure that the best and most appropriate technologies would be tendered. The chosen TETRA network offers secure, encrypted radio communications in predefined groups. Now that the emergency network will be further expanded, TETRA Enhanced Data Service (TEDS) is to be included.

On 9 June, 2011, the Norwegian Parliament gave its approval for the Nødnett emergency network to be extended beyond the eastern region of the country, where the network

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"During the busiest 15-minute period, from 17:15 to 17:30, 75 percent of the maximum available capacity was being utilized."

— Cecilie B. Løken, Norwegian Directorate for Emergency Communication

was already developed, to the rest of Norway. Each emergency service previously had its own dedicated analog radio network. The nationwide emergency network will provide the emergency services with a single, integrated communications network. The Norwegian Parliament emphasized that the development of the Nødnett emergency network throughout Norway is a vital investment in public safety and will enhance emergency preparedness countrywide.

"The new network will be a single, nationwide network with a digital technology that allows each emergency service to experience it as their own network," says Cecilie B. Løken, chief communications officer (CCO) at the Norwegian Directorate for Emergency Communication. "A number of new features will facilitate the work of each individual user. A digital network will make better use of frequency resources, resulting in an improved service to the public."

The terrorist attacks that hit Norway 22 July, 2011, presented the rescue and emergency services with a challenging test. Nødnett was in full operation in the capital city area. However, service was not yet rolled out in the area of the island of Utøya, where the youth camp was located.

15:26 – Explosion Rocks Oslo

Rubble and glass littered the streets, and smoke from the fires drifted across the city from the devastated area — the heart of the Labour Party government. Witnesses said the scene resembled a war zone. — BBC News

The massive blast that shook the center of Oslo blew out the windows of the prime minister's offices and damaged the finance and oil ministries. Eight people were killed.

Immediately following the bomb explosion in the government district of Oslo, communications traffic on Nødnett increased dramatically. The load on the network was extremely high from 15:00 hours and remained at a high level into the early hours of 23 July.

"The analysis shows that, on this

Friday, the traffic load on the base station in central Oslo increased by up to four times the normal level," says Løken. "During the busiest 15-minute period, from 17:15 to 17:30, 75 percent of the maximum available capacity was being utilized."

Despite the dramatic increase in traffic volume on the network, there were no problems with the network capacity. "There was never a question, during those dramatic hours on 22 July, of Nødnett being overloaded with traffic," says Løken. "The greatest challenge we encountered was that several of the emergency rescue teams were trying to report at the same time in the same group call."

The system made it easier to manage the large-scale operations, says Løken. Perhaps one of the most fundamental functions was the fast group communications. Group conversations take place in talk groups, which work like "chat rooms." For example, police officers from different districts who are working on the same case can have a single talk group for everyone who is involved. In rescue operations, all three emergency services can communicate with one another in a single talk group, which can also be extended to include more groups if required.

"The challenge with these talk groups is that only one person can talk at a time," says Løken. During the terrorist attacks, a lot of communications and messages occurred at the same time, making it difficult to get through at times. "If the group becomes too large, it feels like you're at a meeting with too many people taking part. It can be tricky to bring order to a conversation," she says.

The users in the group can talk to one another without being disturbed or interrupted and without other Nødnett users having access to the information. "From what we hear, those involved in the operations

Direct mode on the Nødnett radios allowed some communications on Utøya.

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In Oslo, Nødnett was a key tool in the coordination ... At Utøya, there were severe communications challenges, as Nødnett was not yet rolled out.

connected with the 22 July attacks also felt it was valuable to be able to share information without fear of being eavesdropped," she says.

16:57 – Utøya Shooting

At 16:57, a ferryman was asked to transport a policeman to the island of Utøya, located in a lake about 35 kilometers northwest of Oslo. The uniformed man was armed with a pistol and an automatic rifle, witnesses said. He said that he was there to "do research in connection with the bomb blasts," the BBC reported.

But the policeman turned out to be a gunman, and he went on to shoot and kill scores of young people staying at the island camp. Although initial reports said about 10 people had been killed, the figure soared as horrific details emerged. — BBC News

At 17:24, emergency calls started flooding in to the neighboring emergency call centers about the shooting on Utøya. This triggered a massive response by the emergency services and transport of the injured to hospitals. This was followed by searches for injured and missing persons and extensive cleanup operations.

After reports started coming in about the gunman, a SWAT team was dispatched from Oslo to the island. Local police officers arrived at the lake at 17:52, only to have to wait for a "suitable boat" for their crossing to the island. The SWAT team arrived at 18:09, but also had difficulty crossing the water.

Local police chief Erik Berga said a police boat that was intended to transport the armed unit nearly sank. "When so many people and equipment were put into it, the boat started to take in water, so that the motor stopped," Berga told Reuters news agency. "The boat was way too small and way too poor." Officers eventually arrived on the island at 18:25 after recreational boats were commandeered for the crossing. — BBC News

Utøya Challenges

Once officers made it to the island, the emergency agencies could not use Nødnett, because the system was not yet rolled out in that area. This presented significant communications challenges, especially because the local coverage for the old systems was poor.

Some troops arriving from Oslo chose to use their Nødnett radios in direct mode (DMO), allowing the radios to communicate directly with each other like walkie-talkies. This was an important feature of the TETRA technology, which allowed rescue troops to communicate locally, even if there was no coverage for the network in that specific area. Other troops, who came from areas without Nødnett, were forced to use mobile phones to communicate.

"Nødnett is an efficient network that provides seamless communications across geographical and organizational borders, unlike a mobile network," says Løken.

Previous situations had demonstrated how vulnerable the mobile telecommunications network can be, and is why it was essential to build a more robust system. "It is not acceptable that those responsible for managing emergency situations, such as accidents, fires and other disasters, have to rely on the use of mobile phones," she says.

18:27 – Gunman Surrenders

Haarvard Gaasbakk, the leader of the first police squad to arrive on the island, said a group of youngsters directed them towards the gunman. "We then spotted the gunman shooting on the southern part of the island, and we heard a lot of gunshots coming fast and thick," he said. As the officers ran into a clearing in the forest, they suddenly came face to face with the gunman, hands above his head and his weapons 15 meters away on the ground.

— BBC News

The Nødnett emergency network was not damaged in any respect by the terrorist attacks, and it functioned as expected throughout the response period. Almost 1,000 Nødnett radios were in operation in central Oslo. Traffic statistics show that network traffic in the group calls was so heavy that some users found they had to wait their turn to deliver their messages. The traffic statistics also show that the talk groups shared by the emergency services were not used to any great extent during the response period.

The emergency preparedness and response to the attacks are still being evaluated, says Løken. Authorities are examining what aspects of the operation worked well, what did not and what action needs to be taken to ensure nothing similar happens again. "Regarding Nødnett, we consider it crucial to have a fully functional network in place throughout Norway as soon as possible," says Løken. ■

Maren Bækkelund Ellingsen is a communications adviser in Wergeland/Apenes. She has worked in advertising public relations and as a journalist. Email feedback to editor@RRMediaGroup.com.

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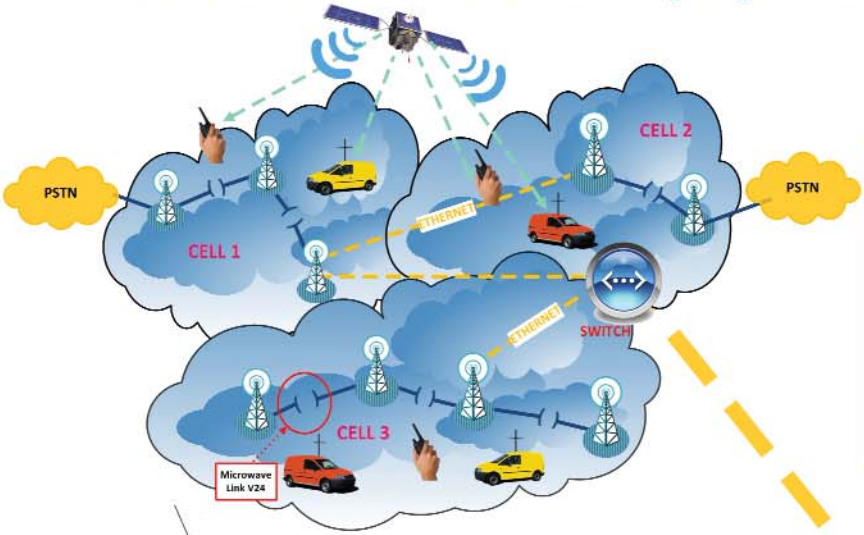

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DMR Standards Move Forward

The Digital Mobile Radio (DMR) standards body defined five features to enhance user applications.

By Tom Mockridge

Photo courtesy Selex Elsag

A DMR mobile base station in Italy.

The last year has been something of a watershed for the European Telecommunications Standards Institute (ETSI) Digital Mobile Radio (DMR) standard. There have been a raft of new suppliers entering the market, sales of devices surged over the 1 million mark and the portfolio of product types available has grown dramatically.

A "standard" can imply something that is fixed, as well as being a technical benchmark. But in the early years following initial drafting of a radio specification, it is more likely that evolution and change are the normal state of affairs. This is the case with DMR.

Because of the rapid uptake of the technology — at least 15 manufacturers are now selling or in the process of building products built to the standard — there is also much ongoing activity in the development of the specification. This has partly taken place within the ETSI technical committee that looks after DMR and partly in the technical working group of the DMR Association, the trade group representing organizations supporting DMR. Developments have taken place in five key areas: improvements in spectrum efficiency for direct mode use, encryption of communications, text services, location services and defining a common application interface specification. In the future, issues such as full duplex support, outlined in the DMR standard but not discussed in detail, are likely to be explored.

DMR Direct Mode

One of the most basic benefits of digital systems is that modern voice encoding and compression techniques deliver a high-quality voice communication in only 6.25 kilohertz of bandwidth, doubling or even quadrupling voice capacity compared with legacy analog systems. An advantage of DMR, based on TDMA technology, is that it does not actually require spectrum channels of 6.25 kilohertz but is able to split existing 12.5-kilohertz channels into two virtual channels by using a two timeslot timing pattern. In this approach, user one has the first timeslot and then stays silent while user two uses the second slot; this pattern repeats over time, effectively dividing the channel into two. However, timing coordination is necessary to make sure that independent timeslot communications take place in sequence with no interference caused by overlap between slots. In the initial version of the DMR standard, repeaters performed this coordination.

This led to a criticism of DMR that in configurations when repeaters were absent — direct-mode communications — there was no timing coordination method for the two timeslots available in a channel. Without timing coordination, radios on timeslot one could not share the channel with other radios on timeslot two. So in direct-mode operation, only one talk path was defined per 12.5-kilohertz channel in the standard. Because the target market for early DMR systems was for more complex systems where repeaters were almost always present, this limitation has not prevented the quick adoption of the technology in the market. As some less sophisticated systems move to digital, it was necessary to tackle the limitation.

The DMR Association agreed on the technology and it was formally published in the ETSI DMR standard in April. Direct-mode radios embed

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timing information within normal transmissions, plus provide some limited additional signaling, to enable correct timing to be propagated to all radios across a wide area. The method enables direct mode slot timing to be synchronized when a repeater is not present. To the user, this timing synchronization process is transparent, and the radios in a geographical area can operate on independent customer systems using different radio manufacturers' equipment. The system also takes account of use cases such as how to treat radios that newly enter the system or lie dormant as hidden nodes, but that may at some point want to start communicating.

Security and Encryption

Even though digital is inherently more secure than analog because the digital signal needs decoding, users in certain industries have asked DMR suppliers for higher levels of security and a common implementation between suppliers. Many requests were from organizations that play a critical role in emergency response such as energy utilities. Existing DMR products offer a range of enhanced security options but they are proprietary.

In early 2011, work started on the request for a common approach to radio-to-radio security — for example with no decryption/re-encryption in the infrastructure components. To achieve interoperability, it was necessary to agree which encryption algorithms would be supported plus a common secure framework for transferring key information over the air. The project took a year to complete, but the association created a common implementation for security that supports the ARC4, digital encryption standard (DES) and advanced encryption standard (AES) algorithms. Products with these common implementations are expected to be on the market soon.

The joint work should also give extra confidence to DMR purchasers because the approach used has been subject to detailed peer review among the security experts in the strong community of DMR suppliers. On the basis of the axiom, "Obscurity does not equal security" —the more people who try to find fault with a proposed security architecture the better — the efforts should pay dividends to all.

Text and Location Services

Two other features commonly used in DMR implementations that were not defined in a uniform way in the original standard were text messages and the transmission of GPS data within systems. Existing manufacturers support these features but not in a common way, and there is no agreed interoperability. There has been extensive debate in the DMR Association about the best way forward. There was also a desire for an approach to enable the common implementation of new features that would not need the basic architecture debate to be re-opened.

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The DMR standard offers two mechanisms for data transport, via IP and via a DMR-specific short data protocol, both of which have advantages and drawbacks. A decision is close to being finalized that will use an IP-based approach for all data applications for DMR Tier II, as well as exact mechanisms for text and data services to enable interoperability between different manufacturers' equipment. For location, the existing Location Information Protocol (LIP) standard will be used as the basis for interoperability because it has a good track record for delivering control and flexibility. These decisions are likely to mean some additions to Tier III of the DMR standard concerned with data services.

Common App Interface

The last technical issues reviewed, but in many ways the most complex task, is to agree to a common application interface specification to DMR infrastructure. It has been clear from market uptake that applications, from well-known professional mobile radio (PMR) peripherals such as dispatcher consoles to more novel applications such as location-based tools using geofencing, have been a major driver in DMR uptake — often justifying the business case for the replacement of an analog radio system. For application providers to have manufacturers use one standard interface makes the task of working with DMR technology more straightforward. The increasing list of application providers in the DMR Association is also a testament to the importance of apps.

Even though the large majority of the applications deployed are data only, much of the work in this area has been centered on how to interconnect voice consoles to DMR. As everything in the DMR world is digital in one form or another, voice can be considered a special and complex case of data that has exacting timing requirements. This makes voice have the more complex interface requirements and the nut that needs to be cracked before the whole architecture can be put in place. Work on the application interface standard is ongoing.

It has been a busy 18 months for the DMR Association technical group, but a pattern has been well established about moving the technology steadily forward at the ETSI level and within the association. It is a clear sign of the long-term success of the technology that the drive is there to take it further forward. This can only be to the long-term benefit of users. ■

Tom Mockridge is chair of the DMR Association's technical working group. Mockridge is a member of Motorola's PMR product management team. He began his career working for the U.K. regulator of pay-per-call services and then moved into commercial positions with network service providers. Email feedback to editor@RRMediaGroup.com.

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www.3m.com/peltor

C4i

C4i added new features to the SwithplusIP, the company's radio/telephony dispatch system, with the release of software upgrade 10. Most notable are the new phonebook features such as filter and search, Lightweight Directory Access Protocol (LDAP) for integration to other server phone books, speed dial, audio routing and a new graphical user interface (GUI). The upgrade also includes Project 25 (P25) features with Tait Communications radios.

www.c4i.com/public-safety

Cassidian

The TH1n is a thin TETRA portable radio that is 19 millimeters long and weighs 160 grams. The radio still features all the qualities a user needs to deal with any demanding situation, Cassidian officials said. The large and bright color display is similar to many other Cassidian radio models. The radio gives critical information in a format that is clear and easy to read. The logical key patterns and clear menus represent simplicity that mission-critical communications professionals appreciate. Clear visibility is combined with a high level of usability.

www.cassidian.com

Codan

With an icon-based, full color user interface, IP connectivity and software-defined architecture, the Envoy is a "smart radio" that mimics the intuitive nature of smartphones. The software-defined radio is intuitive, reliable and advanced, company officials said. The radio delivers dependable, clear and trouble-free voice and data communications in challenging environments, without dependence on existing infrastructure. The HF radio provides a multilingual user interface and offers scalable solutions for mobile, deployed and base station requirements in an affordable commercial platform, officials said.

www.codan.com.au

Datron World Communications

The Guardian 2 professional radio line is available in VHF and UHF single-band and full-spectrum triband (VHF, UHF and 700/800 MHz) portable models. With front-panel keypad programming, public-safety band interoperability and enhanced AMBE+2 vocoder audio quality, the radio provides first responders, federal agencies and public-safety users with the features needed for efficient and reliable Project 25 (P25) communications. The line offers P25 trunking, optional internal GPS receivers, multiple faceplate configurations, adjustable display layouts and 10 programmable auxiliary buttons. Security options include advanced encryption standard (AES), data encryption standard (DESOFB), FIPS 140-2 (level 2 certified) encryption, over-the-air rekeying (OTAR) and enhanced emergency response software.

www.dtwc.com

Detracom

The Detracom DPE portable is capable of operating on existing analog networks with five-tone, CTCSS and the digital e-DMR DETRANET network. The portable is equipped with a user-friendly keypad and color screen and is ideal for the transmission and reception of short messages and various modes of operation. The portable can be equipped with an optional GPS or GSM module and can transmit the user's position and various types of alarm information over any of the networks. The robustness and heavy-duty features add to the radio's ease of operation to make it a highly reliable working tool for professional users, company officials said.

www.detracom.fr

EF Johnson Technologies

EF Johnson's radios are made in America and used throughout the world by military, police, fire, paramedics and homeland security personnel. The radios offer versatility because they are interoperable with Project 25 (P25) trunked and conventional modes, SmartNet/SmartZone, and feature upgrade capability for P25 Phase 2. The portable radios include the Viking VP600, with 2.5 watts of audio and a top display, and the 5100 ES series with the 51FIRE ES. The 5300 ES series of mobiles feature the electroluminescent Lightning control head that offers a bright and clear display.

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intrinsic safety with comprehensive personal security functions. With the TETRA handsets, Funkwerk offers functionality, user-friendly operation and ease of use. In addition to optimal ergonomics, protection against external factors and TETRA performance features, the radios are equipped with special functions and sensors for manual and automatic alarm initiation. All versions are available with GPS and operate in the 410 – 470 MHz frequency band.

www.funkwerk-sc.com

General Dynamics

General Dynamics' Pathmaker network radios provide dynamic wireless, mobile, ad-hoc networking communications without reliance on network infrastructure. Users can become their own network in remote locations where no infrastructure exists or where the infrastructure is destroyed or overloaded. The multigateway allows the radio to also communicate with cell phones, satellites, VHF/UHF radios and IP-based devices such as a laptop with an Internet connection.

www.gdc4s.com/pathmaker

Harris PSPC

Designed for narrowband operations and armed with Bluetooth functionality, the Harris XG-25M mobile radio is an economical solution for agencies transitioning to Project 25 (P25) technology. The mobile offers features suited for a wide variety of mission-critical user requirements, such as a front-mount control unit with oversized display and increased noise-cancellation technology. The radio also features a rugged design that meets Mil-Std-0810G for shock and vibration, dust, salt fog, humidity, rain, solar radiation, low pressure and temperature extremes. With a software-defined architecture, the radio enables field upgrading to future operating modes, including P25 Phase 2.

www.pspc.harris.com

Hytera Communications

Hytera launched the X1e, the first radio in the X1 Digital Mobile Radio (DMR) line. The radio features a profile slightly larger than a smartphone that can be slipped into pockets, mounted on belts or can be hidden using wireless and/or Bluetooth for discrete and covert surveillance applications. The radios are fully compliant with the DMR open-standard. The palm-sized digital radio offers long talking power and is compatible with analog radios to allow for step-by-step digital migration. The radio ensures secure communications with advanced encryption standard

(AES) encryption, meets IP67 standards for water/dust resistance and features built-in GPS.
www.hytera.us

Icom

Icom's IC-F3260D/F4260D series is a 5-watt, 512-channel VHF/UHF handheld radio that combines analog FM and IDAS digital modes with auto sensing function. The IDAS digital mode uses 6.25-kilohertz narrowband FDMA technology and offers a flexible choice of the NXDN digital protocol or the European Telecommunications Standards Institute (ETSI) digital Professional Mobile Radio (dPMR) protocol, with common hardware. The radios feature rugged IP67 dust and waterproof protection, integrated GPS receiver, man down and lone worker safety, voice scrambler, full dot-matrix display, 800 milliwatts loud audio and voice activation (VOX) capability. The radios are available in a 10 keypad and simple keypad versions.

www.icom.co.jp/world

Kenwood

The Kenwood NEXEDGE VHF/UHF digital and FM mobile radio NX-720HG/820HG features a built-in GPS receiver, allowing for better vehicle tracking and automated location for fleet operators. The mobile radio features the NXDN digital air interface, NXDN scrambler, operation at 6.25 and 12.5 kilohertz and an AMBE+2 vocoder. The mobiles are built on the NEXEDGE platform, with a 10-character alphanumeric display and backlit LCD and keys. The units meet Mil-Std-810 C/D/E/F/G specifications and IP54 water and dust intrusion standards. The radios are capable of digital conventional or trunked mode operation, with multi-site IP network capability.

http://nexedge.kenwood.com

Kirisun Communications

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http://en.kirisun.com

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Simoco

Capable of analog and Digital Mobile Radio (DMR) Tier II and Tier III operation, the SDM600 series from the Simoco Xd mobile range combines digital voice and data with flexible vehicle installation options. The SDM610 control microphone, with its compact, simple design and accessible function keys gives the user the right information and control over their communications, making the radio simple to operate in urgent communications situations. The SDM630 advanced control head is designed to push instant messaging, dispatch, telemetry and control applications to the mobile user. The radio expands the user's abilities beyond voice communications.

www.simocogroup.com

Tait Communications

Featuring software upgradability to Project 25 (P25) Phase 2, the Tait T9400 series is a compact portable designed to conquer the challenges faced by mission-critical users. The radio is a small P25 Phase 2-capable portable that meets the demands of first responders, company officials said. The portable enables first responder effectiveness and safety with internal GPS, Bluetooth wireless technology, IP67 protection and advanced encryption standard (AES) encryption. The Tait TM9400 mobile features AES encryption, over-the-air rekeying (OTAR), various emergency modes and an IP54 rating. The radio also features an options slot to extend its capabilities, and a range of remote mounting, control head and display options.

www.taitradio.com

Teltronic

The HTT-500 handheld features 3 watts of RF output for improved coverage, 1 watt of audio and more than 18 hours of battery power. The handheld is ready for a number of new features including Bluetooth connectivity, a tamperproof E2EE module, a WAP browser, GPS and man-down capability. The radio is solid, tough and durable, yet small and lightweight, company officials said. The radio's intuitive graphical color interface is easy to learn and efficient, officials said.

www.teltronic.es

Thales Communications

The Liberty multiband radio enables multiagency communications

in all of the public-safety frequency bands (VHF, UHF, 700/800 MHz) in a single portable radio. The radio operates in Project 25 (P25) conventional, P25 trunked and legacy analog modes with data encryption standard (DES), advanced encryption standard (AES) and over-the-air rekeying (OTAR). The radio is certified intrinsically safe, has a military specification metal housing and is submersible to 2 meters. The radio is easy to use, easy to train and quick to deploy, Thales executives said.

www.thalesliberty.com

Unimo Technology

PZ radios are ideal for public-safety purposes, as well as industrial applications. The PZ-100NW and PZ-400NW support 512 channels with graphic display and feature voice equalizer, whisper mode, wireless cloning, programmable home channel, scrambler and descrambler, remote stun and revive, and emergency function. Operating in the 136 – 174 and 400 – 470 MHz bands, the radios feature output power of 2/4/5 watts, 2.2 ampere hour Li-ion battery, and optional Bluetooth and GPS. The radios are IP67 waterproof type accepted and passed the company's harsh conditions tests, including shock and drop tests.

www.unimo.co.kr/eng

Vertex Standard

The VX-450 series portable radios deliver the balance of performance, safety and savings for use when long work shifts, harsh environments and safety hazards are the norm, company officials said. Intrinsically safe options are now available. Additional features include 5 watt output power, IP57 submersibility in 1 meter of water for 30 minutes, 700 milliwatts (mW) loud audio, Li-ion battery power with up to 18 hours battery life, emergency alert, lone worker, man down and exclusive Auto-Range Transpond System II safety capabilities. Expanded features include channel announce (10 language options), voice activation (VOX) and a digital voice storage option.

www.vertexstandard.com

Wireless Pacific

Wireless Pacific X10DR system enables users to leave the vehicle and stay connected to team members and dispatch control rooms by the vehicle radio. The wireless microphone maintains a reliable, secure link to the mobile radio for up to 200 meters or more from the fixed vehicle radio. The system performs like a remote speaker microphone invisibly connected to the mobile, providing full push-to-talk (PTT) transmit, receive and emergency call functionality. The user experiences easy operation and total control of the full-powered mobile radio.

www.wirelesscorpltd.com

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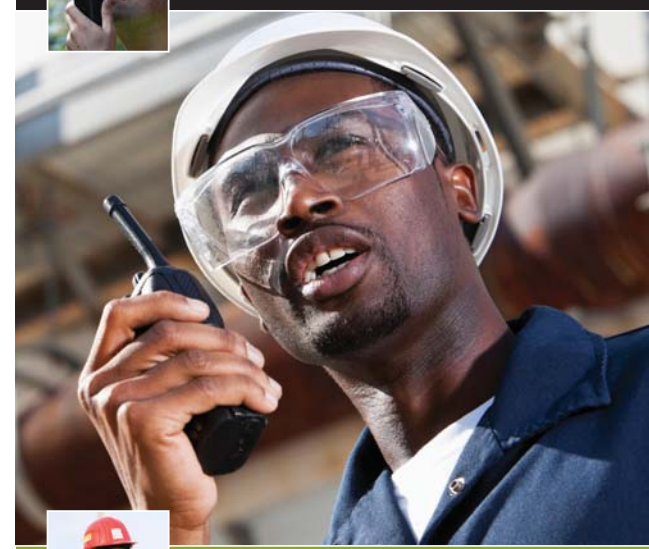

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New Products

Waterproof Handheld

The IC-F4263D-H handheld radio from **Icom Australia** combines waterproof and dustproof construction with a GPS receiver and Icom Digital Advanced System (IDAS) technology based on NXDN.

The radio provides two channels in each 12.5-kilohertz slot rather than one channel with two time slots. The radio also features clear audio transmissions, a large coverage footprint that is audible to the edges of the transmission range, and secure encrypted communications. Adhering to Mil-Std-810 waterproofing standards, the radio also is IP67 waterproof and dustproof rated. The radio includes a backlit dot-matrix LCD, 14-pin accessory connector for speakers or microphones, and a rechargeable Li-ion battery with an average of more than 10 hours of typical use. The radio is configured for use with high-band UHF 450 – 520 MHz networks. Low-band UHF versions are planned. The radio features 512 channels and 128 zones and can switch among 5-, 2- and 1-watt options. Other features include a lone worker function, multiple scan functions, voice scrambling, two-tone and five-tone signaling, silent standby, and radio stun, kill and revive functions.

www.icom.net.au

Transportable System

C4i introduced its Communications – On The Move (C-OTM) transportable product, providing an automated command center that uses VoIP to provide communications between agencies.

The system allows users in deployed environments to use their existing communications equipment and interoperate by connecting or dialing into the system. The unit works with IP phones, radios and cellular equipment and uses DTMF signaling to establish, terminate and conference calls. The system is software configurable and is based on the company's SwitchplusIP product.

www.c4i.com

Console System

Zetron upgraded its DCS-5020 digital console system to incorporate radio over IP (RoIP) capabilities and an interface to Motorola Solutions' MTM5400 TETRA radio, as well as improvements to console development features and language support. The RoIP technology connects console positions over an IP network to a single communications system. An updated console development environment and language support tools take advantage of advanced graphical user interface (GUI) features.

www.zetron.com

Wideband GPS Antenna

Tallysman Wireless introduced the TW4320/4322 wideband GPS and Global Navigation Satellite System (GLONASS) antenna. The antenna is housed in a compact IP67 magnetic mount enclosure with a nearly 3-meter cable and a range of connector options.

Featuring a patch element with 40 percent wider bandwidth than previously available and a two-stage low-noise amplifier, the antenna covers the GPS L1, GLONASS L1 and satellite-based augmentation system (SBAS) frequency bands from 1.575 – 1.606 GHz. A tight pre-filter is available to protect against saturation by high-level subharmonics and L-band signals.

www.tallysman.com

High-Gain Antenna

Rojone modified its A-460D-NF wideband antenna to create a low passive intermodulation (PIM) antenna with high gain. The company upgraded the large cross section radiating element to incorporate silver-plated Polytetrafluoroethylene (PTFE) structures and a solid copper back radiator with plots available for frequencies from 700 MHz to 2.7 GHz.

www.rojone.com.au

Covert Headset

Imtradex upgraded the OnGuard I headset to include a binder disconnect clutch, which allows different headsets to connect to the new OnGuard I-Flex. The headset can connect to all common analog and digital radios. The polyurethane-coated spiral cable withstands pulling forces, and the microphone can be used in the hand

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or worn on the collar.
www.imtradex.com

Network Analysis Software

Airwave Solutions, a partnership between Broadcast Australia and U.K.-based Airwave Solutions, launched Airwave Acuity, an integrated software package that includes analysis performance tools. The software works on any radio, IP data or communications network for public-safety or business applications providing real-time analysis and reports about network performance. The system can operate as a standalone application on a single PC or spread across multiple servers to share the analysis load. The system runs on a Microsoft Windows platform, and extensible plug-ins allow it to link with embedded systems, Linux environments and third-party monitors.
www.airwavesolutions.com.au

Interference Analyzer

Narda Safety Test Solutions added functions to its Interference and Direction Analyzer IDA-3106 that provide faster and more reliable localization of interference and unknown signal sources. The upgrade includes a Max Hold algorithm that allows localization of pulsed or sporadic signals using a horizontal scan for direction finding. The spectrogram display shows the variations in the spectrum with time. The analyzer

records up to 400 compressed individual spectra for the spectrogram display and shows the signal strength in color. Spectra data can be saved as reference traces, and the current spectrum can be displayed as a difference or delta spectrum. Designed for outdoor use, the instrument display can be switched for optimum visibility in daylight, normal lighting or darkness. The unit weighs less than 3 kilograms including battery.
www.narda-ida.com

Digital Test System

The 3550 digital radio test system from **Aeroflex** includes a color touchscreen and isolates problems and assesses performance of AM/FM radios with options for Project 25 (P25), Digital Mobile Radio (DMR), NXDN and digital Professional Mobile Radio (dPMR) radio systems. Weighing 3.8 kilograms with an internal battery, the test set features 4.5 hours of continuous operation and can test all aspects of the radio system, including the transmitter, receiver, cables and antennas. The device meets Mil-PRF-28800A specifications for

humidity, shock and vibration, and operates in a range from zero to 50 degrees Celsius. Specifications include phase noise of -95 dBc/Hz, RF signal generator level accuracy of ±1.5 decibels (dB), FM deviation meter accuracy of 4 percent, and a -140 dBm spectrum analyzer.
www.aeroflex.com

Handheld Analyzers

Agilent Technologies introduced 14 FieldFox handheld analyzers that cover satellite communications, microwave backhaul, military communications, radar systems and

other applications. The analyzers are designed to operate in harsh conditions, complying with Mil-PRF-28800F Class 2 requirements, and can be configured as cable-and-antenna analyzers, spectrum analyzers, vector network analyzers, or all-in-one combination analyzers. Each 3-kilogram package is available in 9, 14, 18 or 26.5 GHz frequency configurations. The instrument includes a vertical orientation and large buttons. The analyzers can be ordered with a built-in power meter, independent signal generator, vector voltmeter, interference analysis, variable DC source, frequency counter and built-in GPS receiver.
www.agilent.com

Vehicle Positioning Unit

Symeo introduced the Symeo Positioning Unit (SPU), a compact positioning device that can be permanently mounted on the roof of a vehicle to capture position and navigation information. The device integrates the positioning system and all antennas in a weatherproof casing and is targeted for buses, locomotives, railcars and other vehi-

cles. The unit uses local positioning radar (LPR) or GPS to obtain positioning information. The company also introduced its Symeo Telemetry Unit (STU) for vehicle management. Ideal for installation on railcars, the unit determines vehicle position and enables the operator to capture vehicle data such as fuel/electricity consumption, miles driven and vehicle status data.
www.symeo.com

TETRA Triplexer

The TRI 70/900/1800/UMTS/FM-SMA from **Procom UK Sales** is a triplexer providing simultaneous operation of TETRA, GSM

and car radio on a common mobile phone antenna. The device provides coverage in 380 – 470 MHz, 870 MHz to 2.3 GHz and 0 – 108 MHz systems. Quick installation is possible with dual-adhesive pads. The device measures about 50 x 21 x 60 millimeters and weighs about 68 grams.
www.procomuk.co.uk

Digital PMR Processor

CML Microcircuits added digital Private Mobile Radio (dPMR) modes 1, 2 and 3 and ARIB STD-T102 to the CMX7131 and CMX7141 digital processors. The devices now support dPMR TS 102 490, DCR ARIB-T98, NXDN, analog professional mobile radio (PMR), dPMR TS 102 658 and ARIB STD-T102. The dPMR mode 1, 2 and 3 function image implements a half-duplex 4FSK modem and a large proportion of the dPMR air interface, data link and call control layers. The 7131/7141FI-2.x function image implements a half-duplex 4FSK modem and a large proportion of the DCR air interface, data link and call control layers.
www.cmlmicro.com

Correction

An item in "New Products" of the Quarter 3 issue of *RadioResource International* incorrectly described the 900 MHz linking solution from MiMOMax Wireless. The item should have stated that the product features 12.5- and 25-kilohertz narrowband channels.

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ConnecTel www.connectel-cz.com	8
Damm Cellular Systems A/S www.damm.dk	3
Daniels Electronics Ltd. www.danelec.com	26
Datron World Communications www.dtwc.com	9
David Clark Co. www.davidclark.com	32
Detracom www.detracom.fr	35
Emcom Wireless www.emcom.co.za	31
Eventide www.eventide.com	38
Funkwerk Security Communications www.funkwerk-sc.com	45
General Dynamics C4 Systems www.gdc4s.com/pathmaker	43
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Icom Inc. www.icom.co.jp/world	7
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OTTO Engineering www.ottoexcellence.com	22
PROCOM A/S www.procom.dk	33
Radio & Trunking Distributors International www.radioandtrunking.com	47
Radiotrans Comunicaciones S.A. www.radiotrans.com	46
Simoco www.simocoradio.com	55
SoftWright www.softwright.com	48
Spectra Engineering www.spectraeng.com.au	25
SuperGUIDE www.RRImag.com	49
Telewave Inc. www.telewave.com	56
Teltronic S. A.U. www.teltronic.es	11
Wilson Electronics Inc. www.WilsonElectronics.com/RR	17
Wireless Corporation Ltd. www.wirelesspac.com	27
World News www.RRImag.com	46
Zetron Inc. www.zetron.com	5

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2. Which of the following best describes your organization?
❑ A Mobile Communications Dealer/Reseller
❑ B Distributor, Agent, Importer, Exporter, Rep
❑ C Commercial Trunked Radio and Other Wireless Service Providers
❑ D Government/Public Safety/Military
❑ E Business/Industrial/Transportation User
❑ F Communications Manufacturer/OEM/Software Developer
❑ G Engineering and Consulting Firm
❑ Z Other—please specify _____

3. What is your function?
❑ A Corporate Management
❑ B Operations/Administration Management
❑ C Technical/Engineering Management
❑ D Sales/Marketing
❑ Z Others Allied to the Field—please specify _____

4. Do you recommend, specify or purchase mobile communications equipment or services?
❑ A Yes ❑ B No

5. Is there any servicing of mobile communications equipment at your location?
❑ A Yes ❑ B No

6. In what area of the world do you do most of your business? (mark only one)
❑ A Western Europe
❑ B Eastern Europe
❑ C Middle East
❑ D Asia
❑ E Australia/New Zealand
❑ F Africa
❑ G Mexico/Central and South America
❑ H United States/Canada
❑ Z Other _____

7. What wireless technologies does your organization plan to use/buy over the next 2 years? (check all that apply)
❑ A Conventional Two-Way
❑ B Cellular/Personal Communications
❑ C Paging/Messaging
❑ D Mobile Data
❑ E SCADA/Telemetry
❑ F Microwave radio
❑ G Trunking
❑ H Location Technologies
❑ I Tone Signaling (ANI, Encryption, etc.)
❑ J Interconnect
❑ K Satellite
❑ L CAD
❑ M Wireless Broadband
❑ Z Other _____

Q412

By Marco Morresi

Digital Progress in Russia

The Russian professional mobile radio (PMR) user base is still largely analog, but digital products are widely available and more are coming to the market. Unlike analog equipment where all manufacturers' products have the same spectrum needs, there are significant differences in the spectrum requirements of digital technologies.

Russian economic growth is largely driven by the oil and gas, utilities and transportation sectors, all of which represent verticals addressable by digital technology. Russia is also tied to price sensitivity issues that are common across numerous markets.

One of the keys to the success of Digital Mobile Radio (DMR) technology in Russia is that it enables a single 12.5-kilohertz channel to support two simultaneous and independent calls, achieved using TDMA under the DMR standard — doubling of capacity in existing licensed channels. Furthermore, TDMA allows users to achieve 6.25-kilohertz efficiency while minimizing investments in repeaters and combining equipment. Users who are migrating from an existing analog 12.5-kilohertz system may re-use much of their existing infrastructure equipment.

Some Russian oil and gas companies, as well as utilities, have migrated from existing analog systems to digital systems, and many others are testing or have tested DMR solutions, including Rosneft, one of the country's largest power companies. Rosneft completed the first phase of the migration of its radio network with DMR infrastructure equipment.

Replacement of analog systems with digital technology is driven by obsolescence, difficulty finding spare parts and maintenance, a need to future-proof investments, and by an increasing market and industry awareness of DMR technology. During the past year, three Russian companies have joined the DMR Association.

Energy projects such as pipelines require large coverage areas, and DMR can provide coverage equivalent, if not better, than analog. DMR offers benefits of a digital system without the need to increase the number of repeater sites required. The ability to monitor the position of terminals is making it easier to manage workers and ensure safety. Furthermore, DMR digital technology provides better noise rejection and preserves voice quality across a greater range than analog, especially at the farthest edges of the transmission range — resulting in fewer misunderstandings and more effective conversations. Moreover, the end-to-end digital nature of DMR enables features such as supervisory control and data acquisition (SCADA) and telemetry to be easily integrated into radios and systems.

Russian economic growth is largely driven by the oil and gas, utilities and transportation sectors, all of which represent verticals addressable by digital technology.

A number of large transportation companies are expected to choose digital for their communications in the near future. Russian railways have been looking to migrate to digital systems for the past 10 years. In 2003 railways reported 77 percent of their radio systems to be outdated. Since then, numerous alternatives have been under scrutiny, and in 2012, several pilot programs were started to evaluate the use of DMR technology.

Almost all Russian airports operate in a 1-megahertz frequency resource in the VHF band, and major airports are looking for ways to increase capacity and to benefit from the advantages of digital technology. A number of large Russian airports in cities such as Moscow and Yekaterinburg have implemented or are planning DMR communications networks. DMR radio base stations can support analog frequency modulation/phase modulation and digital DMR modulations over the same radio channel, automatically selecting in real time the appropriate operating mode from the in-bound RF signal. As a consequence, airports have performed phased migrations from analog by implementing the DMR equipment working in dual mode and interoperating with the analog network.

DMR is also suited to large areas with relatively low traffic applications where simulcast DMR gives the best performance; for this reason DMR has attracted an interest from a number of public safety and security organizations in Russia. These range from the Federal Drug Control Service of Russian Federation to Russia's State Traffic Police and Civil Protection agency. ■

Marco Morresi is a marketing working group member of the DMR Association on behalf of SELEX Elsag. Prior to moving to Italy in 2004, Marco was director of marketing and advertising at the Alexander Graham Bell Association in Washington D.C., and founder and part owner of PrimaSat, a U.S.-based Inmarsat and Iridium satellite service provider.

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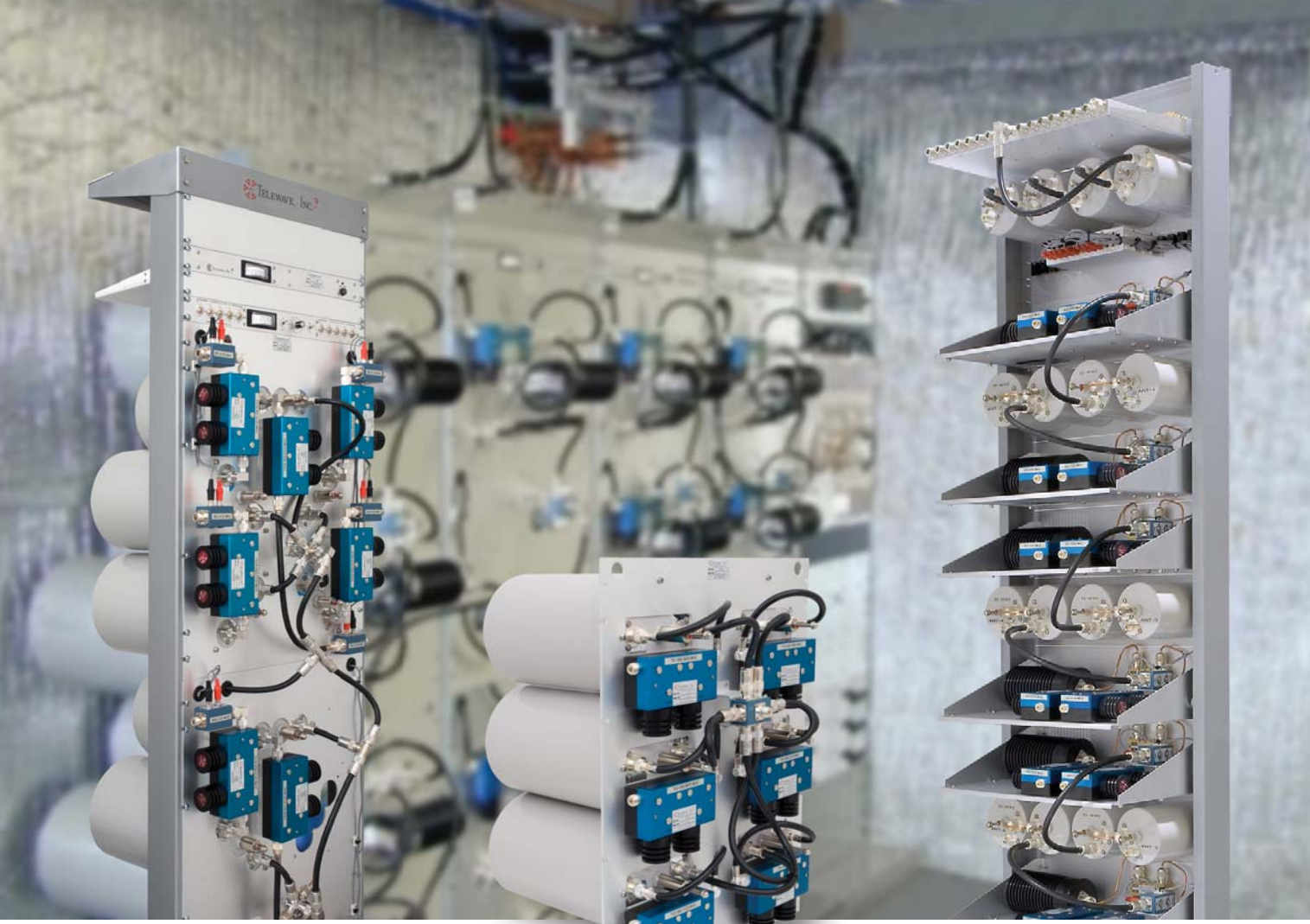

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