

Equipment for mobile telephone networks is an established feature of the Stockholm skyline nowadays. A study carried out by Ericsson and AT&T shows, however, that the networks have limited environmental impact. Photo: Lars Åström

Telecom systems have low environmental impact

IT and telecom systems have little environmental impact. This has been shown by a unique study carried out by Ericsson in cooperation with AT&T in California and Stockholm. The study is a so-called life cycle assessment, covering everything from energy usage to paper consumption.

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NEWS

Ericsson buys IP companies in US

The agreement was finalized on April 13 – Ericsson has acquired two American datacom companies. The acquisition of Torrent Networking Technologies and Touchwave means that Ericsson is strengthening its position in the IP area. Experts in the telecom industry have expected a step in this direction for a long time. **3**



Project manager Per Assarsson and his son Mikael...

...along with wife Karin and daughter Johanna are enjoying life in Tel Aviv.



Life is pleasant living in Israel

The Ahnfors and Assarsson families moved to Israel for work reasons. They enjoy the culture, the people and the pleasant climate. **15-17**

Ericsson strategy shows the way

The new telecom world is here and this means that Ericsson must change. Speed, convergence and wirelessness characterize this new world. Read about Ericsson's strategy. **8-12**

New markets for compact AXE

The world's smallest AXE exchange will encourage Russia and Eastern Europe to invest in new telecommunications. The new exchange provides start-up costs for operators who want to expand their networks. **4**

MANY PATENTS

Patent operations gave Ericsson 1,200 new patents last year. **2**

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The publication for Ericsson employees all over the world

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Ericsson's patent portfolio one of the biggest

Ericsson's intentional focus on patent activities has, in recent years, led to a dramatic increase in the number of patent applications.

In 1998, Ericsson sought over 1,200 individual patents on new inventions in over ten countries. Today, Ericsson's patent portfolio is one of the telecom world's biggest.

A strong patent portfolio has become more important than ever for Ericsson. A large number of patents gives the company greater freedom in the aggressive telecom market.

"Our patents also enable us to reinforce market developments that are favorable for our products and services," says Göran Nordlundh who is responsible for Ericsson's patents and patent strategies.

Above all, it is patents related to a particular standard, such as GSM or WCDMA, which are of greatest strategic importance to Ericsson. The reason for this is that many competing firms also own numerous patent rights.

Patents as weapons

"If a particular company tries to hinder Ericsson's operations or shut us out of a standard by holding on to a patent, it's imperative that we have the ability to respond with similar tactics. A judicial process then becomes pointless for the parties involved. The more valuable the patent, the better the negotiating position."

Göran Nordlundh likens this patent game to the balance of power during the cold war where both parties had the most to gain from constructive negotiations. Most often, negotiations over large, general patent portfolios lead to an exchange of licenses that both parties can freely make use of,

so-called cross-licensure. Otherwise, licenses for specific patents are bought and sold like any other trade goods.

Since patents protect against competitors, Ericsson primarily seeks patents in those countries where competing firms have their manufacturing. As a result, most of Ericsson's patent applications are in the U.S., Europe and Japan. The patent market is large, and there are, in fact, companies who do nothing but buy and sell patents rather than manufacture products.

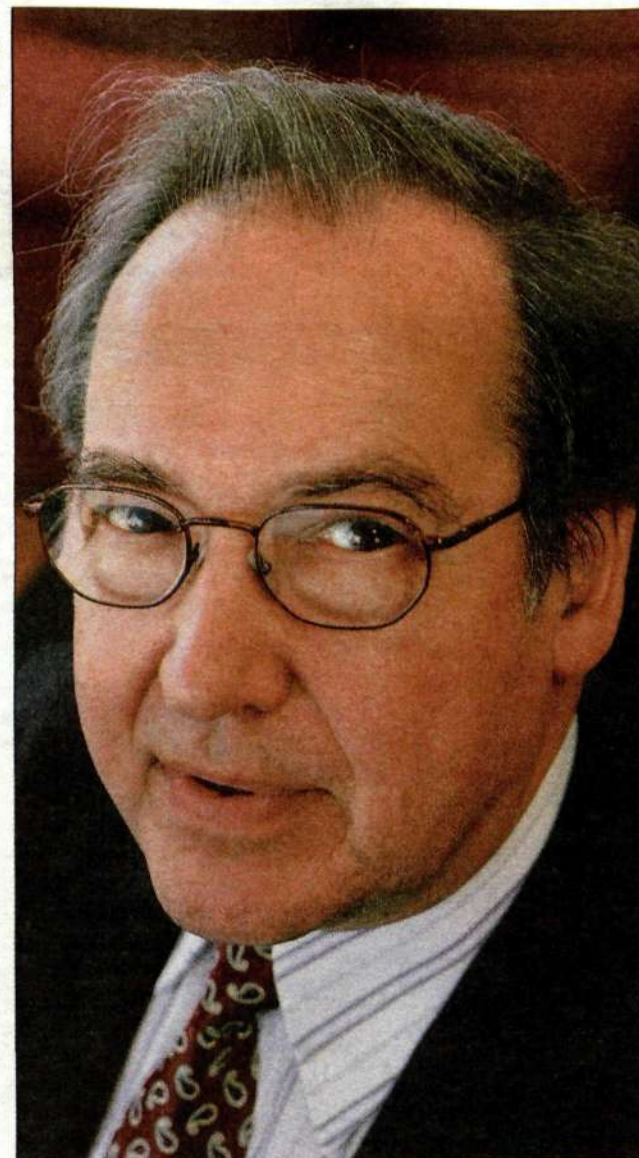
"Such a shortsighted way of thinking does not correspond to our view on patents. Our basic philosophy is that patents should primarily serve to protect the results of our research and development, so that we can deliver leading edge products which are our biggest source of income."

"We do, however, also believe in supporting open standards and low royalties in order to increase the spread of technology.

Everyone benefits from a rapidly expanding market," says Göran Nordlundh.

Ericsson is also very active in various standardization organizations such as UMTS-IPR, ITU and ETSI, in order to be in a position to encourage more openness in the industry. Over the years, Ericsson has been successful in working in a way that has created new, open stan-

“The majority of patent work occurs out in the line organization as a natural part of our research and product development.”



Göran Nordlundh oversees Ericsson's patents. In recent years, individual patent applications, sought in 20-25 countries, have numbered around 1,200 per year. "That is a healthy level," says Göran Nordlundh. "It makes Ericsson one of the biggest in the telecom industry."

Photo: Patrik Lindén

dards that are in line with Ericsson's technology.

Unlike many other companies, patent issues at Ericsson are handled by the Marketing and Strategic Business Planning corporate function. More commonplace is to see companies divide the task up between their technical and legal departments.

Strategic market tool

"This shows our view of patent issues - that they are merely a strategic marketing tool. By adopting such an organizational structure, it also makes it easier for us to raise patent awareness within the company. The majority of patent work occurs out in the line organization as a natural part of our research and product de-

velopment," says Göran Nordlundh.

In every business segment, including applied research, there are patent representatives available to support their unit's patent operations and to ensure that there is an active patent program.

Basis from everyday work

Göran Nordlundh maintains that it is still everyday work that forms the basis for Ericsson's successful patent strategy and the primary reason that Ericsson's patent applications have increased both in quantity and quality in recent years.

Thomas Hedlund

Footnote: This article also ran in the 4/99 issue of Swedish Elektroniktidningen.

More patents in recent years

At present, Ericsson registers approximately 1,200 patents per year.

"That's a healthy level," says Göran Nordlundh, who oversees the company's patent work.

Over the past eight to ten years, Ericsson has placed a heavy emphasis on patents. Now, Ericsson is one of the leading telecom companies in that area.

Patent issues at Ericsson are the overall responsibility of Torbjörn Nilsson, Senior Vice President, Marketing and Strategic Business Planning. In many other companies, patent issues are dealt with by the technical or the legal departments.

"By doing things this way, we are showing that we consider patents to

be a strategic resource. In the future, our strategic patent work will focus on WCDMA technology and other technologies of the future," says Göran Nordlundh.

25 countries on average

Every patent Ericsson applies for is submitted in between 10 and 40

countries. On average, they involve 20 to 25 countries. When Ericsson cites the figure of 1,200 patents per year, that includes only individual patents, each of which could be submitted in as many as 25 different countries.

That is an important fact to consider when comparing the patent statistics of different companies. Some companies add up all their patents in all of the countries in which they were submitted. By that account, Ericsson's 1,200 patents in 1998 would correspond to 25,000 national patents.

Ericsson's corporate patent department will remain in Stockholm for the foreseeable future, since Stockholm accounts for the majority of Ericsson's research and development operations.

Seeks assistance

Ericsson does, however, seek assistance from outside patent representatives and bureaus around the world in order to be as efficient as possible when it comes to new patent applications.

Patrik Lindén

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Strategic acquisitions strengthen Ericsson

Ericsson has strengthened its position in the datacom area by purchasing two U.S. companies for a total of USD 496 million. This is a strategic addition to Ericsson's investment in IP technology.

On April 13, Ericsson announced its purchases of Torrent Networking Technologies and TouchWave. Ericsson is paying USD 450 million for Torrent, which is based in Maryland on the U.S. east coast.

Playing a pivotal role

The company manufactures high-capacity edge routers with dynamic

traffic-shaping capabilities that are expected to play a pivotal role for both IP and ATM--based networks.

"The Torrent products are a strategic addition to Ericsson's carrier-class networking portfolio," said Sven-Christer Nilsson, Ericsson CEO. "The acquisition moves Ericsson squarely into the IP playing field and will have a substantial impact on our ability to provide a complete data network solution. This is in line with our strategy to offer fully integrated capabilities for converged wireless voice and data networks."

Torrent will be incorporated into the Datacom Networks & IP Services business unit. The operations

will remain in Maryland and Triangle Park, North Carolina.

The acquisition of Torrent Networking Technologies brings Ericsson into line with the majority of its major competitors in the datacom area. Ericsson's previous investments in the area include California-based ACC, purchased last autumn.

IP-based corporate solutions

The TouchWave acquisition complements Ericsson's product range in IP-based corporate solutions. Ericsson paid USD 46 million for the Silicon Valley-based company, which will be organized under the Enterprise Solutions business

segment headed by Haijo Pietersma.

TouchWave develops Internet solutions for small and medium-size companies, specializing in IP-telephony solutions. There are many indications that the initial IP-telephony breakthrough will take place in this segment. With the investment in TouchWave, Ericsson now has good possibilities of capturing new market shares in the U.S. and Japan. Concurrently, Ericsson gains access to new distribution channels in the area.

Lena Widegren

hppt://www.torrentnet.com
hppt://www.touchwave.com

Total solutions for future telephony

Third generation mobile telephony will consist of several technical variations. Ericsson supports them all – providing operators with a way to convert to broadband mobile telephony regardless of which frequency and system they currently have.

Ericsson's agreement with the American company Qualcomm, means there are no longer any patent issues standing in the way of developing a third generation mobile telephony system using WCDMA as the dominant standard. The first WCDMA systems are expected to be put into commercial operation in 2001-2002.

Two main standards

"The market has, essentially, two main standards to choose from for the new generation of mobile telephony systems. One standard is known as EDGE and is an extension of today's TDMA and GSM systems, using the existing frequency range. The other standard is based on different variations of broadband CDMA technology," says Mats Nilsson, Ericsson's manager for technical standardization issues.

Ten proposals for a global third generation mobile telephone system standard were submitted last summer to the International Telephone Union (ITU) from standardization organizations around the world.

Fulfilling requirements

Cooperation between the various standardization organizations led to the selection of the two main technologies, and their variations, and both fulfill the ITU's requirements for the third generation mobile telephony system, IMT2000.

"It's quite possible that we'll see mobile phones that work with all the variations of the IMT2000 system. That depends on the needs of the market. The technical challenge will be to provide coverage for all frequency bands in a single mobile phone," says Mats Nilsson.

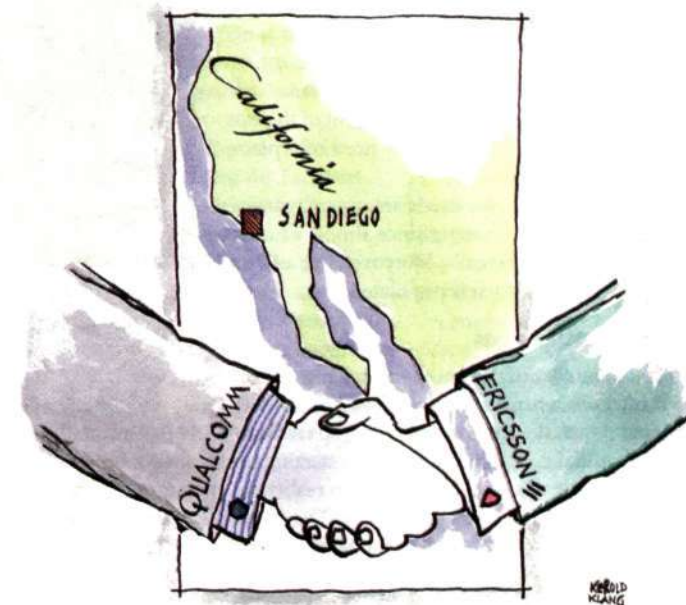
Three CDMA versions

Altogether, there will be three different versions of the broadband CDMA system on the market. These will include the WCDMA system – designed in accordance with the specifications that have been developed by the European standardization organization, ETSI, and the Japanese organization, Arrib – along with the TDD system and the cdma2000 system.

"WCDMA is the optimal technology for the IP and multimedia services that third generation mobile telephony will be able to offer. The technology, which is an evolu-

As a result of the deal with Qualcomm, Ericsson will now be developing the cdma2000 standard. All of the details relating to the deal are expected to be completed by the end of May.

"Ericsson is taking over Qualcomm's infrastructure operations for the CDMA standard and we are forming a new company that will include a business unit within the Operators business segment," says Åke Persson, who will manage operations. The company will be responsible



On March the 25th, Ericsson and Qualcomm announced that the dispute over the CDMA technology patent was over. Illustration: Kerold Klang

tion of GSM, requires that operators have new licenses for the 2GHz band," says Mats Nilsson.

A dozen test systems

Ericsson is leading the development of WCDMA and currently has about a dozen test systems in operation around the world. Ericsson also supports TDD technology, which is a variation of broadband CDMA, and designed for local surface coverage.

Now that an agreement has been

reached with Qualcomm, Ericsson also supports the development of a third CDMA system, cdma2000. This solution is a natural stage of development for current IS-95 operators, most of which are in the U.S.

"This doesn't affect our focus on WCDMA or EDGE. We can now offer a complete package of systems for third generation mobile telephony," says Mats Nilsson.

Nils Sundström

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Developing cdma2000

for developing products and services for CDMA technology, including the current CDMA-One (IS-95) system and the next generation cdma2000 system. Ericsson will also assume control over Qualcomm's production of these systems.

"We're hope to achieve just as high a market share within that area as Ericsson has with its other mobile systems. Having CDMA within Ericsson completes our portfolio and improves our credibility in the market," says Åke Persson.

Åke Persson, who was formerly Ericsson Radio Systems marketing

manager, strongly believes in the future.

"We're aiming at becoming world leader within these mobile systems as well. Now it will be full speed ahead. This was the right step for Ericsson to take."

The focus of Ericsson's CDMA efforts will be on third generation systems. Ericsson now has a complete product line and can support all operators regardless of the technical standard they have chosen.

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IN BRIEF

Major One2One GSM order

► British operator One2One has chosen Ericsson to expand its GSM network. The contract is worth slightly more than USD 320 million.

Ericsson will deliver radio base stations and AXE solutions, among other things, to One2One, which currently has 2.25 million subscribers to its GSM network.

Earlier this year, Ericsson signed a contract with One2One for the delivery of GPRS packet data technology. The technology allows data transmission speeds of up to 115 kilobits per second over GSM networks.

Reduced ownership in AU-System

► Ericsson is scaling down its ownership in the software company AU-System from 41 percent to 25 percent. The shares will be sold to the Schroder Ventures investment company which will become the majority shareholder.

The sale will ensure AU-System's independent role as a supplier to the telecom and datacom industries.

Quick response to Melissa

► The combination of Ericsson's standardized PC environment and its global support organization minimized the effects of the Melissa virus.

On March 29, the Ericsson IT Services hub in Dallas, Texas, sounded the alarm that the Melissa virus had been found in their e-mail system. Within two hours, an antidote was distributed to all users of Ericsson Standard Office Environment.

Design office in Phoenix

► Ericsson Components Group in the U.S. is opening a new design office in Phoenix, Arizona. The design office will develop high-power transistors, RF Power, for the wireless industry. The office will complement Ericsson's design units in Morgan Hill, California; Norristown, Pennsylvania and in Kista, Sweden.

Larry Leighton will be the manager of the new Phoenix office.

E-box network about to be tested

► Gävle Municipality in Sweden will be first in the world to test Ericsson's e-box system which will provide households with a series of new electronic services.

The e-box, the phone jack of the future, operates as a link between the home network and the external world. It will thus be possible to activate and monitor all computer-linked equipment in the home via the Internet.

Ericsson is performing the tests in cooperation with the Royal Institute of Technology, the Gävle Municipality, Gävle Energi, the University of Gävle and housing companies in Gävle.

In the autumn, the test network will provide a number of households with Internet access, IP telephony, emergency services and various types of energy services such as the remote control of the indoor temperature.

There are plans for the large-scale extension of the system in Gävle as early as next year, if the tests prove successful.

Smallest AXE in the world

Working in Stockholm, two small groups of innovative developers have designed a portable, miniature version of the AXE10 exchange. This could be the first step for the millions of people who lack good telephone networks or who have never made a telephone call.

The demand for small, reasonably priced exchanges is enormous, particularly in Russia and former Eastern Bloc countries.

It all began just over a year ago, during the autumn of 1997, on two different fronts:

At what was then known as Public Networks, a group who were working on the Simax simulation platform thought it was time to turn their attention away from testing equipment to real exchanges. At the same time, Per Bergqvist, who had been researching mobile applications for several years, wanted to try something new.

"I wanted to do something that would really be valuable for Ericsson and came up with the idea of building a small exchange for both fixed and mobile telephony. I knew that other attempts had been made before and that it was considered to be impossible, somewhat akin to the fact that bumblebees really shouldn't be able to fly."

Very great demand

According to Svante Axling, who has worked on developing business in Russia, operators there were practically screaming for a small exchange which could be put into operation locally at a reasonable cost.



Svante Axling

Staffan Skogby, Johan Olsson and others formed an innovation cell based on a local exchange at Public Networks, while Per Bergqvist, Christer Palmgren and Simon Cornish started a "skunk works" focusing on the NMT exchange. These two groups maintained ongoing, but informal, cooperation with each other.

After examining Ericsson's technology inventory, the Simax emulator – at that time a testing tool with very good performance – was chosen as the main component, along with SwitchBoard, which had earlier been successfully used in a mobility server.

The two systems were housed together, forming what could be perceived as "real" AXE

hardware. SwitchBoard was also the most cost-effective alternative according to an external comparison.

"We combined various components into a whole and improved the real time properties so that we could test real traffic," says Per. "Things moved quickly. In March 1998, we already had a working prototype for NMT."

The present system fits into a small box and is really a variation of the cabinet used to house the Business Phone small business exchange. The exchange, which has the working name AXE110, weighs approximately 20 kilos and can easily be carried onboard airplanes. It really only consists of two components and is very simple to put into operation. Although it is a copy of the real AXE10 exchange, it is not as robust and fault tolerant with dual processors and so forth.

"But that is of no significance for the environments it is designed for," says Holger Ronquist, Ericsson's market manager for Central and Eastern Europe. "Within our geographic area there are approximately 450 million inhabitants and only every fifth person has a telephone. In addition, about 60 percent of the existing lines are old and are in need of replacing."

In other words, the needs are urgent, particularly for local exchanges since almost all traffic consists of local calls. Moreover, half of this gigantic area is sparsely populated.

Low startup costs

The advantage of this compact exchange is that it offers an operator in, say a village of 1 000 inhabitants, the chance of starting up traffic at a low initial cost. The alternative – starting up directly with a large exchange – is, in reality, an impossibility for most companies. The start-up costs for a country such as Kazakhstan, with 16 million inhabitants, would amount to a couple of billion U.S. dollars. The interest alone on such a loan would amount to almost USD 500 million per year.

"Since there is so little hardware in our mini-exchange, we're able to tear down that initial hurdle and rent out equipment, providing us with ongoing income for the software," explains Holger Ronquist. "In just a few years, based on a calculated cost of USD 10 per month per subscriber, we can receive as much money as a large exchange would cost."



Holger Ronquist

New ideas behind technology

The fact that it was possible to develop a new exchange has had a lot to do with the way the work was conducted. It has been marked by new ways of thinking, questioning old routines and requirements, as well as the reuse of earlier research and knowledge.

The development of Simax, SwitchBoard and AXE110 has consisted of small-scale, entrepreneurial endeavors, bringing together individuals with various skills. The local Ericsson workforce has been supplemented with experts from subsidiaries as well as external resources.

The fact that Per Bergqvist was able to borrow Simon Cornish from the company in Australia was decisive for the success of the project. Thanks to his key expertise, it was possible to assemble the building blocks for the AXE110

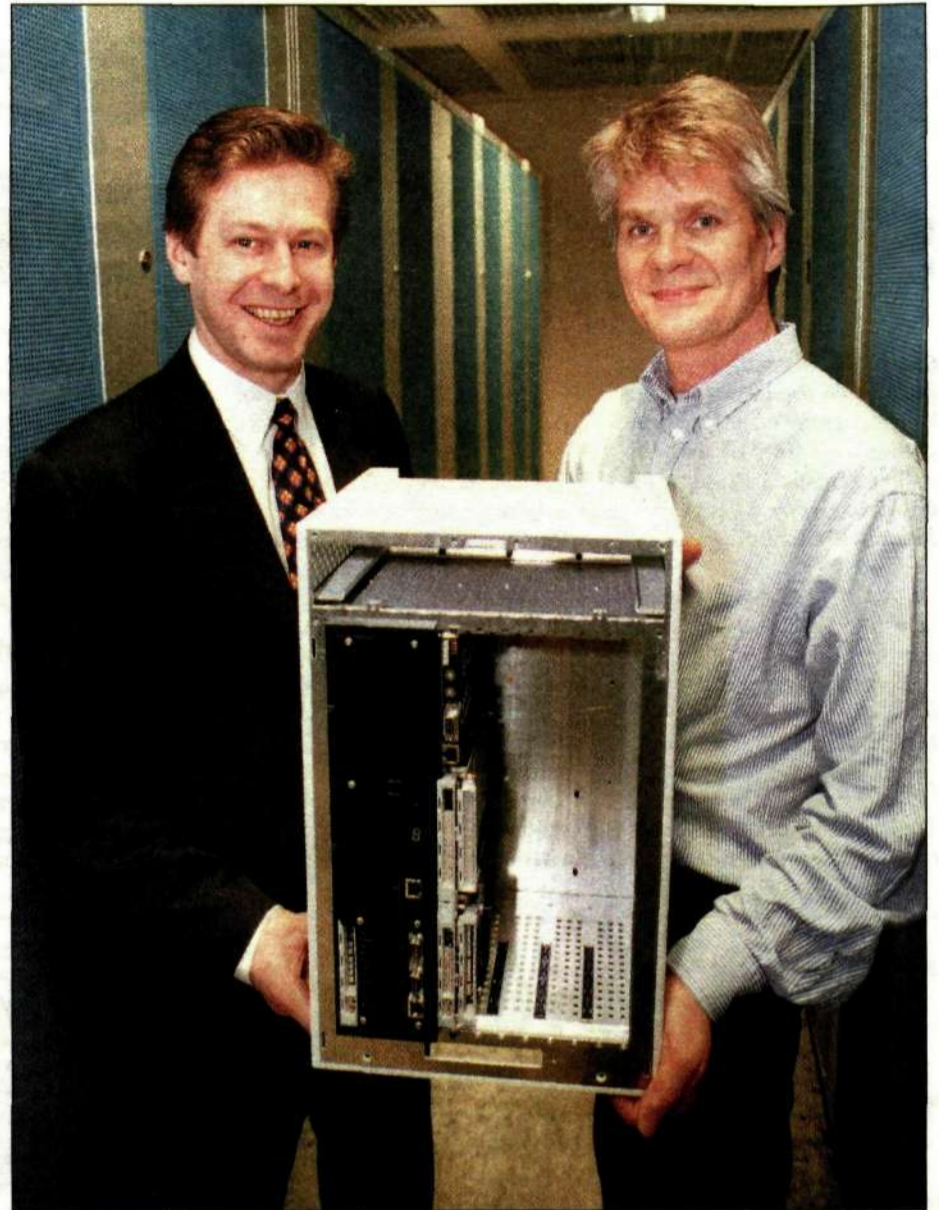
and show off the first demo in only a few weeks.

"The work we did at Ellemtel at the beginning of the 1990s on the AXE research project was essential to the compact AXE110 exchange," says Staffan Skogby.

Staffan subsequently met Karin Werhagen in 1996 who became excited about the idea and dared to invest in the technology. Out of that, the Simax simulation platform was created. The new method of implementing existing AXE10 software using the Simax emulator, makes it possible to take advantage of the millions of hours that were invested in the research and development of AXE over the years.



Staffan Skogby



"It weighs less than 20 kilos," says Per Bergqvist and Per Berg, holding the new micro-AXE exchange which can provide full-service telecommunications to those blank spots on the telecom world map. Photo Kurt Johansson

In Holger Ronquist's opinion, Ericsson has always been good at building up a large customer base, but less successful at making money from those customers.

"This is the way in which we should charge our customers in the future."

Svante Axling emphasizes that the new exchange should be viewed as a start-up package for the market.

Once an operator has generated some revenue and experienced market growth, they can upgrade their system to an AXE10 exchange.

"The fact that our little exchange uses all the same software and has the same functions as the AXE10, means that our old AXE customers will recognize the system and be able to use the equipment immediately," explains Svante.

"That is an advantage over our competitors, who are also trying to develop compact exchanges, but are six months or a year behind us. They lack a similar customer base. And nobody

has yet succeeded in developing a good mini-exchange for both fixed and mobile telephony."

Lars Cederquist

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MINI EXCHANGE TO RUSSIA

"The first trial for the mini exchange will be for NMT in Russia," says Olle Ljungfeldt, manager for analog mobile systems at Ericsson.

The product will be launched at the Sviaz telecom trade fair in Moscow at the beginning of May and the first exchanges are scheduled to be delivered in July to the Krasnodar area, with serial deliveries beginning in September.

"The project has been delayed somewhat compared with our original plans, but it is often difficult to transform entrepreneurial ideas into industrial products, where every variation is required to work. But now we have a single unit, Micro Switch Solutions, with manager Johan Olsson, who is in charge of the industrialization."

The concept was turned into a prototype at the beginning of 1998, around the same time that the Russian customers Transit Telecom and Moscow Cellular Communications approached Ericsson regarding their need for small exchanges for approximately 1,000 cities around the country.

The driving force behind this effort was Vyacheslav F. Gurkin, who oversees NMT construction in Russia.

"We still had a long way to go before we had a product," says Olle Ljungfeldt, "But we chose to unveil our prototype in April 1998 anyway, after which we signed a Letter of Intent with our customers, stating that we would develop the product together."

Lars Cederquist

<http://mega.al.etx.ericsson.se/mss>
<http://switchboard.ericsson.se>

Lars Cederquist

Network impact has been tested



Telia's mobile phone network in Stockholm generates less of an environmental impact than does a similar network in Sacramento, California. This is due to the fact that electricity in California is produced using fossil fuels, and that more energy is required for cooling equipment compared with Stockholm.

Photo: Lars Åström

IT and telephone systems have very little environmental impact. That is the claim the industry itself likes to make. Now there are facts to support that claim. Ericsson and the American telephone company AT&T, have conducted a life cycle assessment of two complete Ericsson mobile systems in operation.

The studies, the first ever of this kind, were conducted on a TDMA network in Sacramento, California and a GSM network in Stockholm, Sweden. Operators Pacific Bell and Telia assisted in the collection of data. Results were presented at the end of February of this year, following the year-long project.

The studies showed that the telephone networks were responsible for only a fraction of the total system load in each city, or about one percent.



Elaine Weidman

Same size, but different

There were, however, differences between the cities of Sacramento and Stockholm, both of which are about the same size and have well developed mobile networks.

Despite the low energy consumption of both systems, the Sacramento network contributes almost twice as much to the greenhouse effect. This is due to the fact that electricity in Swe-

den is generated largely by nuclear and hydroelectric sources, while Sacramento derives its energy from fossil fuels. Another big difference is climate. In California, a great deal of energy is spent on cooling equipment.

A surprisingly large amount of the total energy consumption, over 50 percent, went towards ancillary devices such as faxes, modems and so forth. The consumption of paper was also high, especially in Stockholm.

The interesting aspect of these studies was that whole systems were examined, not just individual products, previously the most common method. Advanced research methods, including Life Cycle Stressor Effects Assessment (LCSEA), were utilized.

No abstract figures

LCSEA differs from ordinary life cycle assessment in that it examines potential environmental impact rather than simply measuring emissions and resources utilized. This means that the study did not utilize abstract figures but instead accounted for the unique properties of individual systems, including their age, configuration, electricity supply and more.

"Using this method, we are able to provide users with individualized environmental information about their specific system," concludes Elaine Weidman, project manager from Ericsson's TDMA unit.

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Environmental web sites updated

Both Ericsson's internal and external web sites for environmental information have been extensively redesigned.

The external web site consists mainly of an ongoing environmental report, based on the four phases of the life cycle assessment – design, production, utilization and waste. It's possible to read about the world's first advanced life cycle assessment of an entire mobile network in operation. This study was undertaken by Ericsson together with the American telephone company AT&T. It concluded that telephone systems are an environmentally friendly alternative that generate only a very small portion of the overall burden on the environment.

It's also possible to read about how Ericsson is able to meet Japanese mo-

bile operator NTT DoCoMo's stringent environmental requirements. This is possible thanks to tools such as a materials database, life cycle assessments, environmental management systems, subcontractor requirements and other elements which are all now available. Detailed as well is the environmental work at the Kumla plant in Sweden which has led to more efficient operations, something which has benefited both production levels and the environment.

Other topics discussed include the advantages of IT, the dematerialization of society, manufacturer accountability laws and much more. The web site is regularly updated and will eventually include external links and more substantial research reports.

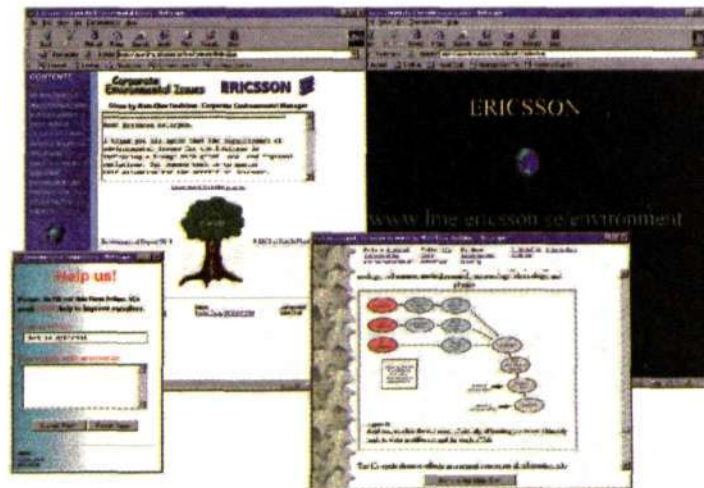
The internal environmental web site has also been improved. All envi-

ronmental work taking place at Ericsson will be uploaded directly to the site and, if appropriate, also be posted to the external web site.

The internal site will also serve as an open forum for environmental questions from within Ericsson. Eight subject areas have been identified and an expert has been appointed for each.

These experts will be responsible for making sure that their areas are kept up-to-date with the latest information. They will also serve as contact people and answer e-mail-questions from Ericsson employees.

"I know that there's a great deal of interest in environmental issues within the company," says Ericsson's industrial systems graduate student Pontus Cerin, who oversees the internal web site. "We're open to all



Both internal and external environmental web sites are available.

types of questions, including those which support our everyday environmental work as well as those that help us answer questions about how we can use environmental measures as a competitive tool."

Environmental manager Mats-Olov Hedblom will also write a weekly column covering current environmental topics for the internal site.

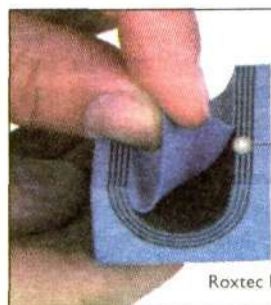
"There are many topics that have

hardly been dealt with, so there's little risk that I'll run out of things to write about," says Mats-Olov Hedblom.

Lars Cederquist

External web site:
www.ericsson.se/environment

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Installation of a Rox System KFO frame in a plexiglass window.



New technology extends multimedia GSM

Ericsson is testing new technology that will enable images, text and audio to be downloaded wirelessly at speeds of up to one megabit per second.

The system, which is one hundred times faster than today's GSM, combines the GSM system with a distribution network for digital audio broadcasting.

"If you'd like to read the daily newspaper directly on your hard disk, it's an ideal system. It's also perfect for interactive mobile data services. You can quickly download road maps to your car, for example, or receive other kinds of information from the Internet while mobile," says Johan Ebenhard, section manager at Ericsson Mobile Data Design in Gothenburg, which is developing the new technology.

Based on available technology

The solution, known as Asymmetric Wideband Internet Access Network (AWIAN) is a hybrid system based on available technology. For the uplink, GSM or some other wireless system is used. For the downlink, the new digital radio network, known as Digital Audio Broadcasting (DAB), is used.

DAB can deliver wireless communication speeds of up to one megabit per second, approximately one hundred times faster than today's GSM systems.

"DAB can be seen as a turbo channel for GSM. It won't be apparent from the terminals or the applications that a different system than GSM is being used to transmit the information being downloaded," says Johan Ebenhard.

Unsuitable for video conferencing

AWIAN's asymmetric transmission technique is ideal for high-speed Internet services, where the users are retrieving more information than they are sending. The technology is unsuitable,



Ericsson is testing new wireless technology in Gothenburg which combines the GSM system with a new network for digital broadcasting. Among other things, it will provide users with high-speed mobile Internet access. Anders Svensson, project manager for the test network, and section manager Johan Ebenhard, at Ericsson Mobile Data Design, are overseeing the development of the technology.

Photo: Lena Bryngelsson/Kamerareportage

however, for such applications as videoconferencing or large file transfers.

"AWIAN is not competing with UMTS, GPRS or other mobile data systems now being developed," emphasizes Johan Ebenhard. "Since this is an asymmetric system, we are aiming it at a slightly different customers. The auto industry is particularly interested. Those companies are looking for new ways to retain customers after their warranty period expires.

That means that when a customer is choosing a car brand, they are selecting a complete concept. In the future, customers who use AWIAN will, for example, be able to receive interactive traffic information or new software to tune up the engine."

Split frequency cell network

An AWIAN test system is running in Gothenburg, where network and terminal technology is being evaluated. On the network side, AWIAN technology requires a new frequency-divided cellular network using DAB transmitters and servers. On the receiver end of things, a DAB receiver connected to a terminal with a GSM module is needed.

"We will be selling test networks with servers and software for terminals this year. Interested customers include telephone companies, Internet service providers, the auto industry and broadcasting companies who are responsible for radio and TV transmissions," says Anders Svensson, project manager for the test network and Ericsson's development of the technology.

"We also see opportunities to utilize the same platform as GPRS (General Packet Radio Services) for a packet-switched solution for AWIAN. That would provide a flexible way of receiving personal data services. At the same

time, the technology is sufficiently cost-effective to allow for the electronic distribution of newspapers, for example."

AWIAN is the result of a technology research project sponsored by the EU. In addition to Ericsson, Bosch, Teracom, France Telecom and a number of media and broadcasting companies are also involved.

"The purpose of the project is to create a generic system for interactive mobile services using broadcast technology, that is, the digital distribution networks for radio and TV," says Johan Ebenhard.

Can handle 20 megabits a second

The digital TV technology DVB (Digital Video Broadcasting) is capable of handling downstream transmission speeds of up to 20 megabits per second.

This spring, an open forum will be formed to create a de facto standard for AWIAN technology. The specifications developed within the EU project for the hybrid system are already available on the Internet. It is hoped that this will generate more interest in the new technology.

Nils Sundström

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A DAB receiver, a laptop computer and a GSM telephone are being used to test the new AWIAN technology in Gothenburg. Users can download information from the Internet at speeds of up to one megabit per second.

DIGITAL BROADCASTING PROVIDES MOBILE DATA SERVICES

DAB (Digital Audio Broadcasting) is a standard for digital broadcasting that will eventually replace all FM broadcasts in Europe, Canada and Australia. The technology is also suitable for distribution of new mobile multimedia services. Special frequencies have been allocated for this purpose.

Digital radio requires less

radio spectrum than traditional radio which means that program channels can share available spectrum.

Teracom, the company overseeing distribution of wideband broadcast transmissions in Sweden, has been testing digital broadcasting in Sweden since 1995. Today, digital transmissions reach 85 percent of the population.

DAB receivers are very different from conventional radios. Among other things, they have a display that shows text and images. Currently, DAB receivers are only available for the automobile market and cost around SEK 5,000. In time, DAB receivers will also replace FM receivers in homes as well, lowering the price of receivers.

Explosive growth in U.S. mobile phone sales

Mobile phone subscribers in the U.S. increased by 25 percent in number during 1998. The increase was larger than expected and means that there are almost 70 million mobile phone subscribers in the country. More Americans are also buying digital telephones.

Those are some of the findings of a Cellular Telecommunications Industry Association study. Tom Wheeler, chairman of the association, believes that 1999 will continue to see strong growth, according to Reuters.

Until recently, the conversion from analog networks to digital ones has been slow. During 1998, however, the winds changed and now an increasing number of Americans

are choosing digital telephones.

Despite that fact, only 28 percent of all American mobile subscribers have a digital telephone. The corresponding figure in Sweden is 88 percent, with the rest having analog NMT telephones.

The growth experienced last year in the number of new mobile phone subscribers in the U.S. was the largest ever. A total of 26 percent of all Americans now have a mobile phone.

Still, there is a long way to go before mobile phone density in the U.S. approaches the level in Finland which is now over 50 percent.

Mia Widell-Örnung



INDUSTRY NEWS

CDMA leads in the U.S.

► PCS mobile phone systems operating at 1.9 GHz, which are based on CDMA technology, offer the most extensive geographic coverage in the U.S. According to a study by the Strategic Group, CDMA systems cover 10.4 percent of the U.S., while GSM systems cover 7.3 percent and TDMA systems 6.2 percent.

GTE-Ameritech deal

► GTE is buying half of Ameritech's mobile communications operations, which have 1.7 million subscribers. If SBC and Ameritech merge this summer, as expected, the deal will then be completed.



Photo: Studio Nilsson & Lundberg

Cisco improves position

American datacom company Cisco is buying two telecom equipment manufacturers – Fibex Systems and SentientNetworks – for SEK 3.7 billion. This will strengthen Cisco's position against Ericsson and Nokia, among others.

At the same time, Ericsson and Nokia are continuing their hunt for small datacom companies according to the Swedish daily Svenska Dagbladet.

Changing the conditions

The convergence of datacom and telecom is completely changing the conditions facing

traditional telecom companies such as Ericsson and Nokia, as well as datacom companies like Cisco and 3Com. Until now, these companies have been competing in their respective playing fields. Now, all of a sudden, they are competing in the same arena and starting to fight over the same customers.

Improvements in new areas

This convergence is forcing companies to make improvements in new areas, such as Ericsson in Internet technology and Cisco in more conventional telephone technology.

Cisco's acquisitions are a step towards improving their position in conventional telephony.

Mannesmann buys o.tel.o

► The German telecom and manufacturing company Mannesmann has acquired the entire wireline telephony division of its competitor o.tel.o.

Through this purchase, Mannesmann will strengthen its position in the German telecom market, where it is the second largest player after the former state monopoly Deutsche Telekom, which was privatized and is now listed on the stock exchange.

O.tel.o will be operated as a separate company from Mannesmann Arcor, Mannesmann's wireline telephony subsidiary, according to Svenska Dagbladet.

CDMA network to China

► China has announced that it plans to invest in a national CDMA mobile phone network. Previously, Chinese authorities had said that the country was suspending tests using CDMA-based mobile phone networks, but that decision has now been reversed.

Ericsson's recent agreement with the American company Qualcomm will now enable it to sell CDMA systems. Previously, Qualcomm controlled a large number of the patents pertaining to the CDMA system.

Finland is first

► Finland has become the first country in the world to issue licenses for third generation mobile phone systems. Sonera, Radiolinja, Telia and a consortium consisting of a number of Finnish operators and Swedish company Tele2 each received a license.

COLUMN

Bellcore becomes Telcordia



Bobby Chang

On March 9, Bellcore, the former research arm of Regional Bell Operating Companies (RBOCs), officially changed its name to Telcordia Technologies. The name change is part of the contractual agreement related to Bellcore's sale in 1997 stating that the company could not continue to use the name with the word "Bell". Telcordia is a combination of "Tel" for telecommunications and "cordia" for the accord among multiple participants and customers in the telecommunications industry. The company is not just changing its identity, it is also focusing its strategy from building circuit-switched, voice networks to developing packet-switched, high-speed broadband networks that can carry the convergence of voice, data and video traffic.

When the former monopoly AT&T was divested in 1984, seven RBOCs for local phone services were formed. Their central research, engineering and service organization that employed 6,000 people, became Bell Communications Research, Inc. (Bellcore). Bellcore soon started to administer the North American Numbering Plan (NANP) to unify phone numbers and established a leadership in promoting multi-supplier interoperability through its Generic Requirements forums and standards activities.

Considerable activity

It was also the single point of contact with the U.S. federal government in dealing with national communications security. From then on, Bellcore very actively led leading many forums and standards such as Sonet, NMA (Network Monitoring and Analysis), ATM, WDM, DSL, 800-number toll free service, AIN and network reliability. Bellcore was known for its standards requirements and technological expertise with more than 1,400 domestic and international patents. About 80 percent of the

U.S. telecommunications networks' software is invented, developed, implemented, or maintained by Bellcore.

Not for ever

Just a few years after Bellcore was established, the research arm, jointly owned by the seven RBOCs, was created, but it looked like it wouldn't last forever. U.S. West had given notice of its intent to withdraw its ownership position in Bellcore to do proprietary R&D. In 1988, U.S. West withdrew its notice after having won the right to create an internal R&D facility. Other RBOCs immediately followed suit. It is clear that the RBOCs are not carrying out strategic R&D activities through the commonly shared organization. As the situation became more competitive with RBOCs competing in cable business, this became a major issue.

In April 1995, RBOCs announced their intent to sell Bellcore. When the Telecommunications Act was signed in 1996, RBOCs were freed to compete with each other in new markets. During the 1996 fiscal year, non-RBOC business accounted for 20 percent of Bellcore's total revenue of about 1 billion dollar.

The long expected sale of Bellcore was finalized in late 1997. The San Diego-based Science Applications International Corporation (SAIC) paid 700 million dollar to buy Bellcore. SAIC is the largest employee-owned research and engineering company in the U.S. The company's sales mainly come from defense contracts. After the acquisition, the combined revenue is about USD 3.5 billion with around 28,000 employees. SAIC is a leader of systems integration and program management and Bellcore can contribute its expertise in telephone services and communication technologies. SAIC also owns Internet domain registration firm Network Solutions, Inc. In January 1998, Richard Smith, most recently a senior vice president at Sprint,

joined SAIC and became the new CEO of the combined company.

The new direction for Telcordia is the development of a next generation network (NGN) that can deliver existing services (cable, Internet, voice and data) with new offerings such as e-commerce, voice over IP, and unified messaging service over a single network. Currently, the company has already formed strategic alliances with Cisco, Hewlett-Packard, Nortel and Oracle. Telcordia is providing NGN services and software to Sprint for its ION, an ATM-based IP network and to Canadian cable operator Le Groupe Videotron Ltee.

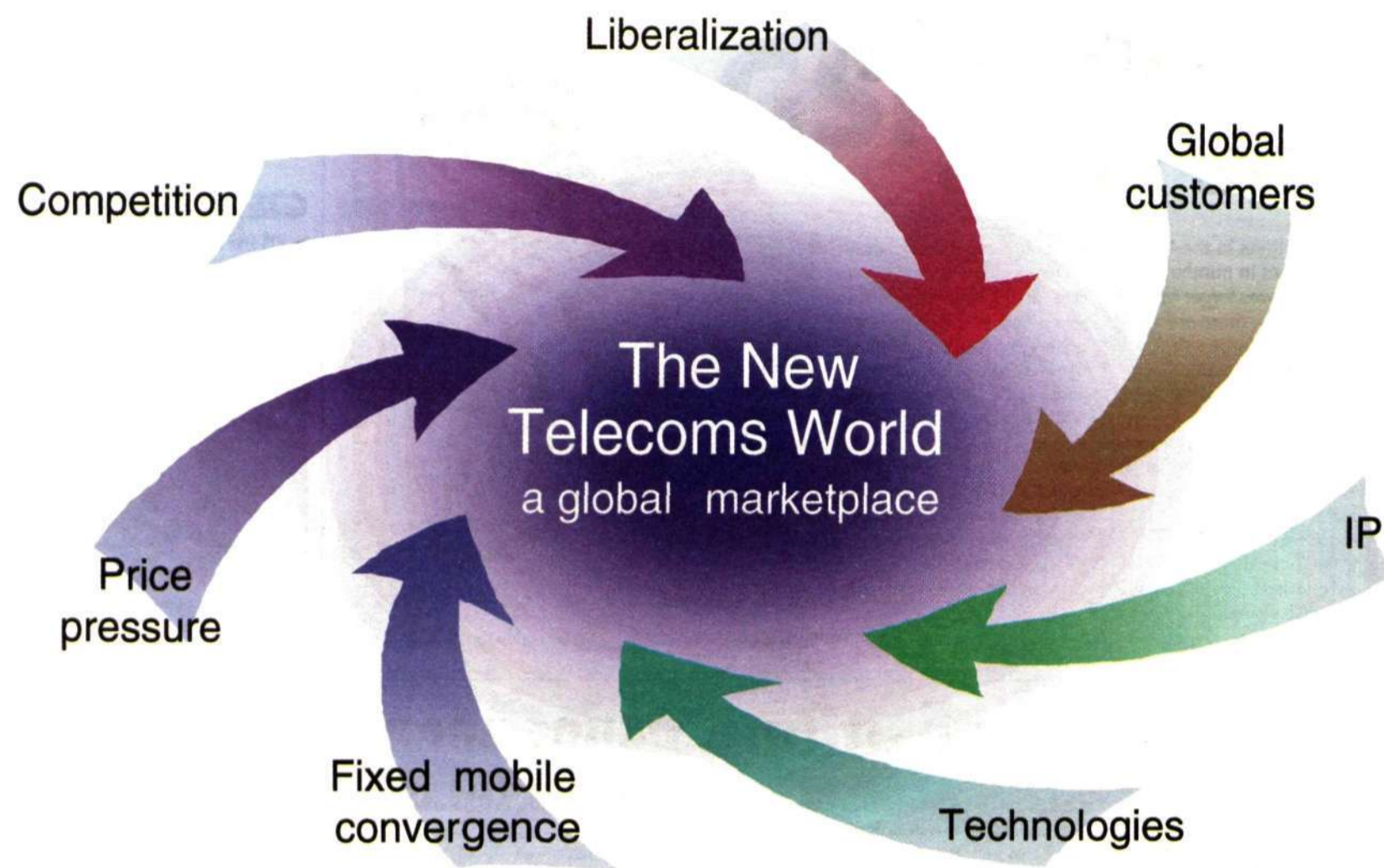
Improve customer

The two major challenges for Telcordia are brand recognition and customer perception. The former Bellcore was an engineering-driven company with little competence in data networking. The new company is only allowed to use the phrase "formerly Bellcore" for six months, after which it will cut all references to the word "Bell." Amazingly, Bellcore did not have any sales and marketing staff for the first 11 years. During 1995, the company started to hire about 250 such professionals. The sale to SAIC will leverage Bellcore's technical competence with marketing sense and this commercial mind-set change will help the company to survive in the future.

Now the old Bellcore is gone and the new Telcordia Technologies have arrived.

Bobby Chang works at the company's business development unit as an industry analyst with responsibility for North America.

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Mobile IP a hit in the New

Minutes are becoming seconds in the New Telecoms World. Using wireless connections to the Internet, the net surfer can download a favorite web site in five seconds instead of the same number of minutes, as is often the case today.

In as little as five years, the reality may be that one billion people have mobile phones and a couple of hundred million of them will have wireless Internet. It is this fantastic development that is addressed in Ericsson's new strategy.

The factors behind the trend are described in the company's 1998 Annual Report.

Ericsson is a world leader in the field of mobile telephony, with a strong position in both mobile systems and mobile phones. With approximately 30 percent of the world market, measured in dollars, the company is the largest supplier of mobile systems. Ericsson is one of the three leading companies in the mobile phone market.

With operations in 140 countries – many stretching back more than 100 years – Ericsson is also the most global of all the players in the telecom market.

By playing a leading role in the development of standards for third-generation mobile systems, Ericsson is further strengthening its position in the market.

Strong starting position

Collectively, these factors give Ericsson a strong starting position prior to the changes expected in the next few years – technically, financially and in market terms. Developments are moving very quickly, however. Stiff competition is placing increasing pressure on the company. For this reason, Ericsson updated its strategy in October last year regarding the way in which the company will position itself in the New Telecoms World.

The telecom industry is currently much more complicated than it was just a few years ago. Previously, there were relatively few players and their roles were clearly defined. For a manufacturer such as Ericsson, this meant that the products were primarily sold to large monopoly operators, with which the company had longstanding and well-established relations.

Now the number of players in the market is increasing dramatically. This is largely the result of the fusion of various industries,

technologies and services – convergence.

Telephony and data are merging with multimedia to form one industry.

Wireline and mobile communications are joining forces.

While this fusion is taking place, technology is being developed as a result of increased digitalization and the increasing significance of the Internet Protocol, IP. The rapid development of Internet and intranet technology is also accelerating the fusion of various products and services.

The continued deregulation of telecommunications worldwide also means that a large number of new, global operators are becoming established within the areas of both wireline and mobile telephony.

Players in the data and datacom industries are now moving into those areas previously dominated by telecom companies. When companies such as Microsoft and Cisco enter the field of telecommunications, the conditions regarding competition are changed completely, affecting many related industries.

Driving force

The operators are responsible for the rapid developments. It is their push for economies of scale and the ability to offer a series of different services which is the driving force. Convenience, reliability, mobility and lower tariffs are important tools of competition among the operators.

Ericsson appreciates that when the operators begin to seriously invest in the third generation of mobile networks – a couple of years into the new century – tariffs will be reduced to levels similar to those for wireline telephony.

One important trend is that markets, customers and products are becoming "global" – that is, global but with local adaptation of design and content.

Another trend is the reduction in the number of operators. In 5 to 10 years, it is expected that 10 to 15 operators will dominate the world market for international telephone traffic, along with some 100 regional operators. A development of this kind increases the need for global standards as a basis for product development. Ericsson is preparing for this by making use of the close contacts the company has with most of the major operators expected to lead this trend, as well as its contacts with many of the new regional operators.

Internet traffic

An increasing share of communications will take place via the Internet. Already in the year 2000, it is estimated that the volume of data traffic on the Internet will be greater than that of voice traffic on the traditional telephone networks.

The Internet Protocol, IP, today enables computers throughout the world to communicate with each other. IP therefore affects, in principal, all of Ericsson's products. The companies in the industry are today convinced that IP technology will be an important driving force behind the convergence.

The operators will gradually transfer their traffic to the Internet. This change will be as significant as when telecommunications switched from analog to digital technology. That change took 15 years. Today's switch could occur in half that time.

The switch to IP-based traffic will offer major savings, since larger amounts of information can be transferred to a single network – first data, then voice telephony and, subsequently, video.



In two or three years, the market for wireless data communication will accelerate. This will give such terms as wireless and mobile a new and deeper meaning.

Photo: Keystone/Schulz/Scanpix

Telecoms World

Internet-based products have been launched. Ericsson has taken up the challenge of Internet telephony – "Voice over IP" – and assesses that this development will start in the long-distance network before expanding to the access network. From 2005, major amounts of tele and data traffic will go via IP. The American operator Delta Three, which is the world leader in IP telephony, uses Ericsson technology in its network for international calls between Israel, the U.S. and the U.K.

This opens up major opportunities for Ericsson and other companies with telecom expertise, since the datacoms still have problems with the reliability and speed of the network. Operational difficulties and long waiting times on the Internet are still common phenomena.

These conditions create major business opportunities for the development of new telecom and datacom applications which will be required in the future. With its strong position in the areas of both wireline and mobile telephony, Ericsson has a head start on many of its competitors. The company is also currently one of the leading players in the area of mobile data systems, which may be regarded as the foundation for developments within mobile data communication.

Strong increase in wireless
It is predicted that the market for wireless data communication will take off in the next 2-3 years. This communication will be based upon the immediate transfer of data, in real time – "always on." The amount of information that can be sent will increase significantly as developments move increasingly toward the cordless office.

Reinforcing skills

To add to existing skills and further strengthen the company within critical product and component areas, Ericsson has adopted a special acquisition strategy in the field of data communications. This means that the company is focusing on the acquisition of, or strategic alliances with, small and medium-sized companies which possess spearhead technology.

This boost to skills is an addition to the considerable datacom and IP-related services and technologies already gathered within the company. A series of new

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At the beginning of last year, the European telecommunications standardization body, ETSI, selected WCDMA technology – developed by Ericsson among others – as the standard for the third generation of mobile systems. In December, five standardization bodies from Asia, Europe and the U.S. united to endorse this radio standard, which forms part of the further development of the GSM network. A majority of the operators who have digital networks support WCDMA.

As a step in the development toward WCDMA, Ericsson has produced GPRS. This is packet-linked technology which will be introduced this year and will enable the cordless transfer of data at 115 kilobits per second over the GSM network.

EDGE, another new technology, is the

next development phase, uniting in one standard GSM and TDMA, the digital technology that is dominant in North America and Latin America, among other regions. With even higher speeds of up to 384 kilobits per second, Edge can also handle multimedia services.

Japan first

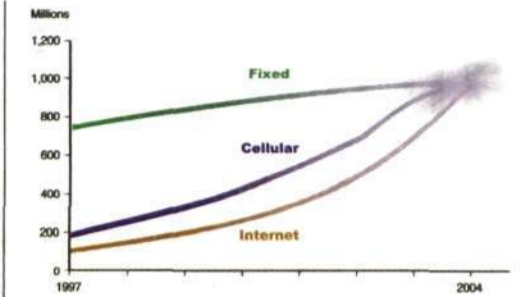
This year sees the start of the new licenses for the third-generation mobile systems being auctioned. Those operators who are unsuccessful in the bid for licenses run the risk of having to wait many years for a new chance. This fact is increasing their motivation to be a part of the process from the beginning.

The third generation of mobile communication systems will be taken into operation as early as 2001, probably starting in Japan. The major driving force behind the third generation is that the systems are adapted for datacom and IP use. Ericsson estimates that almost 200 million Internet users will be connected via wireless systems in 2003. It is estimated that one billion people will have mobile phones by 2004.

Mobile network traffic is expected to increase even more rapidly than the number of users – from 500 billion minutes in 1998 to more than 2,500 billion minutes in 2003.

Wireless IP has many advantages for the consumer. Today, it can take five minutes to download an Internet page, a task that takes five seconds using wireless IP. Waiting times can be eliminated and the user will always be connected.

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It is estimated that by about 2004 there will be as many Internet subscribers as there are for wireline and mobile telephony.

Aggressive growth targets

The rapid development expected in the New Telecoms World is the reason for the long-term growth targets announced by Ericsson in the autumn. Sales will increase by more than 20 percent per year, which is somewhat faster than market growth. The target is to be achieved over a period of three to five years.

The total market for the New Telecoms World can be valued at between 215 and 230 billion (1997) dollars. This includes networks, equipment and related telecom services and networks for datacom. However, the data companies' traditional IT operations are not included.

A decisive factor for Ericsson's growth is the extent to which the company manages to maintain or advance its positions in various markets. There are clearly defined targets, not only for Ericsson as a whole, but for each of the three business segments within the company's new organization. These are all targets that Ericsson aims to achieve within three to five years and they should be compared with the expected total annual growth in the various submarkets:

Targets for the Network Operators and Service Providers business segment:

- Maintain position as number one in the mobile telephony market, which is expected to grow by 15 percent per year.
- Establish Ericsson as number one in the market for wireless data transfer. Expected annual market growth is extremely high. The target should be seen over a longer time perspective, while awaiting the development of the market for important growth areas such as mobile data.
- Continue to be among the three largest players in the market for wireline voice telephony. Total rate of growth for this mature market is expected to be 7 percent per year.
- Establish a niche position among the three major players in top-quality, real-time wireline data transfer. Expected market growth: 20-25 percent.

Targets for Consumer Products business segment:

- Strengthen position and become one of the two largest companies in voice telephony via mobile phones. The world market is expected to grow by 10 percent per year.
- Establish Ericsson as one of the two largest players in wireless data transfer, for which the total annual growth is estimated at almost 30 percent.
- Establish a niche position among the three largest players in the market for top quality, real-time wireline data transfer. Expected market growth is extremely high.

Targets for the Enterprise Solutions business segment:

- Retain a leading position in the market for wireless telephony, with an expected market growth of slightly more than 10 percent, as well as being one of the two largest in the office segment.
- Establish Ericsson as one of the three largest companies for wireless data transfer. Total annual growth is estimated at 30 percent.
- Maintain position as one of the five largest players for wireline voice telephony, for which the total market is expected to grow by only 3-5 percent per year.

Lars-Göran Hedén

Global for more than 100 years

Ericsson has more than 100,000 employees and operations in 140 countries. Being present throughout the world is becoming increasingly important as many of Ericsson's customers go global. Ericsson is on the scene when an operator expands.

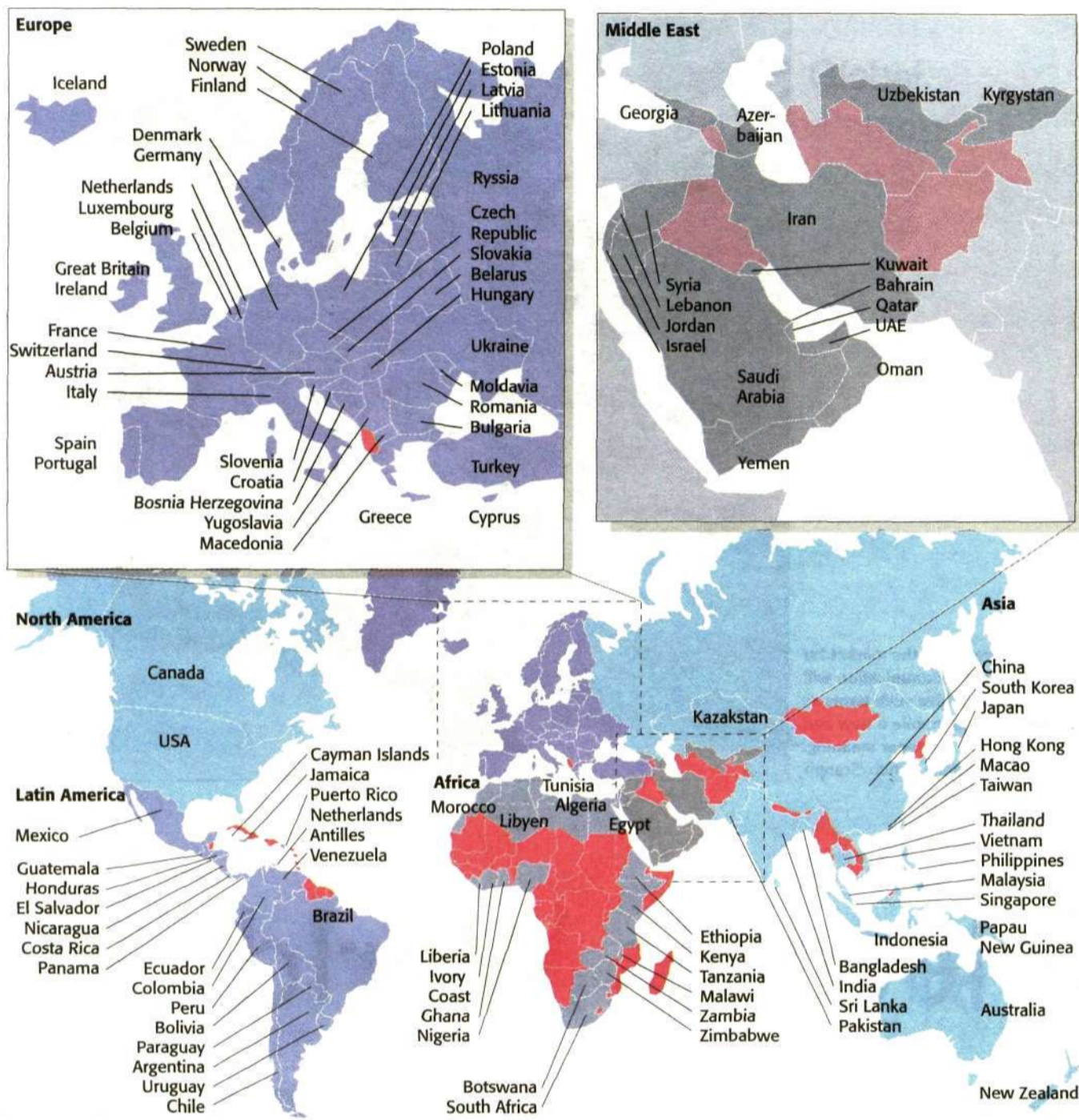
Ericsson's presence in many countries outside Sweden started as early as the end of the nineteenth century. Ericsson has a very long history in South America and Russia.

On the right, you can see where Ericsson is located. There is no obvious answer to what is meant by being active in a country. Far in excess of a hundred countries are shown on the maps and Ericsson has an office in each of these locations. Countries often have their own Ericsson company, but sometimes there is only a representation office. Many of the countries not marked are served by an Ericsson company in an adjacent country. This all means that Ericsson is able to say that the company is active in 140 countries.

Being at home throughout the world gives Ericsson an enormous competitive edge. When a customer wants to expand into another country, Ericsson is already on the scene to assist the operator. Being established for a long time in a country or a market means that Ericsson already has good contacts with the local authorities and the local culture. The expression "Business is local" may be considered a worn-out cliché, but not without relevance. Ericsson has the advantage of large, coordinated technology and research resources in several locations in the world, in parallel with a local marketing and sales organization wherever business is conducted.

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ERICSSON IS AT HOME ALMOST EVERYWHERE



Graphics: Mikael Parment

Convergence leads to entirely new markets

Operators are the driving forces behind the convergence under way within the industry, as Ericsson explains in its corporate strategy. But what does this convergence really entail?

Convergence, or fusion, is taking place between the telecom and datacom industries. Sometimes the media industry is also included in this process. It is also possible to speak of a convergence between wireline and mobile telephony. There are already solutions that integrate networks. The general objective is to erase demarcation lines between the various technologies. What is transported via a network is no longer important. Voice is becoming just one of a multitude of data types that can be conveyed via wireless or wireline connections.

Key to the fusion

The Internet Protocol (IP) is the key to this fusion. IP is a standard language that enables the sending of various types of data via the Internet. At the moment, the technology for sending voice or phone calls using IP is also starting to mature. Once this point is reached, it is no longer possible to speak of datacom and telecom as separate terms.

For Ericsson, this means the emergence of entirely new markets and the technology that



Bo Hjalmarsson is the Global Account Executive for the British operator BT, which means he coordinates Ericsson's transactions with that company.

Photo: Patrik Lindén

has been the cornerstone of almost all of the company's products – circuit-switched telecommunications – will be a thing of the past. At the same time as these new markets are opening up, new competitors are also appearing. These are the traditional telecom companies.

Operators in focus

The operators are in the middle and are receiving offers of solutions from various quarters, while the competition for subscribers is intensifying and prices are falling. This is another aspect of the new telecom world.

It is not always enough for the operators to

offer transportation of voice and data. Many are now also starting to show an interest in content. In order to generate traffic in the networks, they have to offer something that people want. Several operators, including the Swedish company Telia, are showing an interest in Internet content via web ports and other features.

Changed conditions

The British operator BT is a good example of how conditions have changed. BT, formerly British Telecom, has been transformed from a state-run monopoly to the global company of today, which is involved in much more than mere telephony.

Bo Hjalmarsson is the Global Account Executive for BT, which means he coordinates Ericsson's transactions with that company.

"BT is highly advanced as far as technology is concerned and we are discussing several business transactions in the datacom field. But telephony still accounts for the largest volumes."

Recently, Ericsson signed a significant contract with BT regarding, among other features, a hybrid node; that is, the technology that can handle a combination of classic circuit-switched telephony and datacommunication: packaged data.

"This is a practical example of how the fusion is actually taking place. Although most

people agree that the future belongs to IP, major investments have been made in other areas which the operators want to make use of for a long time to come."

BT is part owner of several operator companies throughout the world, including Telfort, a company with which Ericsson recently signed a letter of intention for a GPRS contract. GPRS is the technology for wireless data transfer.

"We are discussing various datacom solutions with BT," says Bo Hjalmarsson. "We have longstanding and positive relations with BT, but we must, of course, compete with datacom companies. Just like many other global operators, BT maintains many different contacts at the same time."

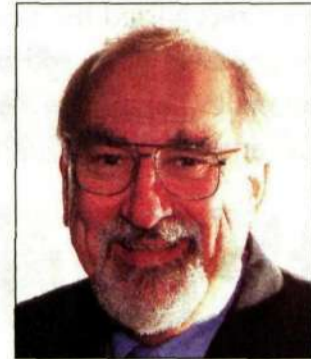
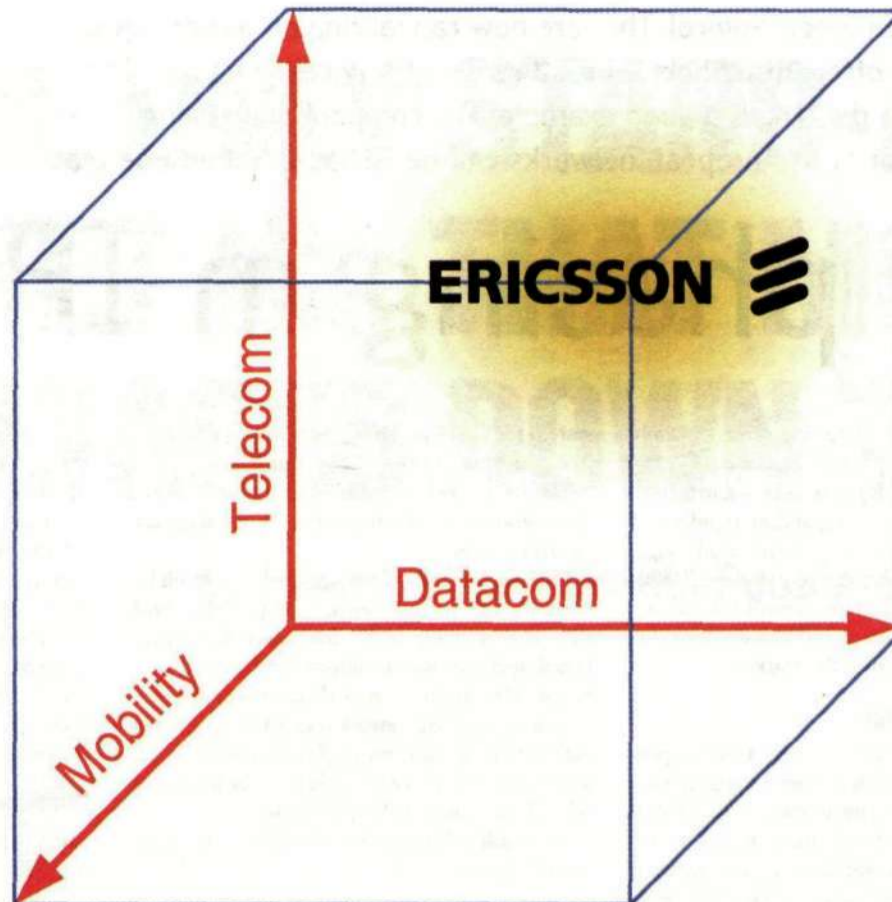
Awaiting the third generation

The factor expected to be the major step toward a converged communications industry is the third generation of mobile telephony. The bandwidth will be so great that it will open up huge possibilities for the transfer of more than just voice and simple data.

"Nobody knows yet who will be the winner in the new industry now emerging. To date, no company is earning large amounts of money from IP orders. But nobody can afford not to be involved," states Bo Hjalmarsson.

Patrik Lindén

Ericsson is in a good position in the telecoms world, where telecom and datacom converge and where mobility becomes even more important.



Bo Landin conducted business transactions for Ericsson in the 1960s. At that time, the customers were state monopolies and completing a transaction was a lengthy process. The customers of the day had solid technical expertise. The fact that Ericsson also sold services was something that was not even discussed.

Customer relations in the 1960s

Of course business was different before the deregulation of the telecom market. The customers were state-owned telephone companies and customer relations mainly involved cooperation to find the best technical solutions.

Bo Landin at the Marketing Corporate Function recalls his first major transaction 33 years ago.

In 1966-67, Ericsson was engaged in negotiations with Televerket (the former Swedish Telecom) regarding an international switching exchange, which was rather unique and was to be situated in a rock chamber in Stockholm. This became the first AKE 13 station.

"It was a genuine cooperation project and we participated in all the discussions, including those that weren't connected to the actual telephone technology. Although Televerket only approached one supplier, Ericsson, an extremely thorough offer was made with exact specifications and the negotiations took a long time. We couldn't take it for granted that our offer would be accepted," says Bo Landin.

Monopoly didn't stop competition

Although the market was controlled by the monopoly situation that existed in Sweden and other countries, there were competitors. For Ericsson, the company then known as ITT, which is now part of Alcatel and Siemens, was the biggest competitor internationally.

"Our customers, the state-owned telephone monopolies, had a high level of technical expertise and were interested in being at the forefront of technological development. Close cooperation with customers in order to find the best solutions was common. Due to demands to show the latest developments, the technology itself that was sometimes the determining factor," says Bo Landin.

Wanted to buy systems only

What the phone companies wanted to buy was the system and nothing else – just the boxes, in other words. Operating the phone system and taking care of service were things the customers themselves were good at. At that time, there was no question at all of Ericsson selling services.

Was business more fun before?

In reply to that question, Bo Landin says that business is always exciting, although customers and the market change.

"What makes it so much fun and so interesting is the contact with customers, meeting and getting to know many people."

Gunilla Tamm

gunilla.tamm@era.ericsson.se

Accelerated business

The pace of the business that Ericsson conducts today is considerably faster than it was only a few years ago.

Katarina Burton works at the Swedish company and has responsibility for the customer Telenordia.

"I'm in touch with the customer several times a day. Often a response to a request for a quote is needed within a couple of weeks. Sometimes, however, we're given a little more time."

Telenordia, is owned by the Norwegian company Telenor, BT of the U.K. and Denmark's Tele Danmark, and has existed for four years. Telenordia is currently the third largest provider of Internet and wireline telephony in Sweden.

Like most new operators, Telenordia makes more use of its suppliers, compared with the conventional monopoly operators.

"The customers often relate the problems they have and it is our job to provide solutions," says Katarina Burton. "We don't supply products in accordance with a technical specification. Instead, we have to respond to the type of functions the customer wants."

Comparison with health-care system

"No-one goes to the doctor and requests a prescription for medication to be taken three times a day for a week. Instead, you explain that you have



Ericsson is well-positioned in the new telecom world in which telecom and datacom will converge and mobility will become increasingly important. Katarina Burton has responsibility for the customer Telenordia, one of the new fast operators placing new demands on Ericsson.

Photo: Patrik Lindén

a pain somewhere and it is the doctor's job to make a diagnosis and suggest treatment. That's how the telecom industry starts to function today."

The new operators don't work with the amount of forward planning that Ericsson was used to with the old operators.

"We dispatch deliveries to Telenordia several times a month. The transactions are consider-

ably smaller and more rapid than they were a few years ago."

The fact that the business pattern has changed also means that Ericsson has to adapt. What often has to be created is a good package of flexible solutions. It is no longer possible for one single person to have complete control over a customer. Ericsson must start to work more as a team. As the range of technology and the demand for fast deliveries increase, more people must become involved in order to handle them.

Previously with Bull

Katarina Burton previously worked in the computer industry for the American company Bull. She is familiar with the development now being experienced by the telecom industry.

"The large computer suppliers experienced the same development ten years ago. When standardization increases and more companies become active – and when strong price pressure is added to this – the conditions for the entire industry change.

"Earlier, Ericsson charged for the products and various related services were included in the price. Nowadays, when the products have become shelf goods, the sale of services and integration as part of total solutions have become more important."

Patrik Lindén

Challenges from everywhere

Many companies are intent on challenging Ericsson and impeding the achievement of its long-term goals.

Today, it is not only the traditional telecom suppliers who are competing for leading positions. Cisco is one of the "new" companies that wants to have a say.

Ericsson currently holds a leading position in mobile systems. In terms of invoicing, the company is at least twice the size of its nearest competitors – Lucent, Motorola, NEC, Nokia and Nortel.

Leading position

AXE has also meant that Ericsson has established a leading position in the market for pub-

lic exchanges. The main competitors in the market are Alcatel, Lucent, Nortel and Siemens.

Ericsson is the leader in the market for mobile data networks. On the other hand, the company's position in traditional wireline data transfer and transport network products is relatively weak.

One of the competitors in the fast-growing datacommunications market is Cisco. The Internet explosion meant that Cisco abandoned its focus on datacom for the commercial sector in favor of directing its interest toward the public market and the operators in that field.

Ericsson is one of three leading players in the mobile phone market, along with Nokia and Motorola.

In the area of enterprise solutions, Ericsson is currently one of the five largest suppliers of traditional business switches. Alcatel, Lucent, Nortel and Siemens are the main competitors.

Most international company

Ericsson is the most international of all the companies in the industry. This is an important strength factor for cooperation with operators who have plans to expand globally.

Cisco, Lucent and Nortel are characterized by a strong presence in North America, while Alcatel and Siemens are highly dependent on their domestic markets – France and Germany.

Lars-Göran Hedin

Operators have recognized the potential of Internet Protocol. They are now capitalizing on technology to achieve economies of scale and be able to offer subscribers a broad range of services. Interoute Telecommunications, a global operator based in the U.K., is a good example. The company is investing strongly in IP, and estimates that 60 percent of its European networks will be IP-based within one year.

Interoute phasing in IP

INTERROUTE

Interoute represents a new generation of telecom operators. The company was founded three and a half years ago. Interoute's head office is situated in London and the company has 750 employees.

Interoute conducts operations in 11 countries in Europe, the U.S. and South America. The company currently has 19 sites in operation in Europe, and about 10 in the U.S. Interoute expects to have 160 sites in operation by next year.

To be awarded a license in Spain, telecom authorities required Interoute to assume operational responsibility for 52 sites, with six main nodes in Madrid, Barcelona, Valencia, Bilbao, Seville and La Coruna, in addition to 46 smaller nodes in surrounding areas.

Interoute Telecommunications recently signed an agreement with Ericsson for delivery of a large IP telephone network in Spain.

"The Spanish market is expanding rapidly and competition is intense," says Nigel Wallbridge, president of Interoute's Europe company. "With Ericsson's modern IP system, we will have strong potential to capitalize on many business opportunities now being offered by the market."

Demand for coverage

When Interoute applied for a license to start operations in Spain, in conjunction with telecom market deregulation, the Spanish telecom authorities placed certain demands on the company. Interoute was assigned coverage for an area comprising 52 sites, so-called Points of Presence (PoP), with the main nodes situated in six large cities and 46 smaller surrounding communities.

"It would have been far too expensive to operate traditional networks. We needed a more profitable solution," explains Ted Rook, technical manager of Interoute Europe. "We were already familiar with Ericsson's system for IP telephony, known as IPTC, or Internet Protocol Telephony

system for Carriers. The project in Spain was our first opportunity to use the system."

The IP network is Spain's first national IP and data network. Competition for the contract was extremely intensive.

Ericsson was the only company able to fulfill Interoute's key requirements. Compatibility with the network operated by Telefónica, Spain's national operator, was an important factor, for example. The ability to meet delivery requirements within the tight framework prescribed by telecom authorities was also crucial. The first six nodes are scheduled to be placed in operation by the end of July. There is no time for pilot tests.

"The only real test will be the customer's acceptance," says Ted Rook.

Transmitting new services

Interoute is making determined investments in IP telephony. After completion of installation work and the start of operations in Spain, the company plans to transmit more than telephony over the IP network. Discussions are already in progress with Ericsson concerning new services.

IP-based virtual private networks are one exam-

ple. The next step will be to expand operations through the construction of similar networks in other European markets.

"If the project in Spain proves successful, Portugal and Ireland are next in line. Portugal has demands similar to Spain's," Ted Rook continues. "Ireland just recently deregulated its telecom market. We see opportunities there to develop a profitable network that will offer subscribers a broad range of attractive services at favorable prices. We have provided Ericsson with a list of priorities that is now being reviewed."

Problems can be solved

Interoute projects that 60 percent of its European networks will be IP-based by year-end 1999.

"Today, everybody is talking about problems with voice transmission delays in IP telephony. These problems can be solved, however. There is no doubt that IP will dominate the world market and eventually become the transport service for most traffic. We are preparing ourselves for the transition."

Lena Widegren

lena.widegren@lme.ericsson.se

IP revolution waiting around the corner

The market for IP telephony is starting to gain momentum, and Ericsson is already well-positioned with products for telephony via the Internet. Pending the definitive IP explosion, Ericsson is constructing infrastructures and accepting whatever orders the company can book.

"Interoute's investment in Spain is interesting for IP development in general. To the best of our knowledge, it's the largest order ever booked for an IP telephony network," says Staffan Lindholm, manager of the IP Services product unit of Datacom Networks and IP Services. Market growth in IP-based telephony is gaining momentum.

Few IP telephony networks

Ericsson is spearheading the move into Internet telephony, and the company is well-positioned in terms of products. Its solutions, for example, are now being used commercially by Delta Three, an American operator that ranks as the world leader in IP telephony. Overall, however, there are still only a few IP telephony networks in operation today.

"Technological development and acceptance of IP telephony has been slower than many people in the industry anticipated. New operators are leading the charge toward IP telephony's breakthrough," Staffan Lindholm continues.

"Traditional operators are now also beginning to show increased interest in the technology," he says. "More inquiries are streaming in, and contracts are becoming more substantial. In the past, we dealt mainly with sales of one or two gateways. In the future, we can expect more large investments similar to Interoute's recent order."

Starting blocks

Staffan Lindholm believes the market for IP telephony will expand in a series of development phases. Development is still in the initial phase, with the technology focused primarily on such services as carriers of low-cost telephony. The technology's definitive breakthrough will not be achieved until market maturity is ready to accept phase two. That's when Ericsson will start selling IP-based services. Phase three will mark IP telephony's true

penetration, when ordinary, everyday people start using multimedia services via the Internet.

"Ericsson is working on the development of world-class IP telephony solutions. IP telephony is a very broad concept, however. The greatest future promise lies in the potential to develop IP technologies that encompass much more than voice telephony. As soon as operators establish a technological base and market base, they will begin to expand through new services."

Ericsson's strategy now is to capture market shares wherever possible.

"The more customers we establish contact with, the better our chances in the future. We are working with several inquiries from customers both in Europe and the U.S."



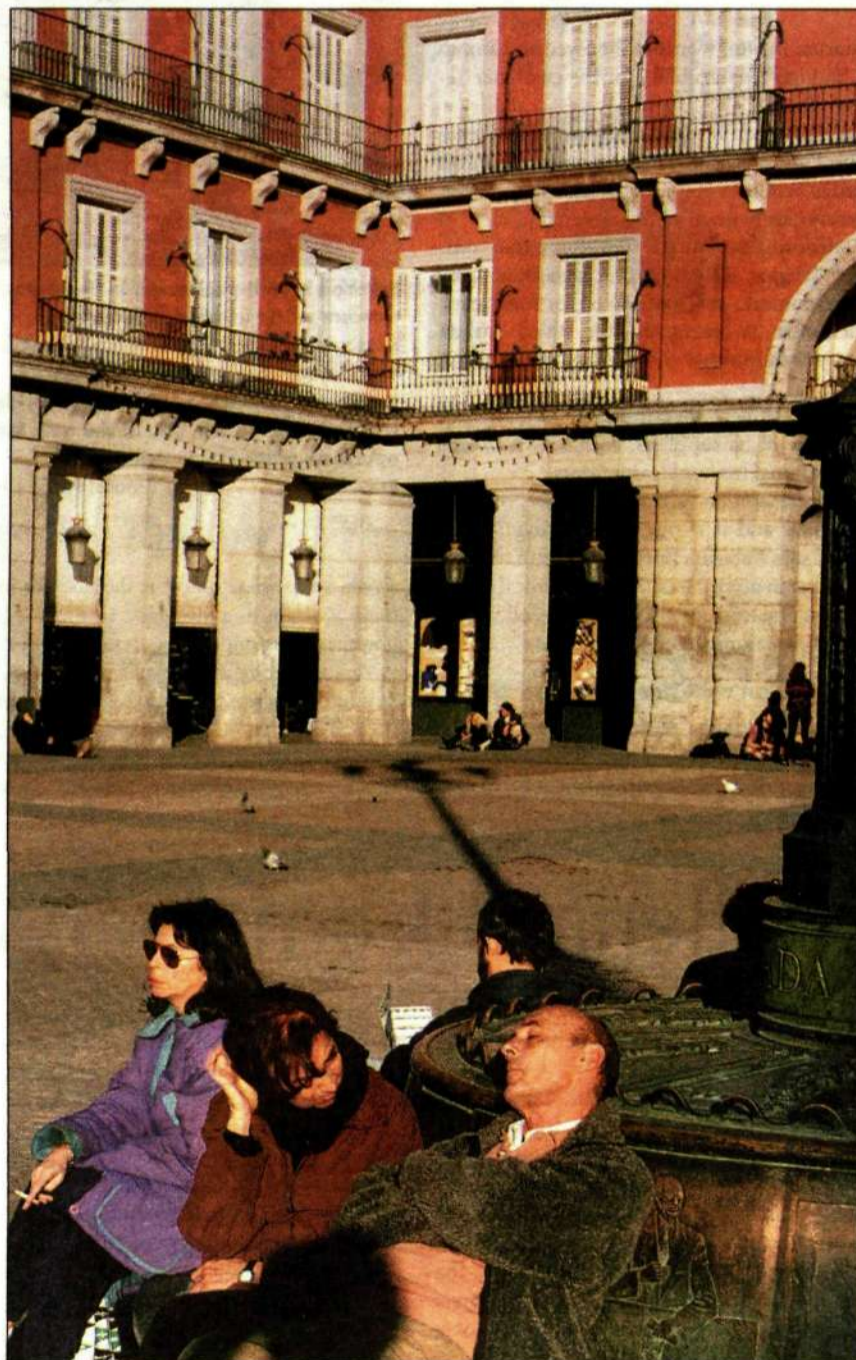
Staffan Lindholm

Lena Widegren

A SINGLE TELEPHONE

The IP Services product unit cooperates closely with Ericsson's product unit for GSM on the Net, which is based on the same fundamental technique as IPTC. GSM on the Net works with IP-based enterprise switches integrated with GSM.

Users can have the same telephone numbers at work, at home and on their mobile phones. Telecom customers with their own business switches represent a huge market sector that will serve as a driving force in development of the IP telephony market. Read more about GSM on the Net in future editions of Contact.

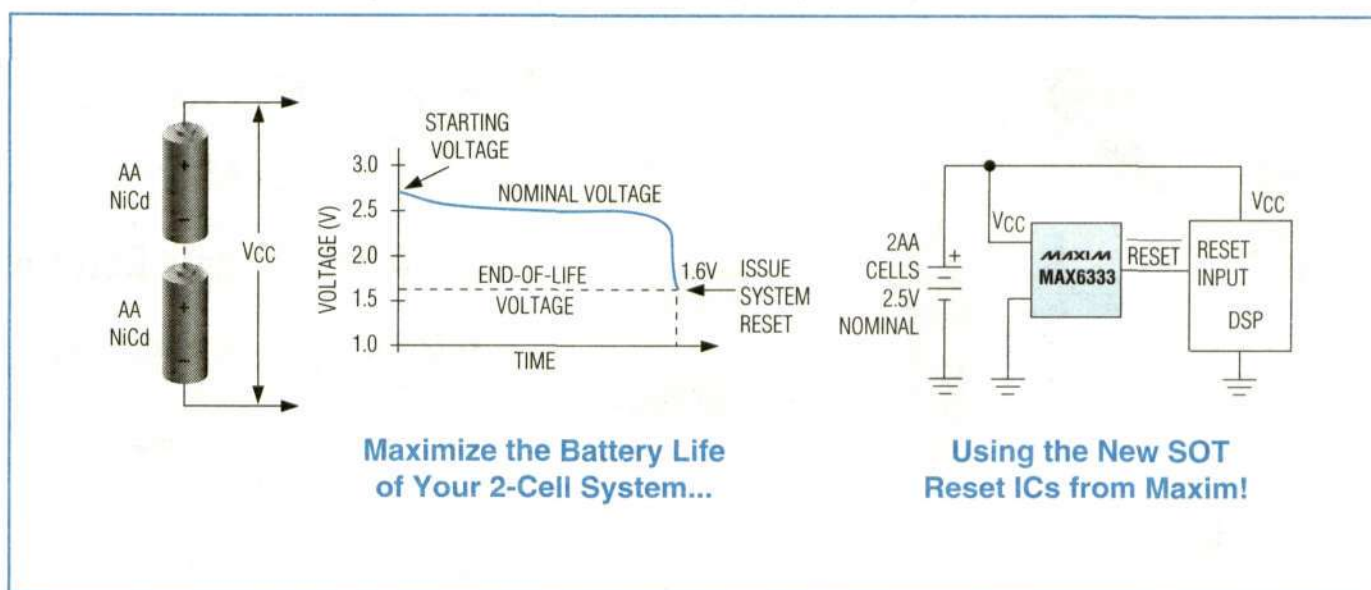


Interoute's site in Madrid will be the hub of the IP telephony network that will provide coverage for six major cities in Spain: Madrid, Barcelona, Valencia, Bilbao, Seville and La Coruna. The network will be placed in operation toward the end of this summer.

Photo: Patrik Lindén

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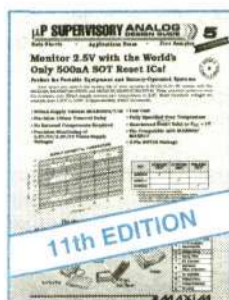
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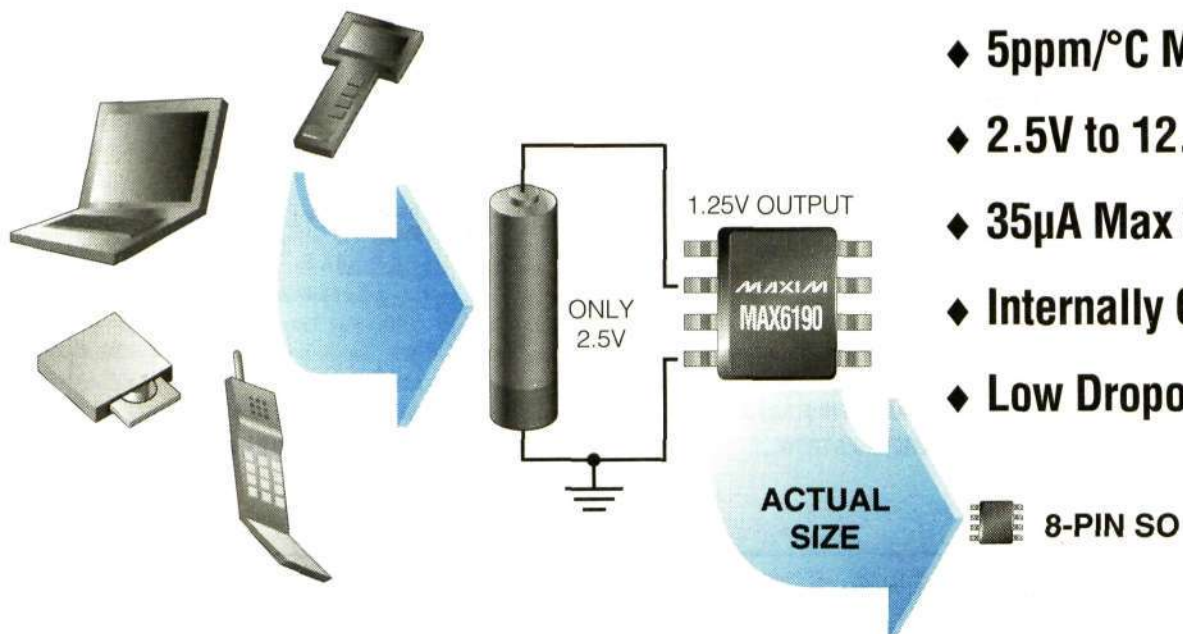


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MAX6193	3	3.2 to 12.6	0.2	5	10	25	-40 to +85
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"My picture of Israel before I moved here was all wrong. After two weeks in Tel Aviv, I felt as if I had lived here all my life," says Ann who, together with her husband Mats Ahnfors, was among the first to arrive when Ericsson Tel Aviv was built two years ago.

New technology meets tradition





Tel Aviv, a large city with fantastic beaches.

Photo: Jon Hicks/Pressens Bild

The climate, the relaxed lifestyle and all the fruit and vegetables – the Ahnfors and Assarsson families agree entirely that these are the best aspects of life in Israel. They feel safe in Tel Aviv, but rely on common sense when political tensions rise.

Easy living in Tel Aviv



Excited teenage girls on the way to the disco in Eilat.

Photo: Alex Farnsworth/Pressens Bild

Raanana, a suburb north of Tel Aviv, has been home to the Ahnfors family for the past two years and the Assarsson family for one and a half years.

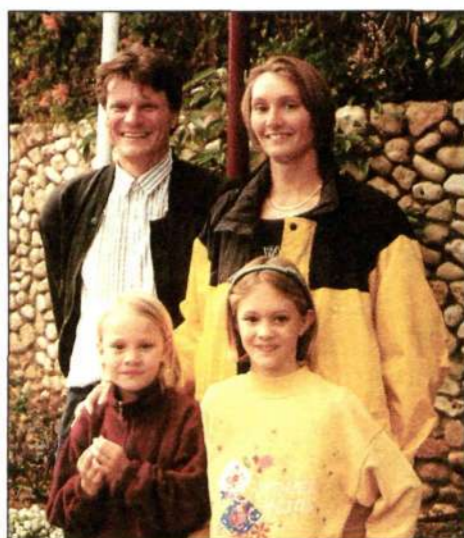
"A car is a necessity here because public transport is so bad," says Mats Ahnfors as he drives home from Ericsson's office in central Tel Aviv. Mats is a marketing manager and is working on the major GSM assignment for the Partner operator. He was one of the very first people to move to Tel Aviv when Ericsson's operations were being established.

Like Mats, Per Assarsson is working on the GSM assignment for which he is project manager. Both men have previously worked for Ericsson outside Sweden – Mats in Kuwait and Saudi Arabia, and Per in Singapore and Slovakia.

This means that Ann Ahnfors and Karin Assarsson know what it is like to be on a foreign contract and are able to understand the intensive rate of work, with long working days and weekend work as well.

Own initiative crucial

Ann and Karin emphasize that it is crucial to take initiatives yourself and make use of the opportunities offered by the country. Both women have



Mats, Ann, Martina and Amelie Ahnfors are very happy in Raanana, the suburb of Tel Aviv where they live.

Gunilla Tamm

got to know Israeli families and have many good friends in Tel Aviv.

All of the children – Amelie (seven years) and Martina (five) Ahnfors and Mikael (five) and Jo-

hanna (three) Assarsson – go to English-speaking schools and nurseries and are very contented.

"It is easy to fit in in Israel, compared with Singapore and Slovakia, where foreigners live outside the normal social sphere," says Karin. For Ann, the difference is even greater compared with life in Saudi Arabia, where she lived in a camp used by several large Swedish companies.

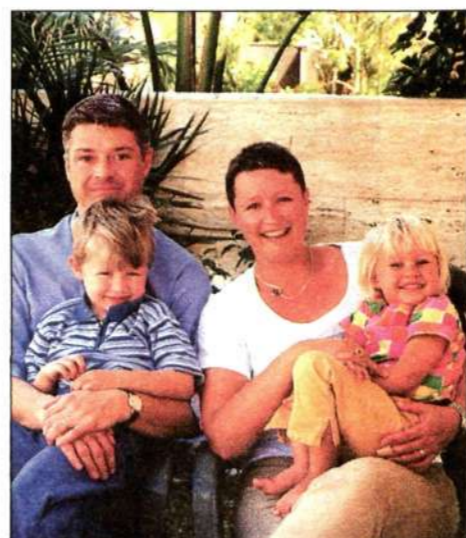
Distance learning

When she was in Southeast Asia, Karin worked and, when the family moved to Slovakia, she was a distance learning student.

"I could find work here in Tel Aviv, but I have decided to enrol in courses I always wanted to do but never had the time for," she says. Riding is an old pastime that Karin has taken up again and it is an interest she shares with Ann and Mats Ahnfors.

"Yes, since we moved here riding really has become a hobby for the whole family," Ann confirms. She herself is participating in a two-year distance learning course in Stable Management, which is run from the U.K. The family's interest in horses and riding is so great that they have bought their own horse.

When the move to Israel was first proposed, Ann wasn't particularly interested and Karin was



Per and Karin Assarsson and their children Mikael and Johanna enjoy the climate in Tel Aviv.

Gunilla Tamm

hesitant because she didn't want to move to the Middle East.

"The picture I had of Israel before we moved



Religious beliefs are strong.

Photo: Lars Åström/Världsbilden



Jaffa oranges.

Photo: Mia Gröndahl/Pressens Bild

here was entirely wrong. After two weeks in Tel Aviv, it felt as if I had lived here all my life," says Ann.

"Before we decided to move to Israel, I came here and met Ann. I was influenced by her positive impression of life here," says Karin.

"That's right. We have in no way regretted that I took on the job here. Now that the GSM assignment has entered a quieter phase, I hope to be able to see a little more of the country. Karin has managed to see many interesting places," Per adds.

Terraced house

Both families live in relatively large and new terraced houses.

"This is the air-raid shelter," says Ann as she shows us around and opens an iron door leading into the cellar. According to Israeli law, all new houses must have an air-raid shelter.

Having an air-raid shelter may sound dramatic, but neither of the families feels any concern about living in Israel. They believe that minor incidents are often exaggerated by foreign television companies.

"Areas and roads are cordoned off now and again and, of course, we avoid those. It's all about common sense," says Ann. Similarly, the families

avoid large crowds of people during Jewish holidays. Ann adds that she never goes to major public events such as rock concerts. On the other hand, she doesn't hesitate to go jogging in the evening – that's safer than in Sweden.

Hebrew text difficult

It is easy to enjoy living in Tel Aviv, but it is also different. This is exemplified by the way in which religion affects everyday life. On Saturdays, everything is closed and hardly any cars pass through the religious areas. If you want pork, you have to go to the German butcher and sometimes it is difficult to obtain dairy products. The range is great, but because everything is written in Hebrew, it can be difficult to tell what is cheese, butter, milk, yogurt and so on.

On Sundays, Ann, Karin and the children (Per and Mats are at work), have Tel Aviv's beautiful sandy beaches virtually to themselves.

Is there nothing that these Swedish Ericsson families miss in Israel?

Yes, there is, and it has to do with snow and ice. Mats sometimes longs to ski and Per misses ice-hockey.

Gunilla Tamm

gunilla.tamm@era.ericsson.se

In Israel, events happen quickly. The country's GSM system – for which Ericsson is supplying the equipment – came into commercial operation in January this year and is now growing by more than a thousand subscribers per day. LM Ericsson Israel Ltd is also expanding rapidly. Slightly more than 155 people are engaged with Ericsson operations.

Record increase in GSM subscribers

In conjunction with the deregulation of the Israeli telecom market, Ericsson decided to establish business there. In Autumn 1996, Bo Andersson arrived in Israel to set up a representation office, and the decision to form a company was taken in spring 1997. Today, LM Ericsson Israel Ltd has 155 employees, some of whom belong to other Ericsson companies but are on contract in Israel. Ericsson's overall operations in the country provide employment for considerably more people – as many as 450, including suppliers.

The major assignment at the moment is the order for a GSM system for Partner/Orange which Ericsson received last spring. A somewhat smaller GSM project is being carried out for Paltel on the West Bank and Gaza Strip.

The company's office in Tel Aviv has become too small and the personnel are currently working at two addresses. In the spring, they will all move into the same building east of the city center in an area where many high-tech companies are located, including Partner/Orange.

Government awarded license

Israel's first mobile telephone system – an analog N-AMPS system which today has 1 million subscribers – was installed as early as 1986. In 1994, a digital AMPS network system was brought into operation and it has 1.1 million users. In autumn 1997, the Israeli government decided to award a license for a GSM 900 system. Three groups were in competition for the operator's license, which went to Partner Communications Co, a joint venture company in which Hutchison Hong Kong is majority shareholder.

"The GSM assignment here in Israel is important to Ericsson because it is such a major business transaction – slightly more than SEK 1 billion up to the middle of 1999. Now the negotiations on the next phase have begun. This is also an important transaction, since it is the first time Hutchison is purchasing a complete GSM system. Previously, the company has only bought parts for the system," says Bo Andersson, President of LM Ericsson Israel Ltd.

The operator Pelephone, which operates Israel's N-AMPS network, recently launched a CDMA network, which makes Israel even more interesting as a mobile telecom market. GSM and CDMA will be measured against one another.

It is no exaggeration to say that everything moves very quickly in Israel.

"The Israelis are business people and want to see things happen fast. The same is true of our customer. It is important for us to listen and adapt so that we are able to cooperate in a constructive manner. Our customer is both skilled and demanding," says Bo Andersson.

Long mobile calls

As many as 35 percent of the Israeli population has mobile telephones, and Israeli mobile users are particularly characterized by their long calls.

For the GSM operator Partner/Orange, it was important to be able to quickly launch its network and put it into operation. Many subscribers



An Israeli soldier concentrating on a mobile call.

Photo: Alex Farnsworth/Pressens Bild

have changed operator because they are interested in being able to travel in Europe and use their mobile phones.

The work on installing the system and putting it into operation has been intensive. At the peak, 43 radio base sites were installed per week. The GSM system now covers 70 percent of the population.

Last summer, the mobile operator Cellcom, which operates the digital AMPS system, placed a major order for MiniLink when the company replaced its previous American supplier with Ericsson Microwave Systems.

"The Israelis are interested in technology and are highly skilled in the field. The country's industry is dominated by software and high-tech companies. For Ericsson, there is the possibility to provide several products and we are currently investigating the possibilities for the MD 110 business switch," says Bo Andersson.

At LM Ericsson Israel, efforts have until now mainly focused on establishing the company and on the major GSM project. Now the task of creating routines and processes for the company is beginning.

"It is important that those who are here on foreign contracts convey their knowledge and contacts within the entire company to the local employees," says Ulf Hellgesson, who is human resources manager. "Everyone has to work the Ericsson way."

"At the moment, switch and BSC specialists, as well as cell planners are needed on contract to pass on their skills to Israeli employees," says Ulf Hellgesson, who himself moved to Tel Aviv a few months ago.

Ulf Hellgesson

Gunilla Tamm



It's difficult to capture consumer attention when the competition is fierce. A recognizable brand name can be crucial.

Photo: Lars Åström

Brand name recognition



Claes-Robert Julander

"A strong orientation towards the market and ongoing communication with consumers are essential in creating a strong brand name," according to Claes-Robert Julander, president of the Stockholm School of Economics and a professor of business economics who has conducted research on people's shopping habits.



One step towards improved sales figures is for the company to be imaginative – by offering telephones in bright colors as well as discreet black, for example. Photo: Lars Åström

Manufacturers should ask just how sophisticated their products need to be in order to sell. Mobile telephones are becoming more and more advanced, even though that may not be what people are looking for. So what is it that makes consumers buy a certain model of mobile phone?

"It isn't easy for consumers to see which telephone is best for them," says Claes-Robert Julander. "Thinking broadly is important when differentiating between products."

Simplicity, or perhaps inexpensive solutions, could be what is required to enter a new market. Colorful, simple telephones for children under the age of 12, could be one such example. Another could be bigger mobile phones with larger keys that are easier to read for older people.

More shelf space

"Successfully expanding into previously untapped customer bases

helps a company to get more shelf space in stores."

No less than 60 percent of purchase decisions are made in mobile phone stores. Consequently, retailers are Ericsson's most important points of contact with consumers.

"Even though retailers mainly choose to sell those products that offer the best margins, it's still important to establish a good relationship with them as well as consumers," says Claes-Robert Julander.

"But as competition increases between manufacturers and they get better at accommodating retailers, other things also need to be done to win the battle for consumers."

Five customer types

There are a number of different ways to divide up a market to meet the needs of different kinds of buyers. Ericsson's Consumer Products business segment has developed a model which divides consumers up into five



Everybody wants to get...

Ericsson's five customer types



Pioneers

Pioneers are active people. They are individualists who enjoy challenges and are interested in advanced technology. They are attracted by strong brand names and want new products with the best possible performance and design. Pioneers will gladly pay for quality.

Achievers

Achievers are hard-working, competitive, goal-oriented people who are looking for success. They will readily purchase luxury products that convey status and which are equipped with useful and time-saving technology. They, too, are willing to pay for quality.

Traditionalists

Traditionalists prefer harmonious environments rather than change. The most important thing for them is that the products they buy are reliable and user-friendly. They are satisfied with a limited number of functions.

Traditionalists prefer established products and well-known brand names, offered at reasonable prices.

Materialists

Materialists are attracted by popular and trendy brand names. They seek to achieve status and recognition.

Belonging to a group is important to them and they like to have fun. Materialists are easy to influence but, on the other hand, they are not especially brand loyal.

Sociables

Sociables are interested in societal issues and culture. They take a rational approach and buy only those products which they believe they need. These people prefer advanced products which are, nonetheless, easy to use and tastefully designed. They are brand loyal customers.

important

different categories (see article above). This model is based on a mature market, in which many people already own mobile telephones.

"In a mature market, consumers are divided up into groups based on how much the telephone is used, while countries with less mature markets are divided into those who have mobile phones and those who do not," says Claes-Robert Julander.

An important condition for entering the consumer market is to have a strong brand name.

Coca-Cola, Levi's and McDonald's, have all put a great deal of effort into building up their brand names, and have succeeded in doing so.

Relations important

But in order to create a strong brand name, a relationship needs to be established directly with the end user. The name given to this is relationship marketing.

This can, for example,

take the form of letters from mobile telephone suppliers to customers with information, special offers or contests.

According to Claes-Robert Julander, all manufacturers are using better at taking care of their retailers. As a result, other features are needed to stand out against the competition.

This is why it is important to build up brand name recognition among end users.

Low prices no good

Attempts have been made to market consumer products using low prices and no advertising.

This has often resulted in a brand name quickly losing its value.

"A brand name is the only guarantee that a product, which may be inside a container and can't be inspected, fulfills the requirements that you have," says Claes-Robert Julander.

Gisela Zeime

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PDC TDMA
WCDMA WLL ROUTER
WDM
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LAN W-LAN

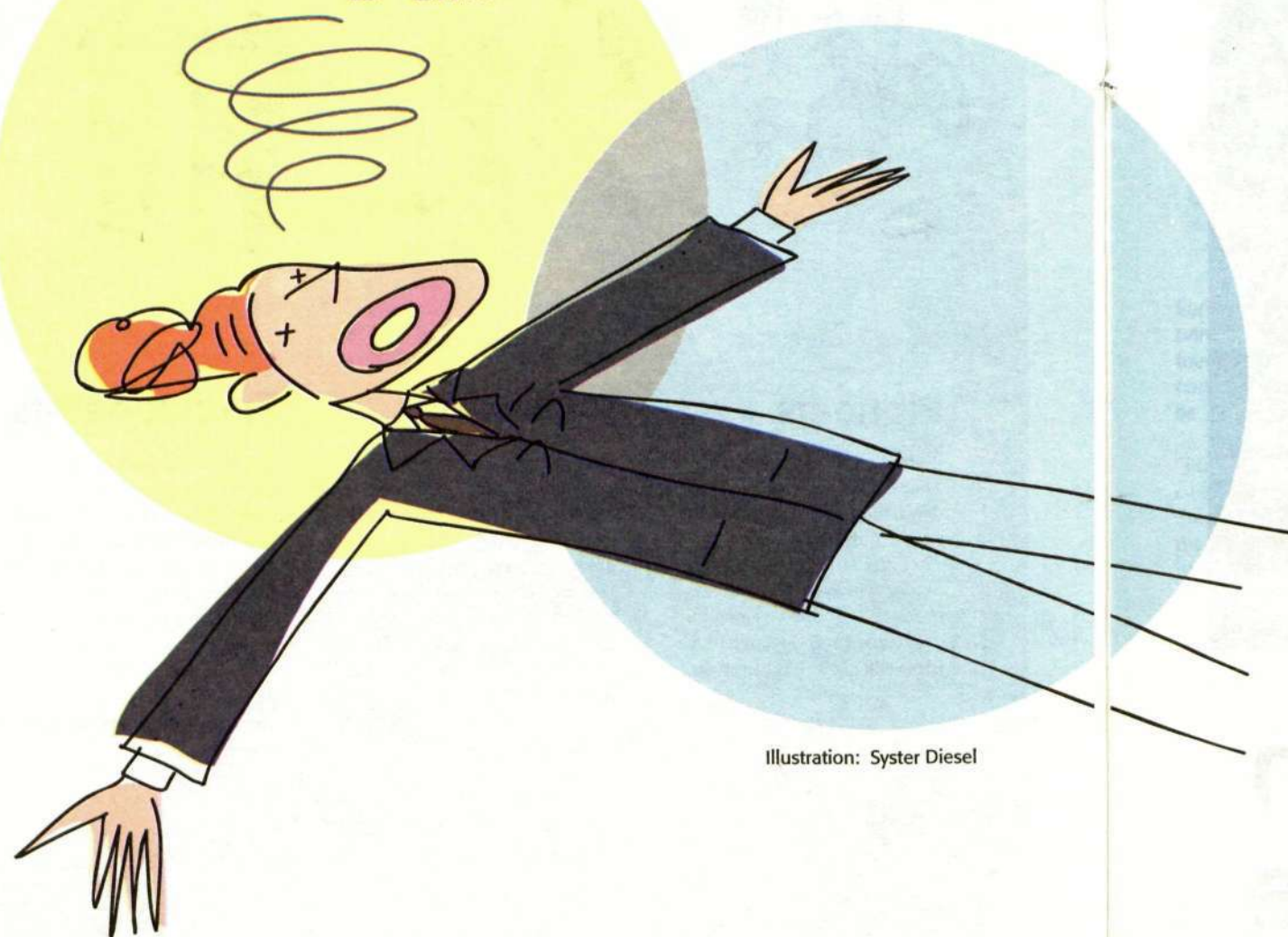


Illustration: Syster Diesel

Best at technology development

Wireless Internet with GPRS and EDGE
GPRS and EDGE are paving the way for wireless Internet and multimedia applications. Together, they can provide data transmission speeds of 384 kilobits per second, considerably faster than the 9.6 kilobits per second that ordinary GSM networks offer today.

During 1998, a new technology known as HSCSD was launched to provide faster GSM data speeds. The circuit-switched technique that can achieve speeds of up to 57 kilobits per second.

In the next phase of GSM development, GPRS will double transmission speeds again to 115 kilobits per second. GPRS is a packet switched service, for which Ericsson is developing its own built-in routers.

GPRS, which will launch during 1999, is a user-friendly service that enables e-mail and other data communications to be sent at high speed on existing frequency bands.

EDGE will be a supplement to GPRS. Over the past year, operators agreed to create a single packet data standard known as EDGE for both the GSM and TDMA systems, the latter being the dominant digital technology in North America and Latin America, among other places. This standard, which is created primarily for multimedia services, will further increase the speed to 384 kilobits per second.

Ericsson, Motorola, Nokia and the Silicon Valley based company Unwired Planet, created a license-free wireless communications protocol in 1998 known as Wireless Application Protocol (WAP). This protocol makes it possible to create advanced mobile telephony services and to read Internet pages from a mobile telephone.

WAP has become the de facto standard, supported by a large number of suppliers. Ericsson

unveiled its first two terminals with WAP readers at CeBIT in Hanover in March.

AXE exchanges world's best

AXE, Ericsson's digital exchange system for fixed and mobile networks, is the world's most successful telephone system. A new, slimmed down version of the AXE exchange was launched in 1998. It is five to ten times smaller than the previous model, resulting in significant savings for operators, as well as considerably lowering production and handling costs.

Ericsson launched the AXD 301, a flexible, high-performance ATM switch intended for Internet operators.

The company also introduced two data switches based on the same technology as the AXD 301. These make it possible for Internet service providers and larger companies to expand the capacity of their IP networks 10 to 20-fold.

Low prices for IP telephony

IP telephony is voice delivered using the Internet's packet-switching protocol. The market is still hesitant, but the International Telephone Union (ITU) predicts that already by the year 2001 there will be 300 million people using IP telephony.

The primary driving force behind this is the lower prices that operators are able to offer, especially for long distance service. Other, new multimedia services are also expected to increase demand.

Although the Internet was not created for voice communication, the use of gateways allows traffic to be converted between the Internet and traditional telephony systems. Ericsson, which is in the advanced stages of IP telephony development, already has such products

and approximately 400 telecom and datacom companies had joined Bluetooth's Special Interest Group (SIG) by 1998. Today, the technology has become the de facto global standard.

The chip has a range of several meters, making it possible to transmit data between a mobile phone and a laptop computer, for example.

The system will be inexpensive and have an open standard, making it possible for other companies to use EPOC for a nominal fee.

Bluetooth

Bluetooth is a new, compact, inexpensive radio chip which has been under development by Ericsson since 1996.

In order to build support for Bluetooth, Ericsson decided to offer this technology to other companies, forming a consortium with IBM, Nokia and Toshiba in 1998.

Ericsson predicts that the chip will be installed in over 100 million mobile phones by the year 2002. The chip has open specifications

RESEARCH AND DEVELOPMENT

During 1998, Ericsson invested SEK 30,000 million in technology development, corresponding to 16 percent of sales.

A total of 22,000 people were employed at design and research centers in 25 countries around the world.

In Ericsson's new organization, product development occurs within product units, each with profit responsibility. There are over 50

and approximately 400 telecom and datacom companies had joined Bluetooth's Special Interest Group (SIG) by 1998. Today, the technology has become the de facto global standard.

The chip has a range of several meters, making it possible to transmit data between a mobile phone and a laptop computer, for example.

Symbian

Ericsson, together with Nokia and the British company Psion, have formed an alliance, creating a new company, Symbian, to develop and market the EPOC operating system for future mobile phones. Psion has been manufacturing and selling handheld computers and calculators since the 1980s. The companies behind Symbian plan to develop the EPOC operating system so that it will work with mobile communications.

The system will be inexpensive and have an open standard, making it possible for other companies to use EPOC for a nominal fee.

Edited by Mia Widell-Örnung

product units connected to various business units.

During 1998, a new unit was also created, Ericsson Research, which has responsibility for advanced early-stage research. The unit has its roots in the mobile systems and mobile telephony research unit which created the WCDMA, EDGE and Bluetooth concepts, among others.

WCDMA

— the next generation

The first generation of mobile telephone systems were based on analog technology like NMT and AMPS. Second generation systems, which appeared around 1990, were based on digital systems such as GSM, PDC and TDMA. During 1998, major decisions regarding third generation mobile systems were made.

Wireless communication using IP (Internet Protocol) will form the basis for third-generation systems and will offer completely new services and transmission speeds over 100 times faster than today's systems.

Third generation systems will be able to offer speeds of up to two megabits per second. That translates into fast Internet downloads and convenient, quick e-mail services, including transmission of images.

New frequencies in the 2 GHz bandwidth have been allocated by the ITU (International Telephone Union) for use by third-generation mobile networks around much of the world.

Worldwide standard

During 1998, Ericsson's WCDMA technology became the accepted standard all over the world for the next generation of mobile phones. In January, the technology was approved by the ETSI (European Telecommunications Standards Institute) as the standard for third generation mobile service in Europe. Comprehensive work was undertaken to unite efforts in Europe with standardization in Japan, China and the U.S. As a result of these efforts, the ITU proposed in June that WCDMA become a worldwide standard.

In concert with the ITU's ongoing work to recommend worldwide standards, rapid developments were taking place in the final technical specification work for WCDMA. By year's end, a cooperative global project known as 3GPP (Third Generation Partnership Project) had been initiated among regional standardization organizations to coordinate and speed work along.

Ericsson has been involved with WCDMA

technology since 1989. Some of the current standardization work has built upon important findings that were made and patented by Ericsson. This work has made the company a pioneer in next-generation mobile telephony.

Emphasizing on the future

In its developmental work on WCDMA, Ericsson has placed a special emphasis on being able to successively evolve into the next generation from current GSM systems. This will ensure that today's operators will be able to migrate into the future at their own pace, depending on the demands of the market. Ericsson's efforts have made WCDMA the leading technology for third-generation mobile telephony, with the support of almost 85 percent of mobile operators worldwide who operate digital networks.

Ericsson is leading the development of third generation test systems. Currently, the company has 16 WCDMA test systems in operation and could begin delivery this year of systems incorporating the new technology to Japan's NTT DoCoMo and several European operators. Ericsson has made an effort to also invest in the development of a special ATM technology - AA12 - in order to meet the transmission requirements that the new radio technology poses.

Licensing of the frequency spectrum for this technology has already started in several markets and will be occurring in Europe, among other places, during 1999. In Japan, systems are expected to be fully built and put into commercial operation already by the year 2001.

Edited by Mia Widell-Örnung



Ericsson's WCDMA technology for the next generation of mobile phones became the accepted worldwide standard during 1998. WCDMA is now the leading technology for third generation mobile telephony and is supported by almost 85 percent of the world's mobile digital network operators. Ulf Rosberg showed off Ericsson's WCDMA solution at the CeBIT trade show in Hanover. Photo: Tord Andersson

GLOSSARY

It's not easy to keep track of all the terminology. Here's a list with quite a few of the abbreviations that are tossed around in the world of Ericsson. The list was taken from this year's annual report.

ATM - (Asynchronous Transfer Mode) A technology for broadband transmission of voice, data and video, capable of handling high-capacity signals transmission.

AXE - An open architecture and Ericsson's communications platform. A system for computer controlled digital exchanges which serve as nodal points in large public telephone networks. The basis for Ericsson's wireline and mobile systems.

Bluetooth - A radio technology, developed by Ericsson and other companies, designed around a new chip that can send wireless transmissions of data between telephones and computers, and so on.

CDMA - (Code Division Multiple Access) A technique for digital transmission of radio signals between a mobile telephone and a mobile base station, for example. In CDMA, frequencies are divided up into a number of codes.

D-AMPS - (Digital Advanced Mobile Phone System) The former name for the American standard of digital mobile telephony, now known as TDMA.

DECT - (Digital Enhanced Cordless Telecommunications) A common standard for wireless telephony, originally set by ETSI. DECT is a solution for wireless business communications.

EDGE - (Enhanced Data rates for GSM Evolution) A technology that coordinates the development of GSM and TDMA, enabling them to handle third-generation services. EDGE was designed to enable the transmission of large quantities of data at high speeds, 384 kilobits per second in mobile applications.

EPOC - An operating system for mobile terminals, developed by Symbian (Ericsson's joint venture company with Motorola, Nokia and Psion).

ETSI - (European Telecommunications Standards Institute)

GPRS - (General Packet Radio Service) A packet switched service, using high-speed, wireless technology, 115 kilobits per second, making wireless Internet and other data communication possible.

GSM - (Global System for Mobile Telecommunications) The world's most widespread mobile telephone standard. Uses the 900 and 1800 MHz frequencies in Europe, Asia and Australia, and 1900 MHz in North America and Latin America.

HSCSD - (High Speed Circuit Switched Data) A circuit switched technique for faster transmission speeds, up to 57 kilobits per second, primarily for GSM.

IMT-2000 - A term used by the UN's International Telephone

Union (ITU), for third generation mobile communication.

IP - (Internet Protocol) A protocol standard which contains network addresses and is used to send messages between various networks via the Internet.

LAN - A smaller data network built in a confined area, for example a building or a group of buildings.

PBX - (Private Branch Exchange) An exchange system which can handle internal and external calls for companies or organizations.

Router - A unit that handles connections between various networks. A router identifies the addresses of data as it passes by, determining how the transmissions should be routed, and bundles data into packets for forwarding.

3GPP - (Third Generation Partnership Project) A cooperative global project where regional standardization organizations in Europe, Japan, South Korea and the U.S. are coordinating WCDMA issues.

TDMA - (Time Division Multiple Access) A technology for digital transmission of radio signals between mobile telephones and radio base stations, for example. TDMA is also the name of a digital technology based on the IS-136 standard. TDMA is the current name for what was once called D-AMPS.

UMTS - (Universal Mobile Telecommunications System) The name for the third-generation mobile standard to be used in Europe and created by ETSI.

VoIP - (Voice over IP) A technique for sending ordinary telephone calls on packet switched routes across the Internet. The technique is also known as IP telephony.

WAP - (Wireless Application Protocol) A license-free protocol for wireless communication that makes it possible to create advanced mobile telephony services and to read web pages from a mobile telephone. WAP has become the de facto standard, supported by a large number of suppliers.

WCDMA - (Wideband Code Division Multiple Access) A technology for wideband digital radio communication for the Internet, multimedia, video and other applications requiring high-capacity, which Ericsson, among others, developed. It has been chosen as the technology to be used in third-generation mobile systems in Europe, Japan and the U.S. The technology is also the primary alternative being looked at in other parts of the world, especially Asia.

W-LAN - (Wireless LAN) A cordless version of a LAN. Provides access to the LAN even when the user is moving around the office.

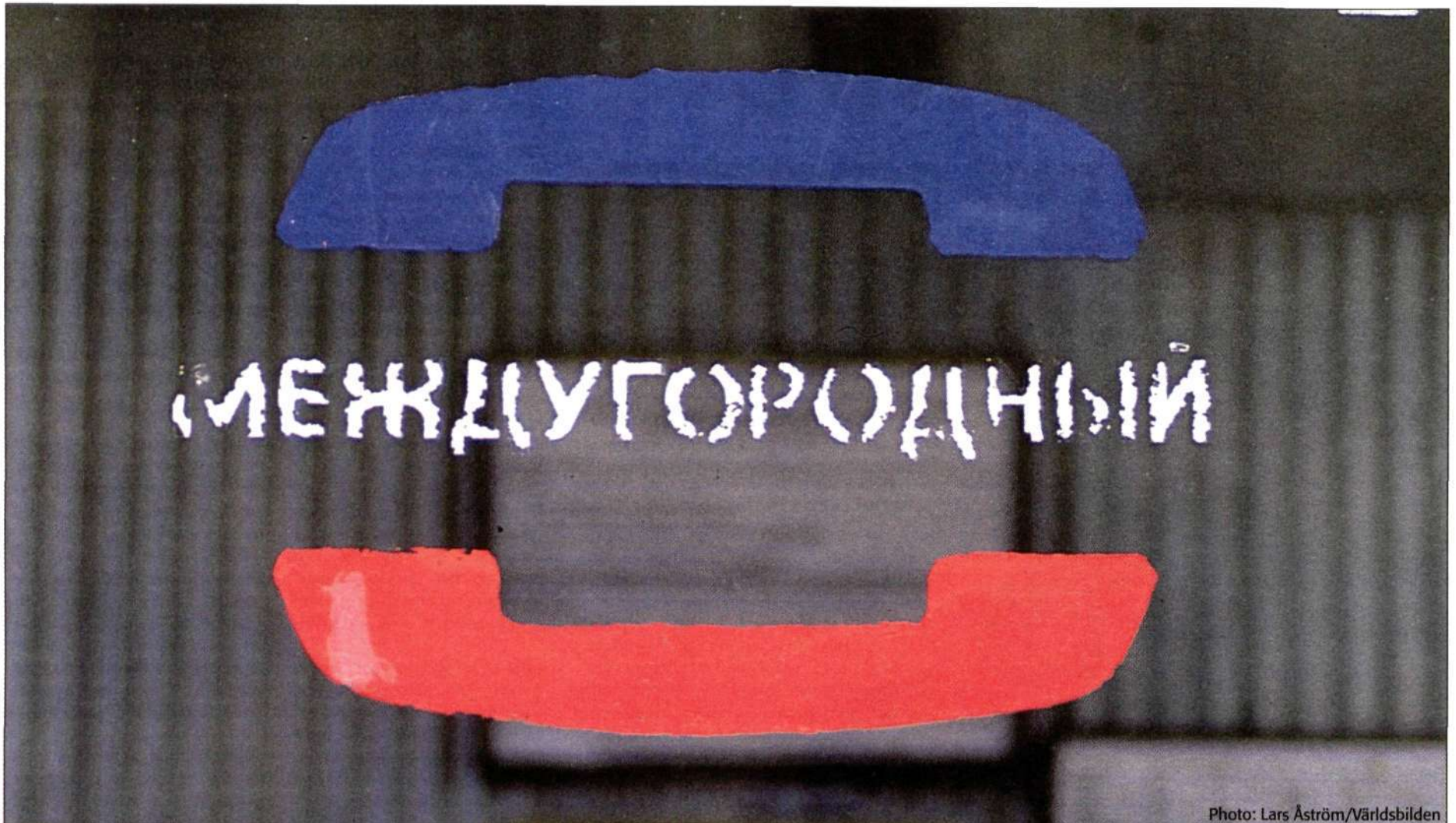


Photo: Lars Åström/Världsbilden

Moscow University and Ericsson in telecommunication exchange

"We can provide Ericsson's training center with competent teachers and, via Ericsson, we receive access to new technology, so that cooperation is highly rewarding for both sides." This is how Professor Vagan Shakhgildyan, rector of the Moscow Technical University of Communications and Informatics, MTUCI, describes the cooperation with Ericsson that was established four years ago.

The Ericsson training center is located in its own building on the university campus. When it was started in 1995, it was located in an older building, but two years ago the operations were moved to newly renovated, modern premises with total floorspace of 6,000 square meters.

Over the past two years, slightly more than 900 people have participated in the center's customer training program. Ericsson's customers – both for fixed and mobile networks – send their employees here from all over Russia and also from the countries of the former Soviet Union.

"Next week, we will have participants from Ukraine," says Alexander Struchkov, who is General Director of Ericsson's training center.

Courses are held in both fixed and mobile telephony, with mobile telephony accounting for 60 percent of the courses. There are training switches for both NMT and AMPS systems.

The languages of instruction are Russian and English, although Russian dominates.

New switch installed

When Contact visited the training center, a new training switch for fixed telephony was about to be installed.

"When it comes to new equipment, English is used a great deal because it is difficult to translate technical terminology," Alexander Struchkov explains. He also tells us that an internal translation standard has been established at the training center.

There are 13 instructors at Ericsson's training center, all of whom have a high level of education in technology. Some of them have also

completed doctorates. In Russia, it is important to have highly qualified teaching staff, since high educational standards are part of the Russian tradition.

Adjacent to the teaching area, there are 32 rooms for those participants who come from further afield and have to live at the training center. All of the rooms are of Scandinavian standard and some of them are even adapted for the handicapped, which is very uncommon in Russia.

The University, which was founded in 1921, has 9,000 students and 800 teachers.

"I studied here myself and also taught here after graduation," says Alexander Struchkov. MTUCI focuses particularly on telecommunications and is prominent in such research areas as antenna technology.

Five companies – Ericsson, NEC, Alcatel, Italtel and Cisco – have training centers at the University. The Ericsson training center consists of two parts, customer training and the

Ericsson Institute, which is responsible for internal training for Ericsson companies in Russia.

"Through their contacts with the five training centers, our teachers obtain knowledge about the various companies' products, which is extremely valuable. This gives us the opportunity to learn about the latest technology," says MTUCI rector Vagan Shakhgildyan.

Specialization

Education at the University lasts five years, with a specialization during the final two years. Part of Ericsson's cooperation agreement with the University is that 46 students receive one year's specialist studies with the company. This includes AXE skills and training in the Erlang programming language.

The center in Moscow cooperates with other Ericsson training centers around the world.

"We have excellent regular contact with Ireland and I believe that increasing the flow of knowledge and experiences between all of the centers would be of use to Ericsson as a whole," says Alexander Struchkov.

Gunilla Tamm

gunilla.tamm@era.ericsson.se



Professor Vagan Shakhgildyan is rector of the Moscow Technical University of Communications and Informatics.



"Make yourself heard" in Russian on one of many billboards in Moscow.
Photo: Gunilla Tamm



Alexander Struchkov is General Director of Ericsson's training center in Moscow.

Better testing required

Earlier and more systematic testing of Ericsson's products is a necessity if the company is to maintain its competitiveness. Traditionally, testing has been conducted towards the end of the development process, but as the time between the initial concept and having the finished product continues to shrink, testing also needs to be improved.

"Planning for the testing of products still occurs towards the end, which means running the risk of delaying an entire project. It's on the testing side that we need to save time now. The design phase is already very streamlined," says PeO Olsson, unit manager for Ericsson's TTCN test language competence center at Ericsson Software Technology in Karlskrona, in southern Sweden.

"Historically, testing has received very low priority compared with design, and the linkage between design and testing has been weak. But awareness of testing has increased significantly, and in many places there's been a strong desire for change. Our goal is to get involved earlier in the development process of a product in order to be able to influence how testing is conducted," says Anders Ejlertsson, customer manager at the unit and Ericsson's representative in this field at ETSI (European Telecommunications Standards Institute).

Contact with companies

Twenty people work in the competence center at Ericsson's modern Karlskrona office, situated by the sea in the old, maritime city. They develop testing environments for software found in various Ericsson products, including the software found in the nodes and exchanges of Ericsson's fixed and mobile systems.

They also help to specify which tests are needed and maintain contact with the companies who will subsequently conduct the tests. Tests are based on the TTCN test language, a standard developed by ETSI, but which is owned by the UN's ITU and the ISO.

"In large projects, up to half of the development time can be devoted to various kinds of tests. So far, we do not have any concrete measurements as to how much time can be saved by following our concept, but from what we've already seen, it's possible to make considerable savings," says Anders Ejlertsson.

Among other things, the competence center is involved in testing certain parts of the

WCDMA system as well as new exchanges, so-called nodes, that are needed for Ericsson's GPRS packet data system.

"We play the role of the integrator. We make sure that testing sites within Ericsson are able to do their job, that is, to conduct the tests. We do the rest," says Anders Ejlertsson.

The TTCN test language competence center in Karlskrona is just over one year old. Prior to its existence, competence in this field was spread throughout the organization, for example, at Ericsson in Finland.

"The need for testing is great. Considering all of the orders we are receiving from our customers, we can really grow as much as we are willing and able to manage," says PeO Olsson, who is the center's manager.

ETSI is now in the process of developing the third version of the TTCN test language. The third version will be a small, generalized yet powerful core language. The language will be able to handle various, specific testing areas and it will be easy to adapt for completely new areas of testing.

Disseminating standards

Ericsson is monitoring and influencing this standardization work. Another important task is to disseminate internationally agreed-upon standards within the organization.

"We can avoid problems by using the same language and having a standard method for writing TTCN code. Unfortunately, not everyone follows those guidelines. I hope that Ericsson will become better at doing so," says Claude Desroches, who works with ETSI on behalf of Ericsson.

The competence center is organizing a TTCN conference in Copenhagen on May 4. More information is available on the web.

Mia Widell Örnung
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TTCN TESTING LANGUAGE

TTCN stands for Tree Tabular Combined Notation and is the only standardized test notation in existence. It is used in a special branch of testing known as conformance testing, and the notation is really a part of the framework for that kind of test. Ericsson, along with many other telecom companies, has developed ways of using TTCN for other kinds of tests as well. In theory, TTCN can be used for any kind of tests that have to do with transmission and reception

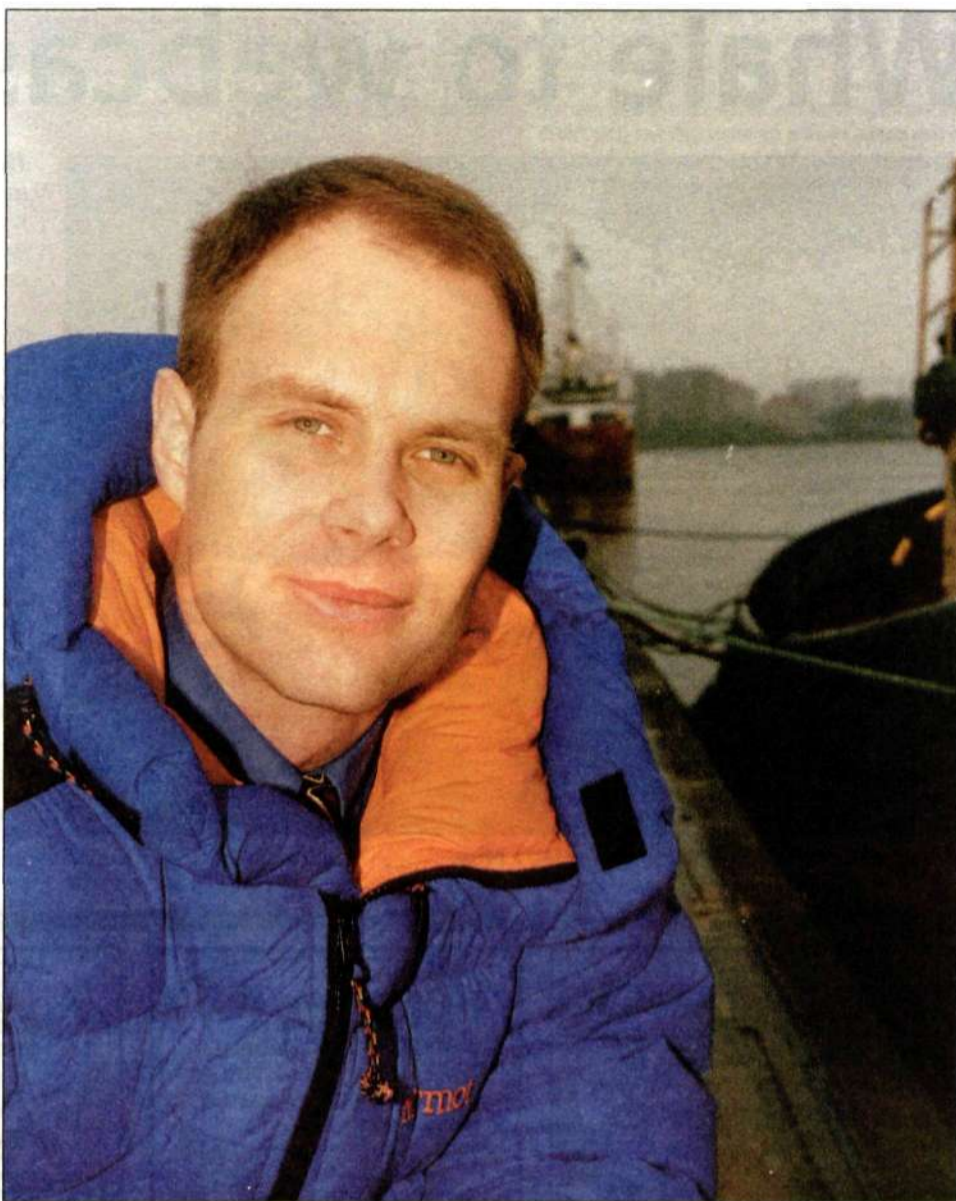
of data. TTCN is a standardized formal notation where test scripts can automatically be generated from earlier designs in a relatively simple manner.

TTCN was developed in the mid-1980s and has undergone only modest changes since then. A major effort is now underway within ETSI to further develop TTCN and expand its usage.

http://www.epk.ericsson.se/~epkttcn/a



Anders Ejlertsson



PeO Olsson at the TTCN test language competence center.

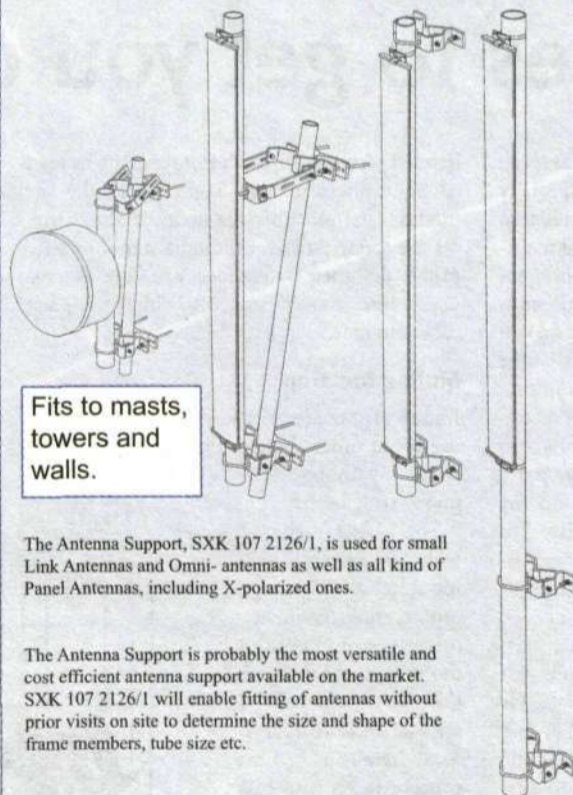
Photo: Mia Widell Örnung

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Whale to webcast final



Keiko the killer whale on his way to winning a prize.

Photo: Kaiser Robert/FLT-PICA

The Ericsson-sponsored Internet transmissions of the homeward journey of Keiko, depicting the killer whale's return to Iceland, has been nominated for a prestigious prize.

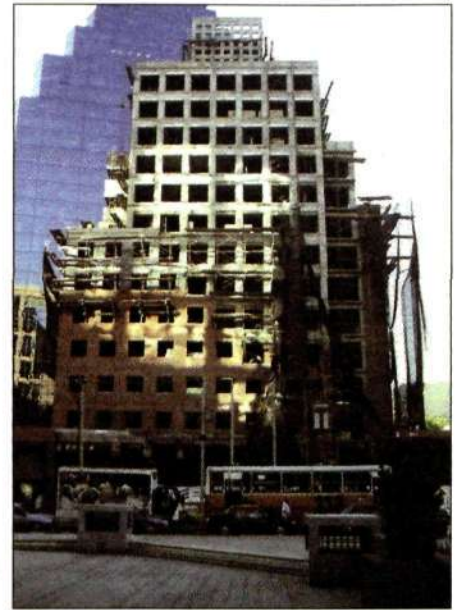
The transmissions have been nominated to compete in the final round of Real Network's competition for best direct transmissions on the world wide web (webcast). The prize will be awarded at the beginning of May.

Keiko is the killer whale that was once a favorite with the audiences at aquatic shows in Florida, before his talent earned him a starring role in the movie *Free Willy*. But Keiko suffered from the confines of life in the big pool. His dorsal fin was afflicted by atrophy and hung limp.

Not long ago, he was transported home to Iceland to a new life of freedom.

Keiko's release attracted a great deal of media attention. Ericsson arranged and sponsored the Webcast transmissions.

<http://www.real.com/conference/streamers/index.html>



Impressive head office building in Santiago.

New head office in Santiago

A new head office building for Ericsson in Chile is now under construction.

The building will include about 300 workplaces and is expected to be ready for occupancy in August of this year. As its first project in South America, Ericsson Real Estate & Services is contributing technical advice and other services throughout the entire project.

The new structure will serve mainly as an office building, since Ericsson in Chile works primarily with sales, sales support and related services.

Today Ericsson you can find Ericsson at six different locations in Santiago. There are also two branches, one in the south and one in the north of Chile.

Mårten Tiselius knows more:

marten.tiselius@rem.ericsson.se

<http://www.rem.ericsson.se/remind>

ERIC & SON



COLUMN

Cellphones to get you out of a fix

I really must confess, dear reader, that I hate talking on a cellular telephone – especially in a public place. However I do agree that cellular telephones can be very useful for maintaining contact with friends, family, colleagues and the Home Shopping Channel. While mobile phones are getting smaller in size and can easily be carried in one's pocket, I find that the phones are getting too small to use comfortably. To avoid sharing my side of every conversation with a horde of strangers I either have to talk in such a low voice that the other party can't hear me, or cup my hand around my mouth and the phone so that I look like I'm sharing top secret information with my CIA contacts. As a result I find myself using the mobile telephone less and less.

But recently I saw a mobile telephone from Japan that had two very clever innovations that gave me hope for the future. The phone itself is about the size of a pack of cards, which at first glance looked too small for my comfort. While holding the receiver to my ear, the microphone would be about halfway down my cheek – with the end result that I would be speaking in such a loud voice that everyone within a 20-meter radius would become unwilling participants in a one-sided conversation. But when I picked up the phone I saw that the microphone was on a folding arm, which when extended would be placed perfectly in front of my mouth. A second clever innovation was a thumb-wheel navigator button that could be used for one-

handed scrolling through number lists instead of the cumbersome two-handed-poke-the-key method that most mobile phone manufacturers use today. At last, I thought, a mobile telephone designed by engineers for the average user, rather than designed to simply impress other engineers.

Muting function

But all of these innovations started me thinking about other changes that I'd like to see to make my mobile telephone truly useful.

The first change would be a simple muting function. That is, a button that could be pressed once to cut out the transmission from the phone, and pressed once again to restore it. And here's a radical concept to go with this idea – the button could be clearly labelled MUTE. The phone I use today apparently has such a function, but for some unknown reason it's accessed by pressing the CLEAR button.

The next change would be an extra "reserve" battery built in to the phone that provided enough current to allow a call in progress to remain connected for about 10 seconds after the

main battery had expired. During this period I could either replace the flat battery with a fully-charged spare, or I could end the call gracefully rather than letting my mother-in-law think I had just hung up on her.

Another important innovation would be a "static" key that could be pressed at appropriate moments during a call to simulate poor reception. For example it would be very helpful when my boss asks me whether I have finished a particular report for him. I could simply

press the STATIC key, which should ideally be placed on the side of the phone within easy reach of my thumb, and I could reply "Well actually, if ... <static> ... I expect that... <static> ... report ... <static> ... most likely finalised ... <static> ... desk on... <static> ... day."

My next proposal is to be the subject of a patent application that will see

me collecting royalties and retiring to the same Caribbean beach from which my devious colleague Furrby recently returned after his ill-earned vacation. Similar in some ways to the anti-shoplifting gates that are found in some stores and in which loud-sounding alarms are triggered by tags attached to articles of mer-



Roger Wilco



chandise, the "Wilco Wireless Watchdog" will utilise gates at the entrance of restaurants, theatres, churches and certain other public places. Any working mobile telephone that passes between the gates will immediately trigger a silent alarm within the phone – in this case an electric shock that emanates from the phone to its user. The shock will repeat every 10 seconds, gradually increasing in intensity until the phone is either switched off or self-destructs.

Phone signal accompanied carol

I was moved to create this invention last Christmas Eve while listening to the choir sing the carol "Silent Night" at midnight in a darkened church when somebody's phone started to ring. Divine inspiration perhaps, but remember you read it here first.

Roger Wilco, over and out.

Roger Wilco

In real life, Roger Wilco is a Technology Manager at a large international telecommunications company that he'd prefer not to identify.

Vacancies

AT ERICSSON

■ This is a selection of vacancies within the Ericsson corporation. They are published in the electronic News system, which is being updated once a week.

For further information about advertising here, send a memo to LME.LMEJOB.

Main responsibilities and tasks: Meet the goals for sales of existing and new products & services in the region. Actively drive sales of new products & services in the region directly towards our customers and through the local sales organizations. Frequently handle customer presentations and negotiations in the relevant markets.

The candidate should preferably have the following qualifications: Documented sales experience. Completed university degree, M.Sc., MBA or similar. Good understanding of IP and data communication. Business minded with strong perseverance and "drive". Fluency in English and good command of other relevant languages. This position will offer you the possibility to work in a stimulating international environment with excellent possibilities for personal development.

Contact No. 6 1999

Updated April 7

In Sweden

Ericsson Radio Systems AB, Kista

MANAGER, GSM MACRO AND MICROCELL RADIO NETWORKS

In the newly formed Radio Network Competence Center we need a manager to take on the new sub-unit GSM Macrocell and Microcell Networks. The area is huge. With today more than 150 million GSM users globally, there is certainly a good deal of action going on!

The unit is responsible for development of features, methodology and guidelines for the GSM networks, primarily towards PU BSS, but also acting as the speaking partner for any unit within BMOG. The unit has a complete responsibility for the macrocell and microcell issues, with clear responsibilities and authority, which means that it is meant to act forcefully on its own as well as in cooperation with others. Examples of technical areas where the unit is active are: UMTS/GSM coexistence, Self-Configuring Systems (SCS), tight frequency reuse, cellplanning methodology, cellplanning tools.

The mission is simple: make sure Ericsson's offerings in the radio network area put our customers well ahead of competition!

The unit consists of highly skilled and professional staff with a broad experience of GSM and is therefore driving many of the state-of-the-art development projects running today. The activities and projects are carried out globally, many joint projects are performed in the field with leading-edge GSM customers and Ericsson competence centers around the world. Close cooperation is necessary with its sister-units Wireless Data and Wireless Office.

● The challenges in the exploding GSM market put high requirements on the unit and therefore also on you in the position as manager. We see that you have previously worked with mobile telephony and that you have relevant managerial (line or project) experience for at least a few years. You need to be a strong and business minded leader for the unit, with good drive and a strong will of your own. Your eyes and ears must be open for future possibilities. You must of course also develop the unit continuously, keeping up with the internal and external requirements. Experience from radio networks and operators is very valuable for the position.

Do you think you are up to it? Please get in touch! We look forward to having you with us!

Contact: ERA/LVR/DC Thomas Johansson E-mail: thomas.johansson@era.ericsson.se Phone: +46 8 40 457 40 Application latest 990415: ERA/LV/HS Kerstin Almblad Ericsson Radio Systems AB SE-

164 80 Stockholm, Sweden E-mail: kerstin.almblad@era.ericsson.se

Ericsson Radio Systems AB, Kista

AREA MANAGER - WIRELESS DATA SALES

The wireless communications field is one of the most dynamic and expansive industries of this century. Today, Ericsson's TDMA (IS-136) products and services support 35% of the world's wireless subscribers. New and dynamic applications such as Wireless Data (via CD-PD), PrePaid, PCS and Wireless Office, are forging new frontiers within the TDMA (IS-136) wireless world. With its strong entrepreneurial spirit, the TDMA Systems business unit has established itself as a leader within the Ericsson group to meet challenges of today and tomorrow in this dynamic wireless communications market.

● TDMA (IS 136) offers today a packet data access using CDPD, making it the only global wireless standard to provide packet and voice services in the same network. The packet data access is becoming an increasingly important part of the BMOA portfolio and we are now looking for an experienced and ambitious Area Manager to develop and manage the wireless data sales business for a selected region.

Contact: AM/R Staffan Hasselrot, phone +46 8 404 34 87 Staffan.Hasselrot@era.ericsson.se or AM/R Håkan Olsson, phone +46 8 757 01 59 Håkan.Olsson@era.ericsson.se Application: Ericsson Radio Systems AB AH/H Annelie Gustafsson 164 80 STOCKHOLM

Ericsson Radio Systems AB, Kista

WIRELESS DATACOM MARKETING AND SALES

Are you up to the challenge of winning the hearts of our customers by guiding them into the next big money generating business? Are you adventurous enough to market and sell wireless data solutions to them? Are you interested in being one of the pioneers that will lay the foundations for Wireless e-Solutions?

We - Wireless Datacom Marketing and Sales - are a unit within Ericsson Radio Systems responsible for making a difference in the success of Wireless Datacom solutions. Our responsibilities encompass the marketing and technical support of our complete Wireless Data product and service portfolio, the management of our Wireless Internet Solutions packaging program, a leading competence management, and the handling of various market projects. Co-operating with other instances, we handle GSM standard solutions such as High Speed Data, General Packet Radio Services (GPRS) as well as other solutions such the WISE? (Wireless Internet Solutions) program and end-user applications (Mobile Banking, etc.).

GSM Data is presenting our customers and us a giant world of new business opportunities. We need to

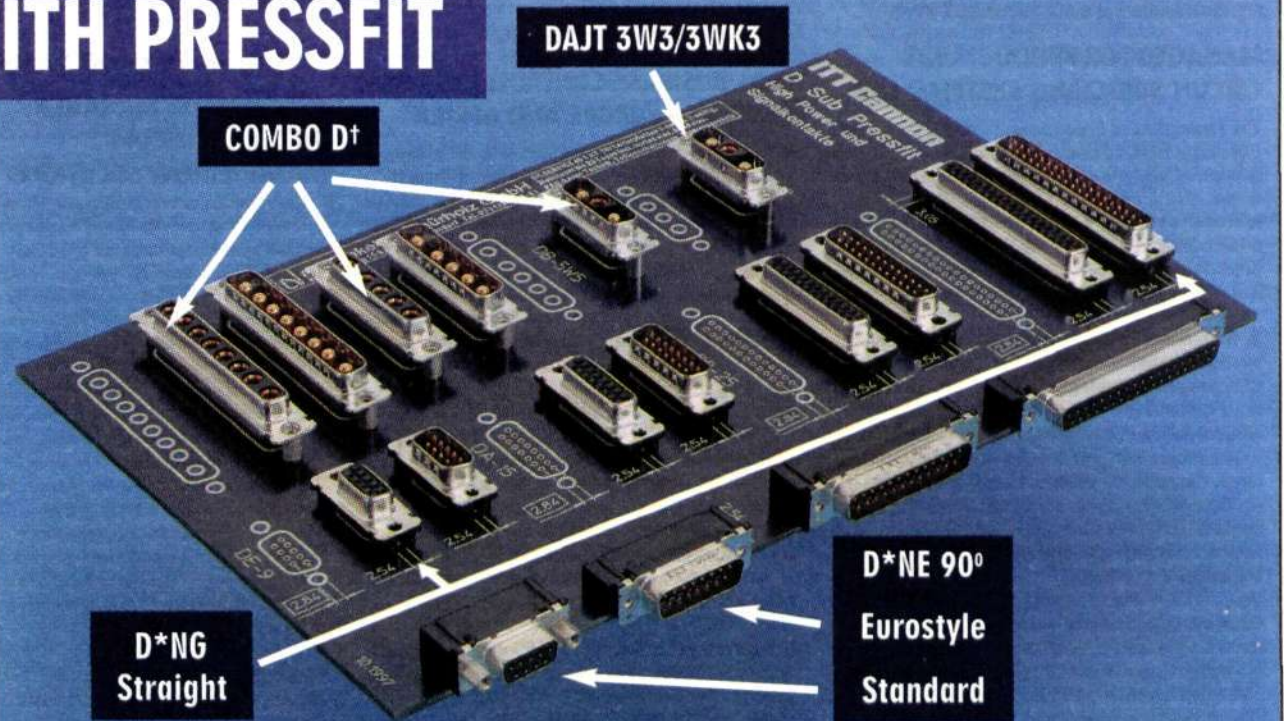
HIGH POWER WITH PRESSFIT

ITT Industries, Cannon Division's well-established combination D Subminiature connectors offer the advantage of an industry standard shielded I/O interconnect, with power contacts up to 40A, designed for power supply for any application and offering excellent protection against EMI/ RFI.

Cannon has now developed high power contacts with pressfit termination. This eliminates the additional soldering process needed when using standard D Subs and Combo D / DAJT with high power contacts on a PCB.

High power pressfit contacts are available for the non filtered Combo D series D*M as well as for the filtered series DAJT with integrated high quality ceramic filter arrays.

- 40A at +60°C for a multilayer 6 x 35µm x 4,5mm
- 28A at +60°C for double layer 35µm x 4,5mm
- Robust design
- Available layouts are 3W3 / 3WK3 / 5W5 / 8W8
- Filtered / Non Filtered
- 90° version under preparation
- High performance and reliability
- Complete customer application tooling available
- High Power pressfit for well known and established D Sub layouts
- Already designed-in and approved by various key customers



† Trademark of ITT Industries

To guarantee a proper positioning of the connector on a PCB - even under rough environment conditions - the connector is fixed on the PCB with special pressfit boardlocks swagged to the flanges. Using Cannon's pressfit technology the shell achieves perfect connection to the PCB ground by its gas tight connection with the boardlocks.

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You can also find out more about our products at our Internet address:
<http://www.ittcannon.com>

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Cannon



ITT Industries
Engineered for life

conquer this rapidly expanding area with the help of ambitious goals and objectives, motivated and skilled people and, most important of all, a winning spirit.

● If you are very ambitious, smart, creative, fun, outgoing, persistent, have an outstanding drive, social, analytical, have a Master of Science in Engineering / Datacom, as business oriented as Gordon Gecko (*), do not accept a "no", spread enthusiasm into your surroundings, an achiever with an entrepreneurial spirit, and think wireless datacom could be as much fun as a Friday night out.

Then you are invited to have the opportunity to join the Ericsson Wireless Datacom Champion Team and pursue our goals. PS: Did we mention that the nature of these positions entails many customer meetings and thus, certain availability for shorter travel periods abroad? (*) Watch the movie "Wall Street" and you will understand.

We need to build our Marketing unit rapidly in order to handle the commercial opportunities delivered by Wireless Internet solutions! The unit will support our account mgmt organisations around the world with expertise commercial and product knowledge of our existing and new products, platforms, and applications!

MANAGER, MARKETING MANAGEMENT

● As Manager of this unit, you shall cater for its build up to reach a functioning state in as a short time as possible. You need to create a winning team of Wireless Data Champions with top competence in both the data and business area. The unit will be supporting the global Ericsson world in customer meetings, sales seminars, marketing guides, business cases, negotiation and pricing support.

In order to reach a critical mass of sales force for GSM datacom products and solutions the unit will have to develop own marketing methods and tools and make them available to the local companies. To ensure this you would need to set up and run a program of which the elements could be network build-up, sales kits, marketing aids, seminars and events.

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Ericsson Radio Systems AB, BMOG, Kista

MANAGER FOR PRODUCT UNIT CIRCUIT SWITCHING SYSTEMS' LAB

The Heuristics and Experimental Lab (HEL) within PU CSS is working to increase the traffic in Ericsson's customers GSM and PDC systems today, through promotion of new, innovative applications using circuit switched connections. The lab consist of approximately 6 persons dedicated to identifying, prototyping and demonstrating interesting applications which will increase the need for mobile switching equipment.

● We are now restructuring this activity in order to increase focus, and employ the lab to support PU CSS' long-term strategic direction. In order to succeed with this increased ambition and effort, an enthusiastic and driving manager is needed.

We believe that you are well educated, have extensive experience in the world of telephony or datacom applications, have a far-reaching contact network within Ericsson, are fluent in English, and have an ambition and drive to succeed with the seemingly impossible.

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Ericsson Services, Network Operators Customer Services Solutions

MANAGER - 2:ND LINE SUPPORT, NETWORK SUPPORT

Customer Services Solutions at Network Support for Wireline Systems, GSM Systems and TDMA Systems is entering a new and exciting phase 1999, we are experiencing a rapid and interesting change in our organization.

New technique and further deregulation of the telecom market leads to an expanding service market.

● We are now looking for a strong and self-motivated manager for the 2:nd line support within the segment.

Some of your most important challenges will be: Definition of the global supply strategy together with Ericsson's PU's. Deployment of the global supply strategy with the Ericsson Services Regional Offices (ES-RO). Ensure operational performance of the global 2:nd line support organiza-

tion. Review product performance together with the product owner's.

To succeed in this work co-ordination of different functions is required it is therefore essential that you have excellent communication skills, are outgoing and independent.

We believe that you have technical knowledge and several years of experience working in the telecom industry, and at least 3 years within Ericsson. You should have a good understanding of services and be business oriented.

Highly developed management skills and fluency in English is required and you need to be enthusiastic about leading a professional team.

Contact: Johan Wibergh, phone + 46 8 719 1797, johan.wibergh@etx.ericsson.se or Gabriella Gerdin, HR, phone + 46 8 719 7930, gabriella.gerdin@etx.ericsson.se Application: Gabriella Gerdin, TB/ETX/X/YH Ericsson telecom AB Customer Services Solutions 126 25 STOCKHOLM

Ericsson Radio Systems AB, Sundbyberg

MANAGER BUSINESS CONTROLLING

Business Management & Support Middle East & Asia-Pacific (ERA/LO) is responsible for business operations for products based on GSM, NMT and TACS standards.

LO consists of 46 people in Sweden and about 15 experts in Asia. Today our workplace is Sundbyberg but before the summer we will move to Kista.

● We are now looking for a person to head the controller function at ERA/LO. Your responsibilities will include the controller function, forecasting, analyzes of outcome, identify and initiate actions improving the profitability and financial reporting. You will work close to our financial Shared Service Center and controllers in the local companies.

You will be part of the unit's Management Team.

Your background includes qualified controller experience, IT knowledge and good command of the English language. You are used to work independently, like analytical challenges and work easily in teams. Travels in Asia is part of your job

Contact: Uldis Zervens, tel. +46 8 757 03 12 Eva Fransson, Human Resources, tel. +46 8 757 57 38 Application: Ericsson Radio Systems AB SG/ERA/LOH Christel Bjurevad 164 80 STOCKHOLM e-mail: christel.bjurevad@era.ericsson.se

Ericsson Radio Systems AB, Kista

REAL BUSINESS CONTROLLERS - GSM SYSTEMS - EUROPE AND AFRICA

● Business controlling at ERA/LG is not mainly about figures. In fact, it is more to do with business than financial figures. Of course, you cannot be a business controller without understanding the figures, but we expect more. Using your knowledge of finance, business, products, customers, and market development, we expect you to interpret the figures, in order to drive the business towards our targets. You work as part of a team consisting of the business manager and the pricing manager. You have prime responsibility for the financials but your contribution as a team member is more critical.

To be able to carry out your role effectively, you must be an experienced controller, who understands Business controlling. Knowledge of GSM products is advantageous but not critical, since your role involves more about driving, realising opportunities, influencing, in fact anything that enables achievement of the targets.

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Ericsson Radio Systems AB, Kista

PRODUCT PROFITABILITY CONTROLLER

Business unit TDMA Systems (BMOA) within segment Network Operators and Service Providers is responsible for mobile networks of TDMA standard. Business control BMOA is the unit responsible for financial analysis and business control of the business unit TDMA-systems.

● We are looking for a product profitability controller with overall responsibility for the product profitability area. Your tasks will include being the main interface between the business unit and our product units in financial questions. You will also have responsibility for product code consolidation, R&D controlling and investment cases.

Your qualifications include a solid financial education, work experience from similar tasks, excellent command of English, drive, speed and initiative.

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Ericsson Business Networks AB, Sundbyberg

GLOBAL SUPPLY MANAGER

Ericsson Dedicated Networks, an important cutting edge area within the Ericsson Group, is looking for a Global Supply Manager. Our business is planning, projecting, installing and maintaining communication networks for voice, data and image. Our customers are primarily in the enterprise segment and are spread across the globe. We are currently in a build-up phase and we quickly need someone who can energetically shoulder the global responsibility as Supply Manager.

● As the Supply Manager you will be a member of the management group and report directly to the head of Dedicated Networks. In your unit you will be responsible for three main areas - Strategic Purchase, Operative Purchase and Logistics Coordination.

The unit's main tasks are: Identifying strategic products, suppliers and partners. Creating routines and models for signing of strategic procurement. Commercial responsibility. Order handling. Support to the projects. Defining and set-up of the logistics procedures.

As the Manager for the supply unit you will have a solid experience in purchasing and logistics, and we also appreciate if you have experience from marketing and sales. Your negotiation skills are excellent, and you have a clear entrepreneurial streak. You will have an important role in our cooperation with other BU's and PU's.

As a person you think positively about people and support the people to develop their skills and by taking away barriers for them to work more efficiently. You have perspective, humor and distance. You will contribute to an open and positive working atmosphere.

Contact: Anders Ericsson (Head of Dedicated Networks), tph +46 8 585 35050, E-mail: Anders.Ericsson@ebc.ericsson.se Per Svahn (Human Resources), +46 8 764 0420, E-mail: Per.Svahn@ebc.ericsson.se Application latest 990423: Ericsson Business Networks AB Att Eva Kling Eldselius S-172 87 SUNDBYBERG Tph: +46 8 764 0774 E-mail: Eva.Kling-Eldselius@ebc.ericsson.se

Ericsson Radio Systems AB, Stockholm

PROGRAMME MANAGER WCDMA TELECOM MANAGEMENT SOLUTIONS

Professional Services is an Ericsson Business Unit that delivers business solutions and consultancy services to network operators around the world. The Product Unit Telecom Management Systems and Integration Services provides systems and services for operators working in multi-vendor and multi-equipment environments. The solutions include implementation, systems integration, training and support.

The third generation mobile networks, based on WCDMA technology, will support mobile multi-media as e.g. fast Internet Access or moving images. Commercial applications will be deployed in the 2000-2001 time perspective but test systems are already deployed. In the mobile market of today Telecom Management issues have big focus and it is foreseen that the Telecom Management solutions offered together with the WCDMA systems will be a key differentiator in the marketplace creating the important competitive advantage.

● In order to get a head start in this we will organize the work as a programme. Similar to a project the programme will use dedicated personnel from the existing organizational units within the Product Unit.

As programme manager for our WCDMA Solutions you will be responsible for the programme team of some 10-15 people dealing with: Product Management. Systems Management. Project Management. Customer Solutions.

You will be reporting directly to our Product Unit Manager.

Focus will be in Network Management, Service Provisioning and Billing Solutions.

We expect you to have a experience in Product Management in large organizations. Interest and knowledge of system architectural questions is important. Further you shall have experience of project management or management positions managing teams of minimum 10-15 people.

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Ericsson Radio Systems AB, Kista

REAL BUSINESS CONTROLLERS - GSM SYSTEMS - EUROPE AND AFRICA

● Business controlling at ERA/LG is not mainly about figures. In fact, it is more to do with business than financial figures. Of course, you cannot be a business controller without understanding the figures, but we expect more. Using your knowledge of finance, business, products, customers, and market development, we expect you to interpret the figures, in order to drive the business towards our targets. You work as part of a team consisting of the business manager and the pricing manager. You have prime responsibility for the financials but your contribution as a team member is more critical.

To be able to carry out your role effectively, you must be an experienced controller, who understands Business controlling. Knowledge of GSM products is advantageous but not critical, since your role involves more about driving, realising opportunities, influencing, in fact anything that enables achievement of the targets.

Contact: Sit Kow Yeung, phone +46 8 757 0070 Application: ERA/LGHS Marie van den Bos Ericsson Radio Systems AB 164 80 Stockholm Marie.vandenBos@era.ericsson.se

Ericsson Radio Systems AB, Kista

CUSTOMER PROJECT MANAGER GSM ON THE NET

GSM and Internet are the greatest bits in the communication world today. We are a newly built organization to integrate these two into one Voice Over IP GSM system. The product is called "GSM on the Net" and is now being launched globally. Our customers include GSM operators, Service Providers and Internet Service Providers. The end-user is the Enterprise.

● We are looking for Customer Project Managers with experience of running customer implementation project in the GSM or the IT world.

As a Customer Project Manager you will be responsible to implement the contracts taken in a region.

However, you will also be involved in pre-sales and sales activities. You will work in co-operation with Ericsson local companies.

You have a university degree with at least 3 years of relevant experience in project management.

You speak and write English fluently. As a person you are result oriented, open-minded, and enjoy working in an entrepreneurial organisation.

Join us and be a part of an organisation that will play a key role in shaping the future of systems integrating GSM and IP.

Contact: LRG/XC Bengt-Åke Ljudén (+46-70-577 1020) or human resources Jan Björson (+46-8-58533872). Application: Ericsson Radio Systems AB LR/HS la Pettersson. 164 80 STOCKHOLM

Ericsson Telecom AB

CUSTOMER GROUP "NEW MARKETS" WIRELINE SYSTEMS

The customer groups within Wireline Systems are the main interfaces to the market units. In the customer group NEW MARKETS we work with CIS, the Baltic states, most of Central & Eastern Europe, Middle East and Africa.

We are located at HF. Our activities in Africa are handled by our organisation in Spain.

BID & CONTRACT MANAGER

● We are seeking individuals with ambitions, initiative and drive that will support our Business Managers with marketing and sales activities, tender preparations, contract-negotiations with customer and follow up of our implementation projects.

You will be responsible for project teams producing tenders, where commercial co-ordination and calculations are important ingredients for the work. You will also be responsible for the transfer of the project to the Customer Configuration Center and for monitoring contract budget and contract fulfillment. We work with the full range of Ericsson's product portfolio, offering our customers infocom solutions tailored to their needs.

The work includes frequent contacts with other Ericsson units such as MU/KAM, as well as with external suppliers and customers. Bid Manager is also involved in Push Team activities for his/her markets. Applicants must be prepared to travel.

The successful candidate has an academically degree and a minimum of five years experience of the telecom/infocom industry. You are service minded, outgoing, well structured and have a drive to get things done. Fluency in English is a requirement and other languages a plus. Previous experience from tender projects and/or international experience is a merit.

You are welcome to contact us for further information!

Contact: Antonia Hägg + 46 8 719 0025, Human Resource: Helene Palm + 46 8 719 6941

Ericsson Radio Systems AB, Kista

KAM - KEY ACCOUNT MANAGER PARAGUAY

The wireless communications field is one of the most dynamic and expansive industries of this century. Today, Ericsson's TDMA (IS-136) products and services support 35% of the world's wireless subscribers. New and dynamic applications such as Wireless Data (via CD-PPD), PrePaid, PCS and Wireless Office, are forging new frontiers within the TDMA (IS-136) wireless world. With its strong entrepreneurial spirit, the TDMA Systems business unit has established itself as a leader within the Ericsson group to meet challenges of today and tomorrow in this dynamic wireless communications market.

● Our markets in the Latin American region are growing rapidly and we're now looking for a KAM-Key Account Manager for Paraguay. As our Key Account Manager you will exceed customer expectations. You will have the overall business responsibility consisting of sales, marketing, implementation and support. Through excellent customer relationships and internal contacts, you will ensure top quality work throughout the TTC process in order to achieve the required consolidated bottom line.

To be successful you need to be excellent in building relationships, in a proactive way drive for results, and enjoy being a team player in an entrepreneurial environment. You have a M.Sc. or equivalent with at least 10 years of experience within the telecom industry with preferably at least 2 years of TDMA marketing experience.

Contact: Patricia Baena, Business Area Manager + 46 8 404 5313 E-mail: patricia.baena@era.ericsson.se Application: Patricia Baena, Business Area Manager + 46 8 404 5313 E-mail: patricia.baena@era.ericsson.se

Ericsson Communications solutions Enterprise Systems

Ericsson communications solutions for enterprise networks combine and improve advanced ways of exchanging information via voice, data, video and evolving future media. This requires a true understanding of how businesses and professionals interact - an understanding that goes far beyond meeting just the technological requirements.

Our customers include owners of small to large enterprise networks, local as well as multinational. We also offer solutions for Internet service providers. We deliver quality of service over converged networks. We provide staff with full onsite and offsite mobility. We integrate computer and telephony applications on the desktop. We enable coordination of all business interactions over the media of choice. In essence, we help businesses forge enduring relationships with customers.

MARKETING MANAGER, PERSONAL EFFICIENCY

● Ericsson is focusing on the area of personal efficiency, i.e. in applications and tools which increase efficiency, and allow the employee to be flexible. We respond to the new ways of working by offering applications and tools that enable staff to be more efficient.

One of the key factors to make this happened is mobility solutions, which are easy to use and sell.

As a Marketing Manager within the Personal efficiency area, you are responsible for: Marketing planning, Market analysis, Customer profiling, Market introduction, Market requirements on development of the associated products and services.

We measure the performance in financial terms, and through customer satisfaction programs. You will work with an international team, and you will have a number of customer contacts to get close to the market place. Your primary interface will be sales- and marketing units in Ericsson worldwide.

We believe that you have international experience, are salesoriented, flexible and fluent in English.

MARKETING MANAGER, SYSTEM & NETWORK MANAGEMENT

● Efficient Network and management administration tools are essential to control the quality and cost off an enterprise communication system. We have today very powerful products within the area, which have been proven to meet the market demands of today. We expect a substantial growth in this area, and we are now looking for a Marketing Manager.

You are as a Marketing Manager, within the System & Network management area, responsible for: Marketing and Business plans, Market analy-

sis. Customer profiling, Market introduction, Market requirements on development of the associated products and services. (D.N.A - Dynamic Network Administration)

We measure the performance in financial terms, and through customer satisfaction programs.

You will work with an international team and you will have a number of customer contacts to get close to the market place. Your primary interface will be sales- and marketing units in Ericsson worldwide. You will also have a close contact with our product unit in California, USA.

We believe that you have international experience, are salesoriented, flexible and fluent in English.

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Ericsson Radio Systems AB, Kista

PRICING MANAGER GSM ON THE NET

GSM and Internet are the greatest bits in the communication world today. We are a newly built organization to integrate these two into one Voice Over IP GSM system. The product is called "GSM on the Net" and is now being launched globally. Our customers include GSM operators, Service Providers and Internet Service Providers. The end-user is the Enterprise.

● As Pricing manager you will be defining price strategies, price models and price levels for GSM on the Net. You will work with price coordination and monitor what is happening on the market. You will work closely with our customers. Value for money is the key word.

We expect you to have a university degree in economics/marketing and some years of working experience in price management. Experience from the IT industry is a merit.

As a person you have excellent analytical skills, a good driving ability and a pragmatic approach. You are not afraid of trying new ways of doing things.

Join us and be a part of the revolution now taking place in Telecom.

Contact: LRG/XC Bengt-Åke Ljudén (+46 8 757 2808) or Jan Björson, human resources, +46 8 58533872 Application: Ericsson Radio Systems AB KI/ERA/LR/HS la Pettersson. 164 80 STOCKHOLM

Ericsson Radio Systems AB, Kista

BUSINESS MANAGER NETWORK OPERATORS HARDWARE SERVICES

● We are looking for two new colleagues to work with us as business managers within Network Operators Hardware Services, for the region Europe, Middle East and Africa. You will be responsible for customer satisfaction and the financial result within your designated region.

This means that you will mainly work with: Account management, Technical sales support, Supply implementation and monitoring.

The persons we look for, have a good business understanding and are fluent in English. Experience from logistic operations in an international environment is a qualification.

You will be stationed at the regional office in Kista, Sweden.

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Ericsson Telecom AB, Telefonplan, Stockholm Wireline Systems Customer Service Solutions

SALES MANAGER

● To meet the challenges of growth and profitability within Customer Service Solutions, we need people to join our results-oriented Sales "Tiger" Team. Professionals, with varying backgrounds, and with the motivation and ability to achieve high targets are needed. We work in a highly focussed group, but interface with a large global team, so good teamwork is essential.

Your responsibility will be to drive the sales of profitable Service Contracts to our installed base.

You will need to establish internal Ericsson support at both Regional and Local market levels, and work closely with Account teams to gain customer buy-in for our Service Contracts. You must be able to travel extensively.

Your Profile: Experience in Services or Solutions sales. Experience in Telecoms and/or I.T. sectors. Ability to communicate well at all levels in Ericsson

and the customer. Experience in handling contract negotiations and outlining proposals. Good track record in successful marketing/sales roles.

International experience. Sound business acumen. What's in it for You: Work on a high profile project. Dynamic working environment. International contacts with Ericsson and Operator management. Opportunities for advancement. Results based rewards. Travel.

Contact: Paddy O'Leary +46 8 7191045 paddy.oleary@ericsson.com or Gabriella Gerdin +46 8 7197930 gabriella.gerdin@etx.ericsson.se

Ericsson Radio Systems AB, Kista

AREA MANAGER - NEW PRODUCTS SALES

The wireless communications field is one of the most dynamic and expansive industries of this century. Today, Ericsson's TDMA (IS-136) products and services support 50% of the world's wireless subscribers. New and dynamic applications such as PrePaid, Wireless IP (via CDPD) PCS and Wireless Office, are forging new frontiers within the TDMA (IS-136) wireless world. With its strong entrepreneurial spirit, the TDMA Systems business unit has established itself as a leader within the Ericsson group to meet challenges of today and tomorrow in this dynamic wireless communications market.

New WIN based applications are becoming an increasingly important part of the BMOA portfolio and are today constituting a very big part of the total sales. The new products and service sales unit is the driving force to continue this growth.

● We are now looking for experienced, energetic and ambitious individuals that are ready to take up the challenge as Area Manager- New Products Sales for either North America, Latin America or Asia.

Main responsibilities and tasks: Meet the goals for sales of new products in the region. Actively drive sales of new products in the region directly towards our customers and through the local sales organizations. Frequently handle customer presentations and negotiations in the relevant markets.

The candidate should preferably have the following qualifications: Documented sales experience. Completed university degree, M.Sc., MBA or similar. Five years working experience from the datacom or telecom industry. Strong perseverance and "drive". Fluency in English and good command of other relevant languages. Experience from the region in question.

This position will offer you the possibility to work in a stimulating international environment, with a high degree of own responsibility, as well as the chance to build up an extensive contact network.

Contact: AM/RPCharald Nabseth, phone +46 8 757 35 62 Harald.Nabseth@era.ericsson.se or AM/RC Håkan Olsson, phone +46 8 757 01 59 Håkan.Olsson@era.ericsson.se Application: Ericsson Radio Systems AB AH/H Annelie Gustafsson 164 80 STOCKHOLM

Ericsson Radio Systems AB, BMOA Global Pricing, Kista

SENIOR STRATEGIC PRICING MANAGER

The BMOA organization and the role of BMOA Global Pricing: BMOA develops, manufactures and sells the Cellular systems AMPS and TDMA (IS-136) for North American, South American and Asian markets. Currently we are at the start of a major technology evolution from Circuit Switched towards Packet Switched. This marks a dramatic change in customer demands, market development, coming products and last but not least in the business logic in our markets. New products like Packet Data backbones and new Radio base products are being developed with very different characteristics from today's products. BMOA Global pricing has a strategic role in this evolution. New products and new standards have to be positioned and priced, often in new and innovative ways, without jeopardizing the existing circuit switched business. A great challenge with great opportunities.

● Worktask: Be responsible for the pricing of BMOA's product portfolio. Develop and implement price strategies and price structures for global markets. Work in close cooperation with Product Units and Product Managers. Work in close cooperation with the Price Manager (and sales) of the different markets.

Qualification and competence: MSc in Economics and/or Engineering. Minimum 5 years of work experience. Experience of Mobile Telecom industry - telecom understanding/technical understanding is required. Experience from marketing/product management or sales. You should have excellent analytical skills, a healthy business sense, good communicator skills and an ability to drive and motivate people. Fluency in English is required.

Contact: Ragnar Klingberg, tel +46-8-585 313 53, e-mail: ragnar.klingberg@era.ericsson.se Thomas Van-Bunningen, tel+46-8-4049407 Application: Ericsson Radio Systems AB AH/H Marie Hällgård 164 80 Stockholm

Ericsson Radio Systems AB, Kista

AREA MANAGER-SERVICES SALES, LATIN AMERICA AND ASIA

The wireless communications field is one of the most dynamic and expansive industries of this century. Today, Ericsson's DAMPS/AMPS products and services support 50% of the world's wireless subscribers. New and dynamic applications such as PCS, Wireless Office, Fixed Wireless, and Wireless IP (via CDPD) are forging new frontiers within the D-AMPS/AMPS wireless world. With its strong entrepreneurial spirit, the Cellular Systems- American Standards (RMOA) business unit has established itself as a leader within the Ericsson group to meet challenges of today and tomorrow in this dynamic wireless communications market.

Services are becoming an increasingly important part of the RMOA portfolio and are today constituting almost a fifth of the total sales. The service sales unit is the driving force to continue this growth.

● We are now looking for two experienced, energetic and ambitious individuals that are ready to take up the challenge as Area Manager- Service Sales for either Latin America or Asia.

Main responsibilities and tasks: Meet the goals for sales of services in the region. Actively drive sales of services in the region directly towards our customers and through the local service sales organizations. Frequently handle customer presentations and negotiations in the relevant markets.

The candidate should preferably have the following qualifications: Completed university degree, M.Sc., MBA or similar. Five years relevant working experience and ideally two years sales experience from the datacom or telecom industry. Strong perseverance and "drive". Fluency in English and good command of other relevant languages. Experience from the region in question.

This position will offer you the possibility to work in a stimulating international environment, with a high degree of own responsibility, as well as the chance to build up an extensive contact network.

Contact: AM/R Jens Johansson, phone +46 8 404 91 14 Jens.Johansson@era.ericsson.se AM/R Klaus Meyer, phone +46 8 404 25 85 Klaus.Meyer@era.ericsson.se Application: Ericsson Radio Systems AB AH/H Annelie Gustafsson 164 80 STOCKHOLM

Ericsson Radio Systems AB, Kista

PRODUCT MANAGER CUSTOMER SERVICES GSM ON THE NET

GSM and Internet are the greatest bits in the communication world today. We are a newly built organization to integrate these two into one Voice Over IP GSM system. The product is called "GSM on the Net" and is now being launched globally. Our customers include GSM operators, Service Providers and Internet Service Providers. The end-user is the Enterprise.

● We are looking for Product Managers with extensive experience from GSM and/or the IT industry in the field of Customer Services, basic services as well as professional services.

As Product Manager you will analyse the market needs and translate this into product plans and offerings. You will prepare business cases, value argumentation and pricing strategies for the market. You will participate in marketing and sales activities.

You speak and write English fluently. As a person you are result oriented, open-minded, and enjoy working in an entrepreneurial organisation.

Join us and be a part of an organisation that will play a key role in shaping the future of systems integrating GSM and IP.

Contact: LRG/XC Bengt-Åke Ljudén (+46-70-577 1020) or human resources Jan Björson (+46-8-58533872). Application: Ericsson Radio Systems AB LR/HS la Pettersson. 164 80 STOCKHOLM

Ericsson Radio Systems AB, Kista

STRATEGIC PRODUCT MANAGER FOR RADIO NETWORK O&M

The product unit Radio Network Products provides competitive Radio Network Products for TDMA, i.e. the American Cellular Standard. Strategic Product Management has the overall profitability Responsibility for the product portfolio.

● We are now looking for a product manager within the area of Operation and maintenance within the radio network.

Strategic product management has the overall task of defining profitable TDMA radio products.

Typical task is to define customer related requirements on products, define product strategies, create business cases and initiate and follow up design together with system management and design organization. To keep close contact with customers and together with the customer define requirements on new products, define prices and be involved in early marketing activities.

We are looking for a Product Manager within the area Operation and Maintenance. The main focus will be on 3rd generation TDMA system based on EDGE but since we are migrating from today's TDMA system, also existing platform must be considered. We offer you a challenging position including opportunity to interact with customers both for defining requirement and making product presentations. Since these task cover both market competence and as well as system competence we put strong requirement on you. We hope that you are person that have good social skills, a good driving ability, a pragmatic approach. You are not afraid of trying new ways of doing things. M.SC. or B.SC and at least 5 years of experience of telecom /IT solutions are prerequisites.

Contact: Johan von Perner, phone +46 8 757 39 78 johan.von.perner@era.ericsson.se Application: Ericsson Radio Systems AB AR/HS Elisabet Grahl 164 80 STOCKHOLM elisabet.grahl@era.ericsson.se

Ericsson Radio Systems AB, Kista

STRATEGIC PROJECT MANAGER – SWITCHING SYSTEMS

TDMA Systems (Business Unit BMOA) is one of the fastest growing business units within Ericsson Radio Systems. We are the market leader for cellular telephone systems and services based on IS136 and AMPS. Today, over 50% of the world's cellular subscribers are served by IS136 and AMPS systems.

● Within Product Unit for Mobile Switching Center (PU-MSC), the section Platform Management, Switching Systems is looking for a person willing to take on exciting challenges as Strategic Project Manager. Your responsibility is to optimize the time to market for new platform products – AXE, AXD, TelORB, and many more – with CMS8800 system releases. This is most important to support a competitive and profitable switching product portfolio.

Your focus is on business value. You will be responsible: to proactively analyze and report the business value of platform development projects and deliveries, to find the timing opportunities, to establish contractual project links, to set priorities for CMS8800 development, integration and release of each switching platform product and enhancements, to analyze and report the business consequences of any delayed platform deliveries on PU-MSC projects

You will also make project presentations, customer presentations and support product introduction of new solutions and products. The job involves some traveling within Asia Pacific, North and South America and Eastern Europe.

The ideal candidate has a M.Sc. or B.Sc. in CS or EE and experience with switching technology, especially in the field of cellular communication. He or she should be familiar with AXE products, and preferably also with other Ericsson platforms (AXD, TelORB, etc.). Fluency in English is required, Spanish or Portuguese is a plus. The person we are looking for is self-motivated, ambitious, outgoing and mature.

Contact: Pierre Lequent, phone +46 8 585 32656, e-mail: Pierre.Lequent@era.ericsson.se Application: Ericsson Radio Systems AB, ERA/AH Elisabet Grahl 164 80 Stockholm

Ericsson Radio Systems AB, Kista

TECHNICAL MANAGER GSM ON THE NET

GSM and Internet are the greatest hits in the communication world today. We are a newly built organization to integrate these two into one Voice Over IP GSM system. The product is called "GSM on the Net" and is now being launched globally. Our customers include GSM operators, Service Providers and Internet Service Providers. The end-user is the Enterprise.

● We are now looking for Technical Managers that will provide our customers with technical competence. That includes technical discussions, product presentations, solution design and offerings. You will work in a team with marketing and projects.

You have a university degree with at least 3 years of relevant experience in Telecom/IT. You should have good technical skills in either GSM or IP and be willing to quickly learn the other. Your experience also include working closely with customers. You speak and write English fluently. As a person you are result oriented, open-minded, and enjoy working in an entrepreneurial organisation.

Join us and be a part of an organisation that will play a key role in shaping the future of systems integrating GSM and IP.

Contact: LRG/XC Bengt-Åke Ljudén (+46-70-577 1020) or human resources Jan Björson (+46-8-58533872. Application: Ericsson Radio Systems AB LR/HS la Pettersson. 164 80 STOCKHOLM

Ericsson Radio Systems AB, Sundbyberg

SWITCHING NETWORK DESIGN – A SYSTEM PERSPECTIVE

ERA/LVR/P is an Ericsson service organization, involved in customer projects worldwide. We are currently focusing at Radio Network Design (Cellplanning), Transmission Network Design, Switching Network Design (MSC/BSC) and Network Performance Improvements.

● We are now looking for more Switching Network Design Engineers, to work with improving our customers' MSC/BSC network architecture and long term MSC/BSC network plans. The work is entirely customer focused and you will often be positioned within different customer's own organizations.

You should match the following criteria for applying: documented AXE-experience, or a Masters Degree in telecommunication. a genuine interest in supporting Ericsson's customers. good interpersonal skills. good oral and written English. able to travel in mainly Europe/Africa/Middle East. committed to achieve tangible results. work and residence permit in Sweden.

You'll be given all necessary training and support in order to meet expectations. Our premises are located in Sundbyberg.

Contact: Zoltán Paska +46-8-757 1435 email: zoltan.paska@era.ericsson.se Application: Ericsson Radio Systems AB LV/HS Kerstin Almblad 164 80 STOCKHOLM

Ericsson Radio Systems AB, Kista

The Product Unit Packet Switching Systems is a part of Ericsson Radio Systems AB in Kista. We develop and market packet data solutions for GSM and the next generation mobile telephony system UMTS.

Product Group UMTS Packet Switching Systems has the mission to provide profitable and competitive UMTS packet switching products to mobile operators all over the world. The unit has a bottom line product responsibility and consists of product management, system management and design departments. UMTS packet is about bringing together two of the most exciting and fast growing areas of technology: wireless communication and internet based services.

SOFTWARE DESIGN, PACKET SWITCHING SYSTEMS

● As a software designer you will be part of a small and creative team, with ambition to make the ever best wireless connection, for the future datacom networks. Our goal is to design a UMTS system that efficiently support Web browsing, Vertical applications Voice over IP, and Multimedia. We are now in the process of building an organisation for design, with the aim to have designers with broad IP-competence as well as with an interest in not only design but also system aspects. The design organisation will work with development in a state of the art design environment.

You will work with, for example, implementation of the protocols needed to "connect" the radio network with the Internet, mobility management, charging etc. The development is made in the languages C and Java. We do promote job-rotation in order to broaden the competence of our colleagues and also to minimise the barriers between the different functional areas such as system management, design and verification.

Contact: Pär Sörme, phone: +46 8 757 14 83 par.sorme@era.ericsson.se or Bo Danielsen, phone: +46 8 404 81 67 bo.danielsen@era.ericsson.se Application: Ericsson Radio Systems AB KI/ERA/LK/HS Susanne Holmene 164 80 STOCKHOLM susanne.holmene@era.ericsson.se

Ericsson Radio Systems AB, Kista

Product Group UMTS Packet Switching Systems has the mission to provide profitable and competitive UMTS packet switching products to mobile operators all over the world. The unit has a bottom line product responsibility and consists of product management, system management and design departments. UMTS packet is about bringing together two of the most exciting and fast growing areas of technology: wireless communication and internet based services.

SYSTEM DESIGNER, PACKET SWITCHING SYSTEMS

● As a System designer you will be part of a small and creative team, with ambition to make the ever best wireless connection, to the future

datacom networks. Our goal is to design a UMTS system that efficiently support Web browsing, Vertical applications Voice over IP, and Multimedia. We perform system analysis, specification work and participate in standardisation activities. There are also possibilities to participate in prototyping and system integration activities.

You have a M.Sc. or equivalent in Telecom, Datacom, Computer Systems or similar, and have experience from object oriented design and programming C++/Java. Knowledge in GSM and Internet technologies is an asset we appreciate.

Contact: Viktor Berggren, phone +46 8 757 13 21 viktor.berggren@era.ericsson.se or Pär Sörme, phone +46 8 757 14 83 par.sorme@era.ericsson.se Bo Danielsen, phone: +46 8 404 81 67 bo.danielsen@era.ericsson.se

SOFTWARE DESIGN, PACKET SWITCHING SYSTEMS

● As a software designer you will be part of a small and creative team, with ambition to make the ever best wireless connection, for the future datacom networks. Our goal is to design a UMTS system that efficiently support Web browsing, Vertical applications Voice over IP, and Multimedia. We are now in the process of building an organisation for design, with the aim to have designers with broad IP-competence as well as with an interest in not only design but also system aspects. The design organisation will work with development in a state of the art design environment.

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Ericsson Research, Kista

WIRELESS AD-HOC NETWORK RESEARCHERS

In 1876, Lars Magnus Ericsson made his dream come true and opened his own little repair shop for telegraph equipment. Today Ericsson is a world leader in telecommunications. About 100 000 people work for Ericsson in 137 countries, but we still need some more. If you are interested in the possibility offered below, we would like you to know that Ericsson's very advanced technologies have only one objective: to make it easier for people to communicate. Wherever they are, whenever they want.

SwitchLab is an applied research lab in the networking area and offers opportunities to work in a wide variety of research projects. The topics may range from advanced theoretical studies and simulations, to hands-on work with network equipment and programming deep in OS kernels. We also take active part in the IETF standardization process in the area of IP QoS. Currently SwitchLab hosts a research group that works with mobile, wireless, multi-hop radio networks. These networks may operate without any centralized control mechanism and are also referred to as ad-hoc networks. A new and very powerful component that Ericsson contribute with in this context is the Bluetooth short range radio technology. Our group has initiated work on how Bluetooth could be used in ad-hoc networks and we need more people to help us with this challenging task.

● We are looking for two persons that have been working actively with TCP/IP networking, but also have experience with performance analysis and simulation studies of such networks. Working with Bluetooth networking at this relatively early stage gives a unique opportunity to gain thorough knowledge in a technology that just seen its first light! To learn more about this opportunity, please

Contact: Johan Söderberg, phone +46 8 719 26 59 e-mail johan.soderberg@era-t.ericsson.se Application: Ericsson Research Ericsson Radio Systems AB T/HS Elisabet Sandström Torshamnsgatan 23 SE-164 80 STOCKHOLM

Ericsson Software Technology AB, Ronneby

Ericsson Software Technology AB is a company within the line of telecommunication. We develop products and services with the latest technologies. We are a young and expansive company with 1500 employees located in Karlskrona, Linköping, Hälsjöholm, Ronneby and Malmö.

Billing Gateway (BGW) is a software product for mobile, fixed public, datacom, and internet networks. The product is developed by Ericsson Software

Technology in Ronneby. The BGW is a flexible gateway which connects the operators network with the post-processing systems.

The product collects charging information from the switches, processes it, reformats it, calculates prices, and distributes the charging information to the operators post-processing systems, for example billing systems, fraud systems and statistical systems.

BGW was born 5 years ago and is still a young product which is now starting to get a brand name in the world market. Today there are more than 40 customers running BGW in their network all over the world.

Our unit in Ronneby has a the overall responsibility of the success of the product and handles agreements with our partners, technical sale support, marketing support, product management, development, design maintenance, training, support and services around the product.

PRODUCT MANAGER

● You will work as an Operational Product Manager (OPM) for Billing Gateway (BGW) in the BGW Product team. You will with your technical expertise and knowledge in the Fixed Public networks, GSM, NMT, TACS, Datacom, and Software engineering area lead us the way into the future!

You will work with technical investigations, long term strategical plans for the product (together with SPM), both from a technical and from a commercial aspect. You must keep an eye on Ericsson long term strategies in our area and keep a good contact with other Ericsson departments. You will have daily contact with the BGW Sales team supporting them with technical answers and solutions. You will perform presentations and demonstrations at customers where a detailed technical discussion takes place. Handling incoming requirements to BGW is a major part of your work. You will thereby be the bridge between the Product team and the Development team. You will follow up the development done to ensure that the product is developed inline with strategies & requirements.

This position contains travels which will bring you all around the world to our Ericsson local companies and to our customers!

Mark your application: BGW OPM, Technical Expert

TEST MANAGER

● You will work as a Test Manager for Billing Gateway (BGW) in the BGW Development team. You will ensure that BGW functionality & software is correct tested, both in design maintenance and in new development (projects). In new development will you act as project test manager. You will participate in testing and provide routines to make the testing of BGW being as smooth as possible. One major issue for this year is to implement automatic testing using a BGW test tool, daily builds and nightly basic tests. We are aiming at making as large part as possible automatically testing.

Mark your application: Test Manager - System Developer

SUPPLY ENGINEER

● You will work as a Supply Engineer for Billing Gateway (BGW) in the BGW Services team. You will travel around the world to our customers and install the BGW software and hardware, connect and integrate it with the customer network and billing systems. Your mission is done when the system is accepted by the customer. You will be the BGW responsible person for managing the customer implementation project from order to acceptance. You will work together with the customer to understand their needs and to implement customer specific requirements into Billing Gateway specific applications.

This position contains a high amount of traveling which will bring you all around the world to our Ericsson local companies and to our customers!

Mark your application: Customer Implementation Responsible

SUPPORT ENGINEER

● You will work as a Support Engineer for Billing Gateway (BGW) in the BGW Support team. You will help customers and Ericsson local companies with their questions around BGW. You will be an expert on usage of the BGW and its components. You will be a part of the helpdesk team and eventually also part of the 24 hour emergency team.

You will work together with the customer to understand their needs and to solve customer specific requirements using Billing Gateway specific applications.

This position may contain travels which will bring you all around the world to our Ericsson local companies and to our customers!

Mark your application: Support Engineer - Technical Expert

TEST MANAGER

● You will work as a Test Manager for Billing Gateway (BGW) in the BGW Verification team and in close cooperation with the other BGW teams. You will support customers, Ericsson local compa-

nies and Ericsson projects with testing the BGW and verifying that BGW can connect to various network elements. You will participate in testing and provide routines to make the verification work being as smooth as possible.

You will project manager when implementing verification projects together with our partners outside Ericsson. You will maintain our BGW verification program which is run in parallel and in close cooperation with development and product management of BGW.

This position contains travels which will bring you all around the world to our Ericsson local companies and to our customers!

Mark your application: Verification Engineer - Test Manager

You will work with Sun and HP hardware, Solaris, HP-UX, C++, Java, X.25 and IP communication, fixed public networks, GSM, NMT, TACS, AMPS/D-AMPS, Datacom, and with charging in these areas.

You must have deep technical interest and knowledge, and be easy to cooperate with.

Contact: Mikael Roos +46 457 775 22 Mikael.Roos@epk.ericsson.se Application: Ericsson Software Technology AB Att: Ann-Sofie Hjertsson 371 23 KARLSKRONA job@epk.ericsson.se

Ericsson Telecom AB, Telefonplan TN

SOFTWARE DESIGNER, ACCESS PRODUCTS

The Access area is changing and growing rapidly. We see an increasing demand for more bandwidth, Internet and ATM capability, as well as support for new services. At the same time we must secure our margins by developing products at minimum cost in the delivery flow.

Product Unit Access and Product offerings within Wireline Systems is now created to meet the customers and end-users need for future Access solutions. We are working with a small company approach which means that we take an end-to-end product and business responsibility.

Within PU Access Product offerings, the Access 910 Product Unit has the responsibility to ensure that Access 910 use the most appropriate technologies and solutions to ensure that 910 is, and remains competitive both technically and cost-wise in an ever changing environment.

The Ericsson Access 910 is a general purpose, access network system that provides PSTN, ISDN, Internet, voice over IP, ATM and switched video broadcast capabilities over a broad array of customer network interfaces and to a wide range of service networks.

● We are looking for you who wants to work with SW design for the Access Unit Switch in Access 910. Our responsibility covers application SW for traffic and protocol handling as well as HW controlling SW. V5 and Q3 interface handling is a big part of the application SW.

You will work with specification, system design, product design and verification of the Access 910 Access Unit Switch. The SW design is done in C, C++ and Erlang. The operating systems are OSE Delta and VxWorks.

You have a university degree with knowledge of programming in C or C++. It is a plus if you are familiar with Clear-Case, Erlang, OSE or VxWorks. You have good skills in English, like to take initiatives and enjoy working in teams in an international environment.

Contact: Robert Mellberg, phone +46 8 7190053, robert.mellberg@etx.ericsson.se or Kerstin Halén HR, phone +46 719 6701, Kerstin.Halen@etx.ericsson.se. Application: Ericsson Telecom AB, Robert Mellberg, TN/ETX/X/AAB, 126 25 Stockholm

international

Nippon Ericsson K.K.

MXE FIELD SUPPORT/PROJECT ENGINEER

Are you interested to join the team and become a Samurai in the field of voice messaging in Japan? Our location is in Yokohama.

We have 3 customers to support, so travel in Japan to them is essential.

● Your responsibilities: Project management and field support of the MXE voice mail. MXE Trouble shooting and Major Disturbance Report technical writing. Interfacing with product management.

Requirements: 2 Years experience in field support of the MXE, prepared to work under stress Knowledge of UNIX shell script design and trouble report handling. Good knowledge of English

Contact: Thomas Aberg, memoid NRJTEMP or Hans Hammar, memoid NRJHAHA +81 - 45 475 7847

Ericsson Indonesia

Ericsson Indonesia within GSM Technical Support there is a vacancy for a BSS support specialist. The main responsibilities for this position will be to provide technical advice and assistance to support engineers and managers. Transfer trouble shooting skill and competence to technical support staff and participate in emergency call out.

● Requirements: Excellent knowledge of support and verification activities such as trouble shooting, CSR/TR handling, APZ/IO recovery and system updates/upgrades. Experience from APZ-swap is considered and additional qualification.

Application: Ingvar Hornsten, Technical Support Manager EID.EIDPER TEI: +62 21 751 9604

Ericsson Radio Systems AB, Kista

GSM SYSTEMS BSS LPM SUPERVISOR FOR CHINA

● Ericsson in China (ETC) is looking for a BSS competent person to support the build-up of an LPM organization.

The main objective with this position is to increase local competence, i.e. competence transfer to and build-up of local employees. Hence, an established contact network within Product Unit Base Station Systems (BSS) will give you an advantage for this challenging position.

Primarily, the position is for 3-4 month short-term assignment, but can be extended to a long-term assignment (1 year) after agreement between the expatriate, PU BSS and ETC. The position is open for immediate assignment.

Among the capabilities you should possess, we would like to emphasize the following: good teamwork, broad network at ERA, in particular within PU BSS, capable to guide and delegate assignments to the local employees, excellent knowledge of BSS (e.g. from SPM, OPM, system mgmt, product marketing, radio network planning, etc), good knowledge on BSS related areas.

You will report to Johnsson Liang, manager of ETC/RPA, the LPM function for BSS and BTS. The LPM group is today about 5-6 persons. The position will be based in Beijing. Domestic travel to the regions is a part of the job.

Contact: Per Arvidsson, General Manager, PU BSS Product Marketing, per.arvidsson@era.ericsson.se, +46 8 404 8115 Ulf Ewaldsson, Director Product Management, ulf.ewaldsson@era.ericsson.se, +46 8 404 9527 Sadru Jamal, Product Manager BTS GSM, sadru.jamal@era.ericsson.se, +46 8 404 5156 Hans Falk, Human Resources, hans.falk@era.ericsson.se, +46 8 757 1402 Johnsson Liang, Manager Product Management BSS and BTS, etc.etcjoli@mesmtpe.ericsson.se, +86-10-656 155 66 Application: Ericsson Radio Systems AB Marie Tällenberg LD/HA 164 80 STOCKHOLM

Ericsson Telecommunications Bulgaria Ltd., Sofia, Bulgaria

(SENIOR) CUSTOMER SUPPORT ENGINEER/AXE SYSTEM EXPERT

ETB is about to sign a Service Agreement with the national fixed network operator. Under this agreement, the Customer Support Office shall deliver Network Support services - 24-hour emergency, helpdesk, trouble report handling and hardware services. The network is small, but expanding both in size and functionality. The supported systems are based on 12.3 and Local 6.

● The job position is open on a short-term (6-month) basis - with possibility for a later long-term contract - in order to gap the time until the CSO raises its local competence base to match the task. In the meanwhile though, the successful candidate shall be the main technical expert, not only organising, helping and supervising the work of 2 local engineers, but taking on a significant workload as well.

Requirements: fluent verbal and written English, training in AXE HW, SW, O&M (incl. IOG11, C7, ISDN, AM, HLPlex), experience in remote SW/HW troubleshooting in live sites, proven record for patch writing in Plex, ASA, RP and EM-RP, experience with MHS, ACH, SRH, MS Office, C7/ISDN/CAS analysers, disciplined, initiative and customer-friendly attitude, ability and will to transfer knowledge to the local engineers. Knowledge about old type of analogue signalling systems is an advantage.

The position offers an opportunity to broaden technical competence, develop customer-handling and management skills, and earn a reputation for intelligent, effective and motivated work in a dynamic and challenging environment.

Contact: latest 990515: Mr. Zoltan Nagy Customer Support Manager memo: ETB.ETBNAZO e-mail: etb.etbnazo@mesmtpe.ericsson.se tel: +359 2 955 9777 fax: +359 2 955 9051. or Mr.

Leif K Larsson Key Account Manager memo: ETXT.ETXLLSN e-mail: etxt.etxllsn@mesmtpe.ericsson.se tel: +359 2 955 9777 fax: +359 2 955 9051.

Ericsson Taiwan Ltd

Ericsson Taiwan welcomes you to join the exciting telecommunication market of Taiwan. The truly competitive market offers a mobile user more than 4 different GSM operators to choose from, and has increased the penetration from 7% to over 20% in less than a year. The strong economy continues to push the development of new services forward at a speed that is rarely seen elsewhere in the world.

Ericsson Taiwan is sole supplier to two GSM accounts; Far East Tone, partly owned by AT&T, and TransAsia, partly owned by SBC. The Far East Tone customer account is an island wide dualband GSM network. Far East Tone has attracted more than 1 million customers in less than 14 month after launch. They have successfully launched Prepaid and value added services such as real-time financial information, and is now preparing for ISP and VPN services. TransAsia supports a GSM 900 network in the southern region and have 200,000 customers.

SUPPORT MANAGER

● In order to continue to support the success of our customers we are now looking for a Support Manager to lead our Field Support Center (FSC). You will enjoy and continue to build the close relationship with the customers of one of the world's biggest dualband (GSM 900 and GSM 1800) systems, as well as a GSM 900 network. We are today sole supplier of BTS (RBS 2000), MSC, Transit (TSC), BSC, HLR, AUC, OSS, SOG, BGW, DXX, and are currently building competence for IN.

The Field Support Center is responsible for support of all sold and installed products. This involves trouble report handling, emergency support, implementation of new releases and consultation handling.

Our close and successful relationship with our customers has proven that excellent support in all phases of business is the key to partnership and future sales. We therefore have the following expectations of you as part of the team here at Ericsson Taiwan.

You have at least 10 years experience in telecommunications, of which 5 years in GSM. You have at least 3 years of experience of customer relations. You have broad technical experience and product knowledge. Documented leadership skills and ability to provide a good working environment. Thorough understanding of the support and supply process. You prefer a challenging environment where speed and excellence rules. Sound analytical capacity. Capability to build up local competence. Good communication skills in English.

Contact: Claes Odman, KAM Far East Tone: +886 936 224 888, claes.odman@ert.ericsson.se Mats Peterstrom, KAM TransAsia: +886 931 727 400, mats.peterstrom@ert.ericsson.se Application: Genevieve Lu, Human Resources, +886 2 2746 1780, genevieve.lu@ert.ericsson.se

Oy L M Ericsson AB, Finland

Now you have a chance to work with us in the country of beautiful nature and midnight sun. Ericsson in Finland is a company with 1100 employees. We have a strong R&D department and 2nd line support for Northern and Eastern Europe. An important part of our business is the support services that we perform to our operator customers. Now we are looking for new resources to our 1st line support.

BSC EXPERT

● We are looking for a BSC expert to the Customer Support organization.

We are only interested in internal Ericsson staff.

Our unit is responsible for support and supply activities to our customers. This involves trouble report handling, emergency support, implementation of new releases and consultation handling. Our customers are Sonera, KPY and VLP in Finland and EMT in Estonia.

You are responsible for BSC support to the customers. You will also work closely together with our second line support LMF-ASO.

You should have: Strong customer orientation. Ability to convert both the needs of the customer and Ericsson prospects into profitable ventures. Broad technical experience in BSC and BTS knowledge. Thorough understanding of the support and supply process to ensure efficient Managing of BSC support. Good communication skills in English.

Contact: Harri Leinonen, phone: +358 9 299 2612, e-mail address: harri.leinonen@ericsson.fi Application: Harri Leinonen, e-mail address: harri.leinonen@ericsson.fi

Ericsson Telecommunicatie B.V., Netherlands

Within the Business Line Customer Services is a vacancy at the Global Response Center (GRC) for a:

CUSTOMER CARE MANAGER

● To ensure GRC customers are satisfied with GRC performance, and that GRC has information and infrastructure to ensure the customers' requirements are handled effectively and met. Reporting to the customer, implementation of customer improvement programs ensuring GRC can meet those needs, and measuring the customers views on the GRC are a key part of the function. This position does not include GRC direct 'CSO' customers in its scope. This position operates the GRC Customer Handling Process.

Goal/Challenge: The concept of a globally linked support in new to Ericsson. It is a major challenge to succeed in this position. With the interfaces, internal and external, it is important that this person be able to communicate complex information in a simple concise manner. This is critical to the success of the GRC concept and is seen as a major challenge.

Tasks: Independent monitoring our customers' view of the GRC by verbal contact, meetings (which can mean traveling to the concerning country), questionnaires. Evaluation of customers' reports to initiate with our customer and within GRC, customer improvement programs. Create, execute, monitor and report on progress of improvement programs. Keep relevant and active. Analysis of type, volume and complexity (character) of customer to ensure monthly invoicing and annual invoiced cost matches our customer's usage of GRC. Coordinate the production of monthly reports done by CCC an if necessary change them, according to customers input. Provides our customers with information regarding the needs of the right infrastructure, including web access, e-mail, and relevant technical information for issues to be handled accurately and quickly. Ensure each customer's needs for the future are documented and communicated to fit into the GRC planning in terms of volume, technical developments and customers.

Required competence: Administration qualifications, Project management experience or customer care training. Minimum 2 years experience in a telecommunication adm. Environment, facing the customer. Good communication skills (written or spoken) in English. Preferred knowledge of Ericsson operation, customer support responsibilities and tasks. Good PC/Mainframe skills. Communication, interpersonal skills, initiative tact and diplomacy. Must be a team player. Ability to perform in a high pressure environment. Ability to establish and maintain excellent customer relationships. Willingness to work hours as the job requires.

Application: latest 990430: The home base is Rijen, The Netherlands. For More information regarding the vacancy please contact Liselore Brabers, recruitment Business Line Customer Services. E-mail: Liselore.brabers@etm.ericsson.se

Ericsson Radio Systems AB TDMA Systems Asia-Pacific, Singapore

TDMA/EDGE/3G LOBBYIST

● You like to be challenged? The Asia-Pacific Task Force for TDMA systems covers an area of over 13 countries, from Pakistan down to Australia / New Zealand. We are working together in a team of highly professional individuals covering different areas, like: marketing & sales, business consulting, business development, marketing communications and TDMA/EDGE/3G lobbying.

For the area of TDMA/EDGE/3G lobbying we are looking for 2-3 experienced individuals who want to join our team and are not afraid to take up a challenge. The challenge is: establish TDMA/EDGE/3G as the preferred technology for Asian operators in the 800- and 1900 Mhz band. Your main tasks will be:

Plan, together with the other members of the team and the local companies, to perform presentations, discussions and other TDMA/EDGE/3G lobbying activities towards operators, government bodies, investors, analysts and media. Maintain up-to-date information on the latest global developments in the area of TDMA, EDGE and 3G. Monitor progress on the different markets in the region, and if required take actions, to ensure that we meet our goal of establishing TDMA/EDGE/3G as the preferred standard in the Asia-Pacific. Maintain a close cooperation with the TDMA interest group UWCC. Actively work together with the corporate TDMA lobby group.

If you are the person we are looking for, you should have the following profile: MSc in Electrical Engineering or in Physics or equivalent education. At least 5 years experience with Mobile Systems. Excellent knowledge of the TDMA standard and the wide range of applications supported by this standard. Good understanding

of the Ericsson 3G evolution path: EDGE/UWC-136 and W-CDMA. Excellent presentation skills. Extensive experience from meetings with the senior management of operators and government bodies. Experience with media relations. Team player and flexible attitude.

Do you fit this profile and you are interested to take up the challenge? Please respond to us by sending your CV to the e-mail address specified below (subject: job application), contact us or visit our homepage <http://enoweb.ericsson.se/rmoa> for further information

Contact: Aart Houweling Manager TDMA/EDGE/3G Lobbying Asia-Pacific (acting) Business Phone: +65.3501 668 Hand Phone: +65.96624359 E-mail: aart.houweling@eno.ericsson.se or Urban Gillström Regional Director Asia-Pacific TDMA systems Business Phone: +65.3501 350 Hand Phone: +65.96583041 Application: Ericsson Radio Systems AB AH/H Catrin Düsing 164 80 STOCKHOLM catrin.dysing@era.ericsson.se

Ericsson Telecommunicatie B.V., Netherlands

Within the GCSO (Business Line Customer Services) is a vacancy for a:

CUSTOMER SERVICE SPECIALIST

● Goal/Challenge: The Global Customer Service Office (GCSO) within the division Business Line Customer Services has a leading role within Ericsson's Global Customer Support. The GCSO is the single point of contact for Global Operators to raise Customer Service Requests to Ericsson. The GCSO has 3 Hubs, located in three different time zones (Holland, United States and Australia) which enables continuous 24hr support to Global Operators. All activities are being executed in an international environment. Our organisation is characterised as challenging, dynamic, progressing and provides excellent opportunities for personal development.

Tasks: Responsible for managing internal relations from a technical point of view. Responsible for well functioning of the sold services. Solving CSR's reported by the customers. Monitoring of follow up of support requests escalated to the GRC. Advises Customer Service Manager regarding services. Report to the customer about delivered services. Guide colleague trainee engineers (mentorship).

Required competence: Education minimum HBO-level. Knowledge of AXE. 5 years experience on AXE within Ericsson as a SW trouble shooter. Able to work under pressure. Attention for detail. Team player. Good communication skills in English

CUSTOMER SERVICE ENGINEER

● Goal/Challenge: The Global Customer Service Office (GCSO) within the division Business Line Customer Services has a leading role within Ericsson's Global Customer Support. The GCSO is the single point of contact for Global Operators to raise Customer Service Requests to Ericsson. The GCSO has 3 Hubs, located in three different time zones (Holland, United States and Australia) which enables continuous 24hr support to Global Operators. All activities are being executed in an international environment. Our organisation is characterised as challenging, dynamic, progressing and provides excellent opportunities for personal development.

Tasks: Responsible for first line support to customers - Helpdesk activities. Interface to other (internal or external) parties when the reported problems need to be escalated. Solving CSR's reported by the customers. Monitoring of follow up of support requests escalated to the GRC. Advises Customer Service Manager regarding services. Report to the customer about delivered services.

Required competence: Education minimum HBO-level. Knowledge of AXE. 3 yr experience on AXE SW within Ericsson (preferably as a SW trouble shooter). Immune to stress. Precise. Team player. Good communication skills in English.

To apply: The home base is Rijen. Opportunities to work abroad both for training and work is possible.

Contact Joop van de Kaa, ext. 2451. Liselore Brabers Recruitment & Search Business Line Customers Services Ericsson Telecommunicatie BV Tel.+ 31(0)161-249850 E-mail: Liselore.Brabers@etm.ericsson.nl. **If you as an Ericsson employee recruit someone who will start in this job, you will earn a bonus of Fl. 1.000,- gross.**

Ericsson Egypt, Cairo, Egypt

Ericsson Egypt is a local company growing fast. In order to increase the pace of competence build-up and transforming the responsibility for our Key Account Management to the local organisation, we are now looking for a Technical Manager on a long-term con-

tract placed in our GSM Key Account department in Cairo.

TECHNICAL MANAGER

● We have a vacancy in the Key Account organisation for Misfone, a GSM900 operator owned by Vodafone and Airtouch, in Egypt. We are looking for an experienced person who is ready for a challenging position as Technical Manager.

You will take up the responsibility for our Product Management unit. The unit provides technical expertise and support to the customer and to the Ericsson implementation project. The unit is responsible for product marketing including the development and proposal of complete technical solutions.

Our Customer has contracted a complete turnkey GSM network including switching, BSS, OSS, IN (pre-paid services) DX and Mini link, VMS, SMS, etc. The customer is very competent and demanding and requires candidates to be knowledgeable in all aspects of a GSM network. Knowledge in the Prepaid area is a plus.

You must have excellent interpersonal and communication skills, be result orientated and have management and leadership experience. In addition to supporting our experienced customer you must also take on the responsibility for transfer of knowledge to local staff. You must be willing to assist in all issues related to the smooth function of this Key Account.

Contact: Hans Hoglund, Key Account Director, tel. +20 2 3038581, Mobile +20 10 1010126 E-mail: hans.hoglund@era.ericsson.se Gote Hedblom, Human Resources Manager, tel. +20 2 303 6524, Mobile +20 12 218 4193 E-mail: gote.hedblom@era.ericsson.se

Ericsson Netherlands

Within the GCSO (Business Line Customer Services) ETM is a vacancy for a:

CUSTOMER SERVICE SPECIALIST

● Goal/Challenge: The Global Customer Service Office (GCSO) within the division Business Line Customer Services has a leading role within Ericsson's Global Customer Support. The GCSO is the single point of contact for Global Operators to raise Customer Service Requests to Ericsson. The GCSO has 3 Hubs, located in three different time zones (Holland, United States and Australia) which enables continuous 24hr support to Global Operators. All activities are being executed in an international environment. Our organisation is characterised as challenging, dynamic, progressing and provides excellent opportunities for personal development.

Tasks: Responsible for managing internal relations from a technical point of view. Responsible for well functioning of the sold services. Solving CSR's reported by the customers. Monitoring of follow up of support requests escalated to the GRC. Advises Customer Service Manager regarding services. Report to the customer about delivered services. Guide colleague trainee engineers (mentorship).

Required competence: Education minimum HBO-level. Knowledge of AXE. 5 years experience on AXE within Ericsson as a SW trouble shooter. Able to work under pressure. Attention for detail. Team player. Good communication skills in English.

CUSTOMER SERVICE ENGINEER

● Goal/Challenge: The Global Customer Service Office (GCSO) within the division Business Line Customer Services has a leading role within Ericsson's Global Customer Support. The GCSO is the single point of contact for Global Operators to raise Customer Service Requests to Ericsson. The GCSO has 3 Hubs, located in three different time zones (Holland, United States and Australia) which enables continuous 24hr support to Global Operators. All activities are being executed in an international environment. Our organisation is characterised as challenging, dynamic, progressing and provides excellent opportunities for personal development.

Tasks: Responsible for first line support to customers - Helpdesk activities. Interface to other (internal or external) parties when the reported problems need to be escalated. Solving CSR's reported by the customers. Monitoring of follow up of support requests escalated to the GRC. Advises Customer Service Manager regarding services. Report to the customer about delivered services.

Required competence: Education minimum HBO-level. Knowledge of AXE. 3 yr experience on AXE SW within Ericsson (preferably as a SW trouble shooter). Immune to stress. Precise. Team player. Good communication skills in English.

Application: The home base is Rijntje Netherlands. Opportunities to work abroad both for training and work is possible. For more information regarding the vacancy, please contact Liselore Brabers, E-mail: Liselore.brabers@etm.ericsson.se

Ericsson Telecommunications Romania S.R.L

APZ/IO SUPPORT ENGINEER

Ericsson Telecommunications Romania SRL has been established Since 1994 and today we have 220 employees working with all Ericsson products. In 1997 ETR signed the contract with Mobifon, one of the mobile operators, dominated by Airtouch and TIW. Our Customer had a flying start, which surpassed all the expectations.

The tempo is very high and the customer is in a tough competitive situation.

● We are now looking for an APZ/IO Support Engineer within our Support department. The objective of the job is to provide technical support in one or more of the system nodes that is operational in the customer network such as HLR, MSC/VLR, AUC/EIR, SMS, MIN and BSC. The current APZ/IO types are APZ 212 11, APZ 212 20, APZ 212 25, IOG 11 and IOG 20.

You will also play an active role in providing support and advice to the local engineers and build up the local competence. This requires close relationship and interaction with the customer, strong technical background that enables the APZ/IO engineer to conduct fault analysis, trouble shooting and program correction handling in an efficient manner.

Requirements: you have experience of working within Customer Support, a good knowledge of support activities, providing emergency and day to day support, trouble report handling, troubleshooting on/off sites, system upgrade. You have good command of written and spoken English.

Contact: Adrian Cliniciu, Back Office Manager, Memoid: EPK.EPKADCL or E-mail: adrian.cliniciu@epk.ericsson.se Phone: + 40 1 4010174 or Simona Serban - Human Resource Manager, Memoid: ETR.ETRSISE or E-mail: simona.serban@etr.ericsson.se Phone: + 40 1 4010122

Ericsson Telecommunications Romania S.R.L

BSS/SS SUPPORT ENGINEER

Ericsson Telecommunications Romania SRL has been established Since 1994 and today we have 220 employees working with all Ericsson products. In 1997 ETR signed the contract with Mobifon, one of the mobile operators, dominated by Airtouch and TIW. Our Customer had a flying start which surpassed all the expectations. The tempo is very high and the customer is in a tough competitive situation.

● We are now looking for a new member in our BSS/SS Support team. The objective of the job is to provide technical support in one or more of the system nodes that are operational in the customer network such as HLR, MSC/VLR, AUC/EIR, SMS, MIN and BSS. You will also play an active role in providing support and advice to the local engineers and build up the local competence.

This require close relationship and interaction with the customer, strong technical background that enables you to conduct fault analysis, trouble shooting and program correction handling in an efficient manner.

Requirements: you have experience of working within Customer Support, a good knowledge of support activities such as; troubleshooting, writing PLEX/ASA, APZ/IO recovery, trouble report handling (MSS and MHS) and system upgrades. You have good command of written and spoken English.

Contact: Joakim Karlsson, Front Office Manager, Memoid: ETR.ETRJOAK or E-mail: joakim.karlsson@etr.ericsson.se Phone: + 40 1 4010105 or Simona Serban - Human Resource Manager, Memoid: ETR.ETRSISE or E-mail: simona.serban@etr.ericsson.se Phone: + 40 1 4010122

Nippon Ericsson K.K, Tokyo

GENERAL MANAGER - PDC/CMS30 PRODUCT MANAGEMENT AND STANDARDISATION

The PDC/CMS30 Product Management unit at NR7, located in Tokyo, has the technical customer interface responsibility for the CMS30 system and associated solutions and applications, as well as for related standardization activities. The unit has around 30 staff and 4 sub-units and is a mixture of expatriates and local Japanese employees.

● Our present General Manager will return back to his home-country and we are now looking for someone who would like to continue in this challenging position This is a unique opportunity to work together with some of Ericsson's largest and most demanding customers in developing and enhancing the competitiveness of their cellular networks.

Contact: Lars Boman, Vice President Phone: +81 3 5216 9010 E-mail: lars.boman@nrj.ericsson.se

or Kai Heikkinen, General manager Phone: +81 3 5216 9030 E-mail: kai.heikkinen@nrj.ericsson.se

Ericsson Oman

SS SENIOR SUPPORT ENGINEER

● We are now looking for a Senior Support Engineer, for the below tasks:

Main Responsibilities: Trouble-shooting activities on/off sites. HW/SW upgrades such as APZ upgrades/AS-changes/AC-A's/EC-A's. Participate in the on-call schedule to handle emergency situations. Test/demo/implementation of new features and services. Trouble Report handling. Transfer of knowledge to local staff.

Competence Requirements: CME 20 experience with a minimum of two years working on the SS subsystem preferably in Customer Support but applications with testing/verification experience will also be considered. Strong knowledge of test system. High competence in APZ / IOG. Ability to handle urgent S/W problem as well as the emergency situation in the field. Familiarity with MHS.

Good command of English and customer relation is a must and fluency in Arabic is a plus but not essential.

The position will be placed in Muscat, frequent travelling not required.

The contract duration is initially for one year.

Contact: Michael Götrich, phone: +46-8-764 1116, mobile: +46-70-552 6712 Michael.Götrich@era.ericsson.se or Bartolome Gaya, phone: +968-68 6076, mobile: +968-934 4601 SMTP:xcom.tkogaya@mesmtpse.ericsson.se

Ericsson Telecomunicações, Portugal

IN/PREPAID SYSTEM ENGINEER TO PORTUGAL

In order to help our GSM customer on a very competitive market we are setting up a local competence center with focus on Ericsson's Prepaid system and services surrounding it.

● Your responsibilities will include studying and discussing customer requirements, making pre-studies, putting design requirements on IN design centers in Spain and Sweden and also plan testing and implementation in the network.

You should have experience from IN design projects. Experience of prepaid, Service Creation, UNIX and ObjectStore is desired.

Contact: Johan Ervius +351 1 446 6417 johan.ervius@sep.ericsson.se or Håkan Svahn +351 1 222 3334 hakan.svahn@sep.ericsson.se

Ericsson reserch & development, Montreal, Canada

CUSTOMER INTERFACE REPRESENTATIVE

Ericsson Research Canada (LMC) has the mandate for software development for the global wireless standard, TDMA. We are developing next-generation software for future wireless networks, handling datacom and Internet services. We are also developing new net work and system architectures based on leading edge open systems technology.

In addition to serving as a major R&D site, Ericsson in Montreal also houses the Technical Assistance Center (TAC1) for the TDMA system. The Technical Assistance Center provides 24-hour service for all national and regional cellular networks in the Americas, Canada and parts of the Caribbean.

● As the primary technical liaison for a North American Customer you will be using your proven customer skills and technical aptitude to provide a single point of contact for all support issues.

Through your outgoing personality and continuous contact with the customer, you will develop close ties with all levels of the customer's management and technical staff as well as gain valuable experience of the cellular business. Some of CMS8800 corporate customers are AT&T, Cantel, Bell south, South Western Bell, Cable & Wireless

The challenges of the position come in balancing technical, managerial and business issues within our corporate customers as well as within Ericsson. As customer Interface, one is challenged with handling the customer's business and operations to their own benefit, whilst facilitating support internally; And on the other hand impacting support internally in order to improve our customers' satisfaction.

The responsibility also includes promoting changes in design and systems to meet our customers' needs in escalations and new requirements. Furthermore, you will be part of a highly trained Outage Team responsible for the immediate recovery of cellular systems in outage situations.

These responsibilities cover a wide range of products including AXE, OSS, Jambala, AP, CDPD and all other products supported by TAC.

Ideally you are an experienced Engineer, who has acquired a good understanding of the TDMA or GSM standard and the CMS88, or CMS40 product line.

You have gained experience in the AXE-10, OSS and/or AP systems coupled with some experience dealing with corporate customers, and an overall knowledge of the Ericsson business.

Come see why Ericsson Canada is the place to be, and gain valuable exposure to the telecom business world.

Application latest 990430: Gad.Bensoussan@Ericsson.com Gad Bensoussan TAC-1, Customer Interface Manager Ericsson Research Canada, Montreal

Ericsson Eurolab Deutschland GmbH Herzogenrath/Aachen, Germany

The General Packet Radio Service (GPRS) within the GSM system is gaining an increasing attention both within the Ericsson organisation as well as on the telecom markets. The GPRS SW Supply and Support organisation was established in autumn last year and will further grow in 1999.

The unit is responsible for GPRS verification projects as well as for market Supply and Support for the GSN node. It cooperates with the ordering units in Kista, with the GPRS application and CORE platform development centers and with the Application Support Offices around the world.

PROJECT MANAGER GSN MARKET SUPPLY

● One common application system world wide, an optimisation of the Type Acceptance process and the involvement of the factory in pre-installation of SW are GPRS strategies to ensure an efficient SW supply. As a project manager Market Supply you will make sure that these strategies become reality.

Since the product unit GPRS is responsible for the first network implementation of the GSN nodes in each customer network, your tasks will be to steer the market supply projects at the ASOs. You will be concerned with how best to verify customer specific configurations, to show that the old features work in the new SW environment, to proof that SW upgrading and remote function change works.

You will have close contacts to Central Configuration Management, Customer Services and Implementation Services.

PROJECT MANAGER GPRS GLOBAL SUPPORT

● As a project manager GPRS Global Support you will be responsible for implementing the support strategy for GPRS by utilising and modifying the established GSM support structure for GPRS purposes in the best possible way.

The efficient handling of the customer service requests flow to design, the correction handling back to the customer, packaging, help desk function (third line) and remote handling will be of your concern as well as interfacing design maintenance and the ASO and FSC organisations.

As a project manager you are target oriented, you are used to operate in the international Ericsson organisation.

You are able to set clear priorities and you are good in communicating and following up strategies and targets.

You have project management experience already, ideally from international project management assignments or customer support projects.

If we are catching your interest to join a dynamic organisation that tries out new ways of working with a newly developed product, facing a tremendous resonance from the GSM markets and thus a real challenge ahead, please

Contact: GPRS SW Supply&Support: Axel Jeske, eedaxj@eed.ericsson.se +49 2407 575 284 Human Resources: Simon Seebass, eedsims@eed.ericsson.se +49 2407 575 163

Cia Ericsson de Chile S.A.

DEPARTMENT MANAGER CUSTOMER SERVICE ERICSSON DE CHILE

● Would you like to have a NEW INTERESTING and CHALLENGING assignment in South America? Ericsson Chile can offer you this!! We are looking for a new manager for our Customer Service Department.

You will, as head of your department report directly to V.P. Operations and be part of the Operation Division Management Team.

The Customer Service Department consists of FSC activities for TMA, GSM, WIRELINE, OTHER PRODUCTS and CELLPLANNING/OPTIMIZATION.

You need long experience in this kind of work. Be able to lead and communicate with people, set priorities and take decisions under pressure. Be creative, interested in improving work procedures and not afraid of a heavy work load.

English both spoken and written is essential. Spanish is a big merit.

Contact: CEC V.P. Operations Jan H. Lindqvist Phone : 56-2 4405651 office 56-09 3207061 mobile E-mail : Jan.Lindqvist@ericsson.cl

Ericsson Research Canada, Montreal

CUSTOMER INTERFACE REPRESENTATIVE

Ericsson Research Canada (LMC) has the mandate for software development for the global wireless standard, TDMA. We are developing next-generation software for future wireless networks, handling datacom and Internet services.

We are also developing new net work and system architectures based on leading edge open systems technology. In addition to serving as a major R&D site, Ericsson in Montreal also houses the Technical Assistance Center (TAC1) for the TDMA system. The Technical Assistance Center provides 24-hour service for all national and regional cellular networks in the Americas, Canada and parts of the Caribbean.

● As the primary technical liaison for a North American Customer you will be using your proven customer skills and technical aptitude to provide a single point of contact for all support issues. Through your outgoing personality and continuous contact with the customer, you will develop close ties with all levels of the customer's management and technical staff as well as gain valuable experience of the cellular business. Some of CMS8800 corporate customers are AT&T, Cantel, Bell south, South Western Bell, Cable & Wireless ...

The challenges of the position come in balancing technical, managerial and business issues within our corporate customers as well as within Ericsson.

As customer Interface, one is challenged with handling the customer's business and operations to their own benefit, whilst facilitating support internally; On the Ericsson side the challenge comes in impacting support internally in order to improve our customers' satisfaction.

The responsibility also includes promoting changes in design and systems to meet our customers' needs in escalations and new requirements. Furthermore, you will be part of a highly trained Outage Team required to manage a team of engineers responsible for the immediate recovery of cellular systems in outage situations.

These responsibilities cover a wide range of products including AXE, OSS, Jambala, AP, CDPD and all other products supported by TAC.

Ideally you are an experienced Engineer, who has acquired a good understanding of the TDMA or GSM standard and the CMS8800, or CMS40 product line.

You have gained experience in the AXE-10, OSS and/or AP systems coupled with some experience dealing with corporate customers, and an overall knowledge of the Ericsson business. This requires that you possess and develop very strong customer and people handling skills.

Come see why Ericsson Canada is the place to be, and gain valuable exposure to the telecom business world.

Contact: Gad.Bensoussan@Ericsson.com,TAC-1, Customer Interface Manager. Application: lmc.lmcmila@memo.ericsson.se

Ericsson Telecommunicatie B.V., Rijen, The Netherlands

TECHNICAL SUPPORT ENGINEER

The Global Response Center (GRC) is located in three different timezones throughout the world (The Netherlands, United States and Australia). The GRC is the responsible for the 2nd line services towards other Ericsson companies. CSR's and other service requests are handled by the GRC or passed through Marketing or Design.

To deliver the technical services requested, we are looking for additional engineers to join our team in Rijen, The Netherlands.

● Key responsibilities: The Technical Support Engineer is responsible for solving technical problems for products based on the PN-product range. This means recovery of outages, making corrections, making emergency corrections, writing trouble reports, route cause analysis, analysing restart and dumps. He or she manages the problems and if necessary takes care of the translation and communication between Ericsson and the customer.

The task also includes checking the Customer Service Requests (CSR's) which are made, monitoring the follow-up of support requests by the customer at the Front Office and the follow-up by Design.

Qualifications: A good knowledge of AXE (APT, APZ or IO) and at least three years experience as Technical Support Engineer, Trouble Shooter or equivalent level. You should be innovative, flexible and tolerate stress well. As we have a lot of male

engineers we would like to invite female engineers to participate in this opportunity.

Contact/Application: Loet Pessers or Andy Hallett Department GRC-EU Ericsson Telecommunicatie b.v. P.O.Box 8, 5120 AA Rijen The Netherlands Tel. +31.161.249200, Fax. +31.161.249374, Mob. +31.6.55303088 Email: mailto:Loet.Pessers@etm.ericsson.se Internet: http://www.ericsson.se

Ericsson Eurolab Deutschland GmbH, Germany

AMC and part of PN switching merged to CAPC. The Core Product Unit Application Core (CAPC) is responsible for providing transit switching and network access functionality commonly used by all Ericsson's wireless and wireline systems and is heavily involved in system innovation initiatives. CAPC is headed from EED, Herzogenrath/Aachen and consists of CAPC Management, CAPC International Operations, TCS Design and CAPC Verification. For further support of our teams we are looking for a

DEPARTMENT MANAGER PRODUCT MANAGEMENT

● The CAPC Product Management Department is responsible for the product management of the transit switching and network access products that are common for many of Ericsson's AXE based systems, both for wireline and wireless systems.

This responsibility includes activities such as business opportunity tracing, product portfolio management and positioning, project cost follow up, product decisions including prioritisation, road map planning, product agreements with other product units, toll gate assessments, supervision of requirements, arrangements of product planning meetings etc..

Present challenges are ATM backbone solutions for the Universal Mobile Telecommunication System (UMTS) and the Next Generation Switch (NGS).

As Manager for CAPC product management you will have a team of product managers working with you. It is the responsibility of this team to define application core deliverables that maximise Ericsson's profit and aligns with the group's overall strategy.

Travelling will be a natural part of the job. To strengthen our international operations we are looking for an experienced Manager with more than 7 years of telecommunication experience.

Contact: CAPC International Operations Ulf Henell, eedugh@eed.ericsson.se, +49.2407.575-256 Ola Melander, eedome@eed.ericsson.se, +49.2407.575-255 Human Resources Simon Seebass, eedsims@eed.ericsson.se, +49.2407.575-163

CAPC PROJECT MANAGER, NGS FEASIBILITY AND DEVELOPMENT

● The CAPC project office has a dynamic group of overall project managers and administrators, managing key projects at the core of all applications. These projects encompass subprojects and associated projects in the Netherlands, USA, Ireland, Finland, Sweden, Norway, England, Spain, Italy, Germany, Denmark, Australia, Mexico, Croatia, Brasil and Greece covering a vast range of development areas at the leading edge of technology.

Requirements: Degree of Engineering with specialisation in telecommunications or equivalent. At least four years work experience in technical aspects of telecommunication. Three years proven experience in project management. Good knowledge of PROPS, project planning, budgeting and management methods. Good knowledge of mobile telephone systems and Ericsson business practices would be an advantage. Resourceful, flexible, initiative, good communication, cooperation skill and good ability to work under pressure are important personal qualities. Travelling is a natural part of the job.

The main task will be to lead a large telephone system project (Next Generation Switch) with full responsibility for fulfillment of Ericsson's commitments to customers.

Contact: Project Office Imo Freese, eediwf@eed.ericsson.se, +49.2407.575-469 Human Resources Simon Seebass, eedsims@eed.ericsson.se, +49.2407.575-163

PC-APT CHAIRMEN

● The CAPC systems groups are responsible for the system development of the transit and network access products that are common for many of Ericsson's AXE based systems, both for wireline and wireless systems.

This responsibility includes activities such as running product committees, handling overall technical coordination in the CAPC projects, perform system studies and source system design. Present challenges are system work for ATM backbone solutions for the Universal Mobile

Telecommunication System (UMTS) and the Next Generation Switch (NGS).

CAPC is responsible for running two PC-APT forums. PC-C/APT 210 25 is responsible for functional allocation and interfaces between XSS subsystems owned by CAPC and towards the mobile access subsystems.

PC-APT 210 18 is responsible for the functional allocation and interfaces between fixed XSS subsystems owned by CAPC and towards the fixed access subsystems. An important task for these two forums is to find synergies and identify core application solutions between wireline and wireless systems.

Other important tasks for PC-APT are to maintain XSS (APT) system properties and structure, ensure that uniform solutions are implemented in XSS, handle allocation of functionality to products, act as a decision making body when a number of PC-ANTs can not come to a common decision and to handle allocation of functionality to products.

To each one of these two PC-APT forums, we are looking for an AXE systems designer or software designer with at least 4 years experience, who is interested in leading and driving an inspection forum.

As a suitable candidate you have good communication and cooperation skills and are able to understand complex technical problems.

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SYSTEMS DESIGNERS

● As CAPC systems designer you will perform system studies or design before or in early phases of our CAPC main projects. An important aspect is to find synergies and identify core application solutions between wireline and wireless systems. The type of tasks requires that you can work independently or in teams, take initiative and drive for progress.

To strengthen our capabilities for this type of systems work, we are looking for experienced systems designers with more than 3 years of Ericsson experience in AXE10 design. We are particularly interested in people who can provide significant competence in one or more of the following areas: ATM, TCP/IP, AM system development, signalling and protocols, data communication, intelligent networks and O&M.

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TECHNICAL COORDINATOR FOR NGS3

● The CAPC NGS3 project technical coordinator coordinates technical issues involving several sub-projects, the related wireline application projects and associated projects within the wireline and data networks systems. The CAPC main technical coordinator also supports the subproject technical coordinators.

To strengthen our capabilities within technical coordination, we are looking for an experienced system designer with more than 4 years of Ericsson experience in AXE10 design.

As a technical coordinator on main level, you should have competence in one or more of the following areas: AM system development, signalling, data communication, ATM, O&M, resource modules, IN development or hardware modernisation.

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TECHNICAL COORDINATOR AMC PHASE 7

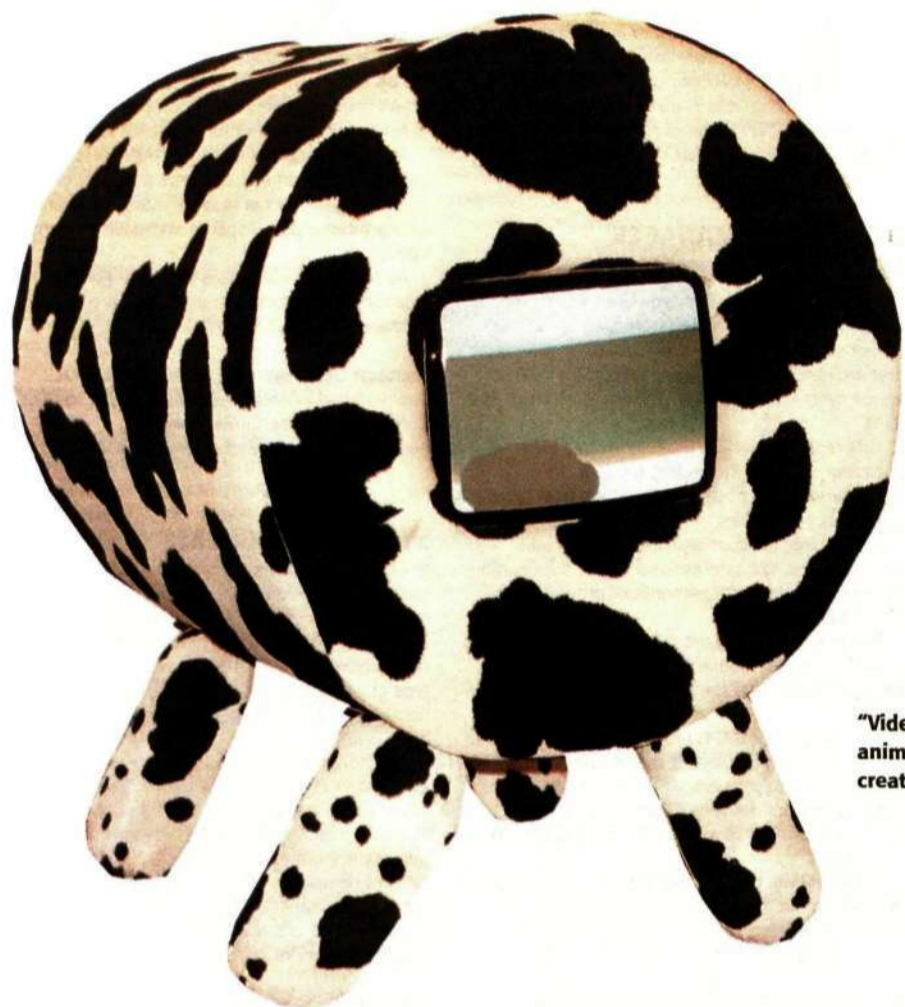
● The AMC Phase 7 project technical coordinator coordinates technical issues involving several sub-projects, the related mobile applications projects and associated projects within the UMTS, CME20, CMS30, CMS40, CMS88 and CMS99 systems. The CAPC main technical coordinator also supports the subprojects technical coordinators.

To strengthen our capabilities within technical coordination, we are looking for an experienced system designer with more than 4 years of Ericsson experience in AXE10 design.

As a technical coordinator on main level, you should have competence in one or more of the following areas: AM system development, signalling and protocols, data communication, ATM, O&M, resource modules, IN development, UMTS or hardware modernisation.

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Ericsson's Cyberlab East, located on 55 Broad Street in Manhattan, has become an important storefront for Ericsson. It is here that contacts are being made with a growing number of New York's independent Internet program developers. Digital art exhibitions at Cyberlab are one new way of attracting their interest.



"Video Cow" is no ordinary farm animal. She is the 1998 artistic creation of New York artist Ray Rapp.

Nothing for cowards

Sure, the digital cow is spectacular, but she doesn't produce any milk or cream for the coffee in Cyberlab's corner coffee area. Rather, she's there to inspire and provide even more creative stimulation to a work environment that, even prior to the digital art exhibitions, strove to be one of the company's most creative.

The term "Cyberlab" was coined when Ericsson opened Cyberlab West in Silicon Valley a couple of years ago. The idea behind the new development center then, as now, was to create an environment where independent datacom program and product developers could come in contact with Ericsson expertise and where they could utilize equipment and solutions from the company to test or further develop their ideas. The decision to open such a center was unusual and generated a great deal of media attention in the U.S.

"Silicon Alley" address

Once Cyberlab East opened in what is known as "Silicon Alley" – New York's Broad Street in lower Manhattan – the eastern affiliate became an important compliment to the California center. The east coast has many people who are specializing in media and content, and Cyberlab East has taken advantage of this trend.

"We've made important contacts with a long list of independent developers in this area," explains Tim Connolly. Tim, who is responsible for business development, is one of a handful of full-time employees who work at Cyberlab East.

Tim explains that the current focus of



"Syn Beach" is another of Ray Rapp's creations, also from 1998.

Cyberlab East is on Wireless Internet solutions, electronic commerce over the Internet and other content-related Internet solutions.

"We were recently involved in a project where a large jewelry company received help in developing a 'Web store'. Our contribution consisted of finding an appealing solution for depicting diamonds on the Internet."

"We're becoming known as the place to

turn to with ideas and to get help in finding people to make them a reality – in those instances where we don't have the expertise to handle the task ourselves."

NASDAQ – the stock exchange where many of the heavy-weight technology companies are listed, including Ericsson – is one client, as is mobile operator Omnipoint along with other companies which are interested in developing exciting content and services that can be linked to wireless Internet solutions.

Attracting visitors to the lab

Cyberlab East works hard to get local sponsorship and tries to make both itself and Ericsson visible in a number of different ways in the American Internet world. Digital art exhibitions are a rather new concept now being explored by the lab. It is hoped that they will contribute towards increasing creativity among those who work on Broad Street but, above all, help to bring in more visitors to the lab.

"We attract around 100 visitors on the opening day of a new exhibit. Not only can they enjoy new and exciting art in pleasant and relaxing surroundings, but they are also able to learn about Ericsson's Internet products and solutions," says Tim Connolly.

Cyberlab East's art exhibitions are making a strong contribution in the company's effort to build up its image in the important IP area.

Lars-Göran Hedin

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UPCOMING

Thursday, 22 April: Ericsson publishes its financial results for the first quarter of 1999.

Monday, May 10–Friday, May 14: The Network and Interop trade fair takes place in Las Vegas, USA.

UPDATES

Tuesday, April 13: Ericsson acquires two U.S. companies, Torrent Networking Technologies and Touch-Wave, for a total of USD 496 million. This is a strategic addition to Ericsson's investment in IP technology.

Monday, April 12: Ericsson announced the signing of a GSM contract with the British operator One 2 One. The contract has a value of SEK 2.5 billion.

Wednesday, April 2: Ericsson sold part of its shareholding in AU-systems. Ericsson now owns 25 percent of AU-systems compared with 41 percent previously.

NEW ASSIGNMENTS

Mats Vilander has been appointed Corporate Director Of Business Analysis & Intelligence, DMI. He is currently working at Ericsson Radio Systems new accounts.

Gunnel Björkert has become manager of Ericsson's technical office in Ethiopia.

Johan Adler is the new President of Ericsson Telecommunications Lanka in Sri Lanka.

Carl Olof Blomqvist has become Senior Vice President and General Counsel for the Legal Affairs corporate function.

Crister Ek is responsible for the new Supply Technologies organization within the Supply and IT corporate function.

THE ERICSSON B SHARE



An Extraordinary General Meeting of shareholders on September 9, 1997, approved a proposed convertible debenture program. The conversion period extends through June 30, 2003. For additional information, access the web site: <http://inside.ericsson.se/converti.htm>

