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Coverage Challenges

How P25 Addresses Tough Terrain

Inside

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CAD Advancements in Norway

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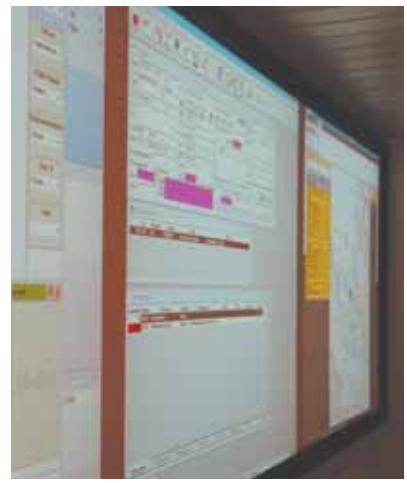

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Coverage is King

We are beginning the new year with an issue full of information on mobile radio coverage and related issues. Coverage is one of the essential elements to any two-way radio communications network, and coverage is influenced by many factors. The nature of our industry requires coverage — having communications availability where you need it — to be scrutinized in network designs.

Frequency is the first factor that affects two-way radio network coverage. In the United States, VHF systems are often used in areas with challenging terrain — near mountains, for example — because the band has good propagation characteristics. The higher the frequency, generally the more towers are needed for the same coverage area.

Technology choice is another factor affecting coverage. Many users have said some of the new digital technologies provide better coverage than older technologies, although it depends on the deployment. In addition, users often make buying decisions between TETRA or Project 25 (P25) based on their coverage needs.

Some U.S. public-safety agencies are beginning to roll out broadband networks using the Long Term Evolution (LTE) standard. Dan Naylor, Motorola government and public-safety product portfolio manager for wireless broadband solutions, recently said that LTE coverage will require two to fives times the number of sites as P25 networks for the same coverage area.

Channel size, radio output power and local issues can also affect a network's coverage. In addition, many users need to be able to communicate in high-rise buildings, tunnels, underground and in other difficult locations. Luckily, mission-critical manufacturers have stepped up to offer numerous products that extend coverage into harsh environments.

Our cover article focuses on a police agency with many coverage challenges and the tools the agency officials used to overcome the challenges. Terrain, spectrum, security and other factors all influenced coverage and related technology decisions for the public-safety network.

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

You'll also find that "Product Expo" on Page 34 highlights several antennas that help with coverage issues. Many of our "World News" briefs touch on coverage issues as well.

Best wishes for happy, healthy, prosperous — and appropriately covered — 2011.

Sandra Wendelken

Sandra Wendelken, Editor
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RadioResource INTERNATIONAL

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

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INTERNATIONAL

ITU Plenipotentiary Brings Agreement on Key Issues

The International Telecommunication Union (ITU) 18th Plenipotentiary Conference saw delegates agreeing on ITU's mandate in several key areas, including bridging the digital divide, strategies to accelerate broadband rollout and implementing the outcomes of the World Summit on the Information Society (WSIS). Delegates also agreed to extend ITU's involvement in areas such as better use of information and communication technologies (ICT) to manage climate change and disaster response, conformance and interoperability, and accessibility for persons with disabilities.

More than 2,022 registered participants and observers from 167 ITU member states, 42 sector members and observer organizations attended the three-week conference in Guadalajara, Mexico, which agreed on ITU's strategic and financial plans for 2012 – 2015.

Member states of the ITU elected Dr. Hamadoun Touré of Mali as secretary-general of ITU for a second four-year term. Touré said he will "put a special emphasis on broadband access, as well as continuing to ensure that cybersecurity is high on everyone's agenda." Houlin Zhao of China was re-elected deputy secretary-general.

François Rancy of France was named director of ITU's Radiocommunication Bureau. The bureau plays a key role in global communications, managing the distribution of international frequency spectrum and the allocation of satellite orbits. Rancy will face challenges including the major World Radiocommunication Conference (WRC) scheduled for 2012. WRC 2012 will review the international framework for radiocommunications, address the digital dividend of radio spectrum freed by the switch to digital TV, and identify spectrum resources for maritime, aeronautical, meteorological and climatology.

The ITU's 18th Plenipotentiary Conference met for three weeks in Guadalajara, Mexico.

Brahima Sanou of Burkina Faso was elected director of the Telecommunication Development Bureau. In addition, Malcolm Johnson of the United Kingdom was re-elected director of the Telecommunication Standardization Bureau.

LONDON — The DMR Association announced **Etherstack**, a U.K.-based wireless communications engineering company, as a new member. Etherstack joins as a category two member of the Digital Mobile Radio (DMR) advocacy group.

GENEVA — Two technologies, LTE-Advanced1 and WirelessMAN-Advanced, were officially designated IMT-Advanced2 by the International Telecommunication Union (ITU), qualifying them as 4G technologies.

The ITU Radiocommunication Sector (ITU-R) assessed six candidate submissions for the global 4G mobile wireless broadband technology, otherwise known as International Mobile Technology (IMT)-Advanced. LTE-Advanced1 is part of the Long Term Evolution (LTE) standard, and WirelessMAN-Advanced is a WiMAX technology.

In the ITU-R Report, the two technologies were each determined to have successfully met all of the criteria established by ITU-R for the first release of IMT-Advanced. The two technologies will move into the final stage of the IMT-Advanced process. In early 2012, an ITU-R Recommendation specifying the in-depth technical standards for the technologies is planned.

HOUSTON — Harris agreed to acquire the Global Connectivity Services (GCS) business from Schlumberger Information Solutions, an operating unit of **Schlumberger**, for US$347.5 million in cash.

Schlumberger GCS will be combined with recently acquired CapRock Communications to form Harris CapRock Communications. With customers in more than 50 countries, Schlumberger GCS provides global communications services for a wide range of customers primarily in the oil and gas industries.

EUROPE

BRUSSELS — The European Commission proposed a five-year policy program for planning and harmonizing the use of European Union (EU) radio spectrum. The proposal, which was sent to the European Parliament and EU Council of Ministers for adoption, includes steps to promote efficient spectrum management, and in particular, to ensure that sufficient spectrum is made available for wireless broadband.

The proposal forms part of a package of broadband measures presented by the EU. The top priority is to earmark sufficient spectrum for wireless services, including broadband. The commission proposed that EU countries should by 2012 give licenses to operators to use the 900/1800 MHz, 2.5 GHz and 3.4 – 3.8 GHz spectrum bands, which have already been technically harmonized at the EU level for wireless broadband. In addition, EU countries are asked to open the 800 MHz band to wireless broadband by 1 January, 2013, with possible derogations until 2015 in exceptional cases.

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NEXEDGE® fits Hessen Roads

Kenwood's NEXEDGE® helps keep Germany's traffic flowing

Hessen Road Maintenance System

The German state of Hessen has a population of six million and an extensive road system, including the busiest highway interchange in Europe. As budgets for state-funded road maintenance are limited, greater efficiencies have to be found in control and communications. Project requirements were demanding, but the solution picked by Hessen was none other than Kenwood's NEXEDGE® digital radio system.

Germany is famous for its highways, and no fewer than 24 pass through the state of Hessen, where the Frankfurter Kreuz A3/A5 interchange handles as many as 320,000 vehicles a day. For maintenance purposes, the state road network is divided into 50 districts, with crews using analog radios to ensure that the right resources are in the right place at the right time. Each district has been using 10~20 mobile radios, 5 portable radios, and up to 4 repeaters. However, Hessen decided to conduct a pilot project

Clear requirements

State officials were looking for a system that would offer the same or even better performance than other digital networks at a lower cost, with narrow-bandwidth operation to increase coverage, high audio quality, security features, and IP connectivity. Moreover, it had to be able to work with the existing analog infrastructure to facilitate a smooth migration. And in addition to replacing the legacy system, there are plans to expand the network in future, to connect with the highway maintenance system.

Robust response

This was a very important project, involving more than 1,000 radios, and it received the full attention of Kenwood Germany and their system partners who have established a good working relationship with the state government. They also received strong support from Japan. It was thus possible to make good use of the multisite IP networking capability of NEXEDGE® to develop a system that was fully customized to meet the state's requirements. And the cost was kept lower than that of competing systems because it required fewer sites.

The complete NEXEDGE® system developed for Hessen comprised 50 sites and 100~140 NXR-700E repeaters, serving nearly 1,000 NX-700E mobile radios and more than 200 NX-200E portable radios, and using up to 10 channels.

Gratifying result

Hessen's new NEXEDGE® system provides much better coverage than the previous analog system. Crews working on road maintenance benefit from an easy-to-use dispatcher system supplied by FunkTronic, and are equipped for data communications to provide crucial GPS location information. Kenwood has again proved that NEXEDGE® is a scalable solution capable of taking on the challenge of even the most demanding applications.

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

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Although a mission-critical communications broadband allocation wasn't mentioned specifically, the EU said the proposal would ensure that spectrum is available for policy priorities including research, Earth observation, Galileo, environmental protection, public protection and disaster relief, and transport.

DERBY, United Kingdom — Team Simoco was appointed to provide communications systems for the new A3 Hindhead road tunnel and the refurbishment of the A1 Hatfield road tunnel in the United Kingdom.

The tunnels' extensive communications systems require GSM mobile, Airwave, fireground, voice break-in and a dedicated professional mobile radio (PMR) radio system. "Both the Hindhead and Hatfield road tunnels are designed to offer vehicles more convenient and quicker journeys, but due to the high volumes of traffic that travel along these routes, it is imperative that the communications systems in place offer reliable and uninterruptable access in case of accidents or fires," said Team Simoco CEO Ian Carr.

Located in Surrey, between London and Portsmouth, the Hindhead twin bore road tunnel is designed to remove traffic congestion from the A3 and the local road network. Work began on the project in 2007, and the tunnel is scheduled to open to traffic in mid-2011. The Hatfield road tunnel in Hertfordshire is also due to be re-opened to traffic in mid-2011.

Motorola Rolls Out New Radio Dealer Track

Motorola announced the radio solutions and mobile solutions tracks of its new PartnerEmpower dealer program announced in 2010. The new tracks are designed for companies delivering two-way radio, bar code scanning, radio frequency identification (RFID) and mobile computing technologies and systems.

Motorola officials said the new tracks improve ways for channel partners to drive business growth. PartnerEmpower aims for two-way radio dealers to function more as systems integrators. A partner company can either get training and certification to sell more products outside its traditional portfolio or partner with another Motorola channel partner that sells the necessary products.

The radio solutions track is designed to reward channel partners for increased levels of competency in two-way radio solutions and includes opportunities for greater incentives for commitment and achievement. The radio track includes three main areas, the MOTOTRBO radio line, manufacturer's representatives and retail business radio, following the industry's migration to digital systems, said Mike deVente, Motorola vice president of North America channels.

Romanian TETRA ISI Test Connects Cassidian with Motorola Networks

The Romanian Ministry of Administration and Interior (MAI) and Cassidian completed testing the Inter-System Interface (ISI) in accordance with the TETRA interoperability standards between Cassidian and Motorola-supplied PHARE TETRA networks. The testing was part of Romania's border security project, Integrated System for Border Security (SISF), which will provide the Romanian Border Police with a coherent TETRA network in all the border counties.

SISF will constitute the TETRA national platform for all governmental security forces in these counties. After several years of development and promotion of the interoperability concept between the TETRA networks, fully certified interoperability is a reality between both the Romanian TETRA systems.

The ISI offers extended coverage to both Cassidian TETRA and PHARE TETRA users, who now can benefit from the TETRA national platform of all locally available services such as air interface encryption, authentication, packet data services, short data messaging, as well as cross-system communications, such as individual calls, private automated branch exchange (PABX) calls and short data services between terminals located in different networks.

With the terminals' automatic roaming feature, the selection of the visited network is done without user interaction, allowing smooth roaming within the TETRA national platform. The ISI is also a key component for the integration of the border police's AVL solution to share positioning information between border police and the TETRA national platform security forces.

BERLIN — Cassidian was commissioned by Berlin's IT service center to link Berlin state's 28 control centers to the digital radio network of its public-safety authorities and organizations (BOS) via two concentrators. If one of the concentrators fails, the linked control stations and TETRA groups are automatically rerouted via a second location to ensure almost uninterrupted operation.

Cassidian also provides a network management system that permits efficient operation and gives a full overview of the operational status of all system components of the concentrator solution. The customer was also provided with training and an individual service and maintenance concept.

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Germany is rolling out a nationwide digital radio network for public-safety authorities and organizations, and Berlin is the first federal state to commission a concentrator solution.

DERBY, United Kingdom — Sir David Brown joined **Team Telecom Group (TTG)** as a non-executive director. Formerly chairman of Motorola from 1997 to 2008, Brown is a fellow of the Royal Academy of Engineering, a chartered engineer and honorary fellow of the Institution of Engineering and Technology, and an honorary fellow of the Chartered Quality Institute.

ASIA/PACIFIC

SEOUL, South Korea — Seven South Korean National Police agencies selected **Unimo Technology** to supply two-way radio equipment following a public tender. The project's total value is about US$10 million.

The project consists of more than 29,300 handheld radios, 4,900 mobile radios, 4,000 base stations, more than 150 motorcycle radios and 30 portable repeaters. Unimo manufactured and delivered VHF portable radios including 5,100 units with built-in Bluetooth options, under the award. Several features helped Unimo win the tender, including its IP-67 waterproof radios with GPS and Bluetooth options, along

European Emergency Services Authorities Recognized

The fourth 1-1-2 awards ceremony was held in November in Brussels. It was organized by the European Emergency Number Association (EENA) under the patronage of the Belgian Presidency of the European Union (EU) Council. The EENA and its members rewarded individuals and organizations particularly engaged in improving and promoting the European emergency number 1-1-2.

Representatives from public authorities in charge of emergency services, international organizations, members of the European Parliament and solution providers attended the gathering.

"We were delighted to reward these European heroes who all deserve our full recognition: their initiatives contribute to make our everyday lives safer," said Olivier Paul-Morandini, president and founder of the EENA.

EXPERIENCE IN DISPATCH SOLUTIONS

In case of power failures, it is essential to dispatch teams quickly and efficiently to the sites where they are required most. Nearly 100 dispatchers allow CEZ, the largest power distribution company in the Czech Republic, to dispatch service teams across the entire power distribution area. The new dispatcher system has furthermore vastly improved the organization of scheduled maintenance on the power network.

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with the products' ruggedness.

The Korean National Police agencies have used outdated VHF systems for more than eight years. By replacing the older VHF systems with the new VHF radios and equipment, the agencies have more secure communications.

Some of the radios were used for the G20 Seoul Summit in November, said Jin H. Chung, president of Unimo Technology.

SEOUL, South Korea — Teltronic partnered with SK Telecom, South Korea's largest wireless service provider, to provide a secure communications system for the Korean International Circuit and the F1 Drivers Championship at the inaugural Korean Grand Prix in Yeongam County, 400 kilometers south of Seoul.

The solution is based on Teltronic's Nebula Ethernet/IP TETRA technology and includes mobile and handheld terminals used by the event organizers and emergency services.

The Incheon Metropolitan Police Agency (IMPA) has been using the company's public-safety TETRA network since 2006, company officials said. Because Incheon hosted the G20 meeting in November, Teltronic completed a number of network upgrades and improvements. The multisite network uses Teltronic mobile units and **Sepura** handhelds.

CAMBRIDGE, United Kingdom — Sepura announced a contract in India with Cochin International Airport. The airport's communications system is being migrated from analog to the digital TETRA standard.

The TETRA components comprised the **Rohde and Schwarz** TETRA infrastructure and Sepura radio terminals, which will operate on the 380 – 430 MHz frequency band. The Indian branch of **Siemens Information Systems** was the turnkey contractor and integrator.

Sepura also appointed Satya Kommanapalli as its new country manager for India. Kommanapalli has worked in the professional mobile radio (PMR) industry in India since 1985.

ULAN BATOR, Mongolia — Teltronic supplied the first public-safety TETRA network in Mongolia. Teltronic's partner in the region, LG CNS, helped install the system supported by funds from the World Bank. LG CNS' local partner, MCS Electronics, the country's second largest mobile operator, also played a key role in setting up the TETRA network.

Teltronic provided multisite infrastructure, mobile units and handhelds. A second phase will include increased coverage of the capital, Ulan Bator.

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Colombian Citizens Fight Crime

About 10,000 volunteers in Antioquia are extending the police force's crime-fighting efforts with the help of a new conventional, NXDN-based VHF system.

By R. Michael Brown

Photos courtesy Icom

The country of Colombia is well known for illicit drugs and their manufacturing by drug cartels, insurgent guerrilla groups such as the National Liberation Army (ELN) and the Revolutionary Armed Forces of Colombia (FARC), and crime. According to United Nations Crime Statistics, Colombia had a homicide rate of 53 – 66 murders per 100,000 people per year in the early part of this decade versus 5 – 6 per 100,000 in the United States. Kidnapping in Colombia, which peaked at 3,572 in 2000, was No. 1 in the world.

Those statistics have steadily improved during recent years. How were the country's 91,000 police officers nationwide able to cope with and reduce the rampant crime rate? They couldn't do it alone.

Political Change

An aggressive anti-drug and anti-crime president, Álvaro Uribe, was elected in 2002. He started a citizen volunteer force and armed the volunteers with two-way radios to extend the eyes and ears of the police. In 2004, as a strategy of the democratically elected national government, states such as Antioquia, created a Citizens Support Network (CSN) to work as volunteers with the police.

"More than 10,000 volunteers in the Citizen Support Network in Antioquia have increased the number of eyes on the street for the police," says Gus Troconis, Icom sales manager for Latin America. "They are working to help the police minimize crime and the chaos caused by drug dealers and other criminals."

It's working. The most recent homicide rate nationwide is 36 per 100,000 people and has dropped steadily since 2003. In 2009, the kidnapping rate fell to 172. Colombia experienced accelerating economic growth between 2002 and 2007, chiefly because of improvements in domestic security. President Uribe reached his term limit in 2010. Juan Manuel Santos, Uribe's minister of defense, was elected president in August 2010. President Santos is continuing the strategy and planning to expand the CSN to the other 47 states.

New Tools

Volunteers began using the police analog two-way radio system in Antioquia. But as the force grew, the Antioquia Police Department needed to migrate the volunteers from the existing system with 63 repeaters to an IDAS digital/analog system from Icom. So far, the volunteers have 121 portables and 75 mobiles, and they can still use their analog radios in mixed mode on the new system until they are replaced with new radios. "Last year the CSN started using its own conventional IDAS radio system," Troconis says. "There are 125 municipalities, and 29 now have VHF IDAS

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Antioquia Governor Luis Alfredo Ramos officially approves the IDAS project for citizen volunteers to support state police.

repeaters. The goal is to achieve 100 percent digital coverage throughout Antioquia in three years."

The new mobile radios are used as base stations at the dispatch centers. Volunteers call dispatch on their radios, and a dispatcher uses the existing analog system to deploy police and ambulances. "They have one volunteer in every designated area to help the police," Troconis says. "Volunteers also patrol in marked vehicles much like the community patrols in the United States."

Mobiles are also installed in taxicabs around the cities. Two-way radio calls are made by drivers to the call center so police command officers can dispatch an adequate number of resources to a scene for both medical and crime emergencies. In one incident, a taxicab driver keyed his CSN radio microphone during a kidnapping attempt that was taking place in his cab. He used the radio's emergency call feature and kept the mic keyed so dispatchers heard the conversation going on in the car. The push-to-talk (PTT) identification function sent the cab driver's unit ID number to the dispatcher. By identifying the cab and from the ongoing conversation in the back of the cab, dispatchers routed police to rescue the victim and driver. The incident resulted in the kidnapper's apprehension.

"Improving communications technology is helping to make police and public safety more effective and efficient," Troconis says. "The new radios make things easier and faster. We work very closely with the police department communications staff, and they especially like the IDAS IP link capability between repeaters and encryption functionality of the system. We trained the police on the new system, and the officers train the citizen volunteers."

The radios are having a positive effect on the streets. In the high-crime capital of Antioquia, Medellin, which is also the headquarters for many drug cartels, citizen volunteers are at work on every block or two, armed with radios. The constant updates and reports from volunteers in the district have resulted in a 20 percent crime rate reduction in that area. The CSN consists of the following key components:

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Source: NXDN Forum

VHF repeaters. The repeaters receive both analog and digital mode signals on a single channel. The police in Colombia are introducing digital radios, while still maintaining the existing analog radios in the system. Digital features, integration and convergence with IP technology, and multiple data applications enhance the basic system.

Mobile radios. The mobile radios are ideal for public safety and transportation agencies such as taxicabs and delivery service users. The 50-watt VHF transceivers offer advanced multimode operation, improved scanning and flexible installation suitable for mobile and base stations. There are 75 mobiles in use in Colombia.

Portable radios. The portable radios are fast becoming a popular radio with CSN volunteers. The portable is digital/analog multimode capable with a Li-ion battery pack that provides 14-hour operation time, ideal for volunteer use. There are 121 portables in use in Colombia.

IDAS is based on NXDN technology. Kenwood Communications and Icom developed NXDN in a collaborative effort, and now the basic outline of the NXDN specification is completed. Both companies have released initial products based on this spectrum-efficient protocol, and the next stage is to standardize the specification and allow other vendors to provide NXDN-compliant products to the market to make it a true multivendor standard technology.

The strategic alliances with the national government and municipal authorities, public and private partnerships, monitoring services and private security, community action boards and leaders, and CSN supported by a communications system in Antioquia, are becoming a model for other states in the country. The environment in Colombia is still dangerous, but with the help of volunteers in the network, they are directly on the line working with police to defeat crime. ■

R. Michael Brown is an internationally published and broadcast writer, producer, speaker, and marketing and public-relations consultant at Brown. He is the recipient of a 1989 New York Film Festival Award and cover stories for *PC Magazine* and *New Media Magazine*. He has written hundreds of articles for newspapers and magazines around the world and worked as a managing editor at IBM Press. E-mail comments to editor@RRMediaGroup.com.

Midian's Voice Scramblers

Midian's new VS-1200 is a DSP based FFT Frequency Domain voice scrambler offering a high level of voice security. This technology is comparable in security to rolling code scrambling, but doesn't require synchronization.

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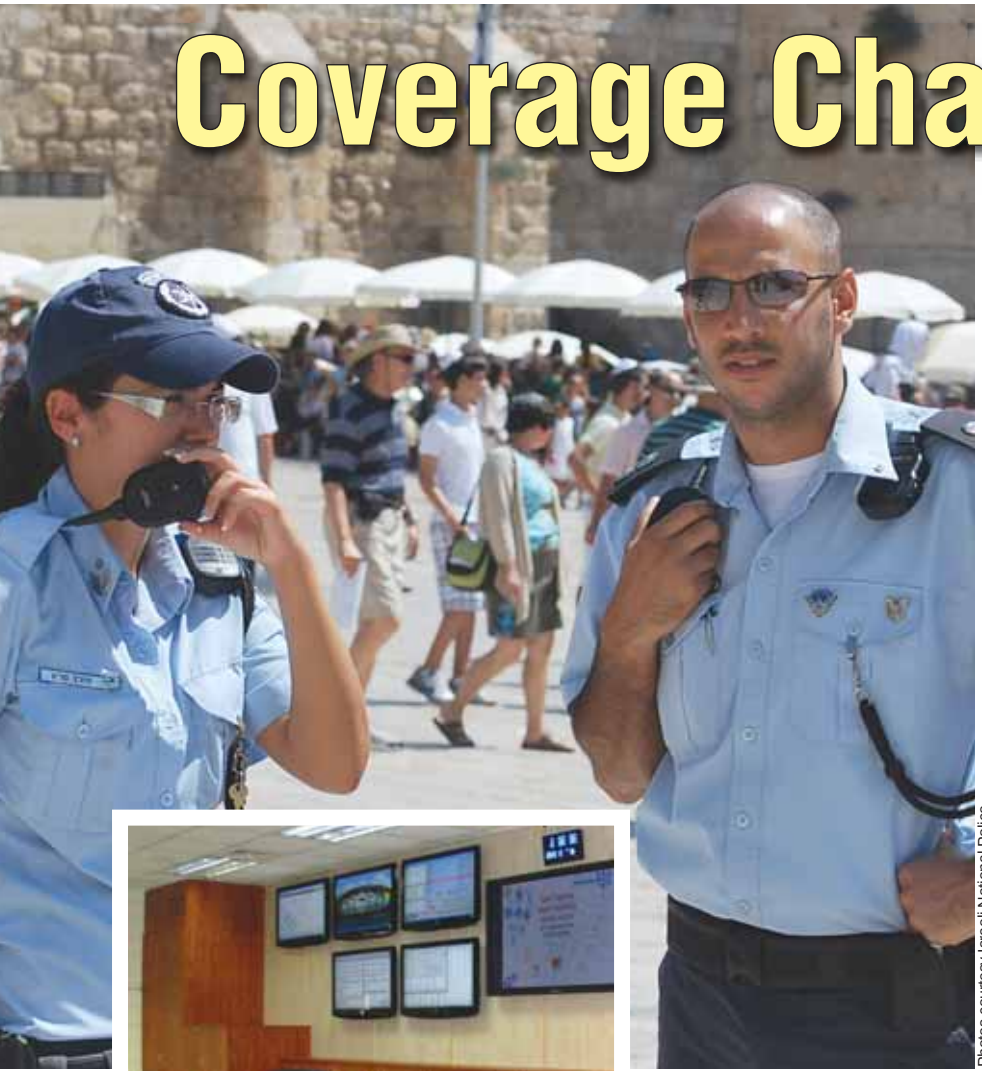

Photos courtesy Israeli National Police

Israeli National Police central control room

The Israeli National Police implement a new Project 25 (P25) radio system and other tools to address tough terrain and in-building communications.

By Yacov Lazar, Eldad Barzilay and Eli Weissbart

A police car was recently attacked by men with automatic weapons while cruising in Kiryat Gat, an Israeli city located south of Tel Aviv. During the ambush, the police officer sent an emergency alert to the dispatch console at district headquarters, and the officer was located through his GPS signal. The dispatcher sent an ATG voice message to all police units in the area and called an ambulance to the incident location. An ATG voice message breaks all sessions and doesn't allow a response. A dispatcher can send the message to all talk groups and handsets. The scenario shows the importance of a reliable communications system to the forces of the Israeli National Police (INP) and the challenges the INP officers face.

The state of Israel is located on the eastern seaboard of the Mediterranean, which serves as its western border. Lebanon and Syria border the country to the north, Jordan in the east, and Egypt to the south. The country covers 22,072 square kilometers, and its population is more than 7.6 million people. According to the laws of Israel, the INP are responsible for the public's safety and order throughout the country and provide first response, coordinate all emergency services, and manage and control all multicasualty incidents. The INP provides a unified command with about 28,000 police officers, border guards, and six territorial districts divided into subdistricts and stations.

Several challenges for the INP are caused by the unique makeup of the state of Israel:

- Israel's geographic location between three continents on the Syrian-African fault put it at a high-risk level for high-magnitude earthquakes.
- Israel's demography is diverse and is made up of secular, as well as religious Jews of Ashkenazi and Sephardic tradition; Christians; Muslims; and Druze.
- Jerusalem is the capital of Israel and a center of the three monotheistic religions.
- Israel has a level of crime, traffic accidents and traffic violations comparable with any western democracy.
- Crime and acts of hostility are prevalent along the borders of neighboring countries.
- Terrorism attacks using suicide

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Drive tests conducted by the INP detected increased coverage; coverage for portable subscriber units didn't decrease.

bombers and long-range weapons sometimes target the civilian population.

System Replacement

An effective police presence depends on a managed communications system with maximum coverage throughout Israel. During the late 1980s, the INP deployed a Motorola proprietary, trunked communications system based on one master site and 40 radio sites. Around 2000, an additional master site was created with OmniLink technology, another Motorola proprietary trunking technology, which enabled the expansion of the network to 60 radio sites. In addition, police were equipped with nearly 5,000 mobile subscriber units and 7,000 portable subscriber units. The INP moved from 60 dispatch-based police stations to six command-and-control district dispatch centers, forcing a greater dependency on the communications system to support police forces operating in a large, diverse geographical area.

The lessons of the Second Lebanon War — a conflict between Hezbollah in Lebanon and the Israeli military during mid-2006 — exposed the threats to the home front. Those threats combined with the need to rapidly mobilize forces revealed weaknesses in the old system. Moreover, advances in technology and the inability to get proper service also rendered the old radio sites and subscriber units obsolete, which led the INP to the conclusion that the system should be replaced.

The INP began a process, led by its communications department, of collecting the operational needs from the different police units. The data, together with the lessons from events such as 11 September, 2001; Hurricane Katrina; the Second Lebanon War; other police forces' experiences; and industry and market analysis assisted in creating the following operational requirements for the new communications system:

- Digital commercial off-the-shelf (COTS) system in open and developing standards for public-safety agencies that can be completely controlled by the INP
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Geographic Factors

The topography of the state of Israel — there are 2,600 meters between the highest peak and the Dead Sea as well as deserts in the south — and the crowded urban centers around Tel Aviv and Jerusalem are the main challenges for communications coverage. Demographic changes have led to an increased demand for police services in the south of the country — Negev and Arava — areas not previously covered by the old system. In addition, the scarcity of bandwidth denied the option of adding radio sites and repeaters, so gaps in coverage were handled at the local level. Another challenge is the ability to provide provisional coverage in areas where there is no regular police activity, or where disasters or events across more than one region take place.

During the early planning stage, frequency and technology issues were discussed to determine which would deliver the best coverage. The frequency debate was between the UHF and 700/800 MHz bands, and in the technological area, discussions centered on TETRA technology and Project 25 (P25). With TETRA, the INP would operate in the UHF band — similar to Europe — and use low-power portable subscriber units. With P25, the frequency debate would still be open, but the INP could use portable subscriber units at a much higher output.

Forecast maps showed that the deployment of a TETRA-based system required deploying a large number of radio sites compared with the P25 standard to meet the coverage goals for portable subscriber units. Beyond that, the low output of the portable subscriber units in a TETRA-based system also limited the range of direct mode of operation (DMO) and the coverage inside heavy constructions.

Deploying radio communications sites isn't just a technical issue — it's economical. In Israel, as well as in many other countries, the acquisition process for a radio communications site is long and complicated, and relying on a system that requires a large number of sites puts a heavy burden over time on the ability to expand communications coverage.

The New System

In 2008, the police command

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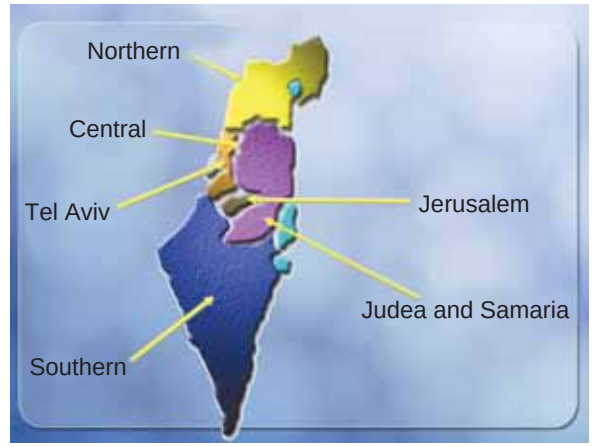
Israeli National Police Districts



authorized the operational requirements and funding to purchase and deploy a new communications system. The communications division within the technological department chose P25 technology. Motorola Israel was selected to supply the system and the radio sites, while the subscriber units were purchased through an international tender.

In January 2009, the INP launched the new communications system — Nitzan. A police steering committee was appointed, led by the head of the INP planning department, including representatives from the ministry of homeland security and various police divisions. A technological management committee was led by the head of the technological department. A specialized branch with 12 officers was created within the communications division to manage the project and execute the project plan while meeting its milestones, strict timeline and budgetary frame.

While the administrative work at the division was executed, the operational requirements were translated into a vision, goals and technological characteristics. At the end of the process, the requirements were translated into a working plan where the INP published an international tender for the subscriber units, still under way, and chose Motorola to supply the system infrastructure.

The INP chose 800 MHz because it was already in use by the police and was preferred in crowded urban areas. In addition, there is an ability to expand the system to the 700 MHz spectrum if and when a national public-safety communications system is created. All emergency agencies in Israel operate their own communications systems. The decision to switch to P25 digital technology at 800 MHz also led to the question of whether the communications coverage would be adversely affected as a result of the change. Digital systems differ from analog systems in the ability of digital users to conduct conversations in borderline coverage conditions, as long as the bit error rate (BER) is not too high. Once the error rate threshold is crossed, a conversation can't be carried out. With analog systems, the quality of the conversation decreases gradually. Theoretically, a digital system should conserve and maybe increase the effective coverage area as measured by the quality of the audio. Drive tests conducted by the INP detected increased coverage; there weren't decreased effective coverage areas for portable subscriber units compared with the old system.

Sites and Buildings

Improvement of coverage using the Nitzan system includes increasing the number of radio sites from about 60 to 90 sites by the end of the deployment, which will enable 95-percent coverage in most of Israel. The new digital system doubled the number of available channels, while maintaining the required grade of service. However, the process of acquiring sites in Israel is difficult. Therefore, the INP joined forces with other public-safety agencies such as the Magen David Adom or Israeli ambulance services, Israel Fire and Rescue Services, the hazardous substance division, and the Israeli Defense Forces (IDF)-Home Front Command to acquire sites and share equipment at existing sites. This cooperation and collocation is a step forward to the development of a communications system for national public-safety agencies in Israel.

Another solution to further the process of building a radio site is to equip a site with a small, lightweight shelter that requires only power and can be deployed adjacent to the antenna tower. In addition, in areas where the volume of activity is small and does not justify the deployment of sites, 14 repeater sites bridged to the trunked system and combined with trunked talk groups provide coverage.

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(BDAs) were also placed in some buildings to provide a local communications solution for traffic routes in narrow and winding canyons. In urban areas, building penetration is a problem. Building technology has advanced, and in the metropolitan areas of Israel, high towers have been built with underground parking lots several floors below. The heavy construction does not allow adequate coverage. The solution includes deploying amplifiers and antennas inside the buildings. The 800 MHz band makes it possible to use infrastructure already deployed by cellular providers for the INP's communications system as well. BDAs exist in several places and depend on agreements reached with property owners and cellular providers. The INP initiated legislation that will require property owners to supply radio communications for INP via BDAs in crowded buildings.

The operational concept of the INP requires agile use of police forces that are mobilized from area to area using about 1,200 talk groups while securing communications. Therefore, assigning talk groups and the ability to change these assignments immediately and to prioritize talk groups related to ongoing events are part of the coverage issue, because an unassigned talk group is like having a hole in the coverage area. Because of this, a control center was created to manage and monitor command and control over the system resources and maintain an adequate level of service for the different talk groups.

Israeli National Police

Mobile Communications Enhancements

In addition to the need for constant communications coverage in the field, the INP required mobile coverage enhancements for operational requirements using a combined technology solution.

Mobile Transmission. The INP operates mobile command posts on all command levels — station, subdistrict, district and national headquarters — to control events. These command posts are connected to the organizational data systems and video feeds through various technologies such as Motorola Canopy systems, landlines and mobile microwave systems. The INP conducted tests in operating command posts and communications sites through satellite communications, and identified the importance of acquiring independent satellite communications abilities.

Mobile Sites. The INP operates mobile sites that are mounted on

four-wheel-drive vehicles. These sites include independent power supplies and pneumatic poles. The vehicles are deployed as needed during a multiarea incident or are held together at one area. The mobile sites can operate as lone sites (local site trunking) or connect to the center of the system and operate as regular sites (wide-area trunking). Bridging to the center of the system is done through landlines and microwave Canopy systems that are connected to Synchronous Digital Hierarchy (SDH) rings of the INP or the Israel Defense Forces (IDF) mobile microwave systems.

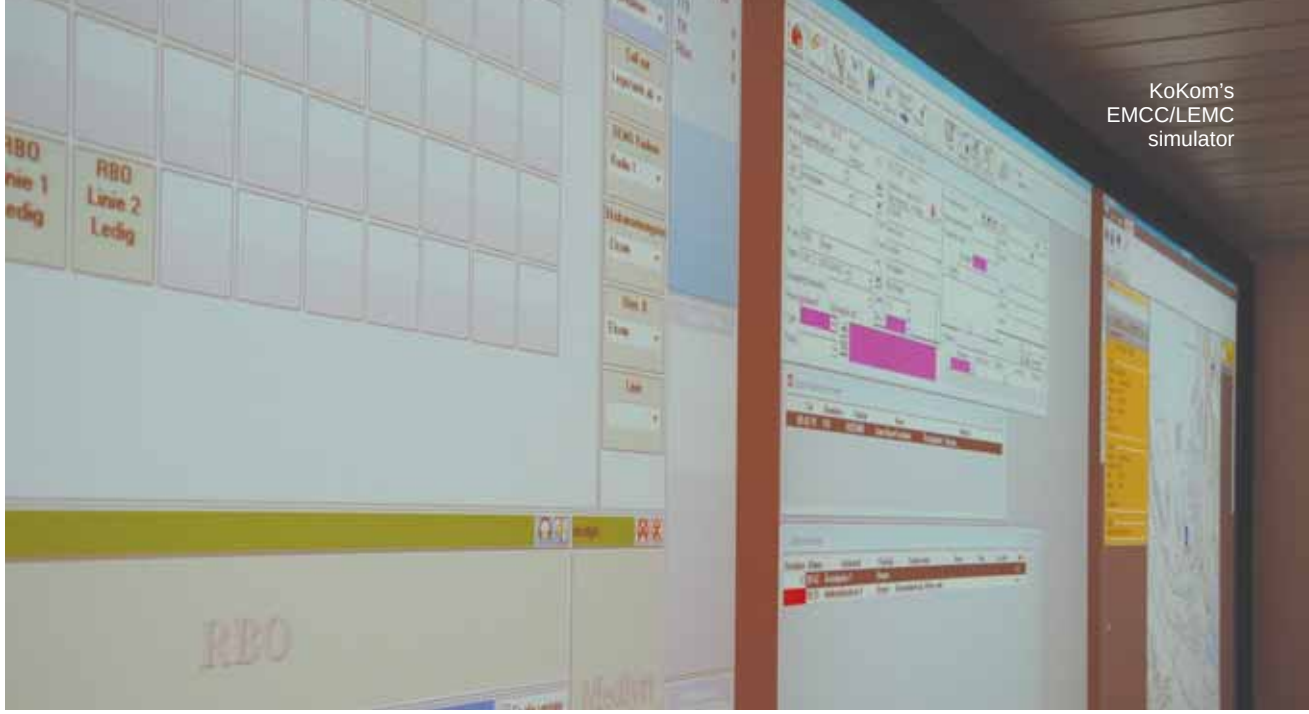
The sites are deployed in advance in mass participation events or in events located in areas with no coverage and are operated in real time as a solution to failure of radio sites or as an enhancement.

Mobile Repeaters. In addition to the mobile communications sites, police forces deployed to an event bring mobile repeaters with them. These repeaters serve as backup in case of system failure and enhance the command-and-control capabilities of the local commanding officers over their forces without overloading the local communications sites. The INP uses its aerial unit to transfer live video feeds, and the aircrafts act as flying repeater sites during special events.

Bridging Systems. The INP deployed a radio over IP (RoIP) system called MOTOBRIDGE from Motorola that serves as a backup to the Nitzan system and enables the district command posts and dispatchers to have radio communications with their forces even when the trunked system fails. In addition, the police use the MOTOBRIDGE gateway to link cellular, iDEN and other radio devices into the Nitzan system. INP also has a Cisco Systems IP Interoperability and Collaboration System (IPICS) that enables police data network users to access radio talk groups from their personal computers.

The Nitzan system was built to achieve maximum coverage and high building penetration with minimum communications site deployment. The communications sites are the skeleton of the coverage solution, but are not the entire solution. Master sites were operational in June 2010. Deployment of digital sites and new end units should be completed by the end of 2011, with deployments of advanced data applications completed by the end of 2012. During the planning and realization of the system, extreme scenarios and failure situations were considered. ■

Commander Yacov Lazar is head of the communications and electronics division for the Israeli National Police (INP). Eldad Barzilay is senior consultant and head of engineering for the Nitzan Project 25 (P25) system. Eli Weissbart is a consultant on the engineering team for Nitzan. E-mail comments to editor@RRMediaGroup.com.



KoKom's EMCC/LEMC simulator

Photo courtesy KoKom

CAD Advancements in Norway

A national agency is conducting research to set technical and staffing capabilities for health emergency dispatch centers.

By Sandra Wendelken

The National Centre on Emergency Communication in Health (KoKom) was established by the Norwegian Ministry of Health and Social Security in 1997. KoKom monitors and improves medical emergency communications in Norway. The agency manages projects in Norway, but also participates in international projects, both inside and outside healthcare services.

The center is charged with dealing with the following areas:

- Evaluating some of the impact of the proposed regulations concerning organization of public-safety answering points (PSAPs) on the emergency dispatch services of Norway;
- Collaborating with central authorities on introducing digital radio communications in health;
- Occupational health concerns in emergency medical services, with an emphasis on dispatch systems; and
- Security of communications systems in emergency care centers.

To meet its objectives, KoKom needs to be well informed on developments in the field and in the sphere of technology and various health sciences. The objectives are achieved through active participation in development work in Norway and through communications with researchers and service providers around the world, the center's website says.

Norway has 27 police emergency control centers, along with 22 fire dispatch centers and 19 health emergency control centers. KoKom fulfills its mission to monitor and improve medical communications through projects with emergency centers, focusing on policy advice and development, says Egil Bovim, director of KoKom.

In Norway, citizens dial 1-1-2 for law-enforcement emergencies. Police emergency communications centers are located within each police district and administered under the chief constable. Dispatch centers are generally collocated with police control rooms.

For fire emergencies, Norwegians dial 1-1-0, and those emergency centers are situated in 22 fire brigades throughout the country, principally located in municipalities. The total number of municipal fire brigades is substantially higher; each 1-1-0 center typically covers a number of fire brigades. Health services dispatch centers are located in hospitals and combined with ambulance services. Citizens of Norway dial 1-1-3 for health emergency services.

KoKom has a simulator for an emergency communications control centre (EMCC) and local emergency medical communications center (LEMC) used to test products and systems for EMCCs and LEMCs and to work on projects involving emergency health communications centers. The simulator is also used for training.

New CAD Research

A CAD specification project that aims to define the functionalities

needed for a CAD system in a Norwegian health emergency dispatch center is under way at KoKom. A separate competence project aims at specifying the capabilities and skills needed for the staff manning a Norwegian health emergency control center. Both reports are scheduled to be made publicly available in June.

KoKom staff, in conjunction with representatives from the national policy-makers and operational personnel from the services, will conduct the research. The results will be based on experiences with the country's common CAD system. The projects are being conducted based on expressed needs from public-safety services agencies in Norway. The main goals are to enable the health services to establish local standards for skill sets and to enable the dispatch centers' staff and industry to further develop or replace CAD systems that are already in use. Funding for the reports is public, channeled through the Norwegian Directorate of Health.

There is no CAD standard in Norway or in Europe, Bovim says. However, all health emergency centers use the same CAD technology, and the police centers all operate the same CAD systems. The fire brigade dispatch centers are upgrading their CAD software in conjunction with a radio network upgrade.

"The owner of the emergency centers has to establish the level of services to be provided," Bovim says. "Based on that decision, a set of capabilities has to be defined. These capabilities can be met in several ways — either through the skills of the personnel or by installing capacities in the CAD system. Hence, it is our view that the two projects we are presently working on need to be seen together."

The Radio Integration

The Norwegian health care services are using an analog radio communications system that will be phased out when the country's nationwide public-safety TETRA system is complete. Norway's new TETRA network is operational in the Oslo area and is awaiting a parliamentary decision regarding whether it will be deployed nationally. "It's very much a financial decision," Bovim says.

In 2007, Motorola announced a contract with Siemens to supply a TETRA radio communications network for the Norwegian national public-safety network, Nodnett. Frequentis signed a subcontract with Siemens to supply all the control rooms within the project. The control rooms will allow operators to receive and make calls to and from the telephone network, the existing analog radio network and the new TETRA network. The total implementation of Nodnett is a US$580 million investment. ■

Sandra Wendelken is editor of *RadioResource International* magazine. Contact her at swendelken@RRMediaGroup.com.

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Product Expo: Antennas and Accessories

ANTENNAS

Bird Technologies Group, TX RX Systems

The 746 – 870 MHz Corporate Collinear

Antenna is passive intermodulation (PIM) and peak instantaneous power (PIP) rated. The antenna allows users to combine a large number of communications services into a single, low-profile collinear antenna array. The true corporate feed of these arrays maintains total pattern integrity over a broad operating bandwidth that's achieved in the preferred form factor of a fully enclosed fiberglass radome.

www.bird-technologies.com

Calearo Advanced Technologies

The multiband multiconfigurable Calearo Radome antenna is a high-end rugged product, suitable for TETRA, DVB-SH, GPS, Wi-Fi and GSM/DCS/UMTS bands and is designed for professional communi-

cations. The special automotive antenna allows for unparalleled transmission and reception capabilities in each range, contemporarily, company officials said. The coexistence and full use of terrestrial and satellite features make the antenna a solution for police service vehicles, from standard operations to emergency disaster recovery. The antenna can be customized and deployed in various configurations on demand, including fully covert special versions.

www.calearo.com

Cobham Antenna Systems, Microwave Antennas

The omnidirectional antenna, model OA1-0.42V/1316, was designed for communications within an underground airport car

park covering TETRA (385 – 400 MHz) and PMR (450 – 470 MHz) frequencies in a single antenna. Many omnidirectional antennas at this frequency would be long, however, height restrictions led to the development of the antenna that has a height of 24 centimeters and a diameter of 39 centimeters, company officials said. The antenna maintains high specification beam patterns, is rugged to withstand extreme temperatures and colored to blend with its surroundings. The antenna design features a flush mounting flange and a flying lead for simplified installation.

www.cobham.com/antennasystems

Comprod Communications

The 874F-70TM*1/2 rugged wideband base station antenna is built with solid aluminum

construction and welded with a minimal number of mechanical joints, making it ideal for the digital era, company executives said. The antennas, with all internal harnessing (cables), are available in 2, 5 and 8 dBd gain in both VHF and UHF. Top- and side-mount versions are available. Black anodize is available on request.

www.comprodcom.com

Cubic Defense Systems

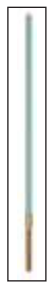
The MA1316 is an accurate, compact, wide frequency coverage direction finding (DF) antenna for mobile operations. The antenna is designed to receive vertically polarized signals in the 0.5 to 280 MHz frequency range. It offers accurate and repeatable

bearings, low-power consumption and a ruggedized, lightweight design. The antenna is available with several mounting options, including tripod mount and car-top mount using magnets and/or car straps. Car straps are provided for added stability. A typical configuration consists of the antenna connected in series between an MA1310 antenna and the DF receiver/processor to achieve a total range of 0.5 MHz to 1.3 GHz.

www.cubic.com

dbSpectra

The DS7C10F36U-N Omni Fiberglass 763 – 869 MHz antenna ensures excellent vertical pattern control and shaping, company exec-



utives said. The antenna is a broadband solution that can be used for both 700 and 800 MHz systems. The rugged 8-centimeter fiberglass radome and mounting interface was tested for quality, strength and stability, executives said. dbSpectra designs and manufactures antennas in a variety of frequency ranges.

www.dbspectra.com

Kaltman Creations

The Aaronia series of antennas and sensors represents a leap in performance, functionality and design, Kaltman execu-

tives said. The antennas are ideal for precision, broad frequency range applications including test and measurement, compliance, data linking, mobile measurements, directional finding and laboratory use. Aaronia antennas and sensors offer cost-effective alternatives while maintaining above-industry specifications and standards. More than 25 models of antennas and sensors are available.

www.rfanalyzers.com

Kendoo Technology

Kendoo's 800 MHz 3.5-inch Stubby Antenna operates in the 806 – 869 MHz frequency

band. The antenna features an SF/SMA connector for portable radios. More information can be found by searching SKU M-152 on the company's website.

www.kendoo.com

Lea Antenne & Progetti

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

www.leagroup.it

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MiMOMax Wireless

The newly released MiMOMax Quad-Array Loop Yagi antenna features a typical gain of 17 dBi and the ability to transmit both horizontally and vertically polarized high performing multiple input multiple output (MIMO) signals simultaneously. The antenna provides up to 6 dB more signal gain than the company's Compact Loop Yagi antenna, and in most cases, the antenna will be positioned at both ends of a link, increasing path gain by up to 12 dB. The core benefit of the antenna is its ability to transmit dual-polarized, high-quality MIMO signals and increase path range by up to three times, depending on the path characteristics, company officials said.

www.mimomax.com

Mobat USA

The HLA-125 magnetic half-loop antenna with built-in high-efficiency automatic tuner for the 1.6 – 30 MHz band is rated at 125 watts PEP/average and can be mounted on vehicles, boats and used in a base station configuration. Designed for near verticle incidence skywave (NVIS) operation, the antenna covers 0 – 966 kilometers without skip zones. The antenna's received signal-to-noise ratio (SNR) in 0 – 161 kilometers is 10 dB stronger than a typical whip antenna, company executives said. Also available is the FAA5522, a 10-meter vertical antenna rated at 1 kilowatt that covers the 2 – 30 MHz range without tuners.

www.mobat-usa.com

Procom

Procom's multichannel hybrid combiner for TETRA radios can be used in vehicle or stationary. The combiner is used for parallel operation of two to four TETRA transceivers on one common antenna where highest possible decoupling (isolation) is necessary. The combiners can be adjusted according to the connected antenna, so the isolation is increased to the necessary value, making parallel operation possible. High isolation is achievable, with up to -50 dB at the center frequency (dependent on the standing wave ratio (SWR) of the connected antenna), and the product features small ripple on the connectors over the total frequency range.

www.procom.dk

Skymasts Antennas

A high-performance indoor panel antenna (752.01.05) for the Project 25 (P25)/TETRA/UHF band of 380 – 470 MHz just completed specific absorption rate (SAR) testing to EN50385:2002. Suitable for indoor or outdoor applications, the antenna can be mounted in several modes: wall,

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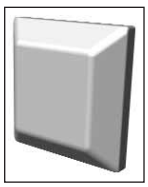

ceiling or on a pole. Dimensions are kept to the minimum, 292 millimeters (mm) square and 76 mm deep. A dual polar panel (7180.01.05) for 870 MHz to 2.7 GHz covers all cellular frequencies with 3G and 4G. Careful attention was given to fire-retardant properties, as well as low intermodulation products, essential for digital systems, company officials said.
www.skymasts.com

Telewave

The Telewave ANT280S is a rugged interoperability antenna for all frequencies between 118 MHz and 3 GHz that features 500-watt power handling. The antenna weighs 10 pounds and can be field deployed or can replace multiple antennas on a mobile command vehicle.

The antenna can also be permanently mounted for long-term operation with an available dual-clamp kit. The antenna is built from welded 6061-T6 solid aluminum and protected with a tough full-surface coating. Each antenna provides a cable with N-male connector and is ready to operate with a single or multiband radio using one antenna output. Several types of low-loss couplers are available for multiradio operation.
www.telewave.com

Webb Industries

Webb Industries designed the SiteMaster SM390-6 collinear antenna for the local TETRA network. The fiberglass collinear antenna is a high-gain base station antenna designed to yield maximum gain in the horizontal plane. Side lobes are reduced to a minimum, and the antenna is supplied with an integral clamp for mounting on a vertical or horizontal support pole. Offering a frequency range of 380 – 400 MHz and a rated power of 300 watts, the antenna is coax grounded and lightning protected.
www.webb.co.za

ACCESSORIES

BatteryJack

BatteryJack's Titan speaker microphones feature IP-67 construction that allows the rugged mics to be waterproof, while the patented metal plate spring clip allows users to position the mic in any way needed. Combined with Kevlar-reinforced cable and one-year warranty, the mic is now available in 35 different connector options, covering more than 1,000 radio options.
www.batteryjack.com

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masks and safety helmets. The system enables and enhances communications for users wearing personal safety equipment in high-noise situations because messages can be received while wearing hearing protection. The system uses patented bone conduction technology to send and receive communications to the user's head, effectively isolating ambient noise, reducing missed messages and improving transmissions to increase safety and operational efficiency, company officials said. The system is ideal for workers operating in high-noise hazardous environments.

www.guardian.com.au

Impact Radio Accessories

The PDM-2 double muff high-noise headset can be worn with most helmets. The headset features push to talk (PTT) on one of the ear cups, Kevlar-reinforced cable, background noise-canceling boom mic and Nexus-style jack that integrates with the company's IP-67-rated oversized Pro PTT. The large, submersible rubber PTT junction is available for most portable models, features an oversized robust clothing clip and is heat rated for extreme temperatures. Throat mic, temple transducer headset and skull mic models are also available for use with the Pro PTT.

www.impactcomms.com

Jing Deng Industrial (JDI)

The JD-DM1 desk microphone features -73 dB sensitivity and output impedance of 600 ohms. Other features include a second push to talk (PTT) for convenient control when standing, PTT-lock switch to lock during long transmissions, and high-impact housing, company officials said. The nondirectional dynamic element measures 170 by 67 by 167 millimeters.

www.jdi-co.com

Klein Electronics

Klein Electronics introduced the Director+ high-noise surveillance with bottom connector for Sprint Nextel networks. The professional miniature armature speaker is built into the earpiece and uses an armature device that acts like a piston to create sound and eliminate most bass. This optimizes the high frequencies for voice clarity. The earpiece features Knowles brand microphone with noise reduction, sidebar push-to-talk (PTT) button with clip, cabling and a Kevlar strand for added pull strength. The product features a balanced armature magnetic receiver, high sound pressure output, high mechanical shock resistance and is self-shielded to reduce magnetic radiation.

www.headsetusa.com

Mobility Sound Technology

Bluetooth products allow users to communicate between a two-way radio and Bluetooth headset without a cord and eliminate the need to charge batteries due to the plug-and-play feature. The Bluetooth adapters are available for Motorola MOTOTRBO, GP, HT-1000; Kenwood Communications' NEXEDGE; as well as Icom and Vertex Standard series. Models will be released for HYT and Cassidian, company officials said. All the adapters can communicate with most Bluetooth headsets, including Plantronic, Peltro, Sony and Motorola.

wwww.mobilitysound.com

Plantronics

The CA12CD cordless headset adapter provides wireless communications and push-to-talk (PTT) functionality for applications within E9-1-1 dispatch and air traffic control. The adapter uses digital 64-bit encryption and operates within the unlicensed personal communications services (UPCS) band (1.92 – 1.93 GHz). The adapter features built-in battery chargers and two batteries that provide eight hours of talk time each. The base has a 3-meter coil cord terminated with a PJ7 connector. The remote offers a quick disconnect that provides compatibility with all Plantronics H-tops. Corded and USB versions of the PTT interface are also available.

www.plantronics.com

Pryme Radio Products

The Pryme GPS-4100P series GPSMICS function as both remote speaker mics and pinpointed GPS location devices. The mic features multiple reporting modes to automatically track field employee locations over existing radio networks and free tracking software. The product is compatible with most professional handheld radios using Pryme's QD adapters. The company just obtained its 12th patent on the mics.

http://gps.pryme.com

Stop Noise Finland

Multi Handset 3 in 1 (audio – data – image) is a speaker microphone that features a keypad for controlling the terminal's functions. The handset includes a man-down alert function for improved user safety. Organizations can choose from a list of features and have the handset tailored to their needs. The handset offers biometric identification in a familiar speaker microphone device. Optional features include barcode scanner camera and radio frequency identification (RFID) reader. Extra features include fingerprint scanner and LED torchlight.

www.stopnoise.fi

Thales Communications

A full line of accessories supports the Liberty multiband land mobile radio, including cases and holsters (spring-loaded belt clips, leather carrying cases, Nylon Duty cases and Chestpack Holsters); antennas (22-centimeter broadband antenna that covers VHF, UHF, 700 and 800 MHz); and audio accessories (speaker microphones, GPS speaker microphones, lightweight headsets and heavy-duty headsets). Other accessories include batteries, chargers and surveillance equipment.

www.thalesliberty.com

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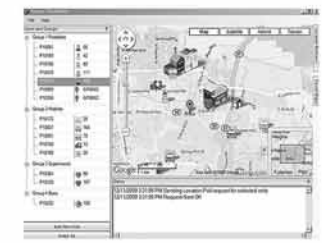

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New Products

TETRAPOL Radio

Cassidian presented a TETRAPOL handheld radio prototype, TPH700 Ex, for explosion-prone areas. The radio comes with an ATEX certification for gas, enabling safe and reliable communications in places where flammable substances are produced, processed, transported and stored, company officials said.

The user interface is similar to the company's other handheld and mobile radio models, including color display, navigation and shortcut keys. The radio will be released in 2011 with a wide-range of ATEX-certified accessories, including a remote speaker microphone and several audio devices.

www.cassidian.com

Portables

Kenwood Communications' TK-2312/3312 VHF/UHF conventional portables are 5-watt, 128-channel high-performance radios suitable for public-safety and business/industrial users. The portables feature an eight-digit display with received signal strength indicator (RSSI) and function/status icon, four-color LED, nine programmable function (PF) keys and lightweight 2-ampere hour (Ah) Li-ion battery. Both versions meet Mil-Std-810 C/D/E/F/G, as well as IP-54/55 for water and dust intrusion.

Kenwood also introduced the TK-5220/5320 Project 25 (P25) portable radios that comply with IP-67 immersion specifications. The UHF/VHF handheld radios meet standards to guarantee operation even if fully immersed in 1 meter of water for up to 30 minutes. The radios are ideal for firefighting, hazardous material (HAZMAT), and search and rescue (SAR), company officials said. The radios are compliant with 11 Mil-Spec categories including driven rain and IP-54/55 for water and dust.

www.kenwoodusa.com

Trunking P25 Radios

Relm Wireless introduced the first trunked version of its KNG-line of digital Project 25 (P25) radio models. Trunked portables and mobiles are immediately available in the VHF, UHF and 700/800 MHz frequencies.

www.relm.com

TETRA Radio Board

Sepura launched SRB8000, a voice and data-capable TETRA radio board. The product meets the requirements of third-party providers, allowing for easy integration, Sepura executives said. The board allows third-party applications to send and receive information using voice, multislot packet and circuit mode data, and status or short data service (SDS) messaging services. Fully compatible with all TETRA infrastructure, the device offers TETRA Air Interface Encryption and customizable RF power up to 1.8 watts in trunked or direct mode. The product is ideal for system integrators who work with police, fire and ambulance, as well as data solutions providers for the transportation and utility sectors.

www.sepura.com

DMR Telephone Interface

Radio Activity developed the first Digital Mobile Radio (DMR) automatic telephone interface. The RA-TI-01 and RA-TI-02 modules perform a high-performance, automatic radio-to-telephone and telephone-to-radio interface for DMR systems, company officials said. Radio base stations RA-XXX, in conjunction with the RA-TI-XX, automatically link a group of DMR radio terminals with a telephone line. Communications will be duplex from the telephone side and semiduplex from the terminal side.

www.radioactivity-tlc.com

Dispatch Control

Telex Radio Dispatch launched the MTRBi radio interface that allows Telex IP consoles to control Motorola MOTOTRBO digital two-way radio systems via MOTOTRBO control stations. The interface allows system features to be controlled via Telex C-Soft-equipped control consoles. Standard controls include automatic number identification (ANI), scan control, and zone and channel change, as well as allowing dispatchers to check the status of a radio, or disable and enable the radio. Other features include GPS and dispatch-enabled remote radio monitoring.

www.telex.com/radiodispatch

Paging Regenerator

The PR-10 simplex repeater maker with selective repeat from **Midian Electronics** records incoming audio and retransmits the audio into dead spots. The instrument offers a tone decoder to retransmit only validated pages for applications such as fire departments retransmitting two-tone pages into remote areas with poor radio coverage.

The company also released the IS-2 interoperability switch that features two ports to interoperate two different radio systems. The switch features an enable/disable option for disabling the switch when interoperability is not desired using DTMF. For trunking systems, the switch has channel acquisition inputs and an audio buffer to store the oncoming audio until the channel is acquired.

www.midians.com

High-Noise Headset

The intrinsically safe (IS) Smart Muff from **Sensear** was designed to enhance communications in high-noise environments while keeping workers protected from noise-induced hearing loss. The headset combines the company's speech enhancement and noise suppression (SENS) technology to enable clear and safe communications in high-noise environments where hazardous and potentially combustible materials are present. Without having to remove the hearing protection, the headset allows for communications face to face, using two-way radio (with a compatible IS model) or using Bluetooth through a cell phone. The headset also allows muff-to-muff communications in

short-range distances, up to 50 meters.
www.sensear.com

Mesh Infrastructure

The HotPort 7000-900 MHz wireless infrastructure mesh from **Firetide** works in fixed and mobile environments. The dual-radio mesh node operates in the 900 MHz spectrum on one of the radios and in the 2.4, 4.9 or 5 GHz frequency bands on the other, and is available in indoor and outdoor configurations. Users can operate the 900 MHz links for non-line-of-sight communications and line-of-sight (2.4, 4.9 and 5 GHz) multiple input multiple output (MIMO) mesh for high-capacity backhaul. The Firetide Mobility Controller (FMC-2050) can maintain network connectivity for Ethernet-enabled devices, such as IP video cameras, Wi-Fi access points, and RFID readers and laptops while traveling at high speeds across multiple Firetide mesh networks. The controller offers management of up to 50 mesh nodes.
www.firetide.com

USB with Vocoder

The USB-3000 from **Digital Voice Systems Inc. (DVSI)** is a USB device embedded with DVSI's AMBE-3000 vocoder chip to encode and decode files and process real-time

speech by plugging the device into a PC. With the vocoder chip built in, the USB can operate at any data rate from 2 to 9.6 kilobits per second (kbps), which permits channel optimization within system requirements to achieve excellent voice quality with robustness to bit errors and acoustic background noise, DVSI executives said. The device also provides access to all of the vocoder chip features, including voice activity detection (VAD), adaptive comfort noise insertion (CNI) and support for DTMF tones.
www.dvsinc.com

Cartesian Feedback Loop IC

The CMX998 from **CML Microcircuits** is an upgrade to the company's integrated solutions for transmitter linearization. The product features an RF operating range from 30 MHz to 1 GHz, is ideal for portable devices and provides all of the basic building block functions needed to implement a Cartesian feedback loop transmitter in a two-way radio design. Suited to multimode software-defined radio (SDR) systems, the product supports a wide range of linear modulation formats and standards, including TDMA operation, TETRA mobile station power classes up to 3 watts, Project 25 (P25) and TETRA 2 terminals.
www.cmlmicro.com

Replacement Batteries

BatteryJack manufactures a Li-ion battery for the Harris (M/A-COM) Jaguar 700P series, P5100, P7100 and P7230 series radios, replacement for original part number BKB191210/36. The battery provides a lightweight, greener substitute to NiCD and NiMH batteries, company officials said.
www.batteryjack.com

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- Trunking System is internet remote-programmable
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- Motorola, Kenwood, Vertex & Icom transceivers can be simply upgraded with the RG-Trunking-Board
- RG-450 transceivers are fully integrated for trunking & conventional operation
- Multi-site-systems can be linked-up by VOIP-PBX for roaming

RG-450 LTR & Smartrunk-Radio

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

VHF 136-174 MHZ
220-260 MHZ

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

Trunking-Option-Boards

RG-117-/
RG-117-R
For Icom™ radios)

VT-80 (for
Vertex™
Radios)

RG-860
(For Kenwood)

RG-380
Trunking board for
motorola Professional
Series Radios

RG-180
Trunking board for Motorola
Commercial Series Radios

Noise-Canceling & Radio-Headset Series

BTH-H43-d

BTH-H-41-a

BTH-H-45-d-1

Radio-Titan

Armada-OTH-Flex

RF-Scanner

(for Racing-car & Heavy-Industries-)

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

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

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

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

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

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

Q111

Asia/Pacific Continues to Rely on Conventional Networks

By Lindsay A. Gross

RadioResource International recently surveyed readers from Asia/Pacific and other regions to find out about mobile radio communications technology trends. The survey revealed that similar to Europe, the Middle East/Africa and Central/South America, digital conventional and analog conventional networks are the most widely used in the region, with more than 50 percent also using digital trunked and analog trunked technologies. Twenty-eight percent of respondents said they use satellite networks.

Similar to some other geographic regions, Digital Mobile Radio (DMR) is the most-used digital technology in the Asia/Pacific region. Thirty-eight percent of respondents use either TETRA or Project 25 (P25). Twenty-nine percent said they use digital Private Mobile Radio (dPMR).

Sixty-two percent who don't already use digital technology said they plan to migrate within the next two years, similar to findings in both Europe and the Middle East/Africa.

"Similar to Europe, the Middle East/Africa and Central/South America, digital conventional and analog conventional networks are the most widely used in the Asia/Pacific region, with more than 50 percent also using digital trunked and analog trunked technologies."

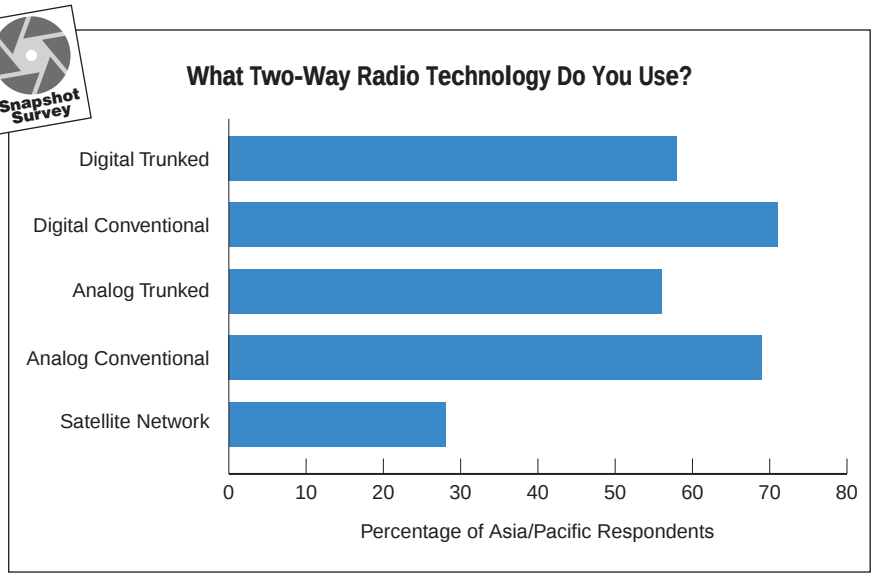
Respondents plan to make other RF technology purchases in the near future as well. Radio accessories such as headsets and microphones, antennas, power supplies, test equipment, and mobile computing devices such as laptops and PDAs comprised some of the equipment planned for purchase within the next two years.

As to the economy, 44 percent of respondents said it has been business as usual during the past year while 30 percent said that the economy has only mildly hurt their organizations during the past year. "I think the business outlook and climate in this part of the world — Asia, and in particular China — is quite different but on the rise," said Jolly Wong, chief police telecommunications engineer for the Hong Kong Police Force.

Wong said he has also observed additional technology, including wireless broadband and interoperability equipment, on the uptake during the past year in the region. ■

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

Snapshot Survey



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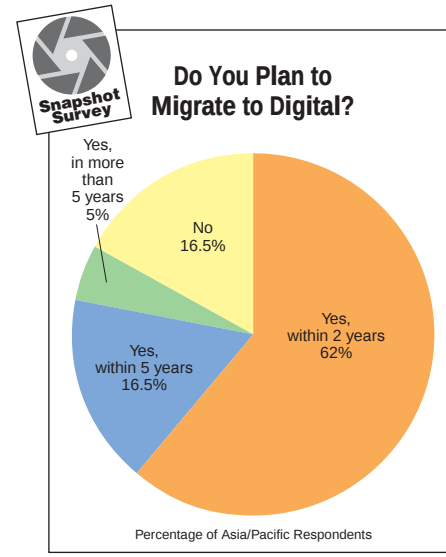
Snapshot Survey



The results reflect a 95 percent confidence level with a ±5 percent margin of error.

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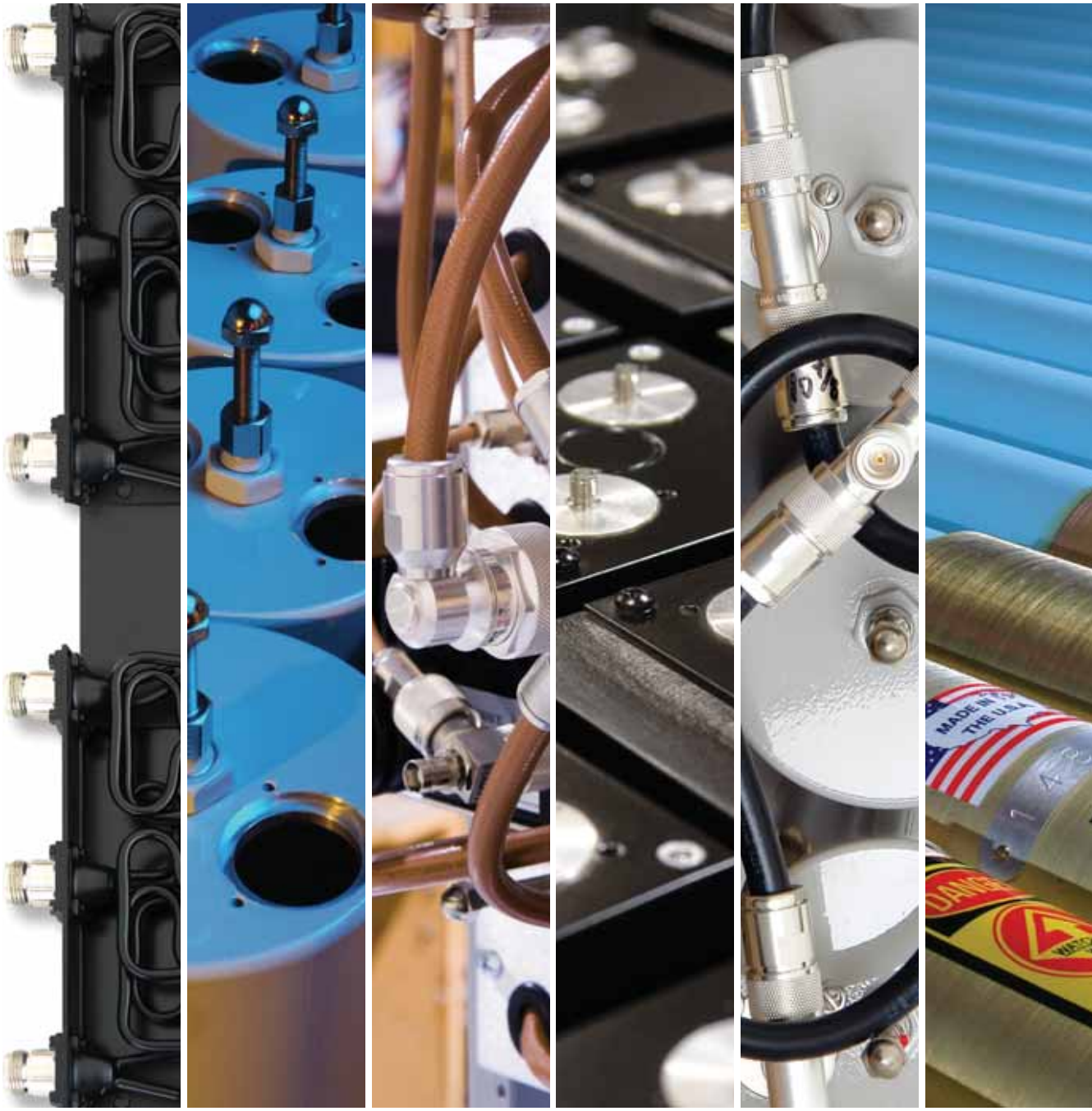

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