key touch®

customer magazine
2/2012

Get the power of innovation

NEW TH1n: In a class of its own

WHO'S IN THIS ISSUE?

Want to know a little more about some of the experts who contribute to Key Touch? Look no further.

TAPIO MÄKINEN has the mission to create marketing and photographic contents for the security of all. He has undertaken photoshoots for Key Touch Magazine and Cassidian to capture events, products, sports, professionals at work, city views and critical infrastructure.

SATU LAMBERG sees communication as the most meaningful issue in life. Technology and devices enable seamless co-operation between people. It is all about information sharing and that's also what Key Touch is for.

JEAN-MICHEL DUMAZERT juggles his time between Cassidian, his family, scuba diving and being a local councillor. Since September 2010 he's now added to his packed schedule by contributing to Key Touch as TETRAPOL correspondent.

TIINA SAARISTO is Editor-in-Chief for Key Touch and has led the team of editors and contributors since 2003. In addition to Key Touch stories, Tiina is into quilting, Nordic walking and reading mystery stories.

AILA KOTILAINEN has been with Key/TETRA Touch more than ten years. Her favourite stories are about people, and she's always keen to make interviews for the magazine. Many photos in the magazine are the result of photoshooting projects she's arranged during the years.

JUHANA SANTALAINEN is focusing on social and environmental issues in the security industry while fi nishing his Master's Degree in Marketing & International business. In his spare time, he is always on a lookout for an adrenaline rush, mostly through kitesurfing or snowboarding.

TERO PESONEN likes to explore new ways of communication and social media, which will eventually be part of critical communications in the scope of full-circle security.

PETRA VAKIALA has been a Key Touch editor since 2008. She is looking forward to the upcoming summer, long sunny days and warmer weather after the long winter in Finland. She is excited that the TWC 2012 is organized in Dubai and is happy to be participating!

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CASSIDIAN

Get the power of innovation

WE FACE CONVENTIONS – widely accepted beliefs – every day. Surrounded by them, we do not usually notice them even though they can confine our thoughts into narrow boxes. Conventions hide in plain sight.

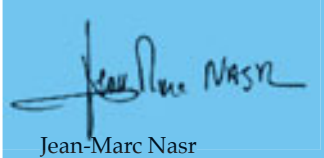
When these conventions are challenged, innovations are born. The four innovations below are solutions that challenge convention and can, in turn, lead to reinventing how professionals work on the move.

1 – TH1n. The world's smallest, lightest TETRA handheld radio ever. Who says that a professional radio has to be heavy? Challenging convention, this lightweight terminal is perfect for people who want a radio that fits as easily in a pocket as in the hand. Many user groups have been looking for a radio like this – those who need to use a radio covertly, managerial staff, industrial users and organizations in the social sector.

This new product has already bred new ideas. The complelety new form-factor enables new ways of carrying it, for example, on the upper arm. See pages 8-10 to read more about how the new TH1n radio is making possible a whole cluster of innovations.

2 – A solution for the future: the integrated LTE 400 PMR solution, achieved by a team of Alcatel-Lucent and Cassidian engineers. The solution brings seamless connectivity for professionals, using integration to avoid the drawbacks of products that work in silos. Read more on pages 19-21.

3 and 4 – Building the professional mobile radio future are two core network products - the all-in-one switch DXT3c and the TB3S base station with broadband inside (find the details on pages 16-18). These innovations were first unveiled at the TETRA World Congress 2012. Meet the challengers of convention at www.cassidian.com/twc and see things differently. Unlock your potential. Get the power of innovation!



Jean-Marc Nasr
General Director
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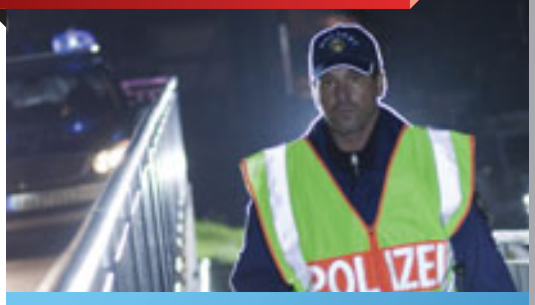

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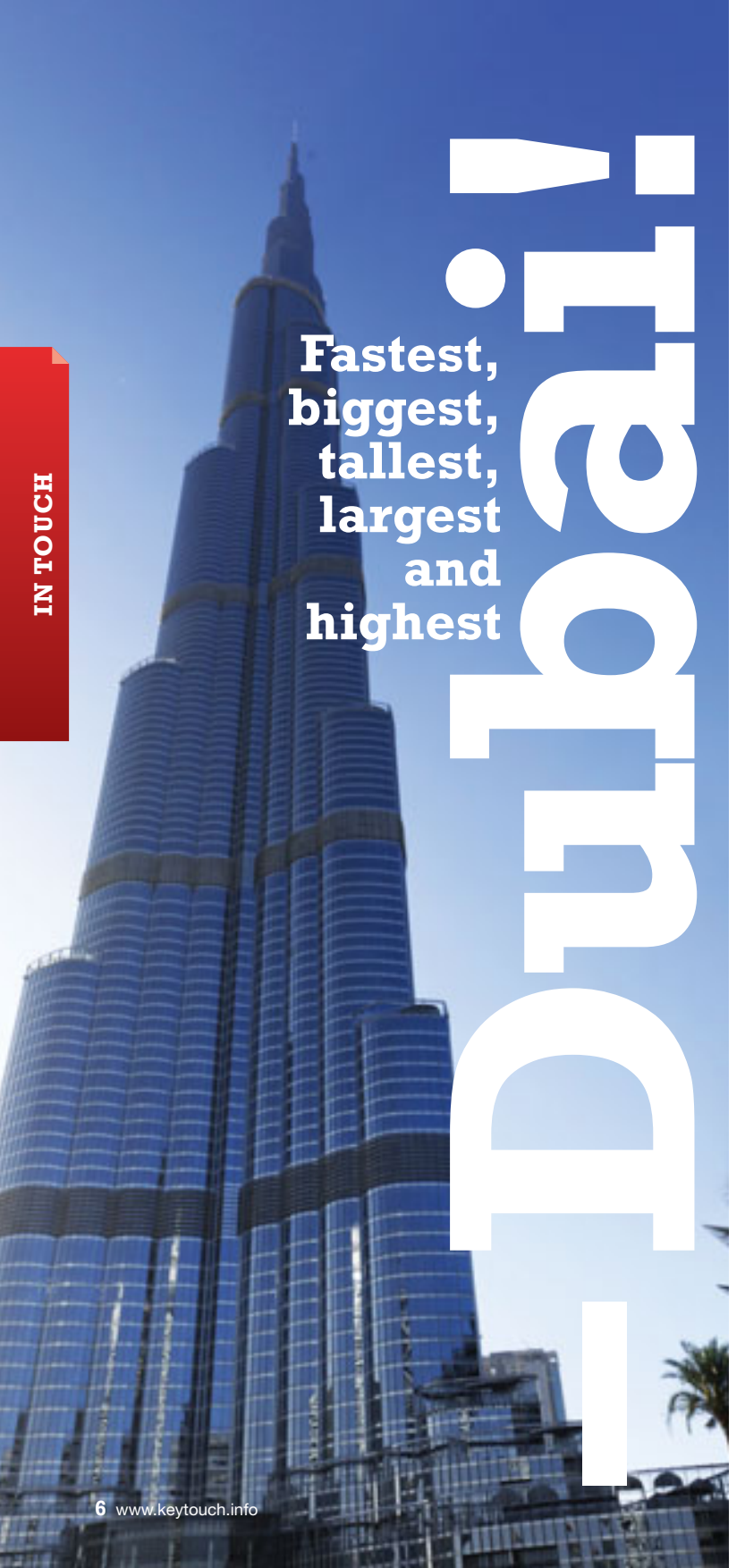


Fastest, biggest, tallest, largest and highest Dubai!

TETRA World Congress is a chance to catch up on the latest developments – and see one of the world's most exciting cultures.

This year's TETRA World Congress takes place at the Dubai International Convention and Exhibition Centre, offering many exhibits and demos to catch the interest of the TETRA user or developer.

Yet, step outside the convention hall and another world awaits, the exciting and vibrant culture of the United Arab Emirates (UAE).

Based on Islam and traditional Arab and Bedouin culture, the UAE is also a modern, cosmopolitan society. Dubai is the most modern and progressive emirate in the UAE and welcomes business and tourist travellers. These guidelines will help you make the most of a visit to Dubai.

Culture

Culture in Dubai is rooted in Islamic traditions so it is very important for visitors to Dubai to respect these and behave accordingly.

Alcohol

Alcohol is not forbidden as long as it is confined to places such as hotels, bars or nightclubs. It is illegal to drink in public places.

Dress

Emiratis tend to dress in traditional clothes, a dishdasha or khandura (a long white shirt-dress), for men and an abaya (a long black cloak), for women. For visitors, knees and shoulders should be covered. Standards are more relaxed in a hotel,

bar or club and swimwear is fine for pool or beach.

Photography

Normal tourist photography is acceptable, though photographs of government buildings, military installations, ports and airports should not be taken. It is polite to ask permission before photographing people, especially an Emirati woman.

Other

Some Muslim women and men will avoid shaking hands with members of the opposite sex - it is best to wait and see if the other person extends their hand first. Local men will greet other local men by touching noses or kissing cheeks. Public affection between members of the opposite sex is highly frowned upon.

Don't miss these

Burj Khalifa, the tallest building in the world at 828 metres and 160 floors.

Burj al-Arab Hotel the only 7 star hotel in the world.

Madinat Jumeirah. A fanciful hotel, shopping and entertainment complex, with the Burj al-Arab in the background. Madinat Jumeirah resembles a traditional Arabian town boasting over 40 world class restaurants.

The Dubai Mall is the world's largest, with over 1200 shops and has a visitors' entrance to the Burj Khalifah.

The Dubai Mall

The Souk Al Bahar ('market of the sailor') features over 20 restaurants offering a variety of cuisines, with many of the restaurants licensed.

The Dubai Fountain, at 270 metres long and a jet that shoots up to 150m, the Dubai Fountain is the world's largest. Easy way to approach it is via the Dubai Mall. Shows are every 30 minutes from 6pm to 10pm on weekdays and from 6pm to 11pm on weekends (weekends being Thursday, Friday, and Saturday).

Desert Safari: Head out to the desert with specialist desert drivers, who will take you over sand dunes, show you the sunset then take you to a lavish dinner.

For something more traditional and less touristic, Deira in eastern Dubai offers visitors attractions such as the Deira Gold Souk and Spice Souk. Dubai water taxis will take you there from the Bur Dubai side.

...And the safest

Catering for 17000 users, Dubai's TETRA network comprises three DXT switches and 100 TETRA base stations to deliver radio coverage across the Dubai area. The network is operated and managed by the Professional Communication Corporation, Nedaa. Major users include the entire Dubai government department, the police, hospitals, civil defence, airports and seaports.

The network is also to help secure the world-famous indoor ski resort, Ski Dubai - not the most traditional PMR use in the middle of the desert. The network also covers the entire metro system, which is partially underground.

The network is updated regularly with the latest technological features to match the communication and data needs of a growing number of user organizations.

Cassidian's slimline TH1n radio is in a class of its own

Who said professional radios have to be big and bulky? Or that they can't be stylish? Welcome to some new thinking in radio design. Get ready for the TH1n – a radio you'll want to carry, not just because you have to.

Everyone has their own ideas about what makes the ideal professional radio, depending on the demands of their particular job. But there are certain characteristics that almost every user can agree on, such as compact size, light weight and good ergonomics. The TH1n TETRA radio from Cassidian brings all these desirable characteristics together into a single, must-have object.

TH1n is the first in a completely new class of pocket-sized TETRA radios. Its classy, elegant design also sets it apart from conventional professional mobile radios, with its metallic finish and well-formed, rubber-coated sides. Yet it still retains the same large, bright colour display already familiar from previous Cassidian radio models. All in all, these features make the TH1n an attractive object that feels good in the hand.

Looks chic, performs well

These attractive design elements are also expected to open up the TETRA market to new sectors, such as social workers and health care personnel who have the option of joining shared public safety networks but so far haven't found a radio model to suit their needs. Someone who spends most of their working day indoors, wearing business

clothes or light uniforms rather than weatherproof gear will find that the TH1n fits their profile better than a heavy-duty radio targeted at fire fighters or paramedics, for instance. Equipped with appropriate accessories, TH1n is also suitable for covert use thanks to its compact and thin design.

On the other hand, the look of the radio cannot be allowed to compromise the performance of mission-critical communications where clear and loud voice quality is a key requirement. The TH1n is a fully-featured professional tool suitable for anyone who needs the most functional and robust tools to support their work. IP65 protection guarantees reliable performance in demanding environments and 1.8 watt output power provides extra reach when network coverage is at its limit or when direct mode operation (DMO) is used. The repeater feature in DMO enables teams to build a voice connection between users who might otherwise be out of reach of each other.

Ultimate versatility

The ability to access and share data in the field is increasingly important and the TH1n also delivers here, enabling field operatives to perform data queries and send reports, for example. They can take advantage of the Java™ platform, which enables many types of easy-to-use applications, thanks to the possibility of custom-made application user interfaces.

A completely new form-factor of a TETRA radio enables ▶

TH1n
TETRA radio

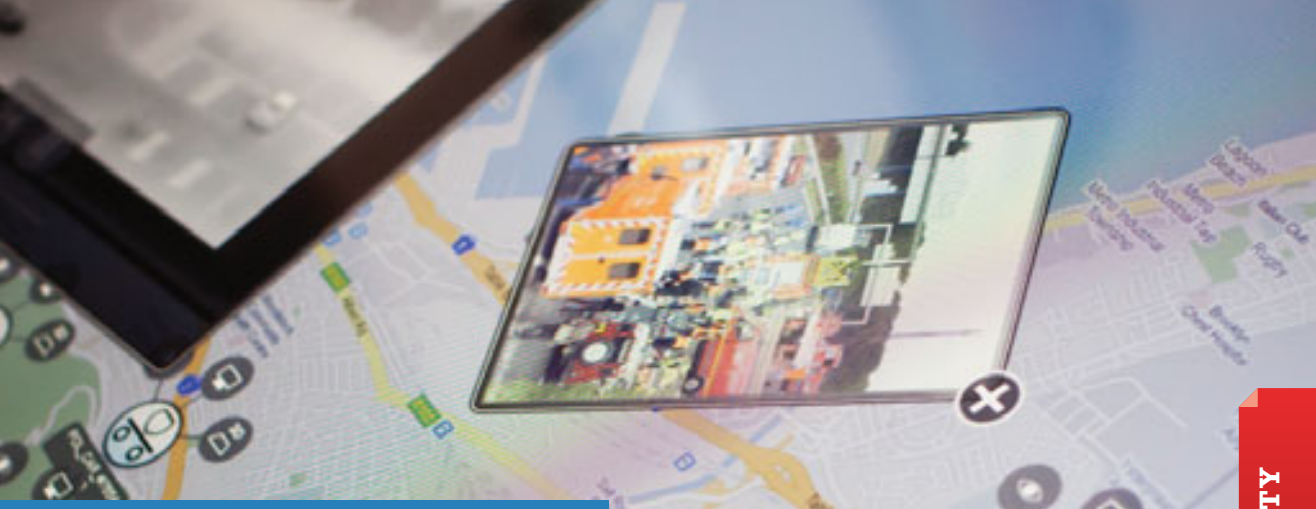
new ways of carrying it. Have you ever considered carrying your radio on your upper arm, for instance? Many of us are used to having something hanging around our neck, such as an ID card or keys. Why not a TETRA radio? A small enough radio can slip into a neck carrying case as a handy alternative to belt- and lapel-mounted holsters.

Whatever your preferred way of carrying the radio, its lightness makes it more comfortable. When it is placed in any of the carrying holders, the radio's built-in recognition mechanism switches automatically to carrying mode. The loudspeaker is switched on and the top microphone is activated to allow convenient use of the radio in its holder.

The extensive range of TH1n accessories includes an active carkit and different types of audio accessories ranging from robust IP65 classified microphones to invisible earpieces and headsets.

Finally, a professional radio needs to be responsive and easy to use if it's going to support people as they go about their jobs day-to-day. Cassidian TETRA radios are already firm favourites with users because of their high level of usability, which combines simplicity with logical keying patterns and clear menus.

Turn the TH1n on and enjoy the power of simplicity and clarity delivered by its fresh new user interface style. The design of TH1n achieves a remarkable blend of features brought together in a radio that's slimmer and lighter than ever.



Staying on top of events

with Cassidian event management solution

Building a control suite to manage the security of major events across a huge man-made island in Abu Dhabi is no mean feat. Cassidian achieved this in record time, creating a system that provides everything needed to ensure visitors stay safe and secure.

A man-made island stretching over 2,500 hectares and including a motor racing circuit, a marina, a theme park, hotels, golf courses, and apartments provides a major challenge to any security and communications system. This was what faced the Abu Dhabi security forces as it prepared to deal with major events on Yas Island, such as the Formula 1 race, thousands of people attending concerts, as well as the visits of major heads of state to the emirate.

To help it deal with these challenges, the Abu Dhabi Event Security Committee needed a turnkey control room solution, an Event Management Room that could serve all the security authorities responsible for the events organised on the island and one that could be delivered to an extremely tight schedule. Previously, temporary solutions had ▶

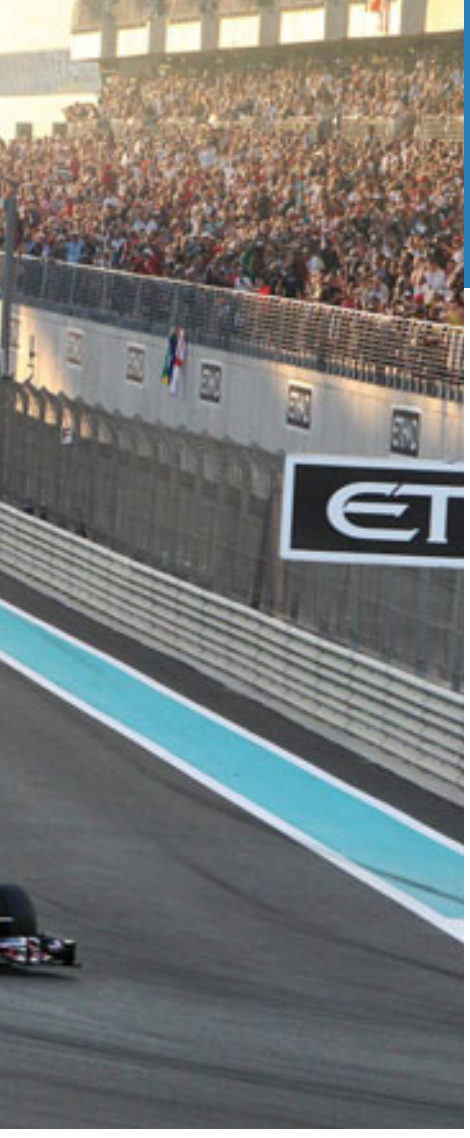
Integrated video surveillance network and control centre

been used, limiting the possibilities for event management.

The project was a turnkey contract, even including the interior design and furniture for the facilities – the operation room, ERC, meeting and training rooms. In addition, both the IT and radio communication infrastructure were designed and integrated, plus cloud computing capacity, video integration, radio dispatch, situation awareness, training and on-site support.

At the centre of communications

The heart of the Event Management Room is Cassidian's next-generation radio console, the RCS 9500. On the RCS 9500 display, operators can easily view and understand the status of all communications and of the units that they are dispatching. Dispatchers use the consoles for communicating with the field units and for managing operations.



Staying on top of events...

Unlike some other dispatching solutions, the RCS 9500 is not a compromise between management and communication. The ability to tailor the user interface means the user can support operative models in exactly the way each organisation wants. All important functions are accessible and everything "unnecessary" can be hidden from the main view completely, with no re-coding needed. This is unique in the dispatching solutions world and feedback from user organisations as well as from actual users has been extremely positive.

When desired, the RCS can be based on IP connectivity, eliminating the sometimes complex and often expensive E1 connections between the dispatching site and the DXT.

Complete package

The RCS was delivered as a complete package, which included all necessary hardware - servers, workstations, displays and audio equipment – as well as software, configured according to contract specifications. These were agreed in a series of workshops. The desired configuration was set up in a training environment, where personnel were trained using this configuration. Following feedback from the trainees, some improvements were made and the personnel re-trained on site.

The package included complete training for the operators and administrators in the local language, tailored to meet the required operational needs. The design and implementation were done in a record time of just four and a half months.

Bringing it all together

As well as the major elements of the RCS 9500 consoles, a variety of other elements served to bring the Event Management Room together and form a complete, useable solution. One of these is a Cassidian TouchTable which includes an advanced 3D model of the Yas Island and the Formula 1 race track. The TouchTable also has a live video feed into the same display, allowing an interactive approach to the planning and monitoring of the event.

Integrating the video surveillance network in Abu Dhabi into the control centre is achieved through the CCTV feeds from thousands of cameras on the Yas Island circuit and in strategic places on the island. These images are displayed on a specially built LED video wall, consisting of thirty 70-inch screens with the ability to show the contents of any one screen over the whole wall.

Further developments will include local development of the RCS, activating more functionalities and building on the operations at all levels.

Keeping the Grand Prix on track

Abu Dhabi's new Event Management Room proved its worth by aiding faultless security management for its 2011 Formula 1 race.

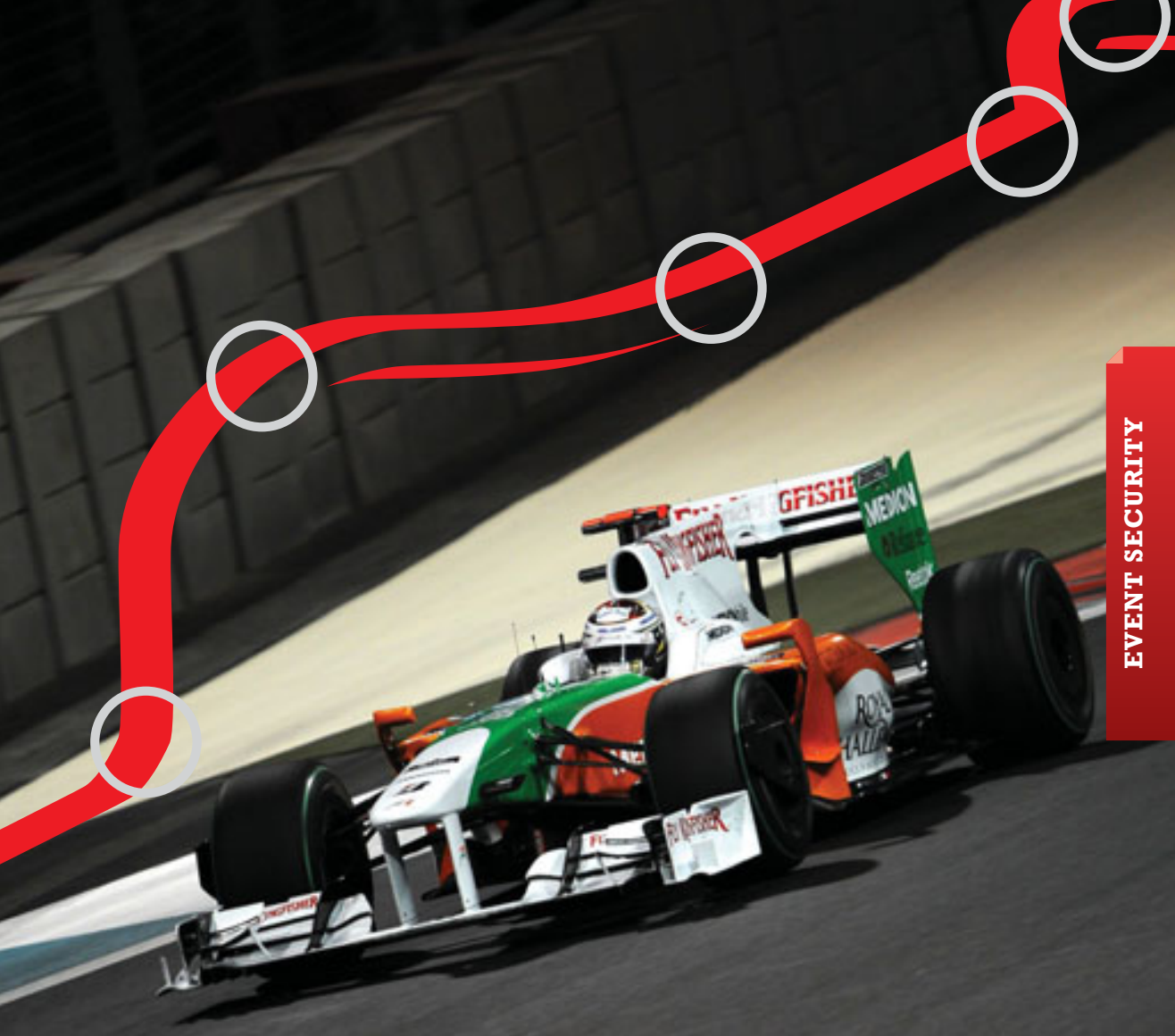
Managing the security of large complex events is no picnic and they don't come much larger or more complex than a Formula 1 Grand Prix. With the world's eyes on Abu Dhabi for the November 2011 Formula 1 race, the Abu Dhabi Event Security Committee entrusted Cassidian to deliver a state of the art command and control room to fullflil its complex missions.

The Formula 1 event was the proving ground for the command facility, known as the Event Management Room. It showed its reliability by operating 24 hours a day for three whole days, with no downtime, and with all the Emirate's security organisations using it to communicate and coordinate their activities and tasks.

The Event Management Room included video integration of the circuit and facilities and featured TouchTable technology for gold and silver command, providing an additional tool for planning and decision-making.

At the core of the control room communication architecture is Cassidian's next-generation radio console system, the RCS 9500. Dispatchers use the console for communicating with the people in the field, and for managing the operations.

During the Formula 1 race, all communications went through the RCS9500. The operators used specific communications features,



namely group calls, SDS/status messaging and tracking of mobile units. RCS worked extremely well with the system's ease of use coming in for particular praise by its users.

Support for other big events

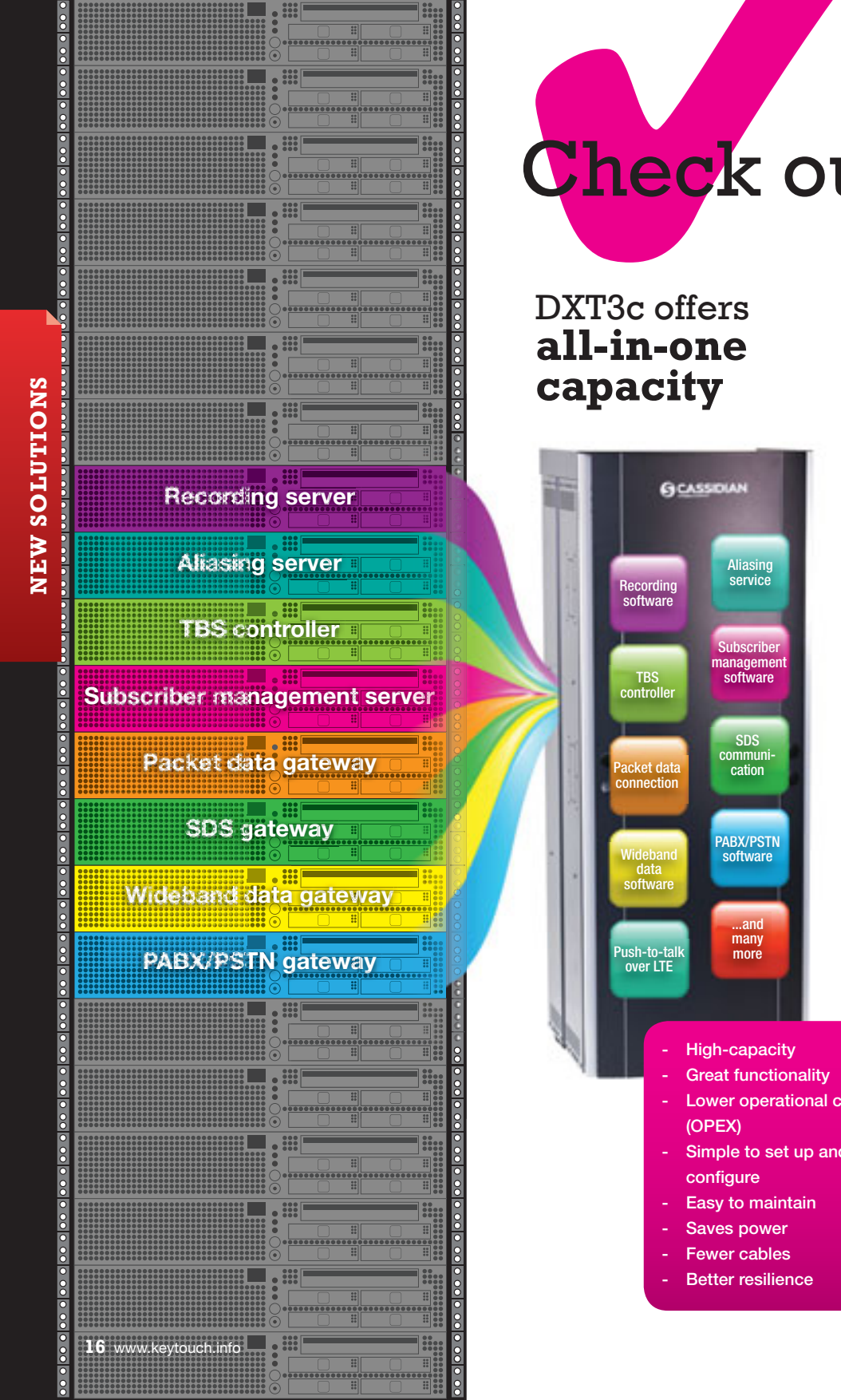
As well as the Grand Prix, the control room situated on Yas Island, is a multi-agency control room, designed for operating and managing other large events across the Emirate.

The system also helped users with their need to make internal announcements within the control room. The combination of the RCS tool with the TETRA system meant that this requirement could be met without any separate voice announcement systems needed. A special talk group named "announcement" was created, including everyone in the control room, and through this talk group, announcements were handled simply and easily.

According to Staff Major General Obaid Al Ketbi, Deputy Commander Abu Dhabi Police: "Security of events such as the 2011 Formula 1 Etihad Airways Abu Dhabi Grand Prix race is taken very seriously in the Emirate of Abu Dhabi. Thus, it was of critical importance to have the event operation room completely operational. We are pleased to say that it is one of the most advanced control rooms in the Emirate".

Check out the

DXT3c offers **all-in-one capacity**



- High-capacity
- Great functionality
- Lower operational cost (OPEX)
- Simple to set up and configure
- Easy to maintain
- Saves power
- Fewer cables
- Better resilience

new DXT3c switch

Easy roll out? ☑ Seamless network management? ☑ Cost-efficient mobility? ☑

TETRA switches are the ultimate backbone of every TETRA network. The new DXT3c switch is as small as a typical base station, making it an ideal solution for creating capacity for metro lines, airports, various industries, and utility companies to name but a few.

DXT3c enables a new level of versatility and adaptability to existing networks. Because it is so much smaller and lighter than its peers, the DXT3c provides whole new opportunities for operators to grow their networks smoothly and cost-efficiently.

Capable of both TDM and IP connectivity, the DXT3c "speaks the same language" as its big brother, the DXT3, as both are managed via the DMX operating system. Therefore, in addition to smooth network extension opportunities, technical support can be managed and provided locally using the existing service channels, a valuable asset for operators aiming for seamless network management.

In essence the new DXT3c is an all-in-one package with a packet data gateway, base station controller, dispatcher controller, pstn/pabx gateway and a multitude of application connections that enable smooth customization.

Wide range of applications

Airports and harbours:

- High traffic profile
- Small but very congested area
- A need for high capacity and seamless communication, supporting more than 900 active talk groups*.

* if average offered group traffic is 200mErl

Metro lines and public networks for large towns and small cities:

- Varied traffic profile
- Medium-sized geographical area with different traffic profiles in smaller sub-areas

Temporary coverage:

- A need for quick and easy roll-out
- An ability to set up the switch in a mobile unit

NEW SOLUTIONS

Did you know?

- All Cassidian DXT series switches run the DMX operating system, offering high security and versatility
- There are no known viruses in the OS, a major advantage compared to commercial OS´
- The DMX OS makes technical maintenance and updating hassle-free while simultaneously enabling seamless network management
- In fact, due to its failsafe nature, the DMX OS has even been used in a drag race car!

What kind of OS are you willing to trust your life to?

Broadband inside:

New, fitter TB3S base station does more

A rethink of the way a TB3 base station's internals are arranged has resulted in a honed unit that delivers a winning performance.

Cassidian engineers went back to basics for the latest TETRA base station, asking themselves what are the really essential parts. What could they trim to make it more like an athlete's body and less like that of the regular guy?

They decided they could make the internal metabolism of a base station better and stronger, using existing components arranged to use less space and making room for new solutions. Just like an athlete who hones their body to perform better, the TB3S will manage all the tasks required of a TB3 series base station, but be able to go further. More room is left for additional solutions, such as the LTE 400 carriers enabling smooth introduction of broadband.

In other words, the TB3S is set up to go that extra mile, offering these essential benefits:

- Smooth upgrade path to tomorrow's communication needs. Commonality between TETRA and broadband base stations allows easy upgrades with incremental investments
- Freedom to upgrade TETRA to TEDS and/or integrated broadband separately
- Choose broadband solution for each country, customer and frequency band
- Share antenna lines and antennas for TETRA and broadband
- Share transmission to core network and battery back-up system with TETRA and broadband

Citius, altius, fortius! Let the new TB3S base station satisfy your communication needs today, tomorrow and beyond.

Evercor® – The power of mobile broadband

Mobile 'apps' that deliver video and images on the move are already widely used by the general public day-in, day-out over commercial networks, and public safety professionals are increasingly looking to take advantage of similar resources. Evercor, the integrated LTE 400 PMR solution from Alcatel-Lucent and Cassidian is making this a reality, as a demonstration at the TETRA World Congress 2012 has shown.

Picture the scene…

A patrol unit reports that three people are behaving in a suspicious way near an industrial storage area. The command and control centre cannot get any fixed camera feed from this area, so the patrol turns on its vehicle-mounted video camera and moves in to investigate.

The command and control dispatch another patrol to the area, complete with a second camera.

In the control room

The dispatcher tracks the location and status of the patrol vehicles on a map on the OM100 display.

Another screen displays the live video stream from the vehicles. The dispatcher pulls up the available video streams until she sees the stream from the incident.

If other field units need to see the footage, the dispatcher can choose to push this live video stream to all the vehicles in the fleet.

In the vehicle

The field patrols are all equipped with vehicle-mounted video cameras, and the field officers have a multi-purpose tablet PC.

Using the tablet, officers can

- operate the vehicle radio for reliable TETRA voice
- see their own location and that of their colleagues on a map
- see the live video stream from the incident, pushed from the control room
- see a recorded video from any vehicle on the map.

The Evercor solution was demonstrated at the TETRA World Congress 2012. A similar integrated TETRAPOL and broadband solution is also being developed.

Three top benefits from an integrated solution

- ➔ An integrated solution ensures that familiar, reliable voice services continue to work efficiently today and in the future.
- ➔ The system automatically optimises the connection (narrowband, wideband or broadband) based on availability and the required level of service without user intervention.
- ➔ What's more, user organisations can manage all system subscribers using the same, easy-to-use Tactilon™ tool.

Interoperability paves the way for multi-vendor TEDS data

The next phase in TETRA data services has arrived, with the development of a multi-vendor market in interoperable equipment for the TETRA Enhanced Data Service (TEDS).

TEDS is the mission-critical high-speed data feature for TETRA networks. It was first demonstrated at the TETRA World Congress in 2007, and May 2010 saw the start of trials in Finland's VIRVE authority network. These soon established TEDS as an exceptionally powerful software feature and showed that Cassidian's TB3 base stations are capable of delivering TEDS for professional radio users.

Since then other companies have launched their own TEDS products and now Cassidian and Motorola have successfully completed private interoperability (IOP) testing on a Motorola TEDS-capable terminal in Cassidian's TEDS-capable network. This paves the way for the first official multi-vendor TEDS IOP certification by the end of 2012.

Interoperability will enable a more diverse TEDS-capable ecosystem to flourish, benefitting professional radio users worldwide.

Building the skills to run and operate **Qatar's nationwide network**

Qatar's new nationwide TETRA network is a perfect example of a successful build-operate-transfer project. Cassidian expertise has helped create a network and its operational processes, as well as build the skills of local staff to achieve world-leading performance.

When, in 2006, the Qatar Ministry of Interior (MOI) awarded a contract to Cassidian and its local partner Atlas Telecom to build and deploy a nationwide TETRA network, so began an extended period of cooperation, climaxing in a network run entirely by the local Qatari organisation and delivering world-class availability.

The original 2006 contract covered the deployment and implementation of the radio network, comprising 90 base stations and two switching sites operated and maintained under the control of a Network Operation Centre as a single point of contact. The project also entailed Cassidian creating from scratch the necessary set of operational processes, practices and tools all tailored to the needs of the Qatari organisation.

Then, in 2008, Cassidian was commissioned by the Qatar MOI to operate the network for three years. This contract covered a managed transfer of knowledge and skills from Cassidian

to Qatari personnel, to culminate in the network being run entirely by the Qatar MOI. At the heart of the cooperation is a dedicated TETRA competence centre, including a training centre and a test bed for applications and services. In addition, a showroom demonstrates the capabilities of the system and new features and applications.

The decision to award the network operations and services deal underlined the Qatar MOI's trust and confidence in Cassidian. "We have a strong partner with whom we wanted to go one step further. Our team has benefited from the knowledge and expertise of Cassidian's experts," says Brigadier Ali Al-Henzab, Head of Communications and Operations Department of the Qatar Ministry of Interior.

Performance targets far exceeded

The right support is important for any network, but for mission-critical services it's essential. Network owners, operators and users are often working under pressure and need to focus on their core activities. Professional services by Cassidian can provide the right expert support at every stage of a solution's lifecycle.

To operate the network in Qatar, Cassidian provided eight management and technical staff to work with and train 90 MOI personnel of six different nationalities. The contract agreement called for Cassidian to meet the requirements of 26 Key Performance Indicators (KPIs). Crucially, Cassidian managed to continuously improve the project's main KPI, Network Availability, to far exceed the target level of 99.97%.

Competence transfer involved Cassidian first assessing the skills of all the Qatar MOI employees and build an individual development plan for everyone. Then a program of 74 training courses was run for 243 MOI staff and 105 students from Cassidian customers in Kuwait and Saudi Arabia.

Competence transfer has now been completed and the network is currently being run successfully by the Qatari team.

LONDON

With the UK gearing up for the world's biggest sporting event, Key Touch looks at the critical role that communications plays in helping to maintain security and what lessons can be learned from the games in Beijing four years ago.

As the world's gaze turns towards London this summer for the 2012 games, organisers are determined to produce a successful event that promises to be a major global spectacle. Before a worldwide TV audience that organisers hope will exceed even the one billion that watched the opening ceremony in Beijing, 17,000 athletes from around 200 nations will compete over 17 days at events across the city and at other sites around the country.

With hundreds of thousands of people attending the games, security is of course a major concern and London 2012 will see the UK's biggest mobilisation of military and security forces since the Second World War. Around 13,500 troops will be deployed at the London 2012 games, more than are currently serving in Afghanistan. The growing security force is being estimated at anything between 24,000 and 49,000 in total.

Large events can be targets for trouble-makers and police officials need the ability to predict trouble, to react quickly when there is a problem and to contain the incident.

Communication is the key to managing and co-ordinating these huge numbers of security staff from different organisations.

Lessons from Beijing

What lessons can be learnt from the most recent games? In 2008, the Beijing Games brought together athletes from 204 nations, the leaders of 50 countries and a sell-out crowd that purchased 6.8 million tickets. One of the major lessons was that efficient communication between all the players is key to being well informed, alert and prepared for anything.

The world's biggest ever sporting event required more than 13 months of rehearsals, nearly 90,000 people and Asia's biggest TETRA network to ensure that everything ran smoothly. Everyone could rely on the network to provide them with secure and seamless communication services that handled up to 1.6 million calls a day.

A major event means a full-blown network in a concentrated area. Cassidian has the capability to deliver and deploy networks to our customers, not only those intended for long term nationwide use, but also scaled down networks. The network in Beijing covered an impressive array of games-related venues, both indoor and outdoor, including 31 competition venues, 15 non-competition venues, 43 training venues and well over 100 hotels and other facilities.

Coping with peak demand

The security operation for London is expected to engage around 23,000 people throughout the Games, and communications will be key for success. During the Beijing Games, the opening ceremony in particular placed exceptional demands on the communication system. The organising committee and public security staff were each assigned to their own dedicated base stations at the

CALLING

Bird's Nest stadium, so that any peaks in the organiser's traffic would not affect the base stations serving the authorities, and vice versa. A total of four base stations covered both indoor and outdoor areas and served more than 20,000 users on the day of the ceremony. Also Cassidian handportable and mobile radios complemented the network by providing a Chinese-language interface and exceptional battery life. In addition, the intuitive user interface made it easy to introduce all the new users to the system.

Co-ordinated, efficient and seamless communication is the key to gold medal standard security. Cassidian can provide that key, so that the overall winner can be the event and its participants.

VROOO

The Monte Carlo rally is a by-word for speed and technical excellence, criteria that also apply to the communications network set up to support the special rally stages in Haute Loire at this year's event.

At the request of SDIS 43 (Departmental Services of Fire and Rescue of the Haute Loire), Cassidian carried out the first ever deployment of its Tactical Cell for the Special stage of the Monte Carlo Rally held in Saint Bonnet le Froid on January 19th.

Only possible solution

Tactical Cell was the only solution able to answer the tough requirements of the safety forces. They needed to deploy additional radio coverage across dozens of square kilometres in just a few hours for a single day, allowing them to communicate in a zone with very restricted relayed network coverage. Tactical Cell also proved itself to be well suited to the needs of fast deployment.

The first step for Cassidian was to deploy a 3G IDR (Independent Digital Repeater), TPH700 handheld terminals equipped with micro-loudspeaker and GPS receiver, and a tactical AVL (Automatic Vehicle Location) solution in the mobile command vehicle to help pinpoint the forces on the ground.

Fast set up

The most time-consuming activity during the roll out was the installation of the mast with the antenna. Once this was done, all that was needed was to connect the antenna to the IDR - a 19" rack-based system powered by a generator provided by the safety forces - and distribute the TPH700 handhelds to the people involved in the event.

The relevant vehicle details were also entered in the AVL server - connected to the IDR through a radio terminal - as well as the map of the region stored in the AVL display solution. On the ground, the radio users selected the IDR channel used for this particular operation on their TPH700, giving them a common communication network and automatically providing the location of all the terminals involved in the mission on the display.

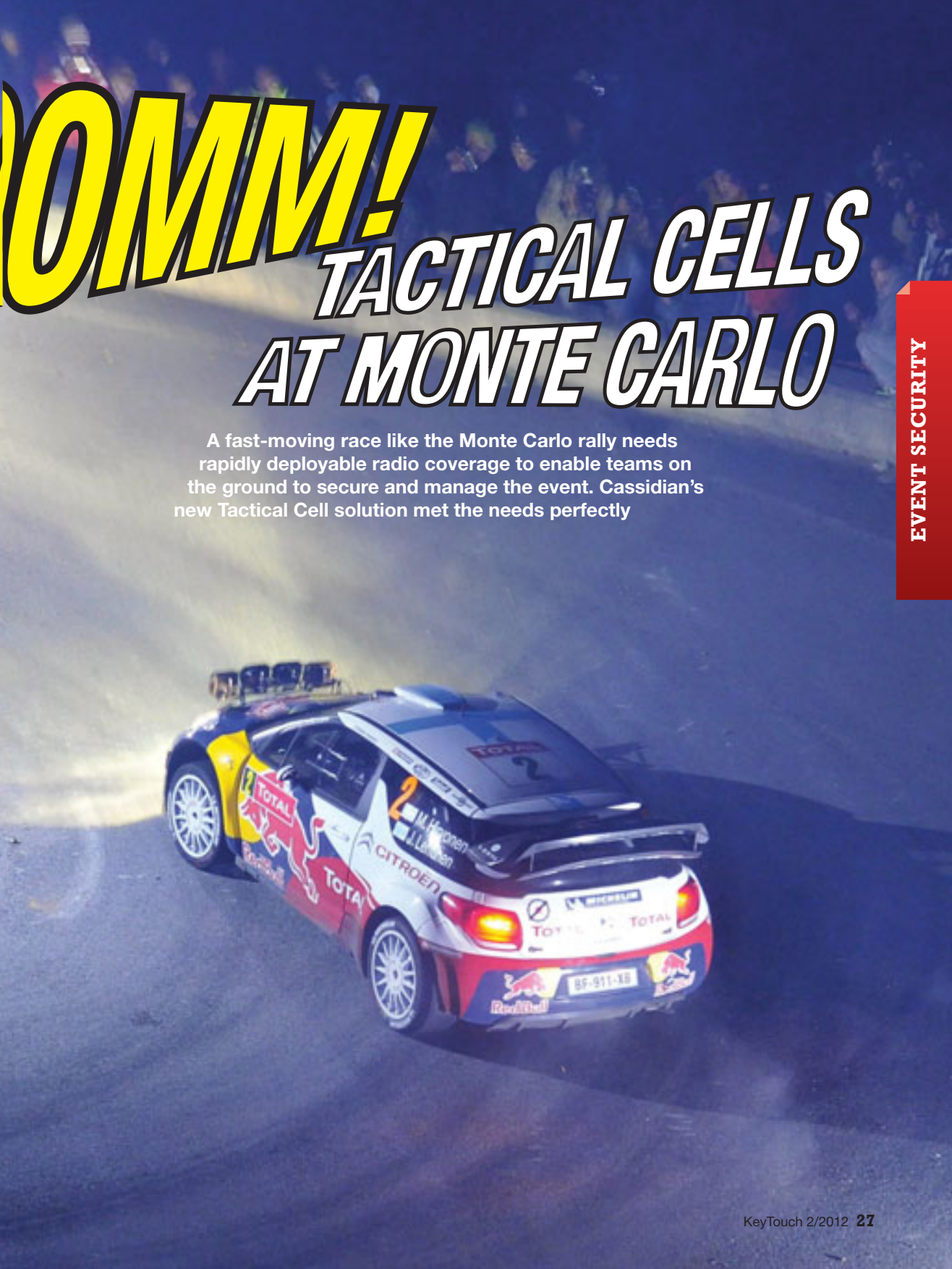
Complete course coverage

The IDR made it possible to provide radio coverage throughout the whole of the course, offering both voice and services to the team leaders and ambulances deployed on the ground. Their location coordinates were transmitted via the IDR to the command vehicle equipped with the tactical AVL and thanks to the OM100 AVL display application developed by Cassidian, it was possible to visualize the precise deployment of the safety team and to follow their activities throughout the race.

The Prefect of the Haute Loire region visited the headquarters of the Special and praised the effectiveness of the solution set up. The other safety organizations present at the event also showed a strong interest in the solution.

OMM! TACTICAL CELLS AT MONTE CARLO

A fast-moving race like the Monte Carlo rally needs rapidly deployable radio coverage to enable teams on the ground to secure and manage the event. Cassidian's new Tactical Cell solution met the needs perfectly



When you need to summon help fast, TETRAPOL emergency calls ensure you can alert the right people, right away.

Help is **just a button away** with **TETRAPOL**

Something unexpected happens. As a field officer you need help. By pressing the emergency button on your TETRAPOL radio terminal, you set off a train of events that quickly summons the help you need.

First, the radio transmits your identifier and, if geo-location is available, your GPS position back to your control centre, so help is only ever a button press away for TETRAPOL users. But behind the scenes the system works in several ways, depending on the network coverage situation and on the configuration of emergency management in the network.

Within network coverage

There are two types of Open Channel communications (called Crisis or Emergency) that can be opened in an emergency. Both open automatically (local crisis or local emergency) when any user presses their emergency button or after acknowledgement of a dispatcher (remote crisis or remote emergency).

Case Emergency Open Channel: When someone presses their emergency button they open a non-encrypted Emergency Open Channel within their current cell, with coverage extending back along the line of cells connecting them to the dispatcher(s). All subscribers under the cell coverage can access this channel, regardless of their group or organisation.

Case Crisis Open Channel: When someone presses their emergency button they open a Crisis Open Channel (encrypted or not, depending on configuration) with radio coverage extending across several cells and accessible to an authorised group.

It is also possible to configure the organisation to ask dispatcher to establish an individual communication with the people who has pressed the emergency button on his terminal.

Without network coverage

If the user is operating in IDR mode within tactical cell coverage or in direct mode outside the reach of network coverage, pressing the emergency button sets up a special emergency communication

If an IDR cell has been set up for tactical reasons, the emergency call is broadcasted through the IDR channel communication to all the radio terminals in the IDR cell. If a Radio Access Gate (RAG) is involved in this IDR communication, the control centre will also receive the emergency call via the RAG. If the radio terminal has a GPS receiver, it also transmits its location within the IDR cell and to the control centre via the RAG. The controller can then use automatic vehicle location (AVL) to help rescuers reach the caller as soon as possible.

If the user is operating in direct mode because they're beyond the reach of the network, the terminal sends the emergency call to any fellow terminals within radio range.

So, no matter where the user is, or whatever their situation, the emergency call function will find a way to connect, enabling the officer in distress to summon assistance right away.

Designing the **future emergency vehicle**

Are emergency service vehicles packed with too much equipment? Many think so, which is why a research project aims to find ways to simplify things

As emergency service workers and police officers gain more ICT facilities and applications in their vehicles, many are asking why they cannot be simplified and rationalized to help them work more efficiently and effectively. Can two items of equipment be combined into one to make it easier to use and decrease power consumption?

This is a major goal behind the Finnish based MOBI project. MOBI, for Mobile Object Bus Interaction Research and Development Project, aims to create a common international ICT infrastructure for all Public Protection and Disaster Relief (PPDR) vehicles, based on better integration of ICT systems, applications and services. Another aim is to extend this project to other PPDR vehicles in European countries, permitting the standardization of tools and technology in EU countries.

The main challenges of the project are to know how the vehicle's IT architecture should be arranged and how the vehicle should be built.

Usually, a police vehicle is a generic car with added features. As the need to transfer data grows exponentially, the number of electronic devices, cables and user manuals that need to be carried also increases greatly, eating into available space and rapidly becoming unmanageable. This trend can only continue to accelerate, driven by the necessity to have fast transfer of photos, videos and heavy documentation between the different units, combined with strong network security.

Reviewing what's needed

The MOBI project will analyze a piece of equipment's user interface, taking into account such factors as its rights and needs and of the IT architecture design built into the vehicle, how it interacts with other necessary features and its security requirements. It will also take into account the user's skills and the services they use.

The results will show what kind of features could be added to the PPDR, and what competencies are needed for use in different types of emergency situations. A demonstration vehicle will be used for tests and further research by the other business partners.

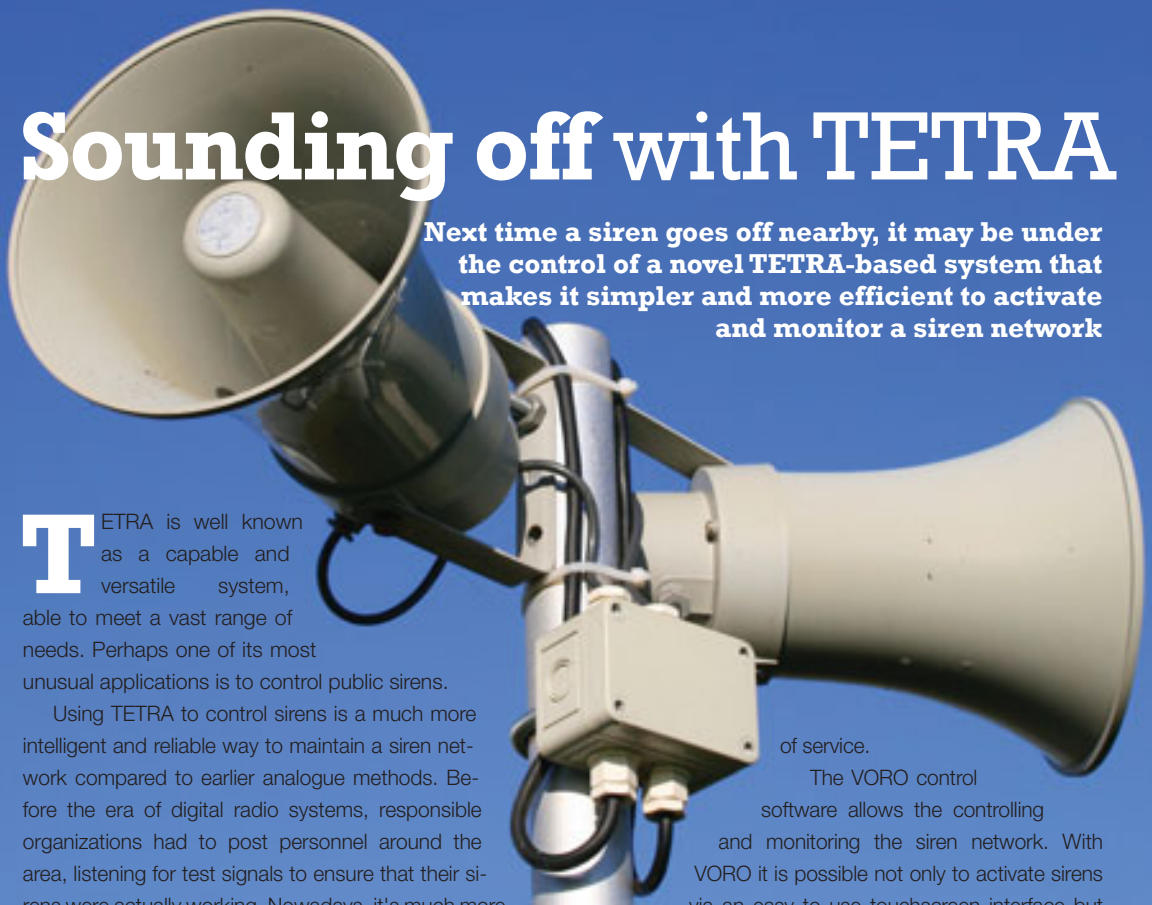
Possible innovations could place more emphasis on the development of digital services rather than physical, the implementation of cable appliances, and increasing the versatility of equipment to make it suitable for different types of users. Cassidian believes in the importance of providing digital services and secured communications and sees the project as a key to becoming more innovative in safety and security.

About MOBI

MOBI, for Mobile Object Bus Interaction Research and Development Project is a three year research project involving collaborative work between Laurea (University of Applied Science of Espoo, Finland), the technical center of the Finnish Police, initiator of the project, and diverse industrial partners: Sunit (in-built vehicle computers and display company), INSTA (IT service provider for public safety in Finland), and Cassidian.

Sounding off with TETRA

Next time a siren goes off nearby, it may be under the control of a novel TETRA-based system that makes it simpler and more efficient to activate and monitor a siren network



TETRA is well known as a capable and versatile system, able to meet a vast range of needs. Perhaps one of its most unusual applications is to control public sirens.

Using TETRA to control sirens is a much more intelligent and reliable way to maintain a siren network compared to earlier analogue methods. Before the era of digital radio systems, responsible organizations had to post personnel around the area, listening for test signals to ensure that their sirens were actually working. Nowadays, it's much more convenient, as all sirens are monitored automatically and potential problems are immediately reported to the control room. A report can also be sent directly to the radio of the person responsible for siren maintenance.

When the nationwide VIRVE public safety network emerged in the early 2000s, a company called Elektro-Arola designed the first connection units to allow existing sirens to be controlled via TETRA. Today, most of the sirens in Finland are controlled through Elektro-Arola's connection units and Cassidian's TETRA radios.

Reliable, sophisticated siren control

The latest siren models – the Teho-Ulvo product family - support TETRA connection directly, needing no external connection units. In addition to integrated TETRA connectivity, direct IP, GSM, analogue PMR and leased line connections are also supported, allowing parallel methods to be used for optimal security.

All models in the range are completely digital, for both control logic and amplifier technology. All the most important units of the siren can be doubled up, so if an individual malfunctions, the whole siren does not go out of service.

The VORO control software allows the controlling and monitoring the siren network. With VORO it is possible not only to activate sirens via an easy to use touchscreen interface but also get detailed status information about them, including components such as the speakers, amplifiers, battery, power supply, temperature and door. Status information can also be shown on a map to give the best picture of the current status of the complete siren network. VORO offers automatic logging and reporting functionality and several VOROs can be installed in parallel if required.

About Elektro-Arola:

Elektro-Arola Oy is a Finnish company with over 35 years of experience with radio communication and alert systems. As part of the latter, the company has designed and manufactured electronic civil defence sirens for outdoor warning and radio control, as well as monitoring systems for them since the 1970s.

ELEKTROAROLA

Ten times faster than voice

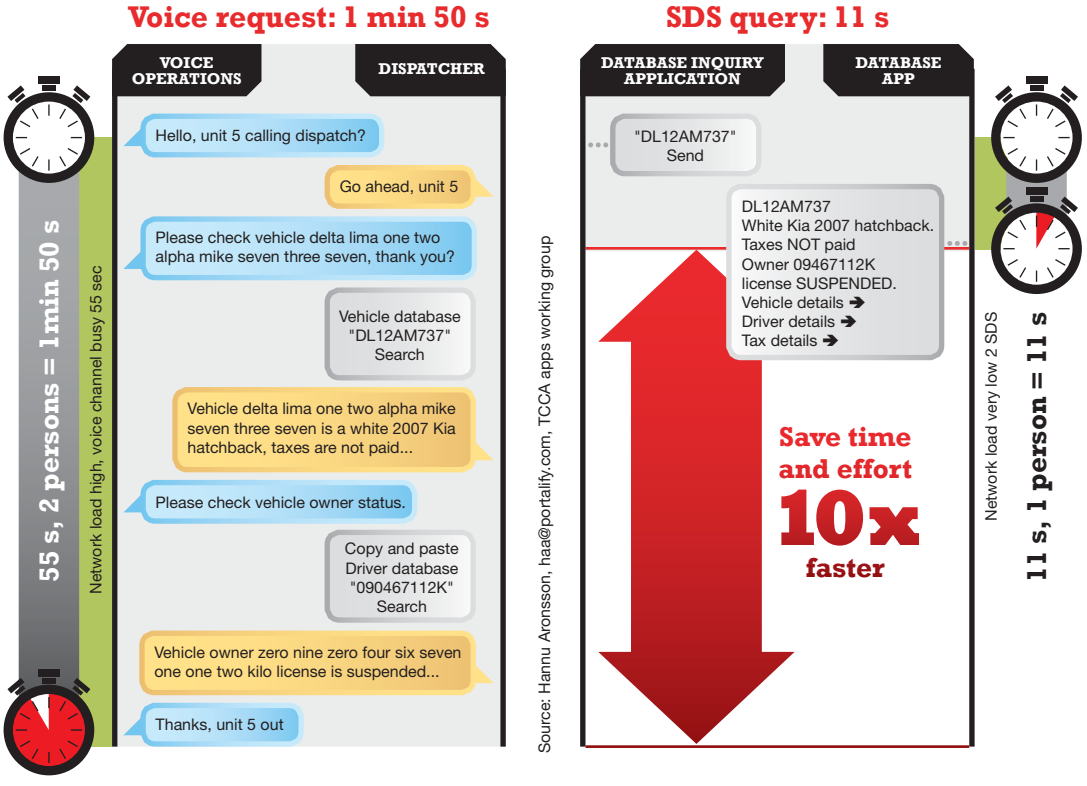
Checking information over the air can be done in two ways – the traditional way, by voice, or by interrogating a database using SDS messaging.

The difference can be stark in the ease of use, accuracy and time saving. With voice, the person receiving the call may not understand or hear a request properly, causing delay. Then thay have to do what is requested, read the information they have retrieved, perhaps interpret it and relay the information back to the person requesting it.

It all takes time. In the example shown here, two people are engaged for one muinute 50 seconds trying to retrieve the needed data.

Contrast this to the SDS method, as exemplified by the sequence above from an application from Portalify. It takes just one person 11 seconds to get the information on screen at the site of the incident – this is ten times faster than voice.

Clearly, this type of automated application is the way to go for organisations concerned to cut costs while improving the speed and accuracy of information retrieval from databases.



Replacing voice requests with automatic SDS applications can slash the time needed to interrogate databases

Keeping Mexico City safe

Since adopting secure radios, Mexico City's police can communicate securely and efficiently, helping them to tackle crime more effectively.

As one of the world's largest cities, with nearly nine million people, Mexico City has its share of urban crime. The burden on the city's police force has been greatly alleviated by the introduction of a TETRA radio communications system, which currently serves 50,000 users. This is a huge increase on the initially planned 10,000 users.

The network serves some 18,000 radios, whose users represent public safety such as patrol police, traffic police, city paramedics, detectives and fire fighters. The secure radio communications bring benefits these personnel: availability, coverage within the city's limits, encryption, Automatic Vehicle Location (AVL) for three thousand vehicles, and user identification.

Edgar González is Communications Director for Mexico City Police, charged with ensuring the operational health of the radio network, including maintaining infrastructure and managing its users.

Things were very different before secure radio, says González: "We used to have a number of communications challenges. These included inefficient use of radio frequencies, information leakage and lack of terminal authentication. Now we serve four times the number of users as previously, making more efficient use of the radio spectrum and also have more security, including

functions offering authentication, encryption and over the air programming. We appreciate that we can disable lost or stolen radios over the air – this was not possible in the previous system."

A still growing network

In terms of architecture, the system currently has four DXT3 switches, 38 base stations (including six double cells), and one mobile unit, with expansion continuing as the number of users grows. Says González: "Currently we have 35 communications Dispatcher Workstations (DWSs) but we will soon have another 300 dispatchers working in our network to serve our new state of the art Command, Control, Communications and Computers Center (C4) and five regional Command and Control Centers (C2s)."

The introduction of the TETRA system has made it easier to co-ordinate a response to incidents among the various agencies connected to the system. "Some emergencies are dispatched to several independent agencies using the same system and dynamic talk groups are created to co-ordinate specific missions by different agencies," says González.

Of all the new capabilities, the confidentiality that digital encryption brings is the single most important feature for the Mexican authorities. This allowed a major success only two years after the system came on line, when agencies across the city co-ordinated their efforts to hit gangs without warning.

Both field officers and high-ranking officials have taken well to using the secure radio communications, finding it extremely easy to use even when trying it out for the first time. Using the TETRA radios by Cassidian is very like using a cell phone, with the addition that the radio menu guides the user through a wider range of options and features, including functions handling data transfer and messaging. Training of users has been straightforward, making use of printed guides to get users up and running with their new equipment.

Overall, the introduction of the radio communication system has been a very positive experience for Mexico City Police, which has plans to improve its usefulness to field personnel still further. Says González: "We want to implement more data functions such as data queries - stolen vehicles, vehicle registry, criminal records - and status messages."

Edgar González

photo: ©Thinkstock

SOLUTIONS

CRITICAL INFRASTRUCTURE

– MAKE SURE IT'S SECURE

The infrastructure that we use to live our modern lives is often taken for granted, yet a disruption to just one of those systems can have dire consequences for us all. Whether caused by equipment failure, human error, sabotage, or natural disaster, the disabling of critical elements of infrastructure could impact a whole nation. But the correct set of solutions can help keep them safe

Assets

All countries have critical assets that help and sustain the life of the country. These include airports, bridges, broadband, canal, dams, electricity, energy, freight, hospitals, lighthouses, ports, mass transit, rail, road, sewerage, telecommunications, utilities and water. Using the right solutions can help secure them from A to Z.

Bridges

Land routes and bridges are used to ship tonnes of goods each day. They are assets that need permanent and reliable surveillance.

Communications

Communications systems help safeguard national assets, keeping security staff in touch and helping keep vulnerable facilities, which can be spread over thousands of square kilometres, under close surveillance.

E IS FOR ELEMENTS

In the past, the elements making up the systems and networks of a country's infrastructure were physically and logically independent and separate, with little interaction or connection with each other or other sectors of the infrastructure. With advances in technology, these elements became automated and interlinked through computers and communications facilities. Although this helps make the economy and nation more efficient and perhaps stronger, it also allows one catastrophic failure in software to bring down many systems, including air traffic control, emergency services, banking, trains and electrical power.

Wide range of security solutions

There is a wide range of solutions from Cassidian to provide a high degree of protection which can be networked and interfaced with other systems to provide a common control and command system covering the whole infrastructure. Possible solutions comprise:

- Security systems: physical protection of critical sites.
- Video surveillance: closed-circuit television (CCTV), intelligent video, licence plate recognition, crowd management, container ISO number identification, road traffic control.
- Non-intrusive inspection: persons, cargo, vehicles and luggage, screening, explosive detection, metal detection, CBRN (chemical, biological, radiological and nuclear) detection, narcotics detection.
- Distribution networks security: protection of pipelines, water, energy, supply chain.
- Cyber security: information systems and data networks are the central infrastructure of all economies. The prevention of cybercrime and the protection of systems and sensitive data is one of the most critical issues that security organisations face. Highly confidential data belonging to governments and private security organisations need to be protected against illegal activities.

However, one has to keep in mind that securing national infrastructure depends on understanding the relationships among its various elements. We need to understand how the elements of the infrastructure mesh together, or how each element functions and affects the others.

DATA NETWORKS

Data networks are the central infrastructure of all economies. The prevention of cybercrime and the protection of systems and sensitive data is one of the most critical issues that security organisations face.

ENERGY

Oil and gas pipelines are valuable yet vulnerable assets, often snaking through remote, almost inaccessible areas. Keeping them safe is essential if oil and gas companies are to prevent economic losses and potentially catastrophic environmental damage.

Taking the measure of a network

With a huge programme to implement the BOS authority radio network across Germany, it was vital to prove that it could provide the desired quality and coverage before entering full service. An automated measurement system is ensuring that the network does what it should.

As one of the world's most technologically advanced nations, Germany is building a nationwide digital radio network to co-ordinate the communications needs of public authorities and emergency organisations. Known as BOS radio network and delivered by Cassidian, the service is being rolled out rapidly across the country and is now available in every Federal State.

To ensure the service is working correctly, an extended test programme is underway in Berlin, Hamburg, Bremen, Munich and Mecklenburg-Western Pomerania, as well as in parts of Baden-Württemberg, Lower Saxony, Schleswig-Holstein, Rhineland-Palatinate and Saxonia.

Objective measurements

The test programme measures the actual network coverage before the user organisations adopt the network into actual operation. This gives users the confidence that the network and its facilities will meet their needs exactly before it starts to form a vital component of their own operations.

Achieving objective and comparable measurement data is the basis for optimising the network.

BOS links up Germany

The BOS digital radio network in Germany is one of the largest ever technical modernisation projects in the country: the introduction of a digital radio network serving all authorities and organisations with safety functions. The introduction of the BOS radio network will mean that for the first time, voice and data services will be available for the radio users seamlessly and uniformly over the whole of Germany.

A further development version of the AQM-TS is a hand-carried solution that can be used for indoor measurements. For this type of use, Cassidian can use its considerable experience with indoor measurements in other digital and similar trunked radio networks. Using AQM-TS allows objective, repeatable collection of the indoor service quality.

Because the network covers such a large area and because so many parties have been involved in the roll-out, all measurements need to be guaranteed accurate and comparable.

The sheer size of the network and the surface area which needs to be covered (over 357,000 km2) means that the measurements taking needs to as automatic as possible.

Coverage and quality

Two kinds of measurements are made. Firstly, a passive instrument (a so-called scanner) measures the network coverage. This does not load the network. The scanner measures and records the field strength, bit error rate and the field strength of neighbouring cells.

Secondly, the quality of service is measured by establishing the availability of individual calls, group calls and other functions. For this, Cassidian has developed a special measuring device, the AQM-TS, which can measure the quality of service that an actual user would perceive.

The measuring device can relate the network connection quality with the service availability, making it possible to determine the causes of lower quality of service. The device can also perform complex optimisation analyses, in which the causes of abnormal behaviour can be determined.

The final component of the AQM-TS is a statistics module that permits the calculation and the reporting of customised KPIs to aid quality monitoring of the network. As well as being shown on a map, statistics can also be exported into a spreadsheet.

Measurements go mobile

Measurements can be done on the move and one of the measuring devices has been fitted into a Mercedes Viano minibus.

The measuring system installed in the vehicle consists of:

- TETRA antenna system
- AQM-TS device
- TETRA scanner
- PC
- Additional antennas for UMTS and GPS
- Power
- Operational board
- Navigation equipment

A high data sample density can be achieved by simultaneous use of two vehicles, allowing up to four calls to be structured and analysed at the same time. Using evaluation tools developed specifically for TETRA systems enables flexible use of the measuring data, as well as allowing optimised parameter records.

Radio mounts to suit any task

New ways to carry radios are making life easier.

Professional mobile radios are essential items of equipment that many users, such as police officers and firefighters, need to carry and have quick and easy access to. With the emphasis on comfort, functionality and practicality, fire service, police and military uniforms often have pockets, loops or clips to carry a radio conveniently or to integrate special carrying solutions easily.

With TETRA networks now expanding rapidly around the world, new organizations are joining the PMR community constantly, many of which will have little or no experience of using a TETRA radio. Often, they will not have uniforms similar to those used by public safety workers and will need to carry and use their radio in a different way.

Hospital workers have unique needs

Even the materials and washing instructions for these work clothes will provide their own special challenge. For example, in hospital work, the clothes are usually not personal, being washed daily and returned to the department for any employee to use the next time. The fabrics are often quite thin and fixed attachment parts for the radio are not allowed. Even though there is a wide range of carrying solutions available on the market, none was perfect for hospital use.

Many people would think that the solution is to use a lanyard to carry the radio separately from the clothes, yet this can create its own problems - the radio might hit a patient or a patient may even use the lanyard to attack the nurse. Keeping the radio in a pocket means it is not quick to use and, with a thin outfit, it will wrinkle the fabric and the user may be annoyed or inconvenienced by the unbalanced weight of the radio.

Innovative fastening

Fanttiset Oy in Finland has now come up with a totally new idea for carrying radios in hospitals, which can also be applied to other working conditions involving the wearing of thin clothes and when a fixed attachment part is not allowed. This new device is fastened with magnets, with the fabric in between. It has a counterweight on the rear to balance the weight on the shoulder and make it more comfortable to use. The radio is ready to be used on the lapel, voice feedback can be heard and it is close by when speaking. It

is also extremely easy to put in place and to remove or change to another outfit and the radio can also be readily switched to the other shoulder.

Innovation is the key word in the development of carrying solutions. As this magnet based device and a new covert carrying solution show, all carrying problems can be solved with an innovative idea.

more info:
www.fanttiset.com

CLP Power triumphs with TETRA award

NEWS

CLP Power Hong Kong has won the award for 'Best use of TETRA for Private Industry' at the inaugural TETRA awards in London.

As Hong Kong's largest power utility, CLP Power delivers an electricity supply that is consistently over 99.99% reliable to more than 2.4 million customers in the Hong Kong area. Starting with voice services, CLP Power has evolved its TETRA network into a control system that monitors and regulates its power distribution network.

The award ceremony, held at London's prestigious Savoy Hotel, celebrated the achievements of TETRA manufacturers and users.

ON TRACK IN CHINA

Public transport operators need to work hard to encourage travellers away from their cars by offering flexibility, reliability and low cost. In China, transportation companies plan to build around 80 new mass transit rail lines in 22 cities.

Communication within mass transport systems brings its own challenges. On-the-move, drivers change network cells frequently, making rapid cell handovers essential. For metro communication, radio coverage in a tunnel is vital. Whether trains run on the ground or under it, public safety also makes demands, requiring instant, reliable, two-way communication between drivers and dispatchers, stations and security personnel.

Professional Mobile Radio (PMR) solutions from Cassidian based on TETRA provide transport operators with an effective answer to these challenges and in China alone, Cassidian has already built nearly a dozen TETRA networks for metro lines.

An example is the TETRA network for Shenzhen, the first city in China to interconnect all TETRA systems from different metro lines, which are built and operated by three companies. With many transfer stops, it's vital that personnel from different lines and stations can communicate effectively.

TETRA systems from Cassidian provide high redundancy, capacity and availability by design, and emergency calls are always given the highest priority.

DID YOU KNOW ...

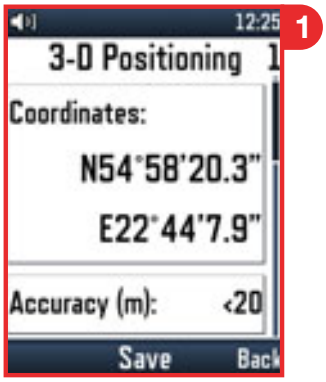
...how to make the most of Waypoints?

There is a lot more to the GPS feature in your Cassidian TETRA radio than simply knowing where you are and seeing your current coordinates on the display 1. Did you know that you can mark a place, for example the scene of an incident, simply by pressing a pre-programmed number key?

This saves the position as a waypoint into your radio along with a time stamp. You can and give it a name 2, as well as a comment to describe what happened. A name can be 20 characters long and a comment up to 100 characters long. Your waypoint could contain information such as 'Menton Street 123' and 'Traffic accident, 2 cars and 1 truck involved. All vehicles crashed, no casualties.' You can also send it as a text message to your team or dispatcher. Using waypoints allows you to provide accurate position information, for example in reports.

You can save up to 100 waypoints in your radio's memory. If you receive a waypoint from a colleague and you want to find that place, just save the waypoint into your radio and open the Waypoint Guidance application by pressing 'Go-to'. Waypoint Guidance shows the shortest distance to the selected waypoint. As with all saved waypoints in the radio, direction and cardinal points as well as speed are shown on the display relative to your position 3 and are updated as you move.

Using TETRA terminal Contact Manager, waypoints can be transferred from a radio to a PC or even vice versa.



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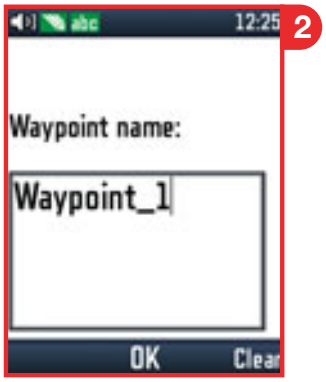

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Malaysian port hub gets even better

One of Asia's busiest ports, handling thousands of ship movements, has chosen Cassidian TETRA to help it run smoothly.

Northport (Malaysia) Bhd, one of the leading port terminals in South East Asia, has chosen the digital TETRA communications solution from Cassidian. Being a major hub and an integral part of the region's transportation pipeline, Northport needs excellent communications with an emphasis on security and safety to ensure reliable service delivery for its customers. The new system will support Northport's state-of-the-art, multi-purpose terminal facilities.

SLW Corporation is a value-added-reseller for Cassidian in Malaysia, and won the contract to set up the TETRA-based Claricor digital system from Cassidian. The turnkey project involves pre-project assessment, system design, supply, installation and commissioning. It also includes training operators and users and providing local emergency support.

The Claricor network provides seamless communication coverage over the entire port facility. The port handles 5 million TEU (twenty-foot equivalent units) per year, generating around 8,000 ship calls. The network employs base stations with IP link and voice recording features for more than 600 terminal users. THR9 Ex handportable radios and TMR880i mobile radios from Cassidian are included as part of the system.

"Before this, SLW was providing an analog trunked radio service to Northport for its port operations. SLW is honored to partner with Cassidian to imple-

ment the TETRA digital solution for Northport, which has been a pioneer in adopting good practices and advanced technology for its operations," says Tony Lee, managing director of SLW. "Jointly with Cassidian, our mission is to provide a top-notch level of service and solutions to the customer, who can be assured of our reliable and high-level service and support anytime. We are also striving towards developing applications to provide end-to-end TETRA solutions for users."

Meanwhile, an associate of SLW has been licensed by the Malaysian Communications and Multimedia Commission to set up TETRA digital networks to provide digital trunked radio services nationwide.

SLW is a leading system integrator in Malaysia, with over 25 years of experience in wireless communication solutions, including consultancy, supply and support services.

www.slwholdings.com.my

When effective and reliable communications can mean the difference between mission success and failure, field officers need to be sure they have the right equipment in their vehicles before they drive off. Specifying the right radio antenna is an important contribution to giving them that confidence.

Picking the right TETRA mobile antenna

Choosing a suitable TETRA mobile radio for a vehicle such as a police car or motorbike is quite straightforward. However, to get the best antenna to mount on the outside of the vehicle involves some considerations that may not be apparent at first sight.

1: MOUNTING

- Where and how is the antenna to be installed on the vehicle?

For permanent installations, the most common type is a panel mount, where the antenna base is fitted through a hole in the roof – this is the most effective and resilient solution. Where drilling a hole is not permitted, a glass mount antenna with external whip is an alternative solution. For temporary installations, a magnetic mount type is usually the best choice.

The antenna must also be grounded. Standard panel mount and magnetic type antennas need to be fitted to a conductive ground plane of adequate size. If the vehicle has a non-metallic roof, an additional ground plane would be needed or, alternatively, a ground plane independent (GPI) type antenna could be used.

2: SHORT OR LONG ANTENNA?

Another consideration is how tall the antenna can be. This can be an issue on larger vehicles with height restrictions or where there is restricted space on the vehicle to install the antenna. The most common solution in these cases is to use a low profile TETRA antenna, which is often GPI. Alternatives include an extremely flexible nickel titanium antenna with a standard panel mount base.

3: FREQUENCY

- It is essential that the antenna is tuned to the right TETRA frequency to ensure the user receives the best quality voice and data connection, something that is critical for all TETRA users.

4: TETRA + GPS

- Many TETRA users also integrate Automatic Vehicle Location (AVL) functionality and require GPS. A combination TETRA and GPS antenna reduces the number of antennas to be fitted on the vehicle as well as the time required for installation.

5: ON SHOW OR HIDDEN?

A covert vehicle will require one or more TETRA and possibly GPS antennas to be hidden, either for a surveillance vehicle or for a senior officer who has private use of the vehicle and who does not want the antennas to be visible. A variety of solutions is available, including an internal glass mount and single or dual bumper mount antennas. However is very often the case that a covert antenna installed in the vehicle will not perform as well as a standard panel mount antenna.

6: CABLE

- Finally, the importance of using a high quality cable to connect the antenna to the radio shouldn't be overlooked. Cable may all look the same, but high quality coaxial cable gives lower loss, which means a better performing antenna and ultimately a better performance from the TETRA radio.

Get all these factors right and the vehicle user will have the best TETRA installation and radio coverage possible.

About Panorama Antennas

Panorama Antennas is the world's largest manufacturer of TETRA mobile antennas. Its products are used by many of the world's emergency services to provide high quality TETRA coverage. Panorama's products are available through Cassidian and Peiker France.

PANORAMA ANTENNAS

www.panorama.co.uk

MONEY WELL SPENT

PMR networks are a good use of tax-payer's money argues Key Touch®

We are often guilty of taking our personal and public safety for granted. If we do think about it, it may be to wonder exactly where our taxes end up. Emergency and police vehicles are a very visible sign of the protection we enjoy, but behind the scenes, much of our hard-earned money is spent on systems to support these frontline assets, such as nationwide communication networks like VIRVE in Finland and ASTRID in Belgium.

Used by various agencies, ranging from medical to police and defence organizations, public security networks considerably increase the likelihood that you will receive appropriate 'services' in an emergency. As well as this direct effect, ensuring public safety also makes it attractive for companies to invest and do business in the area.

Cost-efficiency with quality

Ensuring that citizens can live and work in a safe environment is one of the primary responsibilities of governments. Fulfilling this task requires a major financial commitment over several years, encouraging public decision makers to find communication solutions that won't become obsolete and will be easy and inexpensive to extend and develop.

For this reason, many public safety networks use standard digital radio technologies, designed to meet the current and future challenges posed by high-standard public safety communications. New solutions are constantly developed, making interoperability and long-term evolution more attractive for public organizations.

Vendors and suppliers need to understand the long-term goals of such publicly funded projects, as governments try to ensure no money is spent on unnecessary elements. Interoperability and collaboration is as important between supplier and buyer as it is between end-user agencies.

Calculating the benefits

Large nationwide public safety communication networks can cost billions of euros, while continuing operational costs constantly increase the amount of taxpayers' money spent on maintaining nationwide security. Just as in healthcare and education, it is hard to calculate the overall benefits of such costly activities. Would you be willing to calculate the value of your own or your family's lives? The answer is: 'of course not'. Such services are the backbone of modern societies and they need to be maintained no matter the cost.

With the increasing sophistication of PMR technology, increased interoperability and the constantly accelerating number of service providers and solutions available, citizens can rest assured that their tax money really is being put to good use.

Fieldwork is safer with video

Video is one of today's buzzwords, and the number one reason that professionals want high-speed data. But what would video mean in real-life operations? Key Touch looks at two scenarios in which real-time access to visual information from the field could improve safety.

Example 1 – To catch a thief

A burglar alarm sounds and a police unit is dispatched to an industrial estate. The burglar may be armed and dangerous.

The field officers pull up near the main entrance on the east of the building. To get the widest possible coverage from their vehicle-mounted video camera, they park at the south-east corner of the building, pointing towards north-west.

The officers then move in to investigate. They approach the main entrance and the control centre watches everything using the live video feed. It pays off. As soon as they open the main door, the control centre spots a figure emerging through a window on the south side of the building.

Without the video?

A second field unit could also have kept watch, but it's expensive to send in two teams. Alternatively, a motion sensor could detect the burglar, but it couldn't give a description or warn if someone is armed.

Example 2 – Hidden in the dark

On a dark night, a police unit is called to an isolated house to deal with a case of domestic violence. Officers are warned that the husband is a member of the local hunting association and has permits for several hunting rifles.

At the house, the yard is lit up but it's impossible for officers to see out into the surrounding darkness, although they themselves are in full view. The police sweep the nearby trees with their video camera in infrared mode, looking out for anyone who might be hiding in the undergrowth. It would not be the first time that a person could be waiting in the bushes, pointing a rifle at them.

This time, they see the wife and children hiding in one of the bushes. When they go into the house, they find the husband at the kitchen table, reading a paper and claiming that nothing happened.

Without the video?

Extra personnel would not have made it any easier to see in the dark. A motion sensor might have noticed something, but couldn't tell if someone was preparing to shoot.

Both of these examples clearly show how the use of real-time video in the field can improve the safety of officers.

Keeping communications flowing in the field of oil & gas

We all depend on the oil & gas industry, and in turn it is increasingly depending on advanced digital communications

Although constantly rising fuel prices are a concern for many of us, there is no denying the vital role that the oil and gas sector plays in supporting the world economy. A growing number of professionals working in these industries rely on digital radio communications to help them keep hazardous working environments as safe as possible and, although safety will always come first, seamless wireless communication also helps achieve maximum productivity and efficiency.

Challenges in the supply chain

The oil and gas industry can be divided into three distinct areas, each occupying a different position in the overall supply chain and each having different needs for secure and seamless communications.

- The upstream market consists of production and exploration activities
- The midstream market takes care of processing and transportation needs
- The downstream market consists of refining, distribution and activities to meet end-user needs.

These varying and complex environments need a system that provides both flexibility and coverage and the major advantage of an advanced radio communication solution is that it can be modified, expanded and upgraded as user requirements change.

Despite their differing requirements, one thing that all organizations in this segment need is failsafe emergency communications. In addition to keeping personnel safe, organizations operating in this field must minimize the risk of environmental accidents caused by their daily activities. Business-wise, the aim is to achieve uninterrupted operations and efficient communications can have a tremendous effect, cutting the operational costs of keeping the "black gold" flowing.

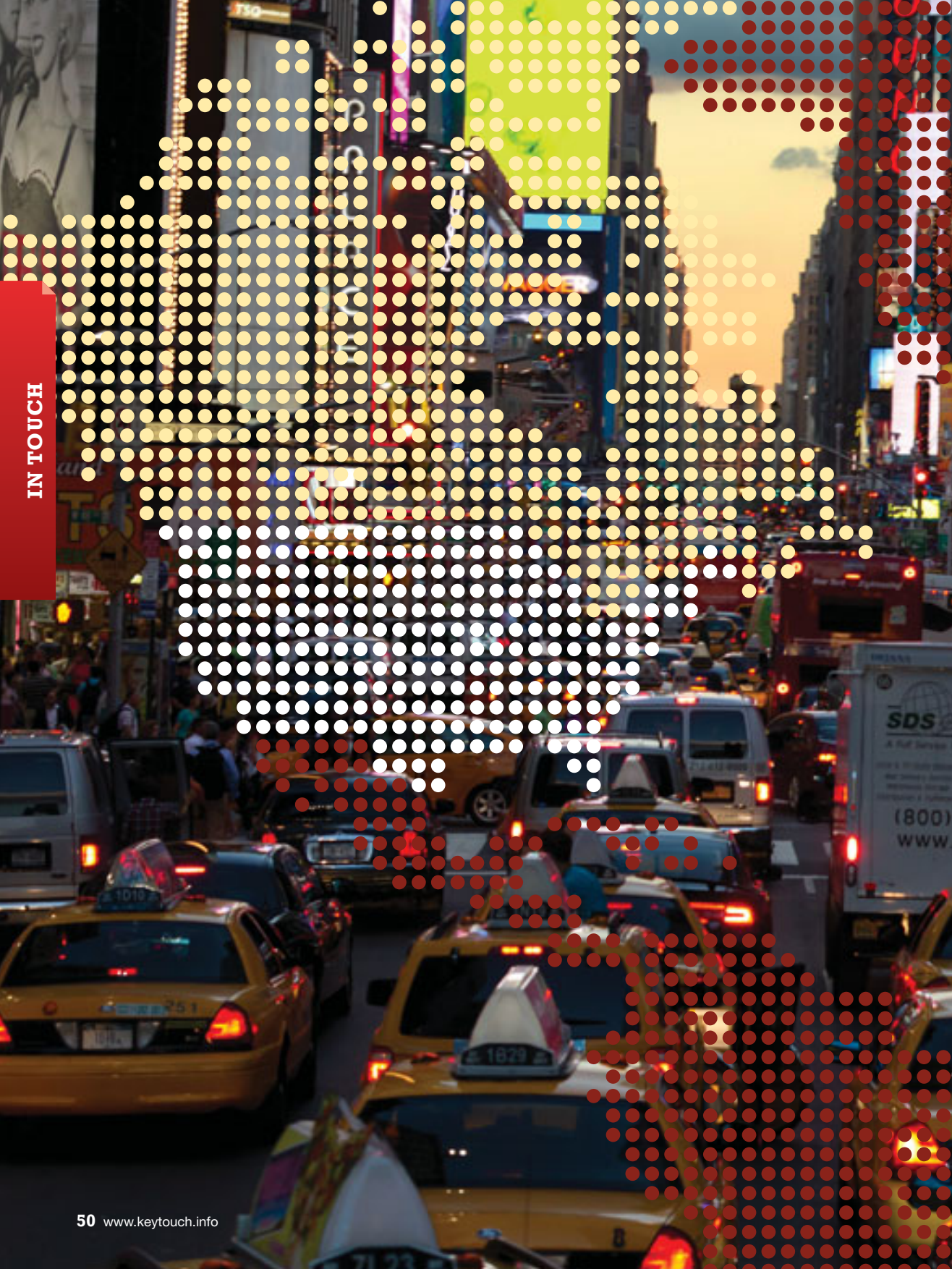
In addition to this, many operational facilities are located in geographically remote areas, where physical maintenance and support work is time-consuming and dangerous. Today's radio communication networks make it possible to implement a variety of data communications solutions and tools that help manage facilities in these hard to reach places.

Some of the more challenging situations that can be managed remotely via data applications running on the radio network include:

- maintenance and update operations
- remote monitoring of scattered assets
- real-time and comprehensive emergency alerts
- location tools that help to identify the source and location of a problem

Because modern data solutions can provide answer these challenges, concrete improvements in operational efficiency can be achieved. Shorter downtimes, increased flexibility and simplified systems management are often the 'killer benefits' for many oil and gas organizations to adopt modern radio communications. Using modern solutions, organizations can be assured of a smooth transition from their current data requirements to future possibilities such as wideband and eventually broadband data environments.

Unpredictable weather conditions, theft, vandalism and even terrorism create tremendous operational and eventually financial concerns for the oil and gas industry. In addition to secure radio, Cassidian's wide array of solutions can help establish a high degree of controllability and security in all three areas of this industry.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TETRA making inroads in North America

In the previous issue of Key Touch, we saw how TETRA is increasingly popular in Australia thanks to promising developments in frequency regulation. This time we turn our spotlight on North America to see what is going on in the USA and Canada.

TETRA passes regulatory trials

The Canadian regulator Industry Canada has ruled that TETRA technology can be used as is. In the United States, the Federal Communications Commission (FCC) has also completed a thorough study of potential interference between TETRA and other technologies. As a result, it will start granting waivers for non-public safety frequency bands for TETRA. One of the goals of the ongoing FCC ruling process is to enable the use of TETRA on all frequencies, but the outcome of the ruling is not known yet.

Utility and transport users assess TETRA

Canadian electric utility BC Hydro conducted one of the first North American TETRA pilots, looking at issues such as audio quality, network coverage and services such as SCADA and AVL.

New Jersey Transit launched an 800MHz TETRA pilot to compare its capabilities with an existing analogue system as well as investigating integration with the existing dispatching system.

A 450MHz TETRA pilot in Wisconsin proved that TETRA coverage is comparable with analogue, as well as demonstrating the superiority of the TETRA voice codec and other features not provided by analogue.

TETRA can provide twice the spectral efficiency of 12.5 kHz FDMA channels, according to a pilot for MTA New York City Transit. The pilot also demonstrated TETRA's multi-vendor interoperability, versatile features and low power consumption.

First North American contract

Late 2011 saw BC Hydro of Canada award the first North American TETRA contract following a technology-neutral tendering process. A 25 base station TETRA network on the 410 MHz band with over 800 terminals will be implemented in the Vancouver Lower Mainland region in British Columbia, with roll-out expected to be completed in October 2012.

Events feed growing interest

The FCC waiver on non-public safety use of TETRA has led to heightened interest in the technology. As a result, the TETRA and Critical Communications Association (T+CCA) held its first independent TETRA event in September 2011 in Forth Worth, Texas. There was also a TETRA stream at IWCE 2012, with plenty of interested parties searching for more information. In June, a TETRA tour will hit the road, calling at Toronto, New York, Washington D.C, Sacramento, and Houston.

TB3p packs a big punch

When it comes to keeping space requirements to a minimum, the TB3p mini TETRA base station certainly ticks the box. It's the world's smallest, yet still packs in the same powerful features as its big brother, the TB3, including fast TEDS data, air interface encryption, Type 1 handover and base station fallback.

The TB3p base station's small size and easy setup makes mobile and "siteless" TETRA networks possible. If a conventional TETRA network exists nearby, the TB3p can link to the wider network, providing a secure communications channel covering a large geographical area.

It also scores points over regular RF repeaters, offering several advantages:

- The TB3p base station does not require line of sight to the serving base station, making it a perfect choice for indoor use, where getting good coverage has traditionally been a problem.
- The TB3p mini base station has no RF-isolation requirements, meaning easier installation and no interference within the coverage area. This is vital for reliable and seamless communication.
- The TB3p comes pre-configured, so no RF-expertise is required for site setup. This is useful when a temporary network needs to be up and running quickly.
- The TB3p requires much less power. No air conditioning is therefore needed, and Battery Back-Up systems are small.

One of the most prominent benefits of the TB3p base station is its TEDS capabilities. This means that professionals working in areas beyond network coverage will be able to transmit data, and even video, through the TB3p base station. Thus, instead of describing a situation, professionals on site can send a picture to engineers at a local control room, giving them a better assessment of the situation . In short, the TB3p helps supplement voice with data even in hard-to-reach locations.

Annual VIRVE gathering extends scope

This year's VIRVE day once again attracted the Finnish TETRA community to discuss the latest trends, challenges and threats in the Finnish public safety environment. Extending beyond radio communications on VIRVE itself, this year's event took as its theme preparedness for both planned and unplanned events, as well as the growing importance of data communications and strategic oversight. Data security issues were another major talking point.

The event was also an opportunity to recognise successful applications of TETRA worldwide, with the Timanttiteko award going to the Embassy of Finland, Tokyo, for its rapid action to support Finnish citizens during the crisis following the earthquake in Japan. The award citation mentioned in particular the embassy's innovative use of social media for crisis communication to reach the hundreds of Finns who were in the areas affected by the emergency.

Key Touch was at the event. Take a look of the pictures from VIRVE Day 2012 at www.keytouch.info.

Two dates for your autumn agenda

ASTRID User Days

18-19 October 2012
Lotto Mons Expo, Mons, Belgium

ASTRID User Days offers a programme of workshops and lectures, as well the latest TETRA applications for secure communications. Providing information, inspiration and discussion opportunities, you can attend for either one or both days.

To register, go to page **www.astriddays.be**

PMRExpo 2012

27-29 November 2012
Koelnmesse, Cologne, Germany

PMRExpo is the leading international specialized trade event for the PMR business, with top vendors presenting their latest products and solutions while end users share their experiences and developments. Last year there were 190 exhibitors from 17 countries and more than 3,000 professional visitors from 34 countries. Another reason to visit is the famous Cologne Christmas Market, which will be open in the city during the Expo.

Find more information at: **www.PMRExpo.com**

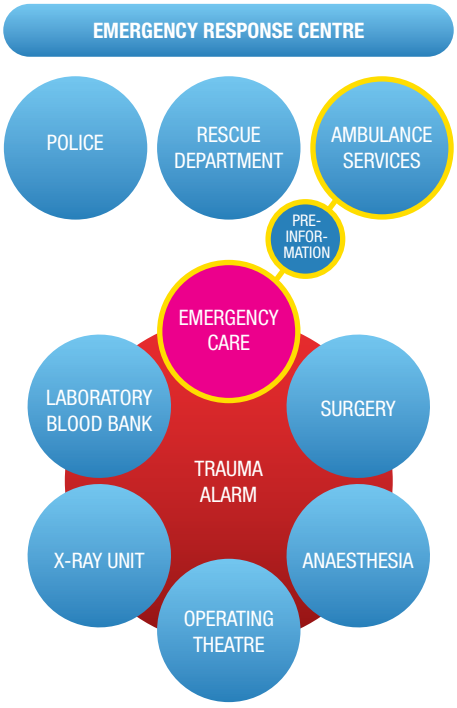
Life-saving communications for medical teams

TETRA communications play a vital role in managing emergency care at the North Karelia Central Hospital. Here's how...

Each year, Finland's North Karelia hospital receives around 54 trauma alarms, with up to five patients needing treatment each time. Using radio communications over the country's VIRVE network has cut the time taken to deal with each case by 20 minutes on average, as well as saving medics around 500 hours a year. Crucially, more lives are saved too.

Here's how it works…

When an incident occurs, the local emergency response centre always sends a preliminary message to the emergency medicine unit at the same time as the rescue department, police and ambulance service



get their alarms. When paramedics have evaluated the patients' traumas and vitals, they inform the emergency medicine unit using VIRVE radios. This is done using a talk group between the ambulances and the emergency response centre. This then triggers a trauma alarm, which means that everyone in the on-call group at the hospital hears what is happening from this point onwards. They know what has happened, how many patients are coming in and what their vital signs are, for instance.

This means that everyone is ready to get to work as soon as the patients arrive at the hospital. The X-ray room is waiting and the laboratory is ready to process any samples. The lab results are available over the radio as soon as they are ready. The blood bank nurses know to reserve four units of O-group blood automatically for each patient.

Faster treatment saves lives

Previously, if the patient was bleeding out, the operating (emergency) theatre would have been freed up and reserved automatically after the trauma alarm. The patient would be wheeled from X-ray to the emergency room and then to the theatre. This took up to 15 minutes.

They also had to make a number of separate calls, for example to send for blood, order lab tests and reserve a theatre. The separate calls could take up to 15 minutes as well.

Now, separate calls are no longer needed, because everyone knows what is happening as it happens and can work automatically without abstract orders. For example if a patient has a ruptured liver and is bleeding profusely, the trauma talk group needs only to inform that the patient is bleeding, four units of blood are needed now and that the patient is on the way to the emergency theatre.

Previously, delays could have a big impact on the condition of patients, with some patients even dying while waiting to be treated. Things are different today, thanks to Finland's VIRVE network.

When the trauma alert comes in everyone in the call-out group can prepare. With everything ready and waiting, they can begin treatment as soon as the patients arrive. With everyone in the loop, double booking can be avoided.

As well as saving lives and time, advanced communications helps hundreds of patients each year to get faster treatment, which may mean that intensive care of cardiac and neurological patients is not needed and will almost always mean fewer hospital days. The new system even conserves blood supplies, since patients are not left to bleed for as long as previously.

PICTURE THIS

Channelling
the security data flood

The rising tide of data from diverse devices holds real potential for the emergency services to improve their response – but only if the flood of data can be handled efficiently

Jamie Wilson is Security Marketing Manager (EMEA) at NICE Systems

Although voice has been the usual way for citizens to alert emergency services to an incident, modern mobile phones, applications and networks are capable of so much more - text, still images, streaming video, telematics, medical information, and data from an array of sensors and alarms.

This flood of possible information is transforming the way emergency services gather data about developing events and is allowing them a much more detailed picture of what is happening. Yet to be useful, the information needs to be organized, accessible and analyzed properly. Situation management technology is designed to achieve this.

Turning data into information

Commonly referred to as PSIM (Physical Security Information Management), the technology helps organizations integrate, synthesize and analyze information and alerts from disparate security and safety systems. The result? A single, clear operational picture of what is really happening. What's more, it guides the operator to co-ordinate an appropriate response to a situation, based on all the different indicators of what's happening, in accordance with pre-defined response plans and processes.

Essentially, Physical Security Information Management (PSIM) products help to solve two problems. They glean the most relevant and interesting data from the deluge of security information sources, while also providing a view of security system usage, performance, regulatory compliance, and general security anomalies that previously have been very difficult to acquire.

Using PSIM makes it possible to improve response plans and their execution, make more informed decisions based on all of the available information about the incident, provide a faster, more co-ordinated initial response and achieve better analysis and training once the emergency has passed.

Evolving 911

Currently, the US is pioneering an initiative known as next generation 911 (often abbreviated to NG9-1-1), a project that the rest of the world is watching closely. NICE Systems is involved with the project through its work with the US organization NENA (National Emergency Number Association) and by all reports, some emergency communications centers will be ready to receive live NG9-1-1 calls in the near future.

Exactly when the complete transition to NG9-1-1 will take place is not entirely clear, but one thing is certain: when the mass migration does take place it will bring with it a flood of information and PSIM from NICE will be ready to help emergency organizations to channel it to make it truly useful.

Physical Security Information Management (PSIM)

Physical Security Information Management (PSIM) products glean the most relevant data from a torrent of security information sources, including cameras, video analytics, access control event logs, intrusion sensors, HVAC and environmental sensors, fire and other alarms, and crime statistics.

PSIM technologies and processes enable their users to:

- Identify threats, trends and security incidents more quickly/easily
- Plan security purchases better
- Install systems for better integration and information sharing
- Distribute and analyze surveillance video better
- Deliver information to the right people at the right time
- Monitor and manage security systems better
- Deploy personnel and resources more efficiently
- Measure success with more accurate, timely and relevant reports

Making radios easy to use helps to keep field staff safe, secure and effective. We look at some essential elements of usability and how Cassidian radios THR8 and THR9i measure up.

Assessing usability
Ten key factors for PMR radios

Usability is about how easily one can use a device or tool and how easy it is to learn to use it. Important to both first time and experienced users, it becomes critical when you need to use a device under high stress.

How do we evaluate and measure usability? Specifically, when selecting a TETRA radio, what will guarantee that users can use their devices in all circumstances without a risk of mixing buttons or being disconnected from an important call?

Using Jacob Nielsen's set of ten usability heuristics as the framework, we look at some usability terms and requirements and assess how the THR8 and THR9i TETRA hand portables from Cassidian meet these needs.

1 Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

A radio user operates in several different communication states during a work shift and needs to be constantly aware of the radio's mode, the currently active talk group and factors such as field strength and battery charging status. The Cassidian radios present the network and direct mode with different coloured backgrounds, while indicators turn to red before the battery runs empty or the radio loses network connection. The user only needs a quick look at the display to see if everything is as it should be. The user can see the current talk group even when browsing in the menu and voice feedback ensures that the user knows the group even without looking at the screen.

2 Match between system and the real world

The system should speak the user's language, with words, phrases and concepts familiar to the user, rather than system-oriented terms.

It's important that the device user interface uses language appropriate to the situation - for example showing 'network mode' instead of 'trunked mode', or 'emergency call' instead of 'priority call'.

3 User control and freedom

Users often choose system functions by mistake and will need a ▶

clearly marked "emergency exit" to quickly leave the unwanted state. Support undo and redo.

Being in control is necessary for user safety and satisfaction. A good user interface allows the user to cancel actions. The THR8 and THR9i have clearly marked exit keys in the user interface and the user can always return to idle mode simply by pressing the end call key. One of the most critical user controlled features in TETRA terminals is talk group selection. On the THR8 and THR9i, groups are selected by simply turning the knob, with selection confirmed by voice feedback.

4 Concistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Consistency in user interfaces means simply that similar things are done in similar ways. When consistency and standards are neglected, the user experience suffers. On the Cassidian radios, messaging follows the same conventions as in any mobile device today - you first enter or select the content for the message and then select the recipient in the same manner.

5 Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

People are prone to errors, especially when in a hurry or under stress. A user interface should not allow a user to input incorrect data. On the Cassidian radios, for example, the user is asked to confirm if they want to delete a contact from the radio's phone book.

6 Recognition rather than recall

Minimize the need for the user to have to remember information by making objects, actions, and options visible.

In a good user interface, the user doesn't have to recall what a particular button does, they simply recognize it. Functions are represented with descriptive texts and easily recognisable graphical icons. Some icons have become so universal that the text isn't even necessary, for example a small envelope symbol signifies a message or an email. The main menu of the THR8 / THR9i is a good example of easy recognition: every main menu item is named and has an associated graphical icon.

7 Flexible and efficient to use

Accelerators - unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users.

Keypad shortcuts are probably the best known example of efficiency. In mobile devices speed dial - pressing a numeric key to phone a pre-determined number - is perhaps the most commonly known shortcut. The radios from Cassidian has numerous shortcuts that make life easier for experienced users. As well as programmable number keys for direct access to functions, pressing Menu and number consecutively gives direct access to a specific part of the device menu.

8 Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed.

User interfaces must be both well designed and look good. Poor design can lead to complicated user interactions, which are time consuming because the user needs extra key presses to find the right function among numerous options. In user interface design, the minimalist approach is usually the best way. On the THR8 and THR9i, the scanning list is a good example of this - scanned groups are marked with two dots, making it clear which groups are included in scanning.

9 Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

Errors cannot be fully avoided or prevented by design. For this reason error notes are needed. The Cassidian radios have clear error notes. For example, if the user attempts to make a call that is not supported by the network, the device shows this clearly.

Usability needs to be built into a product and rather than just a feeling or opinion. As TETRA radios are used in critical conditions and under high stress, some of these criteria are more relevant for PMR devices than others. In the PMR context, consistency and error prevention have a key importance. THR8 and THR9i outperform many other TETRA devices in usability and implements the important PMR usability aspects very well.

10 Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

Public safety and security devices have a lot of functions and features packed into a relatively small device. Basic functions can be learned with minimal training or with no training at all, as with the THR8 and THR9i. However, the user may need to adjust some less frequently used settings or to find shortcuts to use the device more effectively. A good manual helps the user a lot in these situations.

Light-weight, ready for **heavy** duty

Get ready for the **TH1n** – the first truly slim and light TETRA radio. Despite of its light appearance it has all the features and capabilities you need in your work. Whatever your preferred way of carrying the radio, its lightness makes it more comfortable.

Welcome to new era in radio design.

www.cassidian.com/TH1n