Quarter 2 2011 | RRImag.com

RadioResource INTERNATIONAL

THE GLOBAL INFORMATION RESOURCE FOR MISSION-CRITICAL COMMUNICATIONS

TETRA World Congress Issue

Disaster Management

Recovery Efforts in New Zealand and Japan

Inside

TETRA Coverage in Abu Dhabi

dPMR for Transport

Rio Prepares for World Stage

Poland Preps for Nationwide Network

Simplifying advanced communications - for even the harshest working environments

DAMM's fully IP-based TetraFlex® digital radio system is the ideal solution for a wide range of users, from harsh working environments to large-scale mission critical applications.

Simple to set up, easy to use
TetraFlex® has been designed to provide robust, scalable, user-friendly and – above all – 100% reliable digital radio communications for a vast range of applications. The system's Plug'n'Play simplicity, modularity and intuitive user interface makes TetraFlex® extremely quick to deploy, and minimizes overall cost of ownership.

Future-proof flexibility and scalability
There is no limit to the size of the network that TetraFlex® can support. The distributed architecture and TETRA over IP technology allows easy and effective network planning and integration. In addition, built-in scalability and modular product flexibility secures your investment for the future.

Compact, versatile and rugged
TetraFlex® base stations are compact enough to ensure quick and easy outdoor installation, even where space is limited or under harsh environmental conditions.

Intelligent software for maximum usability
The intelligent TetraFlex® software enables simple self-configuring site expansion, even while in operation. TetraFlex® also comes with a wide range of valuable integrated software, such as network management, dispatcher solution, voice/data recording and replay facilities, SIP gateway to legacy networks, packet data gateway and open application interface.

DAMM solutions and support are available worldwide through an exclusive network of authorized partners

www.damm.dk

DAMM

Advanced Communications
Keeping you safe

TETRA - P25 - LMR - CAD - Professional Mobile Broadband

teltronic
professional communications

www.teltronic.es

RadioResource INTERNATIONAL

Quarter 2 2011

CONTENTS

Vol. 25, No. 2

20 dPMR for Transport
The ETSI standard moves forward with sophisticated applications, enhanced functionality and coverage benefits. *By Pete Hizzey*

26 Rio Prepares for World Stage
Officials in the Brazilian city are upgrading communications networks for international sporting events. *By Capt. Renato Cesar de Oliveira Moreira*

32 Coverage Boost in Abu Dhabi
Multiple repeaters enhance TETRA network coverage and security at the Yas Marina Formula 1 Circuit. *By Katja Lehtomaa*

36 Backhaul Transformation
Know the various microwave network options to ensure your system is prepared for broadband applications. *By Dave Christophe*

42 Disaster Management
Mission-critical suppliers support New Zealand and Japanese earthquake recovery efforts. *By Lindsay A. Gross*

IN EVERY ISSUE

Dispatch 6
Expert on Digital Mobile Radio (DMR) joins the editorial advisory board. *By Sandra Wendelken*

Inbox 8

World News 10

Product Expo:
Site and Test Equipment 46

New Products 52

Events 60

Global Forum:
Emerging Markets 62
Poland preps for a nationwide TETRA network. *By Robert Mikulski*

READER SERVICES

Classifieds 57
Advertiser Index 61
Subscription Form 61

Cover photo courtesy New Zealand U.S. Embassy

www.RRImag.com

DIGITAL EDITION
Access feature-rich, interactive issue

View Magazine Online

Features
Exclusive online editorial features

Headline News
Industry news updated daily, plus archives

SuperGUIDE
The industry's most comprehensive online Buyers Guide

MissionCritical UNIVERSITY
White papers, case studies and tutorials

WORLD NEWS
E-newsletter contains breaking news, exclusive content and industry links

How to contact us: www.RRMediaGroup.com or

Editorial	Sales	Subscriptions
edit@RRMediaGroup.com	info@RRMediaGroup.com	lfriday@RRMediaGroup.com
Phone: +1 303 792 2390 ext. 20	Phone: +1 303 792 2390 ext. 10	Phone: +1 303 792 2390 ext. 15
Fax: +1 303 792 2391	Fax: +1 303 792 2391	Fax: +1 303 792 2391

Zetron Console Systems:

At the Heart of What You Do

For over 30 years, Zetron console systems have been serving at the heart of mission-critical communication centers throughout the world. Customers say their Zetron systems are “reliable,” “flexible,” and “rock solid.” And for good reason. Zetron systems don’t miss a beat. They do their jobs so your dispatchers can do theirs.

Zetron Console Systems give you:

- **High interoperability**. Zetron systems connect more radio types together, including analog, digital, and proprietary.
- **Support for small to large centres** and both single-site and multi-site operations.
- **Scalability**; a future-proof investment. Zetron systems can expand along with your needs.
- **Support for P25 TIA DFSI and CSSI, TETRA, NEXEDGE® and iDEN.**
- **Reliability and high availability.** Redundant architecture protects your operations. No single point of failure.
- **Integration with multiple devices and resources**, including telephone and radio communications.
- **A highly configurable UI**. Can be customised to suit your operations.

> “Our Zetron system is excellent. It will be the heart of our dispatch operations for years to come.”
>
> — Bill H., Communications Centre Director

ZETRON AMERICAS
(P) 425.820.6363
(E) zetron@zetron.com

ZETRON AUSTRALASIA
(P) 61 7 3856 4888
(E) ausales@zetron.com

ZETRON EMEA
(P) 44 1256 880663
(E) uk@zetron.com

ZETRON®

Morresi Joins Editorial Advisory Board

As our industry marches toward digital technologies, we will continue to provide you with technical details and case studies for each digital radio technology, along with its benefits and challenges.

This issue is our annual TETRA World Congress issue, and we look forward to meeting many of you in Budapest, Hungary, to learn more about and discuss the latest developments in the TETRA standard. The technology is even making some inroads in the one market holdout — North America. *RadioResource International* continues to lead coverage of the latest trials and demonstration networks in the United States and Canada. Check our website and WORLD NEWS e-newsletter for the latest. The Middle East and Latin America continue to be emerging markets for TETRA as well, and this issue has articles on networks in Abu Dhabi, United Arab Emirates (UAE) and in Rio de Janiero. Project 25 (P25) is also making strides in markets around the world, and our Quarter 3 issue will feature P25 deployments.

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

In addition to the digital technologies focused on the public-safety sector, other digital standards are addressing the business and private-safety markets around the globe. Digital Private Mobile Radio (dPMR) has many features tailored to the transportation industry, among others, as the feature on Page 20 explains.

Digital Mobile Radio (DMR) is finding its place within critical infrastructure industries as well. We are pleased to add DMR expert Marco Morresi to our editorial advisory board to further enhance our coverage of this standard. Member of the DMR Association's marketing working group, Morresi is marketing specialist at Selex Communications.

Prior to moving to Italy in 2004, Morresi was director of marketing at the Alexander Graham Bell Association in Washington, USA, and founder and part owner of PrimaSat, an Inmarsat and Iridium satellite service provider, applications developer and software solutions integrator for maritime, aeronautical and land mobile users based in the United States, where he managed business and channel sales. Morresi has an MBA in marketing and business management from American University in Washington.

We welcome Morresi to our advisory board, and any input you have on our digital radio technology coverage.

Sandra Wendelken, Editor
swendelken@RRMediaGroup.com

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.

PUBLISHER/EDITORIAL DIRECTOR
Paulla A. Nelson-Shira, pnelson-shira@RRMediaGroup.com

EDITOR
Sandra Wendelken, swendelken@RRMediaGroup.com

MANAGING EDITOR
Lindsay A. Gross, lgross@RRMediaGroup.com

ASSOCIATE/WEB EDITOR
Michelle Zilis, mzilis@RRMediaGroup.com

WEBSITE ADMINISTRATOR
Lola Friday, lfriday@RRMediaGroup.com

GRAPHIC DESIGNER
Brad Hamilton, bhamilton@RRMediaGroup.com

CORRESPONDENCE
Editorial, advertising, and circulation correspondence should be addressed to: ***RadioResource International,*** 7108 S. Alton Way, Bldg. H, Centennial, CO 80112-9977, USA Tel: +1 303 792 2390, Fax: +1 303 792 2391.
Editorial email: edit@RRMediaGroup.com
Advertising email: info@RRMediaGroup.com

RadioResource International (ISSN 1080-3025) is published five times a year in the United States. It is circulated free, by name and title, to personnel responsible for purchasing, recommending, specifying or managing equipment and services for radio communications systems outside the United States and Canada. Canadian Post Publications Mail Agreement No. # 40065056. Canadian Return Address : DP Global Mail, 4960-2 Walker Road, Windsor, ON N9A 6J3.

Printed in U.S.A.

www.RRImag.com

Pandata

ICOM

iDAS™
ICOM DIGITAL ADVANCED SYSTEM

IDAS™ Multi-site Trunking

High volume, wide area communication

NXDN™ Type-D trunking protocol

Up to 48-site connection over IP network

Automatic site roaming

*Note: Private IP Network or VPN Tunnels through the Internet with Static endpoints.

Icom Inc.

1–1–32, Kami-minami, Hirano-ku, Osaka 547–0003, Japan Phone: +81(06) 6793 5302 www.icom.co.jp/world

Inbox

Following are reader comments about news from WORLD NEWS, a monthly e-mail newsletter. Submit comments to editor@RRMediaGroup.com and subscribe at RRImag.com.

New Zealand Earthquake

Editor:

Reminds me of Hurricane Katrina when everybody took credit for providing mission-critical communications. A number of communications networks held up. Ambulance communications, for example, were unaffected. TeamTalk, New Zealand's public access mobile radio (PAMR) provider, was unaffected, and a number of wireless Internet suppliers' services were undamaged.

Dave Ware
New Zealand

BPL Interference

Editor:

I agree with the American Radio Relay League (ARRL) in its efforts to protect uninterrupted amateur radio services. There are emissions at levels that could cause harmful interference to licensed amateur radio stations. The ARRL is one of the rarest amateur radio organizations worldwide that is capable of doing something to protect their membership's interests and activities. In my opinion, it is important that *RadioResource International* covers such stories regularly; it might help other ham radio societies to push their own legal actions against eventual producers of harmful interference.

Miroslav Skoric

Donate to Amateurs

Editor:

Amateur radio operators play an important role in disaster and response communications. As public-service agencies transfer their older legacy radio systems to new public-service radio systems, they should consider donating them to local amateur radio organizations to help them improve the technologies they have. The American Radio Relay League (ARRL) could help find new homes for this gear.

William Conklin
Santa Cruz County (California, USA) Amateur Radio Club

KENWOOD
Listen to the Future

Australians Adopt NEXEDGE®

Kenwood's NEXEDGE® now serving Sydney and Melbourne

In July 2010 Vertel, Australia's largest independent wireless network provider, launched Team Talk™, a fully managed push-to-talk two-way communications system powered by Kenwood and using NEXEDGE® technology. Covering Sydney and Melbourne metro areas, Team Talk™ delivers localized and interstate communications for commercial and government organizations that require business-critical voice and data communications over secure digital networks.

Technology for tomorrow

After conducting comprehensive testing and benchmarking, Vertel concluded that the Kenwood NEXEDGE® technology was without question the ideal solution – from the perspective of both network operators and end-users. NEXEDGE® offers a highly secure, spectrally efficient digital (FDMA) technology platform enabling Vertel to deliver enhanced voice communications, improved coverage and highly flexible talk group configurations. Moreover, operating in 12.5 kHz and 6.25 kHz channel widths, it meets and exceeds the requirements of the Australian Communications and Media Authority (ACMA) 400 MHz spectrum strategy. Kenwood's NEXEDGE® was perfect for Vertel's Team Talk™ Network.

Clarity and functionality

A common problem for many analog LMR users can be uneven call quality, but NEXEDGE® delivers consistently better calls, especially in fringe locations and inside buildings. Users also enjoy improved features and functionality – such as encryption, and GPS tracking – and they

can look forward to further enhancements such as telephone-interconnect and over-the-air programming. Another benefit for businesses moving to digital is that analog radios can be gradually replaced with NEXEDGE® devices, which can operate in analog LTR® mode as standard.

Coverage and capacity

With a group ID and unit ID network capacity of 60,000, NEXEDGE® is more than sufficient for large organizations. IP is used to link up to 48 digital trunked sites for wide area roaming and calling capabilities, while IPsec VPN tunneling provides secure communications links.

"The 'smarts' of the NEXEDGE® digital system allowed us to efficiently roll-out a state-of-the-art network which delivers a practical migration path and superior communications to our customers," explains Andrew Findlay, Vertel Managing Director.

All NEXEDGE® equipment operates in 25 & 12.5 kHz analog and 12.5 & 6.25 kHz NXDN® digital modes, allowing users to take advantage of the latest developments in digital radio – enhanced coverage, security and performance – and yet still use legacy analog resources. The FDMA-based digital air interface provides the lowest BER (bit error rate) in the industry, delivering clear, secure communications even at weak RF signal strengths. NEXEDGE® systems are configurable in traditional conventional, trunked and wide area trunked network operation modes, while IP connectivity for trunked sites provides scalability over existing LAN/WAN assets and services.

- Outstanding voice quality
- Extended coverage
- Enhanced capacity & call capabilities
- Secure privacy
- Smooth migration
- Spectrum efficiency
- Simultaneous voice and data (GPS etc.) on one channel
- Easy management
- Affordable networking

NEXEDGE®

http://nexedge.kenwood.com

EUROPE

eCall's 3-Year Pilot Project Launches in Europe

A three-year project to trial Europe's new in-vehicle emergency call service (eCall) launched in January. During the trial, nine European countries forming the HeERO consortium will prepare for the interoperable and harmonized 1-1-2-based in-vehicle emergency call system.

The nine countries involved in the project include Italy, Germany, Romania, Czech Republic, Greece, the Netherlands, Croatia, Finland and Sweden.

HeERO officials will carry out certification and homologation tests and procedures for the eCall systems and end-to-end services. The HeERO consortium includes public-safety answering points (PSAPs), emergency management centers, mobile network operators, fleet owners, private and public road operators, and car manufacturers. Officials will share the results of the pilots with European standardization organizations for fine-tuning the standards.

eCall has stalled over the years because of a lack of standards and the high cost of infrastructure. The pan-European eCall concept started in 2002. The project is estimated to have the potential to save up to 2,500 fatalities annually when fully deployed.

The technology generates an emergency call either manually by vehicle occupants or automatically via in-vehicle sensors. When activated, the in-vehicle system will establish a voice connection with the relevant PSAP, and a minimum set of incident data (MSD) will be sent to the PSAP operator receiving the voice call. The MSD, including key information such as accident time and location and vehicle description, is sent over the voice channel to emergency staff at the relevant PSAP.

eCall console in a Brighton, United Kingdom, patrol car

BUDAPEST, Hungary — BKV awarded a tender to **Selex Communications** to create a radio communications network for all public transports in Budapest and the provinces. The overall value of the program, named Futar, is about 25 million euros (US$34.2 million) of which several million are for the Selex infrastructure.

BKV manages city public transports. The system will be delivered by December 2011 and will provide VHF coverage of the Hungarian capital with Digital Mobile Radio (DMR) simulcast technology. The system allows more than 2,500 means of transport to make use of single, group and emergency voice services and of data exchange services, such as short message service (SMS) and GPS position messages.

The system comprises six sites: one master site and five secondary sites connected with an IP link. Each position is equipped with 16 DMR carriers and offers 32 channels that can be used simultaneously for communications. Each channel can use six ECOS-D DMR radio base stations connected through a LAN.

LYON, France — Lyon-Saint Exupéry Airport selected **Sepura** TETRA terminals following the recent deployment of a new digital communications system that replaced four legacy analog networks.

Sepura's handheld radios, together with **SYSOCO**'s infrastructure and network tracking solutions, deliver outdoor and indoor radio localization, real-time guard tour management and man-down capabilities needed to ensure workers are protected at all times, regardless of their locations, Sepura officials said.

LONDON — The VINCI BAM Nuttall joint venture, working on the Tottenham Court Road station, a London Underground station in central London, sourced the supply and installation of radio communications system equipment from Wall to Wall Communications.

Wall to Wall Communications is providing a **Motorola Solutions** Digital Mobile Radio (DMR) system with multiple channels and a session initiation protocol (SIP) telephone interconnect. A complex antenna system will allow seamless communications between workers at ground level and their team within the tunnel.

COPENHAGEN, Denmark — Invisio received a 1.7 million Swedish kroners (US$249,500) order from the Copenhagen Fire Brigade for heat-resistant headsets with push to talk (PTT). The brigade will use the communications equipment in combination with two-way radios through a TETRA digital communications network.

PARIS — Telvent officials said the company will deliver its supervisory control and data acquisition (SCADA) technology to new customer GRTgaz, which owns and operates the GDF Suez gas transportation network in France. The contract for the project is secured until 2013.

MUNICH — Rohde & Schwarz acquired a majority interest in Romanian company **Topex**, manufacturer of voice communications systems for air traffic control (ATC). The systems complement the Rohde & Schwarz ATC portfolio, which mainly comprises radio communications solutions.

38°45'N 90°23'W

Be everywhere you need to be.

DATRON SCOUT

- Vertical Take Off and Landing (VTOL)
- Intelligent Camera Targeting
- Stream Real Time Digital Video to any Device
- Quiet and Covert
- Completely GPS, Touch-Screen Controlled
- Hot-Swappable Payloads

GUARDIAN II
Portable Handheld Transceiver

- Single and Triband configurations available
- Advanced Vocoder (AMBE)
- 25/12.5 Khz Channel Spacing
- APCO P25 Trunking
- FIPS Certified Encryption
- IP67 Submersible
- Internal GPS Receiver
- 1024 Channels/Talkgroups
- Alphanumeric Display
- Battery Fuel Gauge
- Signal Strength Indicator

DATRON SAFARI
Tactical Wireless Networking System

- Interoperability with nearly all commercial, public safety, or MIL type infrastructure and tactical radios.
- Robust set of restoration and network diversity options for zero failure reliability.
- Integration with edge-based solutions supporting ISR sensors – UAV, SIGINT, and ground.

Systems collaboration for better communication.

DATRON
Performance You Require. Value You Expect.®

www.dtwc.com sales@dtwc.com

Topex will trade under the name Rohde & Schwarz Topex.

ASIA/PACIFIC

BONTANG, East Kalimantan, Indonesia — Team Simoco completed the supply of a TETRA system for the Badak liquid natural gas (LNG) plant in Indonesia.

Designed to cover an area of about 220 square kilometers from a single transmission site with four carriers, the system will support more than 500 radio users equipped with intrinsically safe (IS) hand portables. The system has fully redundant switching and an analog gateway to provide digital voice and data communications throughout the plant, as well as connectivity to legacy analog networks.

The Badak LNG plant in Bontang has capacity to process more than 22

Continued on Page 14

Sweden Rolls Out Nationwide Radio Communications Network

The Swedish authorities' nationwide TETRA network RAKEL, provided by Cassidian, rolled out. The network will allow user organizations to cooperate fully on a national scale.

Serving public order, security and health organizations, it is also used by commercial parties such as utility companies. In addition, other community organizations, such as the Civil Aviation Administration and the Swedish Maritime Administration, can access the system during exceptional incidents.

RAKEL was delivered by a consortium consisting of Saab, Cassidian and Eltel Networks contracted by the Swedish Civil Contingencies Agency (MSB) in December 2010. The final two of the project's seven phases incorporated the geographical areas of Jämtland, Västerbotten and Norrbotten. The network serves around 31,000 users, a number slated to increase to 70,000 within a few years.

The network consists of about 1,700 base stations and a number of switches, replacing 200 communications systems. The first parts of the network have been in operation since 2006.

Swiss Rail Company Upgrades Monitoring System

IBM and Alcatel-Lucent are helping Swiss transportation company Schweizerische Bundesbahnen (SBB) improve on-time arrivals and increase customer satisfaction to transport 900,000 passengers and more than 220,000 tons of cargo each day.

The technology is estimated to recognize and repair more than 50 percent of network issues around delays before they occur or affect service, leading to higher customer satisfaction and an annual savings of about US$2.3 million. The new system will give SBB better visibility into its rail system, reducing problem analysis efforts by about 33 hours each month. It will also simplify the overall management of the rail system and drive higher efficiencies with a single-view map and customizable reporting tools.

Swiss Federal Railways

The rail solution enables SBB to monitor its more than 3,000-kilometer network of tracks and 800 rail stations through one user interface. The solution combines data from railroad track switches, stations and cars gathered from sensors and video at train stations connected by a fiber-optic cable network with 50,000 fixed and 20,000 mobile connections.

"Trying to manage 7,000 kilometers of track is a particularly daunting task," said Martin Schaeren, head of service management, Swiss Federal Railways. "But by leveraging our Alcatel-Lucent and IBM solution, we're able to see our entire infrastructure clearly and respond to problems before they can affect our operations."

The railway shifted to the new integrated system after an isolated power failure in 2005 triggered 18,000 alarms from its various monitoring systems, masking the root cause of the problem, leaving nearly 200,000 passengers stranded for hours, costing almost US$5 million.

Continued from Page 12
million tons a year, supplied to countries including Japan, South Korea and Taiwan.

SEOUL, South Korea — Four remote ground stations deployed by **ARINC** will enhance coverage of its VHF data link network for aviation in South Korea. The company deployed two ground stations at Cheongju International and Yeosu International airports and two auxiliary ground stations to enhance existing coverage at Gimpo International and Incheon International airports.

The company's South Korean network now has 11 ground stations. The stations will provide carriers with fast and reliable operational messaging and enhance in-flight data transfer and communications among airline operations centers, flight decks and among carriers.

MUMBAI, India — Consort Digital, a systems integrator, secured the contract for the Mumbai Monorail TETRA project, commissioned by the Mumbai Metropolitan Region Development Authority (MMRDA).

The new digital communications solution will be integrated with the telephony network, public announcement, onboard train communications, centralized recording and signaling systems, and will consist of **Damm Cellular Systems** TETRA infrastructure and **Sepura** radio terminals.

TAIPEI, Taiwan — The National Taiwan Museum of Fine Arts deployed an integrated digital trunked radio system and private automated branch exchange (PABX) telephone system for inbound and outbound communications from **SmarTrunk Systems**.

The system is used for security and daily communications. All users can employ a desktop telephone to communicate with any other radio group, department or individual users. The museum's security service personnel safeguard the underground treasure storage vault and consistently establish outbound communications by initiating either radio-to-radio or radio-to-telephone calls. The storage vault is a protected area surrounded by metal where cell-phone access isn't available.

SINGAPORE — Motorola Solutions focused its new channel partner program on Asia, planning five conferences in different Asia/Pacific markets during the year. The meetings will directly engage with nearly 2,000 application developers, system integrators and independent software vendors across Southeast Asia about the PartnerEmpower program.

SINGAPORE — Singapore-based technology company **CSE Global** acquired the **Astib Group**, a mobile communications dealer in Western Australia. Astib's business will provide a base for CSE Global to further expand its existing activities within the telecommunications sector.

MIDDLE EAST/AFRICA

DOHA, Qatar — Cassidian and the Ministry of Interior (MOI) of the state of Qatar opened a jointly operated and expanded TETRA Academy in Doha. The first such academy in the Middle East is located at the new MOI telecommunications department complex.

Trainers from Cassidian will train engineers for MOI's telecommunications department, and TETRA training classes are provided for regional customers operating Cassidian-delivered TETRA networks. The competence

Australian Authority Awards Emergency Services Spectrum

The Australian Communications and Media Authority (ACMA) released implementation plans and timeframes to facilitate new arrangements in the 400 MHz band. The changes should reduce congestion, harmonize government spectrum, and promote greater opportunities for new and emerging technologies, ACMA officials said.

Major structural changes to the band include a segment identified for the exclusive use of government (403 – 470 MHz), a 10-megahertz duplex frequency split that will be implemented in parts of the 450 – 470 MHz band, and narrowbanding to a 12.5-kilohertz channel raster throughout the band with provisions for 6.25-kilohertz channels in land mobile segments to address congestion.

"The harmonization of government spectrum use in the 400 MHz band provides an unprecedented opportunity for significant gains in essential and emergency service interoperability between and among state and federal government agencies," said ACMA Chairman Chris Chapman.

ACMA intends to finalize the transition by 31 December, 2015, in congested areas and by 31 December, 2018, in other areas. The transition process consists of a three-phased approach. Phase one will be the creation of vacant channels. Phase two will be the implementation of 10 megahertz duplex frequency split in 450 – 470 MHz. Phase three will be harmonizing the government band.

center first opened last year.

"With 70 students being trained in various disciplines, this is an essential step in building both theoretical and practical know-how locally for operating the Qatar TETRA network," said Franz Peraus, head of Cassidian Middle East.

The firm established a similar academy at the Nelson Mandela Metropolitan University in Port Elizabeth, South Africa, last year.

LATIN AMERICA

SAO PAULO, Brazil — Telvent was awarded a contract by Infraero, the Brazilian company for airport infrastructure, to deliver a new, digital radio communications network to 18 Brazilian airports. The standards-compliant platform affords privacy and security, and its high availability will improve communications efficiency and service to air travelers during routine airport operations at Brazilian airports, Telvent officials said.

BOGOTA, Colombia — Bavaria, a subsidiary of SABMiller in Colombia, is implementing **Verint Systems'** IP video management software, encoders, video analytics and IP cameras in its facilities across Colombia. The organization will benefit from robust security and mission-critical loss prevention and quality-control capabilities, Verint officials said.

INTERNATIONAL

COPENHAGEN, Denmark — The first TETRA Enhanced Data Services (TEDS) interoperability (IOP) testing with Motorola Solutions TEDS-ready Dimetra IP 7.1 infrastructure was held. TETRA vendors and manufacturers tested their terminals with Motorola infrastructure at Motorola's research and development (R&D) laboratory in Copenhagen between January and March.

The IOP test sessions were monitored by ISCOM, an independent body appointed by the TETRA Association to oversee the process and issue the certificates.

Blackpool, Lancashire, United Kingdom — Fylde Micro and **Icom** announced the joint development of Mode 3 digital Private Mobile Radio (dPMR) equipment. The aim is to provide customers with high-quality trunked and networked radio systems ranging in size from a single channel to wide-area networks many sites.

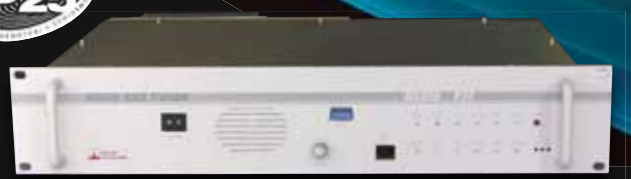
The equipment is the first example of multivendor, interoperable dPMR equipment, a goal of the European Telecommunications Standards Institute (ETSI) open standards architecture. Fylde and Icom are both founding members of the dPMR MoU group

Radio Base Station/Repeater solutions

NEW!

MX800 – Digital APCO P25

- Analog now – upgrade to digital later
- 100 Watt output power now available



MX800 – Expanding System Solutions

- Digital APCO P25 base and repeater
- Analog system trunking base and repeater
- Transmitter power levels to 100 Watts
- Extensive options

MX921 – Power Efficient

- Very low current receiver – 58mA
- Extra high sensitivity
- Optimized for solar systems
- System base and repeater

MX920 – Economical

- Low cost
- TX rating same as MX800/921
- Internal space for PSU, duplexer or battery
- Vertical tower case option

SPECTRA ENGINEERING
9 Trade Road, Malaga,Western Australia, 6090
Phone: +61-8-9248 2755 · Fax: +61-8-9248 2756 · Web: www.spectraeng.com.au · E-mail: info@spectraeng.com.au

we don't just build base stations—we redefine them.

and have been contributors to the content of the ETSI dPMR standards.

HOUSTON, USA — Relm Wireless completed Project 25 (P25) interoperability tests on P25 infrastructure provided by **Tait Electronics** and **Cassidian**. Relm's radios passed all the required P25 Phase 1 Common Air Interface (CAI) trunked interoperability tests specified by the Telecommunications Industry Association (TIA).

The radios were tested on three different manufacturers' P25 infrastructure systems — Tait/Cassidian, **EF Johnson** and **Motorola Solutions** — and met the P25 Compliance Assessment Program (CAP) requirements for trunked interoperability.

RESTON, Virginia, USA — Nice Systems acquired recording solution provider **CyberTech International** for total cash of about US$60 million.

DMR Interoperability Tests Completed

Members of the Digital Mobile Radio (DMR) Association completed DMR interoperability tests. Radio Activity gained a laboratory recognition certificate from the association to carry out tests between DMR terminals and Radio Activity's base stations. Radio Activity and Hytera then performed interoperability tests in UHF and VHF bands using a Radio Activity IP simulcast network and Hytera's mobile and portable terminals. The companies also tested interoperability of Hytera terminals with the Radio Activity audio gateway. Last year, interoperability tests were conducted between Motorola DMR terminals and Radio Activity equipment.

Selex Communications tested its DMR infrastructure with Hytera's DMR terminals. The testing used the DMR Association's interoperability process, which defines a list of interoperability tests, suitable test methodology, testing laboratory criteria and a test result verification process for conventional and trunked modes of operation. Tests include voice calls, call alerts, radio check, remote monitoring, emergency alarm, and radio enable and disable.

Vertex Standard will hold an interoperability test session for DMR-compliant products from 13 – 18 June. Five DMR manufacturers are actively involved in formalized interoperability testing.

Certificates of interoperability and test summaries for the completed test session, along with a white paper explaining the IOP process, are on the association's website.

Separately, the DMR Association signed a letter of intent with the European Telecommunications Standards Institute (ETSI), Europe's standards-setting body, to cooperate on DMR.

Watch our Harsh Test Demo at www.unimo.co.kr/eng Today

UNIMO

"Your Total Solution for Analog to Digital Trunked radios"

UNIMO has been recognized as a leader in KOREA's Radio Communication industry since 1971.

"Clear, Loud, Reliable"

"IP67"

IP67 Waterproof
Embedded Bluetooth (Option)
Embedded GPS (Option)
512 Channels
TX Power: 2, 4, 5W
2200mAh Li-ion

PZ-100/400NW
Delivered 30,000 units
to Korean National Police

PZ-S100/400
Scrambler
Stun & Revive
Emergency
Earpiece Auto-sensing
Whisper mode
Equalizer
16 Channels
TX Power: 2, 4, 5W
2200mAh Li-ion

PX-100/400NW
Scrambler
Stun & Revive
Emergency
Home Channel
16 Channels
TX Power: 2, 4, 5W
1800mAh Li-ion

MU-1000
WORLD's FIRST
TETRA GSM/WCDMA
Dual Mode Terminal
Data, GPS, Encryption
5 bands in 350~870MHz
3W for 400MHz band

- All products with ISO 9001 and ISO 14001
- All products are made in KOREA
- CE, FCC, IP54 or IP67 and MIL-STD 810 E/F approved.

CE FC

"Distributors Wanted"

*All specifications are subject to change without notice.

UNIMO Technology

www.unimo.co.kr/eng e-mail: radiosales@unimo.co.kr
479-12 Bangbae-3Dong, Seocho-Gu, Seoul, KOREA
Tel:+82 2 6710 7030~2 Fax:+82 2 6710 7004

Photos courtesy Icom Japan

dPMR for Transport

The ETSI standard moves forward with sophisticated applications, enhanced functionality and coverage benefits.

By Pete Hizzey

The latest generation of digital Private Mobile Radio (dPMR) hasn't lost sight of the fact that the M stands for mobile. The functionality of analog PMR radios has been extended by the possibilities of a digital format. System developers have exploited this enhanced functionality to offer applications that specifically target the truly mobile users of the transport industry.

Automatic vehicle location (AVL) is a commonplace application for transport. Previous generations of analog radios with digital signaling, such as BIIS1200, supported AVL functions. Other proprietary technologies offered data systems such as mobile credit card terminals. A new technology was needed that could package all the common requirements into one open standard and then back it up with further standards to ensure equipment from different manufacturers would interoperate without issues. This has been achieved by the European Telecommunications Standards Institute (ETSI) dPMR protocol.

Because dPMR radios can offer simultaneous voice and data traffic, it is simple to embed the GPS position of a vehicle inside a voice call. However, the dPMR protocol offers more. Imagine you want to add an extra drop-off point to a driver's route. Just send the address as a data text message, and it will be displayed to the driver, with confirmation of display as well if needed. Vehicles can be polled for position or status.

Because dPMR radios are fully digital it would have been a mistake not to include Internet Protocol (IP) connectivity. A transport radio network can now be fully IP connected with dPMR, and old-style telephone patching hasn't been forgotten either. Transport managers can log into the system in real time anywhere. The radio network can be fully integrated into a corporate operating system, and the result is a total communications package beyond what was possible in the past. As well as offering the ability

For operators where security is a concern, the dPMR protocol allows for remote activation of the radio in a covert manner. Radios can be commanded to transmit without any indication that they are doing so. Such monitoring can be vital in cases of theft or hijack.

to interface data and control applications to the radio network via IP, the voice traffic can also be connected via IP. Multiple radio networks can be easily interconnected. Because all the radio network activity is available via IP, it can be routed to a central processor that compiles a complete daily log of all events and traffic. This log would be accessible from workstations in all departments of a company for the purposes of validation, tracking queries and missed delivery claims.

Mobile services where the routing is fixed are available for users, such as security guards, on a large area plant. In these cases, the real-time AVL operation is useful but does not offer an adequate picture of what is happening on the ground. A typical solution would be to establish the critical areas and buildings within the zone and install proximity transponders at each location. Security guards would then have to stop at each location and place the handheld radio against the transponder. The radio then automatically reports back to the controller. Transponders are numbered, calls are time and date stamped, and a record shows that every critical zone was physically checked. If the level of security warrants it, the system can include GPS location, man-down alerting and panic buttons.

Other types of wireless transponders are also available that offer a proximity detection solution to the same problem. These wireless transponders also find applications in the field of high-value items. Where justified, the dispatched item can have a wireless transponder included in the packing. Provided the package remains within the same zone as the dPMR radio of the driver, all is well. As soon as the package is out of that zone, it is automatically reported to the

dPMR technology has become a popular choice in various transportation genres, such as medical response, vehicle towing services and power maintenence crews, as well as traditional industries such as taxis, freight and railways.

system. This would be analyzed in terms of AVL data — delivery status messages to ensure that a valid delivery occurred. Otherwise, the system could automatically generate alerts to all responsible personnel that an unexpected incident happened.

For operators where security is a concern, the dPMR protocol allows for remote activation of the radio in a covert manner. Radios can be commanded to transmit without any indication that they are doing so. Such monitoring can be vital in cases of theft or hijack.

Coverage and Other Considerations

The coverage area is one detail that separates radio solutions for the transport industry from other uses. The major players in global shipping are obliged to opt for satellite-based solutions, but a great number of smaller companies have operations that are city or county based. The only solution in many of these cases is to use a multiple repeater network to provide radio coverage in the required area. The dPMR standard has several ways of addressing the issue of geographic area coverage.

For large users with a significant number of vehicles, dPMR offers trunked radio solutions in single-channel multisite or multichannel, multisite configurations. This solution is probably not the most cost effective for smaller companies that may have only a few vehicles covering a wide area. For this type of user, dPMR offers a second solution whereby co-channel repeaters are used to cover the area required without the need for trunking controllers. Where the system is required to cover multiple zones rather than a single large area, the IP connectivity of the data, control and voice traffic allows for easy integration.

dPMR has come a long way since the first-generation products that were low-power, license-free radios — similar to Family Radio Service (FRS) types — more than three years ago.

A mobile radio network represents a considerable investment, especially for a wide-area network with multiple repeaters. If you then have to also change all existing radios to digital, finance requires careful planning. To this end, dPMR was designed to offer the most cost-effective upgrade path.

Because dPMR uses the same FDMA technology as almost all analog PMR radio systems, it is possible to offer repeaters and controllers that support systems on an existing radio channel. Once such a system repeater is installed, the user can operate either radio type. A user can add new digital radios to the network when old equipment needs replacing. There is no need to tear out the old system and replace everything at once just because the technology is different. The migration path possible with dPMR is user friendly.

There are other reasons for this dual-role upgrade route. Most mobile radio systems are extremely mission critical, 24 hours a day and seven days a week. Unavailability is a word that doesn't exist because corporate activity would stop dead should that happen. dPMR allows for the possibility to hot switch to a dual-role repeater and controller to avoid any dead time. Because it is most unlikely that all mobile radios can be replaced instantly, it is now possible to schedule such replacement to cause the absolute minimum disruption.

One area where digital can make a difference is at the edge of the radio coverage. Most mobile radio users are familiar with the scratchy and noisy received audio when they get to maximum range. The audio is usually made worse by the flutter

KIRISUN

DMR
DIGITAL MOBILE RADIO ASSOCIATION

Digitalize the future

TDP7700
DMR Portable Radio

Meets ETSI TS 102 361 standards
Graphic Dot-matrix true color LCD display
IP67
Flexible, menu-driven interface
Enhanced call management features
Real time clock(RTC)
Up to 40% longer battery life
Firmware upgradable for new features

PT7800
Professional Trunking Portable Radio

Six System Networks
Meets MPT1327 protocol
Multiple trunked calls
Rapid scanning
Man-down(Optional)
Real time clock
Voice Record (Option)
GPS (Option)
Enhanced 2T/5T/DTMF/MDC Signaling
Enhanced call management

Manufactured by Shenzhen KIRISUN Electronics Co.,Ltd.
CONTACTS: **Tel: + 86 - 755 86096388 Fax: + 86 - 755 8609 6018** E-mail: export @ kirisun.com

effect as the signal goes up and down. With digital, the effect is different. In true digital fashion, either the receiver can decode the signal or it can't. This means the signal to noise remains just about constant right to the limit of radio coverage and is then lost completely. The concept of marginal quality near the coverage limits can be forgotten.

dPMR then goes one step further because it is a new narrowband technology that operates with less than half the bandwidth of normal PMR. Operating at only 6.25-kilohertz channel width, a typical dPMR receiver is more sensitive than other PMR technologies. So not only do users get increased usable range from the fact that the transmission is digital but also extended range because of the narrowband receivers. Users of handheld dPMR radios have the choice of using the extra range or, if battery life is important, reducing the transmit power to give normal range and get longer battery life.

The fact that dPMR is based on FDMA technology is not only important from the point of view of migration from analog systems but also from the ease of having direct-mode subsystems in a radio network. A good example would be an emergency service that has a repeater network with statewide coverage. Once responders are onsite at an incident, there is

dPMR MoU Members

Aeroflex	Hytera Communications
CML Microcircuits	Icom
CTE International	Kenwood Communications
Etherstack	Sicomm
Fylde Micro Systems	Unication

often the demand for local peer-to-peer operation that does not use the main repeater network. With dPMR, the radios always operate in 6.25-kilohertz channels, both on the repeater network and in the local direct mode.

Details of the Standard

dPMR is an open, nonproprietary standard published by ETSI. The European standards organization also published standards for interoperability and conformance testing of all dPMR products. This complete set of standards is to ensure that users of dPMR can buy from different manufacturers without operational problems. Better still, by ensuring interoperability, the result is likely to be increased competition in terms of pricing and functionality, making dPMR an even more cost-effective solution.

dPMR is further reinforced by a memorandum of understanding (MoU) group comprised of manufacturers and support industries working together to ensure the successful development of dPMR equipment and systems. The MoU companies have also agreed to fully adopt the ETSI standards for interoperability and conformance testing as the basis of granting a specific dPMR "approved" trademark. The first dPMR interoperability tests between different manufacturers took place nearly a year ago.

dPMR has come a long way since the first-generation products that were low-power, license-free radios — similar to Family Radio Service (FRS) types — more than three years ago. The dPMR protocol has since been enhanced and now covers every type of PMR application for any typical PMR frequency band and any RF power. These latest dPMR radios have been available since early 2010, and 2011 will see the launch of trunking versions. ■

Pete Hizzey is one of the co-authors of the European dPMR standards, TS102 490 and TS102 658, as well as chairman of the dPMR MoU group since it was formed in 2007. Hizzey is also research manager for Icom and is responsible for all technical, regulatory and legislative issues for Europe. He has been involved in European standardization since 1988 and is responsible for many radio standards including professional mobile radio (PMR), maritime and amateur radio. Email comments to editor@RRMediaGroup.com.

Rio Prepares for World Stage

Officials in the geographically diverse Brazilian city are upgrading communications networks for international sporting events.

By Capt. Renato Cesar de Oliveira Moreira

Rio de Janeiro, Brazil, is undergoing rapid changes to meet security and infrastructure goals of FIFA for the 2014 FIFA World Cup Brazil and the International Olympic Committee for the Rio 2016 Summer Olympic Games. Officials in the geographically diverse city are working to ensure communications are ready for the large, global events.

In December 2010, a new integrated operations center of the city hall of Rio de Janeiro opened. The center incorporates software from Intergraph, and the latest technologies are used at the center, including a close-circuit TV (CCTV) link between municipal departments and state and federal agencies. The new crisis management center of Rio de Janeiro also has an 80-meter screen to monitor occurrences. Security Secretariat of Rio de Janeiro created its own control center, still under construction, which will be located about two blocks away from the new operations center of the city hall of Rio de Janeiro. The city has two major departments for operational integration and crisis management, constructed and working almost side by side as examples of parallel planning to meet the same goals. The centers are almost redundant, because they possess similar technologies and goals.

Radio Communications History

In 1992, the city of Rio de Janeiro implemented a conventional analog system at UHF from Alcatel, phasing

SMART TETRA COVERAGE SOLUTIONS FOR EXTREMES

- We know TETRA coverage -

Meet us at:

TETRA WORLD CONGRESS 2011

24th - 27th May 2010 Hungary
Hungexpo Center, Budapest.
Visit our stand G203

SOLUTIONS

- Indoor coverage
- Outdoor coverage
- Tunnel coverage
- Hazardous environment coverage (ATEX)

SERVICES

- Consultation
- Coverage planning
- Installation
- Training

CREOWAVE
SOLUTIONS FOR EXTREMES

www.creowave.com

Creowave Oy Lentokatu 2 FI-90460 Oulunsalo, Finland | **Phone** +358 10 83 26 300 | **Fax** +358 40 88 29 465 | **E-mail** sales@creowave.com

Repeater station Corcovado located just below Rio's Christ the Redeemer statue

out an analog VHF system used by some institutions. With the installation of the UHF system, public-safety agencies in the state began using equipment in the same frequencies in the capital and interior for civilian and military police and the fire department. Radios from Relm Chatral, Teltronic, Kenwood Communications and Motorola were used on the system. So even with analog technology, there was interoperability among suppliers by sharing the same infrastructure (repeater stations) consisting of seven sites with Consultative Committee International Radio (CCIR) and digital coded squelch (DCS) signaling. The analog network had excellent RF coverage. The only problems were a lack of full-featured encryption and some sources of interference.

Aiding interoperability, the public-safety agencies created a strong governance structure where institutions could regulate recommendations and actions for public-safety radio. Governance group State Integrated Critical Radio Communications System (SIRC)/Rio de Janeiro (RJ), created in 1992, still facilitates joint operation among the public-safety and security institutions in Rio de Janeiro.

In June 2006, a commission composed of representatives of the state of Rio de Janeiro and National Secretariat of Public Security's Ministry of Justice (SENASP/MJ) began drafting a project to guide the bidding for the acquisition of a new radio communications network to be used in Rio de Janeiro during the 15th Pan American Games in 2007 (PAN 2007). After canceling the first announcement in November 2006, a second announcement was released in December 2006. The proposals were opened and following a bidding process conducted by SENASP/MJ in January 2007, Spanish company Teltronic won the TETRA radio system network contract for the PAN 2007.

The choices from the Brazilian telecom regulator for public safety's migration from the 450 MHz band are digital technology at 800 MHz, 360 MHz and VHF.

PAN 2007 in Rio de Janeiro ran smoothly thanks to DETEL, the managing agency for telecommunications of the state of Rio de Janeiro, then managed by Col. Carlos Eduardo Miracles. DETEL convened a meeting with members of the SIRC/RJ to set in place a contingency action plan for public-safety communications during the high-profile event. SIRC continued to operate an analog network around the metropolitan region that secured communications at the various points that were covered, but also in areas without coverage from the TETRA network.

The points of repetition without interconnection (link system) or repeaters ensured the coverage area of each battalion. Other channels were also installed in the same locations to serve other forces such as firefighters, civil police and civil defense.

The current system in the Rio de Janeiro metropolitan area is a TETRA (450 – 470 MHz) network with 31 base stations. Since July 2010, three companies have supplied equipment to the TETRA networks. Teltronic provides infrastructure and fixed and mobile terminals, Sepura supplies portable radios and Ericsson provides microwave equipment. The GPS functionality in the TETRA radios hasn't been fully implemented. In any police force, the agent in the field needs equipment that allows the officer to hear and be heard. An ongoing challenge is coverage, mainly addressing the portable and mobile terminals in some metropolitan areas on the edges of the system.

The analog system, also operating at 450 – 470 MHz, is still working in other geographic regions of Rio de Janeiro, but its replacement is a matter of time. Based on the geographic features for regions in the interior of Rio de Janeiro — topography and population per square kilometer — a VHF technology would likely be more cost effective.

Barriers to Overcome

The Agencia Nacional de Telecomunicações (Anatel), the Brazilian

ST-858QR

SMART XPRESS™

COMMUNITY REPEATER
MULTI-TASK CONTROLLER

Upgradeable To Trunking At No Cost
Community Repeater Tone Panel
Digital Voice Logger
Over IP Gateway

ST-858QR connected to either 2 base radio stations or one repeater works as a stand alone community repeater tone panel; ST-858QR supports all basic functionalities for sharing the reapeater amongst multiple groups using the same repeater channel.

The ST-858QR functionalities and services can be enhanced by connecting to a desktop computer for AVL Fleet Management, Statistics, Voice Logging and Prompting, Etc.

The ST-858QR can be expanded to an unlimited number of community repeater sites linked together via IP. Networking is operated by a remote computer.

Conventional Operation
CTCSS/DTS Encoding/Decoding
2 Tone Signaling
5 Tone signaling

GPS Mapping/Tracking Fleet Management can be integrated to the ST-500QR Server Software module via UDP/IP.

SmarTrunk Systems, Inc.
Asia, Europe or Africa
Contact: SmarTrunk
Phone: (619) 426-3781
Email: salesinfo@smartrunk.com

QUANTUN Electronics, LLC.
USA, South America or Canada
Contact: Quantun Electronics
Toll Free: (888) 361-0521 - Phone: (954) 651-6300
Email: sales@quantunelectronics.com

We manufacture quality products paired with incomparable service.

telecom regulator, ruled that the 450 – 470 MHz spectrum, currently used by public safety in Rio de Janeiro and the Federal Police Department, which operates a Tetrapol network, will be released for rural broadband service based on a federal government project mandated by President Luiz Inácio Lula da Silva. Brazil's national broadband plan promised to deliver broadband to communities in rural regions of Brazil. The choices from Anatel for public safety's migration from the 450 MHz band are digital technology at 800 MHz, 360 MHz and VHF.

Since 2006, the Public Security of Rio de Janeiro has used an AVL system with GSM tracking devices locally manufactured, but cellular jammers are threatening the technology. In Brazil, there is no legislation that prohibits the use, import or manufacturing of jamming technology. However, most jamming gear is smuggled, facilitated by the length of the border between Brazil and other South American countries. Several police reports have confirmed that jammers are already in the hands of cargo thieves and corrupt agents. These jamming units can also affect the CCTV systems that use wireless IEEE 802.11 technology.

Unstructured base station cable installation

Local officials are working to overcome these challenges. PAN 2007 was a good learning opportunity for global events scheduled for Rio de Janeiro in coming years. Public-safety officials plan to implement lessons learned from 2007 to address the upcoming sporting events in 2014 and 2016. ■

Capt. Renato Cesar de Oliveira Moreira is technical adviser to the Superintendent of Command and Control Secretariat of State Security for Rio de Janeiro, Brazil, where he supports procedures for the emergency response system for the police, urban video surveillance cameras, and tracking and auditing vehicle deployment. He has more than 28 years of experience in radio communications in Rio de Janiero. Email comments to editor@RRMediaGroup.com.

MobilitySound

Your Best Partner in Two Way Radio

2010 Innovation Award

BlueTooth Series

Moto M3
BTD-1M3

Hytera
BTD-2T5

Moto M4
BTD-1M4

ICOM
BTD-2S5

Moto Turbo
BTD-Turbo

BT-PTT

Kenwood
BTD-2K2

BT-Ear Muff

Vertex
BTD-2Y5

BT for Mobile Radio
BT for Simple Pin Radio
USB Programming Cable

GPS Series

GPSMic.

GPSBox

GPSDongle

GPS Dongle

Products

BT SPP Adapter

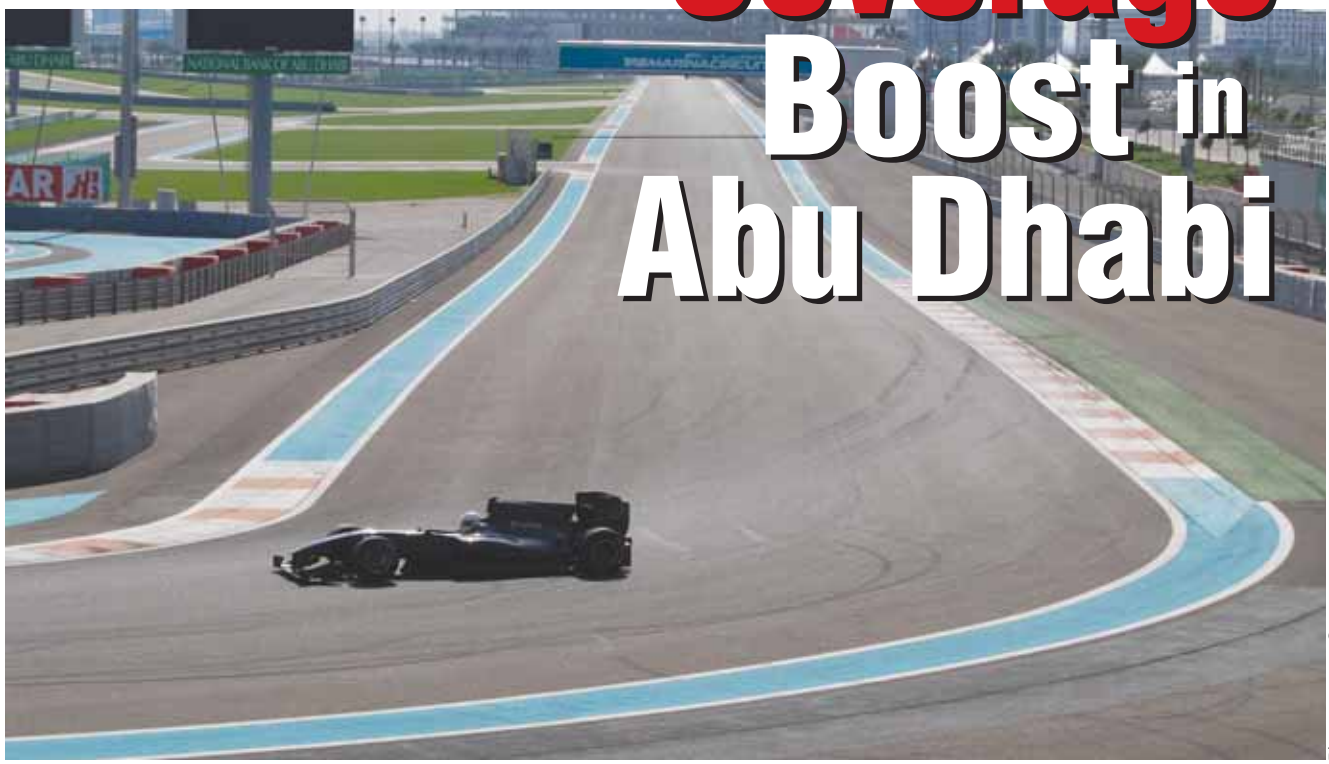
Wireless Dongle & PTT

Military Adapters

Tracker S/W

MobilitySound Technology
4F,No.287,Sec 4,ChengDe RD,
Taipei, 111,Taiwan
Tel:+886-2-2882 9178
Fax:+886-2-2881 8012
www.mobilitysound.com
info@mobilitysound.com

Coverage Boost in Abu Dhabi



Photos courtesy Creowave

Multiple repeaters enhance TETRA network coverage and security at the Yas Marina Formula 1 circuit.

By Katja Lehtomaa

The Formula 1 World Championship is one of the world's most followed and spectacular sports. Formula 1 has its roots in Europe, but the championship also consists of various races in Asia, Australia, South and North America, and the Middle East. The Yas Marina F1 circuit, in Abu Dhabi, United Arab Emirates (UAE), was built in 2009, and the circuit was opened to the public a week before the main event of the year, the Abu Dhabi F1 Grand Prix.

Abu Dhabi F1 Grand Prix has about 50,000 spectators, thousands of organizers and staff, as well as the teams and drivers. In case of an accident or disaster, communications have to work without problems. During the F1 race in Yas Marina circuit, four TETRA networks are used for communications. One of these networks belongs to the organizing party of the event. Circuit organizers, such as security personnel, first aid, parking and catering, use the network. The teams and drivers, the police and the Fédération Internationale de l'Automobile (FIA) use the other three networks. The staff of the circuit are divided into prioritized user groups; in case of a disaster, the top-level management has priority to use the network.

After the first F1 Abu Dhabi Grand Prix, organizers noticed holes in the coverage of the TETRA network. Because of the high-profile nature of the Grand Prix, this was not acceptable, and the organizers wanted to improve the coverage level. In the Yas Marina racing circuit area, one base station was already installed. However, in several cases, the large hotel complex located in the middle of the race circuit blocked the base station signal, causing poor coverage.

To enhance the coverage, Creowave, together with local partner Waves Middle East, provided TETRA coverage enhancement technology for the circuit area. Creowave and Waves representatives performed a site survey in the second quarter of 2010 and began the project to enhance the network coverage in mid-2010. Multiple Creowave repeaters were installed to make sure coverage would be on the required level throughout the circuit. Security offices and first aid stations were the most critical areas requiring adequate network coverage.

The original base station is located in the middle of the circuit area. Repeaters were installed around the base station throughout the circuit area to enhance the RF signal in buildings around the circuit. In February, Creowave and Waves conducted final tests. One repeater with uplink and downlink antennas was

Find the Equipment You Need

SuperGUIDE

The Industry's Most Comprehensive Online Resource.

RRImag.com

Top left: Repeater installed into one underground tunnel in the Yas Marina Circuit area. **Top right:** Field strength with the repeater off. **Left:** An uplink antenna receiving the base station's signal and delivering it to the repeater.

installed in an underground tunnel in the circuit area. The uplink antenna carries the base station's signal into the tunnel and to the repeater. The repeater enhances the signal, and the downlink antenna delivers the enhanced signal to the tunnel. In the final tests in February, the measured field strengths varied between -38 dBm and -88 dBm.

To demonstrate the effect of the repeater, it was turned off to see the field strengths without the repeater. The TETRA radio was not able to log into the network at all without the repeater. After the repeater was turned on again, the field strength was measured at around -50 dBm. The situation with the second repeater installed to another underground tunnel in the circuit area was quite similar to the previous repeater. The field strengths also varied in this tunnel between -38 dBm and -88 dBm, and when the repeater was turned off, the coverage was gone.

During the F1 races, the racing team staff and the drivers have facilities where they spend their time. There is a facility for each race team. To secure the safety of the drivers and teams, adequate coverage also is necessary in these buildings. More repeaters were installed at four of these facilities. The network coverage in all facilities was already quite good, but needed to be enhanced in some areas. Coverage measured -52 dBm inside and -70 dBm outside the buildings in the final tests.

The circuit is surrounded by multiple spectator stands, which include very important people (VIP) areas, as well as first aid stations. Repeaters were installed to secure comprehensive communications for the organizers and security. In one stand, the repeaters were installed at both ends using uplink and downlink antennas carrying the signal all the way through the stand.

Another stand was a more challenging site. The base station signal was not able to cover the stand completely. An uplink antenna was installed at the stand so that it is pointing right at the base station. The signal is then carried to the repeater, and the downlink antenna distributes the enhanced signal all the way to the tunnel.

Needs for coverage enhancement solutions were also discovered in the security officer's premises. In the circuit area, several buildings are not visible to spectators. In addition to the stands and pit buildings, service buildings are used for storage by teams during tests and for administrative purposes. Repeaters were installed at the premises to ensure adequate coverage in these locations. In all final tests conducted in February, the newly installed repeaters and antennas improved coverage throughout the Yas Marina circuit racing area. ■

Katja Lehtomaa is marketing manager of Creowave and has worked at the company since 2009. She is responsible for the marketing planning and activities for the three business areas of Creowave. She received her master's degree in 2010 studying marketing, communications and languages. Email comments to sales@creowave.com.

Critical Communications For An Evolving World

TETRA WORLD CONGRESS 2011

24th – 27th May 2011

Hungexpo Centre – Budapest, Hungary





Gold Sponsors

CASSIDIAN

MOTOROLA

ROHDE&SCHWARZ

ROHILL

SELEX Communications
A Finmeccanica Company

Silver Sponsor

DAMM

The Meeting Place Of The International TETRA Community – Back In Europe!

- Network with 2000+ visitors from around the world
- Learn from 150+ speakers during the conference
- Meet all of the leading suppliers at the exhibition of 100+ stands
- Benefit from 15+ streams, masterclasses and seminars covering insights on both public safety and commercial TETRA usage
- Experience 4 days of conference sessions, training, networking and exhibition

Researched and Produced by:
IIR Telecoms & Technology
London • www iir-telecoms com

In Association with:
TETRA Association

For more information and to register your place:
www.tetraworldcongress.com/MCC

Backhaul Transformation

Images courtesy Alcatel-Lucent

Know the various microwave network options to ensure your system is prepared for broadband applications.

By Dave Christophe

New and emerging applications have the potential to help better share information anytime and anywhere. For example, new digital professional mobile radio (PMR) systems and efforts to eliminate service interruptions are improving the caliber of voice communications. Remote surveillance using video cameras and sensors make it more cost effective to protect perimeters. Streaming live video and high-resolution digital images has shown promise in helping first responders see what is happening at an incident to improve their effectiveness. Access to these capabilities is enabled with the introduction of wireless broadband capabilities that complement mission-critical voice communications.

Understanding the Challenges

Most new, enhanced applications are IP- or packet-based and require considerable network bandwidth. A large organization that heavily uses video surveillance may have hundreds of IP video sources — each requiring 1 Megabit per second (Mbps) to several Mbps of network bandwidth, depending on video image resolution and frame rate — to be sent to multiple viewing and storage locations. To benefit from the full capabilities of wireless broadband applications delivered through new base stations, backhaul network connectivity of up to several multiples of 10 Mbps is required. Some base stations are also packet based, with an Ethernet interface for backhaul.

The intensified traffic must be delivered securely with the bandwidth to support each application's specific delay, reliability and transport requirements. Agencies are challenged by the impact that new capabilities put on communications networks, as well as the need to anticipate the future because a transformed wide area network (WAN) must last for many years.

Many public-safety networks include microwave radio systems that connect base stations. Some of these deployed synchronous optical network/synchronous digital hierarchy (SONET/SDH)-based and plesiochronous digital hierarchy (PDH)-based systems are already at or near capacity supporting time division multiplexing (TDM)-based, mission-critical traffic. A portion of the traffic associated with new applications such as video surveillance, remote sensors and broadband wireless backhaul need support in areas that are only economically accessible using microwave radio systems.

Supporting communications using microwave radio systems with a mix of TDM and increasing packet traffic is a key consideration. The following three radio switching technology

Times Protect™

The Best Lightning and Surge Protection Available for Your Radio System

The LP-BTR Series Provides:

Effective Protection

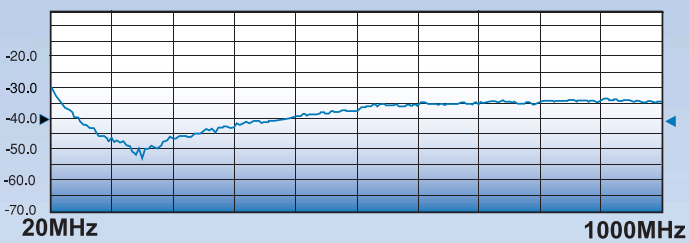
- DC Blocking
- Multi-Strike Capability

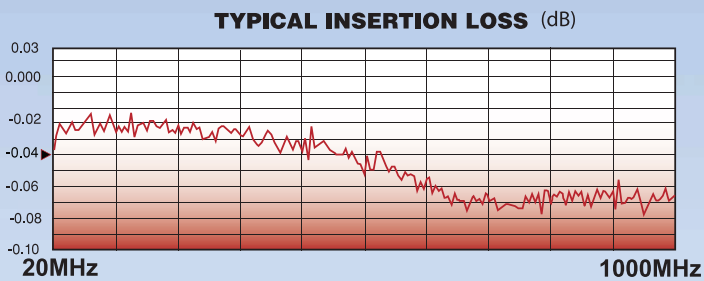
Durable Construction

- Solid Brass Body
- Tri-Metal Plating

Versatile Design

- Flange or Bulkhead Mounting
- Superior RF Performance from 20 to 1000 MHz





LP-BTR Surge Protector Series

- LP-BTR-NFF - N Female connectors on surge side and protected sides
- LP-BTR-NMP - N Male connector on protected side with N Female connector on surge side
- LP-BTR-NMS - N Male connector on surge side with N female connector on protected side

For more information or to order contact the experts in lightning protection and grounding technology:
timesprotect@timesmicrowave.com

TIMES MICROWAVE SYSTEMS
An Amphenol Company

World Headquarters: 358 Hall Avenue, Wallingford, CT 06492 • Tel: 203-949-8400, 1-800-867-2629 Fax: 203-949-8423
International Sales: 4 School Brae, Dysant, Kirkcaldy, Fife, Scotland KY1 2XB UK • Tel: +44(0) 1592655428
China Sales: No.318 Yuan Shan Road Shanghai China • Tel: 86-21-51761234 Fax: 86-21-64424098
www.timesmicrowave.com

Most enhanced applications such as streaming live video require considerable bandwidth.

solutions address varying needs:

1. Hybrid radio system. Based on two switching matrices: a PDH matrix for TDM traffic and a second matrix for Ethernet traffic;

2. Full-packet radio system. Based on one frame-switching complex that uses Ethernet as a common convergence and transmission layer to transport any mix of traffic such as TDM, asynchronous transfer mode (ATM) and Ethernet; and

3. Ethernet radio system. Based on one Ethernet switch matrix that uses an external device to convert TDM and ATM traffic.

Hybrid Radio System

A hybrid radio system supports separate TDM and Ethernet traffic streams. These streams are supported with separate PDH/TDM and Ethernet switch matrices, which both connect to a common backplane. TDM and Ethernet traffic streams are each separately transported over the radio link, which results in maintaining an Ethernet overlay network. ATM traffic is embedded in the TDM channel and is handled similar to TDM traffic, even if it has an assigned ATM service class such as available bit rate (ABR).

Several manufacturers offer existing PDH/TDM system upgrades that enable incremental Ethernet traffic support. A hybrid system can be an attractive near-term option, particularly when packet traffic represents a small portion of the total traffic and embedded systems have sufficient spare bandwidth capacity. However, when deployed in full-packet-based networks, hybrid systems can have limitations such as limited Ethernet-switching scalability because of constraints associated with their TDM heritage and lack of emulated TDM/ATM-traffic support for embedded applications. When existing microwave links are renovated as a result of radios being at the end of their useful lives or there is limited spare capacity to support growth and evolution to a hybrid mode, a future-proof solution with a full-packet-based radio system is deployed.

Full-Packet Radio System

A full-packet-based microwave system accepts any mix of traffic type and converts all TDM and ATM ingress traffic streams into packets. Using an embedded emulation service capability, TDM/ATM services are emulated across the radio link. Traffic (native Ethernet and emulated TDM and ATM services) is forwarded through a single switch and, at the egress, can be delivered in packet form or converted back to its native form. Both service aggregation and

Typical Hybrid and Full-Packet System Comparison

	Hybrid System	Full-Packet System
TDM, Ethernet and ATM Transport	Yes	Yes
TDM and ATM Embedded Emulation Service	No, only native Ethernet and TDM	Yes
Support of Hybrid Mode	Yes	Yes
Support of Packet Mode	No	Yes
Statistical Multiplexing (TDM, Ethernet, ATM)	No, only Ethernet	Yes
Adaptive Modulation (TDM, Ethernet, ATM)	No, only Ethernet	Yes
Quality of Service Differentiation	Yes	Yes
Flow Control Based on Radio Condition	No	Yes
Integrated Handling of Service Types at Ingress	No	Yes
No Single Point of Failure	No	Yes

This table compares the features that contribute to obtaining close to full use of radio resources with optimized performance.

nodal functions are performed within the same system, and emulated services have guaranteed performance as if they were natively transported. Full-packet microwave radio represents the next step in the evolution of microwave transport by allowing a graceful evolution to an all-IP infrastructure.

Ethernet Radio System

Ethernet microwave systems accept only Ethernet connections. To cope with other traffic such as TDM and ATM, they are coupled with an external device that converts these traffic streams to packet form and provides aggregation at the service layer. Because the microwave system is unaware of the emulated traffic, the performance of TDM/ATM transport isn't comparable with native TDM transport, and this isn't a suitable option for a mission-critical agency.

Applicable Options

For deployments with existing applications that still require TDM-based communications support into the foreseeable future, the only two approaches that can be considered are hybrid TDM/Ethernet and full-packet systems. Some microwave radios operate as only hybrid, while others operate as both full packet and hybrid to accommodate an evolving network architecture and traffic mix.

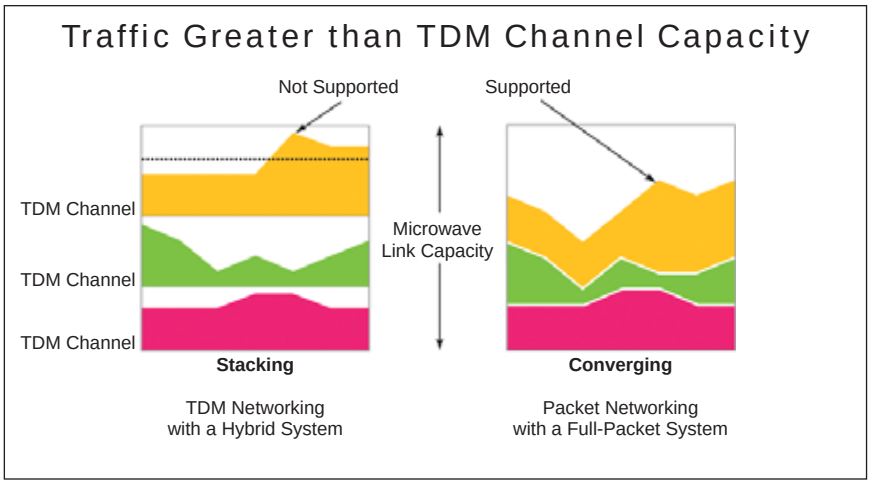
A hybrid system's channel capacity is based on the peak information rate (PIR) of the TDM E1s/T1s and whether they are transmitting. The total system radio link capacity is the sum of the individual radio channel capacities. Application traffic can only use the bandwidth of the dimensioned channel to which it's assigned.

In contrast, a full-packet system packetizes and converges TDM, Ethernet and ATM traffic on a single radio pipe for more efficient transport, while providing priority to mission-critical traffic regardless of the nature of the traffic. The full-packet system enables an application to burst and use available capacity in the overall radio link. Such a capability can be important for cost-effective support as packet traffic begins to dominate with new bandwidth-intensive, IP-based applications, such as first-responder access to digital images stored on remote servers via a broadband wireless system.

Three features contribute to using close to 100 percent of the radio link bandwidth capacity:

Statistical multiplexing. When all types of traffic are converted to a common packet layer, any kind of traffic can share a common radio pipe, leading to maximized use of the link capacity. This capability isn't possible if radio capacity is dimensioned based on the PIR of each connection, such as with a hybrid system.

Service-driven adaptive modulation. Modulation is adapted to the channel condition. Using adaptive



Transforming to packet networking to optimize use of overall bandwidth

modulation can increase the throughput in a specific channel bandwidth by a factor of two to four when favorable channel conditions exist. For full-packet systems with a common packet layer, a change in modulation and corresponding channel capacity affects only best-effort and low-priority traffic, while high-priority, mission-critical operations traffic, regardless of the physical connection, is always transported. Modulation changes are hitless for the traffic stream.

Service awareness. Applications traffic is supported using different service types that reflect communications requirements such as specific delay, jitter, reliability and bandwidth. These services aren't just recognized and treated by the quality of service (QoS) mechanism such as classification and call admission enabled on a system. Each type of traffic must be adapted to the following:

- Underlying transport mechanism, such as pseudo wire;
- Radio channel characteristics, such as addition of the necessary countermeasures against errors to frames; and
- Proper requirements, for example, to minimize jitter and delay — packets may be fragmented and interleaved.

Transformation Strategy

Mission-critical agencies can choose from a variety of paths to transform their network and communications systems so they support the revolutionary applications that workers need in the field. With comparable performance to native TDM

transport, full-packet microwave is being deployed in existing TDM/hybrid networks as a replacement for existing systems that lack the required capacity and/or are at the end of their useful lives. System support of the current TDM/hybrid network mode of operation ensures network performance continuity. Full-packet microwave systems seamlessly interconnect with existing SONET/SDH-based core networks that support TDM traffic natively and packet as Ethernet over SONET/SDH (EoS). When deployed at a base station or remote site that is expected to realize high-packet traffic growth, full-packet microwave offers better use of bandwidth, as well as a smooth migration toward a packet infrastructure. These systems are also being deployed at sites such as dispatch centers, where communications are critical, and have a single copper or fiber link to the network. A second link with microwave provides a redundant path to increase overall network reliability.

Some traffic associated with new broadband applications often needs support in areas that are only economically accessible using microwave radio systems.

Full-packet microwave radio technology is available to organizations that plan to transition a communications network from TDM to IP. This kind of transformation is usually in response to increasing packet application traffic generated by multiagency collaboration using video, image and operational voice between field workers and staff at operations centers. A multiservice aggregation layer is provided with Ethernet as a common convergence and transmission layer to transport any kind of traffic. These capabilities, in combination with an evolution of the core network with the addition of packet capabilities, enable an organization to transform its communications network. The move can be made to a packet-based transport network for reliable, cost-effective support of both legacy and newly increasing IP-based applications traffic to and from the base station and smaller agency sites. Many companies and agencies around the world have already begun the transformation. ■

Dave Christophe is a marketing director with the strategic industries group at Alcatel-Lucent. Email comments to david.christophe@alcatel-lucent.com.

Mission-Critical Suppliers Support Japanese Earthquake Recovery

New Zealand and Efforts

By Lindsay A. Gross

Photo courtesy MiMOMax

Christchurch, New Zealand, after the 6.3-magnitude earthquake struck the country on 22 February

In recent months two major earthquakes have struck the Asia/Pacific region. On 22 February, a 6.3-magnitude earthquake struck Christchurch, New Zealand, the country's second-largest city. The damage is said to be far worse than after the 7.1-magnitude earthquake on 4 September, 2010. News reports claim the death toll is at more than 100, and Christchurch Police estimate the final toll could be as high as 240. The earthquake is the country's deadliest natural disaster in 80 years.

On 11 March, a 9.0-magnitude earthquake struck Japan. Seismologists say it is one of the largest earthquakes to hit Japan since records began. The earthquake caused a tsunami that struck the coastal area of the country. At press time, the official death toll was about 3,500, but some reports suspect that figure to climb to 10,000. Mission-critical suppliers in the affected regions and around the globe have provided support in recovery efforts.

New Zealand

The Tait Electronics campus facilities, which are near the airport rather than the central city district, withstood the earthquake. According to Frank Owen, Tait managing director, because the Tait business was not impacted, it freed the company to respond to its customers' — public-safety agencies, utilities and urban transport providers — needs. Tait staff provided radios and other equipment to mission-critical agencies.

"The team did a fantastic job assembling radios, which the New Zealand Police needed to give to visiting police and rescue teams from overseas," says Dean Mischewski, product engineering manager. "It was a huge team effort to pack all the belt clips, holsters and intrinsically safe (IS) radios to ship across town."

The Sao Paulo Police in Brazil also gave permission for radios intended to be shipped to Brazil to be redirected to be used by rescue teams in Christchurch.

According to Tait officials, interoperability with U.S. and Australian rescue teams was paramount. "Immediately after the quake, [New Zealand Police] were using key fill devices to program Tait and Motorola Solutions portables of some visiting police," says Tait Operations Manager Christine Lewis. "Because the New South Wales Police from Australia use the same digital technology, they were able to communicate with New Zealand Police using their Project 25 (P25) Tait portables with the Motorola equipment they brought from Sydney. This was interoperability really put to the test and ultimately led to a more speedy response."

Aaron Robinson, Tait process improvement engineer, ferried batteries, multiway chargers and other equipment through the police cordon down to the civil defense headquarters in the earthquake-affected area of the city. "We were quickly able to secure and set up the kit," Robinson says. "It took quite a time to get into town, and the officer patrolling the cordon gave me a funny look… but when he realized I was from Tait, with all the radio gear to help, I had no problems going on into the civil defense headquarters."

The MiMOMax Wireless premises suffered some superficial damage but were up and fully operational within a few days of the earthquake. According to MiMOMax officials, the firm's supervisory control and data acquisition (SCADA) communications system remained fully operational, and there was "no apparent data loss whatsoever, even during the seconds after the quake."

After the earthquake, public access systems were overloaded, and some microwave linking solutions were knocked out of alignment, but radio worked. "Radio worked when other systems failed," says Paul Daigneault, MiMOMax managing director.

The day after the earthquake, MiMOMax assisted Orion Energy — a power distributor for all of rural Canterbury and Christchurch — to enhance network capacity and further deploy radios in badly affected urban substations. At the time of the earthquake, most Christchurch residents and commercial entities lost power. Orion staff worked around the clock to get power

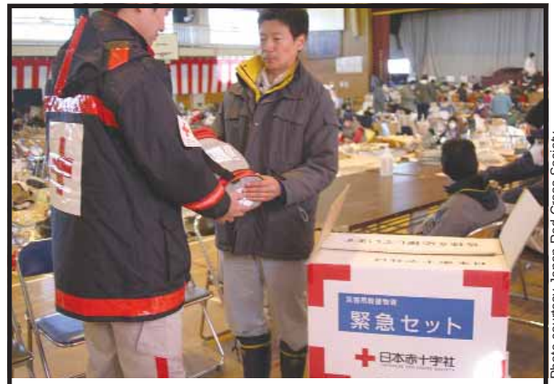


Photo courtesy Japan Red Cross Society

How to Help

Several global organizations are mobilizing to help in the aftermath of two recent earthquakes in the Asia/Pacific. Visit the following websites if you want to help; donations in some cases are as easy as sending a text or following a Twitter feed.

American Red Cross:
http://american.redcross.org

American Jewish Distribution Committee:
www.jdc.org

Doctor's without Borders:
www.doctorswithoutborders.org

Globalgiving.org:
www.globalgiving.org

International Medical Corps:
www.internationalmedicalcorps.org

Operation Blessing International:
http://community.ob.org

Save the Children:
https://secure.savethechildren.org

Salvation Army:
www.salvationarmy.org

ShelterBox:
www.shelterboxusa.org

The United Nations Children's Fund (UNICEF):
www.unicefusa.org

World Vision:
http://donate.worldvision.org

Photo courtesy New Zealand U.S. Embassy

Rescuers survey the damage in Christchurch's central business district.

back up and running around the city. Many fiber-optic and wired connections within the substation were destroyed by the earthquake. "We had to pass through multiple check points guarded by the army to reach the damaged substation," says a MiMOMax official. "It was severely affected by liquefaction, which made it challenging to enter the inside and install the radio link."

According to Icom officials, when the company started hearing reports of destroyed repeater sites, they immediately offered services to emergency response teams, and over the period of the week, three of the staff

After the New Zealand earthquake, public access systems were overloaded, and some microwave linking solutions were knocked out of alignment, but radio worked.

from Icom New Zealand assisted Signals Technology Solutions to re-establish communications. A number of repeaters were sent, including a portable unit from Pacific Wireless. To handle the multiple frequencies the different response agencies use, a cross-band repeater was used. Icom New Zealand and Icom Australia also combined forces to provide hundreds of radios, batteries, microphones and additional accessories for Urban Search and Rescue, Civil Defense and Emergency Management, and the Red Cross. Icom New Zealand also sent personnel to help construct radio sites.

Photo courtesy Kenwood

Kenwood USA sales department employees charge batteries before shipping them to Japan.

Japan

The International Telecommunication Union (ITU) dispatched emergency telecommunications equipment to areas severely affected by the tsunami following the earthquake that struck Japan. The organization deployed 78 Thuraya satellite phones equipped with GPS to facilitate search-and-rescue efforts along with 13 Iridium satellite phones and 87 Inmarsat Broadband Global Area Network (BGAN) terminals. An additional 30 Inmarsat terminals are ready for dispatch. According to ITU officials, the equipment can be charged by car batteries and is supplied with solar panels to enable operations during power outages.

"ITU is prepared to help the government and people of Japan in every way possible in their hour of need and to deal with the colossal tragedy that has overwhelmed the country with unimaginable loss of life and property," says ITU Secretary General Hamadoun Toure. "I hope the deployment of emergency telecommunications equipment will assist the government of Japan in search-and-rescue operations and re-establish vital communications links."

Sepura delivered 50 handheld radios and ancillary equipment to the United Kingdom International Search and Rescue Team (UK-ISAR) in support of the coordination of Japan's search-and-rescue activities on 13 March. The radios were used in direct mode operation (DMO) without TETRA infrastructure and didn't require special training to become operational, according to company executives.

Japan Icom supplied more than 600 two-way radios, and amateur equipment was designated for the affected areas via the Japan Amateur Industries Association (JAIA) and the Japan Amateur Radio League (JARL).

JVC Kenwood Holdings donated 200 UHF digital radios and 100 license-free portable radios to disaster sites. The company also plans to make a monetary donation. ■

Lindsay A. Gross is managing editor of *RadioResource International.* Email comments to lgross@RRMediaGroup.com.

Breaking news, exclusive content, and vital industry links wherever, whenever you need it

Headlines and News Briefs
Breaking news updated daily

SuperGUIDE
The most complete online industry resource with more than 1,500 listings

ONLY Online
Exclusive online content

MissionCritical UNIVERSITY
White papers, case studies and tutorials

TRANSMISSION
MissionCritical's e-newsletter

WORLD NEWS
RadioResource International's e-newsletter

JOBsource
An industry-specific online employment resource

AdLink
Links readers to advertisers' websites real fast

Online Issues
Interactive, electronic editions of our publications

Issue Highlights
A summary of content for our print and e-magazines

Association Links
Links to industry associations and organizations

Regulatory Links
Links to regulatory bodies and government agencies

Events
A comprehensive list of industry events with links

Advertising/Marketing
Current media kit, advertising data, and mDispatch marketing newsletter

Subscription Services
Subscription services for new subscriptions, renewals, and special requests

> www.RRImag.com

Product Expo: Site and Test Equipment

Aeroflex

The Aeroflex 3500A is a 1 GHz handheld radio test set. Weighing less than 3.6 kilograms and packaged in a cast magnesium alloy case, the product is a rugged and portable radio test set. Featuring full radio test set features, with up

to 7 hours of battery life, the device is ready to be used anywhere. It is perfect for testing all components of an installed radio system whether on a bench, installed in a vehicle or in some remote location, company officials said. Aeroflex announced two new digital test options with the new software version 3.8.0 that allows the device to test Digital Mobile Radio (DMR) and NXDN digital narrowband mobile stations and repeaters.

www.aeroflex.com

Aluma Tower

Unit S812 features heavy-duty structural steel supported by 3,629 – 4,536 kilograms of dual-torsion axles, and all are hot dipped galvanized. The unit also features an all-aluminum 3.68-x-2.4-x-2.4-meter shelter containing 0.318 and 8

centimeter tubular 6061-T6 studs for maximum floor, wall and ceiling strength, as well as 0.23-centimeter aluminum walls for low maintenance. The tower is assembled with TIG welds and 3M-panel bonding and offers R-18 insulation with radiant barrier and foam board. Custom paint and custom electrical with numerous options are available. The tower is available in sizes ranging from 18.3 to 30.5 meter unguyed, and the unit features Helo lifting capability and rapid deployment time.

www.alumatower.com

Bird Technologies Group

The SignalHawk series of spectrum analyzers and vector network analyzers

(VNAs) offers user-friendly, accurate handheld test solutions available for installing, maintaining and troubleshooting all segments of RF communications systems. The line is ideal for field engineers, technicians, wireless equipment manufacturers, service providers, contractors, tower erectors and military field personnel.

www.bird-technologies.com

Carmanah Technologies

Carmanah solar-powered obstruction lights are backed by more than 10 years

of experience in solar technologies for industrial applications, company executives said. Field proven to perform in conditions ranging from desert heat to arctic cold, the obstruction lights are self contained, compact, and easy to deploy, executives said. A relocate marking light is available. The Carmanah 502 solar-powered obstruction light installs easily with minimal technical expertise and can be user programmed to seven available flash patterns. The light delivers up to 1.2 Candela (cd) of intensity, complete dusk-to-dawn operation, and is available in red, green, amber, white and blue color outputs.

www.carmanah.com

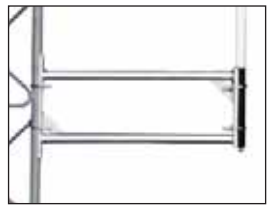
Comprod Communications

The X-Pass compact combiner offers expandability in a small package. The device's design offers three ports, 10- by 13-centimeter bandpass cavities and dual isolators, providing all the benefits of a standard cavity combiner. Other features include low-insertion loss, high isolation between transmitters, high-intermodulation suppression and high-transmit noise suppression. The combiner is easy to install, factory tuned and supplied with interconnect cabling, company executives said. The device allows users to expand one channel at a time.

www.comprodcom.com

Comtelco

Comtelco's Tower Side Mount Kit was designed for use with Comtelco XL



series base stations. The heavy-duty side mounts feature a galvanized finish. Each kit is supplied with 4.45-centimeter stainless U-bolts for easy installation on a Rohn 45-type tower. For a larger tower leg, stainless steel strapping (not supplied) can be used.

www.comtelcoantennas.com

Creowave

Creowave's radio testing business area offers a variety of filtering solutions as well as tailored test systems. The standard filter collection consists of diplexers, duplexers, band pass filters and high pass filters. Filters reduce the number of

test runs in the final tester environment and remove unwanted signals, enabling the wanted signals to enter the test systems. The company's low passive intermodulation (PIM) filters were introduced last fall and allow for the measurement of the actual performance of the base stations. When the intermodulation (IM) performance of a base station is measured, it is important to make sure that the IM results of the test systems are not measured, Creowave executives said.

www.creowave.com

Make sure they're covered

Maximize your coverage with Auto-Test II

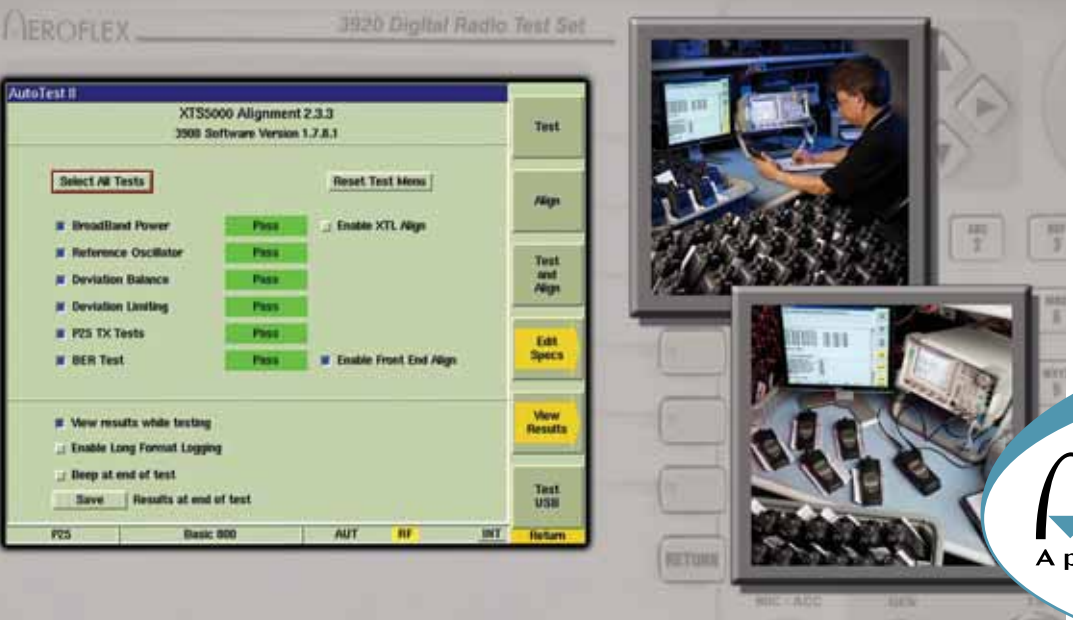
Radio coverage is critical when lives are on the line. Over time, the coverage area of your digital and analog radio system can degrade as radio parameters change and fall out of alignment. They need to know they have radio coverage. With Aeroflex's Auto-Test II, you can have that assurance.

Automatically get your radios back into specification

In as little as 6 minutes, Aeroflex's 3920 with Auto-Test II can automatically perform radio alignment and verification to ensure optimal radio performance. With a simple cable connection, and a push of a button, you can ensure that the radio will properly transmit and receive within the entire coverage area.

Make sure your radios are aligned and verified to specification. Contact Aeroflex today to receive a data sheet, request a quote or arrange a product demo on the Aeroflex 3920.

www.aeroflex.com/Q2RR



AEROFLEX
A passion for performance.

Visit us at TETRA World Congress 2011 Booth #E601

www.aeroflex.com

dbSpectra

The DSCC series 700, 800 and 900 MHz transmitter cavity combiner offers a broadband performing combiner in compact packaging with 12.7-centimeter cavities. Other features include two- to 24-channel availability, lower cost than standard cavity combiners supporting

150-kilohertz channel-to-channel spacing, low insertion loss, and easy field tuning and expansion, company executives said. The isolator has built-in 30 dB coupler test port for tuning under power and 110 watts RF power forward and reflected capability. Frequency ranges include 763 – 776, 851 – 869 and 935 – 940 MHz. The combiner offers an operating temperature range of -30 to +60 degrees Celsius and is easy to order with single channel expansion kits.

www.dbspectra.com

Elma Electronic

A rugged version of Elma's Type 07 line of coded switches is now available. Elma's M07A is a gray coded switch that

comes in 16 positions down to two. BCD or hex versions are available upon request. Based on the company's Type 07 switch line, the switch offers a robust stainless-steel 6-millimeter tapped shaft, or a 3-millimeter version is optional. The switch meets Mil-Std-810F for salt fog and humidity, and Mil-Std-202G for shock and vibration. The switch also features a high-strength reenforced plastic body and IP-60 or IP-68 front-panel sealing at the user's request.

www.elma.com

Fiplex Communications

Fiplex's compact repeaters for TETRA and Project 25 (P25) applications are a cost-effective solution to increase the indoor and outdoor coverage of a system, providing extended coverage with mini-

mum infrastructure investment, company executives said. Typical applications include tunnels, subways, stadiums and airports. Over-the-air and fiber-feed versions are available for different installation requirements. The repeaters offer low and high output power and are band and channel selective with out-of-band rejection. The repeaters meet all European Telecommunications Standards Institute (ETSI) regulations. The repeater line is also available for public safety 700, 800 and 900 MHz, iDEN, GSM, W-CDMA, Advanced Wireless Services (AWS), and Long Term Evolution (LTE) applications.

www.fiplex.com

General Dynamics Satcom Technologies

Featuring comprehensive Project 25 (P25), NXDN and Digital Mobile Radio (DMR), such as MOTOTRBO, test capa-

bility, the General Dynamics R8000 analyzer is ideal for digital radio tests. The portable, full-featured radio test set weighs 6.35 kilograms and features a spectrum analyzer comparable with stand-alone instruments with a noise floor of less than -120 dBm.

www.gdsatcom.com

Midian Electronics

The updated InterMod Calculator software predicts the possible occurrence of intermodulation products that may cause receiver interference at a repeater site. The enhancements to the software

include supporting frequencies from 1 MHz to 999 GHz, 6.25-kilohertz channel spacing, generating CSV reports, Internet mapping and more. The software can be used with a PC to solve intermodulation interference problems at radio repeater sites, cellular sites and more.

www.midians.com

Optoelectronics

The Power Counter measures the frequency range of 10 MHz to 2.6 GHz, and at the same time, measures the RF

power level from 10 milliwatts (mW) up to 5 watts or +37 dBm to 0 dBm by directly coupling the transmitter to the input of the counter. The frequency of the transmitter is displayed on the top line while the power output of the transmitter is displayed on the bottom line. The product allows users to perform quick checks on transmitters, such as wireless microphones or two-way radios, before putting them into service.

www.optoelectronics.com

Pioneer Energy Products (PEPRO)

Brave SMRS-450 secure mobile radio site is an affordable, fully integrated site solution for rapid response communications requirements. The articulated tower

supports vertical separation of multiple antennas and dishes along the full height of the tower, unlike telescoping masts. The unit's antenna is permanently attached via a cable harness, can be raised and lowered in 4 minutes or less, and can withstand 193 kph winds. Additional features include a trailer, pre-wired shelter, generator, heating, ventilation and air conditioning (HVAC), equipment racks, 8.5-kilowatt diesel generator, 189-liter fuel tank and shore power connection. Only one person is required to deploy the tower.

www.peprollc.com

Digital Performance.

Demonstrated Digital Narrowband Testing

With the introduction of NXDN™ test capability, the R8000 is now your best choice for digital radio test. In addition to supporting NXDN, DMR (MOTOTRBO™), and APCO Project 25, the R8000 has the following unmatched core features:

- **Weighs just 14 pounds. No more lugging 50-pounds or more of equipment to remote sites.**
- **Spectrum analyzer noise floor below -120dBm and as low as -140dBm at narrow spans. Allows even very low-level interfering signals to be isolated and analyzed.**
- **Optional Remote Front Panel feature allows you to monitor and control the unit from any networked PC.**
- **Brilliant 8.4" color LCD visible in any lighting conditions.**
- **Dual Display option allows simultaneous viewing of both carrier signal and demodulated audio.**
- **Optional 3GHz capability allows both transmitter and receiver testing across the entire range from 250kHz to 3GHz.**
- **Software-defined architecture allows easy firmware upgrades via one of 4 USB ports.**

P25
NXDN
DMR

Hundreds of two-way radio servicers around the world are enjoying the benefits of the R8000 communications analyzer. To find the General Dynamics Test Equipment distributor in your region, visit our website at: http://www.gdsatcom.com/ctereps.php.

GENERAL DYNAMICS
SATCOM Technologies

MOTOTRBO is a trademark of Motorola, Inc.
NXDN is a trademark of Icom America, Inc. and Kenwood Corporation.

Racom Products

Racom manufactures two automatic station identifier models for transmitters, base stations and repeaters. Model 1214V is an automatic voice station identifier that identifies the transmitter in voice and records the call sign with a microphone.

The unit offers three system monitors, timers, 600-ohm output and speaker. Model 701 provides automatic transmitter identification in Morse code and has three timers and monitors. Call sign and parameters (pulsed tone or carrier) are programmed with a PC.

www.racomproducts.com

RF Precision Products, Division of RF Industries

7-16 DIN adapters are ideal for base station passive intermodulation (PIM) testing. The low-loss, low voltage standing wave ratio (VSWR) rugged adapters are designed for portable antenna and cable analyzers. High-grade DIN adapters are used with Anritsu's Site Master, Summitek's SI series and Boonton's PIM testers. Features include stainless steel coupling nuts, white bronze plating for tarnish-free service and low PIM. The white bronze is nonmagnetic, while retaining high conductivity in the conductor paths, company officials said. Engineered for long life in field applications, the adapters are also suitable for lab environments.

www.rfp2.com

Sinclair Technologies

The FP20603 advanced filters are VHF low-loss, high-selectivity, high-power band-pass filters. The filters feature a compact design that fits into a 48-centimeter EIA 3U high rack mount for single or dual units. The filters cover a range of 132 – 174 MHz with 1 or 2 megahertz pass band. A 150-watt power handling capability makes the filters ideal for filtering both receiving and transmitting channels, Sinclair executives said. The filters can also be paired for duplexing or diplexing applications within the same rack space.

www.sinctech.com

SoftWright

The Terrain Analysis Package (TAP) is now available in a multiseat version as well as the single-seat version. The multiseat version is ideal for users who want to operate on a LAN or to provide remote access to run the software. For example, all authorized users on the network share the fixed facilities database. With this option, if users are authorized to have remote access to the server, they can now operate TAP anywhere with Internet access, and the results will reside and be backed up on the company server that is being accessed.

www.softwright.com

Solarcraft

Solarcraft's Solar Power Giga-Box skid system is tough enough to secure heavy batteries during transit, company officials said. The remote solar power system holds East Penn Unigy II VRLA batteries that meet the latest UBC97 Zone 3 fault line specifications, meaning they are transportable while installed in the battery enclosure. The system is packaged and tested by the company prior to transit; field technicians do not have to lift and connect tons of heavy batteries, making deployment safer and faster, officials said. The 3,240-watt modular solar array installs onsite to a framing system mounted to the enclosure and skid.

www.solarcraft.net

Survey Technologies Inc. (STI)

With proper configuration, the STI-9400

can be used to verify coverage and performance of many kinds of public-safety communications systems. From analog audio quality to signal strength and Project 25 (P25) bit error rate (BER) testing, the instrument can verify wireless communications system coverage. The methodology of the device is about once every second a signal strength or BER measurement is calculated and a GPS location is recorded, verifying critical communications coverage. Results are color contour plots of signal coverage and quality across the area tested.
www.surveytech.com

TC Communications

TC Communications offers an Ethernet gateway and an analog multiplexer for linking radio dispatch centers to remote radio transmitters and receivers over fiber optic networks. The TC8000 28-channel analog fiber multiplexer and the TC3846-6 analog and dry contact Ethernet gateway link or extend 2-/4-wire analog, audio and intercom devices. Benefits include improved voice quality, increased system reliability in harsh environments, replacement of unreliable leased phone circuits and stabilization of voice level settings for 600-ohm audio channels, company officials said. Both products support voice bandwidths from 300 hertz to 3.4 kilohertz, feature hot-swappable interface cards, offer fiber optic and power redundancy, and are available in extreme temperature versions.
www.tccomm.com

Telewave

The Telewave TW380-3HRB1-1R compact hybrid combiner combines three UHF transmitters between 380 – 420 MHz with any frequency spacing. The combiner handles 50 watts per channel in 1 RU of vertical space on a 48-centimeter rack. Each combiner tray is a broadband device and is pretuned for the entire band. Any frequency within this range can be used at any time without additional tuning or custom cabling, and combining adjacent channels is possible, including multiple transmitters on the same frequency. A harmonic filter on each channel maintains any spurious products below minimum standards.
www.telewave.com

TWR Lighting

The L450 Dual LED red/white Federal Aviation Administration (FAA) medium-intensity tower light incorporates advanced optical engineering design and LED technology. The lights minimize the visual impact that tower lights can have on the surrounding environment, while at the same time reducing power consumption, company officials said. The product's design features the light having a built-in power module that allows for a single controller and single cable installation, even with multiple flash heads.
www.twrlighting.com

Xcel Tower Controls

Xcel's CPS series versatile tower lighting controllers provide alarm outputs through standard Form-C dry contact relays. In addition to the controller's standard features, several added features include circuit breaker reset from the face of the panel and an auto-calibration feature, which means it no longer matters whether users have incandescent or LED fixtures. It allows the system to recalibrate itself to the connected fixtures, company officials said.
www.xcel.com

New Products

TETRA Firefighter Radio

The MTP830 S from **Motorola Solutions** is a TETRA radio designed for fire departments that need easy-to-use devices with reliable access to critical controls. The radio features an enlarged multifunction rotary button for volume control and simplified keypad for quick access to radio functions such as group call selection even when wearing gloves, company officials said. An emergency call can be made with the radio through a built-in man-down sensor if a user is unable to move or is hurt. An integrated GPS receiver can also provide location information to assist in managing responses. The device features European Telecommunications Standards Institute (ETSI) Class 3L (1.8 watt) transmit power and increased receiver sensitivity for improved coverage in trunked mode operation (TMO) and direct mode operation (DMO). With its IP-55 certification, the radio is engineered to resist heavy water streams and dust.

www.motorola.com

TETRA Portable

Cassidian presented the THR9i TETRA hand-portable radio with enhanced security features. The Lifeguard feature, also known as the man down, can be activated with one key, and when a user hits the key, the radio automatically sends a message to a predefined number. If the radio stops moving or remains horizontal for too long, it triggers a local man-down alert, and if the user does not respond, the radio automatically activates an emergency call and sends its coordinates to a predefined destination. The IP-65 protection offers resistance to dust and water, while its metallic chassis and front cover design protect against shock. The GPS-based "where are you" feature shows how far and where team members are on the radio display during a call. The radios can be managed using the smart Taqto terminal management tool that allows several radios to be updated and reconfigured simultaneously.

www.cassidian.com

800 MHz Radios

Kenwood Communications expanded the NEXEDGE product line to 800 MHz, introducing the NXR-900 repeater, TK-410 portable and NX-900K mobile. The products are designed for use by utilities, SMR operators, transportation, petro-chemical, government agencies and critical-infrastructure users. All the radios offer NXDN conventional, conventional IP, trunked single-site and multisite network capabilities. All operate in 6.25- and 12.5-kilohertz digital modes.

www.kenwoodusa.com

UHF Radio

FreeWave Technologies introduced the LRS data radio for industrial wireless data connectivity using licensed spectrum outside the United States. The radio is European Telecommunications Standards Institute (ETSI)-certified for use in more than 27 European countries, plus Canada, Mexico and New Zealand. Featuring high RF receive sensitivity and low-power consumption, the radio is well suited for remote installations and solar power, and provides optimum use of the available bandwidth in narrowband UHF channels without the protocol overhead of native IP radios, company officials said. The radio operates in licensed UHF frequencies for exclusive, nonshared use of the RF spectrum and is housed inside an industrial-grade, small rugged enclosure with mounting and installation options.

www.freewave.com

Compact Site Equipment

The lightRadio from **Alcatel-Lucent** is a new line of mobile and broadband infrastructure designed to streamline and simplify mobile networks, company officials said. The system reduces technical complexity and contains power consumption through simpler and smaller equipment, officials said. The architecture's base station is broken into its component elements and then distributed into the antenna and throughout a cloud-like network. The line includes a multifrequency, multistandard wideband active array antenna, multiband remote radio head, baseband unit, controller and the 5620 scalable advanced modulation (SAM) common management system.

www.alcatel-lucent.com

Repeater Multitask Controller

The ST-858QR SmartXpress from **SmarTrunk Systems** and **Quantun Electronics** can operate as a stand-alone repeater tone panel, in computer-operated mode or in IP network operation mode. The stand-alone repeater operation allows multiple groups to share a single repeater channel. In this mode, the device must be connected to a repeater or two base stations. The device functionality can be upgraded by installing a desktop computer running SmarTrunk software applications to operate together with the controller. Additional features in this mode include voice logging, time stamp, AVL tracking alarms and more. Multiple community repeater systems can be tied together by adding a media converter and an IP connection available, creating a wide-area radio network. The number of repeaters is unlimited, and workers from one repeater site can communicate with workers from other remote repeater sites.

www.smartrunk.com

DMR Test Application

Aeroflex announced a PC-based application for sending and receiving Digital Mobile Radio (DMR) radio data using the 3920 Analog and Digital Radio Test Set as the generator and receiver. With the application, users can capture data from DMR radios and repeaters and transmit user-defined data over the air to dynamically analyze DMR radio messages and isolate transmission and receiver problems in systems. The application operates along with the DMR XML channel logger (option 390XOPT402), which sends and receives XML formatted data, streaming it to a PC.

www.aeroflex.com

Satellite Simulation

The R&S SMBV100A from **Rohde & Schwarz** performs satellite simulation and now adds global navigation satellite system (GNSS) simulator to the flexible, multipurpose vector signal generator. The device can generate customized scenarios for GPS and Galileo from up to 12 satellites in real time. Users can define their own scenarios to test GNSS receivers under a variety of conditions. The device supports several satellite, mobile radio, wireless and radio standards simultaneously, and only a few keystrokes are needed to generate complex scenarios that are unlimited in time, company officials said. The user can select the almanac file, the number of visible satellites and the receiver's geographical position. It is also possible to simulate stationary positions and scenarios that simulate the movement of a receiver along a chosen route or in restricted reception conditions.

www.rohde-schwarz.com

Simplex Repeater Maker

Midian Electronics released the SVR-1 simplex repeater maker that can store and forward up to three minutes of audio. When the SVR-1 sees carrier-operated relay (COR) or voice-operated exchange (VOX) from the connected radio, it starts recording the received audio. When the busy indication goes away from a programmable time, the product will key the radio and retransmit the recorded audio. The recorder is ideal for expanding radio coverage into remote areas or creating a low-cost simplex vehicular repeater. Plug-in versions are available for Icom, Kenwood Communications, Motorola Solutions and Vertex Standard.

www.midians.com

DMR IP Gateway

The RA-TI-01 and RA-TI-02 modules from **Radio Activity** offers an automatic radio-to-telephone and telephone-to-radio interface for Digital Mobile Radio (DMR) systems. When the company's radio base station, RA-XXX, is used in conjunction with the interface, users can automatically link a group of DMR radio terminals with a telephone line. The audio gateway permits the cross coding of the signaling and the direct DTMF generation from terminals. A phone book of 10 phone numbers is accessible directly with a call alert from the terminals.

www.radioactivity-tlc.com

Microwave Backhaul

Trango Systems added two models, the TrangoLINK ApexPlus and the TrangoLINK Orion Elite, to the Apex all-outdoor microwave backhaul system product line. Both models feature a flexible design that supports most international frequency bands and TR spacing from 6 to 40 GHz, true zero-footprint design, and integration of the

company's power over Ethernet (PoE)/lightning suppressors or direct power options. Interfaces include GigE copper, fiber and T1/E1. The Orion model also features Intelligent Payload Compression (IPC) with capacity up to 1 Gigabit per second (Gbps) on a single carrier.
www.trangosys.com

Wearable Safety Monitor

The Nardalert S3 from **Narda Safety Test Solutions (STS)** is an RF safety device

designed as a wearable or fixed-area monitor. The device touts a new mechanical design with removable sensors that provides rapid field support and unlimited upgradeability for users. The model's top-mounted color LCD simplifies operation and improves the user's situational awareness, company officials said. The unit is readily chargeable through a computer's USB port, and employs light, sound and vibration alarms. Narda engineers included a protective silicon skin for field use and interchangeable belt or lanyard clips.
www.narda-sts.us

Radar Sensing Device

Cambridge Consultants designed a through-wall radar-sensing device called Prism 200c. By adding mobility and covertness to surveillance, the device can gain intelligence on the location and movement of people who might be inside a particular room. The lightweight and inconspicuous product can fit inside a backpack. Features include a battery-powered and highly portable radar device, a smart radar signal

processing that senses human movement and position even in environments with a number of radar reflecting surfaces, and a data presentation both on-device and remotely, including front, side and overhead.
www.cambridgeconsultants.com

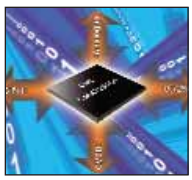
Dispatch Console Software

Zetron launched the next-generation Advanced Communication (Acom) System — Acom EVO. The new release allows the system's dispatch console software to run

either at a position in standard mode, requiring an IP-connected laptop and a headset or as a full-featured dispatch console, using a USB-connected media dock. Other features include console-audio routing, redundancy and low bandwidth requirements.
www.zetron.com

Single Chip Multitranscoder

The CMX 7261 from **CML Microcircuits** is a single-chip speech compression full



duplex multitranscoder device that is suited for use in software-defined radio (SDR), VoIP applications, wireless private branch exchange (PBX) and privacy type digital voice communications. With built-in G.711, G.729A and CVSD algorithms, the device can provide analog-to-digital and digital-to-analog conversations with no additional DSP or programming. Other features include voice activity detection, C-BUS host serial control/data interface, multiple choice of input and output sources, streaming transfers, four GPIO and encoder/decoder test mode support that allows verification of bit exactness and high audio quality.

The company also introduced the CMX148 audio scrambler and sub-audio signaling processor. The half-duplex device performs signaling, including CTCSS/DCS encoding/decoding. Suited for both the professional mobile radio (PMR) market and enhanced MURS/GMRS/FRS with GPS terminal design, the device features an FFSK/MSK data modem for packetized or free-format data operations.

www.cmlmicro.com

NFC Antenna

Premo enlarged its SDTR1103 line with the SDTR1103-HF series antennas for high-frequency (HF) near field communications (NFC) applications. The antenna is suitable for signal reception at 2 MHz and/or 13.56 MHz transmit/receive for NFC applications. The antenna features a high surface resistance nickel zinc (NiZn) ferrite core material and low initial permeability to work at high frequencies, which provides a stable performance in a wide range of temperatures, company officials said. The antenna offers the same format as 125-kilohertz transponders, the surface mounting device (SMD) configuration allows for easy integration in an automatic printed circuit board assembly process, and the antenna offers a super drop test resistance coil.

www.grupopremo.com

Antennas

Procom introduced two new product lines designed for defense units. The G-CXL line is comprised of base station antennas and marine antennas, including the quadruple-band base station and marine antenna for the 900 MHz and 1.8, 1.9 and 2 GHz bands. The SB line features steel band antennas for portable equipment. Antennas for the 160, 450 and 900 MHz bands, as well as for the 1.8 and 2.4 GHz bands are also available.

www.procom.dk

Sector Antenna

Laird Technologies introduced the SKS230090-16N-001 dual 45-degree slant

sector antenna designed for WiMAX/broadband wireless applications. The antenna operates in 2.3 – 2.7 GHz with 16.5 dBi gain at 2.5 GHz and ±45 degree polarization. The antenna features proprietary design elements, a low-loss feed network and a slim profile. The base station antenna is ideal for high-density wireless network coverage in mobile and fixed applications, high multipath environments and large carrier class deployments. The antenna features two type N-female connectors at the bottom.

www.lairdtech.com

TETRA Antenna

TETRACube from **Lea Antenne & Progetti** is a small and smart panel antenna for TETRA applications. The antenna can be tailor-made for user needs by adding more modules. The antenna offers good performance with smaller dimensions, reducing weight and wind resistance, which also makes installation easier, company officials said. With a single code, users can cover all TETRA markets — civil, military and transportation — because of the antenna's large bandwidth.

www.leagroup.it

Digital Earpiece and Fit Testing System

Phonak Communications introduced the Phonito Nano digital covert earpiece. With a tiny form factor, secure fit and skin-matching color options, the earpiece is built around a new hybrid audio chip and inductive technology. The earpiece can be used alongside any existing inductive wiring loops, and the passive coil technology makes it less susceptible to interference.

Phonak also launched SafetyMeter, a fit testing system that ensures the company's Serenity users receive the ear protection they require, company officials said. The system assesses and documents the actual in-ear sound attenuation a user receives from custom-molded ear protection. Following each test, the system provides the user with a personal attenuation rating (PAR) applicable to the user, and test data is stored automatically.

www.phonak-communications.com

Radio Scanners

GRE America introduced the GRECOM Digital EZ Scan radio scanner. The scanner permits programming by selecting what the user wants to hear and works in areas supported by the majority of Project 25 (P25) digital, as well as analog and conventional public service radio systems. The scanner allows users to listen to desired communications without PC or Internet programming and includes a 2-Gigabit secure digital (SD) card.

www.greamerica.com

Classifieds

Contact Debra at +1 303 792 2390, x 13 • Fax: +1 303 792 2391
dsabin@RRMediaGroup.com

Equipment For Sale

Radio-Trunking-System

1 for Car-Racing & Jungle-Fire-Prevention

Features :

- Automaticly searches for clear radio channels
- Group Calls / Team Calls / Selective Calls are standard features
- Radio Calls, Cellphone Calls & Land-line phone Calls are all available
- Conventional Radio & Talk Around Modes to outside systems is available
- Trunking System is internet remote-programmable
- Fleet dispatching & management operation
- Motorola, Kenwood, Vertex & Icom transceivers can be simply upgraded with the RG-Trunking-Board
- RG-450 transceivers are fully integrated for trunking & conventional operation
- Multi-site-systems can be linked-up by VOIP-PBX for roaming

Trunking-Option-Boards

RG-117-/
RG-117-R
For Icom™ radios)

VT-80 (for
Vertex™
Radios)

RG-860
(For Kenwood)

RG-380
Trunking board for
motorola Professional
Series Radios

RG-180
Trunking board for Motorola
Commercial Series Radios

Noise-Canceling & Radio-Headset Series

BTH-H43-d

BTH-H-41-a

BTH-H-45-d-1

Radio-Titan

Armada-OTH-Flex

RF-Scanner

(for Racing-car & Heavy-Industries-)

RG-450 LTR & Smartrunk-Radio

**No-need trunking-board installation ---
RG-450 Transceiver has trunking (+)
conventional-operation fully integrated···
no Trunking-board is necessary!**

VHF 136-174 MHZ
220-260 MHZ

UHF 330-400 MHZ
400-450 MHZ
450-512 MHZ

Regal Group

Floor-3, North-unit, Block-10, Jindouling Industrial Zone, Yantian District, Shenzhen, China (Post-code: 581-083)
Tel: (86-755) 8299-0210 // 8299-0276 Fax: (86-755) 8297 9065
Email: szrg2001@china.com // szrg2005@szrg2005.com Web: www.szrg2003.com

Events

For more events, visit RRImag.com

13 – 14 April: BAPCO, London. British Association of Public-Safety Communications Officers (BAPCO): Lucy McPhail, +44 020 7973 6635, l.mcphail@hgluk.com, www.bapco.co.uk

10 – 13 May: UTC Telecom, Long Beach, California, USA. Utilities Telecom Council (UTC): meetings@utc.org, http://utctelecom2011.utc.org

19 – 21 May: CIPATE 2011: China International Exhibition and Symposium on Police Equipment and Anti-Terrorism Technology and Equipment, Beijing. China Association of Science & Technology: +86 10 5129 8900, info@cipatechina.cn, www.cipatechina.cn

24 – 27 May: TETRA World Congress, Budapest, Hungary. TETRA Association: +44 20 7017 7878, register@tetraworldcongress.com, www.tetraworldcongress.com

6 – 8 June: **APCO Global Congress**, Dubai, United Arab Emirates. APCO Global Alliance: +1 770 874 5830, jeffersond@apcointl.org, www.apcoworldcongress.org

14 – 16 June: Global Paging Convention, Nashville, Tennessee, USA. American Association of Paging Carriers (AAPC): info@pagingcarriers.org, www.globalpagingconvention.com

21 – 24 June: CommunicAsia, Singapore. CommunicAsia: +65 6233 6638, www.communicasia.com

22 – 24 June: European Conference on Communications Technologies and Software Defined Radio (SDR' 11 – WInnComm), Brussels. Wireless Innovation Forum: karen.watkins@wirelessinnovation.org, http://europe.wirelessinnovation.org

22 – 24 June: General Police Equipment Exhibition and Conference (GPEC) Asia, Putrajaya, Malaysia. EWM Exhibition and Marketing: +49 34 743 62 092, info@gpec.de, www.gpecasia.com.my

7 – 10 August: APCO Conference and Exposition, Philadelphia, USA. Association of Public-Safety Communications Officials (APCO) International: www.apco2011.org

1 September: TETRA Association Congress Brazil, Brasilia, Brazil. TETRA Association: nicole.morrison@tetra-association.com, www.tetra-applications.com

1 September: TETRA Association Congress Mexico, Mexico City. TETRA Association: nicole.morrison@tetra-association.com, www.tetra-applications.com

14 – 16 September: VSAT2011 Conference, London. Communication Systems (Comsys): Rose Murphy, +44 1727 832288, rose@comsys.co.uk, www.comsys.co.uk/wvc_main.htm

19 – 21 September: Professional Mobile Radio (PMR) Summit, Barcelona, Spain. IIR Telecoms & Technology: +44 020 7017 7483, registrations@iir-telecoms.com, www.iir-telecoms.com/event/PMR

24 – 27 October: ITU Telecom World 2011, Geneva. ITU Telecom: +41 22 730 6161, itutelecom@itu.int, www.itu.int/WORLD2011

26 – 28 October: EUTC Annual Conference, Madrid. European Utilities Telecom Council (EUTC): +32 2 645 26 77, www.eutc.org/eutc-annual-conference

1 November: TETRA Association Congress India, Delhi, India. TETRA Association: nicole.morrison@tetra-association.com, www.tetra-applications.com

16 – 17 November: RadioComms Connect, Melbourne, Australia. WFevents: Lisa Crossley, lcrossley@westwick-farrow.com.au, www.radiocommsconnect.com.au

22 – 24 November: PMRExpo, Cologne, Germany. PMR Expo: www.pmrexpo.com

ADVERTISER INDEX

Link to advertisers at RRImag.com ONLINE with AdLink

ADVERTISER	PAGE
3T Communications AG www.3t-ag.com	51
Aeroflex Wichita, Inc. www.aeroflex.com/Q2RR	47
APCO Global Congress www.apcoglobalcongress.org	60
Arminia Tecnología y Control www.arminiatyc.com	40
Cassidian www.cassidian.com	13, 15
ConnecTel www.connectel-cz.com	8
Creowave Ltd. www.creowave.com	27
Damm Cellular Systems www.damm.dk	2
Daniels Electronics Ltd. www.danelec.com	25
Datron World Communications www.dtwc.com	11
Eventide www.eventide.com	21
General Dynamics www.gdsatcom.com/ctereps.php	49
HAL Communications www.halcomm.com	18
ICOM Inc. www.icom.co.jp/world/	7
Kathrein-Werke KG www.kathrein.de	39
Kenwood nexedge.kenwood.com	9
Kirisun en.kirisun.com	23
Midian www.midians.com	14
Mobility Sound www.mobilitysound.com	31
Omnitronics Pty. Ltd. www.omnitronicsworld.com	30
OTTO Communications www.ottoexcellence.com	12
Phonak Communications www.phonak-communications.com	54
Procom A/S www.procom.dk	16
RadioResource International www.RRImag.com	45, 55
Radio & Trunking Distributors International www.radioandtrunking.com	53
Radiotrans Comunicaciones www.radiotrans.com	55
SkySweep Technologies www.skysweep.com	41
SmarTrunk Systems www.smartrunk.com	29
SoftWright www.softwright.com	50
Spectra Engineering www.spectraeng.com.au	17
SuperGUIDE www.RRImag.com	33, 56
Team Simoco www.simoco.co	63
Telewave www.telewave.com	64
Teltronic www.teltronic.es	3
TETRA World 2011 www.tetraworldcongress.com/mcc	35
Times Microwave www.timesmicrowave.com	37
Unimo www.unimo.co.kr/eng	19
WORLD NEWS www.RRImag.com	24
Zetron www.zetron.com	5

Is This Your Copy of *RadioResource International*? Start Your Own FREE Subscription TODAY!

RadioResource INTERNATIONAL

FREE SUBSCRIPTION

AND ADDRESS CHANGE CARD

This card is for: ❑ New Subscription ❑ Address Change

Subscribe online: www.RRImag.com

or fax this form to: +1 818 760 4490

COMPLETE ALL ITEMS ON CARD

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____

STATE/PROVINCE _____

COUNTRY _____ POSTAL CODE _____

FAX _____

E-MAIL _____

❑ *Do not share this e-mail address with a third party.*

1a. ❑ **YES**, **I want a FREE subscription to *RadioResource International*** ❑ No
Subscription includes magazine and WORLD NEWS monthly e-newsletter.

1b. How would you like to receive your magazine?
❑ D. **DIGITAL Edition: Clickable, Searchable, Saveable & Ecological** (Available Worldwide)
❑ P. Print Edition (Available Outside US and Canada)

SIGNATURE: _____

DATE: month _____ day _____ year _____

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 _____

Q211

Poland Preps for Nationwide TETRA

By Robert Mikulski

Poland is the largest country in Europe without a nationwide digital trunked system for public-safety services. A tender is ongoing, and Cassidian, Motorola Solutions, Selex Communications and Thales are among the TETRA suppliers vying for it. Although the contract has yet to be awarded, TETRA technology has deep roots in Poland in a variety of other markets.

TETRA Deployments

The Warsaw Metropolitan Police signed the first contract for the implementation of a TETRA system in Poland in 1999, and deployment started in 2000. Since then, implementations of other TETRA installations have continued in many regions and markets in various parts of Poland.

For the Metropolitan Police, TETRA is an integral part of the command-and-control system. By enabling individual and group communications, the technology provides the locations of vehicles based on GPS modules and access to numerous police databases. Command-and-control systems have been operating in the police headquarters in Krakow, Lodz and Szczecin since 2001. In early 2003, the university police department launched another TETRA system, used for training purposes as well as daily work by the local police. TETRA was deployed in the city of Wroclaw in 2003, where it improved daily public transport for the city's public transportation company and citizens. The city guard, fire services, medical rescue and the city authorities also use the Wroclaw's digital trunked system.

Additional TETRA deployments are with polish airports, the naval training center, Polish air forces, the army command battalion and special units of the military police. TETRA became the primary means of communications for the Polish military contingent in Iraq in 2002. The Polish Delta Force unit also purchased a TETRA system in 2010. The Gdansk University of Technology owns a TETRA system that is used for research and teaching.

At the end of 2010, the first TETRA system was deployed at the Dolna Odra power plant. TETRA vendors hope that the rest of the energy industry in Poland will follow this path; the energy distributor sector uses an analog MPT 1327-based system. The cost of repair and system maintenance becomes more expensive each year. The energy sector must eventually decide what digital technology it will migrate to. During 2011, there will be a number of additional small TETRA tenders in Poland.

Nationwide Network History

The first attempt to build a nationwide TETRA system occurred in 2003. Nokia and Motorola both offered to build an emergency communications network in Poland. The contract, worth up to PLN$700 million (US$177 million), was expected to be part of an investment program offset by Lockheed Martin. In 2002, Poland chose Lockheed Martin F-16 jets in a US$3.5 billion tender for a multipurpose fighter.

In 2005, representatives of the Polish government and a consortium, TETRA System Polska, consisting of Motorola and other IT integrators approved a technical scheme for the design and rollout of TETRA. All long-term government projects worth more than PLN$100 million (US$35 million) must be approved by the parliament. Unfortunately, parliament didn't pass the bill to allow the system to be built before the elections. After the parliament election in 2005, the nationwide TETRA project was dismissed.

A new tender was announced in September 2010. Poland was the last country in Europe to announce a tender for a nationwide digital radio communications system for police and emergency services. The tender is a last opportunity to finalize construction before the beginning of the EURO 2012 Football Cup, co-hosted by Poland and Ukraine. Building a new system is essential for proper functioning of emergency services, especially when a large number of football supporters are expected.

The project budget is estimated at PLN$500 million (US$170 million), and 75 percent will be covered by European Union (EU) grants. The pending contract has several stages. During the first stage, the radio network will be built in the major Polish cities — Warsaw, Poznan, Wroclaw, Krakow, Gdansk and Silesia — that will host the football event. The next stage will cover the rest of the country. The project will require the installation of about 1,500 base station sites. There are an estimated 140,000 radio users from public and security sectors in Poland. ■

More information

http://tetraforum.pl/

Robert Mikulski is a project director in SRS Poland, a Sepura partner in Poland. As an IT/telco project manager, he is responsible for various system deployments across the energy industry in Poland. Email comments to info@tetraforum.pl.

simoco
The Professional's Choice

next
GENERATION

Portable Range

Conventional Trunked & P25

with upgrade options

P25

Rugged

Compact

IP67

TeamSimoco
Simoco Group Company

Simoco Group: Tel: +44 (0)1332 375500
Simoco Aus: Tel: 1300 363 607
Email. marketing@simoco.co - Web. www.simoco.co

ComGroup
Simoco Group Company

Tested. Proven. Trusted.

Telewave has supported Public Safety, local and state government, and the military for over 38 years. Our full line of standard radio system products is available for shipping within 10 days or less, and our system engineering team is ready to assist with your most demanding projects.

From 700/800 MHz dual-band combiners to receiver multicouplers, duplexers and multi-channel, multi-band antenna systems, Telewave has the tools and the technology to help you meet your mission requirements. All Telewave system solutions are P25 and narrowband compatible.

TELEWAVE, INC.®

San Jose, CA • +1 408-929-4400 • www.telewave.com