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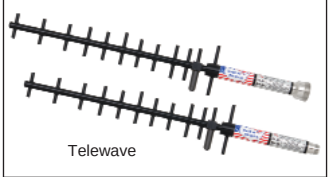
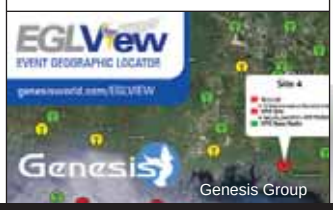

Telewave



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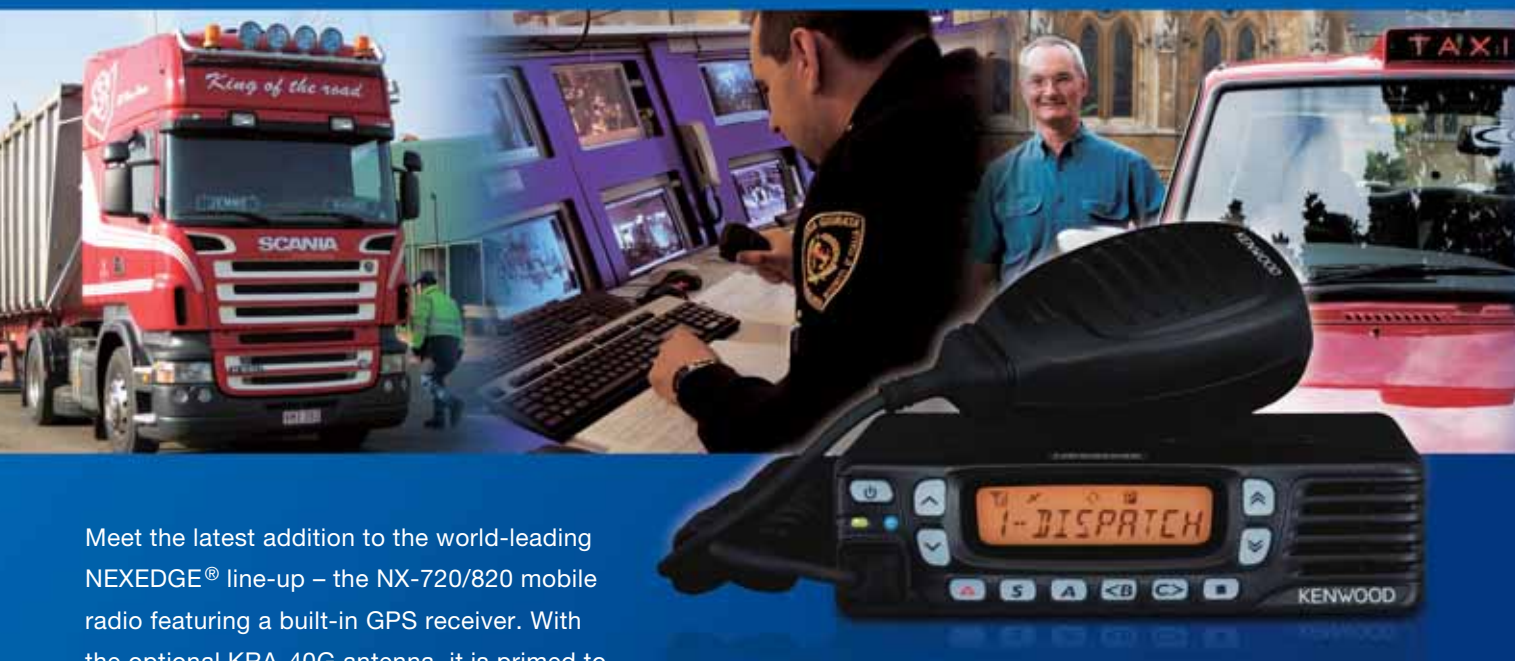

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RadioResource INTERNATIONAL

Worldwide Buyers Guide 2013

Vol. 27, No. 3

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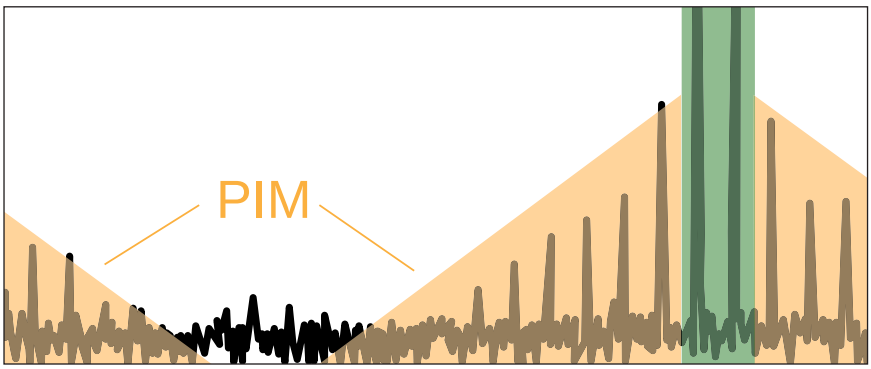

14 Tools to Mitigate Intermodulation
An explanation of intermodulation interference and new tools to find, analyze and alleviate problems seen in many radio networks.
By Chuck Soulliard and Allen Shea

22 2013 Worldwide Buyers Guide
From TETRA and Project 25 (P25) equipment to CAD software to interoperability equipment to mobile-data and asset-tracking technology, the Worldwide Buyers Guide is a veritable resource, featuring nearly 600 manufacturers, software companies and service providers and the products and services they offer to the global mobile-communications market. Use this handy guide to find all the information you need.

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NXDN, dPMR in Europe

The latest on the digital technologies on the Continent.

Emerging Markets

TETRA continues to infiltrate new markets and verticals.

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The Best Purchasing Resource

Every year, this issue of *RadioResource International* is the one resource that buyers depend on for the most detailed product and supplier information available in the global mobile communications industry.

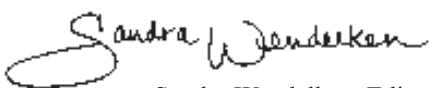
We work on this issue nearly all year long to ensure all the company information is accurate. Our editors work with companies in the industry to update company profiles and verify information. In fact, the sheer amount of information that we compile and update annually sets our buyers guides apart from others in the industry. Our editorial staff works diligently to pull together the information to help you with your 2013 purchasing decisions. A big thank you to all the marketing and press professionals with mobile radio firms around the globe who check and update their company information so we can bring you the latest and most comprehensive information.

The Worldwide Buyers Guide includes information on nearly 600 companies and the products, from portable radios to headsets to base stations to voice logging recorders to mobile data hardware and software, they manufacture or service. We've combined all manufacturers, software companies and service providers into the "Suppliers" listing that begins on Page 22. You'll then find each product category and all the companies that manufacture that product beginning on Page 31.

This issue can help buyers all year long, depending on budget and buying cycles. We welcome your feedback on how we can make this buyers guide even better. If you have suggestions or information to update, please contact us. Good luck with your purchasing decisions this year.

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

In addition to network upgrades and replacements, every communications manager must deal with intermodulation at some time or another. "Tools to Mitigate Intermodulation" on Page 14 offers insights and technical information to help you deal with this problem in your radio network.



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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Cassidian Demos Public-Safety Mobile Broadband at 400 MHz

Cassidian and the French Ministry of Interior (MoI) conducted the first demonstration of mobile broadband services for the evolution of Tetrapol networks with 4G Long Term Evolution (LTE) technology in the 400 MHz band.

The tests showed that by leveraging existing sites and using neighboring frequency bands, new 4G mobile broadband capabilities can be added to existing Tetrapol networks in a non-disruptive and cost-effective method using a dual-mode base station that supports both Tetrapol and LTE services.

"The French MoI is proud to be the first, running this kind of experimentation of LTE at 400 MHz on its Tetrapol network," said Pierre-Philippe Lidureau, INPT program director after the successful demo. "We are considering the future of our secured network, and with that respect, this solution leveraging the 400 MHz frequency is showing a path toward the modernization of our network."

Two 400 MHz base stations were deployed on two Tetrapol sites in the area to allow a first on-the-field verification of the technology performance. The demo highlighted mission-critical applications, including a live video streamed in real time between one vehicle equipped with a camera and a command-and-control center using a 400 MHz LTE network.

"It is no mystery that our TETRA and Tetrapol customers are facing an increasing need for data capacities," said Eric Davalo, head of portfolio and technology authority for Cassidian Security Solutions. "The 400 MHz band is a traditional band for dedicated professional and governmental networks and like other technologies, Tetrapol and TETRA are going through an evolution. Cassidian is investing in those technologies in mission-critical communications of the future, such as IP and broadband. The trial clearly shows that a smooth migration of existing professional mobile radio (PMR) networks, leveraging existing sites and customer investments, is becoming possible."

The 400 MHz broadband demonstration was presented during the Cassidian customer conference Secure communications Network operators and Users Conference (SNUC) in Cannes, France.

LONDON — Airwave, the U.K. mission-critical voice and data communications provider, collaborated with Scottish Ambulance Service (SAS) to deploy an in-building coverage solution at two SAS ambulance stations. SAS installed the solution at its Edinburgh city and Hamilton ambulance stations. The system included a directional antenna, similar to a TV antenna, on the outside of a building.

GLASGOW, Scotland — Riedel Communications was appointed the official radio communications services provider for the Glasgow 2014 Commonwealth Games. Riedel will design and build a radio communications solution for use across Glasgow and in venues. It will also provide all radio handsets and accessories to be used before and during the games.

Riedel will also provide radio communications for the Scottish route of the Queen's Baton Relay, ensuring radio communications run smoothly as the baton makes its way through Scotland in June and July of next year. Glasgow 2014 will be the 20th Commonwealth Games and will feature 17 sports in 11 days of competition with 261 medal events.

PARIS — Cassidian and Astrium Services completed the final validation tests for a remote solution linking Tetrapol tactical cells using Astrium Services' satellite services. The aim is to provide operations centers and the departmental fire and rescue services in France with access to dedicated satellite communications, especially for crisis situations. The system will provide users with a reliable means of communications irrespective of the condition of terrestrial networks.

The tactical cell of Cassidian 3G Independent Digital Repeater (IDR) is a fully autonomous radio solution that can be linked with Tetrapol networks. It allows task forces to communicate in extreme situations and in areas where there is no radio coverage.

The test results demonstrated that several tactical cells can be remotely linked to extend the tactical radio coverage via the satellite communications service. The satellite link can also be used to transmit voice communications and data — terminal geolocation and short message service (SMS) — from the tactical cell to the control room with an IP interface module.

ANKARA, Turkey — Turkish National Police Intelligence Department, part of the National Police force, upgraded its communications equipment with **Hytera Communications** Digital Mobile Radio (DMR) portable covert radios. Hytera also provided a DMR dispatching system to the department, alongside the terminals to realize accurate locating and tracking. The firm is also providing product training.

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STOCKHOLM, Sweden — Cassidian signed a seven-year system maintenance contract with the Swedish Civil Contingencies Agency (MSB) for the Rakel nationwide radio communications network. The contract includes third-line support, hardware repair service, and the supply of TETRA system equipment and software, and will be effective 1 April 2015.

The Rakel network is one of the largest TETRA networks in the world. It consists of almost 1,800 base stations and 22 switches covering most of the Swedish population.

AFRICA/MIDDLE EAST

CAPE TOWN, South Africa — Carlson Wireless launched the first TV white space (TVWS) trial in South Africa. Led by Google, the trial will test TVWS wireless broadband in 10 schools across the Cape Town area. Carlson, the project's equipment vendor, Google and other project partners will attempt to show that broadband can be offered over white spaces without interfering with licensed spectrum holders.

To prevent interference with other channels, the network uses Google's spectrum database to determine white space availability. Carlson's hardware, enabled by Neul Horizon software, provides the communications backbone for the trial, outputting broadband Internet while interacting with the Google database to ensure proper channel assignment.

TVWS's lower frequencies can travel long distances, making the technology well suited to provide low-cost connectivity to rural communities with poor telecommunications infrastructure. It can also be used for expanding coverage of wireless broadband in densely populated urban areas.

JOHANNESBURG, South Africa — Analysys Mason opened an office in Johannesburg, South Africa. The move will extend the company's reach in Africa and recognizes the region's increasing importance in the global telecoms and technology landscape.

"Gross domestic product (GDP) growth above 5 percent in most countries and the opportunity to leapfrog technology generations means that these countries are more attractive to firms … from outsourcing to enterprise IT to fixed and mobile broadband," said Analysys Mason's Johannesburg Office Manager Robert Schumann.

David Eurin, partner and head of African operations at Analysys Mason, said national broadband planning is a priority for African governments, operators and consumers. A team of consultants, including local recruits and experienced staff from other offices, will man the new office. The launch comes two years after Analysys Mason initiated a Middle East and Africa research program.

ASIA

BANGKOK, Thailand — Motorola Solutions is upgrading the analog radio network of Thailand's CAT Telecom to a TETRA digital network to optimize its spectrum use. The company is working with its local partner Samart Telcoms to execute the project.

The upgraded TETRA multisite network will be the first commercial network in Thailand based on an operator model whereby enterprise and government users will be able to subscribe to the public digital trunked radio network without having to invest in their own digital radio communications infrastructure.

The upgrade will be carried out in phases, starting with the introduction of a few thousand TETRA subscriber radios and base stations and a switching center to build a digital network covering the Bangkok metropolitan area and the eastern seaboard industrial hub. The target users of this network include oil and gas and transportation customers, as well as other critical government and enterprise users.

CAT Telecom was the first to

South African Police Upgrade Radio Communications

The South African Police Service (SAPS) awarded South African professional wireless communications integrator Emcom Wireless with two maintenance and support contracts for provincial radio communications networks following a lengthy tender evaluation process. The contracts will run concurrently for three years in Mpumalanga and Kwa-Zulu Natal, Durban.

"Reliable radio communications is non-negotiable for successful police operations, and maintaining and upgrading radio communications infrastructure is a critical, often-overlooked requirement," said Emcom Wireless Managing Director George Spencer.

Emcom Wireless will provide strategically positioned technicians to support and maintain a combination of Tait Communications Quasi-Sync networks, 4RF and Aviat Networks microwave radio links,

Dalman controllers and Daniels Electronics RF base stations.

In addition, Sepura won a contract to provide mobile radios to SAPS throughout the Gauteng province. The contract, secured by Altara, one of Sepura's partners in South Africa, in conjunction with Verstay, will see Sepura deliver an estimated 2,000 radios to the police service during the next two years.

"The Gauteng province, which includes the cities of Johannesburg and Tshwane (formerly Pretoria), covers an extensive area; it has a population of over 12.3 million, and a particularly undulating topology," said Emanuele Algieri, regional director at Sepura.

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Council of Australian Governments Agrees on Public-Safety Broadband Spectrum

By Geoff Spring

The Council of Australian Governments (COAG) accepted the advice from Australia's states and territories that further consideration needs to be given to the amount of broadband spectrum to be allocated to public-safety agencies.

The Association of Public-Safety Communications Officials (APCO) Australasia submitted comments to the Australian Communications and Media Authority (ACMA) 800/900 MHz review that strongly recommended that, consistent with the COAG decision, further work needs to be done before any final decision is made on a matter that will set the future strategic direction for the sector.

COAG agreed with the need to ensure public-safety agencies have adequate capabilities to respond efficiently and effectively when disasters occur. COAG said it agreed with the joint submission from states and territories regarding the need for an allocation of broadband spectrum that is sufficient to meet the needs of public-safety agencies in all jurisdictions now and into the future.

COAG said the issue requires further work and advice from officials on establishing an appropriate public-safety mobile broadband (PSMB) capability. This includes advice on the new governance framework for the development of the PSMB and on ACMA's spectrum reservation for a PSMB network. This advice will follow consultation with the Standing Council on Police and Emergency Management.

operate an analog subscriber radio network in Thailand for the use of multiple government agencies and enterprises, and the new network will support future data services and needs through TETRA Enhanced Data Service (TEDS).

INTERNATIONAL

LONDON — 2012 was the third consecutive year for record shipments by manufacturers of TETRA equipment, according to data released by IMS Research, now part of IHS.

"Our study shows growth of more than 12 percent in the number of terminals shipped in 2012 compared to 2011," said Deryn Evans, senior mobile radio market analyst at IMS Research. "The European public-safety and security market remains the backbone of the TETRA market; however we are seeing increasing success for TETRA in a number of user areas and regions that are not traditional strongholds of the technology.

"TETRA is diversifying its customer base to users considered more in the business-critical model rather than mission critical. The success of TETRA ATEX is of particular note, as it becomes the technology of choice for intrinsically safe operations."

SUWANEE, Georgia, USA — Seven new companies joined the NXDN Forum. The new member companies are **CVDS**, **Compliance Testing**, **Eventide**, **HigherGround**, **Timco Engineering**, **UL Verification Services** and **Ultratech Group of Labs**. The companies comprise a number of two-way radio application solution providers and radio conformance test labs.

The forum estimated that 1 million NXDN terminals and infrastructure are in the market, increasing the requirement for applications, as well as professional test house services to conduct interoperability testing. The NXDN Forum now has 34 member companies that provide various products and services for the platform.

ESSEX, United Kingdom — CML Microcircuits expanded its engineering department. The U.K. company formed a new specialist RF and mixed-signal semiconductor design team in Sheffield, England, as an extension of its existing Essex-based design team.

The move will allow CML to accelerate the design and release of new products into the market, executives said. RF has been a recent focus for CML. The new design team builds on existing foundations and will enable CML to address new opportunities in higher frequency wideband systems. CML also expects to use the new design engineers to further its planned and existing research activities.

PEOPLE

DERBY, United Kingdom — Simoco appointed James Hall group engineering director. Hall has several years' experience in product development and global team management with companies such as Cranfield Consultants and Open Stack.

James Hall

CHRISTCHURCH, New Zealand — Tait Communications appointed Anita Yee as its chief people officer. Yee was formerly general manager human resources at Dimension Data New Zealand and has 20 years' human resources experience in New Zealand, Australia and the United Kingdom.

Phil Burks (left) and Jim Nipp

TYLER, Texas, USA — Phil Burks, founder and CEO of **The Genesis Group**, is stepping down as president of the company. Jim Nipp will replace him as president. Nipp most recently was vice president of business development for the company, and previously worked for Dell Computer and other technology companies.

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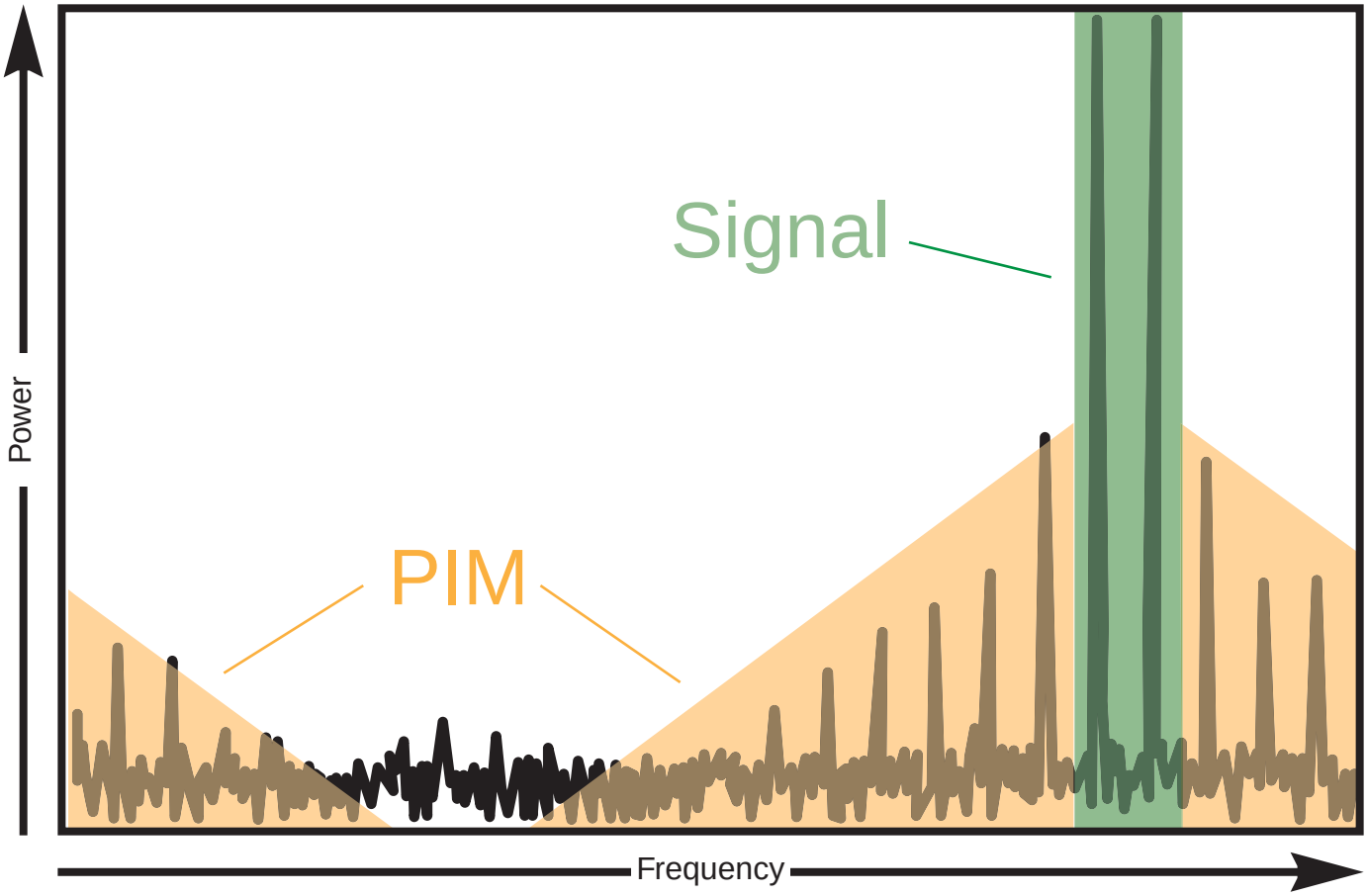

Tools to Mitigate Intermodulation

An explanation of intermodulation interference and new tools to find, analyze and alleviate problems seen in many radio networks.

By Chuck Soulliard and Allen Shea

Intermodulation (IM) is a problem that communications managers have been dealing with for the past 50 years. When two or more carrier signals combine or mix in a nonlinear device, they can create undesired intermodulation products or distortion (IMD), having an output that contains new frequencies representing the sum and differences of the original carrier signals and the sum and differences of their harmonics.

Intermodulation interference occurs when these new IMD frequencies cause interference in adjacent receivers located at repeater sites. Not all interference is a result of intermodulation distortion. It can come from co-channel interference, atmospheric conditions, and man-made noise generated by medical, welding and heating equipment.

Most intermodulation occurs in a transmitter's nonlinear power amplifier (PA). The next most common mixing point is in the front end of a receiver. Usually it occurs in the unprotected

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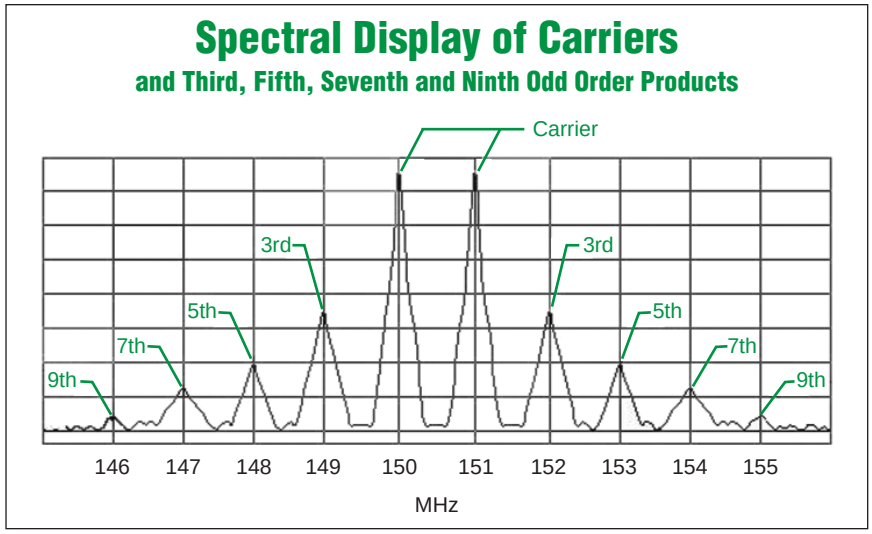

first mixer of older model radios, or in some cases, in an overdriven RF front-end amp. Intermodulation can also be produced in rusty or corroded tower joints, guy wires, turnbuckles and anchor rods or any nearby metallic object, which can act as a nonlinear "mixer/rectifier" device. In cellular systems, passive intermodulation (PIM) occurs when several transmitters are simultaneously keyed up on a shared antenna system with faulty or corroded connectors.

Causes

In the case of transmitter intermodulation, interference can only occur when both transmitters are on the air simultaneously. Suppose that transmitter A and transmitter B, located near each other, are on the air at the same instant on 150 MHz and 151 MHz, respectively. If their antennas are close, the signal from transmitter A could possibly be received by the antenna of transmitter B and coupled into its final PA if no isolator, hybrid combiner or cavity filter protection devices are installed. The opposite case can also occur where B radiates into A. In either case, mixing can occur in one or both of the transmitter's PAs, generating several new frequencies at intervals of 1 megahertz (the difference between transmitter A and B, 151 – 150 MHz). Spurious signals will occur at frequency intervals of ±1.0 megahertz away from each transmit frequency.

Examples are 146, 147, 148, 149, 152, 153, 154 and 155 MHz. The carrier frequencies are 150 and 151 MHz. The third-order products are 149 and 152 MHz. The fifth-order products are 148 and 153 MHz. The seventh orders are 147 and 154 MHz. The ninth orders are 146 and 155 MHz. Notice how the signal level diminishes as the odd order increases. Generally the

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seventh and ninth orders are too weak to cause intermodulation interference.

Receiver intermodulation is the result of two or more high-level off-channel carrier signals overloading the receiver's RF amplifier, causing it to operate in its nonlinear region, thus acting as a mixer. Older radios may not employ an RF amp and go straight into the first mixer.

It may be difficult to determine where intermodulation is occurring because the new frequencies being generated are precisely the same whether they are generated in the receiver front-end, transmitter PA or some other nonlinearity. Inserting a 6-decibel (dB) attenuator in the receiver front-end will attenuate transmitter intermod by 6 dB. Receiver intermod will be attenuated more rapidly because both signals A and B are simultaneously reduced by 6 dB each.

Classification

Intermodulation products are classified by their order (second, third, fourth, fifth, etc.). The frequencies that give rise to the products are designated by capital letters (A, B, C, etc.). These terms may include harmonics, which can be treated in the following manner. The second harmonic of frequency A is designated 2A, and therefore, contributes two terms; the third harmonic of frequency B is designated 3B and contributes three terms, and so on. The general equation for the intermodulation product is written:

$IM = n1A \pm n2B \pm n3C \pm$.

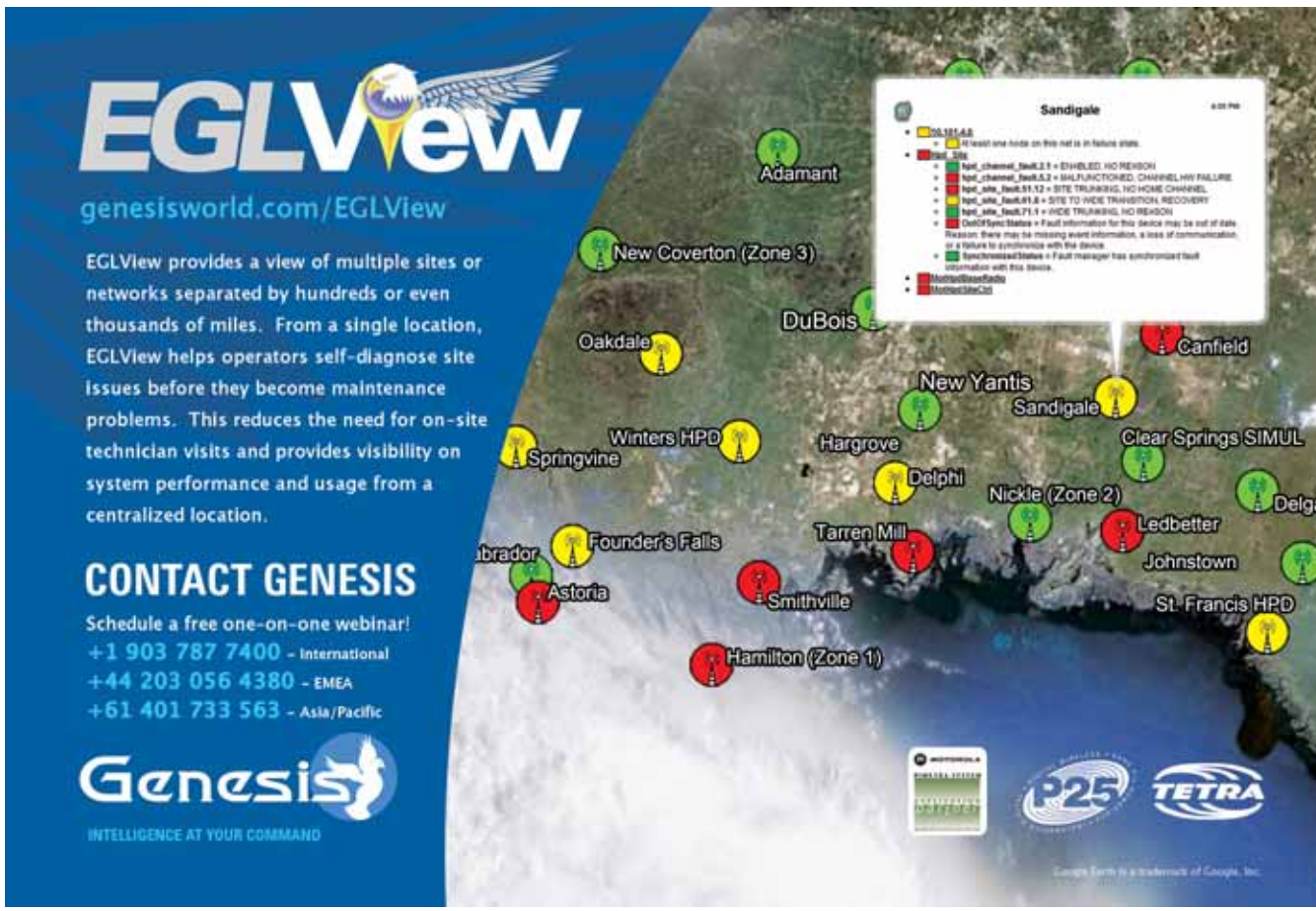
Where A, B and C are the mixing frequencies and n1, n2 and n3 are the harmonics, or multiples, of the mixing frequencies. The order of the intermodulation product is equal to the sum of the harmonics (n1, n2, n3). For instance, A + 2B + 2C generates a fifth order intermodulation term (1 + 2 + 2).

Additional examples of product order include the frequency obtained by adding or subtracting the fundamental frequencies A and B, such as A + B or A – B, are even second order products; likewise, 2A – B and A + B – C are odd-third-order products while 3A – 2B is an odd-fifth-order product, while A + B + C + D – E – F – G generates an odd-seventh-order intermodulation term (1 + 1 + 1 + 1 + 1 + 1 + 1).

There is no limit to the number of products, but only a few are of any practical concern. Even-order products (second, fourth, sixth) can generally, but not always, be dismissed because they usually fall outside the frequency band of interest.

Database Advances

A Windows-based platform with multiple database capability from Midian Electronics allows for the creation of a site with multiple locations within a single database. For example, a mountaintop site — Radio Ridge North — includes a commercial building, a government building, a military building and amateur radio building,



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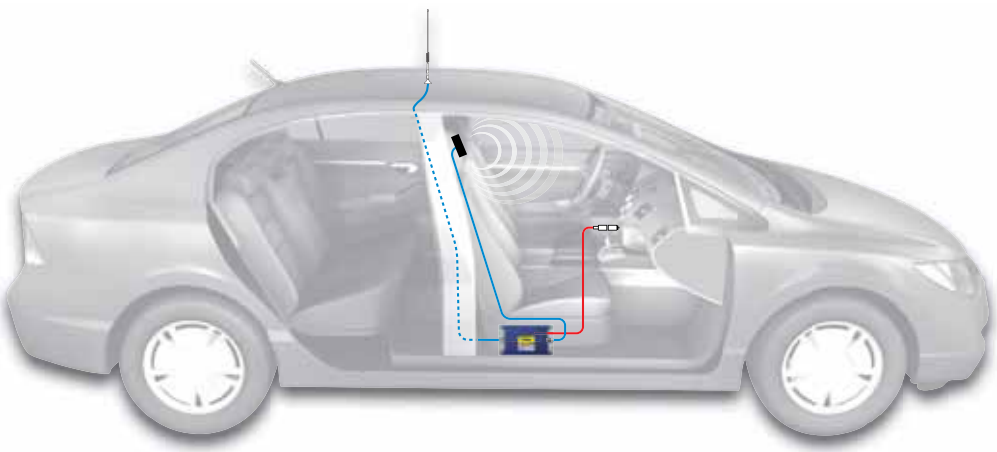

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all within a single database. The product study can then analyze all potential hits from the many users at the site. Another site can be created on the same mountaintop — Radio Ridge South — for the city building, private building and the state building. If no interference is found at either site, a new study merging the two sites and performing another study between them can be performed within a single database.

With the capability of multiple databases, users can create databases for different cities, states, locations or clients. The latitude and longitude entered into the site location window can be used with a Google map application on the Internet to display the street view of an antenna site, if desired.

The Intermod Calculator provides a check box to enable odd-orders-only calculations. By not checking the check box, both odd- and even-orders are tested, which increases the number of calculations and the time required for processing. This product can calculate up to the 33rd order with maximum frequencies of 99.9 GHz and millions of input transmit/receive (TX/RX) frequencies. Printouts include color and or comma-separated values (CSV) tabular data, which can be segmented for extremely large reports.

The calculator can be used when setting up a new system or trying to resolve issues on an existing system. "The software enables our staff to input frequencies chosen for a customer's site and determine if any intermod issues are present, preventing potential problems," says Hernan Regis, service manager, Mobile Business Communications. "In regards to existing systems that have issues present, we have been able to pinpoint for the customer where intermod is a primary concern and recommended either system filtering or frequency changes as options to resolve the issue. The software is a cost-effective tool for engineers and technicians in troubleshooting intermod issues on radio systems."

General Equation for Intermodulation

IM = n1A ± n2B ± n3C ± …

IM: Intermodulation

A, B and C: Mixing frequencies

n1, n2 and n3: Harmonics or multiples of the mixing frequencies

Calculations

Even-order products can sometimes cause problems. For example, a second-order product of 155 and 154 MHz when mixed produces a difference frequency of 1 megahertz and a summation frequency of 309 MHz, both of which are far removed from the 150 MHz band of interest. However, if there was a 309 MHz military channel near this site, it could be affected by a mix occurring in a rusty tower joint or the receiver's front-end. Transmitter intermod at 309 MHz is unlikely because the low-pass filter would attenuate it in either the 155 or 154 MHz transmitters.

Intermodulation interference most often concerns odd-order products. The most common interference is the third and fifth orders. Higher order products are potential sources of intermod, which cannot be ignored, because they also fall on in-band frequencies. However, their practical importance is minimized because they are formed at lower power levels than the third- and fifth-order products and are usually too weak to cause interference. The number of calculations increases exponentially as the order number goes up.

Even if an intermodulation product falls outside the receiver passband, the modulation deviation (especially of the higher order products) may swing across the receiver passband, causing interference. The deviation of the intermodulation product is equal to the sum of each individual's signal deviation, multiplied by the coefficient for that signal indicated in the above formulas. If signal A has a ±5 kilohertz swing and signal B has a ±5 kilohertz swing, the fifth-order intermodulation product represented by 2A + 3B will have a peak deviation of (2 x 5) + (3 x 5) = ±25 kilohertz.

For example, two transmitter frequencies — 155 and 154 MHz — give a fifth order (3A – 2B) = (465 – 308) = 157 MHz. Suppose the receiver frequency that is being interfered with is 157.025 MHz. It would appear that this calculation would not produce a hit on the receiver. However, if tone signaling or voice modulation is present on each channel at the legal maximum of 5-kilohertz deviation, then because of the fifth-order calculation, we would experience a peak deviation of (2 x 5) + (3 x 5) = 25 kilohertz, which will now sweep across the receiver's channel causing interference and possible falsing of CTCSS/DCS/burst tone/touch tone/two-tone/five-tone decoders.

The receive first high IF, on rare occasions, may be susceptible to strong signals and contribute to the potential of intermodulation. This is why the receiver (IF) field has been included but is rarely, if ever, used with modern receivers. Furthermore, any transmitter intermod on a receiver's high IF would be attenuated by the transmitter's PA final tank circuit.

One way to test for intermodulation on rusty tower joints or rusty or corroded guy wire turnbuckles is to use an ultrasonic sniffer. You can actually hear the interference. Try installing a heavy copper gauge wire around the turnbuckle with clamps on each side to shunt or bypass the carrier signals to ground. The most important thing is to use good site maintenance procedures, such as isolators, combiners, cavity filters and vertical/horizontal antenna separation.

With low-cost, easy-to-use intermod product studies available, it is best practice for site engineers to investigate potential sources of intermod from existing or new customers in their buildings or nearby locations. This enables the engineers to install the necessary equipment to prevent or minimize interference to clients. ■

Chuck Soulliard is the founder and president of Midian Electronics. Allen Shea is a software engineer for Midian Electronics. Email feedback to editor@RRMediaGroup.com.

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(B=bidirectional, L=line driver, RF=RF power, S=signal boosters, T=tower top)

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Tait Communications (RF)
Tallysman Wireless (L)
Telewave (T)
Telsate Telecomunicações (B, RF, S)
TPL Communications (RF)
Tunnel Radio of America (B, S)
TX RX Systems Bird Technologies (B, S, T)
Vislink (RF)
Webb Industries (RF, T)
Wilson Electronics (B, RF, S)

ANTENNAS

(B=base station, E=embedded, G=GPS, I=in-building, MW=microwave, M=mobile, MB=multiband portable, P=portable, S=satellite, SA=smart/adaptive, W=wireless and mobile data)

2J Antenna (B, E, G, I, M, SA, W)
4RF (MW)
Air802 (B, G, I, MW, M, SA, W)
Airaya (B, E, W)
Alcatel-Lucent (B, I, MW, W)
Aluma Tower (M, P, SA, W)
Amphenol Antenna Solutions (B, E, I, M, P, SA, W)
Amphenol Jaybeam (B, M)
Antcom (B, E, G, I, MW, M, P, S, SA, W)
Antenna Plus (G, I, M, W)
Antenna Products (B, E, G, I, P)
Antenna World (B, E, G, I, MW, M, P, S, W)
Antennentechnik Bad Blankenburg (B, E, G, I, MW, M, MB, P, S, SA, W)
AR RF Microwave Instrumentation (MW)
Arrowmax.com – Maxtop Technology (P)
ATEL-CAB (B, E, G, I, MW, M, MB, P, S, SA, W)
Avulan (B, E, G, I, M, W)
Benelec (B, G, I, M, W)
Berkeley Varitronics Systems (MW)
Bird Technologies (B)
Broadcast Microwave Services (MW)
CalAmp (B, G, W)
Carlson Wireless Technologies (CWT) (B, MW)
Cobalt AV Comtronics (B, G, I, M, W)
Cobham Antenna Systems, Microwave Antennas (B, E, G, I, MW, M, P, S, SA, W)
Codan (M, P)
Comlab (B, I)
CommScope (B, I, MW, SA, W)
Commtech Wireless (W)
Comprod Communications (B, G, I, MW, M, S, W)
Comsystems (B, M, P, W)
Comtelco (B, E, G, I, MW, M, P, S, W)
Cubic Defense Applications (M)
dbSpectra (B, I, W)
DragonWave (MW)
EF Johnson Technologies (M, P, W)
Elektronika Naglic in Drugi dno Domzale (B, M, P)
El Paso Communications Systems (B, E, G, M, MB, P, W)
EMR (B, E, I, M, P)
Encom Wireless Data Solutions (M, P, W)
Entel UK (P)
ESE (G, S)
Exalt Communications (MW)
FreeWave Technologies (B, E, G, I, W)
GE MDS (B, E, G, MW, M, W)
GME (M)
GPS Networking (G)
GRE America (M, P)
G-Way Microwave (I)
Harris Public Safety and Professional Communications (PSPC) (B, M, P)
HFRadio.US (B, M)
Hytera Communications (M, P)
I.D. Systems (G, W)
Imark Communications (B, M, P)
IPWireless (W)
Kaltman Creations (B, I, MW, W)
Kathrein, Scala div. (B, G, I, SA, W)
Kathrein Werke (B, E, G, I, MW, S, SA)
Kendoo Technology (P)
Kirmuss & Associates (B, G, M, MB, P)
Kyocera Solar (B, S, W)
L-3 Communications, Narda Microwave-East (S)
Laird Technologies (M, MB)
Lea Antenne & Progetti (B, G, I, M, P, W)
Link Communications (M, P)
Linx Technologies (E, G, P, W)
Location Technologies (E, G, W)
Midland Radio (M, P)
MiMOMax Wireless (B, SA, W)
Mobat USA (B, M)
Mobile Mark (B, E, G, I, MW, M, P, S, W)
Mobility Sound Technology (G)
Motorola Solutions (B, E, G, M, P, S)
MotoSAT (S, W)
MP Antenna (B, E, I, MW, M, SA, W)
Narda Safety Test Solutions (S)
Omega-Tec (B, MW, M, P, S)
Panorama Antennas (E, G, I, M, MB, P, W)
PCTEL (B, E, G, I, MW, M, P, W)
Pinyon Technologies (B, E, I, MW, M, P, SA, W)
Powerwave Technologies (B, I, SA)
Procom (B, E, G, I, MW, M, P, S, SA, W)
Pulse Electronics/Larsen Antennas (B, E, G, I, MW, M, P, W)
Quantun Electronics (B, M, P)
RAD Data Communications (B, MW, W)
Radial Firm (B, I, W)
Radio Frequency Systems (RFS) (B, I, MW)
RadioMobile, div. of RF Industries (G, W)
Raytheon JPS Communications (W)
RFI EMEA (B, E, G, I, M, W)
RF Industries (RFI) (B, E, G, I, M, MB, W)
Roger GPS (G)
Rojone (B, E, G, I, MW, M, P, S, SA, W)
Ross Associates/Covert Systems (MW)
Scan Antenna (B, E, G, I, MW, M, MB, P, S, SA, W)
Sigma Wireless (B, I, M, P, S)
Sinclair Technologies (B, E, G, I, MW, M, P, S, SA, W)
Skymasts Antennas (B, G, I, MW, M, W)
SmarTrunk Systems (G)
Sonik Messaging Systems (B)
Spectracom (B, MW, W)
STI-CO Industries (B, E, M, P, W)
Swissphone Telecom (B)
Symmetricom (G)
Tallysman Wireless (E, G, S)
Tekk International (P)
Telewave (B, I, W)
Telsate Telecomunicações (B, G, I, MW, M, P, W)
Thales Communications (P)
TracStar Systems (S)
Trilithic RF & Microwave (I)
Tropos Networks (M, W)
Trylon TSF (MW)
Tunnel Radio of America (B, I)
TX RX Systems Bird Technologies (B)
Unimo Technology (P)
Vislink (G, MW, M, P, S, SA, W)
Wade Antenna /Taco Antennas (B, I, W)
Webb Industries (B, G, I, MW, M, P, W)
Wilson Electronics (I, W)

BASE STATIONS/ REPEATERS

(I=in-building, M=mobile radio, P=paging)

Advanced Digital Systems (M)
Airaya (I, M)
Alcatel-Lucent (I, M)
Alligator Communications (M)
Aluma Tower (M)
Amphenol Antenna Solutions (I, M)
Amphenol Jaybeam (I)
Avulan (I)
Axell Wireless (I, M)
Benelec (M)
BHE Bonn Hungary Electronics (I, M, P)
Bird Technologies (M)
BridgeCom Systems (I, M)
CalAmp (M)
Cassidian (M)
Cobalt AV Comtronics (M)
Cobham Antenna Systems, Microwave Antennas (I)
Codan (M)
Comlab (I, M, P)
CommScope (I, M)
Comsystems (I, M)
Connect Systems (M)
CPI Communications (M)
Creowave (I)
Damm Cellular Systems (I, M)
Daniels Electronics (M, P)
dbSpectra (I)
DX Radio Systems (M, P)
EF Johnson Technologies (M, P)
Elektronika Naglic in Drugi dno Domzale (I, M)
El Paso Communications Systems (I, M)
EMR (I, P)
Encom Wireless Data Solutions (I, M)
Etherstack (I, M)
European Telecommunications S.A. (ETSA) (I, M)
Fiplex Communications (I)
Firecom (M)
Futurecom Systems Group (I, M)
GE MDS (M)
GRE America (M)
G-Way Microwave (I, P)
Harris Public Safety and Professional Communications (PSPC) (M)
Hytera Communications (I, M)
Hytera Mobilfunk (I, M)
Icom (I, M)
I.D. Systems (M)
IHM (M, P)
Imark Communications (M)
Innovative Circuit Technology (ICT) (M)
IPMobileNet (M)
IPWireless (I)
Kenwood (M)
Kenwood USA – Communications Sector (Kenwood) (I, M)
Kirmuss & Associates (M)
Laird Technologies (I, M)
LMR Systems (M, P)
Maxon (M)
Midian Electronics (M, P)
Midland Radio (I, M)
Mobat USA (M)
Motorola Solutions (M)
Pacific Crest (M)
Polycom (I)
Prism – IPX Systems (P)
Quantun Electronics (I, M)
Radio Frequency Systems (RFS) (M)
RadioMobile, div. of RF Industries (I, M)
Raveon Technologies (M)
Relm Wireless (I, M)
RFI EMEA (I, M, P)
RF Industries (RFI) (I, M, P)
RF Technology (M, P)
Ritron (I, M)
Rohill Engineering (M)
Rojone (I, M, P)
Royal Communications International (M)
Schnoor Industrieelektronik (M)
Selex Elsag (I, M)
SmarTrunk Systems (I)
Sonetics (M)
Sonik Messaging Systems (M, P)
Spectra Engineering (I, M, P)
Spectrum Communications (M)
ST Electronics (Info-Comm Systems) (I)
Swissphone Telecom (P)
Tait Communications (I, M, P)
Team Simoco (I, M)
TecNet International (M)
Tekk International (M, P)
Telsate Telecomunicações (I, M)
Teltronic S.A. Unipersonal (M)
Thales Communications (M)
Trilithic RF & Microwave (I, M, P)
Tunnel Radio of America (I)
TX RX Systems Bird Technologies (I)
Vertex Standard (M)
Westel Wireless Systems (M)
WiPath Communications (M, P)
Wireless Pacific (M)
Xiamen Puxing Electronics Science and Technology (I, M, P)

BATTERY EQUIPMENT

(Portable Radio)

Analyzers/Conditioners

Advanced Charger Technology
AdvanceTec Industries
Alexander Technologies
Antcom
Asentria
BatteryJack
BatteryZone
Cadex Electronics
Eagle Eye Power Solutions
Honeywell Batteries/Global Technology Systems
Kendoo Technology
Maha Energy
MarathonNorco Aerospace, Christie div.
Motorola Solutions
Power Products
Team Simoco
Valesco Battery Charger Systems
W&W Manufacturing

Batteries

Addvantech
Alexander Technologies
Aria Industrial
Arrowmax.com – Maxtop Technology
BatteryJack
BatteryZone
Benelec
CAPE
EF Johnson Technologies
El Paso Communications Systems
Emerging Power
Entel UK

GRE America
Harris Public Safety and Professional Communications (PSPC)
Honeywell Batteries/Global Technology Systems
Hytera Communications
Imark Communications
Kendoo Technology
Kenwood
Kenwood USA – Communications Sector (Kenwood)
Kirmuss & Associates
Laird Technologies
Maha Energy
Maxon
Midland Radio
Motorola Solutions
Oy Stop Noise Finland
Power Products
Quantun Electronics
Relm Wireless
Shenzhen Power-Time Technology
Sonic Communications International
Spectrum Communications
Tait Communications
Team Simoco
TecNet International
Telsate Telecomunicações
Thales Communications
Ultralife
Unimo Technology
United Communications
Valesco Battery Charger Systems
W&W Manufacturing
Wireless Pacific
Xiamen Puxing Electronics Science and Technology

Battery Chargers
Addvantech
Advanced Charger Technology
AdvanceTec Industries
Alexander Technologies
Analytic Systems
Aria Industrial
Arrowmax.com – Maxtop Technology
Astron
Ballard Power Systems
BatteryJack
BatteryZone
Benelec
Cadex Electronics
CAPE
CeoTronics
Eagle Eye Power Solutions
EF Johnson Technologies
El Paso Communications Systems
GRE America
Harris Public Safety and Professional Communications (PSPC)
Honeywell Batteries/Global Technology Systems
Imark Communications
Impact Radio Accessories
Innovative Circuit Technology (ICT)
Kendoo Technology
Kenwood
Klein Electronics
Lind Electronics
Maha Energy
MarathonNorco Aerospace, Christie div.
Maxon
Midland Radio
Motorola Solutions
Oy Stop Noise Finland
Power Products
ProClip USA
Quantun Electronics
Samlex America
Shenzhen Power-Time Technology
SmarTrunk Systems
Spectrum Communications
Tait Communications
Team Simoco
TecNet International
Telsate Telecomunicações
Thales Communications
Ultralife
Unimo Technology
Valesco Battery Charger Systems
W&W Manufacturing
Wireless Pacific
Xantrex Technology
Xiamen Puxing Electronics Science and Technology

CRYSTALS/CHANNEL ELEMENTS
Star Microwave Service
United Communications

DISPATCH EQUIPMENT
Automatic Call Distributor (ACD)
Avaya
Cassidian Communications
Motorola Solutions
Schnoor Industrieelektronik
ST Electronics (Info-Comm Systems)
Visual Electronics
Zetron
Zonith

Dispatch Furniture
AFC Industries
Cassidian
Concept Seating
Eaton
Ergotron
E Technology Systems
Motorola Solutions
Prescom
Raytheon JPS Communications
Schnoor Industrieelektronik
Watson Dispatch
Winsted
Zetron

Graphics-Imaging Equipment
C4i
Raveon Technologies
Tech Global

Interconnect
Artevea Digital
C4i
Cassidian Communications
Catalyst Communications Technologies
Communications-Applied Technology
Compuquest
Connect Systems
DX Radio Systems
GAI-Tronics
Hoag Electronics
Kolibri Systems
LMR Systems
Midian Electronics
Motorola Solutions
Mutualink
NHRC Repeater Controllers
Omnitronics
Pantel International
Penta
Prescom
Selex Elsag
SmarTrunk Systems
ST Electronics (Info-Comm Systems)
Tait Communications
Team Simoco
VoiceInterop
Zetron

Radio Consoles
3T Communications
Albrecht Telecommunications
APD Communications
Artevea Digital
Avtec
BridgeCom Systems
C4i
Cassidian Communications
Catalyst Communications Technologies
Cimarron Technologies
CPI Communications
EF Johnson Technologies
Etelm
Etherstack
GAI-Tronics
Harris Public Safety and Professional Communications (PSPC)
IDA
IHM
Midian Electronics
Motorola Solutions
NeoTerra Systems
New Communications Solutions (NCS)
Omnitronics
Pantel International
Penta
Prescom
Raytheon JPS Communications
Schnoor Industrieelektronik
ST Electronics (Info-Comm Systems)
Team Simoco
Telex Radio Dispatch
Telsate Telecomunicações
Zetron

Turnkey Systems (business/industry)
3T Communications
Artevea Digital
BridgeCom Systems
C4i
Cassidian
Cassidian Communications
Comlab
Compuquest
Cyrun
DX Radio Systems
EF Johnson Technologies
Etelm
Etherstack
Frequentis
GE MDS
Hytera Communications
Hytera Mobilfunk
IHM
InterAct
Intergraph
Motorola Solutions
Pantel International
Penta
Prescom
RadioMobile, div. of RF Industries

TETRA

funkwerk
security communications

funkwerk FT4 Ex

Intrinsically safe TETRA handset

IEC IECEx Quality made in Germany

Protection by intrinsic safety "i" & "iD" according to ATEX & IECEx standard (Gas & Dust)

BVS 11 ATEX E 083 X:	II 2G Ex ib IIC T4 Gb	II 2D Ex ib IIIC T125°C IP6X Db
IECEx BVS 11.0099X:	Ex ib IIC T4 Gb	Ex ib IIIC T125°C IP6X Db

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Product Category Index

Raytheon JPS Communications
Sabre Building Systems by Cellxion, div. of Sabre Industries
Selex Elsag
Send Word Now
SmarTrunk Systems
Solacom Technologies
Special Electronics and Designs
Star Microwave Service
ST Electronics (Info-Comm Systems)
Swissphone Telecom
Tait Communications
Team Simoco
Telex Radio Dispatch
VoiceInterop
Zetron

Voice Logging Recorders
3T Communications
ASC Telecom
ATIS Systems
Cassidian Communications
Catalyst Communications Technologies
CVDS
Damm Cellular Systems
Dees Communications
Etherstack
Eventide
Exacom
Frequentis
HigherGround
Hytera Communications
Hytera Mobilfunk
JEI Communication Recorders
Kolibri Systems
Motorola Solutions
Multisuns
Nice Systems
Omnicron Electronics
Pantel International
Raytheon JPS Communications
Record Play Tek (RPT)
Red Box Recorders
Rohill Engineering
Schnoor Industrieelektronik
Send Word Now
Signal Intelligence
Spescom
Stancil
Stancil Solutions
ST Electronics (Info-Comm Systems)
Team Simoco
Telex Radio Dispatch
Telsate Telecomunicações
Total Recall
Verint Systems
Versadial Solutions
Voice Print International (VPI)
Zonith

DISTRIBUTORS/REPS
(See Distributors/Reps Index, Page 30)

ENCRYPTION/SCRAMBLING
Albrecht Telecommunications
Cimarron Technologies
Codan
Communications Specialists
Comsystems
Cromack Industries
Funkwerk Security Communications
Harris Public Safety and Professional Communications (PSPC)
HV Sistemas
Imark Communications
Kantronics
Kavit Electronics Industries
LMR Systems
Maxon
Midian Electronics
Mobat USA
Radio IP Software
Tait Communications
Team Simoco
Tekk International
Teletec
Telsate Telecomunicações
Teltronic S.A. Unipersonal
Thales Communications
Titan Communication Systems
Westel Wireless Systems

LOCATION SYSTEMS EQUIPMENT
ANI/ALI
APD Communications
Benelec
Cassidian Communications
Cimarron Technologies
El Paso Communications Systems
Exacom
Hoag Electronics
HV Sistemas
InterAct
Intergraph
Location Technologies
Midian Electronics
Motorola Solutions
Penta
Raveon Technologies
SmarTrunk Systems
ST Electronics (Info-Comm Systems)
Tait Communications
TeleCommunication Systems (TCS)
Telsate Telecomunicações
TruePosition
Zetron

Asset Tracking/RFID
APD Communications
Benelec
Comm-Net 2000 Manufacturing
Computer Resources
Cubic Defense Applications
Etelm
I.D. Systems
In Motion Technology
InSight Mobile USA dba StreetEagle GPS
Laird Technologies
LMR Systems
Location Technologies
Mobile Mark
Motorola Solutions
Panorama Antennas
Raveon Technologies
Rojone
Skymasts Antennas
Trident Micro Systems
Tunnel Radio of America

AVL/GPS
(A=AVL, G=GPS)
AC DC Industries (G)
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Hytera Mobilfunk (A)
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Kolibri Systems (A)
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Maxon (A, G)
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Midian Electronics (G)
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Teltronic S.A. Unipersonal (A, G)
Thales Communications (G)
Trident Micro Systems (A)
TriTech Software Systems (A, G)
TruePosition (A, G)
TS Mobile (G)
Vecima Networks (G)
Webb Industries (G)
WiPath Communications (A, G)
Xiamen Puxing Electronics Science and Technology (G)
Zonith (G)

Mobile Resource Management
APD Communications
CalAmp
Cassidian Communications
ComGroup Australia
Computer Resources
Elektro-Arola
GE MDS
I.D. Systems
In Motion Technology
InSight Mobile USA dba StreetEagle GPS
Intergraph
Iveda Solutions
Juniper Systems
Location Technologies
Locus Diagnostics
Mentor Engineering
NeoTerra Systems
Raveon Technologies
Raytheon JPS Communications
Rojone
Selex Elsag
Send Word Now
Syntech Systems
Winnebago Industries
WiPath Communications

Modems/Transmitters
Antenna Plus
CalAmp
CML Microcircuits
Comm-Net 2000 Manufacturing
Compuquest
Elektro-Arola
Elektronika Naglic in Drugi dno Domzale
El Paso Communications Systems
FreeWave Technologies
GE MDS
HAL Communications
HV Sistemas
IDA
I.D. Systems
Impact Radio Accessories
In Motion Technology
Kantronics
Kenwood
Linx Technologies
Location Technologies
Maxon
Mentor Engineering
Midian Electronics
Midland Radio
Radiocrafts
RadioMobile, div. of RF Industries
Raveon Technologies
Raytheon JPS Communications
Sentor Monitoring and Control Systems
SmarTrunk Systems
Spectra Engineering
TecNet International
Tekk International
Telsate Telecomunicações
Teltronic S.A. Unipersonal
Trident Micro Systems
TS Mobile
Vecima Networks
Vislink

MOBILE COMPUTING DEVICES
Handheld/Tablet Computers
3T Communications
APD Communications
BatteryJack
Cleartone Telecoms
Comsystems
General Dynamics Itronix
Handheld US
IHM
Juniper Systems
Kirmuss & Associates
Mentor Engineering
Microbus
Motorola Solutions
Panasonic Solutions
RadioMobile, div. of RF Industries
RAM Mounting Systems
Rugged Notebooks
Sentor Monitoring and Control Systems

MDCs/Ruggedized Laptops
3T Communications
APD Communications
Cleartone Telecoms
Comsystems
Data911 Mobile Computer Systems
General Dynamics Itronix
Handheld US
JEI Communication Recorders
Kirmuss & Associates
Location Technologies
Mentor Engineering
Motorola Solutions
Panasonic Solutions
RadioMobile, div. of RF Industries
RAM Mounting Systems
Raytheon JPS Communications
Rugged Notebooks
Sigma Wireless
Solacom Technologies
ST Electronics (Info-Comm Systems)
MDTs
3T Communications
APD Communications
Cleartone Telecoms
Comm-Net 2000 Manufacturing
Critical Response Systems
Data911 Mobile Computer Systems
DX Radio Systems
Handheld US
Hark Systems
Hitech Systems
IDA
I.D. Systems
Kenwood USA – Communications Sector (Kenwood)
LMR Systems
Location Technologies
Logistic Systems
Mentor Engineering
Microbus
Motorola Solutions
RadioMobile, div. of RF Industries
RAM Mounting Systems
Tait Communications
Tunnel Radio of America
WiPath Communications
Zetron

PDAs/Bricks/Radios
APD Communications
BatteryJack
Cleartone Telecoms
CML Microcircuits
Critical Response Systems
DX Radio Systems
El Paso Communications Systems
Fylde Micro Systems
General Dynamics Itronix
Handheld US
Hark Systems
Juniper Systems
Kirmuss & Associates
Location Technologies
Logistic Systems
Motorola Solutions
Panasonic Solutions
RAM Mounting Systems
Rugged Notebooks
Teltronic S.A. Unipersonal
Thales Communications
Zetron

MOBILE-DATA SYSTEMS EQUIPMENT
Infrared Wireless
Location Technologies
Mobile Pro Systems
PDA Safe
Rojone
Safety Vision
Sentor Monitoring and Control Systems

Mesh Networks
Air802
Airaya
Alcatel-Lucent
C4i
Cisco Systems
CoCo Communications
CommScope
DataSoft
Elektronika Naglic in Drugi dno Domzale
El Paso Communications Systems
Encom Wireless Data Solutions
Federal Signal

Firetide
Flash Technology, SPX div.
GE MDS
Hytera Communications
Hytera Mobilfunk
I.D. Systems
IPMobileNet
Location Technologies
Metric Systems
Mobile Pro Systems
Motorola Solutions
PDA Safe
Radiocrafts
Radio IP Software
Raytheon JPS Communications
RFI EMEA
Ross Associates/Covert Systems
Safety Vision
Selex Elsag
ST Electronics (Info-Comm Systems)
TracStar Systems

Mobile Printers
Gamber-Johnson
Location Technologies
PDA Safe

Packet-Radio Systems
4RF
Advanced Digital Systems
Alcatel-Lucent
C4i
CalAmp
Cleartone Telecoms
CML Microcircuits
DataSoft
DragonWave
Elektronika Naglic in Drugi dno Domzale
Etherstack
Exalt Communications
GE MDS
Harris Public Safety and Professional Communications (PSPC)
HV Sistemas
I.D. Systems
IPMobileNet
Kantronics
Location Technologies
Maxon
Motorola Solutions
PDA Safe
Radio IP Software
RadioMobile, div. of RF Industries
Raveon Technologies
RF Neulink, div. of RF Industries
Sentor Monitoring and Control Systems
TecNet International
Tekk International
Telepoint
Telsate Telecomunicações
Teltronic S.A. Unipersonal
TS Mobile
WiPath Communications

Peripherals
Air802
Albrecht Telecommunications
C4i
Compuquest
Data911 Mobile Computer Systems
Gamber-Johnson
Location Technologies
Man & Machine
Motorola Solutions
Panasonic Solutions
Plantronics
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USAlert
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Aluma Tower
Ballard Power Systems
Dupont Building
Emerson Network Power
FWT
Imark Communications
Mobile Pro Systems
VFP
Winco

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Comm-Net 2000 Manufacturing
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Alpha Industrial Power
BatteryJack
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Emerson Network Power
Honeywell Batteries/Global Technology Systems
Innovative Circuit Technology (ICT)
Laird Technologies
Lind Electronics
Mobile Pro Systems
Motorola Solutions
Newmar
Solarcraft
Sonic Communications International
Spectrum Communications
Telsate Telecomunicações
Tripp Lite
Ultralife
VFP

Wind Power Equipment
DuraComm
Sentor Monitoring and Control Systems

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Antcom
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Avtec
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Tech Global
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Teltronic S.A. Unipersonal
TruePosition
Visual Electronics
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Advanced Digital Systems
Artevea Digital
Benelec
Bosch Security Systems
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Carlson Wireless Technologies (CWT)
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Elektro-Arola
Federal Signal

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CeoTronics
Audio · Video · Data Communication

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Technotrend
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Tekk International
Telsate Telecomunicações
Titan Communication Systems
TwitCo Distributing (ParMarLow)
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3T Communications
Addvantech
BatteryJack
Benelec
Blue Star Radios
C4i
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Cobalt AV Comtronics
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Guardian Safety Systems
Harris Public Safety and Professional Communications (PSPC)
Hytera Communications
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Imark Communications
Impact Radio Accessories
Imtradex Hör/Sprechsysteme
Invisio Communications
JCK Jean Couk Enterprise
Jing Deng Industrial (JDI)
Juma Communications
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Maxon
Midland Radio
Mobility Sound Technology
Motorola Solutions
National 2 Way
New Communications Solutions (NCS)
OTTO
Oy Stop Noise Finland
Phonak Communications
Plantronics
Procom
Pryme Radio Products
Quantun Electronics
Savox Communications
Selex Elsag
Setcom
Shenzhen Power-Time Technology
Sonetics
Sonic Communications International
Special Electronics and Designs
Stone Mountain
TecNet International
Tekk International
Telex Radio Dispatch
Telsate Telecomunicações
Thales Communications
Titan Communication Systems
TwitCo Distributing (ParMarLow)
Unimo Technology
Voxtech
Wireless Pacific
Xiamen Puxing Electronics Science and Technology

Labels

BatteryJack
Benelec
Hytera Communications
JCK Jean Couk Enterprise
Label Graphics
Maxon
Motorola Solutions
TecNet International
Telsate Telecomunicações
Xiamen Puxing Electronics Science and Technology

Microphones

3T Communications
Addvantech
Aria Industrial
BatteryJack
Benelec
Blue Star Radios
CAPE
CeoTronics
Cleartone Telecoms
Cobalt AV Comtronics
Communications-Applied Technology
Comsystems
Con-Space Communications
David Clark
EF Johnson Technologies
El Paso Communications Systems
FreeLinc
Gentex
Guardian Safety Systems
Harris Public Safety and Professional Communications (PSPC)
HFRadio.US
Hytera Communications
Hytera Mobilfunk
Imark Communications
Impact Radio Accessories
Invisio Communications
JCK Jean Couk Enterprise
Jing Deng Industrial (JDI)
Juma Communications
Kendoo Technology
Kenwood
Kenwood USA – Communications Sector (Kenwood)
Kirmuss & Associates
Klein Electronics
Maxon
Midian Electronics
Midland Radio
Mobility Sound Technology
Motorola Solutions
National 2 Way
OTTO
Oy Stop Noise Finland
Peiker Acustic
Phonak Communications
Procom
Pryme Radio Products
Quantun Electronics
Ross Associates/Covert Systems
Savox Communications
Selex Elsag
Setcom
Shenzhen Power-Time Technology
Sonic Communications International
Special Electronics and Designs
Spectra Engineering
Spectrum Communications
Stone Mountain
Technotrend
TecNet International
Tekk International
Telex Radio Dispatch
Telsate Telecomunicações
Titan Communication Systems
TwitCo Distributing (ParMarLow)
Unimo Technology
Wireless Pacific
Xiamen Puxing Electronics Science and Technology
Zetron

RADIOS

Mobiles/Portables

(MA=mobiles analog, MD=mobiles digital, M6.25=mobiles 6.25 kHz, MB=multiband, PA=portables analog, PD=portables digital, P6.25=portables 6.25 kHz)

3M Peltor (PA, PD)
Advanced Digital Systems (MA, MD)
BatteryJack (PA, PD)
Benelec (MA, MD, PA, PD)
Blue Star Radios (MA, PA)

Product Category Index

C4i (MA, MD, PA, PD)
CAPE (PA)
CeoTronics (MD)
Ceragon Networks (MD)
Clear-Com (MD, PD)
Cleartone Telecoms (MA, MD)
Codan (MA, MD, PA, PD)
ComGroup Australia (PA, PD)
Comlab (MA, MD, MB)
Communications-Applied Technology (PA, PD)
Comsystems (MA, MD, PA, PD)
Connect Systems (MA, M6.25, PA, PD)
Cyrun (MD, PD)
Datron World Communications (MA, MD, MB, PA, PD)
Detracom (MA, MD, PD, P6.25)
DX Radio Systems (MA, PA)
Eartec (PA, PD)
EF Johnson Technologies (MA, MD, PA, PD)
Elektronika Naglic in Drugi dno Domzale (MA, MD, PA, PD)
El Paso Communications Systems (MA, MD, M6.25, MB, PA, PD, P6.25)
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General Dynamics C4 Systems (PD)
Giant International (MA, PA)
GME (MA, MD, M6.25, PA, PD)
GRE America (MA, MD, PA, PD)
Harris Public Safety and Professional Communications (PSPC) (MA, MD, M6.25, MB, PA, PD, P6.25)
Holzberg Communications (MA, MD, PA, PD)
Hytera Communications (MA, MD, M6.25, PA, PD, P6.25)
Icom (MA, MD, M6.25, PA, PD, P6.25)
IHM (MA, MD, PA, PD)
Imark Communications (MA, PA)
Kenwood (MA, MD, M6.25, PA, PD, P6.25)
Kenwood USA – Communications Sector (Kenwood) (MA, MD, M6.25, PA, PD, P6.25)
Kirisun Communications (MA, MD, PA, PD)
Kirmuss & Associates (MA, MD, M6.25, MB, PA, PD)
Klein Electronics (MA, PA, PD)
Link Communications (MA, MD, PA, PD)
Maxon (MA, MD, PA, PD)
Midland Radio (MA, MD, PA, PD)
Mobat USA (MA, MD, PA, PD)
Motorola Solutions (MA, MD, M6.25, PA, PD, P6.25)
Phonak Communications (PA, PD)
Quantun Electronics (MA, PA)
Raveon Technologies (MD)
Relm Wireless (MA, MD, PA, PD)
Ritron (MA, M6.25, PA)
Roger GPS (MD)
Satel (MA, PA)
Schnoor Industrieelektronik (MA, MD, PA, PD)
Selex Elsag (MA, MD, PA, PD)
Sepura (MD, PD)
Sigma Wireless (PD)
Sigtech Wireless Technologies (MD, PD)
SmarTrunk Systems (MA, PA)
Special Electronics and Designs (MA, MD, PA, PD)
Spectrum Communications (MA, MD, PA, PD)
ST Electronics (Info-Comm Systems) (MA, MD, PA, PD)
Tait Communications (MA, MD, PA, PD)
Team Simoco (MA, MD, M6.25, PA, PD, P6.25)
TecNet International (MA, PA)
Tekk International (MA, PA)
Telsate Telecomunicações (MA, MD, PA, PD)
Teltronic S.A. Unipersonal (MA, MD, PA, PD)
Thales Communications (PA, PD)
Trilithic RF & Microwave (MA, MD, MB, PD, P6.25)
Tunnel Radio of America (MA, MD, PA, PD)
Unimo Technology (MA, PA)
Vertex Standard (MA, MD, PA, PD)
Vislink (MA, MD, PA, PD)
Wireless Pacific (PA)
Xiamen Puxing Electronics Science and Technology (MA, M6.25, PA)

P25 Radios
Benelec
C4i
Cassidian
Cassidian Communications
ComGroup Australia
Datron World Communications
DX Radio Systems
EF Johnson Technologies
Etherstack
GME
GRE America
Harris Public Safety and Professional Communications (PSPC)
Icom
Kenwood USA – Communications Sector (Kenwood)
Kirmuss & Associates
Link Communications
Midland Radio
Motorola Solutions
Phonak Communications
Relm Wireless
ST Electronics (Info-Comm Systems)
Tait Communications
Team Simoco
Thales Communications
Vertex Standard
Westel Wireless Systems

TETRA
3T Communications
Artevea Digital
Cassidian
Cleartone Telecoms
ComGroup Australia
Comsystems
Etherstack
Funk-Electronic Piciorgros
Funkwerk Security Communications
Hytera Communications
Hytera Mobilfunk
IHM
Kenwood USA – Communications Sector (Kenwood)
Motorola Solutions
Phonak Communications
Roger GPS
Selex Elsag
Sepura
Sigma Wireless
Sigtech Wireless Technologies
Syntech Systems
Team Simoco
Teltronic S.A. Unipersonal
Unimo Technology

RADIO SYSTEMS

ACSB
Motorola Solutions

Conventional/Trunked
(CA=conventional analog, CD=conventional digital, TA=trunked analog, TD=trunked digital)
4RF (TA, TD)
Advanced Digital Systems (CA, CD)
Alligator Communications (TA, TD)
APD Communications (TA, TD)
Artevea Digital (TD)
Aviat Networks (TD)
Avtec (CA, CD, TA, TD)
Axell Wireless (TA, TD)
Benelec (CA, CD, TA, TD)
BridgeCom Systems (CA, TA)
C4i (CA, CD)
CalAmp (CA, TA)
Cassidian (TD)
Cassidian Communications (TD)
Catalyst Communications Technologies (CA, CD, TA, TD)
Ceragon Networks (CD, TD)
Cleartone Telecoms (CA, CD, TD)
CML Microcircuits (CA, CD, TA, TD)
Cobalt AV Comtronics (CA, CD)
Codan (CA)
Comlab (CA, CD)
CommScope (TA, TD)
Comsystems (CA, CD, TA, TD)
Connect Systems (CA, CD, TA)
Creowave (CA, CD, TA, TD)
Cubic Defense Applications (CA)
Daniels Electronics (CA, CD, TA, TD)
Datron World Communications (CA, CD)
dbSpectra (TA, TD)
Detracom (CA, CD)
DX Radio Systems (CA, TA, TD)
EF Johnson Technologies (CA, CD, TA, TD)
Elektro-Arola (CA, CD)
Elektronika Naglic in Drugi dno Domzale (CA, CD)
El Paso Communications Systems (CA, CD, TA, TD)
Encom Wireless Data Solutions (CA, CD)
Etelm (TD)
Etherstack (CA, CD, TA, TD)
Fiplex Communications (TA, TD)
FreeWave Technologies (CA, CD)
Frequentis (TA, TD)
Fylde Micro Systems (TA, TD)
GE MDS (CA, CD)
Harris Public Safety and Professional Communications (PSPC) (CA, CD, TA, TD)
Hoag Electronics (TA, TD)
Holzberg Communications (CA, CD, TA, TD)
Hytera Communications (CA, CD, TA, TD)
Hytera Mobilfunk (CA, TA, TD)
Icom (CA, CD, TA, TD)
Idylltek (CA, TA)
IHM (CA, CD, TA, TD)
Imark Communications (CA, TA)
IPMobileNet (CD)
JRD Communications (CA, CD, TA, TD)
Kenwood (CA, TA, TD)
Kenwood USA – Communications Sector (Kenwood) (CA, CD, TA, TD)
Kirisun Communications (CA, CD, TA, TD)
Maxon (CA, TA)
Midland Radio (CA, CD, TA, TD)
MiMOMax Wireless (CA, CD, TA, TD)
Mobat USA (CA, CD)
Motorola Solutions (CA, TA, TD)
Pacific Crest (CD)
Pantel International (CA, TA, TD)
Penta (CA, CD, TA, TD)
Radial Firm (TA)
Radiocrafts (TA, TD)
Radio IP Software (CD, TD)
RadioMobile, div. of RF Industries (CA)
Raveon Technologies (CD)
Relm Wireless (CA, CD)
RF Technology (CA, CD, TA)
Ritron (CA)
Roger GPS (TD)
Rohill Engineering (TA, TD)
Schnoor Industrieelektronik (CA, CD, TA, TD)
Selex Elsag (CA, TA, TD)
Sinclair Technologies (CA, CD, TA, TD)
SmarTrunk Systems (CA, TA)
Sonik Messaging Systems (CA)
Spectra Engineering (CA, CD, TA)
Spectrum Communications (TA)
Spescom (TA)
Star Microwave Service (TA, TD)
ST Electronics (Info-Comm Systems) (TA, TD)
Survey Technologies Inc. (STI) (CA, CD, TA, TD)
Tait Communications (CA, CD, TA, TD)
Team Simoco (CA, CD, TA, TD)
TecNet International (CA, TA)
Tekk International (CA)
Telepoint (CA, CD, TA, TD)
Telsate Telecomunicações (CA, TA)
Teltronic S.A. Unipersonal (CA, TA, TD)
Thales Communications (CA)
Trident Micro Systems (CA, CD, TA, TD)
Tunnel Radio of America (CA, CD)
USAlert (TA, TD)
Vertex Standard (CA, CD)
Westel Wireless Systems (CA, CD, TD)
Zetron (CA, TA, TD)
Zonith (CD, TD)

Microwave
4RF
Alcatel-Lucent
Alligator Communications
Anritsu
Aviat Networks
Carlson Wireless Technologies (CWT)
Ceragon Networks
Cobham Antenna Systems, Microwave Antennas
CommScope
Detracom
DragonWave
Exalt Communications
GE MDS
Hytera Communications
Hytera Mobilfunk
Pantel International
RAD Data Communications
Rojone
Ross Associates/Covert Systems
Sinclair Technologies
Star Microwave Service
ST Electronics (Info-Comm Systems)
Telsate Telecomunicações
Vecima Networks
Vislink

Narrowband (6.25 kHz)
Advanced Digital Systems
CommScope
Connect Systems
Daniels Electronics
Etherstack
GE MDS
Harris Public Safety and Professional Communications (PSPC)
Hytera Communications
Icom
JRD Communications
Kenwood
Kenwood USA – Communications Sector (Kenwood)
MiMOMax Wireless
Motorola Solutions
RadioMobile, div. of RF Industries
Rojone
Survey Technologies Inc. (STI)
Team Simoco
Xiamen Puxing Electronics Science and Technology

P25 Systems Equipment
Aeroflex
Axell Wireless
Benelec
CalAmp
Cassidian
Cassidian Communications
Catalyst Communications Technologies
Cimarron Technologies
CML Microcircuits
Cyrun
Daniels Electronics
Datron World Communications
DX Radio Systems
EF Johnson Technologies
Etherstack
Fiplex Communications
Futurecom Systems Group
Harris Public Safety and Professional Communications (PSPC)
Icom
IPMobileNet
JRD Communications
Kenwood USA – Communications Sector (Kenwood)
Metric Systems
Midland Radio
MiMOMax Wireless
Motorola Solutions
Panorama Antennas
Pantel International
Penta
Raytheon JPS Communications
Relm Wireless
RF Technology
Roger GPS
Sentor Monitoring and Control Systems
Sinclair Technologies
Spectra Engineering
ST Electronics (Info-Comm Systems)
Survey Technologies Inc. (STI)
Tait Communications
Team Simoco
Thales Communications
Trident Micro Systems
Vertex Standard
Westel Wireless Systems
Zetron

Repeater Controllers
AD Telecom
Advanced Digital Systems
Benelec
BHE Bonn Hungary Electronics
BridgeCom Systems
C4i
Cassidian Communications
Communications Specialists
Comsystems
Connect Systems
Creowave
Detracom
El Paso Communications Systems

Encom Wireless Data Solutions
Etherstack
Hytera Communications
Hytera Mobilfunk
I.D. Systems
Idylltek
JRD Communications
Midian Electronics
Midland Radio
NHRC Repeater Controllers
Rojone
See Telecom
SmarTrunk Systems
Telsate Telecomunicações
Trident Micro Systems
Wireless Pacific

Simulcast
Albrecht Telecommunications
Benelec
Carlson Wireless Technologies (CWT)
Cassidian Communications
ComGroup Australia
Comsystems
Daniels Electronics
Detracom
DX Radio Systems
EF Johnson Technologies
Etherstack
Harris Public Safety and Professional Communications (PSPC)
IHM
JRD Communications
Midian Electronics
MiMOMax Wireless
Motorola Solutions
Pantel International
Penta
Racom Products
RF Technology
Schnoor Industrieelektronik
Selex Elsag
Sonik Messaging Systems
Spectra Engineering
Survey Technologies Inc. (STI)
Tait Communications
Team Simoco

Software-Defined Radio
Alligator Communications
Axell Wireless
BHE Bonn Hungary Electronics
CalAmp
Cassidian Communications
CML Microcircuits
ComGroup Australia
Communications Research Centre (CRC)
Comsystems
Creowave
Cubic Defense Applications
DataSoft
DragonWave
DX Radio Systems
EF Johnson Technologies
Encom Wireless Data Solutions
Etherstack
GE MDS
Harris Public Safety and Professional Communications (PSPC)
Mobat USA
Motorola Solutions
Multiple Access Communications (MAC)
Pantel International
Selex Elsag
Thales Communications
Vecima Networks
Westel Wireless Systems
Zonith

Spread-Spectrum Radio
Air802
Albrecht Telecommunications
Alligator Communications
Aviat Networks
BHE Bonn Hungary Electronics
CalAmp
Carlson Wireless Technologies (CWT)
Clear-Com
Communications-Applied Technology
Eartec
Encom Wireless Data Solutions
Etherstack
FreeWave Technologies
GE MDS
Location Technologies
Metric Systems
Pantel International
Radio IP Software
Schneider Electric, Telemetry and Remote SCADA Solutions
Schweitzer Engineering Laboratories
Sentor Monitoring and Control Systems
Solarcraft
Telsate Telecomunicações
Trango Systems

TETRA
3T Communications
Aeroflex
APD Communications
Artevea Digital
Axell Wireless
BHE Bonn Hungary Electronics
Cassidian
Cassidian Communications
Cleartone Telecoms
CML Microcircuits
ComGroup Australia
Comlab
CommScope
Comsystems
Creowave
Damm Cellular Systems
Elektro-Arola
Etelm
Etherstack
European Telecommunications S.A. (ETSA)
Fiplex Communications
Funk-Electronic Piciorgros
Funkwerk Security Communications
Harris Public Safety and Professional Communications (PSPC)
Hytera Communications
Hytera Mobilfunk
IHM
Kenwood USA – Communications Sector (Kenwood)
MiMOMax Wireless
Motorola Solutions
Panorama Antennas
Radial Firm
Radio IP Software
Roger GPS
Rohill Engineering
Rojone
Schnoor Industrieelektronik
See Telecom
Selex Elsag
Sigma Wireless
Sinclair Technologies
Spescom
Spinner
Syntech Systems
Team Simoco
Teltronic S.A. Unipersonal
Zonith

VoIP/RoIP
3T Communications
4RF
Avtec
BridgeCom Systems
C4i
Catalyst Communications Technologies
Cobalt AV Comtronics
CoCo Communications
Communications-Applied Technology
Connect Systems
Cubic Defense Applications
Daniels Electronics
Detracom
DX Radio Systems
EF Johnson Technologies
Elektro-Arola
El Paso Communications Systems
EMR
Etherstack
Firetide
Frequentis
GE MDS
Harris Public Safety and Professional Communications (PSPC)
Hytera Communications
Icom
IHM
JRD Communications
Kolibri Systems
Link Communications
Midian Electronics
MiMOMax Wireless
Motorola Solutions
Mutualink
Omnitronics
Pantel International
Penta
Ritron
Selex Elsag

Product Category Index

SmarTrunk Systems
Spectra Engineering
Spescom
Star Microwave Service
ST Electronics (Info-Comm Systems)
Syntech Systems
Telepoint
TracStar Systems
Tunnel Radio of America
Twisted Pair Solutions
Unimo Technology
VoiceInterop
Westel Wireless Systems
Zetron

REMOTE SITE MONITORING

Modems

Advanced Digital Systems
Albrecht Telecommunications
Alcatel-Lucent
Asentria
Barnett Engineering
CalAmp
Carlson Wireless Technologies (CWT)
Cleartone Telecoms
CML Microcircuits
Compuquest
Cromack Industries
DX Radio Systems
Elektro-Arola
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Hark Systems
HV Sistemas
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Radio IP Software
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Raveon Technologies
RF Neulink, div. of RF Industries
Rojone
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Sentor Monitoring and Control Systems
SmarTrunk Systems
Tait Communications
TC Communications
TecNet International
Trident Micro Systems
TS Mobile
Tunnel Radio of America
Unimo Technology
Vecima Networks
VoiceInterop

Remote Transmitter Units

4RF
Alligator Communications
Asentria
Barnett Engineering
Berkeley Varitronics Systems
Broadcast Microwave Services
C4i
CalAmp
CeoTronics
Cleartone Telecoms
CML Microcircuits
Commtech Wireless
Compuquest
Davicom, div. of Comlab
DPS Telecom
DX Radio Systems
Encom Wireless Data Solutions
Etelm
Etherstack
Flash Technology, SPX div.
Funk-Electronic Piciorgros
GE MDS
HV Sistemas
Kyocera Solar
Linx Technologies
Location Technologies
Maxon
Metric Systems
Midian Electronics
Midland Radio
MiMOMax Wireless
Mobility Sound Technology
Motorola Solutions
Pacific Crest
PageTek
Radiocrafts
Raveon Technologies
RF Neulink, div. of RF Industries
Rojone
Satel
Sentor Monitoring and Control Systems
Solarcraft
Spectra Engineering
Tait Communications
Team Simoco
Tekk International
Telsate Telecomunicações
Trident Micro Systems
Tunnel Radio of America
Vecima Networks
Vislink
Zetron

SCADA

4RF
Advanced Digital Systems
Alligator Communications
Asentria
Bayly Coastcom
CalAmp
Carlson Wireless Technologies (CWT)
CML Microcircuits
Commtech Wireless
Critical Response Systems
Cromack Industries
CTI Products
Davicom, div. of Comlab
DPS Telecom
Elektro-Arola
Emerson Network Power
Encom Wireless Data Solutions
Etelm
Etherstack
Federal Signal
Fial
FreeWave Technologies
Funk-Electronic Piciorgros
GE MDS
HV Sistemas
Hytera Communications
Hytera Mobilfunk
Kantronics
Kyocera Solar
Location Technologies
Maxon
Metric Systems
MiMOMax Wireless
Motorola Solutions
PageTek
Pantel International
Positron
RAD Data Communications
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Schneider Electric, Telemetry and Remote SCADA Solutions
Schweitzer Engineering Laboratories
Selex Elsag
Sentor Monitoring and Control Systems
Sinclair Technologies
Spectra Engineering
Spectrum Communications
TecNet International
Tekk International
Telepoint
Trident Micro Systems
TS Mobile
Unimo Technology
Vecima Networks
Zetron

Software

AD Telecom
Advanced Digital Systems
Asentria
BHE Bonn Hungary Electronics
CeoTronics
CoCo Communications
CommScope
Commtech Wireless
Compuquest
Critical Response Systems
CTI Products
Davicom, div. of Comlab
DPS Telecom
Elektro-Arola
Elektronika Naglic in Drugi dno Domzale
Emerson Network Power
Encom Wireless Data Solutions
Federal Signal
Fial
Flash Technology, SPX div.
Funk-Electronic Piciorgros
HV Sistemas
Hytera Communications
I.D. Systems
In Motion Technology
Integrated Tracking Solutions
Intergraph
Kantronics
Location Technologies
MiMOMax Wireless
Motorola Solutions
NeoTerra Systems
PageTek
Powerwave Technologies
Radio IP Software
Raveon Technologies
RF Neulink, div. of RF Industries
Schneider Electric, Telemetry and Remote SCADA Solutions
Sentor Monitoring and Control Systems
Signal Intelligence
SmarTrunk Systems
Solarcraft
Spectra Engineering
Team Simoco
Vecima Networks
VoiceInterop
Zetron
Zonith

Telemetry

4RF
Advanced Digital Systems
Alcatel-Lucent
Alligator Communications
Asentria
Benelec
BHE Bonn Hungary Electronics
CalAmp
Carlson Wireless Technologies (CWT)
CeoTronics
Cleartone Telecoms
CML Microcircuits
Commtech Wireless
Critical Response Systems
Cromack Industries
Davicom, div. of Comlab
Detracom
Digital Paging Co./Global Sab Inc. (DPC/GSI)
DPS Telecom
Elektro-Arola
Elektronika Naglic in Drugi dno Domzale
Etherstack
Flash Technology, SPX div.
FreeWave Technologies
Funk-Electronic Piciorgros
GE MDS
GME
Hark Systems
Harris Public Safety and Professional Communications (PSPC)
HV Sistemas
Hytera Communications
Hytera Mobilfunk
IDA
I.D. Systems
In Motion Technology
InSight Mobile USA dba StreetEagle GPS
Kantronics
Kyocera Solar
Link Communications
Location Technologies
Maxon
Metric Systems
Midland Radio
MiMOMax Wireless
Mobile Mark
Motorola Solutions
PageTek
Panorama Antennas
Positron
Radiocrafts
Raveon Technologies
RF Neulink, div. of RF Industries
Rojone
Satel
Schneider Electric, Telemetry and Remote SCADA Solutions
Schweitzer Engineering Laboratories
Selex Elsag
Sentor Monitoring and Control Systems
Sigma Wireless
SmarTrunk Systems
Solarcraft
Sonic Communications International
Sonik Messaging Systems
Spectra Engineering
Spectrum Communications
Symmetricom
TecNet International
Tekk International
Telsate Telecomunicações
Trident Micro Systems
TS Mobile
Unimo Technology
Vecima Networks
WiPath Communications
Zetron
Zonith

Transmitters

4RF
Alligator Communications
Asentria
Berkeley Varitronics Systems
Broadcast Microwave Services
CalAmp
CeoTronics
CML Microcircuits
Commtech Wireless
CTI Products
Cubic Defense Applications
DataSoft
Davicom, div. of Comlab
DPS Telecom
DX Radio Systems
Etherstack
Firetide
GE MDS

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- Microwave Links
- Reliability Studies

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- Ground-to-Air
- Terrain Shadowing

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Motorola Solutions
Radiocrafts
Raveon Technologies
RF Neulink, div. of RF Industries
RF Technology
Satel
Schneider Electric, Telemetry and Remote SCADA Solutions
Sentor Monitoring and Control Systems
Sinclair Technologies
Spectra Engineering
Spectrum Communications
Tait Communications
Team Simoco
TecNet International
Tekk International
Telepoint
Telsate Telecomunicações
TS Mobile
Tunnel Radio of America
Vecima Networks
Vislink

Vendor-Specific Protocols
Advanced Digital Systems
Bayly Coastcom
Carlson Wireless Technologies (CWT)
CoCo Communications
CommScope
Commtech Wireless
Creowave
Cromack Industries
CTI Products
Daniels Electronics
DPS Telecom
Eagle Eye Power Solutions
Fial
Funk-Electronic Piciorgros
HV Sistemas
I.D. Systems
Lea Antenne & Progetti
Location Technologies
Lyncole XIT Grounding
Metric Systems
MiMOMax Wireless
Motorola Solutions
Radiocrafts
Radio IP Software
Raveon Technologies
Schweitzer Engineering Laboratories
Sentor Monitoring and Control Systems
SmarTrunk Systems
Trango Systems

Video Surveillance
4RF
Airaya
Alcatel-Lucent
Asentria
Bosch Security Systems
Broadcast Microwave Services
Carlson Wireless Technologies (CWT)
CeoTronics
Cleartone Telecoms
CoCo Communications
El Paso Communications Systems
Etelm
Firetide
GE MDS
Hark Systems
Harris Public Safety and Professional Communications (PSPC)
Intergraph
Iveda Solutions
Metric Systems
Mobile Pro Systems
Motorola Solutions
Nice Systems
RAD Data Communications
Raytheon JPS Communications
Ross Associates/Covert Systems
Safety Vision
Schweitzer Engineering Laboratories
Selex Elsag
Sentor Monitoring and Control Systems
Solarcraft
Technotrend
Telex Radio Dispatch
Telsate Telecomunicações
Vecima Networks
Verint Systems
Vislink

SATELLITE SYSTEMS EQUIPMENT

Mobile Data/Voice
(MD=mobile data, MV=mobile voice)
CML Microcircuits (MD)
Codan (MD, MV)
CPI Communications (MV)
Data911 Mobile Computer Systems (MD)
Motorola Solutions (MD, MV)
MotoSAT (MD, MV)
Radio IP Software (MD)
RadioMobile, div. of RF Industries (MD, MV)
Satel (MD)
Sentor Monitoring and Control Systems (MD, MV)
Tallysman Wireless (MD)
TeleCommunication Systems (TCS) (MD, MV)
TracStar Systems (MD, MV)
Trident Micro Systems (MD)
TS Mobile (MD)
Vislink (MD, MV)
WiPath Communications (MD)

VSAT
Kyocera Solar
MotoSAT
Radio IP Software
Sentor Monitoring and Control Systems
Swissphone Telecom
TeleCommunication Systems (TCS)
TracStar Systems
Vislink

SITE/TOWER EQUIPMENT

Alarms/Access Devices
Asentria
Bosch Security Systems
CML Microcircuits
Compuquest
CTI Products
Davicom, div. of Comlab
DPS Telecom
El Paso Communications Systems
EMR
Fial
Flash Technology, SPX div.
Hark Systems
Location Technologies
Midian Electronics
Mobile Pro Systems
Motorola Solutions
PageTek
Quintron Systems
Racom Products
RF Industries (RFI)
Rojone
Sentor Monitoring and Control Systems
Telewave
Zetron

Beacons
Citel
CML Microcircuits
Dialight
Flash Technology, SPX div.
Funkwerk Security Communications
Nello
Sabre Site Solutions, div. of Sabre Industries
Specialty Tower Lighting
TWR Lighting
Unimar

Cabinets
Aluma Tower
CommScope
Comsystems
dbSpectra
Dupont Building
DX Radio Systems
Elma Electronic
El Paso Communications Systems
Emerson Network Power
Imark Communications
Midland Radio
PDA Safe
Pioneer Energy Products (PEPRO)
Positron
Powerwave Technologies
Sabre Building Systems by Cellxion, div. of Sabre Industries
Shelter One
Solarcraft
Telewave
Tripp Lite
Tunnel Radio of America
VFP
Warehouse Cables
Winsted

Cable
4RF
Air802
Antcom
Benelec
BroadWave Technologies
Comlab
CommScope
Comprod Communications
Comtelco
El Paso Communications Systems
Encom Wireless Data Solutions
GE MDS
GPS Networking
Harger Lightning and Grounding
Hytera Communications
Mobat USA
Mobile Mark
Motorola Solutions
Pulse Electronics/Larsen Antennas
Radio Frequency Systems (RFS)
RF Connectors, div. of RF Industries
RFI EMEA
RF Industries (RFI)
Rojone
Skymasts Antennas
Spinner
Star Microwave Service
Telewave
Times Microwave Systems
Trilogy Communications
Tripp Lite
Warehouse Cables
Webb Industries

Cable Fault Locators
Anritsu
Bird Technologies
Motorola Solutions
Sentor Monitoring and Control Systems
TX RX Systems Bird Technologies

Combiners/Diplexers/Duplexers/Filters/Isolators/Multicouplers/Multiplexers
(C=combiners, DI=diplexers, DU=duplexers, F=filters, I=isolators, MC=multicouplers, MP=multiplexers)
4RF (C)
Alcatel-Lucent (MP)
Aluma Tower (I)
Amphenol Jaybeam (DU, F)
Antcom (C, F, I)
Axell Wireless (C, DI, DU, F, I, MC, MP)
Bayly Coastcom (MP)
Benelec (C, DI, DU, F, MC, MP)
BHE Bonn Hungary Electronics (DI, DU, F, MP)
Bird Technologies (C, DI, DU, F, I, MC)
BroadWave Technologies (C)
C4i (MP)
Carlson Wireless Technologies (CWT) (MP)
Cobham Antenna Systems, Microwave Antennas (C)
Comlab (C, DU, F, I, MC)
CommScope (C, DI, DU, F, MC)
Comprod Communications (C, DI, DU, F, I, MC, MP)
Comtelco (DI, DU, MC)
Creowave (C, DI, DU, F)
dbSpectra (C, DI, DU, F, I, MC, MP)
DX Radio Systems (C, DU, F, I, MC)
El Paso Communications Systems (DU, MP)
Emerson Network Power (F)
EMR (C, DI, DU, F, I, MC, MP)
European Telecommunications S.A. (ETSA) (DI, DU, F, MC)
Exalt Communications (C, DI)
Fiplex Communications (C, DI, DU, F, I, MC, MP)
GE MDS (F, MP)
GPS Networking (C, F)
G-Way Microwave (C, DI, DU, F)
Hytera Communications (C)
Imark Communications (DU, MC)
Innovative Circuit Technology (ICT) (F)
Kathrein, Scala div. (C, DI, DU, F, I, MC, MP)
Kathrein Werke (MC, MP)
L-3 Communications, Narda Microwave-East (C, DU, F, I, MC)
Lea Antenne & Progetti (DI, DU, F, MC, MP)
Midland Radio (DU)
Motorola Solutions (C, DU, F)
Narda Microwave West (L-3 Communications) (C, DI, DU, F, I, MP)
Positron (I)
Powerwave Technologies (C, DI, DU, F)
Procom (C, DI, DU, F, I, MC, MP)
Quintron Systems (MP)
RAD Data Communications (MP)

Product Category Index

Radial Firm (C, DI, DU, F, I, MC)
Radio Frequency Systems (RFS) (C, DI, DU, F, I, MC)
RFI EMEA (C, DI, DU, F, I, MC)
RF Industries (RFI) (C, DI, DU, F, I, MC, MP)
Rojone (C, DI, DU, F, I, MC, MP)
Sinclair Technologies (C, DI, DU, F, I, MC, MP)
Skymasts Antennas (C, DI, DU, F)
Spectra Engineering (DI, DU)
Spinner (C, DI, DU, F, MP)
STI-CO Industries (F, MC)
TC Communications (MP)
Telewave (C, DU, F, I, MC)
Telsate Telecomunicações (C, DI, DU, F)
Temwell (C, DI, DU, F)
Trak Microwave (C, DI, DU, F, I, MC, MP)
Trilithic RF & Microwave (C, DI, DU, F, I, MC, MP)
Tunnel Radio of America (MC, MP)
TX RX Systems Bird Technologies (C, DU, F, I, MC)
Webb Industries (C, DU, F, I, MC, MP)
Zetron (MP)

Connectors

Air802
Anritsu
Antcom
Benelec
Bird Technologies
Bomar Interconnect Products
BroadWave Technologies
CommScope
Comprod Communications
Comtelco
D.W. Electrochemicals
DX Radio Systems
El Paso Communications Systems
EMR
European Telecommunications S.A. (ETSA)
GE MDS
GPS Networking
G-Way Microwave
Harger Lightning and Grounding
Huada Connectors
Procom
Pulse Electronics/Larsen Antennas
Radio Frequency Systems (RFS)
RF Connectors, div. of RF Industries
RFI EMEA
Rojone
Sabre Site Solutions, div. of Sabre Industries
Sinclair Technologies
Skymasts Antennas
Spinner
Star Microwave Service
Telewave
Times Microwave Systems
Trilithic RF & Microwave
Trilogy Communications
Tripp Lite
TX RX Systems Bird Technologies
Webb Industries

HVAC Control Systems

Bard Manufacturing
Compuquest
Emerson Network Power
Marvair
Pioneer Energy Products (PEPRO)
Sentor Monitoring and Control Systems
VFP

Ice Bridges

CommScope
Fred A. Nudd
Nello
Rohn Products
Sabre Site Solutions, div. of Sabre Industries
Specialty Tower Lighting
Valmont Structures
VFP

Lightning-Protection Equipment

4RF
Air802
Aluma Tower
Benelec
Carlson Wireless Technologies (CWT)
Citel
CommScope
Comprod Communications
Emerson Network Power
Encom Wireless Data Solutions
Exalt Communications
GE MDS
G-Way Microwave
Harger Lightning and Grounding
Hark Systems
Imark Communications
L-3 Communications, Narda Microwave-East
Lightning Prevention Systems
Lyncole XIT Grounding
Mobat USA
Pioneer Energy Products (PEPRO)
PolyPhaser
Positron
Powerwave Technologies
Radio Frequency Systems (RFS)
RFI EMEA
Rojone
Sabre Site Solutions, div. of Sabre Industries
Skymasts Antennas
Specialty Tower Lighting
Transtector Systems
Tripp Lite
VFP
Webb Industries
Zetron

Microwave/ MUX Equipment

4RF
Alcatel-Lucent
Antcom
Artevea Digital
Aviat Networks
Bayly Coastcom
BHE Bonn Hungary Electronics
Broadcast Microwave Services
Carlson Wireless Technologies (CWT)
Ceragon Networks
CommScope
DragonWave
DX Radio Systems
Exalt Communications
GE MDS
Praxsym
Procom
RAD Data Communications
RF Industries (RFI)
Rojone
Sinclair Technologies
Spectracom
Star Microwave Service
Trak Microwave
Trango Systems
Trilithic RF & Microwave
Vislink
Zetron

Preamplifiers

Axell Wireless
BHE Bonn Hungary Electronics
Bird Technologies
Comlab
Comprod Communications
dbSpectra
EMR
Fiplex Communications
GPS Networking
Kathrein, Scala div.
Kathrein Werke
Motorola Solutions
Praxsym
Procom
Radial Firm
Radio Frequency Systems (RFS)
RF Industries (RFI)
Rojone
Sinclair Technologies
Telewave
Telsate Telecomunicações
Trilithic RF & Microwave
TX RX Systems Bird Technologies

Racks

Aluma Tower
Comlab
Comprod Communications
Comsystems
dbSpectra
DX Radio Systems
Elma Electronic
Emerson Network Power
EMR
Fylde Micro Systems
GE MDS
Kyocera Solar
Pioneer Energy Products (PEPRO)
Powerwave Technologies
Procom
Radio Frequency Systems (RFS)
Sinclair Technologies
Solarcraft
Spinner
Telewave
Tripp Lite
Tunnel Radio of America
VFP
Winsted

Shelters

Aluma Tower
Dupont Building
Enviro Buildings
FWT
Imark Communications
PDA Safe
Pioneer Energy Products (PEPRO)
Powerwave Technologies
Sabre Building Systems by Cellxion, div. of Sabre Industries
Sentor Monitoring and Control Systems
Shelter One
Sinclair Technologies
TowerWorx
VFP
Webb Industries

Site-Management Software

Advanced Digital Systems
Asentria
Codan
Comlab
CommScope
Commtech Wireless
Compuquest
Computer Resources
Comsystems
DPS Telecom
Eagle Eye Power Solutions
Federal Signal
Fylde Micro Systems
Hark Systems
Hytera Communications
Hytera Mobilfunk
Kathrein Werke
Location Technologies
LS telcom
Midian Electronics
Motorola Solutions
PageTek
Powerwave Technologies
Radio Frequency Systems (RFS)
Selex Elsag
Sentor Monitoring and Control Systems
Signal Intelligence
SmarTrunk Systems
SoftWright
Survey Technologies Inc. (STI)
Tait Communications
Team Simoco
Trylon TSF

Surge Protectors

AC DC Industries
Citel
CommScope
DX Radio Systems
Emerson Network Power
Encom Wireless Data Solutions
GE MDS
GPS Networking
Harger Lightning and Grounding
Innovative Circuit Technology (ICT)
Lyncole XIT Grounding
PDA Safe
Positron
Radio Frequency Systems (RFS)
RFI EMEA
Rojone
Sinclair Technologies
Skymasts Antennas
Solarcraft
Spinner
Telsate Telecomunicações
Transtector Systems
Tripp Lite
VFP
Webb Industries

Switches

3T Communications
Alcatel-Lucent
Cisco Systems
El Paso Communications Systems
Encom Wireless Data Solutions
Frequentis
Fylde Micro Systems
GE MDS
Hytera Communications
Hytera Mobilfunk
IHM
Motorola Solutions
Omnitronics
Quintron Systems
RAD Data Communications
Rojone
Selex Elsag
SmarTrunk Systems
Solacom Technologies
Spinner
Team Simoco
Technotrend
Trak Microwave
Trilithic RF & Microwave
VFP
Zetron

Tower Obstruction

Flash Technology, SPX div.
Kyocera Solar
Rohn Products
Sentor Monitoring and Control Systems
Sinclair Technologies
TWR Lighting
Valmont Structures
Webb Industries

Towers, Fixed/Mobile (F=fixed towers, M=mobile towers)

Aluma Tower (F, M)
Antenna Products (F)
CommScope (F)
Comsystems (F, M)
Fred A. Nudd (F)
FWT (F, M)
GeoStrut (M)
Imark Communications (F)
Nello (F, M)
Pioneer Energy Products (PEPRO) (M)
Powerwave Technologies (M)
Rohn Products (F)
Sabre Building Systems by Cellxion, div. of Sabre Industries (M)
Sabre Site Solutions, div. of Sabre Industries (F)
Sabre Towers and Poles, div. of Sabre Industries (F, M)
Sinclair Technologies (F, M)
Skymasts Antennas (F, M)
Specialty Tower Lighting (F)
Tower Innovations (F)
Tower Solutions (M)
TowerWorx (F, M)
Trylon TSF (F)
TWR Lighting (F)
Valmont Structures (F)
Wade Antenna/Taco Antennas (F)
Webb Industries (F, M)
Winco (M)

Voting Products

CTI Products
DX Radio Systems
GeoStrut
Midian Electronics
Motorola Solutions
RF Technology
Selex Elsag
Spectra Engineering
Tait Communications
Team Simoco

Waveguide

Antcom
CommScope
Nello
Pioneer Energy Products (PEPRO)
Radio Frequency Systems (RFS)
RFI EMEA
Rohn Products
Rojone
Sabre Site Solutions, div. of Sabre Industries
Spinner
Trak Microwave
Trylon TSF
Valmont Structures
VFP

SOFTWARE

CAD Software/Systems (See PSAP/E9-1-1 Equipment)

Custom

Advanced Digital Systems
AGENT511
Albrecht Telecommunications
Antcom
BridgeCom Systems
C4i
Cadex Electronics
Cassidian Communications
Catalyst Communications Technologies
Cleartone Telecoms
CoCo Communications
ComGroup Australia
CommScope
Compuquest
Computer Resources
Comsystems
CTI Products
Data911 Mobile Computer Systems
DataSoft
Digital Voice Systems Inc. (DVSI)
DPS Telecom
Etelm
Fial
Fylde Micro Systems
Genesis Group
Hoag Electronics
HV Sistemas
I.D. Systems
IHM
Integrated Tracking Solutions
InterAct
Iveda Solutions
Location Technologies
Locus Diagnostics
Logistic Systems
Maxon
Mentor Engineering
MiMOMax Wireless
Multiple Access Communications (MAC)
NeoTerra Systems
PageTek
Penta
RadioMobile, div. of RF Industries
RadioSoft

Realtime North America
Schnoor Industrieelektronik
Selex Elsag
Send Word Now
Signal Intelligence
SoftWright
Team Simoco
TeleCommunication Systems (TCS)
Telesoft International
Valid8.com
Ventyx, an ABB co.
Visual Electronics
VoiceInterop
Winsted
Zetron
Zonith

Dispatch (business/industry)
3T Communications
AGENT511
APD Communications
Artevea Digital
Avtec
Cassidian Communications
Catalyst Communications Technologies
Cisco Systems
Compuquest
Critical Response Systems
CTI Products
Cyrun
Damm Cellular Systems
Data911 Mobile Computer Systems
EF Johnson Technologies
Elcomplus
Etelm
Harris Public Safety and Professional Communications (PSPC)
HigherGround
Hytera Communications
Hytera Mobilfunk
IDA
IHM
InterAct
Intergraph
Kolibri Systems
Mentor Engineering
Midian Electronics
Motorola Solutions
NeoTerra Systems
NetMotion Wireless
Omnitronics
Pantel International
Penta
PowerPhone
RadioMobile, div. of RF Industries
Rohill Engineering
Schnoor Industrieelektronik
Selex Elsag
Send Word Now
Signal Intelligence
SmarTrunk Systems
Swissphone Telecom
Tallysman Wireless
Team Simoco
Telex Radio Dispatch
Teltronic S.A. Unipersonal
TETRAsim
TriTech Software Systems
Ventyx, an ABB co.
Voice Print International (VPI)
WiPath Communications
Zetron
Zoll
Zonith

Engineering
3T Communications
Advanced Topographic Development and Images (ATDI)
AGENT511
Berkeley Varitronics Systems
BridgeCom Systems
C4i
Cleartone Telecoms
CommScope
Comsearch
Comsystems
Cromack Industries
DataSoft
DPS Telecom
DX Radio Systems
EDX Wireless
Elektronika Naglic in Drugi dno Domzale
El Paso Communications Systems
Etherstack
Forsk
Hoag Electronics
Location Technologies
LS telcom
Mentor Engineering
Mentum
Motorola Solutions
RadioSoft
RCC Consultants
Signal Intelligence
SoftWright
Survey Technologies Inc. (STI)
Telesoft International
Teltronic S.A. Unipersonal
VoiceInterop

Field Reporting (business/industry)
APD Communications
Cassidian Communications
Cyrun
Data911 Mobile Computer Systems
Hytera Communications
Integrated Tracking Solutions
InterAct
Intergraph
Location Technologies
Locus Diagnostics
NeoTerra Systems
NetMotion Wireless
RadioMobile, div. of RF Industries
Send Word Now
Sentor Monitoring and Control Systems
Syntech Systems
Trident Micro Systems
Ventyx, an ABB co.
Zetron
Zoll

GIS Mapping
3T Communications
Advanced Topographic Development and Images (ATDI)
APD Communications
Cassidian Communications
Cisco Systems
Codea
ComGroup Australia
Comsearch
Damm Cellular Systems
Data911 Mobile Computer Systems
DX Radio Systems
Etelm
Etherstack
Forsk
Hitech Systems
Integrated Tracking Solutions
InterAct
Intergraph
Kirmuss & Associates
Location Technologies
Locus Diagnostics
Logistic Systems
LS telcom
Maxon
Mentum
Mobility Sound Technology
NeoTerra Systems
RadioMobile, div. of RF Industries
Raveon Technologies
Selex Elsag
Send Word Now
SoftWright
Survey Technologies Inc. (STI)
Swissphone Telecom
Trident Micro Systems
TriTech Software Systems
Ventyx, an ABB co.
Wrap International AB
Zonith

Middleware
AGENT511
APD Communications
Avaya
C4i
CalAmp
Columbitech
Commtech Wireless
Data911 Mobile Computer Systems
DataSoft
GE MDS
Integrated Tracking Solutions
Location Technologies
Locus Diagnostics
Mentor Engineering
Motorola Solutions
NeoTerra Systems
NetMotion Wireless
Portalify
Prism – IPX Systems
Quintron Systems
Radio IP Software
RadioMobile, div. of RF Industries
Send Word Now
Sentor Monitoring and Control Systems
Trident Micro Systems

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www.RRMediaGroup.com

Product Category Index

Twisted Pair Solutions
Ventyx, an ABB co.
VoiceInterop

Mobile-Data Systems
3T Communications
Advanced Digital Systems
Albrecht Telecommunications
APD Communications
Avaya
CalAmp
Cassidian Communications
Cleartone Telecoms
CoCo Communications
Compuquest
Critical Response Systems
Cyrun
Damm Cellular Systems
Data911 Mobile Computer Systems
Detracom
Elektro-Arola
Etelm
Fylde Micro Systems
HAL Communications
Hitech Systems
HV Sistemas
IDA
I.D. Systems
InterAct
Intergraph
IPMobileNet
IPWireless
Kantronics
Kolibri Systems
LMR Systems
Location Technologies
Logistic Systems
Mentor Engineering
Motorola Solutions
MotoSAT
NeoTerra Systems
NetMotion Wireless
Portalify
Radio IP Software
RadioMobile, div. of RF Industries
Raveon Technologies
Raytheon JPS Communications
Safety Vision
Selex Elsag
Send Word Now
SkySweep Technologies
Smith Micro Software
SoftWright
Solarcraft
SoundBite Communications
Spescom
Tait Communications
Tallysman Wireless
TeleCommunication Systems (TCS)
Telesoft International
Trident Micro Systems
TriTech Software Systems
Tunnel Radio of America
Twisted Pair Solutions
Ventyx, an ABB co.
WiPath Communications
Zoll
Zonith

Network Management
3T Communications
Alcatel-Lucent
Anritsu
Artevea Digital
Asentria
Avaya
Aviat Networks
Axell Wireless
Bayly Coastcom
CalAmp
CoCo Communications
Comlab
CommScope
Compuquest
Comsearch
Damm Cellular Systems
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Detracom
DPS Telecom
DragonWave
EF Johnson Technologies
El Paso Communications Systems
Etelm
Etherstack
Fial
Firetide
Forsk
FreeWave Technologies
Fylde Micro Systems
GE MDS
Genesis Group
Harris Public Safety and Professional Communications (PSPC)
Hytera Communications
Hytera Mobilfunk
In Motion Technology
Intergraph
Location Technologies
Locus Diagnostics
LS telcom
Mentum
MiMOMax Wireless
Motorola Solutions
NetMotion Wireless
Omnitronics
PageTek
Powerwave Technologies
RAD Data Communications
Radio IP Software
RadioMobile, div. of RF Industries
RCC Consultants
Rohill Engineering
Schweitzer Engineering Laboratories
Selex Elsag
Sentor Monitoring and Control Systems
Signal Intelligence
SmarTrunk Systems
Smith Micro Software
Survey Technologies Inc. (STI)
Symmetricom
Tait Communications
Team Simoco
Telesoft International
Teltronic S.A. Unipersonal
Trango Systems
Tripp Lite
Tropos Networks
Twisted Pair Solutions
Vecima Networks
Wrap International AB
Zonith

Operations
3T Communications
APD Communications
Artevea Digital
Avaya
Catalyst Communications Technologies
Comlab
Computer Resources
Federal Signal
Hytera Communications
Hytera Mobilfunk
Location Technologies
Motorola Solutions
NeoTerra Systems
NetMotion Wireless
RCC Consultants
Sentor Monitoring and Control Systems
Ventyx, an ABB co.
Verint Systems

Paging
Avaya
Commtech Wireless
Compuquest
Computer Resources
Critical Response Systems
Digital Paging Co./Global Sab Inc. (DPC/GSI)
DPS Telecom
DX Radio Systems
EF Johnson Technologies
Elektro-Arola
Fial
Hark Systems
I.D. Systems
IHM
Intergraph
Location Technologies
Midian Electronics
Motorola Solutions
NeoTerra Systems
Penta
Prism – IPX Systems
Send Word Now
Sonik Messaging Systems
Swissphone Telecom
WiPath Communications
Zetron
Zonith

Records Management Systems (business/industry)
Avaya
Cadex Electronics
Cassidian Communications
Cleartone Telecoms
Computer Resources
Cyrun
Data911 Mobile Computer Systems
Hitech Systems
InterAct
Intergraph
Location Technologies
Mentor Engineering
Motorola Solutions
NetMotion Wireless
RadioMobile, div. of RF Industries
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SmarTrunk Systems
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Syntech Systems
TriTech Software Systems
Zoll

RF Safety
Linx Technologies
Locus Diagnostics
Narda Safety Test Solutions
RCC Consultants
Sentor Monitoring and Control Systems

Terrain Propagation
Advanced Topographic Development and Images (ATDI)
Comsearch
Detracom
DX Radio Systems
EDX Wireless
Etelm
Forsk
Harris Public Safety and Professional Communications (PSPC)
LS telcom
Mentum
Motorola Solutions
Multiple Access Communications (MAC)
NeoTerra Systems
RadioSoft
RCC Consultants
Selex Elsag
SoftWright
Survey Technologies Inc. (STI)
Wrap International

Voice Recognition
ASC Telecom
Avaya
Cisco Systems
Location Technologies
Motorola Solutions
Raytheon JPS Communications
Send Word Now
Spescom
Voice Print International (VPI)

Wireless Internet Applications
Avaya
Catalyst Communications Technologies
Ceragon Networks
Cisco Systems
CoCo Communications
Compuquest
Digital Voice Systems Inc. (DVSI)
El Paso Communications Systems
Encom Wireless Data Solutions
Hark Systems
HV Sistemas
I.D. Systems
InSight Mobile USA dba StreetEagle GPS
Intergraph
Location Technologies
Motorola Solutions
NetMotion Wireless
Radio IP Software
Send Word Now
Sentor Monitoring and Control Systems
Smith Micro Software
SoundBite Communications
TeleCommunication Systems (TCS)
Telesoft International
TriTech Software Systems
Vecima Networks
VoiceInterop

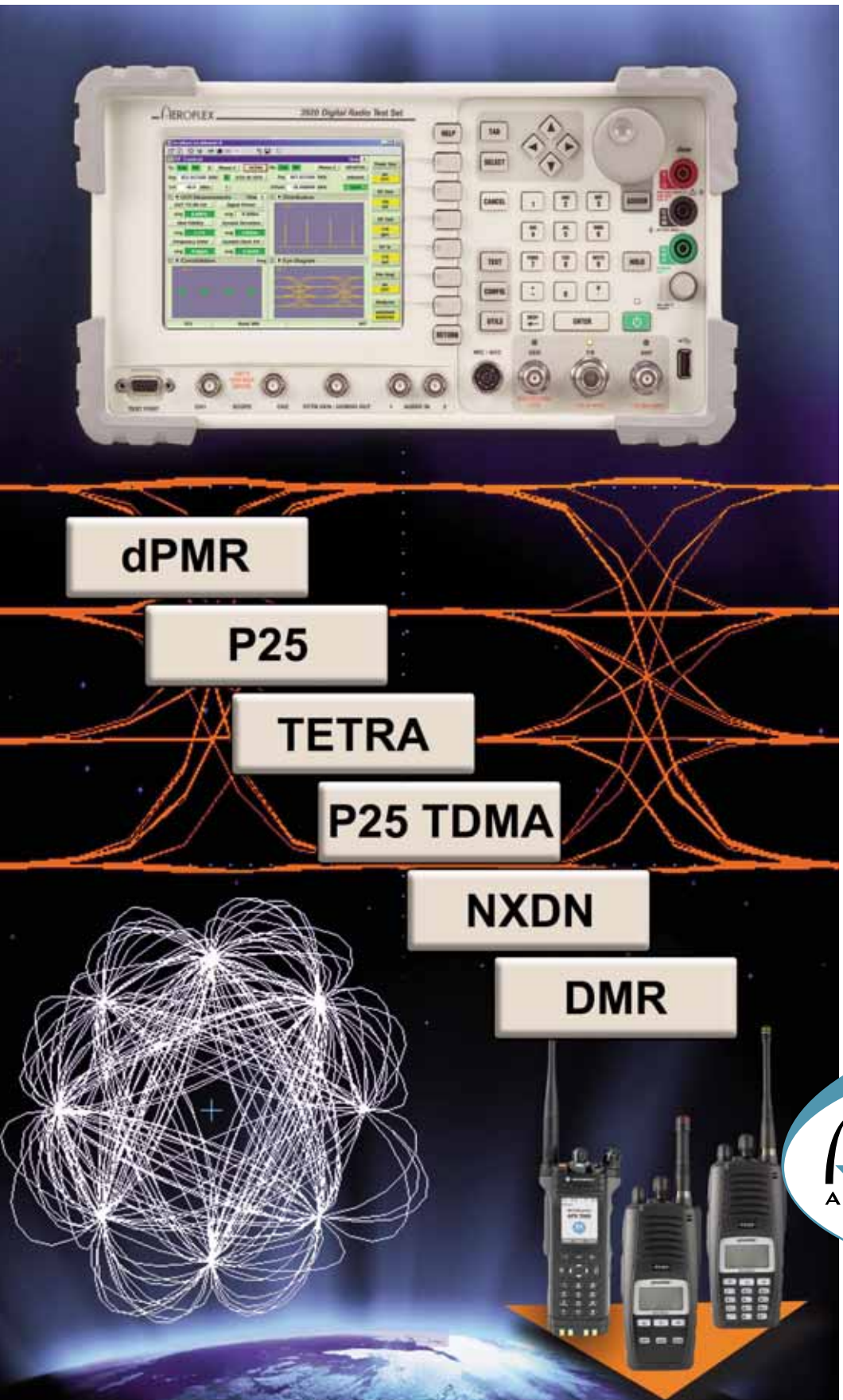
TELEMATICS/ITS EQUIPMENT
Harris Public Safety and Professional Communications (PSPC)
Laird Technologies
Location Technologies
Mobile Mark
NeoTerra Systems
Peiker Acustic
Radio IP Software
Rojone
Sentor Monitoring and Control Systems
Tallysman Wireless
WiPath Communications
Zonith

TEST EQUIPMENT
(D=direction finders, FS=field strength meters, FC=frequency counters, P=power monitors, RF=RF monitors, SM=service monitors, SA=spectrum analyzers, V=voltmeters/wattmeters)
Aeroflex (FC, P, RF, SM, SA)
Agilent Technologies (FC, SA, V)
Albrecht Telecommunications (SM)
Anritsu (D, FS, FC, P, RF, SM, SA, V)
Berkeley Varitronics Systems (D, P, SA)
Bird Technologies (FS, P, RF, SM, SA, V)
Communications Research Centre (CRC) (SA)
Comprod Communications (P, RF)
Creowave (FS, P, RF, SA)
Cubic Defense Applications (D)
Davicom, div. of Comlab (P)
dbSpectra (P)
Doppler Systems (D)
El Paso Communications Systems (SM, SA)
EMR (P)
Etherstack (RF)
General Dynamics Satcom (P, SM, SA, V)
Hytera Communications (D, FS, FC, P, RF, SM, SA, V)
Hytera Mobilfunk (D, FS, FC, P, RF, SM, SA, V)
Kaltman Creations (D, FS, FC, RF, SA)
L-3 Communications, Narda Microwave-East (P, SA)
Link Communications (SM, SA)
Locus Diagnostics (RF)
Lyncole XIT Grounding (P)
Motorola Solutions (SM, SA)
Multiple Access Communications (MAC) (FS, P, RF, SA)
Narda Safety Test Solutions (D, P, RF, SA)
Optoelectronics (FC)
Praxsym (FS, P, RF, SM, V)
RadioMobile, div. of RF Industries (RF, SA)
RF Industries (RFI) (P)
Rojone (RF)
Sentor Monitoring and Control Systems (P, RF, V)
Sinclair Technologies (FC, P, RF)
Spectracom (FC, RF, SA)
Survey Technologies Inc. (STI) (FS, P, RF, SM, SA)
Telewave (P, V)
Telsate Telecomunicações (D, FS, RF)
Times Microwave Systems (RF, SM, SA)
TX RX Systems Bird Technologies (P, RF, SA, V)

TONE SIGNALING EQUIPMENT
Albrecht Telecommunications
Avtec
Benelec
Bosch Security Systems
Cimarron Technologies
Communications Specialists
Compuquest
Connect Systems
Critical Response Systems
Cromack Industries
DX Radio Systems
EF Johnson Technologies
GAI-Tronics
Hark Systems
Hoag Electronics
HV Sistemas
IDA
Linx Technologies
Location Technologies
Maxon
Midian Electronics
Motorola Solutions
NHRC Repeater Controllers
Optoelectronics
Pantel International
Penta
Racom Products
RF Technology
Selex Elsag
Spectra Engineering
Spectrum Communications
Tait Communications
Thales Communications
Veetronix
Vislink
Zetron

WIRELESS LOCAL LOOP/RURAL SYSTEMS
4RF
Amphenol Jaybeam
Aviat Networks
Berkeley Varitronics Systems
Carlson Wireless Technologies (CWT)
Ceragon Networks
Connect Systems
DX Radio Systems
El Paso Communications Systems
Exalt Communications
Hark Systems
Hoag Electronics
Hytera Communications
Hytera Mobilfunk
Kathrein, Scala div.
Kyocera Solar
Location Technologies
MiMOMax Wireless
Mobile Mark
Motorola Solutions
RF Technology
Rojone
Star Microwave Service
Telepoint
Zetron

One Test Set for All Your Narrowbanding Test Needs



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New Products

Broadband Communications Unit

The MCU-30 from **Mobilicom** is a compact 4G mobile wireless IP communications device for public-safety and surveillance applications. The unit creates a secure and

private broadband network that supports 4 Megabits per second (Mbps) speeds without relying on existing wireless networks. The lightweight, rugged device is battery operated and can be embedded in security cameras, sensors, and control and monitoring device platforms. The product has a range of nearly 10 kilometers.

www.mobilicom.com

Hazardous Location Terminal

Hughes Network Systems announced a Broadband Global Area Network (BGAN) machine-to-machine (M2M) terminal with hazardous locations accreditation. The Hughes 9502 is a global-use terminal

designed for operation on Inmarsat's BGAN service. Accreditation testing was completed by Met Laboratories (MetLabs) and certifies the terminal for operation in hazardous locations where explosive gaseous atmospheres may be present. The certification covers operation in Class 1, Division 2, Groups A – D and ATEX Zone 2, Group II, Category 3 environments. The terminal delivers end-to-end IP data connectivity for a variety of applications.

www.hughes.com

Resilient Alerting

PageOne Communications upgraded its Responder two-way pager to provide triple-resilient alerting. The new version supports dual-frequency paging with short message service (SMS) fall-back and can operate on local paging frequencies or the company's national wide-area paging network in the United Kingdom in case of local system failure. The SMS fall-back feature detects when paging signals are not being received and automatically diverts messages via SMS. The company also launched a lower-cost version of the pager targeted at retained firefighters. The Responder Acknowledgement two-way pager provides message delivery, message read and attendance confirmations and is available on a fixed monthly rental option.

www.pageone.co.uk

Interference Mapping

The MA2700A InterferenceHunter from **Anritsu** is a handheld direction finding system that enhances interference mapping and simplifies locating interference sources in wireless networks. Designed for use with Anritsu's BTS Master, Cell Master and Spectrum Master analyzers, the product can be used during deployment, installation

and maintenance, and is well suited for use in spectrum clearing and interference mitigation. The product allows users to draw a vector line to an interfering signal on a map stored in the handheld analyzer and then pan and zoom on maps created using the company's easyMap for more detailed analysis. Features include a GPS receiver and antenna, electronic compass and user-selectable preamplifier. Power is provided through a USB connector.

www.anritsu.com

Remote Spectrum Analyzer

Narda Safety Test Solutions expanded the functionality of its NRA-3000 and NRA-6000 remote spectrum analyzers. The analyzers now provide uninterrupted I/Q data as a real-time stream, and the number of samples for spectrum analysis is increased to more than 600,000. Data is delivered from signal sequences separated into the real, or in-phase, and the imaginary, or

quadrature, components. Coverage is uninterrupted up to a channel bandwidth of 400 kHz. Data is available as a gapless stream via transmission control protocol (TCP)/IP or user datagram protocol (UDP). The product transfers the data in blocks of up to 250,000 points for channel bandwidths of up to 32 megahertz. Remote commands similar to plain text allow for further evaluation using add-on software and hardware analysis tools.

www.narda-test-solutions.de

Transceiver

JVC Kenwood launched the TS-990 series of HF/50 MHz transceivers equipped with dual receivers to enable simultaneous

reception on two bands. The main receiver uses full down conversion and features a new mixer and narrowband roofing filters. The first mixer circuit is equipped with a double balanced grounded switch type mixer. The product's local oscillator features independent circuits optimized for different signals, including voltage-controlled oscillator (VCO) division type/direct digital synthesizer (DDS) direct for the main receiver; DDS direct for the sub receiver; and conventional phase-locked loop (PLL) for the transmitter. Each main section is equipped with its own dedicated digital signal processor (DSP). A dual thin film transistor (TFT) display enhances visibility.

www.jvckenwood.com

Single Tray Combiner

Procom added two four-channel single-tray combiner systems to its line of combining products. The PRO-COM150-HDAR-4 and

PRO-COM450-HDAR-4 are single tray combiners housing a four-channel hybrid transmit (TX) combiner, duplex filter, active receive (RX) multicoupler and preselector. The product is designed to use minimal space within a rack system compatible with digital 6.25-kilohertz channel spacing. Four models cover bands 136 – 156, 152 –175, 340 – 400 and 406 – 470 MHz. Single transmit isolators are standard, and dual isolators are available as an option. Two receive-side ports are standard.

www.procom.co.uk

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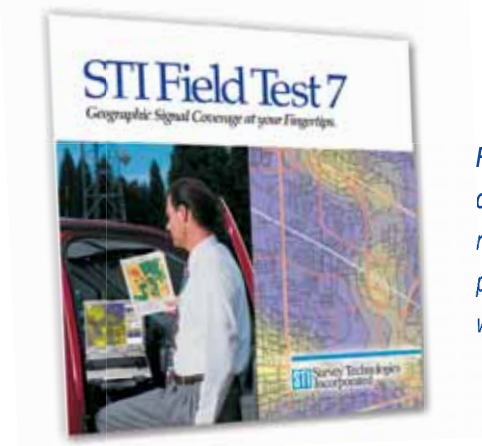

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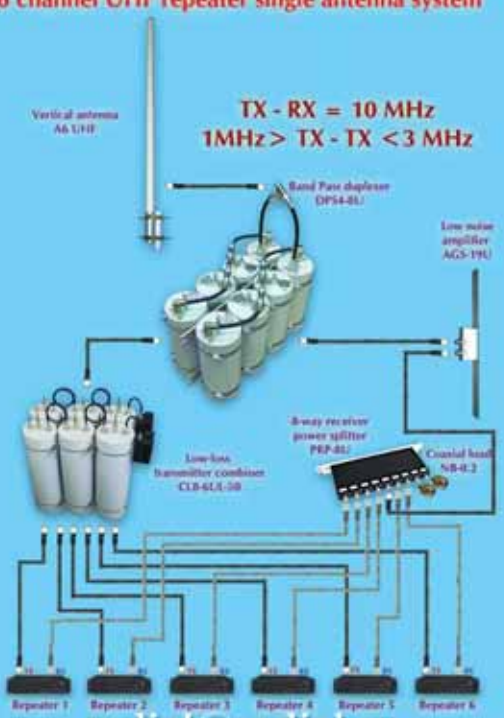

radial@radial.ru

21 – 24 May: Critical Communications World (incorporating TETRA World Congress), Paris. TETRA + Critical Communications Association (TCCA) and IIR: http://criticalcommunicationsworld.com

11 – 13 June: European Conference on Communications Technologies and Software Defined Radio (SDR-WInnComm-Europe 2013), Munich. Wireless Innovation Forum: www.europe.wirelessinnovation.org

18 – 21 June: CommunicAsia 2013, Singapore. Singapore Exhibition Services: www.communicasia.com

24 – 26 June: LTE World Summit, Amsterdam. Informa Telecoms & Media: ws.lteconference.com/lte-public-safety

1 – 3 July: Critical Communications Latin America, Sao Paulo. IIR Telecoms: http://criticalcommunications-latam.com

18 – 20 August: INTERSEG: International Law Enforcement Technology, Services and Product Expo, Rio De Janeiro. International Association of Chiefs of Police (IACP): www.feirainterseg.com.br/en

18 – 21 August: APCO Conference and Exposition, Anaheim, California, United States. Association of Public-Safety Communications Officials (APCO) International: www.apco2013.org

10 – 11 September: Wireless China Industry Summit 2013, Beijing. Infoex: www.wirelesschina-summit.com

10 – 13 September: 8th Metro World Summit, Shanghai. China Decision Makers Consultancy (CDMC): www.cdmc.org.cn/mws

15 – 17 September: Critical Communications Middle East, Dubai, United Arab Emirates. TETRA + Critical Communications Association (TCCA) and IIR: www.tandcca.com

18 – 19 September: LTE Asia 2013, Singapore. Informa Telecoms & Media: http://asia.lteconference.com

18 – 20 September: VSAT 2013, Amsterdam. Informa Telecoms & Media: http://vsatevent.com

25 – 26 September: Emergency Services Show, Birmingham, United Kingdom. Broden Media: www.emergencyuk.com

9 – 11 October: Professional LTE, London. IIR Telecoms & Technology: http://professional-lte.com

23 – 24 October: Critical Communications Expo, Hamburg, Germany. Exhibition & Marketing Wehrstedt: www.ccexpo.de

23 – 25 October: EUTC 2013, Amsterdam. European Utilities Telecom Council (EUTC): www.eutc2013.utc.org

29 October: TETRA in Taiwan: Taipei, Taiwan. TETRA + Critical Communications Association (TCCA): www.tandcca.com

31 October: TETRA in the Philippines, Manila, Philippines. TETRA + Critical Communications Association (TCCA): www.tandcca.com

5 – 7 November: CBTC World Congress, London. Global Transport Forum: www.cbtcworldcongress.com

13 –14 November: Transport Security Expo, London. Nineteen Events: www.transec.com

19 – 21 November: Railway Telecommunications, Amsterdam. Global Transport Forum: www.railway-telecoms.com

19 – 22 November: ITU Telecom World, Bangkok. International Telecommunication Union (ITU): http://world2013.itu.int

20 – 22 November: Comms Connect, Melbourne, Australia. Westwick-Farrow: http://comms-connect.com.au

9 – 11 December: Control Room Communications, Vienna. TETRA + Critical Communications Association (TCCA) and IIR: www.tandcca.com

26 – 28 March 2014: International Wireless Communications Expo (IWCE), Las Vegas, United States. Penton Business Media: www.iwceexpo.com/iwce2014

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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/Senior 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 areas of the world do you do business? (mark all that apply)
❑ 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

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 _____

BG13

By Phil Kidner

The Regional Markets for TETRA

Industry data shows that 2012 marked the third consecutive year for record shipments of TETRA equipment. The technology is being deployed in many regions and vertical markets.

South America

TETRA was adopted fairly early in its development process in Latin America, said Peter Clemons,

Quixoticity managing director. By 2001, TETRA systems had been installed for electricity companies, the armed forces, public safety, and regional governments in Mexico, Brazil and Venezuela. In Argentina, the mining and oil and gas industries also adopted the technology. However, overall sales volumes and market penetration were small compared with traditional professional mobile radio (PMR).

Around 2005, TETRA began a new growth spurt in the region with the arrival of new suppliers of IP-based infrastructure with more advanced, function-rich radio terminals offering GPS for AVL, basic short data service (SDS) and text messaging and improved voice quality. A larger number of public-safety users from Mexico to Argentina and Brazil began deploying networks with tens of thousands of users across larger geographical areas.

As TETRA's use in the transport sector increased worldwide, this trend followed across Latin America, whether on buses in Colombia, metros in Mexico and Chile, light and urban rail in Peru and Brazil, or in Brazilian airports. Large industrial plants also used the technology for operations involving hazardous chemicals and health and safety regulations.

Many countries have also recently profited from high international prices for their raw materials, allowing governments to invest in new infrastructure and manufacturing projects requiring communications networks.

The forthcoming World Cup and Olympic Games in Brazil are driving further growth. IMS Research predicts that the installed base of TETRA users in Latin America, including Central and South, will show a compound annual growth rate (CAGR) of 13.7 percent from 2012 to 2017.

The Middle East

After being affected by political instability, the Middle Eastern TETRA market is looking at growth, said Sami Honkaniemi, CEO at Mentura Group. TETRA is widely deployed across the region for public safety and security, oil and gas-driven industries, as well as large investments in security, transportation and industrial infrastructures.

IMS groups the Middle East with Africa, both of which are emerging and growing regions for TETRA. From 2012 to 2017, the installed base of users is forecast to increase by a CAGR of 8.7 percent.

Gulf Cooperation Council (GCC) countries — Kuwait, United Arab Emirates (UAE), Saudi Arabia, Oman, Bahrain and Qatar — are continuing large-scale investments in security and business infrastructures, as well as investments in operations and control systems. There are countrywide TETRA networks in all countries except Oman, where one is planned. Utilities and transportation share the public-safety networks or have their own networks under different stages of deployment. Oil and gas, with its use of ATEX terminals, are notable segments. Border control, security and surveillance systems are built widely in the region.

Major growth is also seen in the transportation sector. Airport projects with communications system deployments are in progress in all the GCC countries. In addition to air transport, the modernization plans include building metro systems and national railways to link the major cities. As the railways are more or less nonexistent in the fast-growing urban environments, this will also facilitate TETRA growth.

The countries affected by recent uprisings, such as Egypt, Libya and Algeria, are facing government restructuring, and the stabilization of these societies will create the basis for investing in infrastructure and security. This can create major opportunities as the security situation improves and the embargoes for security technologies no longer inhibit business.

North America

Kevin Graham, North American TETRA Forum board director and managing director, Global Digital Solutions North America, said the North American PMR market is changing. These changes are motivated by a combination of factors including equipment age and/or obsolescence; regulatory and spectrum reforms requiring rebanding or narrowbanding; user demand for enhanced capacity and more feature-rich voice and data capability; and networks with higher levels of security and resilience.

Since 2011 in Canada and late 2012 in the U.S., TETRA has received regulatory approval, and non-public-safety users in North America now have the same opportunity to evaluate and deploy TETRA-based solutions.

For a supplement on TETRA in North America, visit MissionCritical University at RRImag.com. ■

Phil Kidner is CEO of the TETRA + Critical Communications Association (TCCA). Email feedback to editor@RRMediaGroup.com.

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