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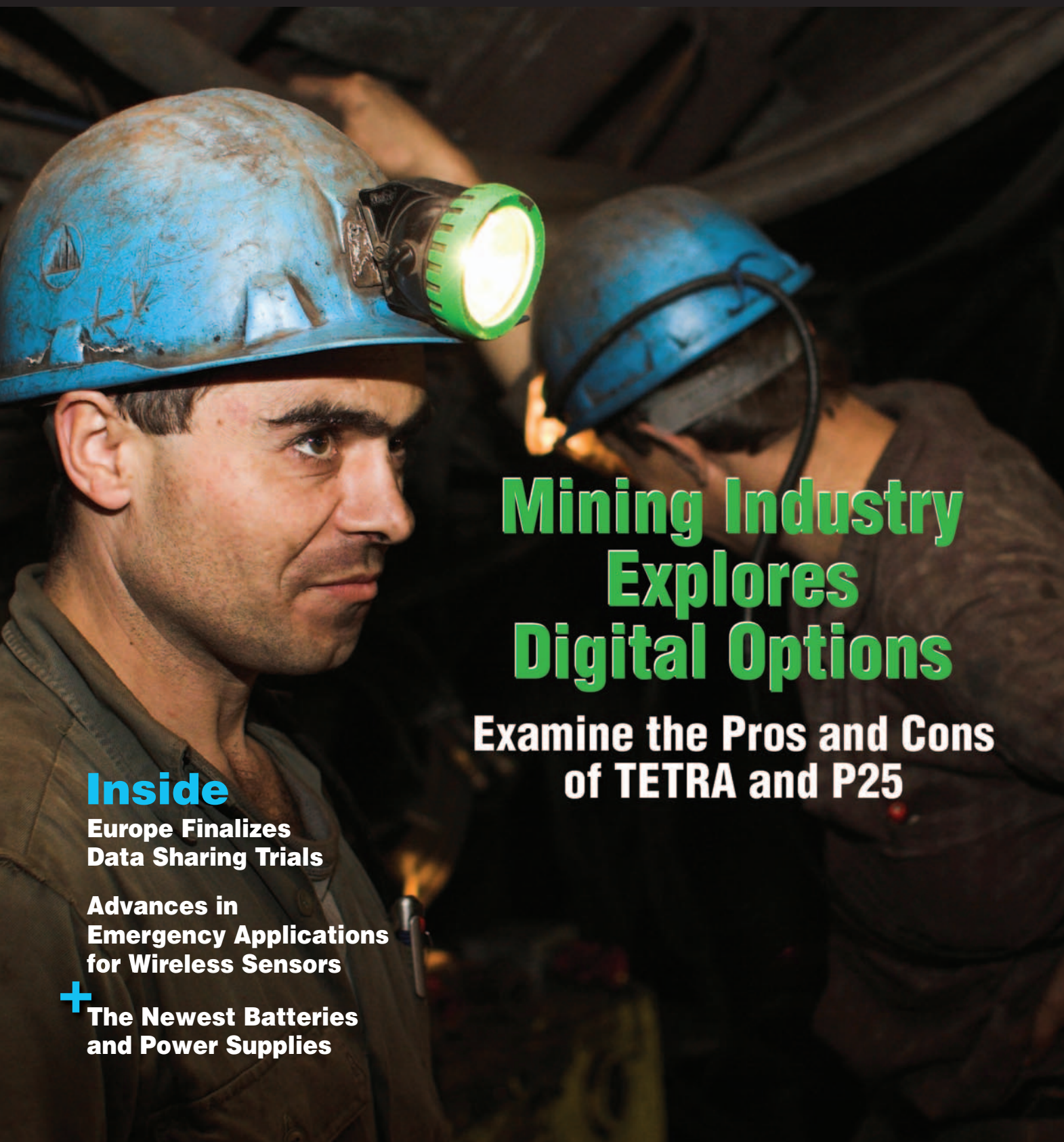

Mining Industry Explores Digital Options

Examine the Pros and Cons of TETRA and P25

Inside

Europe Finalizes Data Sharing Trials

Advances in Emergency Applications for Wireless Sensors

+ The Newest Batteries and Power Supplies

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SS-18	15	18	1¾ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅜	4.2
SS-30	25	30	3¾ x 7 x 9⅜	5.0

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SS-25M*	20	25	2⅞ x 7 x 9⅜	4.2
SS-30M*	25	30	3¾ x 7 x 9⅜	5.0

MODEL SRM-30

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MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-10	7	10	3½ x 19 x 9⅜	4.3
SRM-12	10	12	3½ x 19 x 9⅜	4.7
SRM-18	15	18	3½ x 19 x 9⅜	5.0
SRM-25	20	25	3½ x 19 x 9⅜	6.5
SRM-30	25	30	3½ x 19 x 9⅜	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3½ x 19 x 9⅜	6.5
SRM-30M	25	30	3½ x 19 x 9⅜	7.0

MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30-2	25	30	3½ x 19 x 9⅜	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30M-2	25	30	3½ x 19 x 9⅜	11.0

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

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KENWOOD TK760H, 762H
KENWOOD TK-7150/8150
MOTOROLA LOW POWER SM50, SM120, GTX/M1225
MOTOROLA HIGH POWER SM50, SM120, GTX/M1225
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA CDM 750, CDM1250 and CDM1550
MOTOROLA ASTRO XTL5000
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

NEW SWITCHING MODELS

SS-12EFJ
SS-18EFJ
SS-10EFJ-98, SS-12EFJ-98, SS-18EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-10IF, SS-12IF
SS-10IC, SS-12IC, SS18IC
SS-12ICF-S, SS-18ICF-S
SS-10TK
SS-12TK OR SS-18TK
SS-10TK71/8150, SS-12TK71/8150, SS-18TK71/8150
SS-10SM/GTX/M1225
SS-12SM/GTX/M1225, SS-18SM/GTX/M1225
SS-10RA
SS-12RA
SS-18RA
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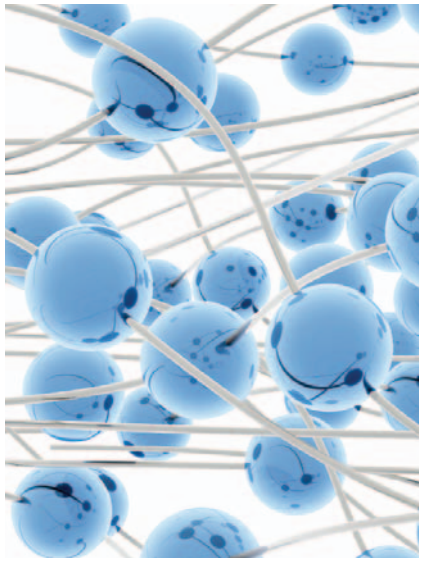
RadioResource INTERNATIONAL

Vol. 23, No. 1

Quarter 1 2009

22 Mining Industry Explores Digital Options

Project 25 and TETRA each have advantages depending on the specific needs of a mine, and both technologies offer efficiency and reliability benefits compared with analog networks. *By Philip Sidebottom*



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EU program creates biologically inspired network design using living organisms as a model for emergency applications, breaking away from other incremental sensor-design approaches. *By Maria-Angeles Grado-Caffaro*

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An EU-backed project develops new technology to allow emergency information exchange between different network types. *By Jean-François Gallet, Edith Wilkinson and Stephan Ribot*

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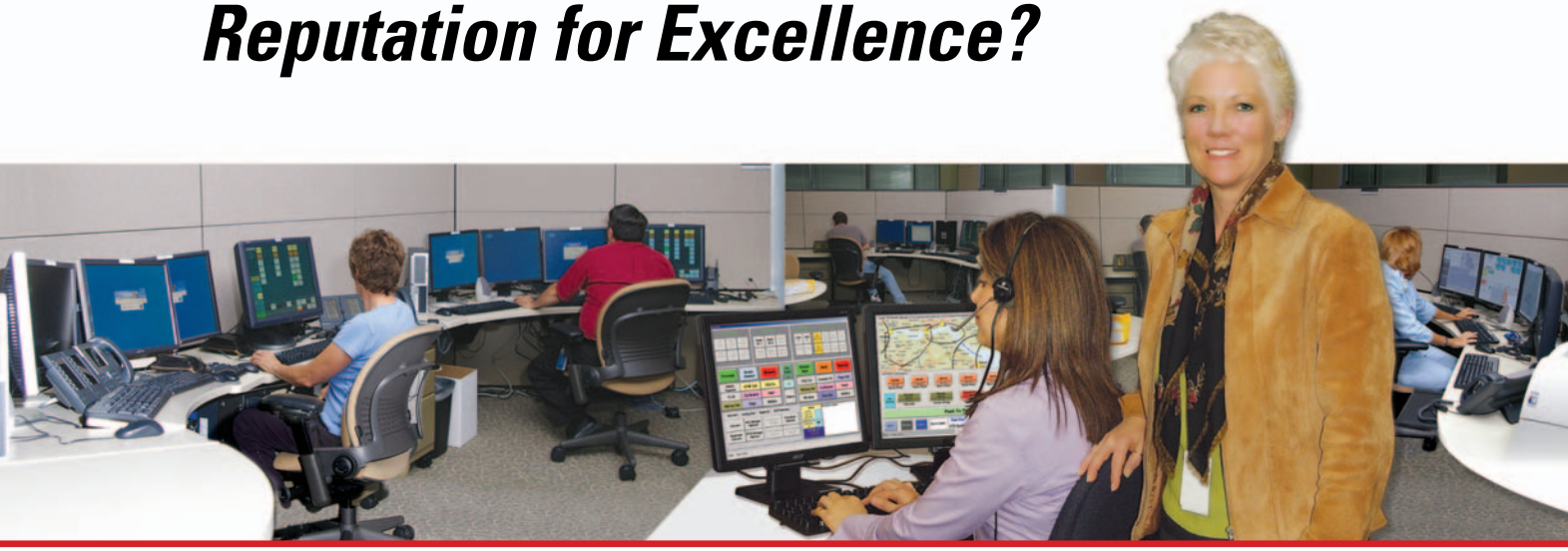
IN EVERY ISSUE

Cover design by Brad Hamilton

READER SERVICES

What Gives Zetron Systems Their Reputation for Excellence?



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Economic Turmoil

How will the recent financial crisis affect the mobile radio business? We interviewed dealers, public-safety officials and economic experts to determine how the industry will weather the storm.

System Implementation

Deploying a multimillion-dollar system requires a systematic approach to putting the pieces into place.

Spectrum Trading

The Australian regulator is seeking comment on the effectiveness of the secondary market for RF licenses.

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Fresh Perspectives

It's hard to believe another year has begun. We have several changes planned for the upcoming year, including more focus on vertical markets in each issue. You'll find an in-depth article on the mining industry beginning on Page 22. Watch for articles covering transportation, oil and gas, and utilities through the rest of 2009. Even if these aren't sectors in which you directly do business, the best practices we will cover likely can be applied in your particular business area.


Jolly Wong

Along with enhanced editorial, we have some fresh perspectives from new editorial advisors this year. We're pleased to introduce Jolly Wong, chief police telecommunications engineer with the Hong Kong Police Force (HKPF), now serving as head of the communications branch.


Phil Kidner

You may remember Wong from our Quarter 4 2008 issue, where he provided an update on mobile-data plans for the HKPF. He is well known and respected in worldwide communications circles. Wong is a fellow of the Hong Kong Institution of Engineers (FHKIE), the British Computer Society (FBCS) and Institution of Engineering and Technology (FIET); member of the Institution of Engineers, Australia (MIEAust); and a chartered IT professional (CITP), chartered professional engineer (CPEng) and registered professional engineer (RPE) in information, electronics, control, automation and instrumentation disciplines.

Phil Kidner, another leader in our industry, also joined the editorial advisory board. Kidner is chief executive officer (CEO) of the TETRA Association, which represents a membership of 150 organizations from 37 countries. Kidner's main responsibility is to promote the TETRA standard and its benefits.

Kidner joined the TETRA Association in April 2006 from the U.K. Police Information Technology Organization (PITO), now the National Police Improvement Agency (NPIA). Having originally joined PITO as a seconded police officer, he retired from the police force in 2003 after 30 years of service. He is a past president of the British Association of Public-Safety Communications Officials (BAPCO).

We value your opinions! Please e-mail your feedback to me at swendelken@RRMediaGroup.com.

Both men are experts in public-safety communications technology, and their knowledge will benefit our editorial coverage. We welcome your comments and ideas as well, so e-mail me with any feedback.

Best wishes for a healthy, prosperous and productive new year.

Sandra Wendelken, Editor

RadioResource INTERNATIONAL

RadioResource International delivers wireless voice and data 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 commercial and private wireless applications. Editorial content is international in scope and encompasses emerging technologies, industry reports and trends, innovative applications, product information and comparisons, news, standards, and troubleshooting tips.

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ASIA/PACIFIC

GATINEAU, Quebec, Canada — The Villa Shipping and Trading Co. (VSTC) selected **SolaCom Technologies**' voice communications system for installation at Maamigili Airport in the Maldives for the airport's air traffic control tower. SolaCom will provide VSTC with a system comprising two touchscreen operator positions, eight radio interfaces and four telephone interfaces.

SolaCom will deliver and install the system, as well as provide factory and site training for all air traffic control crew. Weather information is provided with a weather monitoring software package.

LONDON — IdaTech signed an agreement for up to 30,000 5-kilowatt hydrogen fuel-cell systems to be delivered by March 2013 with the **ACME Group**, a provider of infrastructure solutions to wireless telecom players in India and overseas. The minimum order is for 10,000 systems for delivery during 2009 and 2010 with the potential for two further orders of 10,000 units each for delivery between 2011 and 2013.

The three-party contract includes IdaTech, ACME and **Ballard Power Solutions**. IdaTech will supply ACME with natural gas reformed fuel-cell systems that will incorporate fuel-cell stacks supplied by Ballard. The agreement is subject to IdaTech and Ballard demonstrating certain design and performance criteria for the systems ahead of full deployment in early 2010.

ACME intends to deploy the systems throughout its key markets in India principally as long-duration backup power for base stations of its telecom customers. IdaTech and ACME intend to establish a manufacturing facility in India through a joint venture to produce the systems. Additionally, ACME will act as IdaTech's exclusive distributor for 5-kilowatt fuel-cell systems in India.

"This is a transformational agreement for IdaTech and for the fuel-cell industry," said Hal Koyama, chief executive officer (CEO) of IdaTech. "An order of this magnitude will serve as a catalyst for the fuel-cell industry as a whole and serve as a reference point for fuel-cell adoption in our key market of critical power backup systems."

JEJU ISLAND, South Korea — Jeju Island, a volcanic island off the coast of South Korea and a popular tourist destination, has a new wireless ubiquitous sensor network (USN) for tracking weather patterns. The network provides long-term trend data to weather researchers and instant alerts about severe weather to help protect residents and visitors from danger.

Deployed by South Korea's **KT** and integrator **LANS**, the project — phase two of a larger Jeju Island weather monitoring system designed for the Korea Meteorological Administration (KMA) — employs **Firetide**'s wireless mesh networking technologies to unite KMA's IP-based USN devices located on the south half of the island.

Jeju Island occupies a total land area of about 1,848 square kilometers, making it the largest South Korean island and perhaps the most geographically diverse. KMA compiles weather data from sensors and video cameras to make sure public-safety officials are apprised of the conditions on the island.

"While tourists enjoy Jeju's geography, it can present enormous challenges for wireless network development," said Kim Myongjin, project manager for integrator LANS. "Line-of-sight obstructions are the rule on the island, not the exception,

Unimo TETRA Handset Passes South Korean Approvals

South Korean manufacturer Unimo passed a series of tests by the country's communications regulation agencies, NRSI and NEMA, to certify that its handset can operate reliably on TETRA networks.

The Korean public-security TETRA network uses sophisticated technology features, and interoperability approvals require that all radios pass rigorous performance tests and requirements. The approval adds to many other formal interoperability and European Union type approvals that the Unimo TETRA radio has passed during the past 18 months.

The approval was granted to three other radio providers, all of which are based in Europe or the United States. Unimo partnered with U.K.-based TETRA technology provider Software Radio Technology (SRT) for its TETRA radios.

Unimo has sold its handsets to a number of users around the world. "The development of a high-quality TETRA handset has been a long and difficult task," said Justin Kim, Unimo vice president. "However, we are very proud to have achieved this fantastic Korean approval and look forward to providing local and international buyers with a high-quality, low-cost TETRA handset, coupled with exceptional after-sales service."

Unimo's TETRA handset passes approvals to operate on the South Korean public-safety network.

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and the distances between isolated communities can be several miles."

NEW DELHI, India — The WiMAX Forum highlighted activity in the burgeoning Indian market to illustrate the increase of the technology in emerging markets. The WiMAX Forum projects the Indian WiMAX market including devices will be worth $13 billion in 2012. This market projection takes into account 27.5 million WiMAX users, or 19 million WiMAX subscribers in 2012.

Citing the recent decision by India's Department of Telecommunications to allocate and auction WiMAX spectrum to the 2.3 and 2.5 GHz frequency bands, Ron Resnick, president and chairman of the WiMAX Forum, noted India's goal of connecting more than 1 billion new customers.

"India currently has only 4.5 million broadband users out of a population of 1.2 billion people. And with these recent regulatory decisions, India joins other major developed nations such as the United States, Japan, South Korea, Taiwan and Russia in freeing up prime spectrum for mobile WiMAX deployments," Resnick said.

The forum also announced that it is in the early stages of planning a WiMAX applications lab at the Indian Institute of Technology (IIT) Delhi. With successful applications labs already running in Taiwan and the United States, the third lab will add more developers to the WiMAX fold, officials said.

SYDNEY, Australia — Two Australian mines deployed communications and tracking technologies under separate contracts.

A Wi-Fi-based visibility solution from **AeroScout** is being used by Xstrata Coal to bring increased safety to workers at the Beltana Coal Mine, Australia's most productive longwall operation. Xstrata uses AeroScout's Active RFID technology, integrated into **Mine Site Technologies** (MST) digital communications system and communications lamps, to track 200 workers underground.

All of Beltana Coal Mine's workers wear Integrated Communications Cap Lamps (ICCL) from Mine Site whenever underground. Mine Site has integrated AeroScout's Active RFID tags into the battery packs of the ICCL cap lamps, enabling their locations to be tracked over the mine's Wi-Fi network. The real-time location of every worker can be viewed on a map using AeroScout software, which also enables users to search for the location of specific workers at any given time. The tags also track 50 diesel vehicles throughout the mine.

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In addition, **Rajant** and MST secured two new mining deployments in Australia using the Rajant wireless mesh solution. Beaconsfield Gold is an underground gold mine in Tasmania, and Pooncarie Mineral Sands is located in Pooncarie, New South Wales, and is a Gingko surface operation mine owned by Bemax Resources.

The two mines will deploy a large number of BreadCrumb systems in an interconnected wireless, meshed, self-healing network that will allow loader trucks, shovels, pumps, laptops and other production equipment to communicate with each other in real time.

EUROPE

SOPHIA ANTIPOLIS, France — To help reduce road accidents and traffic jams, the European Telecommunications Standards Institute (ETSI) published a standard enabling the automotive industry to introduce radio systems for "smart" vehicle communications systems, also called cooperative systems. The systems enable cars to "talk" to other cars, as well as to road infrastructure providers, based on wireless communications technology.

Warning other drivers of adverse road conditions or of a crash are two examples of possible uses for the technology. "The completion of these legal and regulatory instruments provides the legal certainty required for investors, manufacturers and operators to develop and deploy intelligent transport systems (ITS) in the automotive domain, and standardized components and radio technology will ease the successful introduction of such systems," said Søren Hess, chairman of the ETSI technical committee ITS.

The European Commission (EC) published a decision for a single European Union (EU)-wide frequency band to be used for immediate and reliable communications between cars and between cars and roadside infrastructure in August. The 30 megahertz of spectrum in the 5.9 GHz band will be allocated soon by European Union (EU) member states.

Arqiva Plans TETRA Services for U.K. PMR Market

Arqiva announced a technical partnership with DAMM Cellular Systems, a provider of TETRA technology, to accelerate the deployment of commercially available digital professional mobile radio (PMR) networks in the United Kingdom. The agreement will give commercial and local government organizations access to the latest TETRA digital radio networks, company officials said.

Arqiva plans to transition single and multisite organizations from legacy analog radio or GSM services to digital trunked radio systems. By combining available spectrum with TETRA infrastructure and terminals, Arqiva is working to bring PMR services to the mass market, executives said.

"We are starting to see the adoption of TETRA by a range of organizations, and our aim is to make the technology more commercially available in the U.K.," said David Green, director of strategy and marketing at Arqiva's public-safety group. "To encourage organizations to make the transition we need to ensure it is both simple and straightforward to integrate, while being as affordable and available as analog."

The Arqiva Web site stated it has an indefinite license for spectrum access in the 412 – 414 MHz bands paired with 422 – 424 MHz. "Arqiva may use this spectrum for any purpose directly in its own business operations or by acting as a band manager sublicensing spectrum to third parties," the Web site stated.

PARIS — Safran's Sagem Securite subsidiary agreed to acquire the biometric business unit within **Motorola**, which includes its Printrak trademark. Motorola's U.S.-based biometric business unit designs, develops, integrates and maintains automated fingerprint identification systems (AFIS) for law enforcement, civil and commercial customers around the world. The firm serves national, state, county and municipal agencies internationally and provides integration solutions and systems for more than 300 customers in 40 countries in North America, Europe, the Middle East and Asia.

"This acquisition enables Sagem Securite to strengthen its position in the U.S. market for homeland security, where it is already committed to offer world-class identification solutions to government, state and local markets," said Jean-Paul Herteman, chief executive officer (CEO) of Safran. "This acquisition is a continuation of Safran's long history of investing in the U.S. It is also an important step in our plan to improve our product offering, expand production in the U.S. and reduce costs."

"Biometrics is a very dynamic business that we believe requires companies to specialize in the technology," said Gene Delaney, president of government and public safety for Motorola. "To best serve our customers and employees, Motorola made a judgment that we need to concentrate and lead in our area of strength — delivering best-in-class mission-critical communications solutions for government, public safety and commercial customers."

The transaction is targeted to close during the first quarter.

PARIS — Zenitel and **Thales** signed a marketing and sales agreement for maritime safety systems. The move is complementary to the acquisition by Thales of Barco's software development unit for maritime safety and surveillance and constitutes a key element in the

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companies' respective strategies to reinforce their positions in maritime safety systems.

The companies will work jointly on developing maritime safety opportunities to offer, deliver and service maritime safety systems, particularly in the increasing traffic monitoring domain. "With 90 percent of the world's goods traveling by sea, ensuring the safety and security of coastal populations, environment, economies and people are a key challenge for all players involved," said Jean-Georges Malcor, senior vice president of Thales and head of the naval division.

CHESHAM, Buckinghamshire, United Kingdom — Stockholm Metro in Sweden awarded a contract for enhanced radio distribution to **Axell Wireless**. The contract encompasses supply, installation and commissioning of the equipment that includes fiber-optic repeaters, optical master units, combiners, antennas and power supplies, along with installation of radiating cable in the ticket halls and above the escalators.

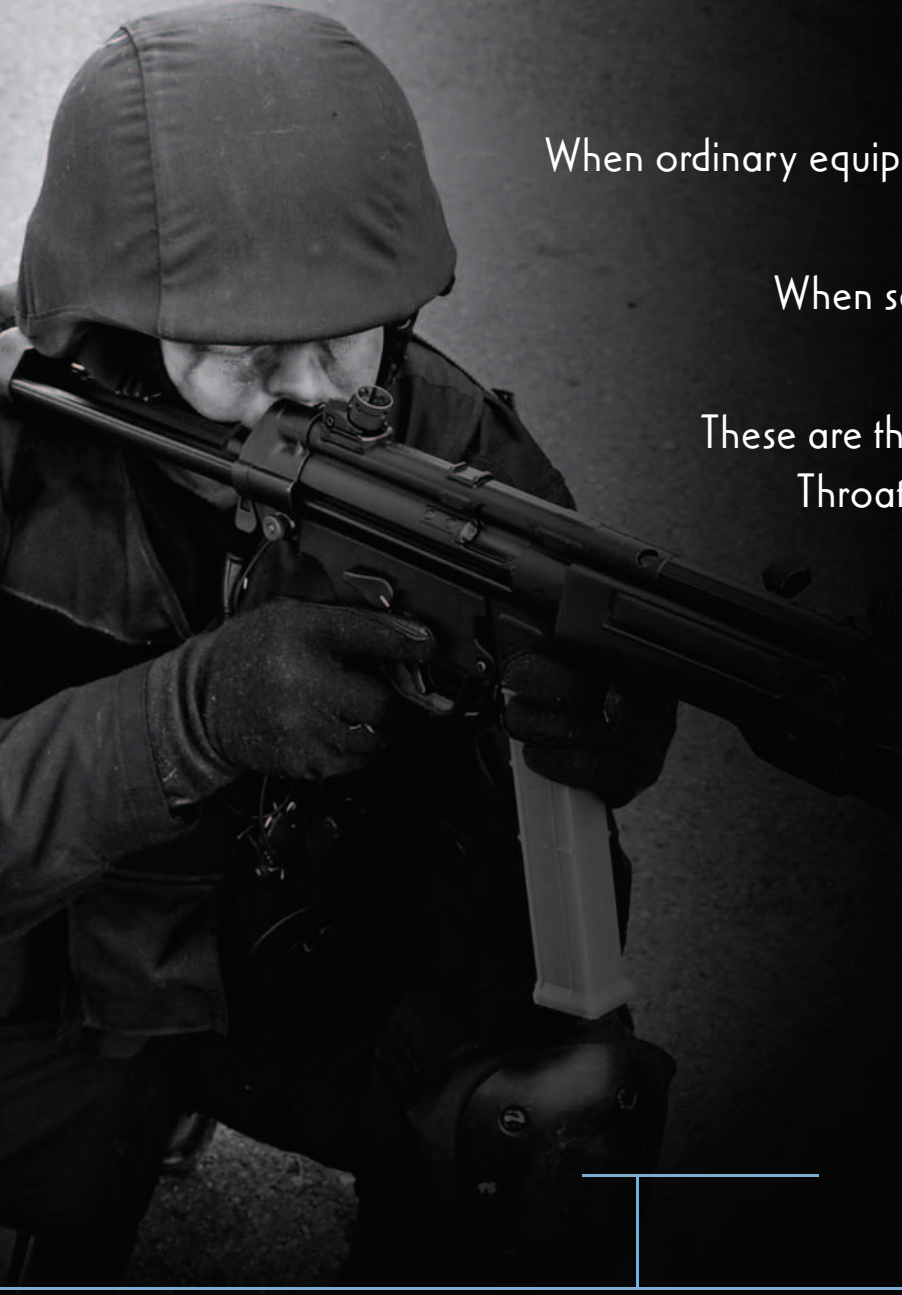
Axell Wireless will also provide service and maintenance of the system for 10 years. The equipment will be delivered in three phases and installed in about 72 metro stations by March.

VIENNA, Austria — The State Police of Mecklenburg-Vorpommern in Germany adopted networked communications solutions for five command-and-control centers from **Frequentis**. The supplier also delivered a new emergency radio system in April.

The new communications infrastructure is planned to be operational in March. The first system to begin service is the command-and-control center of the police department Neubrandenburg, which went operational in October. The next systems to follow are the command-and-control centers in Schwerin, Stralsund and Rostock.

A total of 24 operator positions will be equipped with new voice communications and recording systems. The five command-and-control centers of the police in Schwerin, Anklam, Stralsund, Rostock and Neubrandenburg will be interconnected and will work as one system. In the future, dispatchers of different centers will be able to control and coordinate large-scale operations together in the virtual command-and-control center.

CAMBRIDGE, United Kingdom — Sepura appointed Gordon Watling chief executive officer (CEO) to succeed Graham Matthews, who announced his intention to retire. Since joining the company almost two years ago as chief



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operating officer (COO), Watling has been instrumental in delivering operating efficiencies and major internal change, board members said.


Gordon Watling

Matthews is a founding member of Sepura and served as the company's first CEO since its formation in 2002. He will remain with the business in the short term to ensure a seamless handover.

Separately, Sepura said its 500,000th TETRA digital radio rolled off the production line at the factory of its manufacturer, Siemens, in Austria. Commencing manufacturing in 2002, Siemens has produced the second- and third-generation handheld and surveillance products, as well as vehicle radios. The Sepura range of products is now in use in nearly 100 countries.

DERBY, United Kingdom — Ian Carr was appointed managing director (MD) at **Team Simoco** to support the company's growth and international expansion. The appointment follows previous managing director Mike Norfield's promotion to head Team Telecom Group, the parent company of Team Simoco, with both appointments representing a key element of the group's succession planning and expansion strategy.

Carr joins Team Simoco with 28 years of industry experience, having worked at BT and Cable & Wireless, and most recently at Greenwoods Communications, where he held the position of group business director, driving the commercial, manufacturing and operational performance of the group.

Mike Norfield (left) and Ian Carr

BASKINGSTOKE, United Kingdom — Motorola signed a contract to supply 4,600 MTP850 TETRA terminals to Northumbria Police in the United Kingdom. The contract included the delivery of terminals and support services to manage the force's migration to the MTP850, which has been accredited by the U.K. government's Communications Electronics Specialist Group (CESG) as meeting the requirements for operations on the U.K. Airwave network.

The company also won two contracts in Norway. First, Motorola is supplying the Norwegian Ministry of Foreign Affairs (UD) and the National Police Computing and Material Service (PDMT) with biometric enrollment kiosks and divided models. The stations will enable Norway's multiple public agencies to digitally capture and store biometric data for passports, visas and other official identity documents.

The implementation began in September and will be completed in June. Around 500,000 applications for Norwegian passports are made every year, along with more than 150,000 visa applications.

Motorola also was awarded an upgrade contract with Oslo Lufthavn (Gardermoen airport). The upgrade will transform the existing system to Motorola's next-generation Dimetra IP Compact TETRA system. The upgrade is expected to be in place by the end of the year, offering enhanced security, efficiency and communications across the airport for both workers and passengers, company officials said.

LONDON — ICO Global Communications Holdings announced that its European subsidiary filed an application with the European Commission (EC) in response to the commission's call for applications for pan-European systems providing mobile satellite services.

ICO has also initiated proceedings in the European Court of First Instance for the annulment of Decision No. 626/2008/EC of the European Parliament and Council of June 30, 2008. ICO contends that the decision is illegal and therefore should be annulled.

LATIN AMERICA

SANTIAGO, Chile — NII Holdings, an international iDEN carrier, announced the commercial launch of Melody, **Motorola**'s next-generation iDEN dispatch and telephone interconnect core switching platform, for its clients in Chile.

The new Melody platform lets push-to-talk and telephone interconnect users roam and seamlessly communicate with other iDEN subscribers in four NII Holdings markets — Argentina, Brazil, Mexico and Peru — as well as with iDEN subscribers in the United States. The Melody switching core platform can scale up in capacity over time to serve several million dispatch and interconnect subscribers and to expand to more than 1,000 cell sites, Motorola officials said.

The new iDEN architecture uses the latest advanced telecom computing architecture (ATCA) hardware, Motorola executives said. The switching core has all the same features and scalable capacity as the first-generation iDEN core design but occupies about one-tenth the amount of floor space and has significantly lower power consumption and operating costs for an iDEN operator. The Melody platform is planned to be generally available in the fourth quarter.

Motorola currently has iDEN networks operating with 25 operators in 23 countries worldwide with more than 24 million subscribers.

MIDDLE EAST

COSTA MESA, California, USA — Astrata Group received a contract from Academia Management Solutions International (AMSI) in Dubai, United Arab Emirates (UAE),

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to track and monitor buses from its Al Mawakeb Schools and the International School of Arts & Sciences as part of a new student transportation safety program.

About 100 school buses have been installed with Astrata's tracking and monitoring system. The interactive solution allows parents to track their children's travel in a designated school bus, enabling them to access data via the Internet from home or office PC at any time via a secure and personal password, assigned to each family.

"This is an interesting new business model as the school has included the tracking system as an added service as part of their annual school fees," said Anthony Harrison, Astrata's executive chairman. "As such, some 700 paying parents are actually funding this system."

The system provides parents with real-time information about the transportation of their children to and from school and the exact time they arrived at school or home. A short message service (SMS) can also alert parents in advance of an approaching bus at designated pick-up points so that they can be met safely. A bus driver's driving performance can also be monitored at all times.

INTERNATIONAL

GAITHERSBURG, Maryland, USA — UltiSat, a global satellite communications provider, recently completed the migration of a non-governmental organization's global very small aperture terminal (VSAT) network comprising more than 200 sites in nearly 100 countries.

The customer's mission is to provide highly reliable communications and transport for data products that receive, collect, process, analyze and report on information received from remote stations located around the world. As part of its 10-year contract, UltiSat designed, implemented and commissioned a secure hybrid satellite/terrestrial network to accomplish the objectives of this mission.

FORT LEE, New Jersey, USA — Satellite machine-to-machine (M2M) provider **Orbcomm** received regulatory approval and authorization to provide its two-way satellite data communications services in Nigeria, Singapore, Republic of Cyprus and Mongolia.

"Regulatory authorizations are important for our international value-added resellers (IVARs) and original equipment managers (OEMs)," said Marc Eisenberg, Orbcomm chief executive officer (CEO). "In most cases, our OEMs already have established sales and distribution channels in these markets. These territories also give us the opportunity to recruit new resellers in these markets."

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Photos courtesy CSC Australia

Mining Industry Explores Digital Options

Project 25 and TETRA each have advantages depending on the specific needs of a mine, and both technologies offer efficiency and reliability benefits compared with analog networks.

By Philip Sidebottom

The Australian mining industry is experiencing rapid growth. As one of Australia's largest export sectors, it's also helping shield the Australian economy from the worst of the current global credit crunch. The industry is also making leaps in communications technology from legacy analog radio systems to the latest in digital two-way radio technology. Digital technology is providing mining organizations more reliable, efficient communications for operations management, as well as a safer and more secure workplace than with legacy systems.

Boddington Gold Mine was one of the first mines in remote Western Australia to take advantage of digital radio technology. The mine installed a Project 25 (P25) network in 2007 for its 36.5-square-kilometer mine site, located 130 kilometers southeast of the state's capital, Perth. The P25 system is a robust system primarily engineered for the mission-critical government and emergency services market, so it's well suited to the harsh mining environment. Safety is the No. 1 concern for every mine site. Boddington's move to P25 is indicative of the surge to digital two-way radio communications technology across the industry, with several other diversified resource companies moving to update their networks as well. The two leading digital technologies, P25 and TETRA, provide massive improvements to safety standards compared with traditional technology by better equipping workers with the tools to report and respond to critical situations.

IP-based digital networks provide great control over voice traffic management, enabling emergency calls to take priority in the system, quickly accessing resources and connecting the right teams at the right time. Effective call management, hot microphones for instant communications, wide-area announcements and dynamic regrouping of teams to respond to changes are all part of a comprehensive safety toolbox. The integration of a GPS and an emergency button in the digital two-way radio handset also ensures the location of someone in distress can be pinpointed quickly, enabling fast and accurate dispatch of emergency assistance. Therefore, staff is

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Communications are essential to each stage of a mine's life cycle from exploration and evaluation to shutdown and rehabilitation.

assured that help is at hand, while managers have peace of mind that they can effectively assist their teams in a crisis.

Two of the largest nickel mines in the Pacific islands of New Caledonia have also embraced digital two-way radio to incorporate a range of operational and emergency functions for workers, and safety teams can better respond to workers around the clock. Safety in the mining industry isn't just about protecting staff but also protecting continued productivity. In Australia, for safety reasons, mines are required to interrupt or cease normal operations if on-site communications aren't fully functional. Two-way radio reliability becomes even more paramount when millions of dollars can be lost every day if mine operations are interrupted.

Another added advantage for mines opting for either TETRA or P25 networks is their ability to access a wider variety of equipment from manufacturers and remove the risk of being locked into a particular vendor's system. Open standards also mean greater competition and development in features, functionality and applications. While the two technologies differ in specifications such as spectrum efficiency, ease of migration and coverage area, both offer unique features and applicability to each stage of the mine life cycle — exploration and evaluation, development, ongoing production, and shutdown and rehabilitation — to suit the changing communications requirements of each phase.

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Exploration and Evaluation

Clear, crisp voice and data communications between teams during the exploration and evaluation stage of the mine life cycle are essential. An exploration crew in the field is likely to be relatively small and may be operating in areas with little or no communications or power infrastructure, while the team analyzing the data is usually located remotely at the mine headquarters. New digital two-way radio technologies provide all the features of legacy analog systems, as well as the digital advantages of reliability, flexibility, clear voice quality, integrated data and privacy. However, P25 is likely to be favored in the first stage of the mine life cycle when traffic is low and most communications are conventional — simplex or repeater.

Mine Development

During the mine development stage, hundreds of contractors represent thousands of workers building roads, accommodation, utilities and necessary infrastructure across a mine site. Coordinating this activity requires sophisticated communications that provide coverage in all needed areas and the capacity to serve a large number of users. These requirements are best fulfilled through digital trunked systems.

The two leading digital technologies, P25 and TETRA, provide massive improvements to safety standards by equipping mine workers with the tools to report and respond to critical situations.

A trunked system allows a number of resources to be shared intelligently by multiple users and enables features such as user access priorities, selective calling, status and high-assurance emergency calls. Each user group has its own virtual private channel or talk group to ensure interference from other groups is eliminated. This digital two-way radio technology also allows mine management to maintain a pool of subscriber radios that can be provided to contractors while on site, which is logical with the large population of contractors constantly coming and going. A digital system simplifies the re-configuration of subscriber radios and avoids the difficulties traditionally encountered in configuring conventional radios. These digital trunked systems are used throughout Australia and the Pacific region because of ease of use and the added capacity available for many users. In addition

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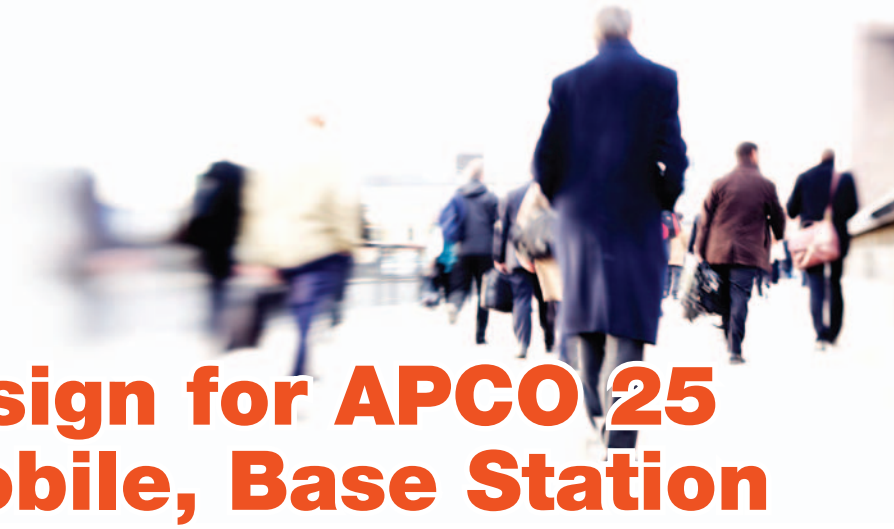

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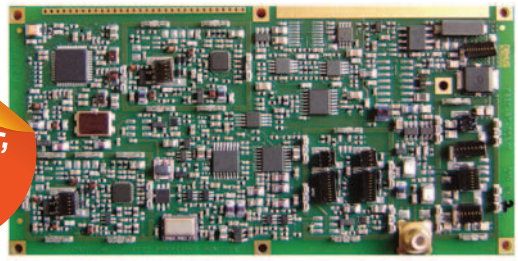
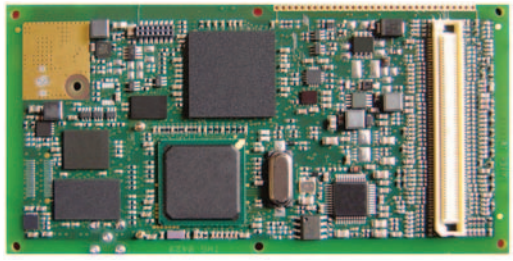
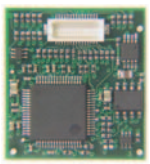


Transceiver Side



Baseband Side



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to voice communications for managing and coordinating activities on a mine site, a digital radio network can also be used for safety, security, GPS location and temporary communications in areas where permanent communications systems aren't established yet.

While TETRA and P25 both provide improved voice quality, integrated data and trunking capability at this stage, TETRA can also support twice as many voice paths in the same amount of spectrum — advantageous for a large number of users and limited spectrum. If a sizeable area needs to be covered, such as in a country like Australia, P25 provides more coverage per base site established, reducing associated costs.

Ongoing Production

Boddington Gold Mine expects to have a life of 20 years or more, and in the life of a mine, the ongoing production stage is the longest. Therefore, the mine's digital radio system must be scalable, proven and provide system longevity. The mine's P25 digital radio network covers the mining belt to a depth of 620 meters and a distance of about 34 kilometers long and 10 kilometers wide. The flexibility of the digital technology means that as the size of the Boddington site increases, so does its radio coverage. Mobility management also allows transparent roaming capabilities between areas of coverage, such as mine to village, without the need to change the channel on the radio.

The population of workers on a mine site in full production is less than during the development stage. The reduction in the number of groups requires a smaller number of talk groups and fewer subscribers on the system. Each of the groups still needs its own virtual communications channel, which favors the continued use of the digital trunked technology. Although the system capacity is significantly reduced compared with the capacity at the development stage, the coverage requirement stays the same. The flexibility of digital radio networks allows the existing sites and communications towers to be maintained throughout the life of the mine even with changing communications demands.

The greatest role that the communications system can play during this stage of the mine life cycle is to enable the most efficient use of assets and manpower and reduce consumables and ongoing costs. Digital two-way radio systems with integrated data offer high-quality voice calls and emergency alarms, as well as status and location data to be sent automatically, allowing computer-controlled dispatch of vehicles and personnel. Individual paging and private calls between units is also supported.

9 Questions for Mining Communications

Following are nine questions mine sites should ask to help pick the best digital standard:

1. Is the mine geographically constrained or a wide area, covering roads and railway lines?
2. Are there requirements for temporary or deployable coverage systems?
3. How much will the coverage area change during the lifetime of the mine, and how does that impact the system requirements over the long term?
4. Are voice talk-group calls, as well as private calls or telephone-interconnect calls, required?
5. Is GPS location information, status, text messaging or database access for remote computers required?
6. Is emergency call capability required?
7. Is there sensitive information being communicated within some groups in the system that would require encryption?
8. Is there a requirement for full-duplex communications for some calls?
9. Which RF bands are available and appropriate for coverage in the area of the proposed mine?

Shutdown and Rehabilitation

Communications are used during this stage to coordinate the rehabilitation process and ensure security and safety. The communications sites are the last to be removed before the land returns to its natural state.

Choosing a Technology

How do mine sites choose TETRA versus P25? There are many different requirements for a communications system that support an efficient and safe mine. Requirements for safety features, coverage, product durability and system reliability are non-negotiable. Mines deciding which digital two-way radio network standard is best should consider the most significant differences between TETRA and P25 technology.

Spectrum efficiency. The TETRA standard is twice as efficient as P25. TETRA can support four voice paths in a channel compared with two voice paths supported by P25. Phase 2 of P25 — expected in 2011 — will bridge the gap, offering four voice paths as well.

Migration. The P25 standard can operate in digital and analog modes, while the TETRA standard defines only digital operation. Therefore, the migration from an analog legacy system to a digital system is seamless when moving to P25 and a major upheaval when moving to TETRA.

Boddington's migration from its analog radios was easily managed because the P25 digital radios are programmed to receive both analog and digital signals. This instant compatibility ensured no gap in productivity at the mine.

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patchy and unreliable analog radio system can be upgraded to a new digital system to ensure voice quality is maintained across the network range. P25 networks operate at the same power level as current analog systems, while the TETRA equipment operates at lower levels. This will not impact single-site systems where the desired area of coverage is geographically limited. However, for wide-area systems and in-building penetration, fewer P25 sites will be required than TETRA sites to provide equivalent coverage. Fewer sites mean lower establishment, operational and maintenance costs for the user.

Available frequency bands. There is currently much greater flexibility in the choice of frequency bands available for P25 equipment than for TETRA systems in some countries.

Mines deciding which digital two-way radio network standard is best need to consider the differences between TETRA and P25.

Full duplex/half duplex. The method of channel access used by TETRA is called TDMA, which effectively shares the channel on a time slot basis. P25 uses FDMA, in which the channel is subdivided into narrower channels, and these are shared among users. This difference means that it's possible to support full-duplex voice calls on a TETRA system, but not on a P25 system.

In general, Australian mines are leaning toward the P25 standard because it is considered the better fit across the life cycle of a mine based on its greater flexibility in supporting conventional as well as trunked modes of operation, ease of migration from legacy analog systems, greater coverage and building penetration, and its greater RF band availability. However, P25 and TETRA are serious contenders over every analog system across the Pacific region and around the world. And both provide significant advantages compared with existing analog systems for the rapid growth of the mining industry. ■

Philip Sidebottom is responsible for managing and supporting Motorola's radio communications systems products across the Asia Pacific region. He has more than 30 years of experience in the industry, working in development, manufacturing, quality, marketing and product support. E-mail comments to editor@RRMediaGroup.com.

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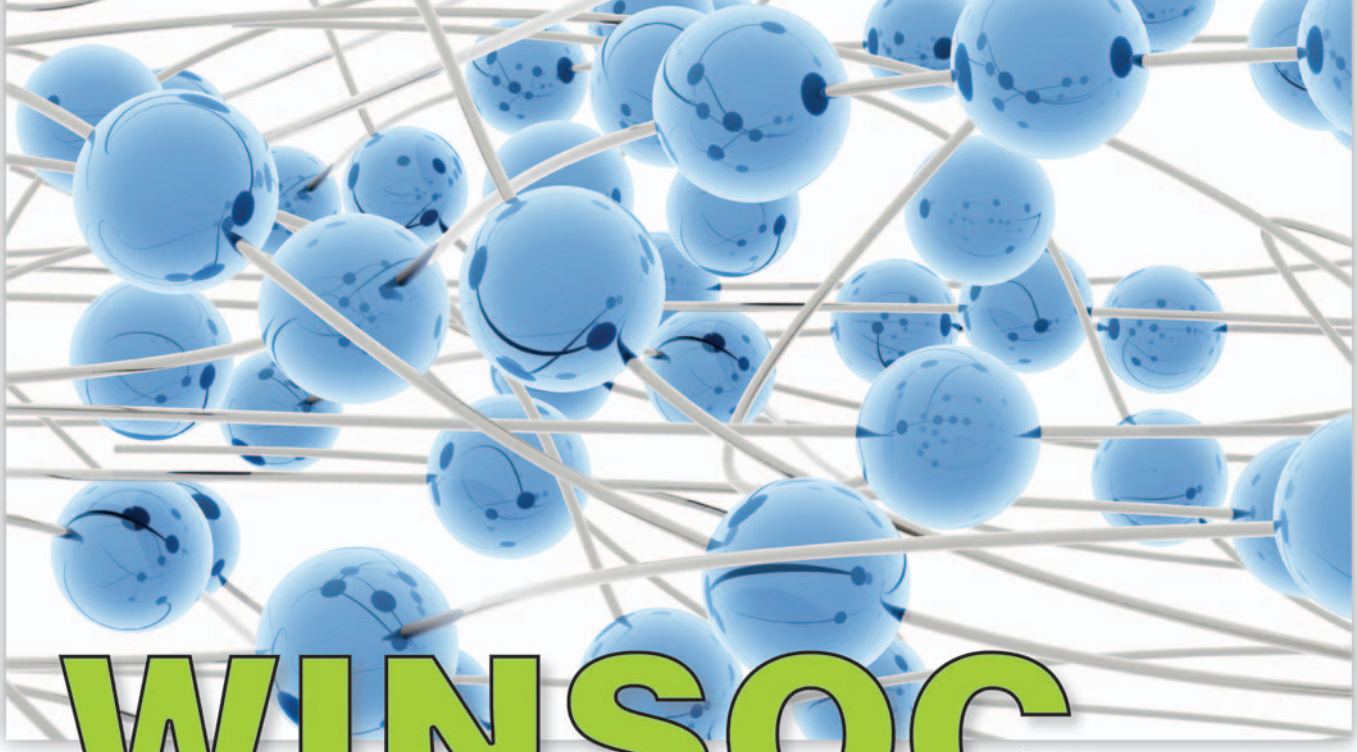

WINSOC Breathes Life into Sensor Networks

EU program creates biologically inspired network design for emergency applications.

By Maria-Angeles Grado-Caffaro

Wireless Sensor Networks with Self-Organization Capabilities (WINSOC) for critical and emergency applications, a project funded by the FP6 information society technologies program of the European Union (EU), is already delivering results. WINSOC started in September 2006 and will run until the end of February 2009. The project goal is to improve the performance of sensor networks with a biologically inspired design using living organisms as a model to study and conceptualize problems in a variety of fields, breaking away from other incremental sensor-design approaches.

The wireless sensor networks (WSNs) are made up of miniature, low-power and inexpensive devices that sense, compute and communicate and are deployed throughout a physical space. In fact, the devices gather, share and disseminate information about the instrumented environment, monitoring parameters distributed in the environment. These parameters are related to a variety of applications such as infrastructure security, chemical and biological hazard detection, natural hazards, and the broad area of environment including disaster relief, emergency, patient and habitat monitoring, traffic control and any other unexplored application/field that could be part of a pervasive scenario.

The emergence of sensor networks has been possible because of advances in the design and fabrication of very large-scale integration (VLSI) circuitry that enables the production of small, low-power sensors that make up a network. Advances in nanotechnology make the sensor network arena more promising and challenging. The sensors would become part of the manufacturing process for materials and objects and take the energy from their environment. The vision would continuously evolve, requiring new information technology (IT) architectures and design paradigms. In act, WSNs promise to revolutionize our ability to sense and control a variety of physical environments and help create a nascent infrastructure for a technical, economic and social revolution.

Nevertheless, more needs to be done before wireless sensor networks reach their potential. These networks' unique attributes, such as limited power and memory, computational resources, and a dynamically varying network configuration, make it difficult to address WSNs in the same way as conventional networks. Current paradigms in sensor networks, although scaled and adapted, reflect well known and consolidated methodological approaches borrowed from telecom networks that have

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WINSOC targets applications that would be used during wildfires and landslides.

been developed to cope with totally different requirements with respect to a sensor network, according to WINSOC research.

WINSOC introduced a new model to address conflicting requirements appearing in a sensor network. The paradigm includes low complexity in sensor devices, high reliability of the decision/estimation/measurement of the network as a whole, long-term lifetime, high scalability and resilience to congestion. To this end, WINSOC also introduced a systemic design approach that views a sensor network as a system made up of elements evolving in time, mimicking biological systems. The accuracy and reliability of the system is achieved through proper interaction among nearby sensors, which thanks to a protocol-free and simple local coupling mechanism, can enable reliable decisions and estimates with minimal energy consumption and with no — or greatly reduced — need for data fusion. This approach allows building distributed detection and estimation capabilities, which are key to understand a WSN scenario.

"WINSOC develops an innovative design methodology where the high accuracy and reliability of the whole network is achieved by introducing a suitable coupling among adjacent, low-cost sensors, enabling a global distributed detection or estimation more accurate than that achievable by each single sensor," says Paolo Capodieci, project coordinator from Selex Communications. "In this way, we eliminate the need for sending all the data to a fusion center."

Emergency Applications

By drawing inspiration from processes found in biology to devise sensor networks, WINSOC improves performance and competitiveness in both generic network sensor design and in the broad area of environment and emergency applications. Three system-level simulators have been developed and tested for prediction and detection of landslides and monitoring temperature fields for forest detection and fire risk estimation.

The key to the project is using distributed algorithms. The uniqueness of the research is decentralizing the decision making to the node level. "We have obtained a distributed consensus mechanism that allows a set of nodes to reach globally optimal estimation or detection tests, without requiring a fusion center, in the case where the whole network is observing a common event," Capodieci says. This approach provides full scalability, low vulnerability, robustness to duty cycle and low congestion. The system is particularly attractive for detection and estimation applications.

"We also are developing a sensor Web that will allow both applications and services to access sensors of all types over the Web; this aspect will be particularly important to the wireless sensor network community," Capodieci says. Sensor Web is a technology conceived in 1997 at the U.S. National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) in California and can be described as a distributed sensing system where information is shared globally and used by all networked platforms. The objective of a sensor Web is to extract knowledge from the data it gathers and use it to intelligently react and adapt to surroundings.

WSN design is generally application driven, and specific application requirements, such as environment and emergency response, determine how the network behaves. Environmental risk management has emerged as one of the key application areas for sensor networks. Recent advances in sensor design and development make the deployment of large-scale networks for the in-situ monitoring of natural phenomena with a spatial-temporal density that allows decision-support systems to reach new levels of operational standards in risk assessment, disaster prevention and emergency response more affordable. The scale, complexity and reliability requirements of such systems combined with the critical importance of the risk management operation pose a unique set of challenges that existing sensor designs have difficulty meeting.

WINSOC targets applications that would be typically used during wildfires and landslides. The research concerning fires is based on an integrated environment for the development and evaluation of data-driven applications for wildfire risk assessment detection and tracking. The implementation of this environment comprises the FARSITE fire-modeling tool and the CASTALIA open-source sensor network simulator, and the environment has been used to evaluate the performance of sensor network protocols in realistic wildfire scenarios played out over specific geographic areas. Landslides and avalanches in Europe, and all over the world, cause important

"We are driven by a commitment of translating our research results into a product that can sell."

— Paolo Capodieci, WINSOC project coordinator

WINSOC Partners

Selex Communications (Italy)

University of Rome "La Sapienza" (Italy)

Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Intracom (Greece)

Commissariat per l'Energie Atomique – LETI (France)

Czech Centre for Science and Society (Czech Republic)

Dune (Italy)

Technical University of Catalonia – UPC (Spain)

Indian Space Organization (India)

Amrita University (India)

Sapienza (Spain)

economic and societal losses, and the number of casualties as a direct or indirect consequence is increasing.

In WINSOC, the landslide application is being developed in India at Amrita University. The annual loss due to landslides in India is around US$400 million, making the country an ideal location to develop the application study. The network architecture specific to landslide scenarios is constructed with a lower level of wireless network nodes connected to a column of geological sensors. These nodes are then connected to a hierarchy of upper-level wireless network nodes that forward the data to a central data-collection point. From there, the data is sent to a local analysis computer and then forwarded over the Indian Space Research Organization's (ISRO) Edusat satellite and village resource center satellite network to a more sophisticated landslide data processing and modeling center at Amrita University.

The design of a prototype node is already completed, and the work teams led by Selex Communications have begun development. "We are driven by a commitment of translating our research results into a product that can sell," Capodieci says. "That is why we are going to articulate the node implementation in terms of ability to adapt to different operational scenarios, flexibility meaning no intrinsic constraints, reconfiguration capability, and in terms of suitability for multiapplication overlay that means parallel running procedures; and also suitability for potential networking enabling clustering. In this way, we will be able to actually introduce the knowledge produced by WINSOC into the marketplace." ■

Maria-Angeles Grado-Caffaro is a research scientist and consultant in physics and related technologies who works as exploitation dissemination manager for the WINSOC project. E-mail comments to editor@RRMediaGroup.com.

A Data Sharing Oasis

An EU-backed project develops new technology to allow emergency information exchange between different network types.

By Jean-François Gallet, Edith Wilkinson and Stephan Ribot

The ultimate purpose in any disaster or emergency is to deliver a rapid and coordinated response. But when the best response demands action from a range of user groups and organizations, it's crucial to ensure that everyone has easy access to timely and consistent information. The aim of the European Union (EU) FP6 Oasis project is to allow emergency services to interoperate by sharing information. Currently, emergency communications solutions are provided on a case-by-case basis. Collaborating agencies, such as police, fire and health organizations, use their own communications means, which are generally not interoperable with the other deployed networks. To achieve efficient crisis communications, all users require access to voice and data services in a secure and timely manner through a multitude of access technologies, including legacy systems and guaranteeing:

- Interoperability among different core and fixed/mobile access network technologies, services and disaster management systems;
- The capability to exchange increased volumes of data through deployable and mobile access networks; current technologies are only capable of sending short data messages, but it's highly desirable to enable the transmission of images to and from mobile users.

The Oasis project has tackled the issue of communications tools, and the proposed solution will assist professional mobile radio (PMR) users to share information more effectively.

Network Architecture

The Oasis consortium designed the tactical situation object (TSO) for carrying a description of a situation between systems. The TSO is a structured set of data that describes an event, resources engaged and tasks in progress. The TSO encoded in XML assembles specific information about a disaster in code form and allows it to be communicated across information technology (IT) networks. The codes used are taken from a dictionary that is part of the TSO definition; they ensure that data transfers are unmistakable. The TSOs can be transmitted and displayed in the recipient's preferred format, language and platform.

Oasis also designed an emergency communications architecture and developed a first version of a communications platform. The main focus of the project is to create an open, robust, generic and modular solution that could be used in a simple accident, as well as in a major emergency and disaster operation. Using a mix of existing communications network infrastructures, as well as taking advantage of new technologies, is important. The architecture is based on an advanced common IP-based core network, allowing the use of multiple heterogeneous networks, such as satellite, Internet, GSM, TETRA and TETRAPOL technologies. It also supports advanced voice and data services, and a plug-and-play architecture makes distributed voice and data services and key legacy systems available to users.

The network is divided into core and access — TETRAPOL, UHF and GSM — networks. This simplifies the

use of different technologies and makes a clear distinction between the legacy networks and the standardized IP core network infrastructure. The split between access and core may also represent the boundaries between different network owners and administrators, as well as between different organizations and nations. The approach is useful even though the core network may be split into several administrative domains and use different underlying network technologies.

The Oasis architecture uses existing communications links such as GSM and GPRS. Nonetheless, the design also allows the network to function if an existing infrastructure has been affected by a disaster or where there isn't an existing system.

Communications Trials

The Oasis project trialed its proposed solution on several occasions. For the first prototype trials simultaneously run in Shrivenham, United Kingdom, and Velizy, France, in September 2006, an extensive communications platform was developed using a mix of existing network infrastructures, as well as taking advantage of new technologies. A set of communications services was developed, prototyped and integrated to serve as a test bench for the first prototype software and hardware components.

Various components of the Oasis system were used during the pre-operational system version 1 (POS 1) field operation, including a head mounted display (HMD), ad hoc network nodes and a noise-reduction earpiece. The field operation is part of the tactical command level that manages the front-line operations and on-scene emergency responders. Two ad hoc networks were established during the trials to connect field users to the Oasis network. The field users could access all of the information and applications available on the Oasis network including VoIP, Internet access, e-mail and video over IP via the high-bandwidth

Oasis Consortium Members

EADS
BAE Systems
Ericsson
Fraunhofer-Gesellschaft
Elsag Datamat
Cranfield University
Thales Norway
Edisoft
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Russian Academy of Science
SINTEF
Ministry of the Interior, Czech Republic
iMass

— up to 54 Megabits per second (Mbps) — ad hoc networks.

The HMD was used in the field as a way of presenting information to an operator in unfamiliar or unknown areas or where visibility was poor so text and graphics could be viewed and exchanged with a control room operator. Several cameras were deployed during the field operations, providing live video from the incident site back to the Oasis headquarters. The fire tactical headquarters was a mobile vehicle deployed to an incident/field operation site. The fire tactical network was further extended by deploying ad hoc nodes with associated field equipment such as laptops and cameras. A further tactical unit was established using a 3G connection, allowing a field user with an Oasis laptop to drive around the area.

The second Oasis prototype trials consisted of a series of trials held from October 2007 to July 2008, each evaluating different aspects of the overall Oasis solution. None of the trials deployed a network of the scale of the first trials. Many of the networks were based in office environments using LAN technology similar to typical control rooms and strategic command headquarters; this time, situation awareness rather than communications capabilities was evaluated.

Several of the POS 2 trials resulted in novel communications solutions. The first example is from the Filton, United Kingdom, trial where firefighters were sent on a search and rescue mission in an underground bunker. Voice, data and video communications were supported between firefighters and their commander using a self-deployed ad hoc network. The firefighters carried ad hoc relay nodes and deployed them around obstructions in the bunker that would otherwise prohibit line of sight RF propagation. The ad hoc network supported a conventional IP service so that Microsoft's Netmeeting video conferencing software could be run in the terminal equipment.

The Shropshire County, United Kingdom, trial used a relatively low-risk LAN, but nevertheless deployed a network management system so that problems could be detected and repaired quickly and the trial wouldn't be delayed. A May trial in a remote location in Romania combined several network technologies used during emergency operations: a TETRA local network was deployed on the location of the simulated incident, and a satellite link was used for the communications between the fixed control room located in the closest big city and the mobile control room established near the incident. A gateway between the two networks was also deployed inside the mobile control room.

Sharing Information

Sharing information between different applications and different PMR

For More Information
visit www.oasis-fp6.org

networks is about enabling the different technologies to interface with one another. To help meet this aim, EADS developed middleware that effectively hides the communications network interface from an Oasis application. The middleware also protects the radio network from the poor use of radio resources and prevents any application from overloading the network with untimely data requests. The initial solution was developed for TETRAPOL, but it was followed by connectors to support other PMR technologies such as TETRA, as well as public networks such as 2G, 3G and Wi-Fi. Successful trials have already taken place with TETRAPOL, TETRA and GPRS networks. The most recent tests in October 2008 show that different communications networks — in this case TETRA and TETRAPOL — can exchange data using the same standard mail application.

Emergency-response organizations require systems that allow different responders to interact together and with remote teams. They also need rapidly deployable assets such as mobile vehicles, satellite communications or tools to operate in hazardous buildings or when communications infrastructure has failed. Moreover, the ability to quickly establish and function without an existing infrastructure is also crucial to users, as well as the possibility to extend the range with the use of ad hoc networks. All of these issues have been considered within the Oasis project and are now integrated to wider research programs or exploitation strategies by the respective consortium partners. ■

Jean-François Gallet works in the mission systems and solutions (MSS) business in EADS Defence and Security in France. In the Oasis project, he coordinates the technical activities of the 15 project partners, including the definition of the communication and IT architectures. Gallet helped define the Oasis trials and was involved in the deployment and in-the-field activities for the Romanian trial.

Edith Wilkinson currently works for the Security and Resilience Group of Cranfield University. As a senior project manager, she serves as a neutral interface between users and industry developing future solutions for disaster management information systems. In the Oasis project, Wilkinson coordinates user evaluation and dissemination activities.

Stephan Ribot works for EADS Secure Networks in France as system architect. In the Oasis project, he helped define the Oasis trials, and the EADS solution that provides data services for radio users was deployed during several trials. E-mail comments to editor@RRMediaGroup.com.

Batteries and Power Supplies

In this issue, we look at a variety of batteries and power supplies. For more information on a product, please contact the appropriate company via its Web site at the end of each listing. Be sure to mention that you found the information in *RadioResource International* magazine.

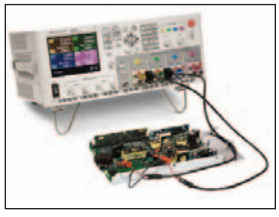
Active Power

Active Power introduced the PowerHouse power protection system. The product can contain diesel generators, the company's CleanSource

uninterruptible power supply (UPS) systems, switchgear, power distribution units and more. The system meets users' needs for modular infrastructure expansion, fast deployment, disaster recovery and temporary system support, company executives said. Visit the Web site www.activepower.com.

Agilent Technologies

The N6705A DC Power Analyzer provides productivity gains for sourcing and measuring DC voltage and current into the device under test (DUT) by integrating up to four advanced power supplies with



digital multimeter (DMM), scope, arb and data logger features. The analyzer eliminates the need to gather multiple pieces of equipment and create complex test setups including transducers, such as current probes and shunts, to measure current into a DUT. There is no need to develop and debug programs to control a collection of instruments and take useful measurements, because all functions and measurements are available on the front panel of the analyzer. Visit the Web site www.agilent.com.

Analytic Systems

Analytic Systems introduced the PWS1503, part of the PWS series of high-performance power supplies with a range of 110, 220 or auto-ranging 85 – 264 VAC input and 12, 24 or 48 VDC output. The product features a power range of 300 watts up to 1.5 kilowatts, as well as a variety of ruggedization packages

such as IP67 and waterproofing. Military connectors and options for battery backup can be added. The U.S. Army versions — with more than 7,000 units in the field — have less than a 1 percent return rate. The company offers low electromagnetic interference (EMI) for use with sensitive electronics. Visit the Web site www.analyticsystems.com.

Argus Technologies

The CXDF 24 – 48 volt DC-to-DC converter system provides power density and up to 148 amperes of output current in a 23-inch, two-rack unit (2RU) shelf. The converter provides 48 VDC output from a standard

24 VDC power system for a variety of dual-voltage applications, including GSM overlays and microwave support. High-temperature operation makes the converter ideal for remote and harsh installation environments, company officials said. The system controller provides remote Web access for advanced control and monitoring, as well as simple network management protocol (SNMP) and e-mail alert notification. Visit the Web site www.argus.ca.

Aria Industrial

Aria Batteries offers more than 300 models of replacement batteries for

25 brands of two-way radios, including NiCd, NiMH, Li-ion and Li-polymer versions. The batteries' capacities are equivalent to or higher than the original, company officials said. The batteries feature short circuit and temperature protection, and at a customers' request, batteries can be made suitable for low temperatures. All batteries have a one-year warranty. Visit the Web site www.ariabattery.com.

Astrodyne

Astrodyne introduced UL508-listed ultra-thin industrial DIN rail mount switching supplies for industrial control and embedded systems applications. Features include 240 watts of output power, universal input of

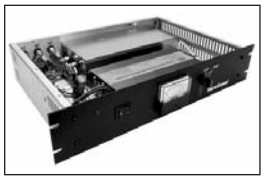
90 – 264 VAC, 24 and 48 VDC models with active power factor correction (PFC) of less than 0.93 and 93 percent efficiency, over-voltage and over-temperature protection, free air convection cooling, and a 2.48-inch wide metal casing. The supplies also feature a power-good LED indicator and output adjustment potentiometer, operating range of -25 to 60 degrees Celsius without forced cooling or output power derating, a DIN Rail TS35/7.5 or 15 compatibility; and UL508 and TUV EN60950-1 specification compliance. Visit the Web site www.astrodyne.com.

Cadex Electronics

The C8000 is a battery testing system capable of performing complex lifecycle tests, Cadex executives said. The system can simulate battery runtimes of two-way radios, power tools, digital cameras or computing devices by capturing the current profile and then applying the load on the test battery for reply. The system tests the function of a Li-ion charger, verifies battery safety circuits and reads SMBus registers. Each channel delivers up to 10 amperes and 36 volts. The system can run as a stand-alone unit or with PC BatteryLab software. Total power is 400 watts on charge and 320 watts on discharge. Visit the Web site www.cadex.com.

DuraComm

The RU2-4012-BMS is a power supply and battery management system in one rack mount unit. The system provides 40 amperes of power and 24 amperes of battery charging, along with a volt/ampere meter and AC fail indication on the front panel. The unit transfers to the battery backup when AC power fails and monitors an external battery backup for optimal charging and maintenance with a built-in smart charger, low-voltage disconnect and diode isolation with a switch selectable in 110 or 220 VAC. The unit also features power factor correction (PFC). Visit the Web site www.duracomm.com.



Eaton Corporation

The Eaton 9135 uninterruptible power supply (UPS) delivers up to 6 kilovolt-amperes of clean double-conversion power in a 5.14-inch (3U) enclosure. While operating up to 97 percent efficiency, the UPS uses less energy and dissipates less heat, Eaton officials said. The product features wide input voltage that eliminates dependence on batteries to correct power fluctuations and hot-swappable battery and control modules for quick removal and replacement without powering down or interrupting connected equipment. The UPS also offers extended runtime options to power essential systems for more than an hour. Visit the Web site www.eaton.com.

EF Johnson Technologies

EF Johnson introduced a Li-ion battery for its ES series of portable radios. The battery weighs 227 grams and is lighter and thinner than NiMH batteries, company executives said. The battery lasts 12 hours on a charge. The company also introduced a rapid battery charger, which can charge a portable radio battery in one hour, along with a line of trichemistry chargers, which are capable of charging NiCd, NiMH and Li-ion batteries. Visit the Web site www.efjohnsontechnologies.com.

Honeywell Batteries

Honeywell Batteries products for M/A-COM P7100/P7200 radios include a high-capacity 3.6 ampere-hours Li-polymer battery and a suite of multichemistry chargers to support the technology used in the batteries. The battery provides up to 20 hours

of run time – an increase from existing nickel-based batteries, company executives said. The battery also provides more than 650 cycles, has no memory effect and is lightweight. A variety of chargers, including a single bay, four-bay and DC charger, are available. Visit the Web site www.honeywellbatteries.com/p7100.

Imark

The DC2412-20 is a full specification DC-to-DC converter, which operates by converting 24 to 12 VDC at full 20 amperes load in mining,

transport, industrial, agricultural, marine, electrical and military environments. Built-in features protect the converter from user tampering or incorrect installation and include reverse polarity, over current and over-temperature protection. The compact size, in addition to a slight bending of the mounting tabs and the contoured shape and full sealing against the ingress of dust and moisture, allows for easy installation in restricted spaces, on uneven surfaces or in exposed locations, Imark officials said.

Imark also introduced the 5020RM, a regulated power supply that operates from a 110 or 240 VAC power source and provides a 13.8 VDC output to operate 12-volt (nominal) equipment. The power supply includes over-voltage protection, fold-back current protection, short circuit protection and large filter capacitors to provide a low noise output. Visit the Web site www.imark.com.au.

Kenwood

The KSC-326/256/356/316 are six pocket multiple chargers designed to be used in an "inline" layout with a label space for each pocket. The optional KMB-30 allows for versatile wall mounting. The units can charge a radio/battery/belt clip combination, in addition to charging a battery by itself. The chargers feature built-in overcharge protection, independent circuit design for each pocket and RF immunity. Visit the Web site www.kenwood.com.

Majorpower

Majorpower introduced the MDC DC-to-DC converter. The MDC series rack-mounted system offers conversion capabilities for multiple voltage arrangements. Users can combine multiple units for increased capacity and fault tolerance reliability. The regulated power with integrated filtering, stability and output protection is suitable for many critical applications throughout telecom, cable, IT and utility industries, officials said. The converter is available in 24-, 48- and 130-volt configurations. Visit the Web site www.majorpower.com.

Multiplier Industries

Multiplier Industries released replacement batteries for the Motorola GP300/LTS2000 radios, as well as high-capacity models higher than the OEM that offer 40 percent more talk time, company officials said. The batteries use performing cells and are constructed with a rugged polycarbonate housing. Models include the M9628HX NiMH 1.8 ampere-hours and the M9628H NiMH, 1.3-ampere-hour, high-capacity batteries, neither of which are available from the OEM. The M9628 NiCd 1.2 ampere-hours standard-capacity battery and the M9701 NiCd 1.2 ampere-hour, intrinsically safe battery approved by Factory Mutual for use in hazardous locations are also available. Visit the Web site www.multiplier.com.

North American Battery Co. (NABC)

NABC released four replacement batteries for its UltraLast family radio service (FRS), general mobile radio service (GMRS) and two-way radio battery line. The battery line offers a replacement battery for the following models: the Motorola KEBT-071-B/072-B and HKNN4002A, Midland's BATT-6R, Uniden BP-38 and Cobra FA-BP. Visit the Web site www.batterymatch.com.

ReliOn

The T-2000 hydrogen fuel cell is designed specifically for communications backup power applications within the government, telecommunications and utility sectors. The fuel cell uses patented Modular Cartridge Technology for hot swappable high reliability, ease of maintenance and simplicity of design, ReliOn executives said. The fuel cell provides a flexible configuration from 600 watts to its full-rated, 2-kilowatt capacity in one chassis and is scalable to provide outputs up to 12 kilowatts for a variety of site requirements. Visit the Web site www.relion-inc.com.

Tait Radio Communications

Tait introduced low-weight,

high-capacity Li-ion battery packs for the company's range of analog and digital portable radios. The conventional and trunked analog TP8100 radio series is enhanced with a new Li-ion pack with 2.5 ampere-hours capacity, which allows for a 20-percent greater shift life than existing battery packs, Tait officials said. The Project 25 (P25) TP9100 Li-ion battery series is 100 grams lighter with the pack, with radio weight totalling 459 grams including the battery. Intelligent chargers ensure long service life and maximum shift life for both Li-ion and NiMH battery packs, officials said. Visit the Web site www.taitworld.com.

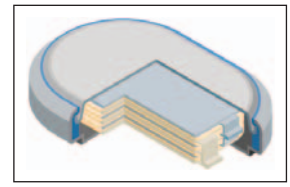
Tripp Lite

The SU8000RT3UN50 SmartOnline hot-swappable modular uninterruptible power supply (UPS) system

provides 8 kilovolt-amperes power protection for mission-critical network and telecommunications equipment in 6U of rack space. Online, double conversion technology produces pure sine wave output with zero transfer time to battery, which prevents damage, downtime and data loss by isolating connected equipment from power problems. A detachable protocol data unit (PDU) with manual bypass switch enables the UPS power module and battery pack to be removed for maintenance without interrupting power to connected equipment. Features include a Hubbell twist-lock 50-amp input plug and a removable cordset if professional hardwire installation is preferred. Visit the Web site www.tripplite.com.

Varta Microbattery

The NiMH high-performance Button Cell line for automotive and server back-up applications includes the V500HT. The latest product can operate in temperatures up to 85 degrees Celsius, with a life expectancy of four to six years. The battery features an overcharge capability comparable to standard button cells,



no memory effect, environmental compatibility, and NiMH technology that guarantees reliability and safety, company officials said. Visit the Web site www.varta-microbattery.com.

VYCON

The VDC Direct Connect DC power systems provide continuous backup power to broadcast applications. Offering up to 220 kilowatts of DC power within a cabinet, the VDC provides ride-through protection to transfer to a standby generator. The VDC flywheel system features a 20-year life, optimized power electronics and is the first line of defense against power disturbances by saving uninterruptible power supply (UPS) battery life for prolonged power outages. The system's slim footprint occupies only a fraction of the floor space of other products, and the unit offers a low total cost of ownership, company officials said. Visit the Web site www.vyconenergy.com.

Wilmore Electronics

The Model 1620H-74-13-30 DC-to-DC converter provides an isolated, regulated and well-filtered 13.6 VDC output from 74 VDC electrical systems on locomotives and other rail vehicles. The maximum output current rating is 30 amperes, giving the converter up to 400 watts of output power. Featuring the company's input-transient protection system and rugged construction, the converters are designed to power voice/data radios, train control equipment and other sensitive electronics in the harsh environment onboard railroad vehicles. Additional features include an 85-percent conversion efficiency, output over-voltage and short circuit protection, and a -40 to 70 degrees Celsius operating temperature range. Visit the Web site www.wilmoreelectronics.com.

Winco

Winco's PSS line of standby generators for emergency backup power applications is available from 8 to 75 kilowatts. All sizes feature premium engines using economical clean burning L.P. vapor or natural gas and have a 12-volt electric start operation. The generators also come with sound attenuated weather protective enclosures constructed of galvannealed steel with powder paint coated and baked finish. The generators offer automatic operation when coupled with optional automatic transfer switch, critical grade silencers, are emissions compliance and UL approval. Visit the Web site www.wincogen.com.

Wi-Fi Positioning Solution

Ascom Wireless Solutions and **Ekahau** announced a Wi-Fi positioning solution using Ekahau's location-based services with Ascom's i75 voice over Wi-Fi (VoWi-Fi) handset. The system is ideal for locating people in emergency situations, according to company officials. The system enables locatable handsets within the coverage area of an existing indoor or outdoor enterprise Wi-Fi network. The solution does not require additional infrastructure components, and the open application programming interface (API) accesses real-time location information from any software application and enables location-based services such as nearest-person-to-task, workflow improvement and asset-tracking applications. Visit the Web sites **www.ascom.com** and **ww.ekahau.com**.

Mobile Computing Terminal

RadioMobile introduced the IQ Mobile, a mobile computing terminal to provide fleet owners, managers and end users with efficiency in mobile data management. The unit provides mobile messaging and status updates while interfacing

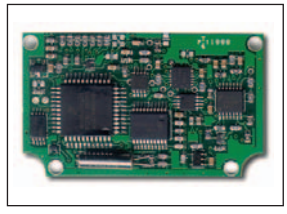
with applications such as CAD, mapping, AVL and records management systems (RMS). The terminal provides the fundamental engine for conducting law-enforcement queries such as National Law Enforcement Telecommunication Systems (NLETS), National Crime Information Center (NCIC) and others, according to company officials. The company's IQ Map application is an integrated feature, along with a touchscreen, multiple day and night color combinations, and multiple sound selections. Visit the Web site **www.radiomobile.com**.

P25 Digital UHF Radio

Relm Wireless introduced the KNG P400, the company's entry into the Project 25 (P25) digital UHF (380 – 470 MHz) band radio market. The 5-watt portable radio has an FCC-certified power rating of 5.7 watts, power consumption for 18 hours of uninterrupted duty cycle, a Mil-Std-800-F rating and 512 channels and up to 32 zones. Other features include menu-driven programming, over-the-air rekeying (OTAR) and cloning, software-driven upgrades, National Institute of Standards and Technology (NIST)-certified FIPS 140-2 encryption and IP-67 submersible rating. Visit the Web site **www.relm.com**.

Plug-In Encryption for Radios

Midian Electronics released high-level hopping code and voice inversion scramblers for HYT and Tait radios. The hopping code scramblers use the frequency hopping type of rolling-code encryption for high security, company executives said. All scramblers use Midian's Kryptic signaling format for features such as automatic number identification (ANI), selective calling, deadbeat disable and over-the-air-reprogramming (OTAR) of security codes. Midian's TVS-2-H1 and VPU-15-H1 are for the HYT TC-780 and TM-800 radios. The TVS-2-TP8 and the VPU-15-TP8 are for the Tait TP-8100 series radios. Visit the Web site **www.midians.com**.



Locomotive Radio

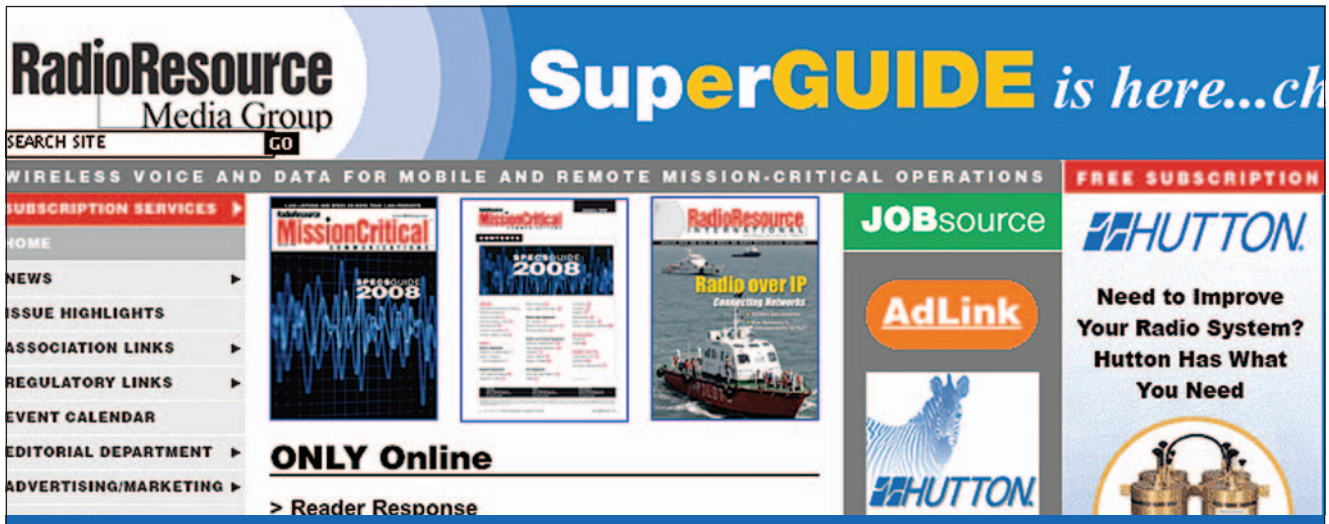
Ritron introduced the Locomotive Radio, available in one- and two-piece remote head models. The radio features adjustable RF transmit power output of 10 to 50 watts, is capable of wideband (25 kilohertz) or narrowband (12.5 kilohertz) operation, and is upgradeable to NXDN FDMA 6.25-kilohertz digital operation with optional plug-in PCB. The unit's LED display has automatic dimming in low-light environments and provides automatic high voltage standing wave ratio (VSWR) alerts. The speaker is protected in a rugged, all-metal enclosure that provides maximum durability, Ritron executives said. Visit the Web site **www.ritron.com**.

Lightning Control Head

EF Johnson Technologies introduced the Lightning Control Head for its Project 25 (P25) compliant ES series mobile radio. Key features of the control head include dash or remote configuration, 320-by-80-pixel display resolution, electroluminescent three-line text display with 16 alphanumeric characters and five soft keys. The control head uses technology found in military applications, according to company officials. The ES series mobile radios include P25 trunked and conventional operation, interoperability with SmartNet/SmartZone, enhanced P25 vocoder, over the air rekeying (OTAR) and reprogramming, and support for up to 864 talk groups. Visit the Web site **www.efjohnsontechnologies.com**.

Backhaul Radios

Radwin introduced the Radwin 2000 radio series, carrier-class, high-capacity sub-6 GHz radios for IP and WiMAX backhaul. The system offers operational expenditure (OPEX) savings, significantly reduced cost of ownership, and easy installation and maintenance, company officials said. The radio system supports multiple bands in a single radio platform,



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provides 50 megabits per second (Mbps) full-duplex net throughput and a range of up to 120 kilometers in various sub-6 GHz frequencies. The system is built on the company's proprietary air interface and is coupled with built-in Diversity, multiple input and multiple output (MIMO), and orthogonal frequency division multiplexing (OFDM) technologies. The system is suited for a variety of Ethernet applications, high-capacity data transport and private networks. Visit the Web site **www.radwin.com**.

Mine Radio, Russian System

Motorola unveiled the MotoMesh solo wireless broadband network solution and the Mine Safety and Health Administration (MSHA)-approved HT750 portable two-way radio. The network operates in the 2.4 GHz frequency band, adapts to high multipath, highly mobile environments and avoids other 2.4 GHz traffic automatically. The product line has a wide range of fixed access points and client devices to meet a variety of industrial needs, company executives said. The radio is approved for use in underground gaseous mines containing methane and includes audio accessories. The company's X-Pand technology ensures audio quality in noisy environments.

Motorola also introduced an intrinsically safe TETRA solution for industrial use in Russia in response to changing European and international legislation, officials said. The new system will encompass the specific needs of companies operating in the Russian oil, gas and industrial markets. The product combines a scalable IP-based TETRA network, with offsite redundancy for ultra-reliable operations and a range of ATEX terminals. The solution extends from standard FM-equivalent radios to highly specified TETRA radios that meet gas and dust specifications. Visit the Web site **www.motorola.com**.

RoIP System

TechMer released the mACS radio over IP (RoIP) system that provides digital VoIP power and a private wireless network. The system uses network bridging technologies to create an instant wireless conference call network for up to 10 radios, cell phones, phone lines or other devices per site. The fully redundant system merges digital data elements and puts them at the command of a radio gateway. The system features full radio and cellular digital interoperability; networking to an unlimited number of land mobile radios (LMRs); interoperability between networks with no technological limitations; unlimited range to two-way radios, iDEN, TETRA, GSM and landline

telephones; and recording and playing back all activity on controlled networks. Applications include command centers, air and sea traffic control, mobile tactical control, two-way radio communications networks, training and simulation communications, communications in harsh environments such as mines and pipelines, and emergency dispatching. Visit the Web site **www.tech-mer.com**.

Quadrature Receiver

The CMX992 quadrature receiver from **CML Microcircuits** uses a superheterodyne receiver section along with intermediate frequency (IF) local oscillator

circuitry and low noise figures. The unit operates from 100 megahertz to 1 gigahertz and supports multistandard digital and analog systems of both constant envelope and linear modulation types. The receiver's inphase/quadrature (I/Q) architecture supports a range of modulation types with various integrated, selectable functions to maintain performance across multiple modulations and bandwidths. The receiver path is an integrated first RF mixer having two outputs to support two external first IF filter choices, then an integrated 2:1 filtered first IF input multiplexer (MUX), followed by video graphics array (VGA) and wideband received signal strength indicator (RSSI) functions to support automatic gain control (AGC) implementation. The receiver operates at 3.3/1.8 volts and comes in a 48-pin VQFN package. Visit the Web site **www.cmlmicro.com**.

Handheld Spectrum Analyzer

Bird Technologies Group launched the

SignalHawk VNA spectrum analyzer, which makes accurate installation, troubleshooting and maintenance of wireless communications systems easy and affordable, according to officials. The equipment measures a variety of RF readings; allows novices to easily carry out spectral monitoring and interference analysis; makes one-port cable insertion loss measurements; and has a high resolution determination of distant to fault. The handheld and portable device was drop/splash tested to military specifications, and has large color indoor/outdoor display with an intuitive user interface. Visit the Web site **www.bird-technologies.com**.

Bullet Adapter

Times Microwave Systems introduced the Times TuffGrip Adapter 7-16 female bullet adapter, designed to facilitate RF testing at a cell-tower top. The equipment

gives users a secure way to grip the device using the patented TuffGrip handle; the adapter is an alternative for current small adapters that are difficult to use when wearing gloves, officials said. The adapter has RF characteristics through 6 gigahertz, is manufactured from stainless steel, has a stainless steel ring for attachment to a tool belt with a carabineer hook and comes with attached end caps to protect the 7-16 interfaces. Visit the Web site **www.timesmicrowave.com**.

Test Sets for DMR Devices

Aeroflex unveiled an option that enables the 3900 series digital radio test set to test and align a range of Digital Mobile

Radio (DMR) devices. The test option supports AM, FM, Project 25 (P25), TETRA, Motorola's High Performance Data (HPD) and DMR digital formats. Using a 12.5-kilohertz channel, the DMR standard uses a two-slot TDMA digital modulation to achieve effective channel bandwidths of 6.25 kilohertz. The product analyzes parameters associated with digital modulation including modulation fidelity and burst profiles. The series is the only testing set with the capabilities to test DMR in the industry, Aeroflex executives said. Visit the Web site **www.aeroflex.com**.

Satellite Phone

The Iridium 9555 satellite phone from **Iridium Satellite** offers complete coverage of the Earth, including oceans, airways and Polar Regions by using the largest commercial satellite constellation, Iridium officials said. The phone features a menu-driven interface, lightweight design, internally retractable antenna, weather-resistant soft keypad, and a menu configurable in 21 languages. It also has improved short messaging service (SMS), additional address book fields, programmable international codes, integrated speakerphone and a mini-USB data port. The phone uses Sarantel PowerHelix antenna technology, which allows for an internal antenna to reduce handset size, officials said. Visit the Web site **www.iridium.com**.

Bluetooth Hands-Free Kit

AdvanceTec Industries presented a commercial pro-installed Bluetooth hands-free kit. The kit is targeted at a variety of users, from first responders to industrial fleet operators, company officials said. The kit includes a 10-watt amplified speaker, an LCD display with caller ID and phonebook, a remote control module, a noise cancellation

microphone and an optional privacy handset. The kit can be used with up to five Bluetooth devices. The kit rapidly charges and provides sound with digital signal processing (DSP) technology. Visit the Web site **www.advancetec.com**.

Airline Data Management

AeroConnx platform by **ARINC** was designed to help airlines manage their fleet data and messages by distributing large blocks of data from onboard data repositories for in-flight entertainment systems, onboard sales, electronic flight

bags (EFBs) and maintenance applications. The platform is an integrated solution for onboard information management, designed to streamline the delivery of operational messages to airline fleets and to automate the delivery and verification of data updates. Key components of the platform include the company's content management system (CMS), AeroSync communications service, the mobile communications gateway (MCG) for wireless connectivity and program manager, open-source software that runs and manages all types of flight applications on any EFB system. Visit the Web site **www.arinc.com**.

Remote Recording

CyberTech International announced a remote-installation service offering for advanced recording solutions. The product is now available for customers worldwide after successful installation in banks and other large enterprises in the Americas and Europe, company officials said. The installation was driven by strategic benefits that included significant cost savings and zero network downtime for secure, seamless execution. The remote installation is the latest product in the company's evolution of remote service features. Visit the Web site **www.cybertech-int.com**.

In-Vehicle PC

Linx, **Microbus'** demountable PC designed for vehicles, offers a built-in car power management system and programmable keys on the docking station to allow users to operate the "blues and twos" and other peripheral devices even when the PC is out of the car. The PC has a built-in TETRA radio card that provides full communications over a TETRA network, in or out of a car. Visit the Web site **www.microbus.com**.

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Events

For more events, visit RRImag.com

13 – 15 January: Project MESA Meeting No. 17, Sophia Antipolis, France. European Telecommunications Standard Institute (ETSI): mesasupport@etsi.org, www.projectmesa.org

18 – 21 January: PTC 2009, Honolulu, Hawaii, USA. Pacific Telecommunications Council: +1 808 941 3789, www.ptc.org

27 – 28 January: ITnT/Expo Comm Austria 2009, Vienna, Austria. E.J. Krause & Associates: Beth Harrington, +1 301 493 5500, ext. 3312, harrington@ejkrause.com, www.expocomm.com

6 – 9 February: Globalcomm India Business 2009, New Delhi. Pragati Maidan: www.globalcomm-india.com

16 – 18 February: APCO International Sixth Annual Winter Summit, Orlando, Florida, USA. Association of Public-Safety Officials: www.apco911.org/wintersummit2009

16 – 19 February: GSMA Mobile World Congress, Barcelona, Spain. Mobile World Congress: +44 (0) 208 879 2422, www.mobileworldcongress.com

24 – 26 February: Expo Comm Mexico 2009, Mexico City. E.J. Krause & Associates: Beth Harrington, +1 301 493 5500, ext. 3312, harrington@ejkrause.com, www.expocomm.com/mexico

1 – 4 March: APCO Australasia, Sydney, Australia. APCO Australasia Headquarters: +61 3 8680 2250, enquiries@apcoaust.com.au, www.apcoaust.com.au

3 – 8 March: CeBIT 2009, Hannover, Germany. Deutsche Messe, +49 511 890, www.cebit.de

17 – 18 March: 11th Annual Arabcom 2009, Lebanon. Arabcom Group. Syed Kashif Noman +971 4 3903511, esm@arabcomgroup.com, www.arabcom.com

18 – 20 March: IWCE 2009, Las Vegas, USA. International Wireless Communications Expo: Stacey Orlick, +1 203 358 3777, stacey.orlick@penton.com, www.iwceexpo.com

29 – 31 March: 10th Annual Asia Pacific Executive Policing Conference, Taipei, Taiwan. IACP: Mara Johnston, +1 703 836 6767, ext. 365, johnstonm@theiacp.org, www.theiacp.org/international/Conferences.htm

5 – 8 April: IEEE Wireless Communications & Networking Conference (WCNC 2009), Budapest, Hungary. IEEE Communications Society: +1 212 705 8900, meetings-conferences@comsoc.org, www.ieee-wcnc.org/index.html

22 – 23 April: BAPCO 2009, London. British Association of Public-Safety Communications Officers: Lucy McPhail, +44 20 7973 6401, l.mcphail@hgluk.com, www.bapco.co.uk

26 – 28 April: 26th IACP European Executive Policing Conference, Tallinn, Estonia. www.theiacp.org/international/Conferences.htm

26 – 29 April: IEEE 69th Vehicular Technology Conference (VTC2009), Barcelona, Spain. IEEE: www.ieeevtc.org/vtc2009spring/

28 – 29 April: WiMAX Forum Congress Asia 2008, Singapore. David Langrish: +44 (0) 208 017 7788, david.langrish@informa.com, www.wimax-vision.co.uk/asia

12 – 15 May: ITU Telecom Africa 2009, Cairo, Egypt. ITU: Fernando Lagrana, +41 22 730 5094, fernando.lagrana@itu.int, www.itu.int

12 – 15 May: SVIAZ/Expo Comm Moscow 2009, Moscow. E.J. Krause & Associates: Beth Harrington, +1 301 493 5500, ext. 3312, harrington@ejkrause.com, www.expocomm.com

12 – 14 May: CeBIT Australia 2009, Sydney, Australia. Hannover Fairs Australia: + 61 2 9280 3400, cebit@hannoverfairs.com.au, www.cebit.com.au

26 – 29 May: TETRA World Congress 2009, Munich, Germany. TETRA World Congress: www.tetraworldcongress.com/index.cfm

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- ❑ 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 radio communications equipment or services?
- ❑ A Yes ❑ B No

5. Is there any servicing of radio 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 _____

Q109

West Meets East: Doing Business in Asia

By Ian Carr

Asian tiger economies are leaping forward faster than Western counterparts by ignoring legacy systems and embracing digital technologies. The trend is apparent in the professional mobile radio (PMR) industry, with South Korea, Malaysia and Singapore allocating frequencies to drive digital deployments. The biggest Asian market — China — favors digital TETRA technology for civil contingency deployments, including the recent Beijing Olympic Games. There is rapid growth in demand for TETRA and Project 25 (P25) markets throughout Asia. However, TETRA is the strongest digital player in Asia's major mission-critical markets.

According to IMS Research's "The Worldwide Market for Licensed Mobile Radio 2007," TETRA is the largest shipping technology by volume and the largest projected growth technology in the region from 2006 to 2011. IMS also identifies four major problems for P25 to overcome — perception that equipment is expensive, lack of competition on tenders, lack of promotion and political backlash.

However, some technical capabilities favor P25; in rural Asia, FDMA technologies offer coverage advantages. Asia will need to address the rural divide; this will drive digital PMR into new rural territories most suited to P25. TETRA is only part of the answer, because TETRA's inroads in Asia have been in densely populated areas. IMS Research indicates TETRA terminal volumes may double year-on-year during the next four years.

Opportunity for the West

There is an appetite for TETRA and P25 technology in Asia, which represents a market opportunity for Western companies with radio communications experience to meet the demand. Established PMR manufacturers have competitive advantages over their Eastern counterparts; they offer more technically advanced products and applications and have experience delivering similar deployments in mature TETRA and P25 markets across Europe and America.

However, the right technical credentials aren't enough to succeed in the Asian marketplace. Western radio communications companies also need the right attitude and approach to do business in Asia. The first thing to consider when doing business in the Far East is the difference in culture; having a different approach to society and way of life means having a different approach to doing business.

Adapting to Local Markets

Don't underestimate the importance of a multinational approach that focuses on working with local businessmen and establishing a firm and visible local presence. Tangible commitments, such as using and investing in the skills of the local workforce, are positive milestones. Cultivate relationships with local influencers and potential employees and make the best use of local contacts and partners with industry experience to draw in expertise and local knowledge. This is the case in China where market entry is a ritualized and formal process. The general notion is that you apply to enter the Chinese market; you must prove your worthiness upfront before allowed to prove it in practice.

The concept of "guanxi" is central to the way the Chinese do business. Guanxi emphasizes the importance in forming relationships and close networks based on mutual respect and understanding. Influence is affected through guanxi networks by word of mouth. Obligations and dependencies built during many years can be called on often from an individual indirectly connected through two, three or more steps in the network to facilitate an action or introduction. Having called on the network, one is expected to actively offer goodwill back to the group. The value of guanxi lies in the amount of dependency one has built rather than what one has consumed.

When doing business in China, you will engage with a social elite steeped in a planning culture. Centralized planning in China is an intellectual process, driven by the elite, and the Chinese are good at it; they will expect you to be good at it too. Careful preparation and command of the facts is crucial to avoid unforeseen barriers and cultural clashes. An important part of succeeding in the Far East is convincing key in-country and industry influencers of your purpose and capability, both in terms of differentiation from existing, local players and commitment to a long-run sales and marketing plan.

Prove you can offer something they don't already have or could get locally. This is an important area where established Western radio communications companies have distinct business advantages when looking to enter the Asian market. Having the technical advantage and supplying technically advanced products and applications to meet demand within the tiger economies puts Western firms in strong positions. But technical excellence on its own isn't enough to succeed in the Far East. Taking on a long-term strategic approach to the market and adapting business models to mirror those in country will best position you for an effective market entry. ■

Ian Carr is the managing director of radio communications specialist Team Simoco, responsible for the strategic growth and international expansion of the company. Carr has 28 years of industry experience managing commercial, manufacturing and operational performance. E-mail comments to editor@RRMediaGroup.com.

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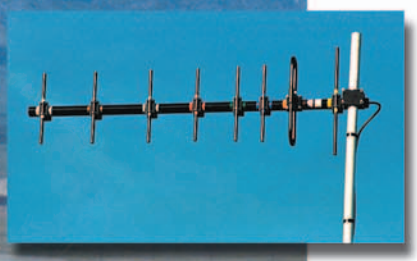

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