TETRA Touch

Sharing TETRA networks
– Reliable first aid for disasters

More efficient disaster management with shared TETRA network

- Public safety organisations sharing the network: ASTRID in Belgium and VIRVE in Finland
- Essential TETRA features supporting shared systems
- Tough TETRA terminals for authorities

China special

- PMR market in China
- Chinese user interfaces

Sharing

Dear Reader,

The need for improved communication between individuals is one of the mantras of today. In the world we live in, the idea is being taken even further. Not only the communications within an end-user organisation but also an improved communication between different organisations is seen essential. Traditionally Professional Mobile Radio networks have been dedicated to a specific user organisation only and the possibility to communicate across organisational boundaries has been limited. TETRA has already proved that it can effectively remove these obstacles. The first Nokia TETRA solutions used by multiple authority organisations are already in operational use.

Sharing is one of those things that brings benefits to all - it promotes co-operation, helps the exchange of information and expertise and it can cut costs significantly.

In some countries, the idea of sharing radio resources among authority organisations is often extended to include other groups vital to the efficient running of society - transportation hubs, power and water distribution and telephony and other communication networks, to name a few. This is the concept of 'strategic national communications', knitting a country's vital organisations together with a single, highly sophisticated medium.

Sharing radio network resources also brings advantages beyond enhanced communication between groups. The biggest of these is the cost savings it can produce. Savings in capital expenditure can be significant, but even bigger are the savings in operational costs, which can amount to 70-80% of the total lifetime cost of a radio network.

In areas where the radio spectrum is highly congested, a wider allocation of frequency band for shared use is clearly a better option than splitting the frequency pairs into small slices and allocating them for dedicated use only.

And what's more, this can all be achieved without compromising network security or affecting administration of the network's services.

Whether you need communications dedicated for your own organisation, or one for multiple user organisations - Nokia is your reliable partner in building the network as you need it.

Hans Holmberg
Vice President
Professional Mobile Radio

First fully integrated system

The ASTRID project has already been rolled out in Flanders, with 40 Nokia TETRA base stations covering the province. The complete national network will have a capacity of 40,000 users across all the emergency services. This could easily be expanded in the future. The ASTRID network is a world first for both Nokia and Belgium. Not only is it the first all-IP nationwide TETRA network for public safety and security, but it is also the world's only system in which radio, telephone and computer aided dispatching are fully integrated in a single environment. When an emergency call for help comes in, the control room operator's screen shows the address and map details, as well as the locations of the nearest available units even before the call is answered.

Uncompromised security

Security is a crucial factor in police communications and the Nokia TETRA System uses an air interface encryption method. In this system, the ciphering key can be changed, depending on the security level, in every authentication sequence or at regular periods. This fast change of encryption keys gives a very high level of security and a stolen radio can very quickly be denied access to the network without damaging information leaks.

TETRA supports the operational models

As one of the world's most advanced public safety and security communications systems, the ASTRID TETRA network is already fulfilling all expectations, and as roll out is completed, will help police and emergency forces across

radio networks
– the theory and the practice

With today's technology, organizations of all types and sizes can gain access to advanced Professional Mobile Radio services without needing to invest in building the network itself. The solution lies in sharing a network with other organisations. Communications are secure and efficient and can grow easily as demands change.

TETRA Touch reviews the theoretical demands on such shared networks and takes a look at the experiences of some working networks around the world.

Making it work
– Sharing TETRA networks

The high capital costs of countrywide radio services means that many of today's professional communication networks are shared by several organisations.

The overriding concern of all these users is service availability and quality – services must always meet safety and security requirements, regardless of how the network is actually shared. It is also vital that emergency services can coordinate their operations effectively in the event of an accident or disaster.

A typical shared national network based on TETRA technology is ASTRID, a network operator owned by the Belgian government and used by police and emergency services throughout the country. Nokia is supplying ASTRID with the complete TETRA solution. Another TETRA service shared by a wide range of official users, including emergency rescue services, the police, border guards, health and social services, the customs authority and defence forces is VIRVE, the Finnish authority network.

Belgium work together more effectively as they operate in a new structure.

The most innovative TETRA service

ASTRID won the "Most Innovative TETRA Service of the year 2000" award at the third TETRA World Congress in Roma last November. Laurent Poot, Head of R&D at ASTRID says: "I believe we received the award because ASTRID is implementing a very advanced solution for public safety and security services. Not only is this a complete TETRA network, but it also integrates with other advanced systems such as computer aided dispatching."

Raoul Carlier, CEO and General Manager of ASTRID: "There is only one European standard and that is TETRA. Our technical experts are convinced that an open standard is the only way to achieve better communications throughout Europe, now and into the future."

The world's first operational nationwide authority TETRA network

Another major development in the world of shared TETRA networks is the opening of the VIRVE network in Finland, the world's first nationwide authority TETRA network to become operational. Owned by the Finnish government and operated on its behalf by commercial mobile network operator Sonera, VIRVE provides secure digital communications to a wide range of official users, including emergency rescue services, the police, border guards, health and social services, the customs authority and defence forces.

Two major sections are ready to accept users, with 10 functional exchanges and over 1000 base stations covering eastern, southern, western and middle Finland. The remining parts of national system will be handed over to users in 2003.

Dynamic grouping supports the rescue operations

Users of both networks have been pleased with the advanced features available. The Virtual Private Networks option gives secure communications within the shared network, while other functions allow organisations to communicate effectively with each other when necessary. This is particularly important in disaster management, where all emergency services need to communicate effectively. Dynamic grouping allows people from different services to be placed in a single group to handle an incident, allowing them all to coordinate their efforts quickly and effectively.

Sharing radio networks – the

Gaining access to radio services – the demands

Many organisations are looking for a new Professional Mobile Radio (PMR) system. In addition to owning a private network, today's technologies offer two other ways to gain access to services: leasing or buying the service from a commercial PAMR operator and jointly owned, shared networks.

There are some obvious core technological requirements that PMR networks should meet. Firstly, the network needs to be a future-proofed digital standard supported by several manufacturers, ensuring compatibility between the equipment. Among others, voice and data communication need to be both integrated and secure, the system must be easily scalable, dispatching needs to be efficient and flexible and there must be good mobility management.

On the other hand, capital and operational costs need to be low and the organisation needs its own private solution. Separation of the operational management from the organisational man-

agement is also desirable, allowing operation of the network to be outsourced. This also allows organisations to manage their own people's communication by themselves.

Some users may require priority access to the system and co-operation with other organisations may also be vital.

Considering all the requirements, a shared TETRA network using Virtual Private Networking would be the best solution for most organisations seeking to deploy PMR services.

Market trends towards shared systems

A shared TETRA network can be a combination of several government organisations sharing the same system. Good examples of such networks are the ASTRID network in Belgium and the VIRVE network in Finland. The VIRVE network provides a common infrastructure for a diversity of public bodies, from rescue forces to the social services.

Another scenario is a Private/Shared network. Here, a large PMR user organisation procures its own network, but also provides mobile radio communication services to other organisations on a subscription basis. It is also possible for the organisations to procure the network together and agree on the sharing of responsibilities, payment of the costs and usage of the network services.

In shared systems, the technical operation of the network can be performed by the organisation(s) or it can be completely outsourced to a commercial operator. The outsourcing of operational tasks is used in the VIRVE network, where the network operator is Sonera, the former Telecom Finland.

theory and the practice
Essential TETRA features supporting shared systems

Virtual Private Network

As a future-proofed trunked digital radio standard, TETRA is the best solution for shared networks. The Virtual Private Network (VPN) concept allows hundreds of organisations to share the network and yet still feel they have their own independent, private network. As well as allowing individual organisations to communicate with and manage their own talkgroups, they can also easily contact other users of the system when they need to.
(see figure 1.)

VPNs are also available for TETRA IP data networks, enabling shared usage of services and data applications such as quick access to WAP services via the network's fast IP connections.

Fleet Specific Short Numbering

Fleet Specific Short Numbering (FSSN) is another essential feature of TETRA that supports the concept of a shared system. FSSN enables radio subscribers and workstation users such as dispatchers to dial individual calls and send status and SDS messages using short numbers, based on an organisation's needs and its users' roles and functions.

Subscriber Class and Priority Access

TETRA also has several features that provide further options for private/shared networks.

Subscriber Class is used to define the user's rights to access TETRA radio channels within a certain base station. This feature gives a way of controlling the usage of the TETRA network within an organisation, but also in shared systems, where members of different organisations may have a different Subscriber Class based on their own needs.

Another key TETRA service supporting shared systems is known as Priority Access. Using Priority Access, a TETRA network operator can guarantee that a particular organisation always has radio channels reserved for it, even though there are many other user organisations also sharing the network.

There are also other features, such as priorities in queuing for use of system resources, priorities for group communication, and channel congestion mechanisms to control the usage of the shared TETRA system.
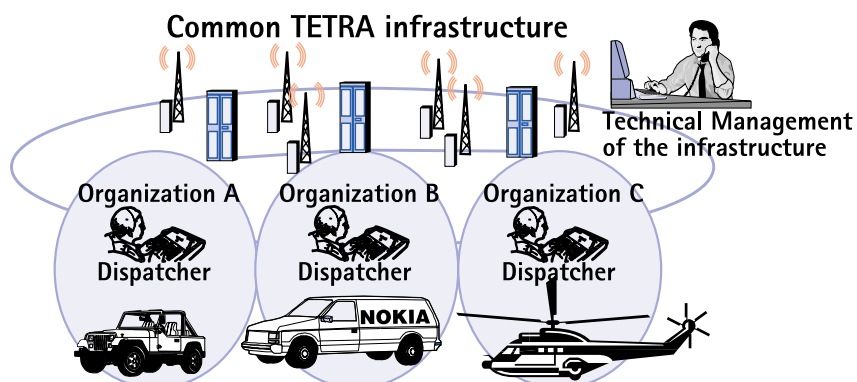
Operation of a Shared Network

The shared TETRA network can be operated either by the user organisation(s) or a commercial operator.

TETRA supports both operational models, as technical management of the network can be outsourced to the commercial operator while the organisations using the network can manage their own Virtual Private Networks. Technical management here means, for instance, alarm, fault and performance management of the network. Also, certain issues such as authentication key management, subscriber provisioning and customer care and billing can be part of the commercial operator's responsibility. The operator can also provide some common value added services and applications that are used by the organisations using the network.

PMR market trends indicate a move away from the traditional private procurement of networks to shared networks. This is an obvious development, as the investment and operating cost can then be spread across the organisations using the shared network. These operational and cost benefits have only become available and practical with the arrival of TETRA.

Figure 1. A shared system provides a common, TETRA based infrastructure for a number of organisations. Individual organisations communicate via their own talk groups within their Virtual Private Networks. Dispatchers and administrative operators of the organisation can manage the subscribers of the organisation in the Virtual Private Network. The organisations can also easily communicate with each other when they need to.

Common TETRA infrastructure

Technical Management of the infrastructure

Organization A — Dispatcher
Organization B — Dispatcher
Organization C — Dispatcher

NOKIA

TETRA
– Reliable first aid for disasters

Disasters require many emergency services to work together, which can be an extremely complex organisational challenge. However, the task can be much easier with TETRA, a standard that provides an excellent basis for communication in difficult, unexpected and even disastrous conditions. One of TETRA's strengths is the ability to create a shared network that manages the operations of several organisations. New communications groups can be created as operations develop, helping to make emergency crews more efficient.

Redundancy for network disasters

In most emergencies, the need for communication grows very rapidly. The system needs surplus capacity to handle this demand, but it also needs to perform even in overload situations, using limiters, queues and priorities to guarantee that the most important information gets through.

Prioritising calls secure the most critical communication

The resources e.g. chanel in the air interface and the speech lines between exchanges can be guaranteed for the groups with the highest priority. In the future, a specified number of predefined channels could be made available for particular user groups.

At the same time, there is always the threat of interruptions in the electricity supply or transmission links. Meeting this threat means setting up secondary power supplies and alternative transmission routes - this can be done by having batteries at the base station site and connecting base stations into a ring. To avoid service interruptions, a minimum measure should be to duplicate the core elements of the switches.

Alternative transmission paths ensure the service

Providing alternative transmission paths gives a possibility to the network protec-tion against the loss of an entire switch - this allows critical information, such as subscriber data in the switches, to be distributed to different sites so it is never entirely lost. Furthermore, the base stations served by the destroyed switch can be served by another.

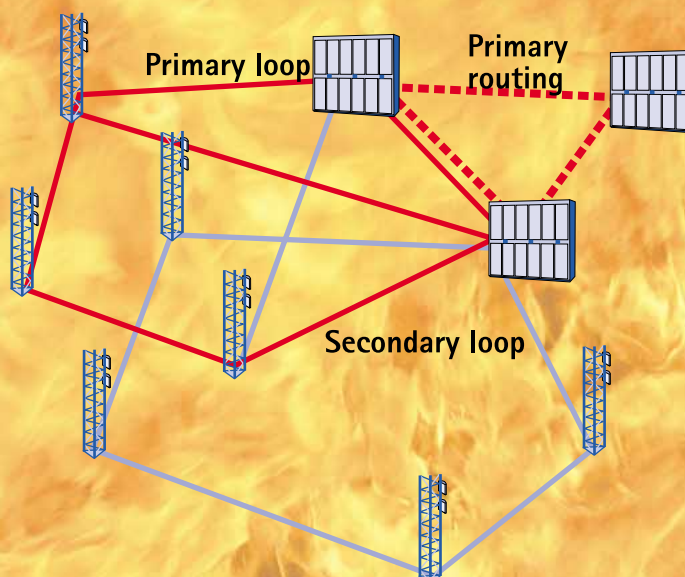## The insurance in larger scale disasters – base station fall back

In extreme cases, where even the spare, redundant transmission path is broken, the system needs extra switches to fall back on or, in the worst cases, extra base stations. This will allow the network to serve a limited area. However, the design principle should be to build a secure trunked network where the failure of a base station is covered by others providing all serv-ices - the base station fall back mode acts as insurance in larger scale disasters, leaving Direct Mode Operation as the ultimate backup.

Additional resilience can be obtained by careful coverage and capacity planning - covering key areas with base stations from more than one switch, planning enough overlap to cover for a damaged base station and adding extra carrier capacity in areas with dense traffic.

Ensuring security

Authentication keys produced by the terminal manufacturer are the foundation for the network's entire security - they are used to prevent unauthorised access and cloning of terminals. When 'spoofing' has been eliminated, the next step is to protect the information from professional eavesdropping by using air interface encryption. This involves individual and often changing keys. Air interface encryption provides privacy for the information but also cloaks the identities of the users, as well as hiding the communication event from external intruders. In cases of extreme sensitivity end-to-end encryption may be required.
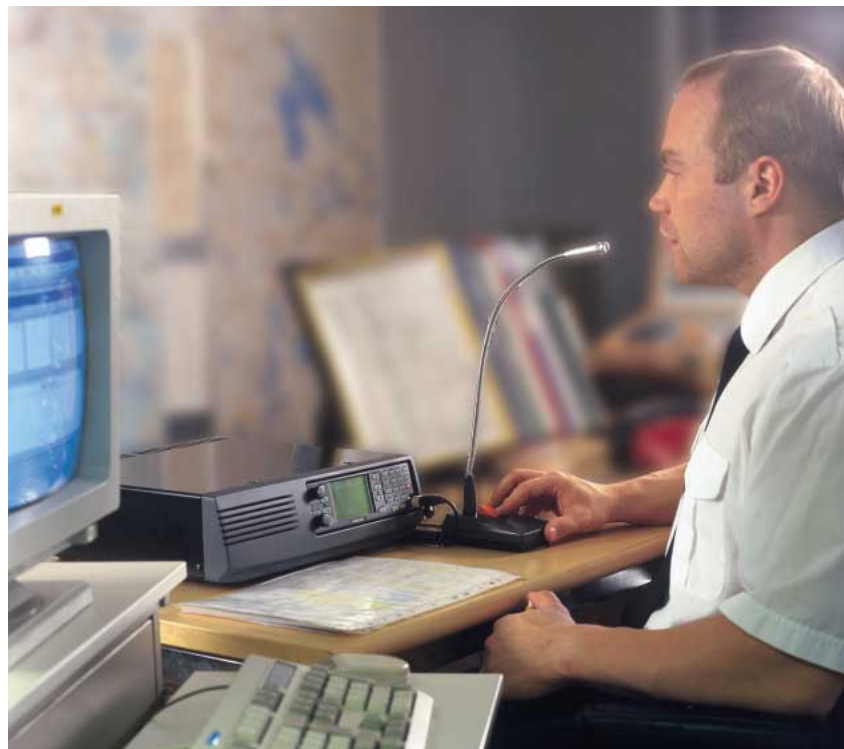

Primary loop   Primary routing

Secondary loop

Rushing to the rescue
– Rapid Deployment TETRA

When a huge event, incident or disaster happens, police and other public safety organisations usually have to apply a variety of resources to control the situation, often when working in a small area. Existing mobile radio communication systems can be inadequate, providing little coverage in forested and mountainous areas, or providing insufficient capacity even in urban environments to handle the radio communication needs of the rescuers and other professionals on the scene.

Such situations demand Nokia Rapid Deployment TETRA system, which provides secure and efficient voice and data communication facilities at extremely short notice. Rapid Deployment TETRA is quickly deployed from one or more portable containers with different configurations to meet the needs of the users concerned. Using a helicopter or truck, the containers can be moved rapidly to the incident's location, sometimes within a couple of hours. Such TETRA container can be used as the management and control center of the rescue operations.

Boxed and ready to go

Each container contains a Nokia TETRA node that includes, as a minimum, a Nokia TETRA switch (DXT), a base station (TBS), Dispatching equipment (DSC and DWS), several TETRA terminals, a portable power supply and a rapid erection mast system for the TETRA antenna to provide the required coverage. Coverage depends on the terrain and the antenna mast's height. The system can be expanded and connections to the external world can be provided over a wireless LAN (WLAN), if the site has this facility.

All the equipment is configured and ready-to-use. Terminals are set to standby mode, ready for immediate use as soon as the container arrives on site. Moreover, the dispatcher can create new talkgroups over the air (DGNA) and specify user priorities as needed.

A containerised TETRA node provides a capacity of 8 carriers, equal to 31 traffic channels, which could serve as many as 1500 users. In addition, TETRA also provides Direct Mode communication between the terminals without the need for the TETRA base station.

The Nokia TETRA System and Nokia TETRA terminals are extremely easy to use, enabling users to quickly learn how to operate them and get quickly into action. When urgent action is needed, urgent communications are a pre-requisite. Nokia Rapid Deployment TETRA meets this need.

Professor Li Jinliang is a leading figure in Chinese telecommunications. A developer of military communications and telecommunications systems for over 50 years, he is now Chief Editor of the magazine Mobile Telecommunication. It was he who led the Standard wording group to stipulate Chinese Digital Trunking Standard. Here he tells TETRA Touch about the prospects and plans for Professional Mobile Radio in the People's Republic.

PMR in China

Tetra Touch: Can you summarise the PMR situation in China?
Professor Li Jinliang: Currently, there are handred of analogue trunking systems in operation all over China, based on several standards (e.g LTR, MPT1327, Smartzone, EDACS, etc) that could not communicate with each other. And most of them were used for duplex phone calls, with some exceptions, e.g Public Security's system.

In order to avoid same situation in digital trunking, the Ministry of Information Industry (MII) decided to organize a working group to stipulate a unified digital trunking standard. Due to many reasons, eventually, the Chinese Industrial Digital trunking standard was published in Dec of 2000, in which both iDEN and TETRA are included . But, the Chinese National digital trunking standard is still need to be specified and only one technology is allowed, according to the official document issued by China Technical Supervisor Bureau .

Since this year, more and more professional customers are putting strong interest in digital trunking system ,especially to TETRA, due to its multi-vendor environment.
 In order to increase frequency efficiency, this Summer MII issued an officially document to promote shared digital PMR network and announced that no frequencies will be allocated to analoge networks. And there are many potential operators now emerging, and planning to set up shared digital trunking networks and providing PMR services to professional users.

According the conservative estimation by MII, the total value of digital PMR market in China will be about 50 billion RMB. I am quite confident the digital trunking market here will be developing very fast in the coming 5 years.

TT: What is the need for digital trunking?
Prof. LJ: As well as voice communication, professional subscribers also want data. Compared with GSM, the data transmission speed of TETRA has some advantages. But GPRS and 3G are coming along, so digital trunking systems should be continually developed. The hot requirements of Chinese customer are Virtual Private Networks (VPN), encryption and DMO functions, which TETRA can provide.

TT: What is the future of TETRA in China?
Prof. LJ: In China, there are many customers already selected TETRA, e.g. Hong Kong police, CLP, Shanghai Public Police, Tianjing Water and so on, in which Hongkong police network has already put into use.

Even though TETRA facing fierce competition from iDEN in China, I am still quite confident about the future of TETRA , because it can provide real multi-vendor environment and unparalleled dispatching functionality.

I am happy to know that Nokia can provide Chinese user interface for its terminals and dispatching workstations and Chinese text messaging are also supported, which will have strong attraction to Chinese customers. And if a terminal could be produced in China, reducing the price quickly, TETRA could have a very good future here.

TT: Who will use TETRA? Public Safety organizations? Utilities?
Prof. LJ: PMR users will be railway , public police, armed police, security authorities and probably the military. PAMR users will be communication industries, airports, fire brigades, ambulances, construction companies, utilities and factories, etc.

TT: Is there a market for commercial TETRA networks ?
Prof. LJ: As I mentioned, MII is now promoting shared network in digital trunking by strickly controlling frequency allocation to small private network, which makes the opportunities for operators to provide PMR services to professional users. Currently, the market is just starting. The rich province like Hubei, Sichuan, Zhejiang and Shangdong provinces and big cities like Beijing,are now planning for big shared PMR network in their areas.

TT: What are the critical success factors for TETRA in China?
Prof. LJ: The critical factors are: Get support from the government for one National digital trunking standard and enough standard frequency resources for TETRA.

The right marketing positioning. Digital trunking systems are used mainly for dispatching and group communication, so digital trunking will not compete with public radio network.

Reasonable price. Especially for ProCell market, TETRA suppliers need to provide very attractive price of their terminals for operators to promote the market development.

TT: What kind of terminals do end users need and want?
Prof. LJ: Generally speaking, the users from different segment have different requirements for the terminals. However, the common requirements here in China is high quality terminal with lower price. GSM prices fell dramatically, so subscriber numbers are increasing very quickly. For a professional network, the end user is a group user, and system function is different also - the terminal price should be a little bit more expensive than GSM phone prices, but not so high. We hope TETRA terminal prices will fall in the future. In addition, Terminal functionality and aesthetics are also important. A manufacturer should produce several models, some with all the functions for PMR users and some with simple functions for PAMR users.

Chinese language ability increases TETRA market

A new Chinese language variant of the Nokia Dispatcher Workstation (DWS) is set to broaden the appeal of Nokia TETRA and increase its competitiveness in the important Chinese market. The new DWS variant supports a simplified Chinese character set, as used in mainland China.

Along with the radio terminals themselves, Nokia DWS is the most important tool for accessing TETRA services. Use of the DWS is made easier and efficiency improved if commands are available in the user's own language.

The new DWS provides the fixed texts of the Graphical User Interface (GUI) in Chinese, allowing Chinese speaking users to take full advantage of the most advanced DWS services. The User's Guide is also available in Chinese, providing further support to users.

This first version of the Chinese DWS does not support Chinese mnemonics for subscriber, group or organisation names and although Chinese SDSs can be transmitted between Chinese DWSs and customised client applications, the DWS does not support sending Chinese SDS messages between radio terminals.

In addition to Chinese, the Nokia DWS GUI is currently also available in English, French, Dutch and Finnish. Nokia is able and willing to consider other language variants for implementation on DWS.

Another important development in this market is the world's first TETRA phone with a Chinese language user interface, the Nokia THR850. The keypad has Chinese characters and the screen displays both menus and information texts in Chinese.

The terminals also features predictive text input in Chinese. Instead of pressing each key up to three times, users need only press it once. The text input software decodes the keystrokes and scans the internal dictionary for matching words, making the Nokia THR850 much easier to use for writing short messages.

Mr Zhang Shen Li, Director General of National Radio Monitoring Center of MII was happily surprised with the new product development of the Nokia TETRA System

The delegation of the National radio Monitoring Center of Ministry of Information Industry of Peoples Republic of China was shown a live demonstration of the new chinese user interface of Nokia Dispatcher Workstation.

Nokia 800MHz TETRA wins Chinese Type Approval

Nokia has gained type approval for its 800MHz TETRA equipment from the Peoples' Republic of China. Approvals cover 800MHz TETRA equipment including Nokia TETRA Base Stations and mobile terminals as well as the Nokia THR850 TETRA handset.

Nokia delivered the 800MHz TETRA system to Beijing Customs this May, fulfilling a commitment following the system's launch at PT/ExComm 2000 in Beijing. Following delivery,

system components underwent testing as part of a 800MHz TETRA technical trial project carried out by Nokia and the Hubei Quantong Telecom Company. The trial system has now completed testing and is ready for feature demonstrations.

VIRVE a winner at Neste Rally Finland

TETRA has proved its worth in yet another challenging application, supporting contestants in this year's Neste Rally Finland.

The race, part of the World Rally Championship, is held over three days in late August and regarded by many as the ultimate demonstration of driving skill. Winding 407 km around the lakes and forests of central Finland, the contestants must complete 21 stages, full of challenging jumps that test both driver and car and give the Neste Rally much

of its character. One of the highlights of the Finnish summer, Neste Rally Finland attracts massive crowds every year, who flock to field and forest to follow the cars and to the town of Jyväskylä, site of the race headquarters.

The Neste Rally organisation works closely with a number of authorities to ensure the race is safe. Major tasks include guaranteeing the safety of spectators and drivers, making traffic arrangements and taking action in the event of accidents. Previous races relied on setting up a temporary radio communication system for the event. In addition, all the authorities involved have been using their own radio communication systems. This set-up has proved fussy and complex, not least be-

cause the users of the separate radio systems could not connect to each other. External parties could also listen to the analogue systems' open radio channels.

To solve these problems, VIRVE, the Finnish Authority radio network, was made available to the Neste Rally organisation, bringing a common radio communication system to all the parties involved. For the first time in the event's 51-year history, the management and the security organisation of Neste Rally Finland operated a single, shared radio network, together with fire, rescue and ambulance services. A connection to the police was also established.

Around 150 Nokia TETRA terminals were used during the Neste Rally, some of them installed in ambulances and helicopters, as well as in the security cars that test drove the stages before the racers hit the track.

Jari Wilén, Neste Rally security manager looked after planning and implementation of the complete communication network. "From the HQ we can follow the course of events in real time and from the Dispatcher workstation we have access to all the units in the field

TETRA systems such as the Finnish VIRVE network are well suited to the needs of organisers of mass events like Neste Rally Finland. "This experience shows that VIRVE is ready for operational deployment: it has good coverage and capacity and users are happy with the ease of use of the terminals", says Esko Rajahalme, Project Manager of VIRVE.

Things under control: Juha-Pekka Iso-llomäki on duty in the HQ's Control Centre. He is used to managing complex radio communication systems from the dispatcher workstation.

Jari Wilén, responsible for the communication network of Neste Rally, was pleased with the performance of the network: "All in all, the experiences from the Neste Rally Finland were positive."

Special Stage 9, Killeri, was raced on Friday evening, 24th August in Jyväskylä. Jyri Muhonen, a member of the security group, took care of control and safety in the car park. He found his Nokia THR420 phone very useful for coordinating the incoming spectator traffic.

– security cars, ambulances, fire engines, rescue helicopters. When a race car drove off the track during the race, we received immediate information about the incident: what happened, where, are the drivers injured, and are any spectators in danger? In the control centre we have a detailed map of the Special stages and route of the Neste Rally as well as the whereabouts of the nearest rescue units and paramedic helicopters. Therefore, we called the required forces for help and in ad-

dition, gave them driving instructions to help them find their way to the scene of the accident. The VIRVE network provides perfect coverage in the geographical area of Neste Rally Finland. Therefore it was a natural choice for the Neste Rally's security staff."

Seamless and immediate communication and the ability to set-up groups dynamically helped produce a successful Neste Rally for drivers, spectators and organisers.

Jukka Rautiainen, in charge of technical implementation of Special Stage 9, made sure that the track was ready for the drivers. He kept in contact with the Neste Rally's Control Centre: the first security car is about to start.

Paramedics Harri Kuha and Harri Lampinen were on standby in the start area of Special Stage 9. They relied on VIRVE and Nokia TETRA for communication with rescue helicopters and Special Stage managers.

A tale of two dogs and the man
Holding the Leash

Turkey, the day after the earthquake: the heat is unbearable. Night temperatures average 43 °C. Ten rescue dog teams from Germany have set out to search for people buried under the debris of the earthquake.

Scouring the rubble is Helmut Haller and his dogs Apollo and Gwenifer. On a normal day you'd find him sitting at the desk of the General Manager of Customer Service in Germany, Austria and Switzerland at Nokia Networks. But in times of exceptional emergency, Helmut hangs up his business tie and takes up the leash.

For five years, Helmut, his wife, and their dogs have been active in the German Association of Rescue Dog Services. What for some would be too extreme and strenuous a way to earn a living, is for Helmut a welcome change from work. The dog owners have to invest a

Rescue dogs and their owners give their all in training. Climbing ladders and speeding through fire prepare them for the real thing.

lot in this job: apart from the deep conviction of wanting to work actively in disaster control, the dog owners must be physically fit, psychologically stable and generally able to handle a lot of stress.

"Furthermore, being able to work in a team is an absolute must," says Helmut. In particular, in exceptional situations- and that is what disaster control is all about- the interaction of the team members is absolutely decisive. You also need time, stamina, discipline and the readiness to make personal sacrifices and bear financial costs, and also an enormous amount of patience in training the dogs.

But all of Helmut's qualifications were put to the test during the 1999 earthquake in Turkey, the worst disaster Helmut and his dogs have had to confront. "We received the alarm and were on our way to Turkey within a few hours," remembers Helmut. "The dogs accompanied us in the passenger cabin, because they had to be rested and ready to go as soon as we arrived at our destination."

Assisting in New York

The most recent rescue activity the German Association of Rescue Dog Services were involved was the tragedy of World Trade Center in United States. A group of 25 volunteers from Germany with 12 rescue dogs flew on the same night over to New York to assist the local rescue teams in searching the people buried in the ruins. After one and a half weeks hard work they returned back to Germany ready to go for the next assignment.

For five years, Helmut, his wife, and their dogs have been active in the German Association of Rescue Dog Services.
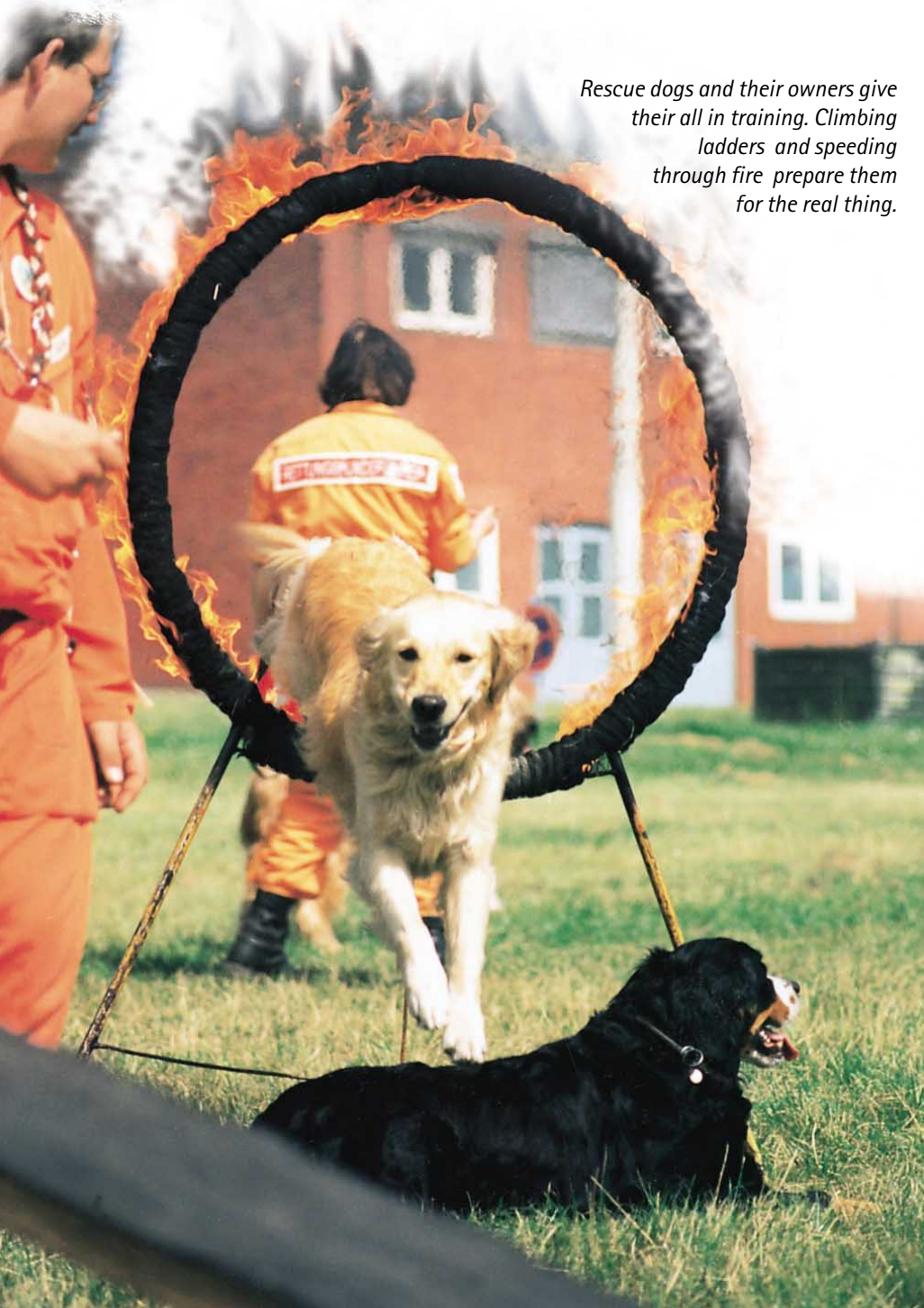
After a 14-hour journey, Helmut and the other volunteers arrived in Adapazari, 130 kilometers east of Istanbul, which became their center of operations. In the sweltering heat, the deployment time of the dogs is limited: "The dogs can only be deployed for a maximum of 20 minutes without a break," explains Helmut. In particular it was the aftershocks that caused anxiety. "The extent of the disaster was appalling, the conditions everything but ideal. But we still managed to save the lives of a lot of people buried under the rubble."

Even if the rescues themselves are the most dramatic part of the operations, there is a lot more work that goes on in preparation for quick response to disaster. Training is a must for both dog and owner alike.

"We train twice a week. The training consists of different exercises, for example guiding the dog over ladders and scaffolding or getting it to jump through a burning tire," says Helmut. Among other things the dog learns to search systematically over great distances and reliably point out the victims. It is above all the natural instincts of the dog that are the most valuable. For the dog owner, first aid skills to treat both humans and dogs are crucial.

According to the association, the rescue teams are called upon to provide support 300 times a year on average, mainly in Germany. In 1999, however, dog teams were deployed in Turkey, Taiwan, Russia and Greece. The teams are called in, for example, after explosions, fires, aircraft crashes, train accidents and earthquakes.

Giving 110 percent even in your leisure time may give a lot of satisfaction, especially when you can save lives at the same time. But Helmut Haller and the many other helpers will also always need time to cope with images and emotions of their experiences.

Text: Matthias Wevelsiep & Nadja van Keeken
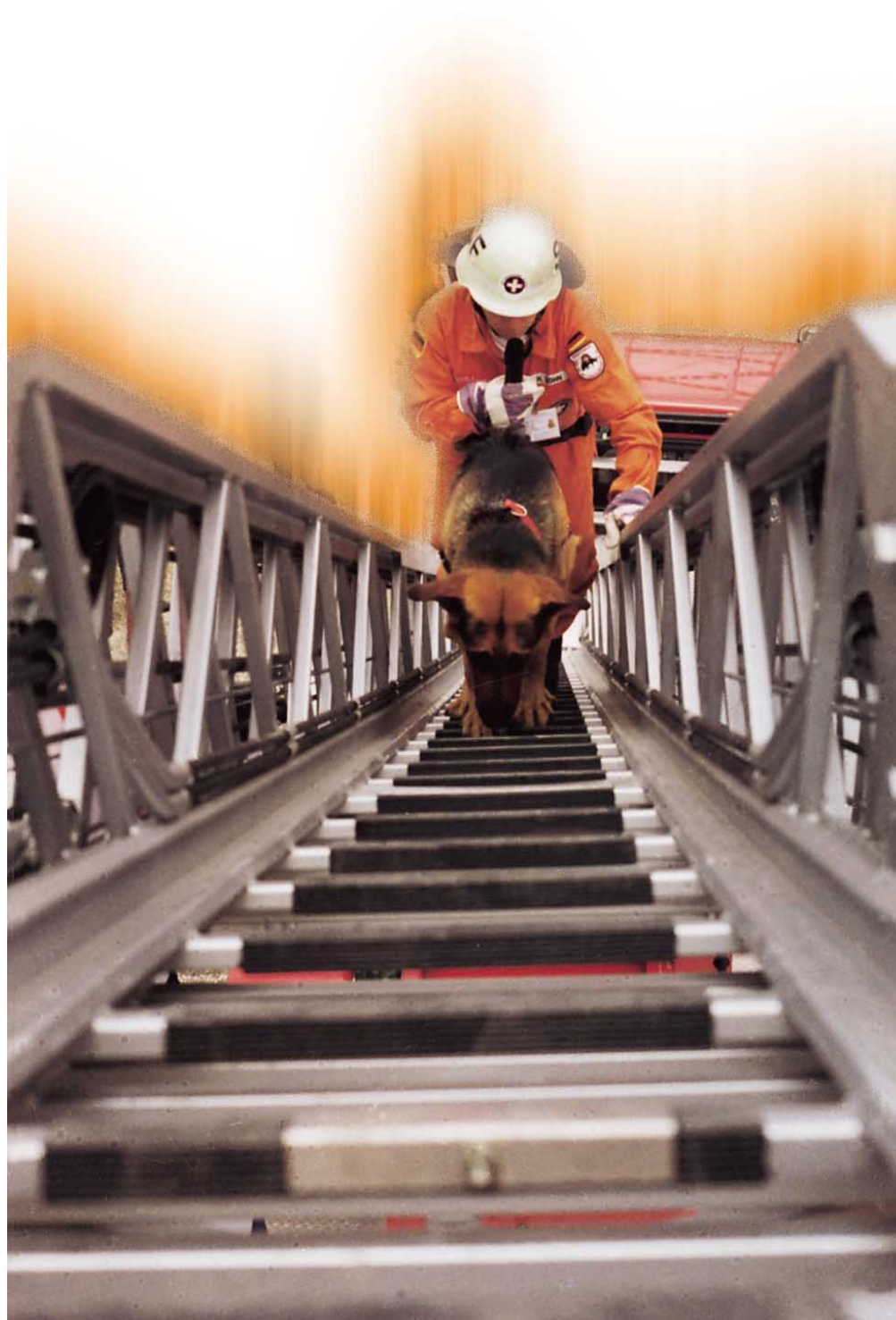
Unmatched ability in implementing TETRA networks

No other TETRA vendor can match Nokia's track record of fully operational authority radio networks. Several countrywide and regional TETRA services have been launched for the law enforcement and rescue services during past couple of years. The networks have been equipped with the most modern features and the service has been stable. It has been easy for the user organisations to adopt the new communications means such as the dispatching work stations in their daily routines.

Nokia TETRA networks can be scaled up easily and rolled out quickly, to a schedule that suits the customer's timetable. These capabilities are based on Nokia's extensive experience of large mobile network rollouts that typically include thousands of base stations.

Countrywide networks such as ASTRID in Belgium, VIRVE in Finland and Stikla in Iceland are all proof of Nokia's capability to deliver high performance systems. Regional networks providing service for organisations such as the Catalonian fire brigades, Walky-Talky in Austria and the Hong Kong Police are also fully operational.

Recently, orders have been received from Tianjin Water Conservancy, China Light and Power, Hubei Quantong, and Hong Kong Fire Department which are all presently in the phase of implemetation.

Major new orders have also been received from VIRVE and ASTRID, moving these major national networks a step nearer to completion. Nokia has introduced the world's largest open-standard digital PMR systems featuring full TETRA functions such as country-wide group calls.

References such as these reassure future customers that Nokia is a competent partner. Whatever the network and whatever the needs of the user, from a single airport or railway to a fully integrated nationwide network, Nokia has the resources. And in the Nokia TETRA System, all functions are available, no matter how large the network.

Nokia as a corporate citizen

Our goal is to make a fitting and enduring contribution to the communities in which we conduct our business.

We believe one way of doing that is to focus on the long-term projects aimed at helping young people to create a firm foundation for themselves and their future.

Our global partner in supporting young people is the International Youth Foundation (IYF). Our joint program is called 'Make Connection', and it is aimed at improving the lives of young people worldwide through education.

Nokia have been supporting numerous other projects in partnership with several community and charitable organizations worldwide such as disaster relief: We donated USD 1 million for humanitarian assistance to the victims of the Kosovo crisis through the Finnish Red Cross and also contributed to the Red Cross of Venezuela after the Venezuela floods

In September, Nokia established, in coordination with the International Youth Foundation, a global Education Fund for children who have lost a parent or parents in the tragic destruction of the World Trade Center complex in USA. Our rationale for this is simple; we need to do something that has a long-term and lasting effect. We need to think about the future.

There are of course immediate needs for restoration and support. Nokia has been supporting the emergency relief efforts through donations of cellular phones, extra batteries, chargers and technology engineering expertise. Nokia and its employees have also been making cash donations to the American Red Cross

http://www.makeaconnection.org
http://www.redcross.org/

http://www.nokia.com/insight/social/corp_citizen.html

Nokia TETRA News

A.S.T.R.I.D. and Nokia sign contract to complete the nationwide roll-out of TETRA network in Belgium

Network build-out already underway with successful launch of TETRA service in East Flanders

Nokia and A.S.T.R.I.D., the Belgium public-safety and security network operator, have signed an agreement for the supply and implementation of A.S.T.R.I.D.'s nationwide TETRA network,

marking a major milestone in efforts to bring secure, digital professional mobile radio communications to all Belgian public safety organizations.

Under this and previous agreements with A.S.T.R.I.D., Nokia is providing a complete TETRA network with full IP capability to the KNT consortium, which

is overseeing the implementation of the network. Included in the agreements are switches, base stations and a network management system. The initial roll-out of the network is already underway, with the recent launch of TETRA service in East Flanders. The latest contract calls for the roll-out to be extended all ten Belgium provinces.

The city of Sint-Niklaas in East Flanders was the first to inaugurate A.S.T.R.I.D.'s TETRA network when its local police, fire department and town council started using the system for their radio communications. Geraardsbergen, another city in East-Flanders, followed suit soon afterward. The next two provinces to receive a TETRA service will be West-Flanders and Henegouwen.

Helping TETRA developers

Companies developing applications for TETRA networks can now get extra help through Nokia's Developer NetPoint programme.

Nokia Developer NetPoint suits any application developer or content provider who wants to develop applications and services for Mobile Internet solutions. Netpoint is designed to bring information to developers quickly. This helps them to develop applications quickly and produce a fast response to the needs of end-users.

Netpoint offers its members a wide range of both technical and commercial services, including early access to Nokia's Mobile Internet solutions. Members also receive marketing and business services, including permission to use the Nokia OK logo for developers with certified applications. These members also get the chance to co-operate more closely with Nokia customers.

TWISP for TETRA developers
Many TETRA developers will already be members of TWISP (TETRA Wireless Solution Partner) community, which now

also comes inside Nokia Developers Netpoint.

The TWISP - provides the newest technical information and knowledge about TETRA data services and solutions, such as WAP use in TETRA networks. Partners also get detailed information concerning Nokia API interfaces. Simulator tools, which help software houses develop and test their work, are also available for Nokia partners.

The Nokia TETRA System has an open Application Programming Interface (API) Server product, called Nokia CIS

Server, which enables easy application integration. This powerful product cuts the time needed to integrate 3rd party applications. Following technical co-operation, the TWISP partner product catalogue also helps members with the marketing of their applications.

Nokia Developer NetPoint is accessible via Forum Nokia - the largest mobile application developer community with approximately 400,000 registered members. Forum Nokia is a website created to bring together professional developers working with technologies and platforms supported by Nokia mobile devices. Members can find a wide range of development tools and supporting documents and meet other developers on-line.

To join NetPoint, you can register via Forum Nokia (http://forum.nokia.com). Developers interested in TETRA will need extra registration for security reasons.

Tough Terminals for TETRA

Organisations that depend on efficient and reliable communication need radio terminals that are solidly built, easy to use, and technologically advanced. Nokia TETRA radios offer top-quality performance, based on Nokia's expertise in mobile telephony, but which are also built to withstand the rigours and rough handling that they can be subjected to in the demanding situations that emergency and other users find themselves.

Nokia TETRA terminals are easy to use, with no need to enter complicated strings of keys. Users can also choose from more than 10 display languages for ease of operation. Dynamic Group Number Assignment and Scanning, the crucial features for efficient group work and communication, are standard features on all Nokia terminals. All Nokia TETRA terminal models also have IP connectivity for seamless integration with the organisation's information and communication systems.

Nokia THR420

The robust, highly ergonomic Nokia THR420 provides reliable, easy-to-control communication in the most demanding conditions. Solid construction and an intuitive, easy to use design make this handheld terminal the ultimate communication tool for

emergency and patrol personnel. Outside network coverage, users can still keep in touch with other terminals within the range using direct mode.

- Strong aluminium chassis provides excellent resistance to exposure
- Accessories for rough use in combination with special devices e.g. smoke diving outfit and ear protectors
- Rugged rotary switches for easy volume and group control, intelligent placement of emergency key

Nokia TMR400 and TMR420

These mobile radios are aimed at reliable and efficient communication on the move. The transceiver provides 10W of output power, maximising the unit's operational area in the TETRA network, with direct mode for use in remote areas.

- Superior audio quality for use in vehicles
- Straightforward user interface with large display and distinct keypad
- Versatile connectivity through the intelligent MCB420 connection box with interfaces including serial port, PTT, volume control, group selection, recorder, two speech equipment as well as digital in/outputs, for emergency call activation, external alarm light / signal or status panels.

Nokia THR850

The lightest, most ergonomic TETRA phone yet, but designed with the features needed by a team in the field. This is an ideal communication device for mobile field organisations that require fast, dynamic and effortless communication.

- Extra large display screen
- erfect ergonomics and usability
- High volume loudspeaker for hands-free use
- Extensive set of features for enhanced work and time management.

NOKIA
CONNECTING PEOPLE