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MDM

MOBILE DATA MAGAZINE

1

NO.1 2002.

AR, AT, AU, BU, BR, BE, CA, CL, CO, DE, DK, FI, FR, GB, IN, ID, IE, IT, KR, CN, LB, MX, NL, NO, PE, PL, SG, SE, TR, US, VE.

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MOBILE INTERNET UPDATE

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DAWNING OF A NEW ERA

Mobitex is now being introduced in China, the world's largest wireless market. Sky Networks Communications Group is currently building a Mobitex network that is designed to serve 750,000 subscribers in Beijing, Shanghai and other cities in northeastern China.

The new era now beginning in China will take the technology to new heights. The Mobitex community will be changed forever. For Ericsson, the breakthrough for Mobitex in China is the culmination of an effort that began some years ago. The real work began following a market study in early 1999 that identified significant potential for Mobitex in China. However, neither of the existing Mobitex frequencies of 400 and 900 MHz were suitable for China, so we had to develop new products for 800 MHz. Obtaining technical test licenses, commercial test licenses and commercial licenses for Mobitex and certification of the 800 MHz frequency band were also significant hurdles to be overcome.

As we have reported in Mobile Data Magazine over the past year, our progress in overcoming these difficulties has been very rapid. This would not have been possible if Ericsson had not made a very strong commitment to the Chinese market. Companies such as Symbol, Teklogix, CNI and Ortivus were also invaluable in achieving this success. First and foremost, however, the technical tests proved to the Chinese authorities that Mobitex is a superior technology that met or exceeded their most stringent requirements.

We believe that it is impossible to underestimate the potential in the Chinese market. The appetite for wireless communications is almost insatiable. In just five years, mobile phone usage increased from virtually zero to 110 million subscribers, making this the fastest wireless take-up in the history of telecommunications. All forms of wireless communications, including paging networks, are growing rapidly, and the prospects for Mobitex are particularly bright.

Realizing this potential will require hard work, however. The challenges facing Mobitex suppliers in the Chinese market are formidable. Achieving success without local partners will be impossible. Yet for companies with strong partners that are able to rise to the challenge and adapt to the local culture, the opportunities are almost unlimited.

There is a need for virtually all types of wireless data applications in China. Traditional vertical applications in such areas as transport, telemetry and security will be in great demand. There are already millions of people discovering the importance of messaging and Internet-based information services and applications. In a country where wireless subscribers will far outnumber fixed lines, the benefits of wireless POS applications and stock trading are obvious.

With China joining the World Trade Organization and plans already being made for the 2008 Olympics, more and more eyes will be turning to China.

Pontus Lindqvist

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A MORE ACTIVE MOA ORGANIZATION

Mobile Data Magazine took the opportunity to talk with Andrew Fitton, who was elected as president at the recent meeting of the Mobitex Operators Association in Gothenburg.

Congratulations on becoming the first-ever president of MOA!

Thank you! Becoming president is quite an accomplishment for a Brit, isn't it?

As a relative newcomer to the Mobitex community, was accepting the post as president of MOA a difficult decision?

I was obviously very flattered when David Neale and Jack Barse approached me and asked if I was interested. I naturally had to go back to my board and ask their opinion. They felt that if Transcomm was making such a substantial investment in Mobitex and was going to be part of the organization, then it was definitely to our advantage to be able to play a leading role. With such strong backing, accepting the job as president of MOA was an easy decision.

What will the new organization mean for MOA?

With the new organization, I believe that we are entering a third phase of development in which MOA will become a more professional organization that will be more active in the industry and more capable of promoting its members interests. Obviously, the new board of directors also creates a more streamlined management structure that will allow us to work more efficiently.

What are some of MOA's goals going forward?

One of the primary tasks will be to create a partnership program that will be attractive to new members. Today we only have just over ten associate members. That's pitiful. In the UK, Transcomm has hundreds of business partners. Therefore, over the next year, each board member has pledged to devote special effort to recruiting at least one new developer as an associate member.

What changes do you hope to make?

I believe that too little information is being exchanged. I would like to see benchmarking between operators. Reports should be produced on all networks that include such statistics as costs per user. Obviously this information would be treated confidentially so that sensitive business data would not be revealed, but within the MOA community, we all stand to gain by sharing information with each other.

Is it significant that you as a representative for a 400 MHz operator are the new president of MOA?

The 400 MHz operators have some very legitimate concerns and face obstacles that operators of 800 and 900 MHz networks do not have. The 400 MHz operators have met informally several times to discuss these issues, and I expect that they will continue to get the attention that they deserve within MOA. Speaking for Transcomm, we have taken several initiatives, including commissioning CNI to develop a 400 MHz version of the TWM III on our behalf, that will benefit other 400 MHz operators.

What role will the Chinese play within MOA?

There are significant differences in our cultures, and I believe that it will take MOA some time to adapt to the challenges of Chinese culture. Therefore I do not expect that the new Chinese Mobitex operator will play a very active role within MOA initially. China is a huge and strategically important market for Mobitex, however, and I expect that we will all become increasingly involved over the coming years. MOA associate members, in particular, will have an important role to play as business partners for local Chinese companies and in helping to ensure that Mobitex realizes its potential in China.

What are Mobitex prospects in today's market?

I believe that the window of opportunity for Mobitex is being extended. We have a proven technology that is available now and extremely cost-effective. That has already won us a significant share of many markets. Now the problems and delays that GPRS and 3G operators are experiencing are creating opportunities for Mobitex. We simply have to be smarter than the others. We have to realize that we will not win every battle, but like the Chinese philosopher who observed that a good general does not lose a battle that he does not intend to lose, we must choose our targets carefully and identify the applications and market segments that play to Mobitex' strengths.

Perhaps it's wishful thinking, but I increasingly have the feeling that Mobitex is at the tipping point. In the US, one could argue that it has already happened. Mobitex is mentioned frequently in the national media, and RIM's BlackBerry is nearly a household word. We're not quite there yet on the global level, but my feeling is that we are close. In targeting our markets, we simply have to increase the uniqueness of our value proposition for the customer. ■

MOBILE BUSINESS NEWS

SUPERCHARGING BRAZILIAN BUSINESS

TWW do Brasil S/A is a new Mobitex operator in Brazil whose management has a refreshingly different view of the wireless data market and an almost philosophical approach to marketing that emphasizes thinking out of the box. Formed as PageNet in 1996, TWW changed its name last year and recently began operating a Mobitex network.

"We believe that when you think wireless, you think creatively," says Anthony Pain, CEO at TWW. "We want to take away the crutch. We want to tell customers, 'Don't just walk, start running!' because we believe that wireless data is a paradigm shift that will help companies re-shape themselves."

TWW started its Mobitex operations in 2001 and will focus primarily on the main economic centers of Brazil: São Paulo and Rio de Janeiro. This is the country's most populous region, accounting for more than 40 percent of the Brazilian GDP. Today the Mobitex network provides coverage in Sao Paulo and Rio, but it will be expanded in stages over a short period of time to cover all of southern Brazil. Through a third-party satellite provider, TWW will also offer coverage in rural areas.

As Anthony Pain points out, however, there are 15 Brazilian cities with a population of more than one million. As the Mobitex network is gradually expanded over the months and years to come, these densely populated regions will provide fertile ground for wireless data applications.

COMBATING MARKETING MYOPIA

Although TWW will continue to operate its paging network which currently has some 50,000 subscribers and remains a growing business, the new Mobitex operator is not targeting the horizontal market at this time. Instead, TWW's is targeting corporate customers. Partners are primarily business consultants who have established relationships with senior management and are thus able to present new ways of viewing the customer company's business.

"We're looking for the visionaries who do not suffer from marketing myopia," explains Sergio Santos Rutowitsch, the company chief operating officer, noting that the classic change from trains to airplanes was also a paradigm shift. Had the railway companies of that time understood that their business was transporting people and goods and not focused on being cheaper than the emerging airlines the history of transportation would have been much different.

"We believe that when you think wireless, you think creatively."

"When senior managers and management consultants perceive that wireless technology is not just one more method for cost saving, but a new dimension in efficiency that improves management in virtually all areas of business where fast decisions are essential for beating the competition, the Mobitex network will begin to realize its immense potential. Our business is to help other companies to use wireless data to create stronger businesses and become more competitive," says Sergio Rutowitsch.

One example of an area in which the new operator is successfully applying this philosophy is wireless asset tracking to help insurance companies trace stolen cars. This not only helps the insurers to reduce costs for claims and lower insurance premiums. Customers appreciate the speed with which stolen vehicles can be located and returned.

Other vertical markets in which the new Brazilian Mobitex operator sees significant opportunities are wireless point-of-sale applications for the retailing and banking sectors and wireless telemetry for security applications. In addition, TWW sees considerable potential for mobile Internet and intranet applications among corporate customers, where the marketing strategy is not just to automate existing processes, but to achieve synergies at a high level in the company.

"The wireless decision is forever. The essence of change is to open minds to the potential for enhancing the business," notes Sergio Rutowitsch, who is clearly intent on supercharging Brazilian businesses with wireless data. ■

John Swendsen, Donald Pearson, Anthony Pain and Sergio Santos Rutowitsch

MOBILE INTERNET CONSTRUCTION BEGINS IN CHINA

移动互联网

The new Chinese Operator, Sky Networks and Communication Group Co. Ltd., is set to start building the mobile Internet in China. With Ericsson's Mobitex technology, a wireless data network will be built that is designed to serve up to 750,000 users and to provide coverage of northern China centering on Beijing and southern China centering on Shanghai.

IDEAL TECHNOLOGY FOR CHINA

"Mobitex is an ideal technology for Beijing and other international metropolis and densely populated areas," says Mr. Chen Yuanming, CEO of Sky Networks and Communication Group. "Mobitex's very efficient use of radio spectrum and high capacity and reliability, plus the availability of a wide range of terminal products, allow us to bring wireless data and messaging to a large number of users quickly and cost-efficiently. More importantly, Mobitex is being advanced by Ericsson, which is a large and well-respected player in the Chinese market."

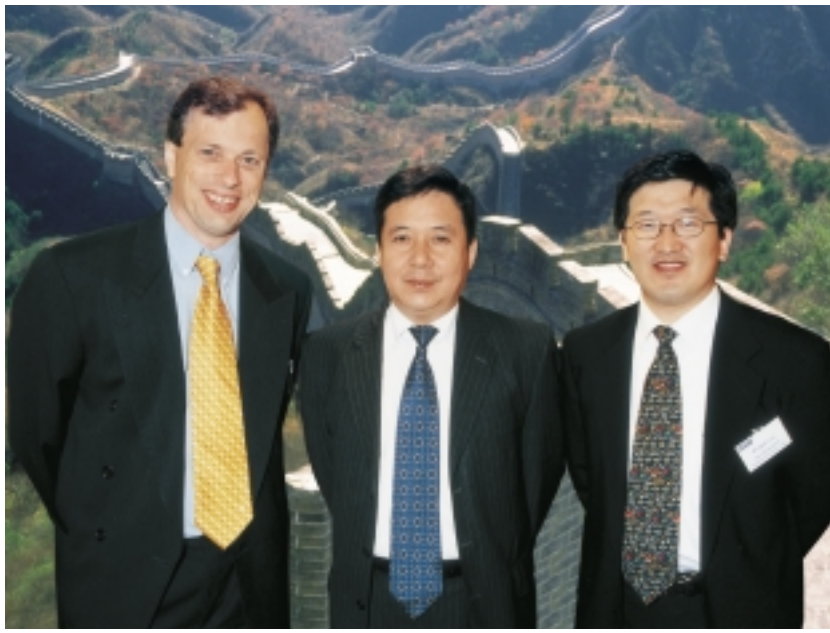
Although the new Chinese Mobitex operator is initially focusing on mobile Internet services for stock trading and messaging, value-added applications in such areas as telemetry/monitoring and logistics will play an important role. In fact, one of the first applications for the network is a parking application inspired by the operator's visits to Gothenburg, Sweden, where wireless data is used to relay data about parking availability in inner-city garages to information signs on the outskirts of the city. Other applications that are under development include meter reading for Capital Steel factory and mobile office for public safety.

The Sky Group is an experienced operator whose wireless communications business includes paging, cellular and satellite networks. Equally important as the networks it operates, the Sky Group has created a powerful data center and a call center that interconnect the networks and provide various services. In creating the mobile Internet, the Sky Group will thus act as an Internet service provider and an Internet data network provider.

TERMINALS KEY TO SUCCESS

"With Mobitex, we will begin by focusing on large customers with large needs," says Chen Yuanming. Initial customers for logistics solutions, for example, will consist of large public-sector transport companies. These companies will undoubtedly begin with simple dispatching applications, but the Chinese Mobitex operator will help them to develop more sophisticated fleet management systems.

Chen Yuanming believes that terminals will be crucial in opening the market. "Our goals include offering terminals that are reasonably priced yet offer superior functionality for the intended task. We will therefore be introducing no fewer than five terminals," reveals Chen Yuanming.



Tomas Lundkvist, Chen Yuanming and Mingwei Liu

One terminal will be a simple wireless e-mail and messaging device being developed entirely in-house by the Sky Group. A special terminal for wireless stock trading and a wireless version of an existing Chinese PDA will be developed in joint ventures with local partners. Finally, customized versions of a wireless messaging device and a wireless PDA will be sourced from a foreign supplier.

EXCITING DEVELOPMENT AHEAD

Equipment has been delivered to China, and construction of the Mobitex network in Beijing is now commencing. Commercial service is expected to start in early 2002, with network expansion continuing throughout the year.

"This is a very exciting development for Mobitex," says Jan Malm, president of Ericsson (China) Company Ltd. "With demand for all types of wireless communications growing more rapidly in China than anywhere else in the world, China offers an enormous market for Mobitex, and Ericsson is committed to help making the Sky Group's new Mobitex service a success." ■

DEVICES AND MOBILE INTERNET IN FOCUS AT MOA

More than 100 representatives from Mobitex operators, associate members and others from the Mobitex community gathered in Gothenburg Sweden on October 14 to 17, 2001 for the annual meeting of the Mobitex Operators Association at which the mobile Internet and new devices were major themes.

New devices were presented by no fewer than four vendors, including Psion Techlogix, CNI, Mentor and Duretech, and representatives from several other vendors were on hand to give sneak previews of devices still in the pipeline. These devices, many of which are presented in our Market News section, included not only new PDAs (Personal Digital Assistants) and OEM radio modems, but also new wireless POS (point-of-sale) terminals. In addition to their many impressive features, these new devices demonstrated convincingly that the previous shortage of products for 400 MHz Mobitex networks is a thing of the past.

Peter Gavigan and Jack Barse

Real-world experience from mobile Internet services in Canada, Korea, the UK and the US were presented, and participants were able to talk with representatives from the new Chinese Operator Sky Networks Communication Group about their plans. Mobile Internet is already a large and rapidly growing market for Mobitex, but experience from around the world suggests that the white collar corporate and corporate vertical segments, rather than the consumer or mobile professional segments, provide the best opportunities for Mobitex.

"There was a very high level of transparency. As a new operator, we felt that the meeting brought us closer to partners and made us stronger," says Sergio Rutowitsch, chief operating officer at TWW do Brasil S.A, which was represented at the MOA meeting for the first time. ■

NEW MOA BOARD OF DIRECTORS

At the meeting of the Mobitex Operators Association in Gothenburg on October 14 to 17, 2001, a board of directors was elected in accordance with MOA's new status as a non-profit corporation. The new corporation, which is registered in the US, introduces several important changes in MOA's organization. MOA is now headed by a president and governed by a five-member board of directors. Full MOA members, who are Mobitex operators, elect the president, who is also a board member, and three other board members. Associate members elect the fifth member of the board of directors.

New board members elected in Gothenburg are Andrew Fitton (Transcomm, UK), David Neale (Rogers AT&T Wireless, Canada), Won Baek (Intec Telecom, Korea), Bill Hogg who has since been replaced by Lee Rudolph (also from Cingular Wireless, US) and Pontus Lindqvist (Ericsson, Sweden). ■

APPLICATION DATABASE

Can customers find your solution? The Mobitex website www.ericsson.se/mobitex contains a comprehensive application database that is an invaluable resource for customers seeking wireless data solutions. If your company has a Mobitex application, you can register it in Ericsson's database so that customers can find it.

Applications are classified according to market segment, geographic market and functionality. The information available for each application includes a short description, as well as how long it has been available commercially or whether it is still in development, number of users, contact information etc. ■

CINGULAR WIRELESS ANNOUNCES WAVE 2002

Billed as the wireless conference where business gets done, WAVE 2002 will be held from May 13 to 15 in Orlando, Florida at the Gaylord Palms Resort and Convention Center. Now in its sixth year, WAVE is a dynamic forum where you can present business opportunities, create profitable alliances, exchange ideas and discover emerging wireless business strategies, applications and technologies. Ericsson and MOA are two of the main sponsors of this event, which was attended by more than 900 persons last year. Attendance has been growing by 30 percent annually, while the number of exhibitors rises by as much as 25 percent each year, so be sure to make plans early. ■

WIRELESS DATA IS DEPENDABLE

Security has become an important concern in the US in the wake of the terrorist attacks on September 11. As public authorities begin looking at ways to improve communications and share real-time information in responding to emergencies, they are coming to realize that the infrastructure is already in place and that Mobitex provides the capabilities they need.

After the recent terrorist actions against the US, members of Congress and their staffs found themselves largely cut off from reliable sources of information and from one another. As a result of new investment the Congress is now better prepared with wireless devices and can keep up business and keep in touch away from office. BlackBerry wireless handhelds are now widely deployed using Cingular Mobitex network.

Through another initiative, Aether has deployed its mobile law enforcement product PocketBlue™, which is being used by investigative officers throughout the state of Maryland and in Washington D.C. These officers are equipped with BlackBerry wireless handhelds and Palm wireless PDAs that also allow them to share information using Cingular Wireless's messaging service and to access the National Crime Information Center (NCIC) database from the field.

"The national mobile data infrastructure that exists today is an incredible asset. When cellular phones become overloaded, the RIM BlackBerry devices very often remain operational. Today, wireless data is dependable," says Charley Vlcek, vice president of strategic projects at wireless solutions provider Aether Systems Inc., which recently joined with Maryland Lieutenant Governor Kathleen Kennedy Townsend, as well as federal, state and local officials, to launch its own Homeland Security Initiative. The success of Homeland Security will largely depend on one factor – the ability to act on timely information. Today, over 1,000 law enforcement agencies have this capability. ■

MOBICOM AND SUPERONLINE JOIN FORCES

Turkish Mobitex operator Mobicom and SuperOnline, a Turkish ISP, are now one company. Seeing significant synergies between the two businesses, the owners moved to create a single company that will continue to pursue such successful markets as wireless POS and telemetry, while opening new markets. With its existing customer base of Internet users and experience of web services, SuperOnline brings significant assets to the new company, while Mobicom with its Mobitex network can add a new dimension of wireless access and mobility. ■

mobicom

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SUPERONLINE

MOBILE INTERNET

UPDATES FROM AROUND THE WORLD

The new interactive lifestyle that wireless data enables is helping more and more people to access information when and where it is needed and to respond instantly to important events regardless of their location. With wireless access, the vast resources of the Internet become ubiquitous. However great a force the Internet may be in shaping tomorrow's society, it is mobility that will unleash its power and put it in the hands of users with wireless devices. The stories and solutions that we present here are not future scenarios as pictured by high-tech visionaries. These are real-world examples of how Mobitex is creating the mobile Internet today.

A voyage of discovery

With a brand new 400 MHz version of CNI's superbly designed TWM3 handheld, opening a mass market for mobile Internet services in the UK seemed like a no brainer. In what managing director Andrew Fitton describes as a voyage of discovery, UK Mobitex operator Transcomm learned a number of valuable lessons and discovered that creating a market for mobile Internet services involves several significant challenges.

SEEKING STRONG PARTNERS

"Our initial vision was based on gradual penetration of wireless data and mobile Internet services in the business and consumer horizontal markets over the period from 1999 to 2002, with a target of 250,000 subscribers by 2005," notes Andrew Fitton, CEO at Transcomm. "Our business plan was well conceived. We felt that we had the network, the devices and the content and applications required for a very competitive offering. However, we did not realize at that point that there were storm clouds ahead."

The first difficulties that the UK operator experienced related to distribution for horizontal markets. For retail sales to consumers and mobile professionals, Transcomm sought a partner that could contribute branding, distribution, logistics and warehousing, as well as customer care and billing. Although discussions continue with several possible partners, Transcomm still has not solved this problem. "Although we have a very strong offering, trends are converging, particularly in the consumer market, that constitute significant barriers," continues Andrew Fitton. "Obviously the consumer market is extremely competitive, with downward price trends and substantial operator subsidies for devices. The PDA market, which was empty when Palm, Psion and others arrived on the scene, is now overcrowded. At the same time, the initial WAP experience has been negative, leading to a slowing in sales of both handsets and PDAs."

ADAPTING TO MARKET CHANGES

Continued market research revealed some disturbing trends. For example, a comparison of forecasts for UK mobile data penetration published by Strategy Analytics in 1999 and by the ARC Group in 2001, revealed that the projected market growth was delayed by about two years and that the expected penetration by 2005 would be lower than originally estimated. In addition, the rapid changes taking place in the market forced Transcomm to refocus on somewhat different market segments with greater potential for Mobitex.

"Without the support of a strong retail partner able to help us address the issues of branding, pricing and distribution, we had to conclude that the consumer and mobile professional markets would be difficult to penetrate. While we certainly are not giving up these markets, our research indicates that there are significant opportunities over the short term in what can be described as the white collar corporate and corporate vertical segments," reveals Andrew Fitton.

These are segments in which the perceived value of wireless messaging and mobile Internet access is very high. Examples include financial workers, such as stockbrokers and insurance agents, white-collar professionals, particularly in such areas as real estate and law, and sales representatives for pharmaceutical manufacturers and other companies involved in business-to-business marketing.

"Our research indicates that the business market will still account for about 40 percent of the mobile data market by 2005 and that the white collar corporate and corporate vertical segments in turn will account for about 40 percent of that market," says Andrew Fitton. "What makes them particularly attractive for Transcomm is that they play to our strengths. We have a network that provides the coverage that these groups demand, and we have devices that will support the applications they need to work more effectively."

In addition to a 400 MHz version of the TWM3 handheld, which Transcomm commissioned from Korean manufacturer CNI, the UK operator is planning to market a wireless cradle for Palm PDAs being produced by Maxon and an as-yet-unannounced handheld messaging device that will compete directly with RIM's BlackBerry device for GPRS.

MOVING CLOSER TO LAUNCH

"Just when we thought that we had weathered all the storms and finally had all the pieces in place, lightening struck again," says Andrew Fitton. "The telecom market collapse in 2000 was a severe blow for everyone, and even today its effects remain evident. Investor funding has dried up. The mobile voice market has become saturated. The hype surrounding 3G and GPRS is deafening."

"Nonetheless, it is worth noting that no one has successfully launched a mobile Internet service in the UK to date. We therefore remain confident that we will get there in the end. Transcomm still has time to build the customer proposition, and I see an expanding window of opportunity over the next 12 to 24 months," concludes Andrew Fitton.

The mobile Internet revolution is thus just beginning in the UK, and Transcomm's voyage of discovery indicates that it will be a different experience for British users. As Transcomm begins pilot tests of its services prior to launch, the first mobile Internet users are likely to be traders on the floor of the London Stock Exchange or estate agents showing country houses to prospective buyers. ■

"We have identified the segment in which the value of mobile Internet access is very high."

MOBILE INTERNET

PLATFORM

FOR MOBITEX

The mobile Internet presents a number of opportunities for wireless ASPs (Application Service Providers). In the Mobitex market, one Wireless ASP that has been quick to identify and exploit these opportunities is dotWAP.com Pty Limited Holding Inc., an Australian company with European offices in Sweden that also owns the Australian Mobitex network. Key to the company's success is its dotLINK server solution.

COMPLETE SERVICE SOLUTION

The dotLINK product developed by dotWAP is a complete solution for mobile Internet over Mobitex. Unlike some products that merely provide IP connectivity over Mobitex, dotLINK offers a complete platform that allows Mobitex operators and service providers to address the PDA and laptop markets. With dotLINK, they thus have the potential to reach large volume markets with a powerful package based on Internet and industry standards.

Central to this solution is the dotLINK gateway and server system, which is currently installed in Mobitex networks in Australia, Hong Kong and the Netherlands. This is the server-side component that is typically installed in the operator's network and which provides a gateway to various Internet services. Equally important, however, is the NEO1 software for the client, which integrates a tri-mode (WAP, HTML and i-Mode) browser, a POP3 e-mail client, a corporate e-mail client for Microsoft Exchange and Lotus Domino, a virtual IP driver that supports TCP and UDP applications over Mobitex and a SyncLib component to handle push traffic to the device. The NEO1 client software is currently available for the Palm and Pocket PC operating systems, as well as the one used on the CNI PDAs.

"With our dotLINK application service solution, virtually any wirelessly enabled device can be easily turned into a versatile mobile Internet terminal that is able to access Internet or corporate intranet-based content and services, as well as WAP portals and service," says Ross Symons, chief technology officer at dotWAP in Australia.

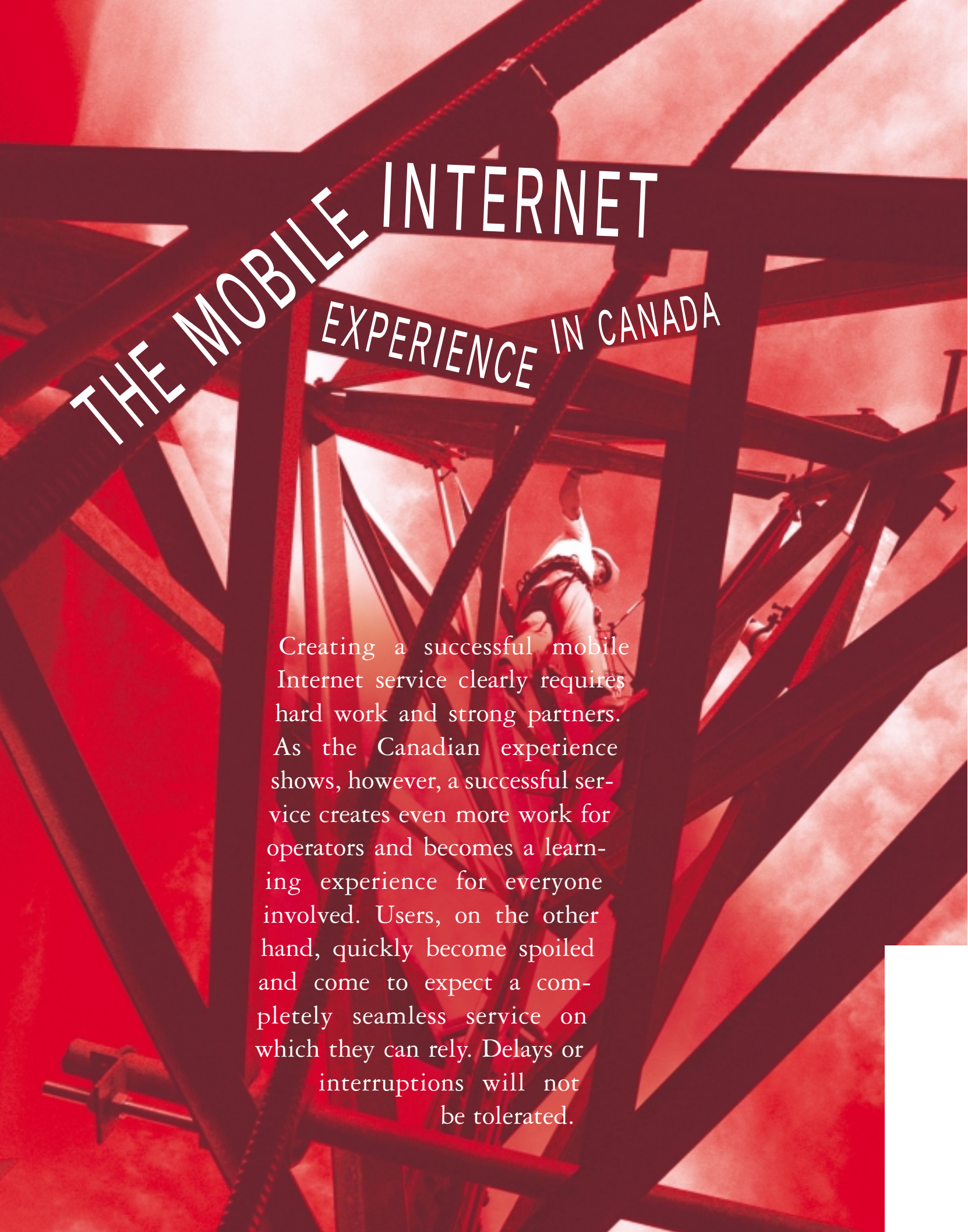
COMPELLING USER SERVICES

The Mobitex device communicates with the dotLINK server via a Mobitex IP Gateway installed in the network, thus providing a bridge between Mobitex and IP-based networks. The dotLINK server system acts on behalf of the client to access other servers and gateways, which may include WAP portals, Palm.Net servers, WAP-enabled Internet content, e-mail (POP3 and IMAP) and SMS gateways, or corporate intranets. In addition to these services, the dotLINK server system provides billing functionality and wireless subscription management and can be easily expanded as traffic increases.

This rich environment in combination with support for a wide range of devices, offers operators and service providers many opportunities for creating compelling mobile Internet services. With the platform provided by the dotLINK server system and the NEO1 client software, operators can create compelling mobile Internet services targeted to a number of volume markets. Particularly interesting for corporate customers is the ability to access intranet-based services and content and a new corporate e-mail solution that allows the e-mail gateway to be located behind the corporate firewall.

With dotLINK servers running on Mobitex networks in three countries and discussions in progress with operators in several other countries, dotWAP is set to play a key role as the mobile Internet expands on Mobitex. ■

"The NEO1 client software is currently available for the Palm, pocket PC and CNI operating systems."



THE MOBILE INTERNET EXPERIENCE IN CANADA

Creating a successful mobile Internet service clearly requires hard work and strong partners. As the Canadian experience shows, however, a successful service creates even more work for operators and becomes a learning experience for everyone involved. Users, on the other hand, quickly become spoiled and come to expect a completely seamless service on which they can rely. Delays or interruptions will not be tolerated.

"Simplicity and reliability are the two key factors for our users."

Canadian Mobitex operator Rogers AT&T Wireless in cooperation with several business partners offers users a rich mobile Internet experience that includes a variety of messaging, information, m-commerce and entertainment services. The RIM 957 handheld was launched with the BlackBerry Internet edition and the GoAmerica browser in July 2000 and became an immediate success. Although messaging still accounts for the majority of traffic, use of other services is increasing. Average revenue per user (ARPU) is CAD 43 per month and rising.

"Simplicity and reliability are the two key factors for our users," notes David Neale, vice president for network strategy and product development at Rogers AT&T Wireless and former MOA chairman. "Of course, Mobitex technology is extremely reliable, so users can count on messages reaching their recipient and transactions completing successfully. The service also is very user-friendly and provides the mobile Internet experience that users want."

For operators and other providers wishing to offer a successful mobile Internet service, however, there are some important lessons to be learned from Canada. "Long latencies and interruptions of service are totally unacceptable," explains David Neale, adding that users quickly become accustomed and dependant to an interactive service that makes information available wherever they are. "If the service doesn't work, users don't understand why. They just get upset very quickly."

CREATING PERSONAL PROFILES

"What we have learned from focus groups and other studies is that most customers are unable to differentiate between content, transport or application layer failures," reveals David Neale. "This means that mobile Internet services must be very tightly integrated and that content and service providers and application developers must work together to provide a user experience that is totally seamless."

"Operators must realize that there are also multiple points of failure, such as web mail, gateway and redirector services for messaging," continues David Neale. "While it may be tempting to offer many different kinds of services, they must be totally reliable before they are launched. Operators must also remember that users want simple services and that all services need to be tested with actual users before they go live."

To enhance the user experience, Rogers AT&T Wireless allows users to create personalized start pages via the operator's website. There are three pre-defined profiles, which are labeled Well Connected, Smart Business and Cool Stuff to reflect different lifestyles. After choosing one of these alternatives, the user can further customize the start page by adding different services and favorite locations and by configuring various settings. In addition to making the service more personal, the ability to customize start pages makes it easier for users to change devices or to use different devices at different times.

Interactive and location-based information and m-commerce services are steadily gaining ground. Somewhat surprisingly, the most popular service by far is weather reports, followed by search engine, travel and local information services. On the other hand, the heavy use of such services shows that people on the move are the group that find them most valuable.

ELIMINATING CONGESTION

"One of the most difficult problems that we encountered in getting the service to run smoothly was congestion at base stations, particularly in sections of Toronto," reports David Neale. "Like many international cities, Toronto has a relatively small and very concentrated financial district where there may be hundreds of users trying to use the service simultaneously. In many cases, they don't move outside the base station area all day long. They also have easy access to phones and PCs connected to the Internet, but they prefer to use the wireless handheld device because it is more personal and more convenient."

Caught somewhat by surprise by the heavy traffic, Rogers AT&T Wireless was forced to act quickly to add channels and create multi-frequency sites. The Canadian Mobitex operator also found other remedies, which included increasing antenna down-tilt and reducing power. "Our experience with mobile Internet and wireless e-mail services indicates that considerable planning is required to eliminate these congestion points. Traffic data shows that 15 percent of the customer base generates 90 percent of the traffic. These are also the users who are most likely to gather together in the same place, such as the financial district," notes David Neale.

MEETING USER EXPECTATIONS

"We worked very hard with our partners GoAmerica and RIM to offer our customers BlackBerry with Internet services. Since the service was launched nearly two years ago, it has been tremendously successful, proving that we offer a simple, reliable and truly integrated service that users find indispensable.

"Our mobile Internet service goes from strength to strength. It has the lowest churn rate of all the many services that Rogers AT&T Wireless operates. More and more people are using it and becoming dependent on it. We couldn't ask for greater success than that," concludes David Neale. ■

SERVICE	RANK
Weather	1
Search Engine/Tools	2
Travel	3T
Town/Local Information	3T
News/Information	5
Shopping	6
Living	7
Entertainment	8
Work Matters	9
Mobile Banking	10
Personal Finance/Stocks, Quotes and Trades	11
Sports	12

Search Engine/Tools = Search Engine for the Web, Dictionary, Reference.

Travel = Traffic Update, Airline/Train Update, Vacation Resources, Lodging, Car Rental.

News/Information = Financial News.

Shopping = Auctions, Gifts and Flowers, Comparison Shopping, Buyers Guides, Computers and Gadgets.

Living = Gourmet/Recipes, Toddler Watch, Chat, Communities, Craft and lifestyle, Health/Nutrition/Fitness Resources, Family Advice/Recources. Location/Tracking.

Work Matters = Small business Resources, Career Resources, Job Search.

MICESS ONE YEAR ON

The mobile Internet is taking off in Korea. The country's Mobitex operator Intec Telecom launched its Micess mobile Internet access service towards the end of 2000 and has steadily been adding subscribers.

"The unique features of the Mobitex network and our Micess service give us a significant advantage in the market," says Won Baek, MOA board member and CEO of Intec Telecom. "Much hard work remains, but we are confident that our strategy will be successful and that we will achieve our targets."

Korea is a challenging market for mobile Internet services in many respects. Mobile telephone penetration is now above 50 percent, with CDMA as the dominant technology, and pagers remain popular. Koreans are very knowledgeable about technology, well educated and relatively affluent. The country is also home to many world-renowned high tech companies. Korea was severely affected by the Asian crisis of the late 1990s but has recovered rapidly. Stock prices slumped, and technology stocks in particular remain depressed. However, this has not stopped Koreans from stock trading.

"More than three million Koreans are active stock market traders. The popularity of securities trading is probably attributable to the fact that we Koreans like to take risks," notes Won Baek.

Stock trading was the first mobile Internet service launched. A special application was developed for the TWM3 wireless hand-held that provides stock price information and charts, stock market news and special screens for buying and selling stocks. The application is currently used by ten stock brokerage firms. There is a fixed monthly fee of USD 35 for the service, which is typically paid by the brokerage for VIP customers.

Customers are very pleased with the application. "The display is much larger than on other hand-held devices. The menu is easy to understand and selections can be made by simply clicking on the icons," says Moon Hong Jo of the Korean Investment Trust Management & Securities Company (KITC).

UNIQUE TRAFFIC PATTERNS

The Micess service for the consumer market soon followed. In addition to various forms of wireless messaging, such as Internet e-mail and interactive messaging, Micess includes WAP access to popular websites, interactive games and a variety of information services. A fixed monthly fee of USD 27 is charged for the service.

"We experienced some initial problems with applications and content, and the service had to be re-launched in May 2001. Now the Micess service is running smoothly and is quickly becoming the success that we anticipated. Thousands of subscribers are signing up each month," reports Won Baek. Korean mobile Internet users show a somewhat unique traffic pattern. Because the TWM3 device includes a WAP browser, WAP traffic is greater than any other application. This is closely followed by stock market information, while e-mail comes far down on the list.

TROJAN NICHES

Intec Telecom is looking for what Won Baek refers to as Trojan niches for Mobitex technology. "The real challenges are not from other technologies," says Baek, who has carefully studied the CDMA2000 technology now being introduced in Korea. "We need to focus on niche markets and form strategic alliances that leverage the unique benefits of Mobitex."

One such Trojan niche in which the Korean operator sees considerable potential is gambling. Intec Telecom has worked with the Korea Racing Association to develop a betting application for use at race tracks that exploits Mobitex' unique strengths. People betting on horse races naturally want the most up-to-date race-related information, which can easily be delivered to a wireless handheld device. However, they also tend to wait until the last minute before placing their bets, meaning that hundreds or even thousands of transactions must be processed simultaneously. This is where all other wireless technologies break down, while Mobitex, which was designed from the start to handle short, bursty data and hundreds of users per channel, really shines.

VALUABLE LESSONS LEARNED

Intec Telecom is working hard to identify other Trojan niches for its network services, in which the mobile Internet, WAP and IP connectivity will play an increasingly important role. The next major application area will undoubtedly be wireless POS (point-of-sale) services, for which CNI has developed both a wireless POS terminal and a wireless POS attachment for the TWM3 that are described in greater detail in the Market News section. "We are targeting the fixed wireless POS segment, rather than the mobile POS market," says Won Baek. "Our focus will be on fast transaction times and low services fees. We will also include additional functions for advertising and CRM (customer relationship management) that will take advantage of WAP and Internet connectivity."

"People betting on horse races naturally want the most up-to-date information."

"In summary, we are still struggling to achieve the success to which we aspire," concludes Won Baek. "However, we have learned some important lessons that will ensure that success. We now have very flexible business models and well orchestrated marketing plans for carefully selected target markets. In addition, we have enhanced our network and now offer very robust applications and higher quality devices at lower prices. We have opened up a consumer market and continue to gain ground in vertical markets." ■

Don´t miss the 2002 FIFA World Cup soccer championship in Korea/Japan.

Design the hardware. Develop the software. Test the completed product. These are the three easy steps for building a Mobitex modem. Well, maybe they aren't so easy, but the design process for producing a Mobitex modem is very straightforward. Luckily, much of the hard work has already been done. Today there are a variety of tools and hardware and software components readily available for building a Mobitex modem. Ericsson can also provide extensive support for testing and verification of the final product.

BUILDING A MODEM IN THREE EASY STEPS

Step one: Design the hardware. The radio modem is the core component in any wireless terminal device and the component that provides the network connection. In addition to network connectivity, a fully functional terminal, whether it is a wireless PDA (personal digital assistant) or a POS (point-of-sale) terminal, must provide some form of user interface that allows input and display of the data being sent and received over the network. Since the focus in this article is on radio modems, we will not be concerned with the many different types of terminal devices used on Mobitex networks. However, it is important to consider the interfaces that a radio modem provides to support terminal applications.

Typically, a radio modem provides connectors for an antenna, a power supply and a serial interface. Data is normally exchanged between the modem and the terminal via the serial interface. In addition to this interface, some radio modems, such as the Ericsson M3000 series of OEM modems, employ I^2C or some other interface that is more powerful and versatile than the standard RS-232C serial interface. In most cases, the actual data being exchanged over the network is still handled by the serial interface, while the second interface is used for communication between the modem and the application. As will become clearer below, the serial interface is often called the MASC port, since it uses the Mobitex asynchronous communications protocol exclusively.

"Basically, a Mobitex radio modem implements the functionality required for the lowest levels of data communication, which are the physical, link and network layers," explains Folke Bergqvist, chief technology officer Mobitex at Ericsson Mobile Data Design. "Primarily this is done in hardware, but software called firmware that is embedded in the modem plays an important role. Some OEM modems, such as our M3000 products, are also able to host onboard applications, while others are designed to be connected to a separate data terminal."

Step two: Write the software. The hardware required for a Mobitex modem can be implemented in a number of ways, depending in part in how much software will be hosted on the modem. The simplest approach is to use a special chip, such as the CMX909B from Consumer Microcircuits Limited (CML), which contains all the baseband signal processing functions required for a Mobitex modem in a single integrated circuit. Other approaches are to use a general-purpose DSP (digital signal processor) chip or a powerful CPU (central processing unit) chip, both of which can be programmed to perform the required baseband signal processing functions, as well as other signal processing. The CPU can also provide enough processing power to host onboard applications and a Java virtual machine (JVM).

An important component in the software required for a Mobitex radio modem is the protocol stack. Technically, a protocol stack is the set of protocols that work together on various levels to enable communication over the network. For a complex protocol suite, such as IP (Internet Protocol), the protocol stack must support not only the familiar higher-level protocols ftp (file transfer protocol) and http (hypertext transfer protocol), but dozens of other less familiar protocols. Mobitex is much simpler, requiring only MASC and MPAK protocols (see following sidebar) for basic functionality. It is worth noting, however, that the protocol stacks used in many Mobitex terminals also support additional protocols for POS (point-of-sale) applications, for example, as well as extensions for such purposes as data compression and encryption.

"Developing the protocol stack and associated software required for the basic radio modem functionality is a challenging task," notes Folke Bergqvist. "For this reason, many designers of wireless data terminals elect to use OEM modems for Mobitex, which are available from a variety of sources and typically provide a high-level application programming interface (API) for developers. Alternatively, several suppliers offer software packages that can be integrated with the modem hardware. This approach requires more work and involves more low-level programming, but it is sometimes the only alternative when a custom design is required."

Step three: Test the device. The final step in building a Mobitex radio modem is to make sure that it works. This naturally includes verifying the design and testing the basic hardware and software functions, steps that are normally completed before a prototype is produced and further development work is begun. More importantly, however, the designers must verify that the Mobitex protocol has been implemented correctly and that the modem functions correctly on the network under a variety of traffic conditions. Some of these tests can be performed using emulation software, but final testing requires a live network.

"We can provide a number of time-saving tools and services during the testing and verification stages to help designers get their product to market faster," notes Folke Bergqvist. "Ericsson has extensive modem expertise that our business partners can leverage. We can also assist in ROSI, MASC and Radio Performance verification. Naturally, these services are provided under strict confidentiality."

As was recently announced, Ericsson does not currently plan to develop any new Mobitex modems. Instead, the company will continue to support the M3000 series OEM radio modems for Mobitex and to assist third-party suppliers in developing new radio modem products. Companies wishing to develop Mobitex modems can thus count on Ericsson's expertise and rest assured that Ericsson is committed to helping its partners succeed in their targeted markets and to making Mobitex an even greater success. ▶

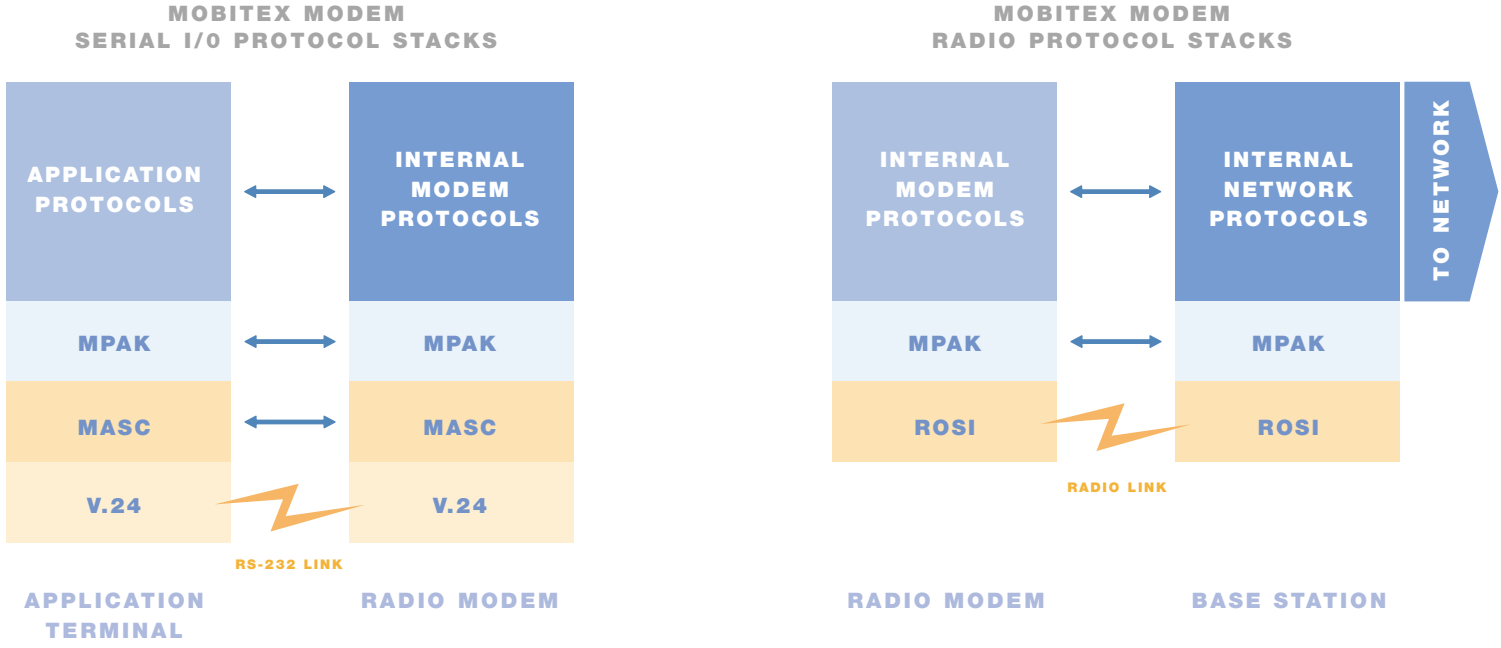
ROSI – HOW TO GET MPAKs INTO THE AIR

The term modem is actually a contraction of MOdulator/DEModulator. The modem thus modulates and demodulates the radio frequency carrier with a signal to be transmitted or received. This is the baseband signal, which is an analog signal that contains the bit stream that is the input or output on the radio port.

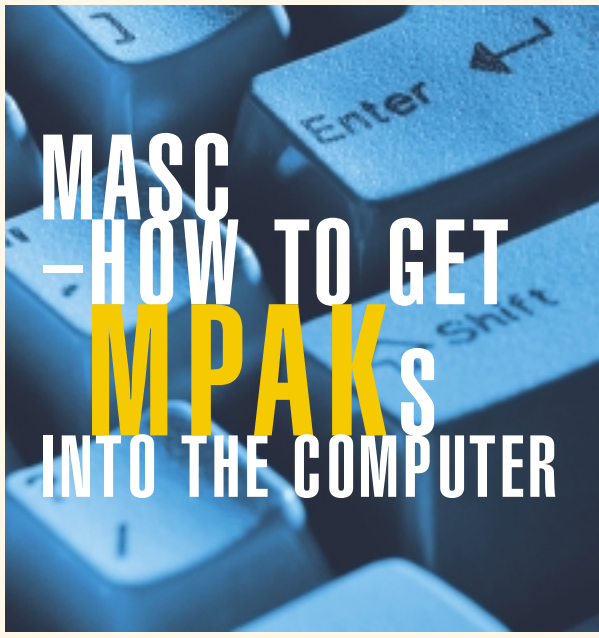
The digital bit stream is coded according to ROSI, the Mobitex RadiO SIgnaling protocol, which in turn carries the MPAKs used for data exchange. Within the modem, there is a circuit that codes and decodes the MASC binary data, adding error correction and error detection codes and framing data in the process (Illustration below).

This digital signal is converted into the analog baseband signal that will modulate the carrier using a technique called Gaussian Mean Shift Keying (GMSK). GMSK is one of several modulation techniques in which the amplitude, frequency or phase of an analog signal is varied to indicate a change in state between 0 and 1 in a digital bit stream. When the baseband signal is modulated onto the radio frequency carrier, the result is ROSI, the RadiO SIgnaling layer that defines the air interface for the Mobitex wireless data network.

GMSK and ROSI are thus the lowest two levels of the Mobitex radio interface. On the terminal side, the corresponding interfaces are V.24/V.28 or a similar serial interface at the physical layer and MASC at the link level.



"Mobitex OEM modems are manufactured by CNI, Ericsson, Maxon and RIM. Several new products are currently being developed."



MASC – HOW TO GET MPAKs INTO THE COMPUTER

MPAKs (Mobitex PAcKets) are the basic unit used for communication between the terminal and the network and for data exchange between users. As the diagram shows, MPAKs correspond to the network layer in the data communications model and are formed using MASC, the Mobitex asynchronous protocol, which is a full-duplex serial data protocol.

The data on the serial port can thus be interpreted as characters or bytes and adheres to the MASC protocol. Certain byte sequences are directly interpreted as link-layer commands for controlling the modem or the connection. Data being exchanged between the terminal and the network, however, is formatted as MPAKs, which employ a frame structure with a number of pre-defined fields depending on the packet type.

MPAKs provide the functionality required at the network layer. Each MPAK contains the MAN numbers of the sender and receiver, an optional address list and one or more type-dependent components. MPAKs are normally divided into two types called DTESERV (data terminal service communication) packets, which update the data used for traffic switching in the network or data terminal, and PSUBCOM (packet subscriber communications) packets, which are exchanged between subscribers. The HPDATA (higher protocol data) MPAK, for example, belongs to this latter class and can be used to embed higher level IP packets in a mobile Internet application.

HARDWIRED OR HAND-CODED?

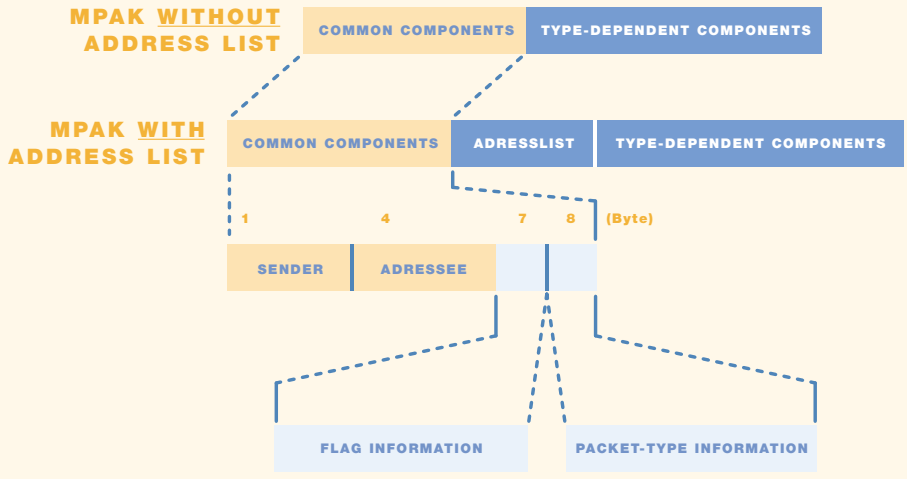
The signal processing functions required for a Mobitex radio modem may be implemented in hardware and/or software. Devices used for signal processing range from a chip specially designed for Mobitex or GSMK radio modems to a digital signal processor (DSP) or a general purpose CPU chip. Conceptually, the modem chip is an ASIC (Application Specific Integrated Circuit) that performs a single signal processing function that is hardwired in the chip, while the CPU chip, which could be the same as the processor used in a conventional handheld or desktop PC, implements the signal processing function entirely in software, often as a highly optimized and hand-coded algorithm included as firmware in a ROM chip in the modem.

Between these two extremes are DSP chips, which can be programmed with software to perform a variety of signal processing functions. The chip itself implements a number of general purpose signal processing functions, such as matrix multiplication, which is required for many types of spectral analysis. These powerful functions make it much easier to write software that performs sophisticated signal processing tasks like noise reduction algorithms for improved RF sensitivity. Because the DSP chip itself is relatively expensive and a general purpose CPU chip is often also needed, a DSP-based design is typically employed only when other types of signal processing are needed than that required for the Mobitex modems.

A basic radio modem that will be connected to a data terminal via the serial port can employ an ASIC-based design that does not include a CPU chip. A design that includes an onboard CPU, on the other hand, is typically employed for self-contained devices, such as a wireless PDA or POS terminal. In this case, the display and keypad are integrated in the device, and the functions required for a PDA or POS terminal are implemented in the firmware.

Some OEM radio modems for Mobitex, such as the Ericsson M3000 series, are a special case, because they are more than a modem, yet not designed as stand-alone units, but rather for integration in another manufacturer's device. The M3000, for example, not only includes a general purpose CPU and firmware stored in ROM. It also offers RAM memory and a Java Virtual Machine (JVM) for hosting onboard applications. For the designer of a vending machine or an electricity meter, for example, such a device makes it very easy to add wireless telemetry capability.

MPAKs STRUCTURE



MOBILE MARKET NEWS

TOUGHBOOK 01 CUSTOMIZABLE WIRELESS HANDHELD PC

The Toughbook 01 is a new wireless handheld PC from Panasonic, a company well known for its ruggedized computers. The new unit is designed to be extremely durable, with sealed port and connector covers and a moisture resistant casing. Powered by an 206 MHz Intel Strong ARM processor, the Toughbook 01 features 32 MB RAM and 32 MB flash EPROM as standard, a 240 x 320 active matrix color LCD display and a 36-key backlit keyboard.

Mobitex and several other wireless communication options are available for the Toughbook 01. The handheld device is powered by a rechargeable Lithium Ion battery that provides 8 hours of operation with the front light on or 24 hours with the light off. A GPS compact flash card is available as an integrated option, as are numerous accessories.

RAD FOR MOBILE INTERNET

Rapid application development (RAD) for the mobile Internet is getting easier. As Cliff Haas, manager of the Cingular Wireless' Development Program, reports, when the US Mobitex operator needed a web-based application to support its own sales force, the company decided to use a tool called Intava Gravity that allowed the developers to get an application up and running in just days.

DEVELOPERS HAD THE SOLUTION

"Not long ago, simply making data available on the Internet was enough to satisfy the user community. In today's mobile society, however, users want more. Cingular Interactive's direct sales force was no exception. They wanted a way to wirelessly access critical sales information," notes Cliff Haas.

Cingular's web developers quickly found the solution. They started by adding few web pages to the sales portal to allow sales representatives to log in and execute a database query to determine the status of their order. Once the sales force was satisfied with this solution, the next step was to extend the functionality of the web portal to a micro browser running on a RIM handheld.

"This was not as daunting a task as might be thought," says Cliff Haas. "Although fully developed resources for integrating wireless technology into a wired application were relatively scarce only a short time ago, the space has rapidly been filled with a variety of easy to use tools and references. In this case, Cingular used the Intava Gravity toolset to build the application for querying the sales database through the micro browser. Within the Gravity toolset, there is not only a WYSIWYG WML editor for the static content, but also assistance in setting up the backend functionality."

FOCUS ON REAL BENEFITS

Intava Gravity is an open and extensible platform in which users can rapidly and professionally develop rich mobile applications that are both easy to use and scalable. It provides a modular environment where code can be re-used and shared and allows developers to target multiple device platforms with a single development effort. Initially supporting both WAP and the Palm operating system, Gravity will also provide support for Microsoft's Pocket PC platform.

"Intava Gravity reduces the complexity, time and cost of making compelling Internet solutions available on a range of mobile platforms. This is the industry's first multi-platform wireless Web development application," notes Troy Kaser, vice president of product management at Intava.

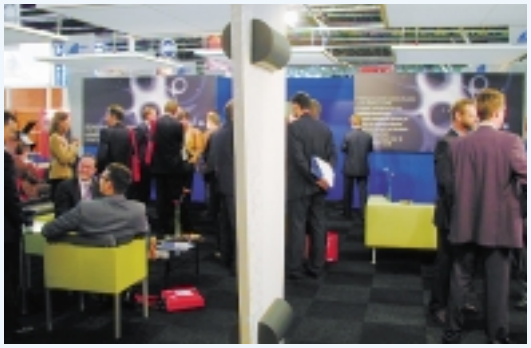
"Using the Gravity toolset, the simple database query application was built in just a few days," relates Cliff Haas. "The convenience to the sales force is immeasurable. The implementation was both expedient and low cost. To those working in the wireless industry, the most valuable reward here may be the fact that a user group has been introduced to the convenience of wireless through a positive experience."

Cliff Haas feels that Cingular's experience in rapidly developing and deploying this application provides some valuable lessons for people who are still waiting for wireless multimedia and all of the other things promised by 3G. "Enthusiasm for what may come tomorrow should not be allowed to distort the reality of the present. It is important that this generation of wireless developers and users have their expectation set properly in order to keep the focus on the real benefits of today's technology," concludes Cliff Haas. ■

NEW KOREAN MODEM SUPPLIER

Duretech, a leading Korean communications supplier established in 1999 and with annual sales of USD one million, has announced a wireless PDA and an OEM radio modem for Mobitex. The PDA, which has a clamshell form factor, will support wireless messaging, as well as calendar, memo and to-do list applications. Weighing only 32 grams, the radio modem is extremely compact, measuring just 41 x 61 x 8.5 mm, yet delivers 2.0 watts of transmit power with a receiver sensitivity of –115 dBm. Both products, which are designed for 900 MHz operation, will be available early next year. ■

RAM AND PARTNERS AT MOBILE & WIRELESS



RAM Mobile Data Netherlands made an impressive showing recently at a Mobile and Wireless exhibition in Amsterdam on November 28 to 30 that proves that partners hold the key to customers. Exhibiting together with no less than 18 partners in a stand totaling some 3,000 square meters and in which the focus was on field service, RAM Mobile Data was perceived by visitors as the largest exhibitor and the supplier capable of delivering mobile solutions for every business.

As part of the exhibit, RAM sponsored a three-hour seminar at which the most popular and interesting presentation was about Essent, which is the Netherland's largest gas and electricity supplier and a satisfied RAM customer since 1997. Today, they have 280 active users but are planning for an increase to 1000 users.

"When introducing wireless data, it is absolutely essential to have a clear business process and not to mix different processes," says Keimpe Bleekert, consultant at Essent. "Transaction times also need to be related to the duration of the process. If an order handling process takes several days, then it makes little difference if entering the order wirelessly takes three or ten seconds.

Our experience indicates that choosing the hardware is the last thing you should do in a mobile data project," continues Keimpe Bleekert. "Network availability, on the other hand, is extremely critical. We chose RAM Mobile Data because the network is extremely reliable and will continue to function even during power failures." ■

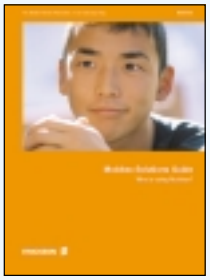
Web addresses to exhibiting RAM partners:
www.groenevold-group.com
www.citygis.nl
www.transics.com
www.dataction.nl
www.idesta.com
www.zetes.com
www.crmvision.com
www.axias.com
www.ctrack.nl
www.ferranti.be
www.park-line.com

NEW MOBITEX BROCHURES

New Mobitex brochures and product sheets are now available. The Mobitex Systems Guide (What is Mobitex technology), Mobitex Solutions Guide (Who is using Mobitex) and Mobitex Business Guide (Why use Mobitex as a carrier) are three completely re-designed brochures that present Mobitex technology from three different perspectives in an informative yet informal manner. New product sheets include a presentation of the Network Control Center (NCC) that describes all the latest product enhancements, as well as the business benefits for operators.

These new brochures will become essential marketing tools for Mobitex. All brochures and product sheets can be downloaded from the Mobitex website or ordered directly from Ericsson. ■

Mobitex Systems Guide



Mobitex Solutions Guide

Mobitex Business Guide

Product sheet Network Control center

PALM i705

Palm announced the i705 handheld, a new Mobitex-based device which features an always-on wireless architecture, rechargable battery, and a number of new and upgraded features. Read more in our next issue. ■

CNI COVERS ALL BANDS

Korean manufacturer CNI (Communication Network Interface) has become the first supplier to offer devices for all Mobitex frequencies. Both the company's OEM radio modem and highly successful wireless PDA for Mobitex are now available in 400, 800 and 900 MHz versions.

Last year, CNI's 400 MHz products for the UK received ETSI certification. In january of this year, the CNI-430 ME device for use in continental Europe was also certified. The corresponding products for 900 MHz were certified by the FCC last year for use in North America, and type approval for the 800 MHz products was recently granted in China. Type approval is in the process in Hong-Kong.

The CNI-430MU wireless handheld for the UK was developed in record time. Work commenced in March of 2001, when UK Mobitex operator Transcomm signed a contract with CNI for development of the device. Just four months later, the device was ready and ETSI certification was received on the first try. Wireless modems and handhelds are now shipping to different countries. ■

INTELLECT SAPPHIRE FOR WIRELESS POS

The Intellect Sapphire is a wireless POS (point-of-sale) terminal developed by the Belgian company Intellect International. The company, which also has offices in the UK, Australia and HongKong, has been active in the global market for electronic payment solutions for more than 15 years. Intellect International is represented actively in 30 countries by qualified partner channels.

Sapphire wireless POS terminal will soon be available in a version for Mobitex 400 MHz. Designed to be fully portable, the Intellect Sapphire can be operated on rechargeable batteries, AC power or DC power provided by a vehicle. Other device features include a hybrid magnetic card reader supporting any combination of tracks 1, 2 and 3, support for up to four SAM chip card modules and standard or high performance security modules. A carrying case, a docking station, an extra battery and a vehicle charger are available as accessories. ■

VERSATILE POS TERMINALS

Adding to its already impressive line-up of Mobitex devices, Korean manufacturer CNI has released a new wireless POS (point-of-sale) terminal called the ePOS and an add-on device for its popular wireless handheld. The ePOS wireless payment terminal is unusual in that it supports both wireless (Mobitex) and fixed (PSTN) connections in a single device. The CNI ePOS terminal is now being deployed in Korea, but because it is based on CNI's OEM radio modem for Mobitex, it will be available in all markets.

The CNI ePOS accepts both magnetic cards and smart cards and can support up to three SAM cards. Multiple card operating systems are supported, including systems from Gemplus while Bull and Samsung will be supported in the near future. An SDK (software development kit) is available for third party developers.

The ePOS mobile add-on device for CNI's wireless handheld has the same basic functionality as the ePOS device, although it lacks support for a PSTN connection. The device plugs into the base of the handheld, which is then used as the POS terminal. ■

NETPAD MADE FOR BUSY HANDS

Psion Teklogix's new netpad is a handheld tablet computer based on the Symbian operating system that is specially designed for demanding mobile applications. Combining power and flexibility in an innovative design, netpad is a cost-effective solution that delivers data capture and processing capabilities to workers on the move. Lightweight and ergonomic, the netpad's rugged design and tablet form factor make it an ideal choice for all field service, field data collection, mobile sales and track, trace and delivery applications, including installation and repair, meter reading, route sales and asset tracking.

Based on a 206 MHz Intel Strong ARM processor, the netpad features a half-VGA size (640 x 240 pixel) color display that can be switched dynamically between landscape and portrait operation, a pen and touch-sensitive screen, and an on-screen keyboard. Power performance is outstanding, with a single charge providing more than 8 hours of battery life plus instant-on capability. A wide range of charging, docking and wireless connectivity options will be available, including Mobitex.

Designed as a rugged and ergonomic tablet that can be used in the most demanding environments yet fits comfortably in the hand, the netpad is destined to play a central role in Psion Teklogix' mobile computing strategy. The multi-tasking Symbian operating system and built-in Java support also provide an ideal platform for rapid development of applications for the task-specific industrial mobile computing solutions in which Psion Teklogix is a world leader. ■

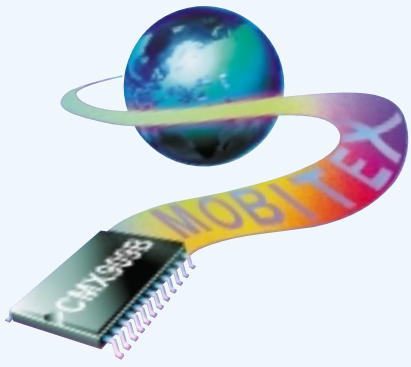
MENTOR INTRODUCES STRYDER

Stryder is a new handheld PC from Mentor Engineering, a Canadian company that is a leader in mobile data and AVL/GPS solutions with more than 140 installations worldwide. The Windows CE-based Stryder features a 206 MHz Intel Strong ARM processor, a 6.4 inch VGA TFT display, a touch screen, number pad and navigation control keys. In addition to an infrared (IrDA) port, the Stryder handheld PC offers Bluetooth as an option.

Options available for Stryder include a DVD/CD-ROM drive, an internal GPS module and an internal Mobitex modem, both with built-in antennas. The unit also includes a type II Compact Flash socket, USB, RS-232 ports and a magnetic or smart card reader. Based in Calgary, Alberta, Mentor Engineering has recently opened a European sales office in the UK. ■

CML INTRODUCES NEXT-GENERATION MODEM CHIP

CML (Consumer Microcircuits Limited) has introduced the CMX 909B, the latest version of its highly successful GMSK packet data modem chip for Mobitex. The new product contains several enhancements for improving battery life, including support for the Short Block acknowledgement frame as specified in the R14N Mobitex system release and multiple power save modes that allow implementation of more intelligent power management functions. Envelope detection algorithms and other signal processing functions have also been enhanced to further improve modem performance. The CMX 909B is being used in several next-generation devices, including products from CNI and Duretech. ■



WIRELESS DATA EXTENDS CARE

Dr. Rolf Karlsten is the head doctor for the ambulance services of Uppsala County Council comprising an area of 6,846 square kilometers in central Sweden just north of Stockholm. The county's central hospital is Uppsala University Hospital. Today all ambulances are equipped with Mobitex and dispatched centrally by the SOS Alarm Center, which handles all calls to the 112 emergency number.

The Mobitex application used in the ambulances is MobiMed, a system for telemedicine, IT support and data communication (patient informatics) for pre-hospital and ambulance care supplied by Ortivus.

When did Uppsala begin using MobiMed?

We first began using MobiMed in 1989. At that time, we wanted to see if we could send electrocardiogram (ECG) data from the ambulance to the receiving doctor at the hospital. We showed that it was possible to do it, but at that time, no one knew what to do with the data. Since then, MobiMed has become a central application in an integrated information system for patient data.

What information is sent from ambulances on the way to the hospital?

The information sent from the ambulance naturally depends on the diagnosis. Two prioritized patient groups are heart and stroke patients. For heart patients, for example, we send ECG data, as well as other vital signs. The handheld computers also contain various electronic forms for specific conditions, such as breathing difficulties, that prompt the person administering treatment in the ambulance for different types of data and provide instructions for the procedures to be used.

Who receives this information at the hospital and how is it used?

The information goes directly into the hospital's information system and becomes part of the patient's medical record. It is important that data should only be entered once and that

Portable PS-based Mobimed ambulance unit.

it should be easy to generate medical records that document treatment as it is being provided. We have also devoted considerable effort to developing decision support systems that not only automatically collect certain types of data, but also provide guidance for medical personnel administering the treatment.

What are the benefits for the patient?

Treatment can be provided more quickly and at an earlier stage. With heart patients, for example, we can begin anticoagulant treatment in the ambulance on the way to the hospital. Heart patients are taken directly to the cardiovascular intensive care unit. Stroke patients are taken directly to radiology or neurology. At the hospital, specialists are standing by, ready to take care of the patient when the ambulance arrives.

Are there cases where MobiMed has saved lives?

There are many scientific studies showing that reducing the time until treatment begins significantly reduces the number of deaths. For heart patients, for example, beginning treatment one and a half to two hours earlier can reduce one-year mortality by 50 percent. In a county where an ambulance transport from some outlying towns into the central hospital can take one to one and a half hours, we know that MobiMed saves lives.

What other forms of wireless communications are used in your organization?

Mobitex is the communications channel that we depend on. The ambulances are also all equipped with GPS positioning equipment. Naturally most personnel have mobile phones, but they are only used as a supplement to Mobitex. Unfortunately, when mobile phones are needed most in conjunction with major accidents, they are not reliable, because the network quickly becomes overloaded.

Do medical applications make special demands on communications and computing devices?

For data communications coverage, reliability and security are the key concerns. It took some time to get from what the engineers considered 99-percent coverage to the coverage we need, but we now have complete coverage so that when a serious bus accident occurred a few years ago in a very isolated area, we could depend on Mobitex. The network does not become overloaded, even when dozens of emergency workers need to use it in a single location. Data communications are reliable and secure, meaning that we can send critical medical data wirelessly with complete confidence that the patient's integrity is protected.

With respect to computing devices, ambulance personnel need extremely rugged devices that are compact and easy to use. Accidents often happen under the worst possible weather conditions, and accident scenes place far greater demands on equipment than the most demanding industrial environments. The ambulance personnel's first priority is naturally bringing medical equipment, not computers, to accident victims, so any computing device they may carry really has to be as compact and lightweight as possible and provide functionality that motivates its use at an accident scene.

What kinds of wireless communications and computing devices would you like to see in the future?

Handheld computing devices are becoming increasingly powerful and can now support some very sophisticated decision support software, in addition to the basic telemedicine, IT support and data communication functions that are needed for our system. Computing devices still need to become easier to use, and a rugged and ergonomic design is naturally particularly important for us. Touch screens and a simpler user interface are also desirable.

What are the most promising developments for the future?

One area where I am particularly hopeful concerns local communications at the scene. When our personnel leave the ambulance to enter a patient's home, for example, there is a need to exchange data between the equipment that they carry and the equipment in the ambulance, as well as to maintain wireless wide area communications. Particularly at major accident scenes, there is also a need to share information among emergency workers. New, more portable wireless devices, docking stations and new technologies such as Bluetooth could revolutionize rescue work. The potential exists to share data and coordinate everyone's actions, thus significantly improving emergency medical care.

Is Sweden a leading country in this area?

I'm not sure that Sweden is the leader in this field, but we are certainly very advanced. Perhaps what distinguishes us the most is that boundaries between different parts of the medical care system are disappearing. We obviously work very closely with intensive care units and medical specialties, such as neurology and radiology. On the other hand, we also work very closely with the primary care organization and have an important role to play there.

Today, the ambulance service is not solely a question of emergency transport. We are an integral part of the medical care organization, and an ambulance is really a mobile medical care unit. Sometimes when we are dispatched to the home of a person experiencing a medical emergency, we can provide the necessary treatment in the home and ensure that a primary care physician follows up the treatment. With the resources that we have, we do not always have to bring the patient to a hospital. That not only saves money for society. It increases the quality of care for the patient. ■

"New, more portable devices and new technologies such as Bluetooth could revolutionize rescue work."

Leaving the digerati in the dust

"What kind of work do you do?" asked my seatmate. My sigh of exasperation must have been a little too loud because I could see that his face immediately assumed an apologetic expression.

"I'm a telecom consultant. I mostly work with mobile Internet," I replied, trying to assume a friendly tone. Explaining my work to an outsider was never an easy task, but it was a long flight and there would be plenty of time. I put down the handheld that I had been using to enter my latest expenses and prepared myself for a long conversation. It was a wireless device, but naturally the radio had been turned off to comply with aviation regulations.

"That's really interesting! But tell me. Just what is the mobile Internet? I mean, if I understand things correctly, the Internet doesn't exactly move around, does it?" replied the man, who had introduced himself as Jerry.

"No, it doesn't!" I laughed, grateful that Jerry was at least taking a tongue-in-cheek approach to a subject that he probably knew little about. "The Internet is a fixed network with a high capacity IP backbone that interconnects a bunch of other networks and lots of servers. So in that sense, the mobile Internet really is a misnomer. It actually refers to the means of access, which is wireless."

"I see. Well, if it's wireless, it's got to be hot, but I suppose calling it the wireless Internet would sound like a contradiction in terms," said Jerry with a mischievous glint in his eye.

"Yes, wireless is the rage, all right, and it certainly helps me to pay the bills," I countered, feeling myself relax. "More to the point, wireless Internet access lets people on the move get information when and where they need it."

"So the technology is wireless, but from the user's perspective, it's all about mobility," said Jerry, striking a suddenly serious tone. I was momentarily taken aback. My first impression of a clueless individual was obviously wrong. Jerry's comment showed genuine insight.

"That's right. But more than that, it's about interactivity. With the Mobitex technology that I work with, a user can schedule meetings on the fly and interact with colleagues all over the world via Internet e-mail," I said, hoping that my excitement would not dampen Jerry's interest.

"That must really be great," said Jerry, pausing to think for a moment and looking at the laptop on the tray table in front of him. "I wonder, though. I mean, I've never had much use for those tiny personal organizers, even though I've heard you can do great things with them these days. To me, they just seem like toys that can't perform the kind of work that I need a real computer for. As for surfing the Internet using one of those handhelds, well, I just don't see how it could work."

"Well, that's the other part of what the mobile Internet is all about," I said, wondering how much I needed to explain to Jerry. "You're right about small devices not being much good for accessing conventional sites, but things are changing. Today there are lots of websites and portals that are specially designed for mobile users. Many handhelds are now also WAP- or Java-enabled so that they are truly useful for accessing the Internet."

"So the mobile Internet really is something different," said Jerry, pausing to reflect on this insight. "But tell me something. If not all websites are designed for mobile users, then the mobile Internet must only be a small subset of the whole Internet, meaning that the fixed Internet that PC users see and the mobile Internet that you see are two different beasts."

"It's no small subset any more, and it's growing all the time. Tomorrow's Internet will support access from a wide variety of devices, not just multimedia PCs with a broadband connection," I replied gesturing toward the laptop on which Jerry had been watching a DVD film.

"So those wired guys who design all those cool websites really just don't get it, do they?" replied Jerry, clearly amused by this thought.

"No, they don't. I'm afraid the mobile Internet revolution is going to leave the digerati in the dust," I chuckled.