

# CONTACT

PUBLICATION FOR ERICSSON WORLDWIDE

NO. 3 • APRIL 1995

## Important choice

Choosing the right technologies for future development efforts is vital to the future of Ericsson. R&D executive Bernt Ericsson explains the selection process.

**2**

## Environment prize from BT

Ericsson has been awarded an environmental prize by BT for its purification plant in Norrköping. The plant purifies solvents using a biological filter in which the toxins become food for worms.

**8**

## CeBIT: Trade fair colossus

As usual, the Ce-Bit Fair in Hannover was a colossal exhibition. The giants in the telecommunications market, plus hundreds of smaller suppliers gather here each year. And of course Ericsson was present.

**12**

## Good money on service

A new approach to customer service is now being introduced in Ericsson. The Customer Services unit in Public Telecommunications is now making good money on services formerly "thrown in" with sales of AXE-systems.

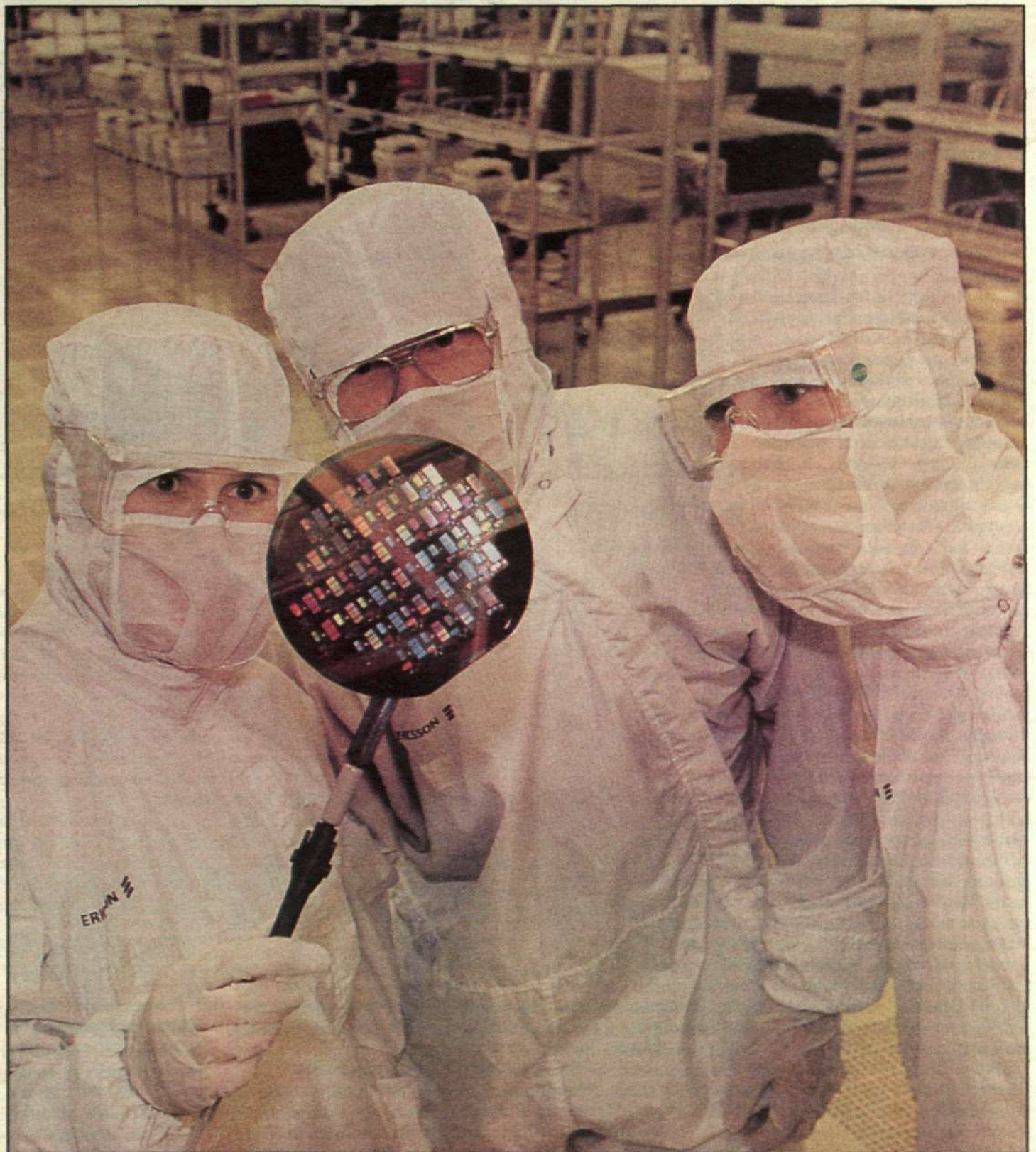
**22**

Foto: Victor Brott

## It really worked!

The first chip has now been manufactured in Ericsson's new microelectronics factory, called the mini-fab, in Kista, outside Stockholm. After several months of test production,

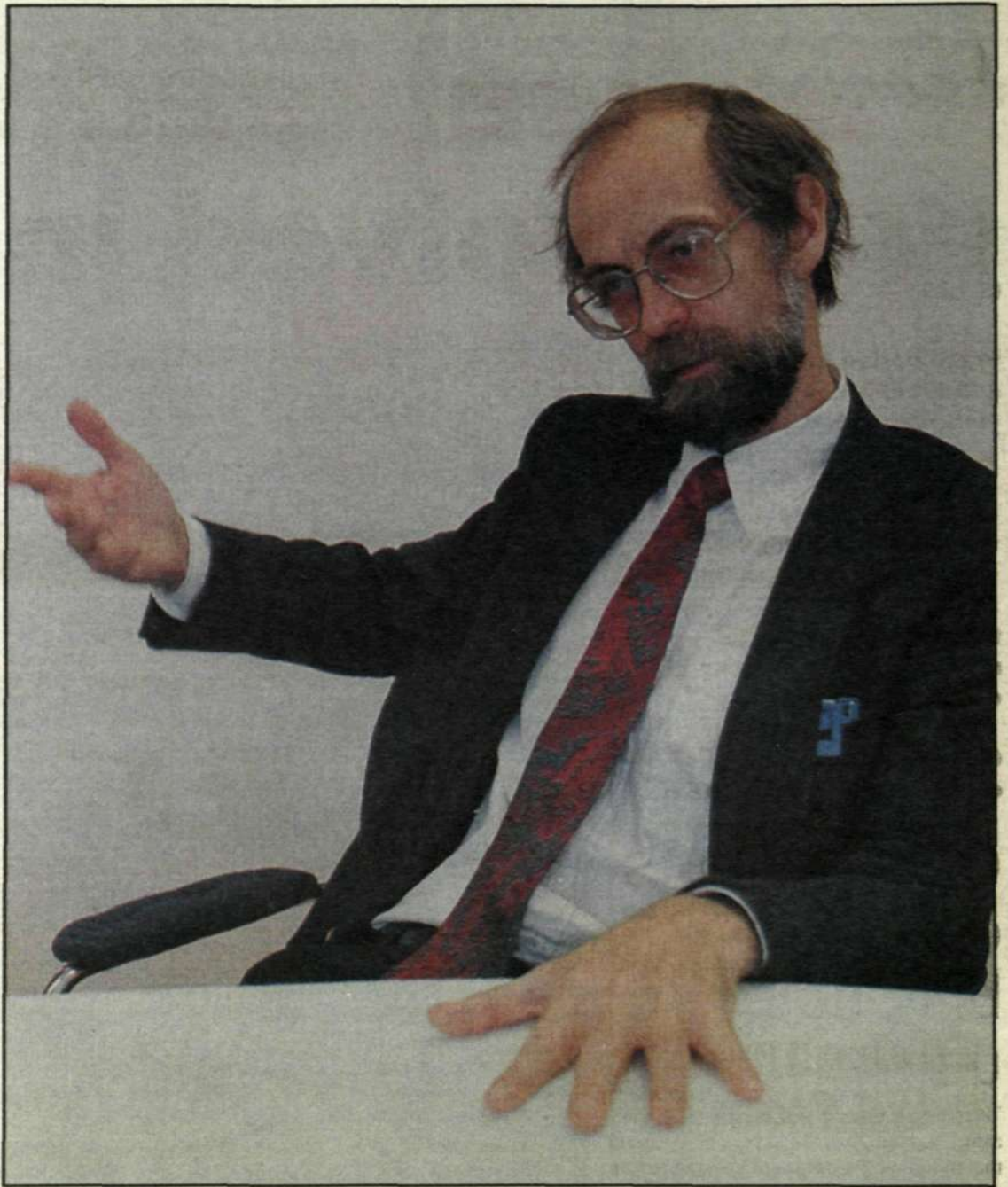
Ericsson Components has proved that the new plant lives up to expectations. Commercial production will begin this summer.

**7**

# 'Ericsson is facing difficult choices'

**Bernt Ericson, Ericsson's corporate R&D manager, has initiated a number of activities to secure Ericsson's choice of future technologies. It is a choice which determines whether the company will be a winner or a loser in the future telecommunications market.**

**"If we select the wrong technology, we will fall hopelessly behind and see others take over as technical leaders in our key areas," Bernt warns.**



**"There is no guarantee of continued success with respect to the selection of technologies," Bernt Ericsson contends. "You have to continually question which technology you select to work with." Photo: Anders Anjou**

Ericsson's massive investments in technical development have yielded favorable results to date. Ericsson's strong position in mobile telephony is a glowing example of what can be the outcome of a sensible and farsighted technology choice, according to Bernt Ericsson. However, it is not certain that the company's engineers will continue on the right path. There are no guarantees for continued success. Instead, you have to continually question which technologies you choose to work with.

"There are a number of examples of the wrong choice of technology in our technology organization. The reason for this is mainly a lack of information when the choice is supposed to be done. You don't know what others have experienced and above all, you don't know what costs are connected to the use of a certain technology or component."

"One of the most important measures we are now initiating in the new technology organization is to develop experience banks where our engineers can determine what other units within Ericsson have learned with respect to a certain programming language, a certain microprocessor, etc."

## Good example

Bernt Ericsson refers to the components area as a relatively good example. There is a systematic classification, the so-called Stako classification, of the various components. With the help of this system, Ericsson engineers can access information

## Bernt Ericson underlines the importance of making the right choices of technology

about how good or bad a component is, what it is best suited for, etc.

"We have fairly good control over standard components within Ericsson, but when we look at microprocessors and operating systems, we are not as good. Currently, there are some 50 different microprocessors from several manufacturers in use within Ericsson. It must be possible to reduce this number and screen them to identify the very best."

## Post-order catalog

"Accordingly, we are developing an electronic post-order catalog where designers can find information about items. This catalog should provide comparative information about different technologies, the experiences others have had with them and who has worked with them previously. All of our engineers will have access to this database," Bernt promises.

## Lack of order

The greatest problem is in software. While there has always been various points for judging the quality of the hardware, it has been more or less open to use

whatever software you want in development projects.

"Naturally, this is totally wrong. There has to be units responsible for the software. Due to the lack of these in certain cases, Ericsson has fallen far behind the competition," Bernt emphasizes.

He points to the computer language C++ as an example. It is being used in many development projects within Ericsson. "In some cases it functions well, in others C++ it has been disastrous," according to Bernt.

"Within the programming area it is particularly important to define the technology that is to be used. In this context the AXE system sets a good example, making it possible for 6,000 engineers all over the world to continuously add more functionality."

## The correct choice

An important condition to ensure that the selection technologies in a development project is correct is to delay the choice as long as possible.

"Then you avoid taking a chance on unfinished technologies and can select those that are documented as being re-

liable, but still modern," Bernt contends.

"We should use the applied research as help when we fill our technology portfolio. The laboratory should test various products and technologies before we apply them. And we should get assistance from the new corporate purchasing function managed by Jan Thufvesson to procure those items others can produce better!"

Bernt Ericsson is a strong advocate of partnerships with other companies of the type that Ericsson has today with, for example, Texas Instruments and Hewlett-Packard.

"This provides use early access to the new technologies these partners develop."

## Niche companies

In other cases, it may be better to purchase emerging companies in niche areas. Determining which path to choose in various situations can be mapped in conjunction the Ericsson Strategic Planning (ESP) process.

## Three questions

"I believe that we can achieve very large improvements in the

technology area," Bernt says. "Ericsson is moving in the right directions with the work that is now being initiated. Actually, the key is that all of those with technical responsibility must have three important questions in the back of their minds at all times:

1. What features will be demanded for our products and systems in the future?

2. What are the critical technologies for creating these features?

3. What are the best support technologies for these critical technologies?

"With a systematic methodology for selecting these technologies, we can be sure that we make the correct choice."

"And, if we choose correctly in the beginning, we achieve another important goal in our technical projects; complete them in less time!"

"We must make our development projects smaller, since we learned from experience that the larger the project, the greater the possibility of a delays."

"The goal is that no project should require more than six months to complete!"

**Lars-Göran Hedin**

# CONTACT

**CONTACT is published by:**  
Telefonaktiebolaget LM Ericsson  
HF/LME/DI, 126 25 STOCKHOLM  
Publisher under Swedish law: Nils Ingvar Lundin

**Corporate editor:** Lars-Göran Hedin,  
phone: +46 8 719 98 68,

fax: +46 8 719 19 76, memo: LMELGH  
**Editorial assistant:** Pia Rehnberg,  
phone +46 8 719 78 69, memo: LMEPRG  
**Distribution:** Birgitta Michels,  
phone: +46 8 719 28 14, memo: LMEBIMI  
**Layout:** Paues Media AB, phone +46 8-665 80 72  
**Printing:** Aftonbladet Civil, Gothenburg, 1995

# 'Political leaders must get involved in IT issues'

**In the United States, Canada and Japan and within the European Union, political visions of how the information society should lead human beings into the next millennium are now being formulated. Among the world's political leaders, there is great confidence in Information Technology (IT) as the engine of economic growth.**

**Lars Ramqvist, Ericsson's CEO, discussed this trend at a conference in Oslo recently.**

## Governments can save billions by using IT

"It is easy to be carried away by enthusiasm," he said, "but we have to understand that much work remains to be done before the visions can be realized."

Mr. Ramqvist has been invited by Telnor – the former Norwegian PTT that has now been restructured as a corporation – to be the principal speaker at a major conference on telecommunications and information technology. Meeting sessions were held in a number of locations, with video transmissions linking the various conference halls.

Much of Mr. Ramqvist's speech was devoted to issues he had discussed several weeks earlier at the meeting of representatives of G7 countries in Brussels. The Brussels meeting focused on information technology and its importance for economic growth throughout the world.

Norway today is well advanced in developing telecommunications for the future. But, like many other countries, it lacks an established political strategy for utilizing IT in the country's future development.

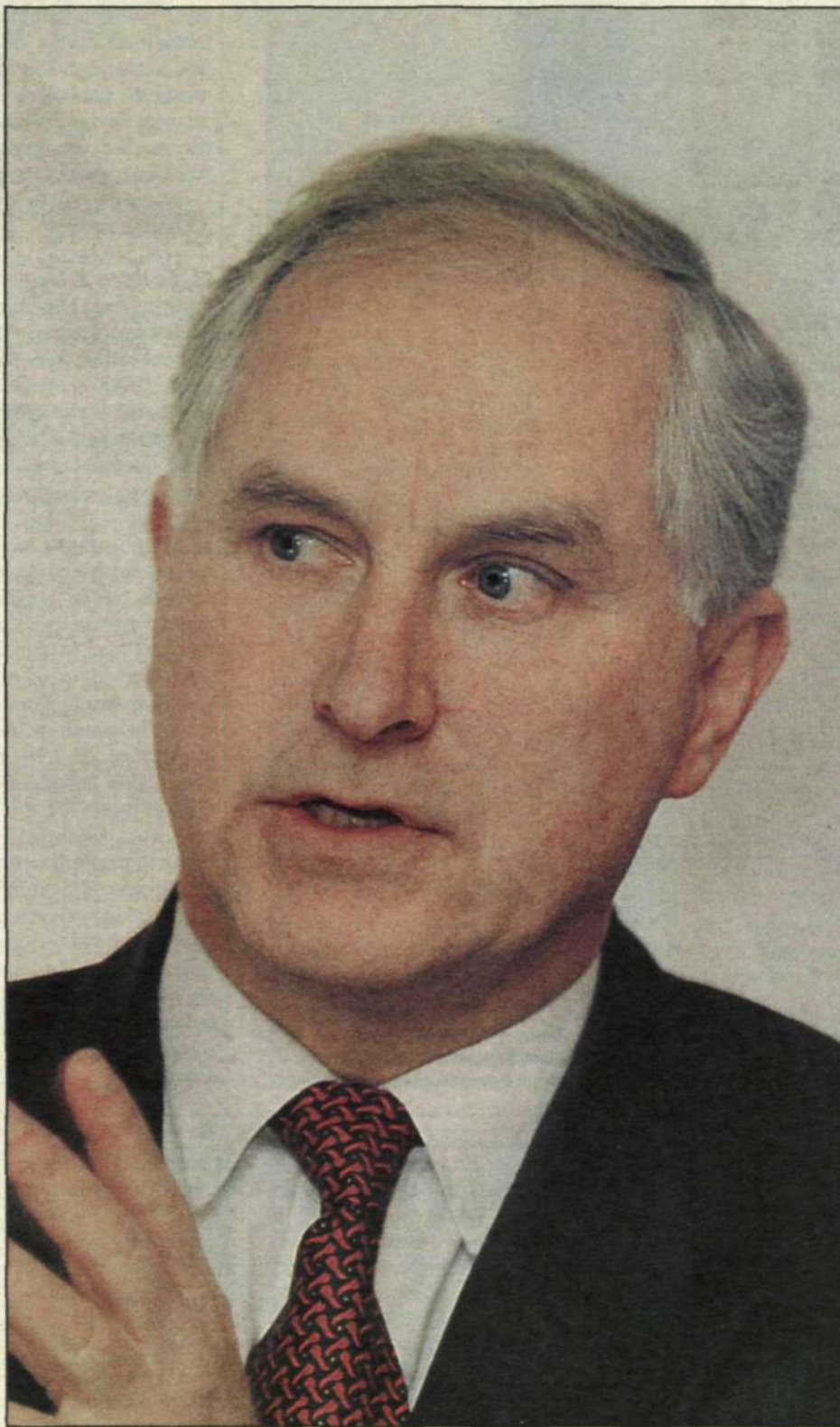
### Political visions

"Today we are seeing how political initiatives with respect to IT are being taken in the industrialized countries in particular," Mr. Ramqvist said.

"The political vision of an 'electronic highway' and the 'information society' has been formulated by the Bangemann Commission in the EU and by Al Gore, the vice president of the United States, among others. They are talking not only about a national information infrastructure but a global one as well.

"Similar projects have been started in Canada and Japan, and in other countries. In Sweden, I participated personally in the IT Commission that was appointed by the former Government. In our vision we spoke of 'Giving wings to Man's capacity.'

"This expressed the enthusiasm with which so many regard IT today. But I think we now have to appreciate how



**"Along with the enthusiasm surrounding information technology and the information society, there is a need for realism," Lars Ramqvist says. A sound framework and a global infrastructure has to be created for IT, he points out.** Photo: Peter Nordahl

much work remains to be done before the visions are realized – even in the rich industrialized countries."

### Need for realism

"Along with enthusiasm, there is also a need for realism. This need characterized many of the views expressed at roundtable discussions at the G7 meeting in Brussels. For my part, I emphasized the need for efficient, market-driven standardization as a prerequisite for a global infrastructure. And I also pointed out that the enormous investments that are needed require that countries not discriminate against private investors."

"Other representatives of industry felt that the private sector's leadership had to be supplemented with governmental programs. First and foremost, it is a matter of creating a sound framework for IT. What are needed are laws and statutes that

promote investments and that enable market mechanisms to function.

"In principle, for example, all countries are paying tribute to the importance of increased competition through deregulation, but I suspect that their support will not be as strong when deregulation is implemented."

### 'Bloc' problem

In a discussion with Norwegian journalists following his talk, Mr. Ramqvist returned to the political problem.

"In Ericsson, which has operations in 120 countries, we are now seeing in various parts of the world a disturbing tendency for IT policy to become a 'bloc' problem," he said. "Unnecessary barriers are being built up between the various market blocs – the EU, NAFTA, etc. – where people want to promote their own telecom standards. They are battling for

'their own' solutions rather than promoting international openness. At the same time that our world is becoming increasingly free of boundaries, new political barriers are being erected. This is a trend that, hopefully, the new World Trade Organization – GATT's successor – will be able to counteract."

"International cooperation is also needed in the areas of information security, safeguards of personal privacy, intangible property rights, barriers to trading and the establishment of new enterprises, and similar areas."

### Need for a strategy

"I agree with the Bangemann Commission when it recommends the adoption of a European strategy to mobilize the new technologies required in the communications and information fields. And I support wholeheartedly its position that the structure for both telecommunications and information services in Europe must be deregulated as soon as possible."

"Political leaders must become involved in the important issues related to creation of an environment in which private initiative can support the financing of an efficient infrastructure and the telecommunications services that are being demanded."

"I also agree that the political leaders – at the European level, in each country and at the local level – should and can support positive growth."

"This can be done, for example, by using the new technologies in their own operations and by ensuring that they are used in training programs, health care and other areas."

### A Norwegian example

Ole Petter Haakonsen, Executive Vice President of Telnor, offered a striking example of the importance of a solidly based national IT policy. Without such a policy, he said, countries lack the means to benefit fully from the potentials offered by IT.

"By taking advantage of the opportunities for 'telediagnosis' of illnesses, the Norwegian society would be able to save more than NOK 4 billion annually," he pointed out.

"Let me cite just one example. Today, a patient who cannot be treated by the doctors in Kirkenes has to be flown to Tromsø, admitted to a hospital there for examination, and then flown back home again. The cost of this procedure, which amounts to thousands of kronor, is paid by the Norwegian National Insurance Board. With telediagnosis, which enables a doctor to see and talk with a patient via video, the cost is only several hundred kronor.

"But since there is no political directive to utilize an approach of this type, it founders on the rocks of the various special financial interests that are involved. The hospital in Tromsø has budgeted for 'guest' patients, and the doctor in Kirkenes has no budget for a video link to his colleagues in the southern part of the country."

Because of such situations, all countries need a clearly defined IT strategy, Lars Ramqvist declared. "Political leaders have to become involved in these issues."

**Lars-Göran Hedin**

# Thord's prize: SEK 750,000!

**Good ideas pay off. Just ask Thord Sundqvist. His idea was so profitable for Ericsson that he is receiving SEK 750,000 in prize money for it.**

This time, it's Thord Sundqvist at Network Services Systems in Ericsson Telecom who is being rewarded for his idea: the creation of a tool for release handling and software production.

The tool, which has been given the working name "Swaxe," is a system of software programs and instructions that control a number of work processes from start to finish.

## Time savings

Swaxe provides its greatest benefits in the design of systems where a large number of software programs work together. In such systems, a single fault in any one of the programs can have repercussions on the entire system. Swaxe is an excellent instrument because it monitors each action of the system designer, from the first step through to final testing of the product.

Swaxe has been used in a large number of development projects in recent years and has resulted in substantial time-savings for Ericsson.

The SEK 750,000 check for the award was presented by Anders Igel during a small ceremony at which champagne corks popped and Thord was duly honored.



Friday, March 3, 1995 became a memorable day for Thord Sundqvist at Ericsson Telecom, when Manager Anders Igel signed a check in the amount of SEK 750,000 for Thord's idea. Kjell Persson checked the number of zeros.

## Suppliers' eyes on operatorship

■ AT&T has formed AT&T Solutions, a new consulting and network-operations division. The objective is to be able to offer corporate customers package solutions including everything from design and installation to management of communications networks. AT&T is aiming, in particular, to enter the market for corporate network operations that, according to estimates, will be worth USD 77 billion in 1997.

■ Northern Telecom is changing its name. The change is expected to occur early this spring in connection with the company's 100th anniversary. The new name is expected to reflect the fundamental changes that have occurred – and that will occur – in the company.

■ Alcatel wants to enter the market for telecommunications services since profit margins and growth in this sector are stronger than in the equipment field. The company plans to invest in networks throughout the world in order to increase its knowledge of network operations. This knowledge will be used to improve the company's products. Alcatel plans to purchase minority interests, generally in operating companies that are its customers. Alcatel says it does not intend to compete with its customers, but the new strategy is still expected to disturb the company's already strained relationship with France Telecom.

■ Alcatel plans to invest USD 300 million in the Chinese telecommunications industry during the next two to three years. This will double the amount of the company's investments in production in China.

■ Nokia reported a profit of USD 881 million for 1994, an increase of 250 percent compared with 1993. The company's telecommunications business has grown between 50 and 80 percent annually during the past three years.

■ Siemens sees opportunities to grow in Asia, where it plans to invest DEM 5 billion between now and the year 2000, in addition to the DEM 1.5 billion it has already invested in the region. One third of the investments will be made in China.

■ Nynex, the American operator, TelecomAsia and Benpres, a Philippine company, will invest USD 650 million in a telecommunications project in the Philippines. The project comprises international traffic facilities, a microwave network that will link local exchanges, and the addition of 300,000 lines of



TELE

CLIPPINGS

KJELL ERIKSSON

fixed-wire connections during the next three years.

■ STET (Italy) is discussing the possibility of participating in IBM's global network project. The network will offer sophisticated voice and data communications for large multinational companies.

■ In Germany, a number of power companies are planning to link their networks to form a common telecommunications network. The network, which would cover two thirds of the country, would enable the companies to compete for a share of the German telecommunications market. When pending deregulation becomes effective, the size of this market is expected to increase from DEM 50 billion to DEM 100 billion annually!

■ In the U.S., the barriers that formerly limited foreign firms' ownership of telecommunications companies will be lifted. But such ownership will be restricted to companies domiciled in countries whose telecommunications laws are considered to be as liberal as those in the U.S.

■ Robert Allen, AT&T's chairman, has expressed his doubts, and those of many associates, in connection with the G7 meeting in Brussels. He questions the speed of "liberalization" in European countries. Although the larger countries have promised to have opened up their markets for competition by January 1, 1998, many observers think that movement in that direction is too slow.

■ Cable & Wireless is joining with Japan's NTT to offer personal telephony in that country. There are expected to be 15 million subscribers for such service in Japan within 15 years. The alliance of the companies is expected to increase the potential for spread of the Japanese version of the service – PHS (Personal Handy-phone Services) – to Asian countries with large centers of population.

## PCN Breakthrough In Malaysia

**Ericsson has made its first breakthrough for Personal Communications Network (PCN) in Asia with a contract valued at about SEK 1.3 billion from Mutiara Telecommunications Sdn Bhd in Malaysia.**

The contract covers the purchase of infrastructure, switching equipment and mobile telephones. It will make it possible for Mutiara Telecommunications to install a personal communications network that will initially be placed in operation on the Malaysian peninsula.

PCN is a digital mobile communications system operated by the 1800 MHz System, also called DCS 1800.

It is particularly well-adapted to provide the operator with competitive advantages in densely populated metropolitan areas, where heavy telephone traffic rather than coverage is the restricting factor.

### Strong growth

"We are very satisfied that Mutiara Telecommunications Sdn Bhd chose Ericsson as the supplier for its PCN project," says Olle Ulvenholm, president of Ericsson Telecommunications Sdn Bhd.

"The mobile telephone mar-

ket is undergoing strong growth in Malaysia, as in so many other countries," continues Olle Ulvenholm.

"Today, there are already about 600,000 subscribers in Malaysia, or about 3 percent of the country's population.

"Malaysia is a liberalized and, nowadays, highly competitive market, and we think the PCN system will stimulate increased growth to about one million subscribers by year-end 1995. Penetration may approach 15 percent of the population by the year 2000, or about 3 million subscribers."

There are eight licensees for mobile telephony in Malaysia today.

IN THE NEXT ISSUE OF CONTACT:

**The battle for PCS – a real thriller!**

# Ericsson toward victory in patent case

**Motorola won the first battle last week in an important American legal case concerning patent rights. According to the decision by a federal court, Ericsson, which is also involved in the case, will not have to pay billions of dollars annually in royalties.**

InterDigital Communications (IDC), an American company that works with mobile communications, has stated that it has patents on the so-called TDMA technique for cellular telephony. The technique enables several calls to be made simultaneously on one and the same radio channel. It is used today for all leading digital mobile telephone systems.

## Paying millions

IDC has accused several leading telecommunications companies of patent infringements. Some manufacturers, including AT&T, Siemens and Matsushita of Japan, have accepted IDC's claims and paid the company large amounts of money in licensing fees — a total of approxima-

tely USD 70 million. However, Motorola has refused to pay and claims the patent covers a generally well-known technique. Ericsson has also been dragged into the case and sued by IDC for patent infringement. The company answered the charges with a counter-suit in U.S. federal court.

## Not guilty

Last week, a federal court in Delaware ruled that Motorola is not guilty of any patent infringement and that the four patents IDC has cited are not valid. The ruling was greeted with great satisfaction by Ericsson.

"The federal court ruling confirms that our position in relation to IDC is correct and will strengthen our efforts to supply

TDMA-based equipment without the heavy burden of royalty fees," commented Anders Dalenstam, manager of Ericsson's radio operations in the U.S.

## To court in november

Ericsson submitted a plaint against IDC on September 10, 1993, for a court ruling, stating that IDC's TDMA patents are null and void, and that Ericsson's TDMA equipment does not infringe upon them.

Ericsson's suit also requests a court order to bar IDC from filing any additional charges against the Group. The case is expected to be heard in a federal court in northern Texas during November.

LGH

## Mobile for Siberia

Ericsson has received an order for the installation of an AMPS/D-AMPS standard mobile telephone system in Siberia. The order was placed by Cellular Communications in Omsk. The first part of the order is valued at SEK 18 million and installation has already been started.

The system will be the first digital AMPS/D-AMPS system to be placed in operation in Siberia.

The standard has been highly successful in the Russian market, where Ericsson now has six AMPS/D-AMPS systems in operations or under installation.

## Taking a stake in Nikola Tesla

**In the beginning of March it became clear that Ericsson will become the principal owner of Nikola Tesla, the Croatian telecommunications manufacturer, by acquiring 49.07 percent of Tesla's shares.**

Ericsson has worked closely with the Croatian company, which has been its licensee since 1953, for many years. Nikola Tesla's main products have for some time been Ericsson's AXE and MD110 systems, which it exports to more than 10 countries in Eastern Europe. Approximately half of the sales have gone to states in the former Soviet Union, mainly Russia.

As a result, Ericsson's plans to become involved as an owner of the company in connection with the present privatiza-

tion program of the Croatian company come as no surprise. With just under half of the share capital, Ericsson will be the largest single owner, since the remaining shares will be owned by the company's employees.

In connection with the acquisition, it also became known that Ericsson will sign a supply agreement with the Croatian telecommunications administration covering delivery of AXE and other equipment valued at between SEK 3 billion and SEK 4 billion during the next five years.

"The purchase assures the growth of Ericsson's business in Croatia. And as a result of Nikola Tesla's substantial activity in Eastern Europe, especially in Russia, our own position in the area is being greatly strengthened" comments P O Sjöstedt at Ericsson Telecom.

## New Ericsson phone for PCN networks

More than one million copies of Ericsson's smallest pocket telephone, the winner of many prizes, have already been sold. Another model of the tiny unit, the PH337, designed for use in PCN networks based on the DCS1800 standard, was introduced at the recent Ce-Bit Trade Fair in Hannover.

With its lightest batteries, the new PH337 telephone weighs only 193 grams, making it the lightest and smallest pocket 'phone on the market today. Despite its tiny size, it offers a full two hours of talk time on a



The PH 337 resembles the GSM GH 337 model, but it has a new antenna and a slightly larger display panel.

single charge. With the most powerful — and heavier — batteries, the talk time increases to four hours — with standby time of 38 hours!



## 1995 Presentation ready for delivery

The 1995 edition of the Ericsson Corporate Presentation containing overhead displays and speaker text in is the final stages of production. The "Silver Bible," as it is sometimes called, has been thoroughly revised and now contains 47 charts and tables and accompanying text. As usual, the material is also available in the form of a pocket folder. Both items are available in English and Swedish. This year, for the first time, the Presentation will also be available in new media. A CD-ROM is being produced and the entire "package" will be accessible on the Internet.

The presentation can be ordered from the printing inventory in Karlstad, Sweden: memo ETX.ETXFICK; telephone +46-54 19 30 22. The standard package costs SEK 2.400 and the CD-ROM version (English only) costs SEK 120.

## NEWS AROUND THE GLOBE

### German pilot network to use GSM and DECT

Ericsson and DeTeMobil, a German network operator, have agreed to jointly establish a pilot network for GSM/DECT mobile telecommunications. Ericsson will supply DeTeMobil, which is owned by Deutsche Bundespost Telekom, with DECT terminals, DECT systems and the technology for connections to the Telekom D1 GSM network.

### Continuing growth in sales in Japan

The Japanese digital mobile telephone systems are continuing to grow at an accelerated rate. Today, 3.2 percent of the Japanese population are subscribers to an analog or digital system.

This growth means continuing strong sales for Ericsson as the supplier of digital systems to four large operators in Japan. The Company recently received two substantial expansion contracts from Central Japan Digital Phone Co. (CDP) in Nagoya.

The contracts, which are valued at a total of SEK 300 million, cover mobile exchanges and radio base stations to be delivered during the spring of 1995. The portion of CDP's network that is now being expanded will be placed in commercial operation on July 31.

### Ericsson supplying GSM to Spain

Ericsson has received a letter of intent from Airtel, the second GSM operator in Spain, covering deliveries of GSM equipment during 1995.

The contract will cover the supply of exchange equipment and radio base stations to be used in Airtel's new GSM networks in the provinces of Madrid, Barcelona, Vizcaya, Seville, Valencia, Malaga and Zaragoza. Airtel will be operating GSM services in these areas in October.

Airtel received its license to operate GSM networks last December. The company is owned by two operators — Airtouch and British Telecom — that are

active internationally and by a number of Spanish interests headed by Banco Central Hispano and Banco Santander.

### Record for AXE!

Ericsson set a new record by installing 13.5 million lines of AXE equipment in 1994. Never before have so many AXE lines been installed in a single year.

To date, customers in a total of 111 countries have chosen AXE and nearly 94 million AXE lines are in service or on order throughout the world.

### Poles order Mobitex

Ericsson's Mobitex system for mobile data communications is now being introduced in Poland. The country's largest banks have ordered Mobitex equipment via their jointly owned company, Telbank.

Telbank has established a pilot system in Warsaw and the surrounding area, including the city's international airport. This system, which was placed in operation on March 1, is estimated to be worth SEK 15 million.

# Upswing for network construction activities

The network construction market is growing steadily with new projects in more and more countries worldwide. Network Engineering within the Business Network Business Area is a specialist in this area, and can be described as Ericsson's coordination center for putting together turnkey solutions.

The challenge to acquire new customers is being taken up on a broad front. A key element in this effort is the sales and marketing unit in Sweden.

"In countries where there are Ericsson companies, we work through them to reach the customer with our offering. In many instances, they cooperation has already been established with the prospective customer," relates Bo Hildingsson, manager of the direct sales unit. In large markets, the network project is handled directly by the Major Local Company (MLC). In such cases, the Network Engineering division in Sweden plays a support role, providing engineering and technical support as required.

## Important to gain a foothold

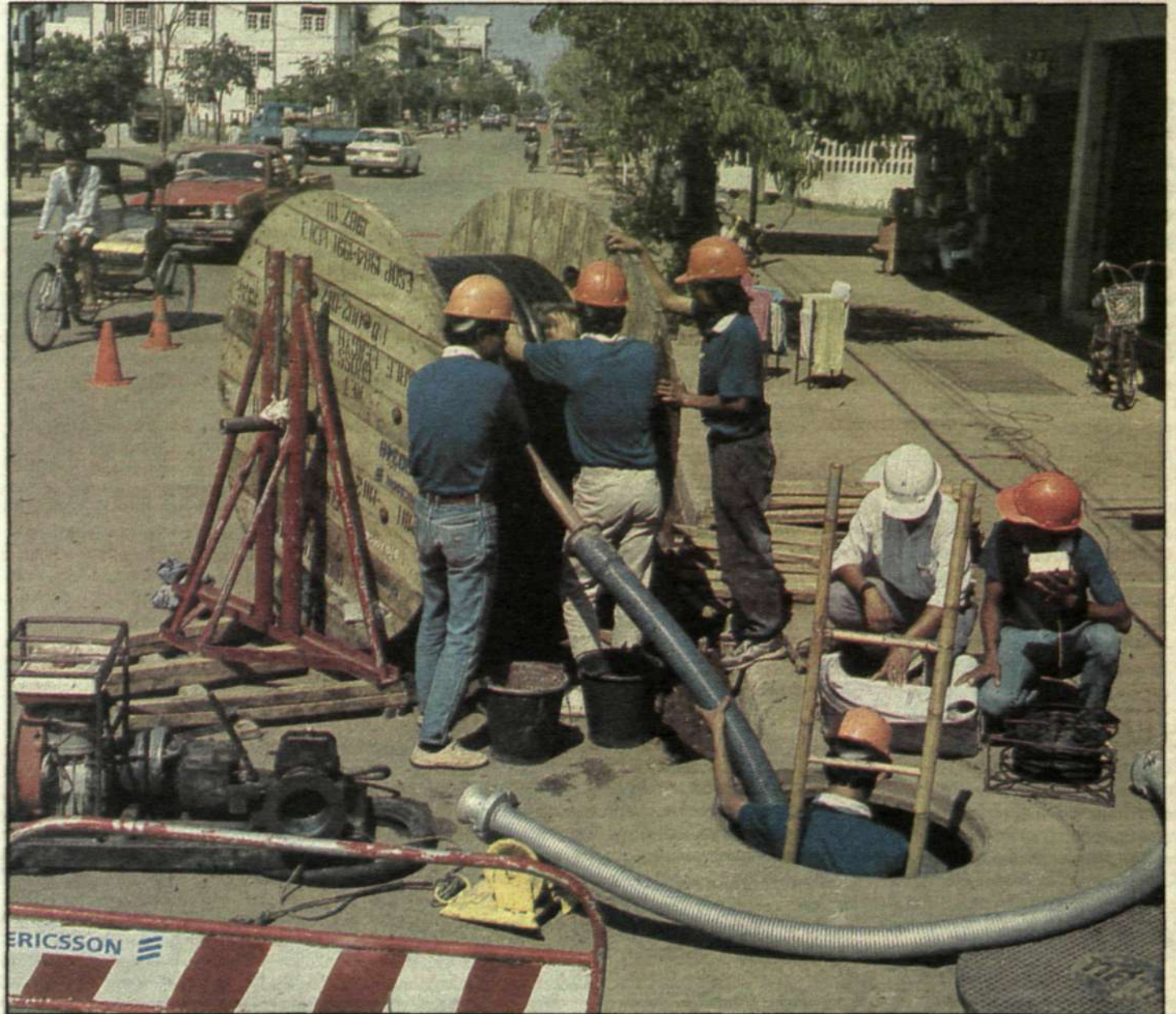
In many countries, Ericsson as yet only has a technical office, or a smaller local company (LC), or there are no on-site personnel. In these instances, the aim is to break new ground through marketing efforts direct from Sweden. The direct sales unit focuses initially on the traditional telephone and data network market segment. Typical new markets are often in acute need of basic telephony and a fundamental network infrastructure. There is much to be accomplished in Latin America, the Middle East, parts of Asia and, particularly, in central and eastern Europe for a competent network supplier.

"In attractive markets, we monitor political and economic developments in order to determine a suitable time to move in," relates Bo Hildingsson. "Poland is an example where we are marketing our services intensively. The Polish market has quickly become one of the most deregulated in Europe. We have approached a number of operators with information about our offering."

## Turnkey A to Z

In pace with deregulation and expansion, competition between network operators has stiffened, in new as well as established markets. The operator must focus on its specialty, providing tele services and does not have the time or the resources to develop the technical solutions and to install them. A completed installation, ready for operation is what they want. And what they need is a reliable supplier.

In this respect, Ericsson can provide a very competitive offering. In principle, the Network Engineering Division has no proprietary products, but substantial expertise in putting together customized solutions. There is a wide range of products to choose from within Ericsson. The Division is up-to-date on the entire range on the market



Ericsson employees in action, here in a project in the town of Udon Thai in north east Thailand.



Bo Hildingsson, was earlier in charge of the Thai network engineering company. He is looking forward to an eventful year within network engineering.

and can supplement with products from other suppliers, if a certain component is not available within Ericsson.

"We offer a complete, technically advanced solution at a reasonable price and with rapid installation time. What we promise, we keep. The customer must be able rely on the facility being complete to place in service as agreed. Right from the start, we focus on network solutions that

can be upgraded and expanded to meet the customer's future needs.

The aim is to carry out the project as close to the customer as possible. The project organization is established in cooperation with the local Ericsson company in the country, when there is one, with support from the home operations. All decisions are delegated to the project and the project leader is responsible for results and the di-

rect sales unit holds the contract and is responsible to the customer.

There are a number of projects under way. A network is under construction in the Philippines for the fourth Ericsson customer in the highly deregulated Philippine market. At year-end 1994, a contract was secured in Sri Lanka, valued at about SEK 750 million, covering delivery to the national tele administration. The major billion kronor project in Lebanon is entering into an intensive phase.

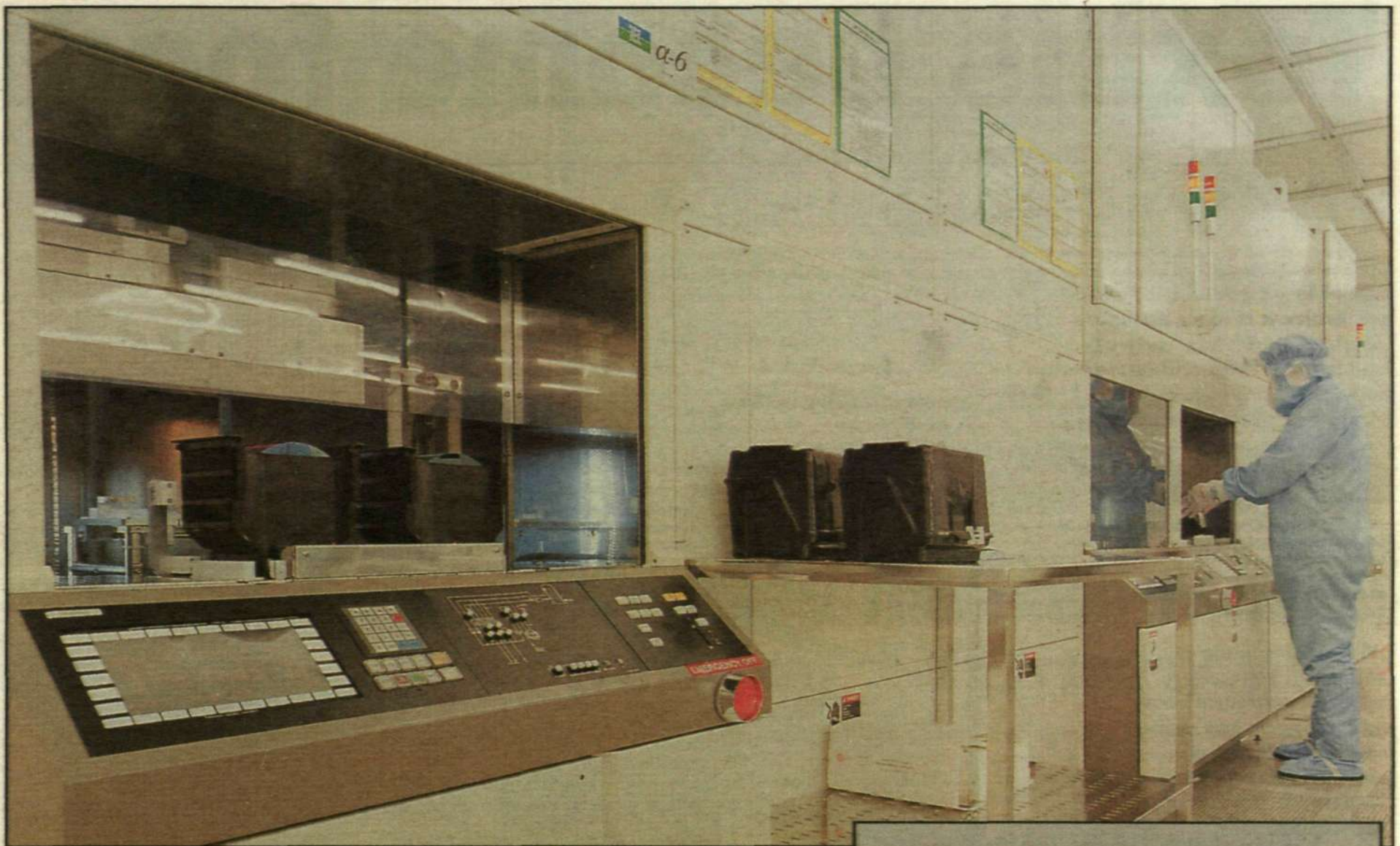
"We also have high expectations for the market in Hungary, where we have projects under way and have submitted bids for several hundred million. Deregulation is in full bloom in Hungary and the need for rapid installation should provide good opportunities," Bo Hildingsson hopes.

## Room for new recruits

The fifteen men and women in the direct sales unit have a lot of irons in the fire and can expect much more to do in the future. There is a need for reinforcements.

"We need costing engineers, project engineers and leaders, in the Swedish organization and for the export market," Bo Hildingsson says. "We more than doubled order bookings in 1994, compared with a year earlier and expect a 50-percent increase in 1995. There is much to do!"

Kari Malmström  
Photos: Thord Andersson



A major portion of the billion-kronor investment in the new "Fabben" has been expended on highly advanced production equipment. Some of the machines in the new facility are completely unique in Sweden.

# First chips from "Fabben"

Following several months of production trials, the first Ericsson-designed semiconductor has now been ordered and production will commence during the summer. This is a "chip" featuring 100,000 gates, designed for the next generation of group selector switches in AXE exchanges.

According to current plans, a finished prototype chip will be ready during November this year – just 30 months after the construction of the plant started.

"The startup of regular production of circuits in submicron technology is an important and exciting step for the new fab," says Hans Borgnäs, head of prototypes at the Ericsson Components' Microelectronic Systems Technology unit. "This shows that both the plant and its processes are fully operational and capable of producing state-of-the-art semiconductors to the most exacting world standards."

The shift from test wafers to regular production is being conducted in close cooperation with Texas Instruments (TI). The first chip is a gate matrix in the TEC3000 family.

## Important milestone for new semiconductor plant in Kista

"TI is our chosen strategic partner and supplier in semiconductors, and in some ways we work with them as though they were an extension of our own company, comments Christer Jungsand, manager of core unit Microelectronic Systems Technology at Ericsson Components.

Cooperation with TI is giving Ericsson the opportunity to apply a flexible strategy within the semiconductor technology area. Chip design and wafer production can be conducted using Ericsson's own resources, or those of TI. Principally, the plant in Kista will handle the production of more complex semiconductors in prototype form and in small volumes.

Naturally, the cooperation with TI will not prevent Ericsson from purchasing semiconductors externally, from manufacturers throughout the world.

### Italian design

The customer receiving the first "real" chips from the Kista plant is Ericsson Telecomunicazioni in Rome. It's research and development department employs approximately 700 persons, of whom a high proportion hold academic degrees.

"We are one of Ericsson's most advanced engineering design centers in the areas of both machine hardware and software – thanks to a successful blend of high technology, efficient tools, a powerful computer platform and our skilled personnel," says Alessandro Giacalone, HW department manager.

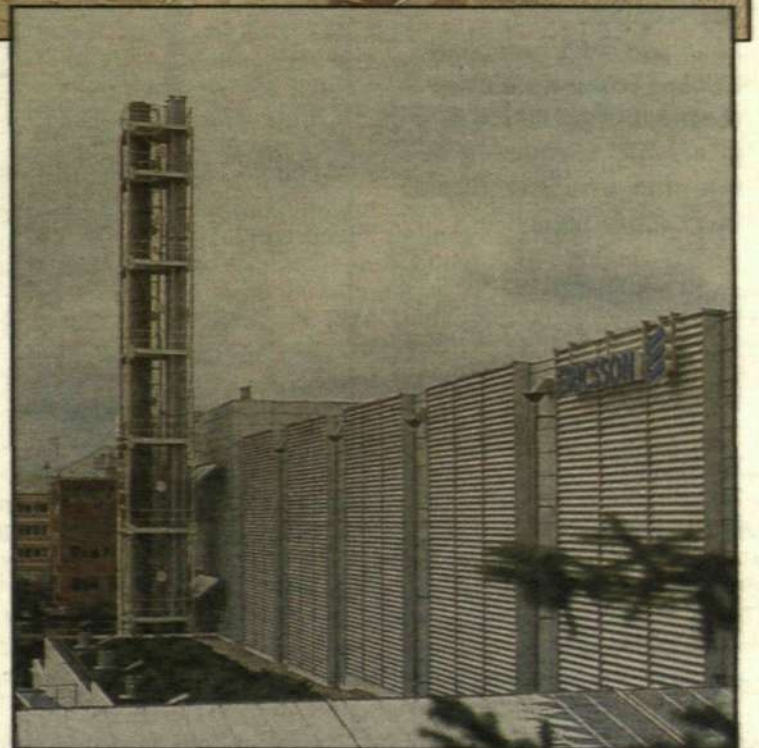
"Our hardware unit is responsible for customized chips (ASIC), integrated circuits and construction methodology."

The team designing the customized chips, which is part of the machine hardware unit, currently consists of 25 design engineers. They have worked with ASIC design since 1989. To date, their work – which extends to a miscellany of technologies – has resulted in more than 20 applications, all highly complex.

### More powerful

The design of the new AXE chip is based on TI's TEC3000 gate matrix technology using an advanced 0.5  $\mu$ m CMOS technique.

The term 0.5  $\mu$ m relates to the physical size of the smallest cells that make up the circuitry in the component. This reflects the state-of-the-art in miniaturization technology.



Ericsson's new semiconductor plant was inaugurated in August 1994. Production is now being started of the first Ericsson-designed chips.



L to R: Christer Jungsand, Ericsson Components, Alessandro Giacalone, Ericsson Telecomunicazioni in Rome, the Kista plant's first customer, and Hans Borgnäs, Ericsson Components.

The Kista plant has been built with the aim of reducing the size to 0.35  $\mu$ m within the near future.

The component which will soon start to be produced in the Ericsson semiconductor plant

will be the first 0.5  $\mu$ m ASIC to be used within AXE. It will play a vital role in the continuing development of the AXE system by increasing the station's performance and conserving energy.

# Toxins become food for worms



Ulf Ljungberg is the man behind the biofilter, a purification method that has reduced Ericsson's emission of solvents at the Norrköping plant in Sweden from 33 tons to three.

With a filter made of soil, peat, heather, worms and natural bacteria, Ericsson has reduced the emission of solvents by more than 90 percent. For its accomplishment, Ericsson was awarded British Telecom's environmental prize for suppliers. Ulf Ljungberg is the man who introduced the technique.

"It all started in 1991, when the County Administration demanded that Ericsson reduce its emissions of solvents," says Ulf Ljungberg, environmental coordinator at the Ingelsta factory in Norrköping.

## Ericsson awarded prize for technique that reduces emissions

The emissions came from three main areas: solder resisting, solder lacquering and soldering (the fusing agent applied to the circuit boards before soldering contains solvents).

"In the first phase," Ulf explains, "we decided to reduce emissions from the solder lacquering station, the source of the largest emissions."

### Burn the solvents

One solution to the problem could have been to burn the solvents in a special incineration plant that would transform the solvents into water and carbon dioxide.

"But the process was extremely expensive because it requires a great deal of energy. Instead, Ericsson chose a method developed more than 20 years ago in Germany. It is based on breaking down organic materials with the help of natural earth bacteria and worms. The process is used mainly in the food industry, but a professor had the idea of testing it to see if organic solvents could be broken down in the same way. It proved to be an excellent alternative," Ulf says.

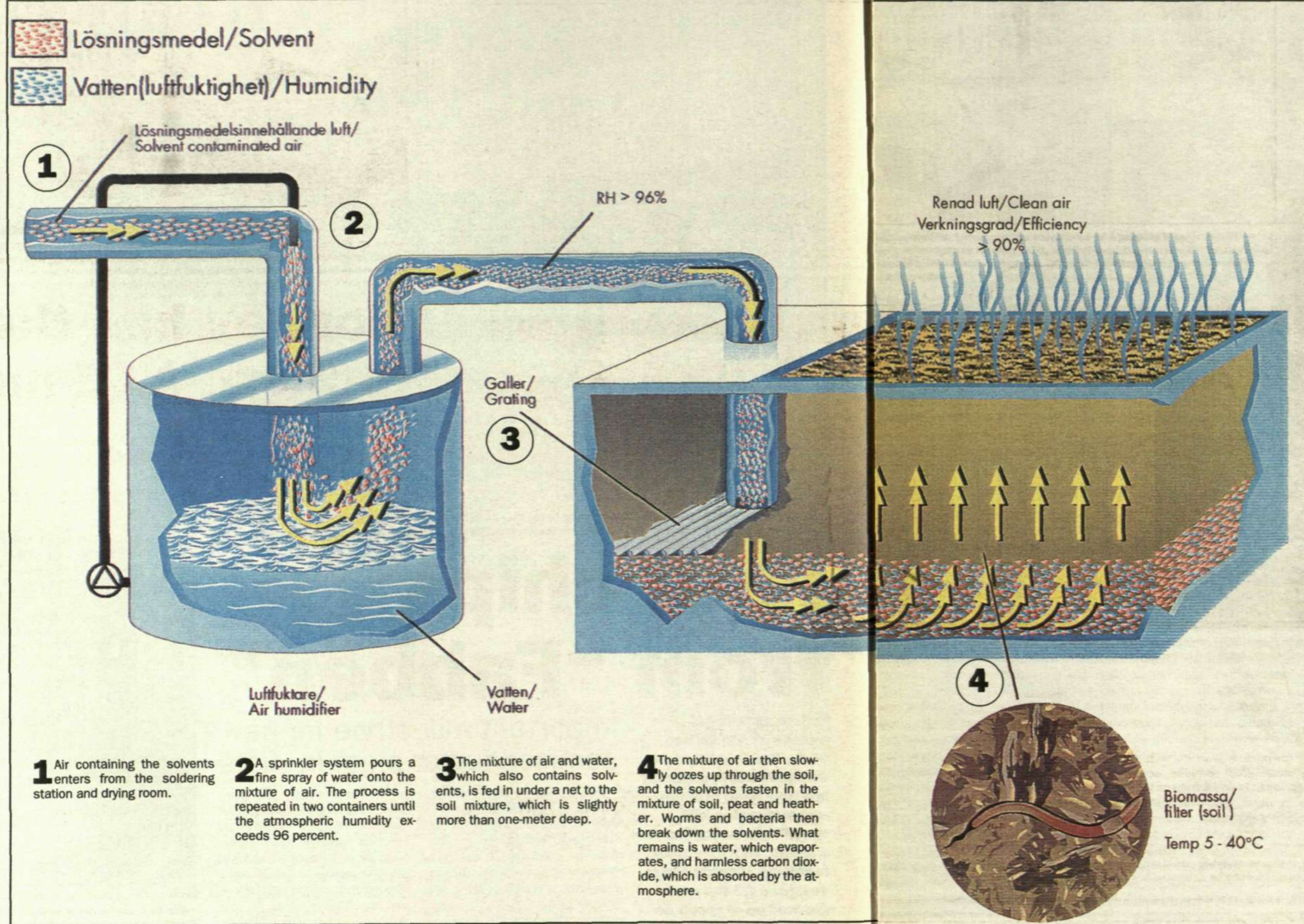
### From 33 tons to 3

"Once we saw the effects, we didn't hesitate one second" says Håkan Gustavsson, Manager of the circuit board plant in Ingelsta.

The biological purification process has reduced emissions from the solder resisting plant from 33 tons to three.

In addition to the Norrköping plant, purification with biological filters is used today by Astra, the Swedish pharmaceuticals company in Södertälje, and at Ericsson's production plants in Kumla and Kista.

L. E. Wretblad



**1** Air containing the solvents enters from the soldering station and drying room.

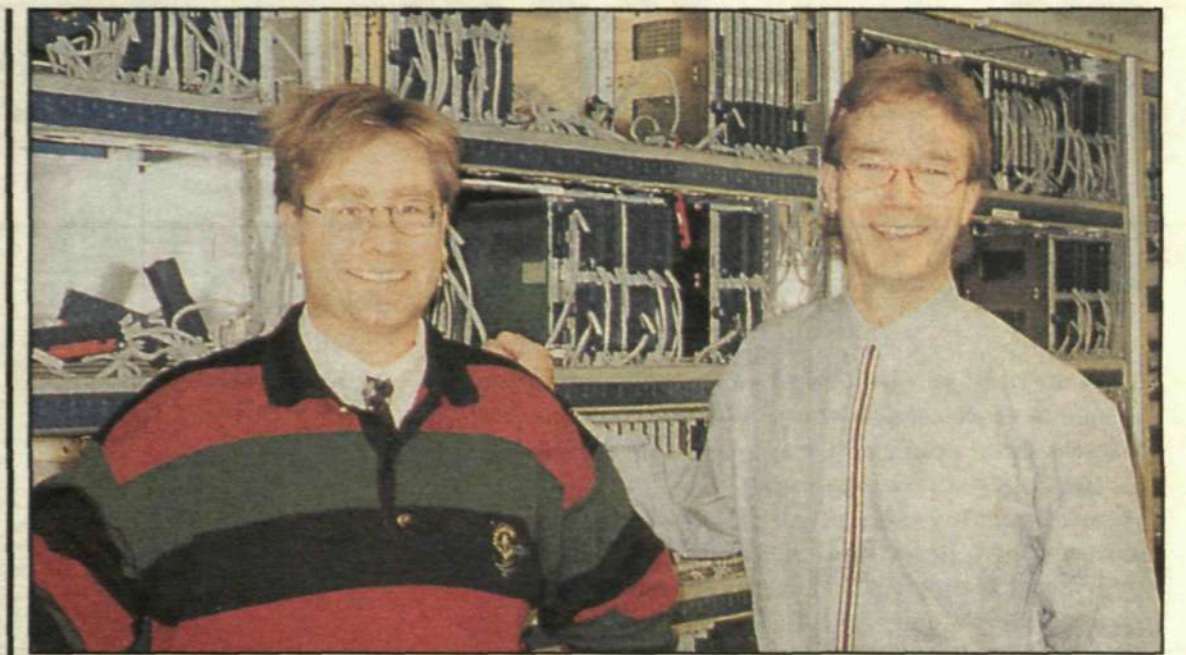
**2** A sprinkler system pours a fine spray of water onto the mixture of air. The process is repeated in two containers until the atmospheric humidity exceeds 96 percent.

**3** The mixture of air and water, which also contains solvents, is fed in under a net to the soil mixture, which is slightly more than one-meter deep.

**4** The mixture of air then slowly oozes up through the soil, and the solvents fasten in the mixture of soil, peat and heather. Worms and bacteria then break down the solvents, which is slightly more than one-meter deep. What remains is water, which evaporates, and harmless carbon dioxide, which is absorbed by the atmosphere.



The man behind the biological purification process, Ulf Ljungberg, is seen in the center of action. In this biological filter comprising soil, peat and heather, solvents are transformed into the harmless substances of water and carbon dioxide.



Faster start-ups with lower costs and higher quality. Those are the objectives of a joint AXE system test project now being conducted by Ericsson's subsidiary in Norway, ETO, and Telenor, the Norwegian telecommunications authority. Telenor's project manager, Nils Faugli is seen at left with Leif Arne Dalane, Ericsson's project manager, at the test site in Hisøy, Norway.

## Norway has the most modern AXE network

Faster upgrades and tests conducted in cooperation with customers are two factors that have contributed to the fact that Norway has the most modern AXE network in the world.

In 1990, Ericsson's subsidiary in Norway, Ericsson Telecom A.S., signed a general agreement with what was then Norway's telecommunications authority, which became a public company on January 1, 1995 and was renamed Telenor. Among other terms of the agreement, Ericsson was contracted to deliver up to 250,000 lines per year through 1994. By November 1994, 710,000 lines had been installed in 93 stations.

From the time the contract was signed, up to and including 1995, the norwegian subsidiary has been the so-called First Office Application (FOA) for Ericsson Telecom's products for local stations.

### Modern AXE network

To be the first market means to always be first with the latest Ericsson has to offer in the form of services and other exchange functions.

"We had an advantage in that we started with a blank sheet of paper," says Petter Amundsen, the AXE product manager at Ericsson Telecom A.S. By continuously upgrading our system with the latest versions from our product line, we have built up what is the most modern AXE network in the world today."

The latest release is called AXE Local 12.3. It differs from previous versions in that it enables customers to combine analog and digital services in their systems with functions for intelligent networks (IN).

### Rapid upgrades

"Our objective is to complete upgrades as quickly as possible,

says Petter. We strive to sustain long periods of stable operations and short periods for upgrading the network. In this way, we reduce disturbances in network operations and reduce costs, both for us and the customers.

The first time this was tested was during the upgrade of the previous product version, AXE Local 12.2. Seventy stations were upgraded in three months. Our goal now is to reduce that time by one-two months.

### It costs to be No. 1

"Speed is our strength," says Petter. "The faster we can install new software, the sooner customers gain access to it and market it to their customer. It provides them with a head start against their competitors and the possibility to increase their revenues."

Petter does not deny, however, that it costs money to be No. 1, always first with the latest equipment.

"But we knew that when we signed the contract. Furthermore, we expect to save money through more rapid upgrades, simplified configuration and improved operations and maintenance of our systems."

### Joint tests

In conjunction with the most recent upgrade, Ericsson Telecom A.S. and its customer, Telenor, have cooperated in joint tests of the products.

"Traditionally, in these tests, we test the products for three months before they are given to the customer who, in turn, tests them for six months before they are ready to put into operation," Petter says.

Both Ericsson and Telenor thought this was a costly and time-consuming procedure that could and should be made simpler. Working together, they developed a new model for testing.

Among other features, the new model provides joint test specifications, reports and a common test site.

"We have a complete network consisting of six stations, three here at Hisøy and three at Telenor's installation in Haslevangen, outside Oslo," says Leif Arne Dalane, Ericsson Telecom A.S.'s manager of the test project.

### Skipped one step

By conducting the tests jointly, both parties quite simply have been able to skip one step in the process, thereby saving time. Their objective is to reduce test times by 30 percent, compared with previous upgrades.

The combination of Ericsson's AXE know-how and Norwegian Telenor's knowledge of services and customer demands also contributes to higher quality products.

"We reduce our costs by being able to test the product at an earlier stage and discovering faults and shortcomings before it is placed in operation. In this respect, the goal is to reduce reports of malfunctions and system errors by 30 percent," says Nils Faugli, Telenor's project manager.

This type of cooperation is more revolutionary for Ericsson than for Telenor, which has a history of working in close cooperation with suppliers in product testing.

"This type of cooperation requires a competent operator, and we feel that Telenor is definitely competent. This project will help us in other markets. In addition, we have also assumed equal shares of all risks and profits," says Petter Amundsen.

"Although the cooperation makes us somewhat vulnerable in that we open our organization to insights from the customer, we feel it is becoming increasingly important to work more closely with customers," he concludes.

The first station with the AXE Local 12.3 version was placed in operation in Tvedestrand on February 9th. Work is continuing to upgrade other stations.

by Lotta Muth



On March 16th, Ericsson was awarded an environmental prize BT in London. (L-r): Stephen Hutchinson, environmental coordinator of ETL, Sten Hebert, formerly environmental coordinator of LME, Nils Grimso, President of ETL, Lady Vallance, the wife of the Chairman of BT, Brian Rigby, Director of BT, Ulf Ljungberg, and Jackie Karlsson, Marketing Communications Manager of ETL.



# The difficult radio choice

**What method will be used to transmit radio signals in future mobile telephony? Will the current TDMA technique be retained or will the new CDMA technology gain acceptance?**

**Most probably the network of the future will be an advanced, flexible, hierarchical network in several layers and today there is only one technology which permits simple and satisfactory solutions - TDMA.**

Radio frequencies are normally considered the only limit for mobile telephony. There is a fixed frequency range for transmission and this band must be utilized as efficiently as possible. Demands are now being further intensified as mobile telephony is becoming a standard item and personal telephony, Personal Communications Service (PCS) is just around the corner.

Two different techniques for transmitting signals between mobile base stations are currently available for PCS systems to be built in the U.S. - TDMA and CDMA. The T is for Time, the C for Code. Very simply, you can say that the TDMA system divides the signals into repetitive time slots. In a CDMA system, each call is given a unique code.

**Established and new**

TDMA is an established technology which has been a success in digital mobile telephone systems, such as GSM, D-AMPS and the Japanese PDC, as well as the cordless DECT telephone system.

In contrast, CDMA is a yet unproved technology for mobile telephony, but is projected by some (the Americans) as being the method of the future, and others as being advertised.

"CDMA cannot increase capacity more than a developed TDMA system," it is argued. Most significantly, "CDMA cannot be used to build hierarchical cell structures" which it appears is the only method which can be used to increase capacity.

If a CDMA system or a new TDMA system can provide seven or ten times the capacity of today's analog mobile telephone system, is of minor importance when a hierarchical system can provide fifty times or more. This is the level required to meet the demands of personal telephony.

**TDMA**

All of today's digital mobile systems use the fundamental techniques of TDMA, Time Division Multiple Access, for the signals between the base station and the mobile telephone.

The assigned frequency band of 10-15 MHz, as is the case with the analog NMT, AMPS and TACS systems, is divided into a number of carrier frequencies (at 30 - 200 KHz). However, in an analog system, each call is given

a frequency wave (according to so-called FDMA), but in TDMA the call is also divided in the digitized modulated carrier wave into different time slots.

A carrier wave in a GSM network at 200 KHz has eight time slots. which means that eight calls can be carried on the same frequency simultaneously. (In the American D-AMPS there are three slots at 30 KHz to gain compatibility with the analog AMPS system.) The fact that the call only takes up one-eighth of the time is not noticed by the receiver since the bits are transmitted eight times faster than they were created.

Call number 1 repeatedly gets the first slot in each frame of eight slots, call number 2 the second, and so on. A call involving advanced services (sending data and such) is assigned several slots in the frame. In order for the receiver to find the right stream of bits, each time slot must contain, in addition to the message, a synchronizing sequence and to prevent collisions, a guard time at the start and finish.

Both the FDMA and TDMA systems are based on a network of base stations in so-called cells. Each cell has a fixed list of radio frequencies which are reused in other cells at a suitable distance according to an optimally calculated pattern. A mobile telephone moving through the network is assigned a new frequency when it changes cells.

**CDMA concept**

TDMA is facing off against CDMA. The discussion in this respect has been a bit confusing, since many people equating CDMA and the Q-CDMA system which currently exists as a test system in northwestern United States. CDMA is an access technique which is based on codes and currently there is work under way to develop several ways to build systems based on this technology.

In addition, there are other forms of CDMA, for example, so-called frequency hopping CDMA (based on a technique developed for the military to prevent interference) where the signal jumps at very high speed between various frequencies within the entire spectrum (30 MHz).

Another possible development could be a hybrid between

What radio technology will win the battle - TDMA or CDMA?

TDMA and CDMA, where the advantages of both techniques are used, or systems which use OFDMA, Orthogonal Frequency Division Multiple Access. But that's another article.

**Today's CDMA**

One of the CDMA systems being discussed for PCS in the U.S. today is a so-called direct sequence CDMA, which is known as Q-CDMA after the U.S. company Qualcomm.

Q-CDMA differs in many respects from TDMA. All the cells in a Q-CDMA system have the same frequency and the network constructor does not have to bother about frequency planning. In Q-CDMA all calls are sent stacked on each other, seemingly unstructured, within a 1.25 MHz.

The calls can be held apart because each is assigned a unique code. Simply stated, a code signal which varies 125 time faster than the actual message is attached to each digital bit in the message, which creates a broad band signal (more than 1 Mbit per second instead of the original of about 10 Kbit).

The receiver takes all calls and multiplies them with the calls own code, with the result that the digital signal of own calls is converted into a slow varying signal (since the code times itself is equal to 1) while the other calls are still broad band. A receiver filter cuts out the smaller frequency bits and listens where its "compressed" call is 125 times stronger than the other calls, which is noticed as disturbing static.

In principle, you can stuff as many calls as you like in a CDMA system, but the effect is the static gets stronger with the increase in the number of calls.

In practice, the capacity of Q-CDMA with acceptable quality is not higher than with a TDMA system. With TDMA, you can also adapt the quality and with tighter reuse of frequencies gain more channels, but the penalty is also higher static.

**Hierarchical systems**

The most effective method to radically increase the number of



TDMA-technology today has some unchallenged advantages when it comes to building mobile systems in hierarchical structures - which is the only method to significantly increase the capacity of the networks,

calls within a certain area is to make the system tighter with microcells. In order to be manageable, a so-called hierarchical system is required where the various large cells are stacked in layers.

In such a case, the network comprises so-called three-dimensional picocells for interior use, microcells stacked over them for tighter call traffic in a city environment, slower transfers, etc. and over them larger macrocells for users moving rapidly through the system in a car or train, etc. and in the future, gigantic umbrella-cells over everything in the form of satellite cells. With such a network, it would not be difficult to provide fifty or more time the capacity.

The most interesting point in this respect is that only TDMA

can in a simple fashion support such a hierarchical network where the various cell layers operate on different frequencies.

**Prisoner**

The reason is that the CDMA receiver is totally blind to other frequencies. A Q-CDMA telephone itself cannot detect different frequencies but upon hand-over to another cell it must rely on being controlled by the system. It is a prisoner of its own frequency band and can only function in a hierarchical network where the cells in the various layers work on the same frequency.

However, even if this was the case, when the mobile telephone passes through the microcell's stronger signals it would be forced to make a handover,

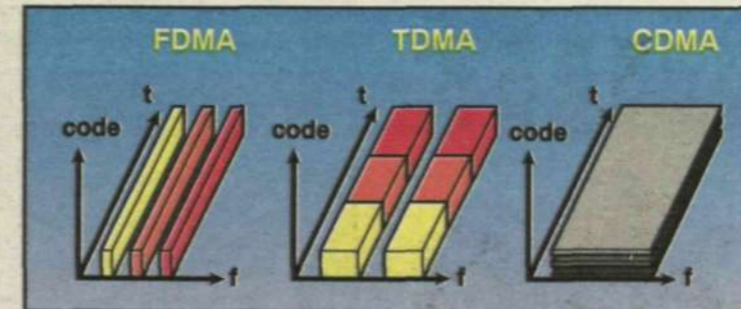
explains Håkan Andersson, product manager at Ericsson Radio Systems. Photo: Lars Åström

which is impractical when you pass through several microcells at high speed in a car.

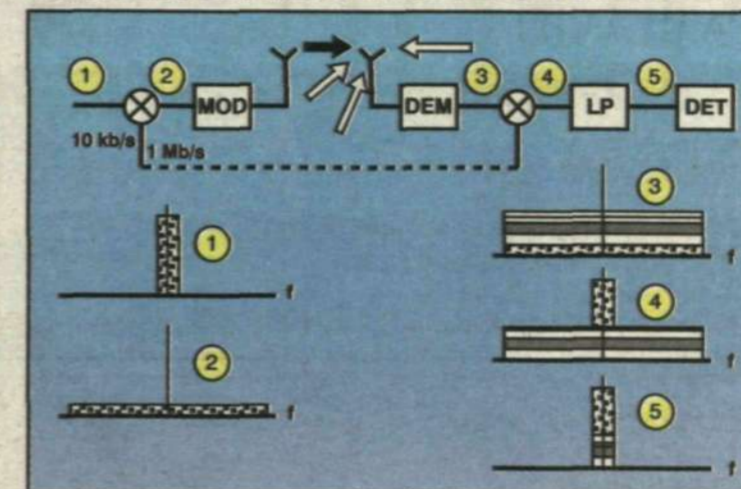
In contrast, the TDMA mobile telephone can function in a network with different frequencies. It works with time slots and during "free times" (in a digital control channel) it can systematically read the other frequencies from other base stations at a rate of about 100 times per second and in such a manner can report to the system how it is traveling through the network and when it is suitable for a handover from a macrocell to a microcell, for example.

The control parameters can be speed, how long the mobile unit was inside the microcell, relation to a picocell area, etc.

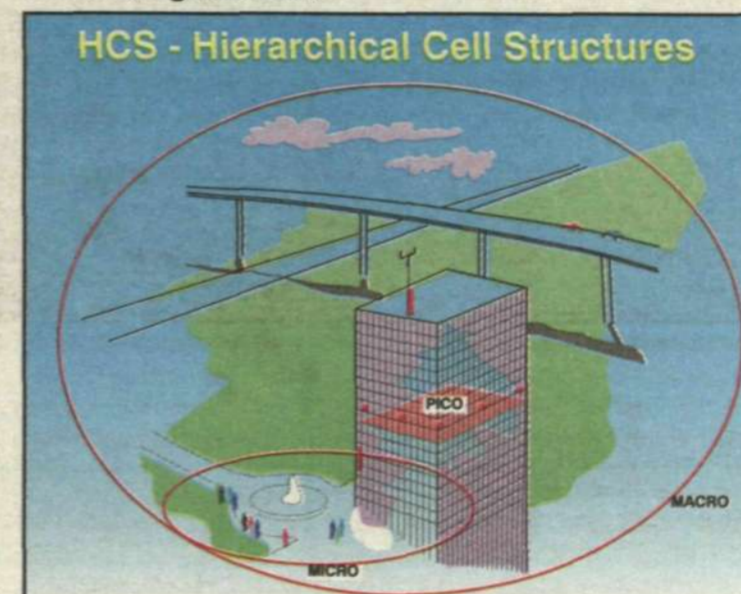
The mobile unit assists the system in a manner which with a



Currently, there are three main methods in a mobile system for the transfer of radio signals between a mobile telephone and a radio base station. The access techniques are called FDMA, TDMA and CDMA, where the key words are Frequency, Time and Code. In FDMA (used for the analog systems), each user has an own frequency. In TDMA (digital systems) a broader carrier wave frequency is divided into time slots where each call has repetitive slots in a frame of, for example, eight slots (GSM). Finally, in CDMA all calls are transmitted on a broad band frequency and are kept apart by each being assigned a unique code.



Principle of CDMA. A code is attached to a 10-kb/s signal which varies 125 faster than the original signal creating a broad band signal (2). At the receiver, the signal is decoded and own calls revert to a narrow-band signal while all other calls are broad band (4). The receiver then filters out the small frequency bits (5) and can then read (hear) its own call amplified against the background. However, the other calls are still there as background static and the more calls being sent at the same time the stronger the static.



Hierarchical structures where cells of varying sizes are in layers above one another can sharply increase the capacity in a network. Today, only the TDMA technique can support in a simple fashion a structure of cells with different frequencies. In a CDMA system, all cells would be working on the same frequency and the mobile unit would be forced to switch over to the cell which has the strongest signal strength, which would be impractical for a mobile unit which is in a larger macrocell and at high speed passes through an area with several microcells.

CDMA mobile would require double receivers.

**Evolution**

Since the hierarchical network is a good solution for personal telephony, it would appear that TDMA is the best alternative. Not even the advantage with CDMA of avoiding the detailed frequency planning in constructing the network is unchallenged. For certain TDMA systems, there is now a technique called adaptive channel selection (working well in DECT systems), where the system automatically assigns the cells different frequencies as needed. And for other systems (GSM), there is frequency hopping, which reduces the need for frequency planning.

"What is revolutionary perhaps is that there will not be any

revolution, but an evolution, that is, that PCS will be a natural evolution of the TDMA system which exists today," says Håkan Andersson, project leader at Ericsson Radio Systems AB, American standards.

"Then we will be able to reuse the infrastructure that already exists and PCS will not be a question of access technology but a matter of services, capacities, good coverage, high voice quality, etc. This puts the end-user in focus."

It appears perhaps that the issue is not whether to cut the loaf lengthwise or crosswise, which makes no difference in terms of the amount of bread, but to cut it in such a way that a flexible system is created in accordance with the hierarchical model where capacity is adapted to need.

Lars Cederquist



Peter Bergenbarg, who works in the business unit for mobile systems of American standard, struck a blow for the TDMA technique during a tour through Latin America. Photo: Lars Åström

## Striking a blow for TDMA

The struggle between the competing digital technologies, TDMA and CDMA, is not being fought solely on U.S. ground. American interests have also carried the fight into other markets, particularly in Latin America.

Last autumn, Ericsson gathered its forces in the radio field for a counter attack. Information about TDMA was spread throughout Latin America during two extensive information tours.

Since TDMA is the technology underlying most of Ericsson's mobile telephone systems, personnel from several business units with Ericsson Radio participated in the information tour. Although in some instances, these units compete with each other in certain areas, Ericsson displayed a united TDMA front.

"The group which we targeted were mainly the government regulatory agencies, authorities and journalists in the various countries, as well as the operators," Peter Bergenbarg relates, Peter, works in marketing within the business unit for mobile systems of American standard, deemed the trip a real success.

**Overwhelming**

"We received an overwhelming response from our target groups, and also to great extent from the local Ericsson companies in the various countries. They all agreed that it was about time that a large delegation from Ericsson's headquarters in Sweden made an appearance and received us as ambassadors for the group!"

"Overall, everything went well. This activity whetted our appetites and we are now carrying out activities in other areas of the world where CDMA is being promoted as the only solution."

LGH

"Another general comment among the target groups was that they were glad to receive such detailed information about what TDMA really was and what it could accomplish. There was a strongly perceived need to receive more information and for information from another quarter than just the American CDMA advocates," Peter says.

"An example, is the experience in Santiago, Chile. We arrived on Friday afternoon and made a presentation which was scheduled from 4 p.m. to eight in the evening. This was not the best time, but circumstances had forced us into it.

"Despite this, more than 100 persons attended and they stayed until the final minute. The discussions continued afterwards over dinner and some of the guests were still locked in discussions with Ericsson personnel until midnight. Everyone was highly appreciative that Ericsson had traveled to Chile to provide this information and this effort was perceived as strong evidence that Ericsson truly views Chile as an important market.

Prior to starting the tour, Peter and his colleagues were a bit concerned about what kind of media coverage they would attract.

"Outside Europe and North America, we are not as strong in press relations. Nevertheless, the coverage in magazines, radio and TV was favorable.

"Overall, everything went well. This activity whetted our appetites and we are now carrying out activities in other areas of the world where CDMA is being promoted as the only solution."

LGH

# CeBit reaches new heights

Largest IT trade fair sets records for exhibitors, visitors, waste – and for setting records

*Location: The underground central station in Hannover, Germany. Time: Thursday, March 9, 1995. The queue shuffles slowly forward. A sea of men, with here and there a woman. CeBit, March 8-15, the world's largest trade fair for data processing, telecommunications and every conceivable information technology, is only 20 minutes away – if you can get a ticket for the underground trip.*



Queues at the underground station were long and conductors had their hands full selling loose tickets to Fair-bound visitors.

One is struck by the contrasts between the old and the new in this queue. The future's fantastic potential in global communications versus the ticket vending machines that today are out of service. A number of conductors are selling loose tickets that then have to be punched, one by one.

Finally, into the underground car, with guaranteed standing room all the way. At the end of the ride, the passengers scramble to reach the entrances to the Fair.

Many visitors arrive by train at the Fair's own 12-platform railway station, the largest private station in Europe. Only 14 percent come by plane, mostly from abroad. CeBit focuses primarily on German attendance. Most Germans arrive by car. But the more than 50,000 parking spaces are not adequate during peak visiting periods. On the second day of the Fair, highway traffic patterns were changed so that four lines led directly to the Fairgrounds. Despite this, cars were backed up for as much as seven miles.

This year, the 25 exhibition halls – in which every last square meter of space had been sold – were occupied by 6,170 exhibitors from 59 countries and were visited by more than 700,000 persons. On Thursday alone, 129,000 crowded in. A record number.

The number of persons visiting Ericsson's two-story display was markedly higher than last year. Forty-seven percent of the visitors who were recorded on Friday came from outside Germany. A new record.

During Fair days, CeBit produces as much waste, consumes as much electricity

and flushes away as much water as a city of 25,000 inhabitants in a comparable period. Calculated in personalized terms, we are dealing with a kilogram of waste, 7 kilowatts of electricity and 42 liters dirty water.

### Enormous mountain of paper

Despite the fantastic opportunities offered by the information technology that is sweeping triumphantly through large parts of the world – making it possible to transmit virtually all information electronically as well as via the spoken word – every visitor accumulates about two kilograms of brochures. More than 62,000 copies of the Fair catalog, which weighs more than a kilogram, were printed. According to an estimate by the World Wildlife Foundation (WWF), it takes 31,000 trees and 380,000 cubic meters of water to produce this mountain of paper.

But environmental issues are, of course, taken seriously. This was emphasized in Hall 15. The discussion there, under the heading "Opportunity 2000," centered on how companies should act in order to be able to best utilize technical advances at the turn of the century and improve the environment at the same time.

Text and photo: Thord Andersson



Springtime in Hannover. And springtime for revolutionary communications systems that will change society. At the beginning of the Fair 360 persons were involved in Ericsson's exhibit. Another record.

## Ericsson ranks in forefront in all the important sectors

*"Everyone has everything!"*

*That was the reaction of Anders Igel, Manager of Ericsson's Public Telecommunications Business Area, after conducting a brief but effective review of the Company's competitors at CeBit.*

But having everything doesn't mean that all competitors are equally good at everything. Ericsson unquestionably ranks among the very best in the world in a number of areas, including mobile telephony.

This year Ericsson introduced a new 193-gram pocket telephone, the PH 337, for the digital DCS 1800 standard. The instrument is based on the GH 337 model for GSM networks that has won numerous awards. Ericsson now has telephones for all the leading mobile telephone standards.

The new 130-gram Freeset telephone for other telecommunications administrations. The full range of the AXE system, the switching system most widely used throughout the world, was also displayed.

The Fair's own cordless DECT system, placed in service in March, is based on Ericsson technology and comprises 1,200 instruments. For next year's Fair the system will be increased by 2,000 instruments that will be rented to exhibitors and visitors.

"The market now needs a common instrument for both GSM and DECT," said Stellan Jacobsson, the head of Volvo's telecommunications services, who rented at DECT-telephone during his visit at the fair.

### ATM fully operative

Ericsson's broadband system based on the ATM standard was demonstrated under operating conditions. Systems for the new ATM technology have already been supplied to Deutsche Telekom and a number of

other telecommunications administrations. The full range of the AXE system, the switching system most widely used throughout the world, was also displayed.

Consono, the new brand name for the greater part of Ericsson's systems and products for business communications, was introduced at the Fair, with the spotlight on new MD110 systems.

In this area, the public was attracted by the multimedia solutions based on isoENET. As a result of strategic joint ventures with National Semiconductor, IBM, Chipcom, Microsoft and other companies, Ericsson is well in the forefront in this field.

Many systems are being offered and it is still too early to determine who will win the battle for the market and customers. Ericsson is in the most advanced ranks in all important sectors of global communications. It offered ample proof of this in its well-attended exhibit at CeBit.



Heleen de Bruijn demonstrates the new feather-light Freeset phone to a visitor. This new 130-gram instrument for cordless business communication systems, which is based on the DECT standard, was one of the CeBit crowd's favorites.



"I want one of those," said Anders Igel when Jan Snygg completed his demonstration of a multimedia system based on isoEthernet.



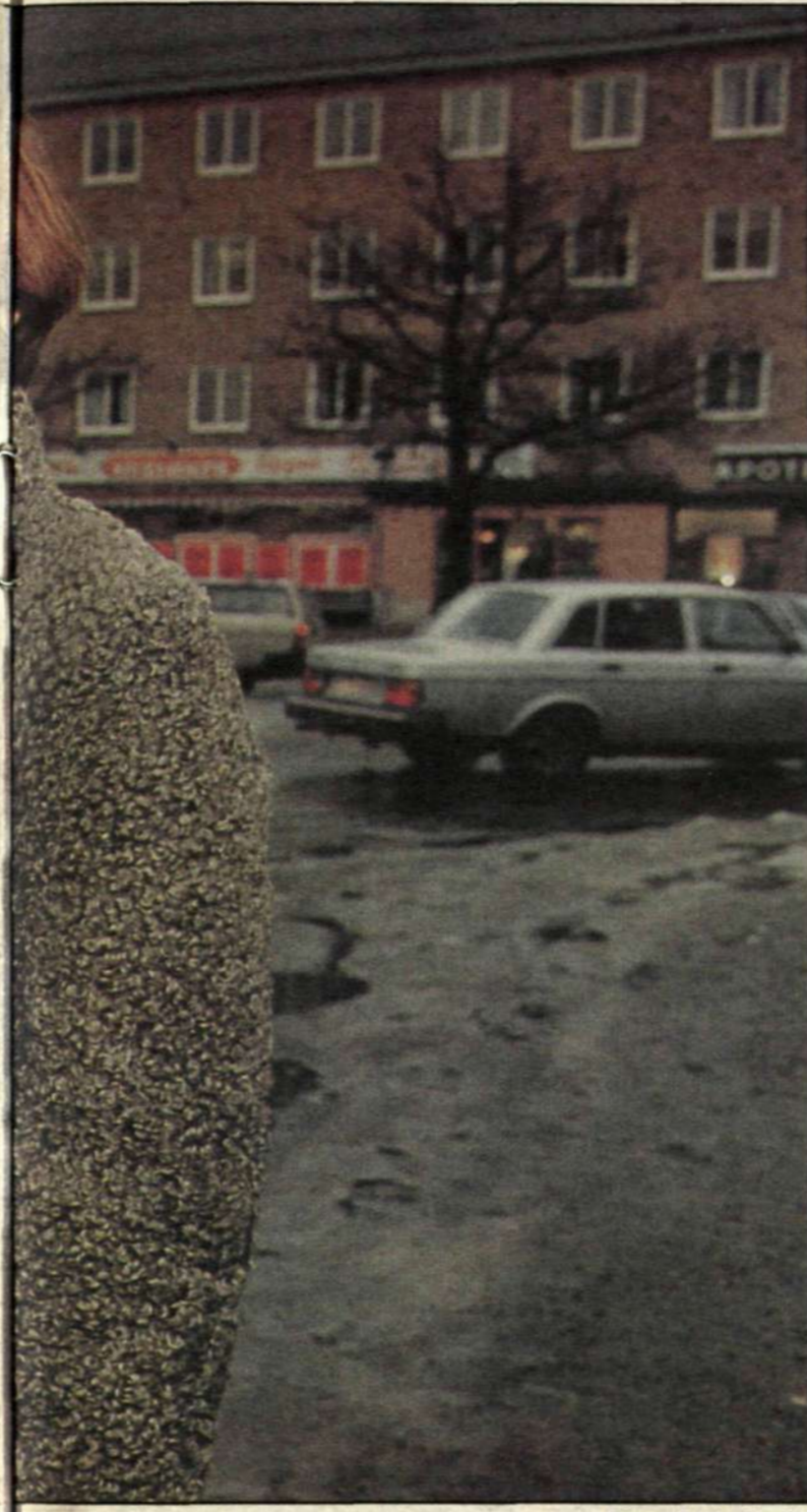
Ericsson's program for ATM-based systems was presented by Nils-Erik Gustafsson. Ericsson provided the Fair's only fully functional ATM transmission.



The world's smallest mobile telephone was highly visible in the Ericsson exhibit. Here impersonated by Ulrika Haselbeck and Jörg Loke who were attracting visitors to the stand.



Karin Almqvist Liwendahl (right) is in charge of Ericsson Investor Relations in Sweden and the rest of the Europe. At her side is Gunilla Brunnberg, her assistant.



Lars Jonsteg serves the American market with updated information about Ericsson.

# The true view of Ericsson

*Guessing and wishful thinking are absolutely taboo for Karin Almqvist Liwendahl, head of Ericsson's investor relations (IR) in Sweden and the rest of Europe.*

*"To gain credibility in this job, you have to choose your words carefully. The information has to be objective and correct," says Ms Almqvist Liwendahl*

Karin just returned to the firing line six months ago after a prolonged maternal leave of absence.

She accepted the tough challenge to manage Ericsson's relations with share investors in Sweden and the rest of Europe.

But Karin is not alone. At her side is her assistant, Gunilla Brunnberg, a person with many years of experience and excellent language skills.

It's a weekday in February when Karin and Gunilla greet me at Ericsson's Head Office at Telefonplan in Stockholm. The telephones had just stopped ringing after a few days of intensive activity.

The price of Ericsson shares fell SEK 16 in just one day. That alone is indicative of the stock market's behavioral patterns. It reacts quickly and instinctively to the slightest sign that something is not quite right.

**To interpret figures**

Karin and Gunilla can't always foresee when information demands will increase, or what types of questions will arise, except for questions related directly to Ericsson's official reports.

"During most working hours, we provide strict financial information based on the reports," states Karin.

"I often help our analysts and shareholders interpret the meaning of figures in the results we present."

"But there are also times when we are asked questions that cannot be answered directly. When that happens, it is important to avoid the start of speculation and ask to get back to the person. Our job is to convey what we call 'a true and fair view'."

There is no temptation to get caught up in overoptimism concerning your own company in order to inflate the Ericsson share. Well-founded information is all that counts.

"An overvalued share is of no use to anyone, especially to us, if we want to nurture long-term confidence," Karin explains.

"We are in continuous contact

**"An overvalued share is of no use to anyone. We want to nurture long-term confidence."**

with hundreds of investors and private individuals in all parts of Europe. One thing they all have in common is their interest in development trends for Ericsson and its share price."

The department also maintains contacts with schools, students, share savings associations

and graduate school candidates.

Great Britain dominates contacts outside Sweden. Contacts with other European countries, for example France and Germany, are also intensive, however. Any dialogue not taken care of over the phone is dealt with when Karin and her able colleagues from Ericsson see foreign guests on their visits to Stockholm, or when she travels abroad.

**"Road Shows"**

Two or three times a year, usually after Ericsson has issued its quarterly or six-month reports, Karin goes on what she calls "road shows" to London, Paris and Scotland. The objective of the trips is to provide on-site, direct, up-dated information to important foreign investors.

C.W. Ros, Ericsson's Executive Vice President, and Gerhard Wise, the Group's Corporate Financial Controller, also take part in some road shows, which may also include the U.S.

A basic requirement for fulfilling investors' demands for cor-

rect information, naturally, is that Karin and Gunilla always stay informed and up-to-date. This means not only about Ericsson, but also society in general.

Karin also keeps in close contact with Lars Jonsteg, her IR colleague in the U.S.

"We talk on the phone every day. We confirm whatever has happened and prepare ourselves for questions we might expect during the day.

"One of our strengths is that we convey the same message at the same time," Karin explains.

Lars Jonsteg has North America as his horizon, while Karin and Gunilla have Sweden and the rest of Europe. Karin explains that there are important differences between investors in the two parts of the world.

"The difference is in analysis methods. In the U.S., it is normal to have analysts who specialize in certain industrial areas, for example, with special focus on what is happening in mobile telephony."

"In London, on the other hand, analysts specialize in countries or regions, for example, Scandinavia. They carefully monitor general economic and political trends in Sweden, rather than industrial development. They decide if the time is right to buy shares in Sweden, for instance."

**Extensive knowledge**

According to Karin, the most fascinating part of her job is the international contact, the opportunity to gain more extensive knowledge about Ericsson.

"It is really fascinating to learn how investors think and what issues are important to them," she says.

For Gunilla, who has worked in IR for four years, it is the chance to use her language skills that makes her job exciting.

"I like keeping my knowledge of languages a jour," she says. "I also appreciate staying abreast of what is happening in the world."

by Magnus Backlund

## Interest in Ericsson Growing fast in U.S.

*Right in the heart of New York, at 100 Park Avenue, is the office of Lars Jonsteg, the man responsible for Ericsson's investor relations (IR) in the U.S. His job is to disseminate prompt and correct information about Ericsson to all interested parties in the American market.*

Since Lars Jonsteg started his assignment in the U.S. on September 1, 1990, interest in Ericsson "over there" has grown tremendously. American ownership interests in the Company have increased from 7-8 percent of capital stock to today's level of about 35 percent, which makes the United States the largest owner country outside Sweden.

The dramatic increase can be explained in part by the general upswing in the telecommunications industry. The main reason, however, is Ericsson's strategic concentration on local representation in the U.S., a strategy that is beginning to bear fruit.

"If you want to have 'active' shares in the U.S., you really must have an IR function," says Lars.

"Of course, a company might be satisfied by just listing its shares on the stock market, but then trading in the shares will be limited."

Ericsson is one of most heavily traded, international shares listed on NASDAQ, the electronic stock market.

**Spreading the word**

Lars Jonsteg's main responsibility is to spread the word about Ericsson's business operations among American investors. The objective is to attract buyers to Ericsson's ADRs (American Depositary Receipts), a type of commercial paper that represents the Company's B-series shares.

Actual information activities concerning Ericsson are not restricted to materials based on financial results. Of equal importance is the effort to try to describe the soul and vision of the large Swedish enterprise.

"I feel it is my job to provide insights into how Ericsson thinks, how we explain what we have done and what we want to do in the future," Lars says.

"The information should have the depth and breadth to enable

everyone to form an opinion of our future development potential."

In his role as the "messenger," Lars is able to draw upon his own diversified background in the Ericsson Group. In addition to serving as Information Manager of Ericsson Radio for a few years in the late 1980s, the graduate technical engineer has also worked as a marketing manager for Ericsson.

everyone to form an opinion of our future development potential."

Lars is able to draw upon his own diversified background in the Ericsson Group. In addition to serving as Information Manager of Ericsson Radio for a few years in the late 1980s, the graduate technical engineer has also worked as a marketing manager for Ericsson.

**Road shows**

In the great melting pot of the U.S., there a number of brokers who specialize in the telecommunications industry. The largest brokerage firms often invite representatives of certain industries to technical conferences.

In the late 1980s, Ericsson seldom attended or made presentations at these conferences. Today, on the other hand, a conference is never held that Ericsson does not attend.

"Whenever possible, I try to get a representative of Group Management to attend the conferences," Lars says.

**Conference calls**

Another information medium growing in popularity is the conference calls. Calls are made every three months when interim reports are issued. Investors and analysts can be connected and even ask direct questions to members of Ericsson Group management.

"Nearly 200 persons from Sweden, the rest of Europe and North America took part in the last conference call," says Lars.

"We have also tried video conferences, but they still don't work as well," he explains.

Telephone conference calls

Lars Jonsteg likes his job in New York.

"It is a very fast and flexible information job that appeals to me. I get to travel frequently and use my technical skills in the field of information," Lars concludes.

also guarantee that investors in Europe and North America get the same information at the same time.

Press releases, the distribution of annual reports and telephone contacts with normal small investors are also part of Investor Relations. Last year alone, for example, more than 20,000 copies of Ericsson's Annual Report were mailed from the New York office.

**Multifaceted**

Trading in Ericsson shares, as we mentioned, is very intensive in the U.S. Fluctuations in the share price have given rise to rumors about the whimsicality of American investors. Lars, however, does not agree with that characterization.

"No, the word whimsical is misleading," Lars says. "However, one might say there is a broad spectrum of ideas on when is the right time to sell stock and invest in something else."

"The American stock market is so gigantic and multifaceted that it would be strange if everybody always had the same opinion," the IR man says.

According to Lars, American investors are characterized by their serious nature and inquiring minds.

"When I am out talking about Ericsson, it is seldom a monologue by me, but rather a dialogue," he says. "The people I have contact with are very knowledgeable and want to learn as much as possible."

"I often am asked questions about Swedish politics in general. For this and other reasons, I read one Swedish and two American daily newspapers."

Lars Jonsteg likes his job in New York.

"It is a very fast and flexible information job that appeals to me. I get to travel frequently and use my technical skills in the field of information," Lars concludes.

MB

# Tackling projects in the 1990s

Ericsson's interpretation of Concurrent Engineering – the "megatrend" toward a method of work in which operations formerly handled sequentially are dealt with in parallel – has caused many raised eyebrows. In the mobile telephone project for Japan, the network was delivered two months ahead of schedule. In some cases, there is also talk of 100-percent increases in efficiency. But the question is whether or not Concurrent Engineering is primarily a matter of very hard, sustained work.

Although it has been promoted by various management gurus as the way to tackle projects in the 1990s, Concurrent Engineering is nothing new. Working-in-parallel has been practiced for a long time, in the automotive industry, among others. What is new and interesting about the phenomenon is how the method is applied

Not one thing at a time. Everything at once!

and the consequences it has on an organization and of motivation, etc.

"Schedules become sacred," says Thomas Axelsson, project manager for the CMS 30 mobile telephone system delivered in Japan. "We break down the various phases – design, function test, system test, etc. – into 'sub blocks' with unchangeable deadlines. What isn't ready at a deadline simply is not included."

"Concurrent engineering can be summed up as: Keep deadlines and work together."

## Working in parallel

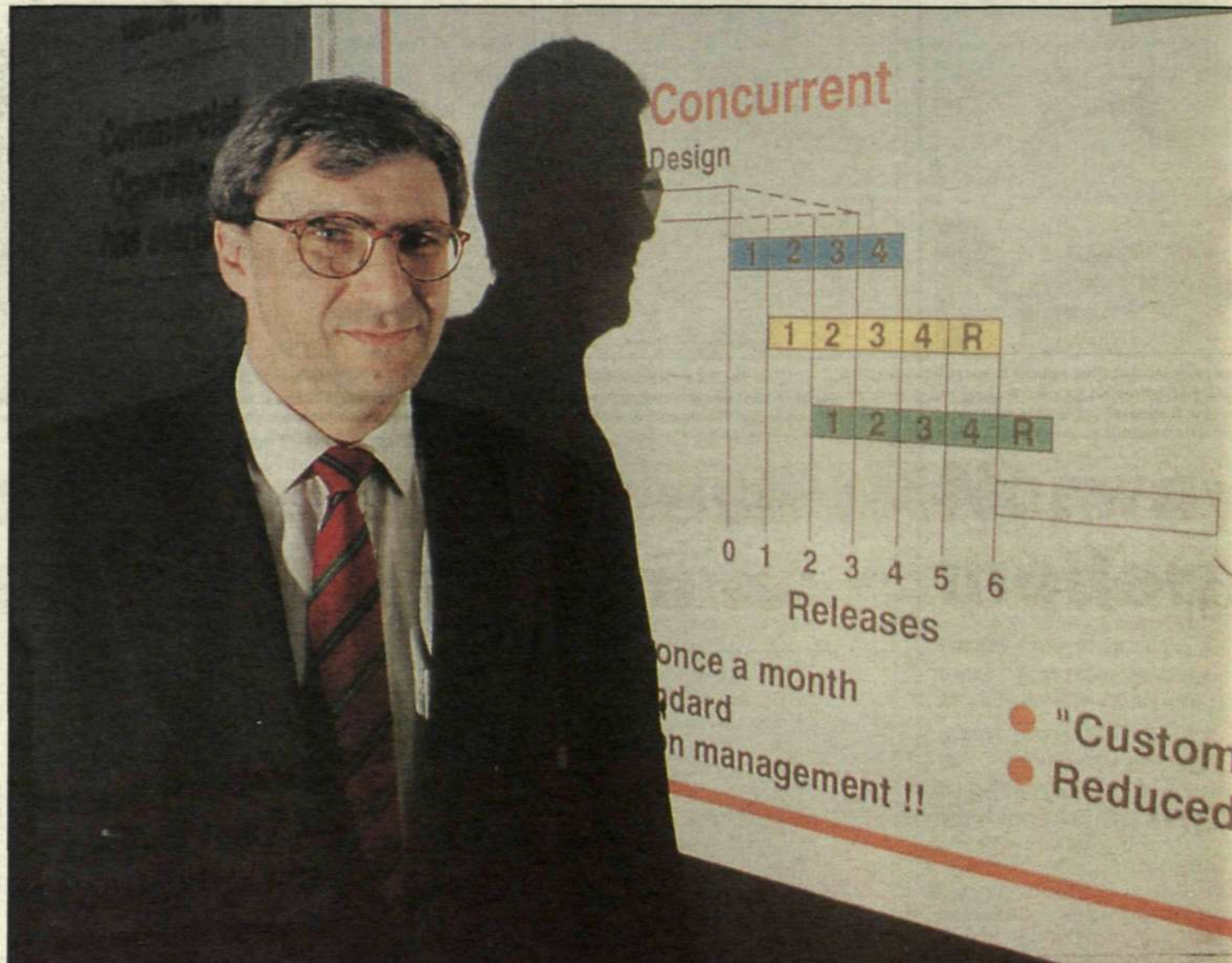
In traditional project work within Ericsson, the system design, development, function test and system test phases follow one another. When one phase is complete, the project is handed over to the next one. A delay in one phase, affects the next one, and so on down the line. As someone expressed it, "You then have a good check on how delayed you are."

In "parallel" work, the phases are divided into a number of parts: 1, 2, 3, and so forth. When part 1, which involves fundamental demands on the system, is handed over from system design to development work, system design for part 2 is begun simultaneously. When part 1 is then handed over from development work to testing, development of part 2 and system design of part 3 take place.

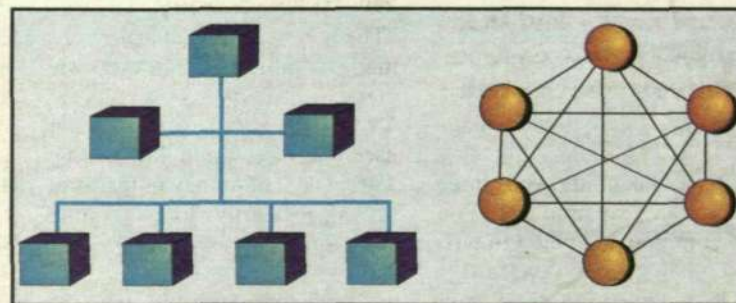
The biggest change occurs in testing. Tests of a number of functions start before the design is complete. When a number of functions have been tested, system tests can also begin.

The number of "subdeliveries" depends on the size of the project but may amount to between five and ten, with an "assembly heat" at the end.

Despite the fact that each phase of the project work takes longer than before, the



"Although individual parts of a project take longer, the total time required in the 'parallel work' method is reduced by half a year or more," says Thomas Axelsson, project manager for the Japanese mobile telephone system that, surprisingly, was delivered several months



A hierarchical organization was employed in the old work model (left), while "parallel work" (right) requires a high degree of cooperation.

total project time is reduced by as much as half a year.

## Difficult planning

Parallel work requires, first and foremost, very carefully thought-out and intensive planning. The design phase in a development project is critical and accordingly takes a relatively long time. All managers and units involved have to participate in the feasibility studies, there has to be proper staffing and the (design) content has to be correct since there is no opportunity to tack on things later on.

And it is here that the consequences of parallel work begin to be clearly apparent. The entire organization must be motivated to work hard to keep to schedules and focus on objectives. This in turn requires active leadership (the manager makes the rounds of the project, for example), continuous information (meetings every Monday morning), efficient communication between design and verification, independent thinking, etc.

"We are not interested in who may have made a mistake," says Thomas Axelsson. "The important thing is to help correct the mistake."

To create the right sense of togetherness and common responsibility, the organization cannot be too large – and people have to work in teams.

## Team spirit

The design and testing in the Japan project was handled by small teams of four to six persons. Each team, which was responsible for several functions in the project, had a leader who had participated in earlier projects, as well as both experienced and new designers.

A "forum" that included all the team leaders, the project manager and technical experts was formed to deal with emergency matters.

Coordination of the teams was important and team members tried to work "clean-room oriented," a term meaning that during the design phase there was successive verification that the teams were on the right track.

## Proper organization

It is also important to have the project office report directly to management to ensure that the relationship between the project and the line organization is clear. The project manager must be able to assume the responsibility that is required, and project management should be an "area of expertise" that can be expanded and that can preserve the knowledge gained during a project. (Otherwise one is likely to make the same mistakes in the next project.)

It is also important that project management and line managers work toward the same objectives. (A line manager general-

ly wants to fuss with a product, while the project manager wants to get it out on time.)

"One of the keys to success is being able to reuse products, processes and ideas," says Matts Norin, who was responsible for developing the software for the base stations in the project.

"We are a rather small organization, so we have to be pragmatic and solve problems in a practical way. We take what we think has worked well in other Ericsson projects – the GSM project, for example – and try to refine it. We have to take the risk that we may also be getting something that is not so good."

"We are also influenced to a high degree by monitoring what is happening in the outside world. We then focus on what is simple for us to introduce in our project, not on what seems to offer a tremendous boost. "Here, we call that 'doing just enough.'"

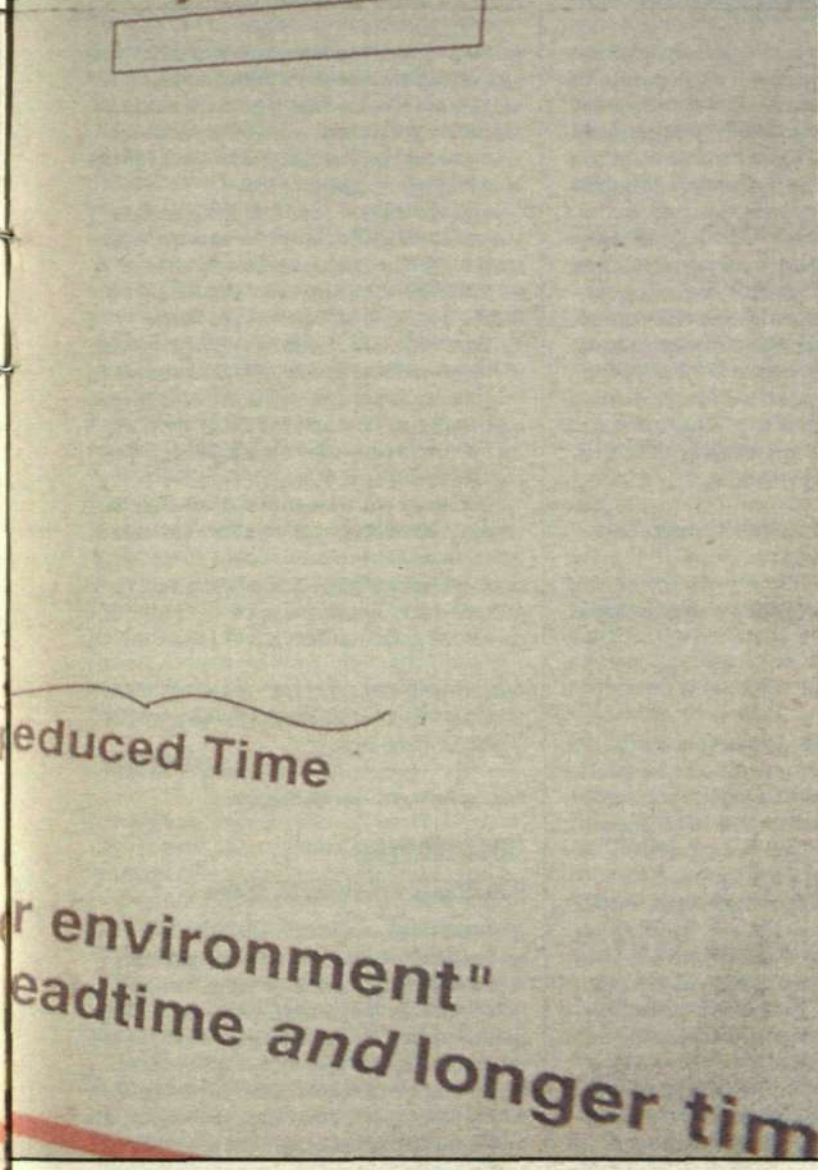
## No easy recipe

"Many people have asked us to put what we do in writing," Thomas Axelsson says, "but this approach is not simple, and not something you can find in a methods handbook. Here, you have to think independently – interpret the method very freely – or else you will wind up in a trap."

Then one may ask why the method worked so well in the Japan project in particular. There really isn't any answer to that question. But the important thing seems to be that everyone knew what the objective was, and that everyone was determined to meet it.

The method is now also being used in three new Japan projects.

Lars Coderquist



ahead of schedule. But 'concurrent engineering' is difficult; it requires a positive attitude toward change, high motivation and an extremely

## Customers posing tougher demands

"You can always trim five percent off schedules but radical measures are required when it's a matter of drastically reducing development time," says Stellan Nennerfeldt, manager of operations development in the Radio Communications Business Area.

But necessity is the mother of invention and the "impossible" projects in Germany and Japan proved to be do-able.

The deregulated market in which new operators are competing is imposing increasingly tough demands on suppliers. The operators, who are making very large basic investments for rights to use frequencies, and for other purposes, have to start up their networks quickly and be able to attract subscribers by offering proper coverage and services.

"The pressure on suppliers – to develop and produce the

right systems faster and on tight schedules – is here to stay," Stellan Nennerfeldt says.

## Clear objectives

The objectives in the both the GSM project in Germany and the PDC digital mobile telephone system in Japan were clear. A specific amount of system equipment had to be delivered by a specific date.

Time thus had the highest priority. And so, indirectly, did productivity and quality. There simply wasn't time to do things twice.

## Same demands

"These concepts had their origin in the base station project for GSM and have since been used in a number of mobile telephone projects," Stellan Nennerfeldt notes. "But all operations will face the same demands and we are trying to promote the basic principles throughout Ericsson, in part by including sections in management training programs for project managers and line managers."

## GENERAL MEETING APRIL 25

All who work with user interfaces are invited to attend a full-day seminar in Kista on April 25. The meeting will be held in the NCC Building, Nordic Forum, Torshamnsgatan 35. Outside researchers and Ericsson employees who have worked

with the Delta method will discuss developments in the increasingly important "user interface" field. Interested? Contact Yvonne Törjék, +46-8 719 9169, memo TSAC.EINYTO.



"Working with outside researchers, we will create better user interfaces," says Yvonne Törjék, who is now building an interdisciplinary network for all users within Ericsson. Photo: Anders Anjou

## The network that 'clarifies' software

"I want to be the spokesperson between designers and users," says Yvonne Törjék, who has been assigned to build up an internal network for all employees who are affected by user interfaces. Today, there is too great a gap between the designer of a tool and the person who has to use it. The focus should, indeed, be on the customer – and the customer in this case is the person who uses the system.

You have been allowed three hours for an academic test. You grasp your pen and begin to write, and then become aware that you are really not familiar with the new-model pen. You press here, twist there. But it takes 25 minutes before you figure out how the pen works. You begin to write – and then all the ink sud-

## New approach to user interfaces

Ericsson Infocom Consultants, in cooperation with Linköping University, has developed the "Delta method," a structured approach to the production of user interfaces based on users' needs.

The new method, which employs concepts derived from "Usability Engineering," is based on close cooperation between system developers, technical information personnel, users and customers.

denly gushes out on your paper. You start over, slightly sweaty and stressed by this time.

Yvonne Törjék thinks that's roughly what happens with a lot of computer tools. Yvonne, a psychologist who holds a doctorate in education and who has done research on systems, is now employed at Ericsson Infocom Consultants, working to improve interfaces for users.

Her surveys have shown frightening "loose connections" between designers and users.

## Worth the money

"The investments that have to be made in simplified interfaces are certainly worth the money," Yvonne Törjék declares. "Poor user interfaces are today costing a great deal of money in the form of unnecessarily long training and inefficient use of systems."

A user who doesn't understand what his tools can do, and who can't get help from manuals and other sources in a reasonable amount of time, simply abandons the tool and solves problems in another manner.

## Definitions used in the Delta method

A "user interface" is what the average user encounters when he or she works with a system. In the Delta method it is defined to include:

- Services that the system offers the user
- The specific configuration of the services on the terminal screen
- The supplementary information that is required: instructions, sample texts, training, etc.

"It must be better if the designer, at an early stage, asks who is going to use the system. Products have to be adapted to the knowledge and needs of users. A product may work well in tests, but how will it perform when it is delivered?"

One may question whether the same interface that is provided for Japanese users should also be supplied to Mexicans, for example. What kind of background knowledge do the users have?

## Network

The network will enable users to consult and help each other. A meeting of all parties with an interest in interfaces will be held at the end of April. The primary purpose is to identify who within Ericsson works with user interfaces and then help managers understand the importance of a good interface.

A network will then be built. The key problems will be to determine how people should communicate with each other and how the various users should be divided into appropriate areas.

# 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, contact Birgitta Michels at Ericsson Events, HF/LME/A. Phone +46 871928 14.

## INTERNATIONAL

Ericsson Communications Ltd, Montreal, Canada

### FOUR SYSTEM ENGINEERS/ SPECIALISTS

Requirements: Extensive MTS and HRS (Home Location Register Subsystem) knowledge with emphasis on network functions and interfaces. Good APT knowledge. Good organizational skills. Must have good communication and negotiation skills. Must possess Leadership skills. Availability to travel. Job description: Perform technical investigations and prestudies. Support project during feasibility study and development. Participate and/or support standardization activities. Perform and participate in long term network system development plans.

Contact: Vi Nguyen, Memo LMCVUNG.

Ericsson (China) Company Limited, China

### SYSTEM SUPPORT ENGINEERS

The Telecommunications China market is dynamic and growing fast. The customers needs are changing. The demand

for digit systems, mainly GSM, is urgent. Ericsson's history in China has been primarily in analogue mobile systems (TACS). Our challenge is to meet these urgent demands in the shortest possible time as comes GSM now too. In order to meet this challenge we need committed and motivated people with GSM experience.

Two or more years of well documented experience in at least one of the areas above, strong background in GSM, ability to take initiative and find creative solutions, good communications skills, good command of English, the commitment and ability to train and develop local staff. Experience as a manager or project leader would be a valuable asset. Long term assignment will be available for both single or married candidates. Positions are based on a number of different locations within China and you must be prepared to travel.

Contact: Magnus Ask, 08-7197481, Memo LMEMASK or Henk Werkman, +86-1-5051190m ETCHEWE. Appl. to KJ/ERA/LDH Hans Falk, 08-7571402, ERAHFA.

Ericsson Taiwan Ltd, Taipei, Taiwan

### CMS88 AMPS SUPPORT EXPERT

Due to the rapid expansion of the local AMPS activities, along with other exciting mobile telephony forecasting, Field Support Center of Ericsson Taiwan current has an opening for CMS8800 system support engineer. Our AMPS (AS26) System consisting 1 HLR, 8 MSC and 4 Memory Modules. The APZs will soon be upgraded to APZ 212 10 R2, while CNA 11 will be implemented in the same project. The 600K subscribers' market, as well as the on-going S/W & H/W upgrades, present the great and noticeable challenge for the support. Main Job tasks: Trouble shooting and report handling, Implementation of ASM packages such as ECA, ACA, CNA and new AS's for MSC and HLR in service, participate in 24 hour emergency support team, transfer the knowledge to local trouble shooter. The position is for an initial period of one year with the possibility of extensions.

Experience: Minimum 3-4 years experience of working in System support environment at ESO or FSC as system expert, Very good knowledge of Mobile application, preferably CMS88, proven ability to deal with and correct S/W fault and ability to work in emergency situation and remain calm and to create good customer relation. Good capability in spoken and written english required, knowing the Chinese language is a plus but not a must.

Contact: Alex Kuang, +8862 7461759, Memo ECOM.ERTA-KU or Harald Nabsseth, +468 7571426, ERA.ERAHANA. Appl. to KJ/ERA/AH Karin Enberg, ERA.ERAKEG.

Ericsson Communications Inc., Mississauga, Canada

### PRODUCT MANAGEMENT - CELLULAR SYSTEMS/PCS

We are currently searching for candidates with Technical education at the University level, 4 - 7 years experience with cellular systems, broad technical switching, OSS or radio competence within CME20 or CMS 40. Candidates should also have a commercial background and interest, and possess experience in offers and contract negotiations, good company knowledge and good presentation and negotiation skills are requirements of these positions. You will be involved in support in the tender/bid process, provide technical and regulatory expertise, Co-ordination of product and network related issues for new and existing customers, represent the Company when required, for establishing and maintaining customer relations, detect product requirements, communicate and impact product offerings through the product management process and co-ordinate with all other departments and business units relative to products and service for new and existing PCS customers.

Contact: Barbara Lloyd, (905) 629-6792 phone (905) 629-6701 fax Memo EBCBALL.

Ericsson Ltd., Product and System Management, Burgess Hill, UK

### JOB VACANCIES

A significant number of genuine vacancies exist for the right individuals that are prepared to support our commitment for advancement in our early development phases....contributing to technology like , Intelligent Networks , ISUP , Broad and Narrow Band signalling....our Product and System Management provides leading edge involvement in elements of Requirements Management, formal specification, Network Analysis, Studies and Modelling, Product Planning, System Analysis, coordination, Modelling and Characterisation, Configuration Management. With a highly ambitious strategic intent , considerable investment is being applied to evolve our processes supporting the definition stages of our life cycles.

This leads us to seek professionals with a number of years in industrial / academic placings relative to telecommunications and computing / systems integration.

Contact: Paul Langley, +44 444234838, Memo ETLPDLY.

Ericsson AS, Norway

### SUPPORT ENGINEERS - SMAS/IN SCRIPTS

After Sales Support (A/F) is a department in division tele-net at ETO. We are working with Customer Support of AXE (GSM, NMT, ISDN, IN) and TMOS systems on the Norwegian market. ETO is now building up our competence on UPT and IN service design for the global market. In parallel we are building up a team to strengthen our support on IN and IN-scripts against our customer. Roles/Duties will be: Test, Implementation support, Customer Support and running Customer projects.

You have experience from IN or SMAS service design, from AXE and/or general telecommunication, from working in or managing projects. You are service minded and have good communications skills, are able to cooperate easily both within the company as well as with customers.

Contact: Anne Torunn Hvideberg, +47 3705 1784, Memo ETO.ETOATH or Steinar Strömsvåg, +47 3705 1787, Memo ETO.ETOSTST

Business Area Radio Communications, Kista

### BR-MANAGER AND VICE PRESIDENT TO POLAND

With over 40 million inhabitants and the fastest growing economy in Europe, Poland offers a very interesting business potential. Ericsson is well established through a local company, employing 70 employees. The BR business is increasing rapidly with successes in the area of EDACS, Mobitex and NMT450 radiobases. One of the most exciting business ahead of us is GSM, and licences are expected to be issued in the very near future. We are now looking for a manager who will assume the challenge of coordinating and developing all our expanding BR activities in Poland. You will be responsible for marketing, sales, operations etc for BR, with the rank of vice president.

It's important that you have a managerial experience and a large network of contacts within Business Area Radio Communications. As the assignment involves political lobbying on high levels, such experience is very valued. You will be stationed in Warsaw and report to the President of the Ericsson company in Poland.

Contact: Mats Arnamo, 08-7573366, Memo ERAMAMO, Göran Ulmer, 08-7571804, ERAGUV, Urban Casteheim, 08-7573304, RSAUCM, Ulf Borison, 08-7571580, ECSUBN or Katarina Ljunggren, personnel, ERAKLJ.

Ascom Hasler, Berne, Switzerland

### AXE DESIGN & MAINTENANCE

ASCOS is a leading international telecommunications company with headquarters in Berne, Switzerland. Since the mid-80's, Ascom worked closely together with Ericsson on AXE, TMOS and BB activities. In mid-95 our part of Ascom will, together with Ericsson, form Ericsson Ascom Telecom AG with Ericsson as majority shareholder.

In the AXE design unit we are looking for 4 people to work on MAINTENANCE and DESIGN of our market design products. Our in-service application systems are based on FMP1 and FMP3, with a large market content in SSS and SCS. We are currently working on a market Generic Functional Protocol project to add on to FMP3 and our next projects will add further services (eg. CCBS and core INAP).

For the 2 senior posts we would expect degree level education and 5 years AXE experience in design and/or test. The maintenance position needs proven ability to analyse and solve complex faults.

For the design position experience of block design, function design and feasibility study are needed. Experience in ISDN is essential for both senior positions. For the 2 junior posts we would expect degree level education and 2 years AXE experience in design and/or test, as well as (for the maintenance position) familiarity with MHS-TR and MHS-CH.

Contact: Paul Hulbert, (Maint.) +41 31 9991095, Memo EXTR.XHAPAHU, or Christoph Guedel, (Design), +41 31 9991306, EXTR.XHAGUED.

Ericsson Ascom Telecom AG, Switzerland

### OPERATIONAL PRODUCT MANAGER, ISDN

We are expanding our organisation unit (SFDR). We have 8 open positions for Operational Product Managers at present. We need experts in all fixed switching areas, i.e. ISDN, IN Business Communication and also overall experts (generalists). Tasks and responsibilities: write Requirement specifications based on input from our customers, keep track on design and possible deviations from desired functionality, (re)negotiate new and changed requirements, keep track on all influences that changes have on our customers network, help our customer plan his network (technically), represent our company position in technical working parties where our competitors and customer are represented, help define critical test cases and the relevant test environment needed, help solve critical problems (trouble reports) where requirements are impacted, follow standardisation body activities (ETSI, ITU-T), help find technical solutions for difficult problems, support our marketing in technical matters (studies, concepts, offers...)

Knowledge & experience: AXE on system expert level, signalling related standards (DSS1 and/or ISUP or INAP), ISDN supplementary services, Core Functions and competent negotiator capabilities.

Contact: Beat Affentranger, +41 31 9991557, Memo EXTR.XHABAF.

Ericsson AS, Billingstadsletta, Norway

### DATA COMMUNICATIONS METHODS AND PROCESSES SENIOR LEVEL POSITION

The Datacom section ETO/X/D/F at ERICSSON AS, OSLO Norway, are designing subsystems for data communication in the fixed and mobile public networks ISDN, GSM, PCS1900, PDC and D-AMPS, (CME20, CMS40, CMS30, CMS88 and APT 210 12) We need an innovative person with lots of initiative and good human skills to join the development teams to lead structured improvement projects.

Experience from telecommunications, system design, AXE10 methods, Medax, SDL, 'C' and 'C++' and general ERICSSON training and practice is a plus.

Contact: Espen Skare, +47 66841370, Memo ETOES.

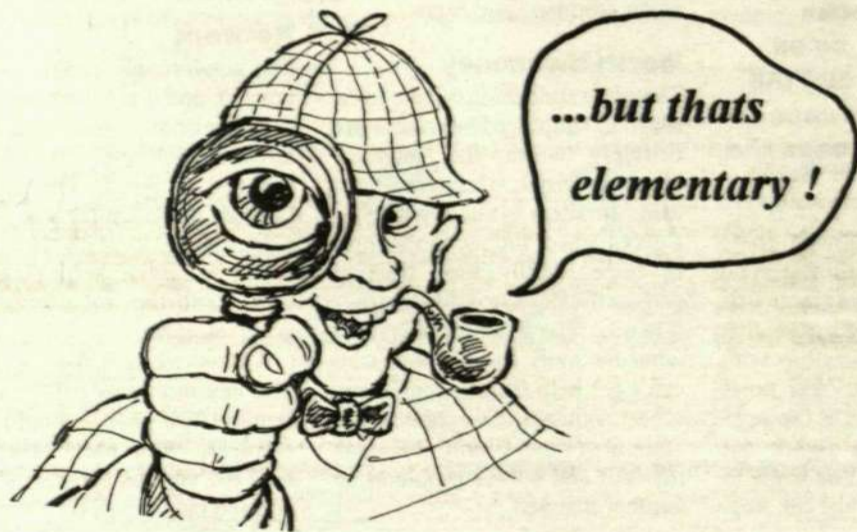
Ericsson Radio Systems AB, Kista

### CELL PLANNER FOR LONG TERM CONTRACT IN THE PHILIPPINES

We're looking for a cell planner for a long term contract in Manila, Philippines. The main part of the job is planning and tuning the fast growing TACS network which today has about 50000 subscribers mainly in the Manila area. The job will also include market support for GSM 900 and DCS 1800 systems.

You should have experience from cell planning, good knowledge of cellular systems, good written and oral skills in English, ability to build and maintain good customer relations and to work independently.

## How to trace semiconductors ?



We specialise in locating hard-to-find items with fast delivery through our world wide supplier network.

We have a large stock of semiconductors (logic, linear, memories etc.) with all of the major brands represented. Discrete semiconductors are also stocked.

We are one of scandinavia's largest suppliers of PC-supplies, such as simms, CPUs, HD-drives and multi-media. We are...

**ROTAKORN AB**  
elektronikmäklarna

Tel. +46-120 130 40

Fax +46-120 131 11

Start of contract is "at the soonest" and last day for application is 29 March 1995.

**Contact:** Nils Torstensson, +46 8 7572639, Memo ERANIT or Jan Lönnström, +46 8 7573314, ERAJAL.

**Ericsson Ltd, Guildford, England**

**CUSTOMER SUPPORT ENGINEER**

**Reference:** EX422. **Purpose:** The purpose of this position within Field Support is the ongoing improvement of the customers equipment by answering trouble reports and providing solutions to problems within contractual deadlines.

**Training:** The following are required: Basic Telephony / AXE Introduction / AXE Installation Testing 1 and 2 / CMS8800 Survey II / CME20 Survey The following or equivalent are desirable: CME20 BSC O&M / CME20 MSC O&M OPS O&M / Extended fault finding / Stoppage course Qualifications: HNC/HND in a maths/computing subject or equivalent Experience: A minimum or 5 years relevant experience working in the Telecoms/computing industry where at least 3 years have been with Ericsson. Should also be experienced in the running of the AXE and be familiar with operational and maintenance procedures.

**Personal skills:** A thorough and methodical approach to work Good analytical abilities Able to work as a team member Commitment to the improving of Ericsson methods Good communicator of ideas and solutions Be able to work unsupervised for periods of time Perseverance in tracking and proving the existence of faults Having a cooperative and conscientious approach Be flexible to changing work patterns and demands

**Contact:** Jo Howat, +44 483 303666, Memo ETL.ETLJOHT.

**Ericsson Communications Ltd, New Zealand**

**CMS88 DT ENGINEER**

for a long term assignment with the possibility of future local employment. ENZ is supporting a CMS88-D network, and require the services of a data engineer. The network consists of CMS88-D MSC's, a HLR/SCP, a SMAS node and a AOM. Up and coming network expansions include CMOS, MXE and regular network package upgrades.

With a reduction in our customers DT production staff we are taking an active roll in CT production and have the goal of eventually producing all DT for the NZ CMS88 network.

**Qualifications:** 2 or more years experience with the production of AXE data is a minimum requirement. Involvement with CMS88 or other mobile networks is desirable. The successful candidate will take an active role in DT production and implementation in the live network and work closely with our commissioning and testing staff as well as with our customers DT Management group.

**Contact:** John Van Dalen, +64 4 389-0083, Memo ECOM.ENZ/VD, Fax +64 4 389-0098 or Diane Bridgeman +64 4 389-0014, ECOM.ENZDMB.

**Ericsson Telecommunications Pte Ltd., Malaysia**

**MARKETING MANAGER**

Malaysia is today the most liberalized telecommunications market in Asia. Nine (9) network operators have got licences to operate cellular and/or fixed networks in the country. The new players on the Malaysia market emphasize introduction of modern technologies, fast deployment of services and quick response to requests. The amount of business opportunities is big and keep increasing. This is why we, ENO Singapore, need to place a SENIOR MARKETING MANAGER in Malaysia, with broad telecommunications background. The position requires the ability to commercial market and conceptually motivate different complete network solutions.

We expect the applicant to have good commercial sense, a broad technical understanding and good communications skills. Good co-operation with existing account managers is key to good achievements.

**Contact:** Petri Marikkanen, +65 350 1593, Memo ENOPM or Chua C.L., +65 350 1560, ENOCCL.

**Ericsson Telecomunicazioni, Roma, Italy**

**GSM TESTERS FOR MSC AND BSC**

We are expanding the GSM network in Italy and Greece supplying both MSC and BSC and need to increase our potentiality. Main tasks of the job will be to perform internal verification and acceptance test of new releases with our customer, contribute to write test specificatin/instructions for acceptance test with customer of new functionalities including market corrections, execute first implementation on the field in Italy and/or Greece of the new releases, including trouble shooting.

The ideal candidates for these positions should have university degree in electronics, 3-4 years of experience within telecommunication equipment industry (2-3 years on

cellular product, switching side MSC or BSC in AXE testing), good knowledge on CME 201. Some experience in R5 will be appreciated. Good knowledge of AXE testing methodology including MHS and use of protocol analyzer, good knowledge of Common Channel Signalling N.7 (ISUP, TUP, ITUP) and Associated Channel Signalling (R2, CAS-4) for the position related to the MSC. Good knowledge of the A and A-bis interfaces, O&M of BTS's STS and TAS subsystems for the position of the BSC. Contract will start in May and duration is 9-12 months. Contract will start in May and duration is 9-12 month. Business trips within Italy and to Greece are possible.

**Contact:** Nazzareno Fattori, Memo EITA.TEIFAT, Marco Silvestri, EITA.TEISIL or Andrea Penza, EITA.TEIAND.

**Ericsson Ltd, Burgess Hill, England**

**TEST LEADER, PRODUCT PROVISIONING, MOBILE**

Ericsson Limited has recently achieved significant new business with a major cellular operator in the UK for GSM equipment. To support this, a new business sector has been established.

We are currently looking for CME 20 expertise to work in our newly established Product Provisioning Department. Key activities are Interface and Software verification, Customer technical support and Switch intergration.

You should have minimum 4 years testing/support experience, GSM experience, proven ability to solve complex technical problems and to work on own initiative and good general level of business awareness. Our customer demands technical excellence and quality. In return for your hard work and devotion we can offer you the chance to work as part of one of the world's most exciting and fast moving telecommunications markets. You will be based in Sussex, although a certain amount of travelling would be expected.

**Contact:** Alastair Swaffer, +44 1444 234184, Memo ETL.ETLMASR or Lars Ostman, +44 1444 231719, ETL.ETLSON.

**Ericsson Telecommunicatie BV, The Netherlands**

**NMT SYSTEM SUPPORT**

2 open positions exists for NMT System Support Experts at our FSC here at ETM in Rijen.(long and/or short term) Our FSC is responsible for the Dutch PTT, the network is about 200.000 subscribers and is still growing. The departments consists of local and expatriots staff and is handling all Mobile products Ericsson is selling. We are looking for people with the following experience:

- Previous experience of working in System support environment ESO FSC F50 or Design as System Expert.
- Proven ability to deal with and correct software faults.
- Good communication skills and ability to deal with the customer in a manner which is satisfactory to the customer.
- Very good knowledge of NMT 450/900
- Experience of trouble shooting and fault finding in NMT

**Contact:** Adrie v. Rijsbergen +31 1612 29489, MEMO ETM.ETMAVRI or Hans Oudhoff +31 1612 29802 ETM.ETMHAOU.

**Ericsson A/S, Norway**

**AXE SUPPORT ENGINEER**

After Sales Support (A/F) is a department in division telenett at ETO. WE are working with Customer Support of AXE (ISDN, IN) as well as ASV for deliveries of new systems to the Norwegian market. Currently the system base in the Norwegian network is 12.2, we are now introducing 12.3, and we will be FOA for FMP4. With focus on Customer Services, our department will in the next years have a central role in communication and business towards our Customers. We are located in beautiful surroundings at Hisøy near Arendal.

We are now looking for people interested in working as "AXE SUPPORT ENGINEERS", and are looking for YOU: - With experience from ASV, TR-Shooting, Field Support. - With 4-5 years of work experience, test/support. - Who are service minded and have good communication skills. - Who are able to cooperate easily both within the company as well as with Customers.

Roles/Duties will be: ASV test and deliveries, Customer Support and Customer Follow up, AC-A packages and TR-handling, Technical support to our customer.

**Contact:** Roar Walderhaug, +47 3705 1599, Memo ETO.ETORWor Bjørne Trøvig, +47 3705 1724, ETO.ETOBT.

**Ericsson Australia Pty. Ltd. Melbourne**

**HARDWARE PRODUCT SUPPORT ENGINEER**

Ericsson Australia (EPA) is searching for a suitably qualified Hardware Product Support Engineer to service its major customer - Telecom Australia. EPA is looking for an experienced engineer willing to move to Australia on local conditions, hopefully with the intent of becoming a permanent resident (this is not a short or long term contracting position). This challenging role will suit an engineer with AXE and hardware debug skills who enjoys learning and self development through practical participation. There will be opportunities for interstate travel within Australia and establishing close customer relationships.

**KEY RESPONSIBILITIES INCLUDE:** - Representing Ericsson in customer discussions and support activities. - AXE Hardware trouble shooting. - Trouble report handling. - Performing hardware design modifications.

**PREREQUISITES:** - A degree qualification in electronic engineering or similar discipline (at least 5 years AXE hardware experience would also suffice). - Practical AXE System knowledge. - Experience in analogue and digital circuit analysis design. - Familiarity with software programming techniques. - Must have excellent English communication skills. - Must have a strong customer focus.

**IT WOULD BE ADVANTAGEOUS TO POSSESS:** - Hardware CAD experience. - Experience with VMS, RSX-11 (and UNIX)

Operating Systems. - AXE installation experience. - PC skills : Database, Excel, C, SYBASE. - Knowledge of Testability requirements.

Applicants must meet the minimum listed prerequisites. Closing date for applications is 20th March 1995.

**Contact:** Nola Newton, Memo EPANAN, Fax +61 3 301 4300.

**ASCOM Public Switching Division, Berne, Switzerland**

Our product informatic services department is looking for a person to join an established IT/DS group. IT/DS Person: Job Scope: member of a group with responsibilities for: - local SW-tools installation, configuration, user support and training (eg. APStools, APS3, PRODA, RELAX, etc.) - coordination towards remote system / SW-tool owners at ETX/EDT regarding local support and training - various local IT tasks as necessary Prerequisites: 5+ years general IT experience with 2+ years technical UNIX; degree / diploma with informatic content; good written and spoken English; good communication skills. Advantageous would be; IBM(VM/CMS) experience; database experience; AXE design/test environment knowledge.

**Further information** is available on request (reference 'SFDI3') from: Douglas Miles / Design Support Group, Tel.: +41-31-9993967 or Malcolm Sturdy, Memo EXTR.XHAS-TUR.

**Ericsson Inc., RTP, North Carolina, USA**

**SENIOR SYSTEMS ENGINEER**

Provide packaged wireless data communication solutions to the field sales force in response to marketplace opportunities and associated revenue projections. these solutions may be part of an initial voice system sale or as a follow-on implementation to an existing voice system, and will consist of both Ericsson and third-party products. The successful candidate must interact effectively with field sales force personnel, third-party suppliers, customer decision makers, and miscellaneous Ericsson personnel on marketing, technical sales, and project issues. Essential functions: Solution development, Consulting, Communications and in general be alert and responsive to overall business needs, be flexible and able to function as both a team leader and a member. Secondary functions are vendor support, product certification and test lab management.

BS degree in computer science or electrical engineering with data communication, programming or telecommunications emphasis or equivalent, advanced degree preferred, minimum five to ten years of applicable experience, sales/marketing experience, working directly with customers, demonstrated proficiency in the design and engineering of complex data systems, excellent interpersonal skills and the demonstrated ability to effectively foster team building with and beyond his/hor work groupm, will possess shared values of professionalism, respect and perseverance.

**Contact:** Mikki Winn, fax +1 804 528 7403.

*Welcome to Ericsson Eurolab Deutschland!*

**MTS Expert**

Ericsson Eurolab Deutschland is our young international research and development centre located in Herzogenrath, near Aachen, Germany. Our Switching Serction within the Mobile Network Department is responsible for the MTS subsystem and the software development and design for CME20 SS & CME40 SS. Furthermore we have the responsibility for the cooperation and coordination of the MTS design centres in Aachen, Paris, Athens and Dallas. We are looking for a MTS EXPERT, Expatriate basis.

As a suitable MTS Expert candidate, you have deep knowledge of Mobile Telphony Systems (MTS), telecommunications, relevant specifications (e.g. ETSI, CCITT), mobile systems (e.g. GSM, NMT, TACS) and the actual implementation in AXE. The MTS areas "Radio Interface", "Basic Call Handling", "Supplementary Services", "VLR Database", "MAP" and "Interface to other subsystems (e.g. TSS, TCS, CHS, STS)" are of special interest.

All candidates should be Ericsson employees, have a minimum of 5 years appropriate MTS knowledge and experience in working in projects. You should be open minded, self motivated and team oriented and have good communication skills as well as good ability to work under pressure.

**Contact:** Hans-Georg Lilge, Director Human Resources  
Memo-ID: eed.eedhgl  
Jyri Andersson, Section Manager Mobile,  
eed.eedjaa

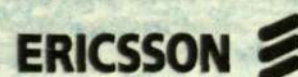
**IN Expert**

Our intelligent Network (IN) design group within the Fixed Network Department is participating in standard AXE 10 design projects for intelligent network platforms. Furthermore, our operational unit secures design resources for future IN market projects related to the German market. We are looking for an INTELLIGENT NETWORK SENIOR SOFTWARE DESIGNER on Expatriate basis.

You areas of responsibility will be within the software development for IN. As an IN expert, you have a sound knowledge of the Service Provisioning Subsystem (SES), relevant specifications (e.g. ETSI, ITU) and Ericsson's IN concept in general. Your are familiar with the Service Switching function (SSF) and the Intelligent Network Application Protocol (INAP).

As a candidate you should meed the MCOO/MKY requirements of a Senior Software Designer. You should be open-minded, self-motivated and team oriented and have good communication skills as well as a good ability to work under pressure.

**Contact:** Hans-Georg Lilge, Director Human Resources  
Memo-ID: eed.eedhgl  
Ralf Meier, Group Manager, IN  
eed.eedram



Please address your application to: Ericsson Eurolab Deutschland GmbH, Human Resources, Ericsson Allee 1, D-52134 Herzogenrath

**BUSINESS AREA RADIO COMMUNICATIONS**

Ericsson Corporatia AO (ECR) is the recently established local company in the Ericsson group located in Moscow, Russia. ECR is responsible for all Ericsson market activities in Russia. Already many contracts have been signed for cellular systems (NMT, AMPS/D-AMPS, GSM) as well as trunked mobile radio systems (EDACS). The company expects major growth in 1995. In addition to that a number of joint ventures are foreseen in the areas of training, research and development, software and consultancy. To build up the company we are seeking dedicated and energetic colleagues, to be placed as expatriates on short- or long term contracts. Your main task will be the hiring and training of local employees, and organise the contacts necessary with both the home organisation as well as the customers in Russia. Applicants should have at least 5 years experience in Ericsson, preferable in the area of radio communications. You must be fluent in English and willing to learn Russian. Management experience and working experience from Russia are of value.

**Manager Marketing and Sale**

The manager of this department is responsible for the local marketing, the budgets, the forecasts and the reports of its

employees. As manager you have a special task in hiring and training the local staff and establishing the working and administrative routines. You are responsible for the contacts, and reporting to the business unit managers within the business area. You are personally involved in key-customer contracts. A marketing background is necessary, as well as previous management experience in Ericsson.

**Sales/account Managers**

**Tasks and Responsibilities:** Management of selected accounts. Building long-term customer relations. Offers, contracts and projects follow-up to the accounts. Sales, budgets and forecasts to the selected accounts. Sales of products, systems and services of Ericsson.

**Knowledge and Experience:** Experience with commercial work in Ericsson. General technical training on Radio products (NMT, GSM AMPS/D-AMPS, AXE) Contact persons: Eric Franke, Hans Jeborn, Michael Kühner.

**Manager Product Management**

The manager of this department is responsible for the local product management, the budgets, the forecasts and the reports of its employees. As manager you have a special task in hiring and training the local staff and establishing the working and administrative routines. You are responsi-

ble for the contacts, and reporting to the business unit managers within the business area. You are personally involved in key-customer contracts.

**Local Product Managers**

**Tasks and responsibilities:** Technical support for RMOG and RMOA products. Support Account Manager and their customers on technical issues. Technical contents in offers, contracts and project operation. Coordination with Account Management and Market Operations. Coordination with RMOG or RMOA Product management. Technical presentations and seminars.

**Knowledge and Experience:** Experience with product management work in Ericsson. Detailed technical training on CMS products and radio communications. Technical education (M. Sc. or equivalent) Contact persons: Eric Franke, Hans Jeborn, Michael Kühner

**Manager Operations**

The manager of this department is responsible for the local operations, the budgets, the forecasts and the reports of its employees. As manager you have a special task in hiring and training the local staff and establishing the working and administrative routines. You are responsible for the contacts, and reporting to the business unit managers within

the business area. You are personally involved in key-customer contracts. A project management background is necessary, as well as previous management experience in Ericsson.

**Operation Support Managers**

**Task and Responsibilities:** Project Management of RMOG and RMOA projects. Secure, hire and train local competent Operations personnel. Local support activities toward the global RMOG or RMOA support organisation. Coordination with Account Management and Product Management. Establish reporting routines. Operation budget and forecast. Resource planning.

**Knowledge and Experience:** Experience with project management work in Ericsson. Detailed technical training on CMS products and radio communication Contact persons: Eric Franke, Hans Jeborn, Arne Palmkvist

**Market Communications**

This position is a short term contract.

**Tasks and Responsibilities:** Internal and external market communications. Press and media contacts in Russia. Advice on Ericsson identity and style. Organise events. Hire and train local employee(s) for Market communications. Sales, budgets and forecasts to the selected accounts.

## ERICSSON RADIO SYSTEMS AB CHALLENGING OPPORTUNITIES WITHIN RMOA SYSTEMS ENGINEERING

*Ericsson's 75,000 employees are active in more than 100 countries.*

*Their combined expertise in switching, radio and networking makes Ericsson a world leader in telecommunications.*

**CELLULAR SYSTEMS – AMERICAN STANDARDS**

*Business Unit Cellular systems – American Standards is the market leader in providing products and services based on Cellular Systems – American Standards (AMPS/D-AMPS). Today, over 10 millions subscribers worldwide rely on our AMPS/D-AMPS cellular systems. We are working with the development, sale, and provisioning of products and services to carriers providing wireless services. Our organization consist of nearly 4000 employees based both in Sweden and around the world, with market activities concentrated in North America, Latin America, Asia, Australia, New Zealand and the former Soviet Union. Sales and Market Operations is responsible for the activities that generate the Business Unit's sales as well as logistics, implementation and customer services. We are based in Stockholm and our organization provides global market support, technical sales support and direct sales for existing cellular products as well as Personal Communications Services (PCS) and Fixed Cellular applications. We are working in close cooperation with local Ericsson Companies all over the world.*

*As we are now strengthening our customer support activity within RMOA Kista, we need a number of new team players willing to participate in our*

*exciting and developing activities.*

*At the unit for Systems Engineering Headed by Jan H. Lindqvist we work with the planning, dimensioning, specification and documentation of our mobile telephone systems AMPS/D-AMPS to be delivered to our customers worldwide. We need the following persons to reinforce our team in SYSTEMS ENGINEERING*

**RADIO NETWORK ENGINEERING****Manager for Radio Network Engineering and Radio Network Planners**

You will make radio network design, which includes traffic planning, cellular planning, coverage predictions and frequency planning. The work is done in close cooperation with marketing managers, project leaders and customers.

Contact person: Bo Berglund, phone 08-757 37 06, MemoID ERA. ERABBD.

**Radio Network Optimizing**

You will take measurements and statistics on running mobile telephone systems and suggest improvements to optimize the performance of the system.

Contact person: Bo Berglund, phone 08-757 37 06, MemoID ERA. ERABBD.

**Radio Site Engineering**

You will work with construction design of Radio Base Stations in customer projects. The work involves contacts with customers and other Ericsson subsidiaries.

Contact person: Bo Berglund, phone: 08-757 37 06, MemoID ERA. ERABBD.

**NETWORK ENGINEERING**

Manager for Network Engineering and Exchange Network planners. You will work with the planning of the switching network for the mobile telephone system, which includes trunking net, roaming net, signalling and number plans.

Contact person: Ulf Malmerberg, phone 08-757 29 49, MemoID ERA. ERAUMG Arne Palmqvist, phone 08-757 04 22, MemoID ERA. ERAARP Jan H. Lindqvist, phone 009-886-2-746 17 45, MemoID ECOM. ERTJL

**SWITCH PLANT/ ENGINEERING**

Manager for Switch Plant/ Engineering and AXE Installation Engineers (IE) You will work with the Installation Engineering of the AXE Switches in our mobile telephone systems.

Contact person: Ulf Malmerberg, phone 08-757 29 49, MemoID ERA. ERAUMG Jan H. Lindqvist, phone 009-886-2-746 17 45, MemoID ECOM. ERTJL

**AXE Data Transcript (DT)**

You will work with the Data Transcript of the AXE switches in our mobile telephone systems. Contact person: Ulf Malmerberg, phone 08-757 29 49, MemoID ERA. ERAUMG Jan H. Lindqvist, phone 009-886-2-746 17 45, MemoID ECOM. ERTJL

**Requirements:**

To apply for the management positions, you need to have a number of years experience within the area and have a good knowledge of English written/ spoken. Management experience is also considered as additional qualification.

Contact person: Jan H. Lindqvist, phone 009-886-2-746 17 45, MemoID ECOM. ERTJL.

For all other positions experience is a merit but not essential. English knowledge is a necessity.

**PRODUCT DEPLOYMENT****Project Manager**

You will coordinate the introduction of new products on all our markets outside North America.

Contact person: Brian Ackles, phone 08-757 57 19, MemoID ERA. ERABRAC

**INSTALLATION/TEST****Installation Tester for test and cut over**

You will perform test work and give support of advanced test/ problem solving to our local companies when they introduce new products.

We work with the following systems:

- MSC, HLR and power
- Analog and Digital base stations as well as Transmission
- CMOS

You have experience of AXE, TMOS or RBS within the mobile telephony.

Knowledge in working areas such as installation, engineering, and DT as well as in Spanish are considered additional qualification.

Contact person: Matz Andersson, phone 08-757 11 02. MemoID ERA. ERAMZA.

Please send your applications to:

Ericsson Radio Systems AB  
Cellular Systems – American Standards  
KI/ERA/AH Karin Enberg  
MemoID ERA. ERAKEG  
164 80 Stockholm

**Knowledge an Experience:** Experience with market communications within Ericsson . General knowledge of Ericsson products . Knowledge of the Russian culture Contact persons: Eric Franke, Hans Jeborn, Michael Kühner

**Field Support Centre**

**Implementation Engineers Installation Engineers RBS Senior Support Engineers AXE Senio Support Engineers.**

**Contact persons:** Bo Ekström, Neil Urquhart, Dragan Radic  
**Contact persons Ericsson Corporatia AO:**

Eric Franke, +7 095 2476211, fax +7 095 205 2667, memo ETM.ETMERFR Dragan Radic +7 095 2476211, fax +7 095 2052667, memo ETH.ETHDRA

**Ericsson Radio Systems AB:**

Michael Kühner +46 8 7571628, memo ERA.ERAMKU  
Håkan Jonasson, +46 8 7572842, memo ERA.ERAHUN Bo Ekström, +46 8 7570241, memo ERA.ERABOEK Neil Urquhart, +46 8 7570475, memo ERA.ERANLUT Arne Palmkvist, +46 8 7570422, memo ERA.ERABRP

**Send your application to:** Ericsson Mobile Communications AB Eva Jansson 164 80 STOCKHOLM

**Ericsson Radio Systems AB, Kista**

**LOCAL PROJECT MANAGERS**

Would you like to work with project management abroad? Ericsson RMOA has local project manager positions open in several countries in ASIA, South-America and Russia. We are looking for project managers with experience from project management of implementation projects. Preferably people with already documented experiences as local project managers for mobile or telecommunication projects. You will be based in the country of implementation. The projects normally includes switches, base station transmission etc. You will report to a steering committee for the project. and be accountable and responsible for the total implementation project that includes installations and test of the system, timeplan and contract requirements, invoicing and payment, cost follow-up control and personnel. Apart from this you will support the marketing organization in customer negotiations and offers.

You should have a Master in EE or equivalent and some years of experience in project management of mobile telephone projects or similar. In addition to this you should have good communication skills. Fluent English is required and for South America also Spanish.

**Contact:** Thomas Uhlander, 08-7572345, Memo ERAULLE or Arne Palmkvist, 08-7570422, ERAARP. Appl. to KI/ERA/AH Karin Enberg, ERAKEG.

**ASCOM Public Switching Division, Berne, Switzerland**

**IT/DS PERSON**

Our product informatic services department is looking for a person to join an established IT/DS group: Job Scope: Job Scope: member of a group with responsibilities for:

- local SW-tools installation, configuration, user support and training (eg. APStools, APS3, PRODAX, RELAX, etc.)
- coordination towards remote system / SW-tool owners at ETX/EDT regarding local support and training
- various local IT tasks as necessary

Prerequisites: 5+ years general IT experience with 2+ years technical UNIX; degree / diploma with informatic content; good written and spoken English; good communication skills. Advantageous would be; IBM(VM/CMS) experience; database experience; AXE design/test environment knowledge.

**Further information** is available on request (reference 'SFDI3') from: Douglas Miles / Design Support Group, Tel.: +41-31-9993967 or Malcolm Sturdy, Memo EXTR.XHASTUR.

**Ericsson Inc., Lynchburg, VA, USA**

**SENIOR SYSTEM ENGINEER**

Design complex radio systems that satisfy customer specific requirements. Systems involve Ericsson equipment and often include microwave, data and/or other custom design peripheral subsystems. Principle responsibilities: Using engineering mathematics and available engineering tools, plan costeffective EDACS system and equipment design to satisfy customer requirements while limiting expenses and risks to Private Radio systems, estimate engineering effort and schedules, list special equipment and material and define manufacturing tasks necessary to design, build and test equipment required for system proposals, define vendor subsystems, equipment, and implementation services needed so favorable subcontractor quotations can be obtained, coordinate with subcontractors on technical matters for equipment and services, provide proposal text and drawings that effectively describe the system and special equipment being offered etc.

Candidate will have minimum of a BSEE degree and 5-10 years of demonstrated technical experience in telecommunications systems design or related field, experience in de-

sign of RF systems, two-way radio systems and/or DEC controlled systems or subsystems as well as system configuration documentation is preferred. Responsibilities will include working with project management, bids and proposals, design engineering and marketing to develop private Radio system designs in response to customer specific requirements. You possess excellent interpersonal skills and have demonstrated the capacity to effectively foster team building within and beyond his/her work group, will also possess shared values of Professionalism, Respect and perseverance.

**Contact:** Tom Sherrier, +1 804 5287303, Memo EUS.EUSTJSH.

**ASCOM Public Switching Division, Berne, Switzerland**

ASCOM is a leading international telecommunications company with headquarters in Berne, Switzerland. Since the mid-80's, the ASCOM Public Switching Division has worked closely together with Ericsson on AXE, TMOS and BB activities. From mid-95, we will be joined into the Ericsson Corporation with majority share Ericsson. The informatic services department is looking for 2 persons to join an established UNIX System Administration team:

**UNIX SYSTEM ADMINISTRATOR**

Job Scope: System administration activities in a developing, predominantly SUN UNIX based, client/server network.

Diverse hardware and software environment supporting numerous modern telecommunications development projects.

Prerequisites: 2-5 years relevant experience. University degree or equivalent. Good written and spoken English. Good communication skills.

**Contact:** Paul Goode, +41 31 9993171, or Malcolm Sturdy, +41 31 9991389, Memo EXTR.XHASTUR.

**Ascom Hasler AG, Bern**

**SENIOR TESTER**

The P3GFP project for Switzerland market is just starting. The project is based on FMP3 project (PL12.3). We are going to implement Generic Functional Protocol (GFP) for

the support of (ISDN) supplementary services. We are looking for people interested to work as testers in FT/AST. The test project is starting in Mar. 95 and ending Mar.96.

Working in this project you will get opportunity to get familiar with DSS1, GFP, ETSI and ITU-T recommendations.

The applicant should have more than 3 years test experience (Function Test) and ISDN experience (DSS1) or experience with protocols.

**Contact:** Zvonko Ljutic, +41 31 9991623, Memo EXTR.XHALIUT.

**Ericsson Communications Ltd HONG KONG (EHK)**

**PROJECT IMPLEMENTATION MANAGER GSM/PCN SUPPORT ENGINEERS**

Challenging positions are available in the world's most dynamic business community. The government will be issuing 6 PCN and PHS/DECT licences to bidding operators in the summer. These are in addition to the existing 10 analogue and digital cellular licences today and follows the liberalisation of the local network. EHK needs good people with the right background to secure this potential business and at the same time offering good conditions in an interesting commercial and political environment. The EHK office has grown dramatically in the last 6 years and is now 180 people strong. It is a regional office for the newlyformed MLC in Beijing, ETC. The successful candidates will join the customer-oriented Operations organisation. We need:

**PROJECT IMPLEMENTATION MANAGER FOR PUBLIC AND CELLULAR SYSTEMS**

We are urgently needing an experienced Project Manager or Implementation Manager to head our Project Implementation Department, ready to take on the responsibility for implementing public and cellular projects, both on a supervision and turnkey basis, and to continue the program of sub-contracting short term staff in parallel with the local staff recruitment and training. The position is for an initial period of one year with the possibility of extension.

**GSM/PCN SUPPORT ENGINEERS**

We need experienced GSM/PCN support engineers to work in our FSC, motivated people prepared to take on focused support towards our customers in line with our service agreements and associated procedures, this including but not li-

mitted to customer responsibility, modification handling, emergency support, consultation and on-site up-dating and upgrading activities. The positions are available for an initial period of one year with the possibility of extension.

**Contact:** Simon Murray, +852 28807883, Memo EHKSIM, Charles Henshaw, +852 25902360, EHKCHW or Hans Falk, personnel, +46 8 7571402, ERAHFA.

**Ericsson Radio Systems AB, Kista**

**PRODUCT MANAGER - PROFESSIONAL SERVICES FOR BUSINESS OPERATIONS, MOBILE NETWORKS**

Within business unit RMOG a unit responsible for providing professional services (build, operate, transfer services) for mobile operators has been formed. To this unit we are now looking for a Product Manager - Professional Services for Business Operations, Mobile Networks with the following main responsibilities: Specify, develop and maintain a portfolio of Professional Services (PS) and Total Service Commitments (TSC) for Business Operation Mobile networks, orderer for PS/TSC development for business operations within BR, create marketing and pricing guides for PS & TSC, PS/TSC Competence build up at ERA & LC/MLC:s, internal marketing of PS:s & TSC:s towards market operations and external towards customers.

You have 2 years experience in the field of professional services, documented experience in customer and subcontractor negotiations, good understanding of mobile network operations, especially newly established operators, and good experience in conducting international business. Apart from the above we also require very good communication skills in oral and writing, the ability to work in teams and willing to share information.

What we can offer is a new business opportunity (for us and the applicant) in a very dynamic environment. Within the forthcoming 4-5 years there will be some 200+ new mobile operators in the world and the bulk of these new mobile operators need extensive help in the beginning to get started.

**Contact:** Mats Ulfgrén, 08-7641349, Memo ERAMUN, Kerstin Efraimsson, 08-7575515, ERAKEEF or Lars Sandström, 08-7641387, ERAALASA.



**First-rate. And first to market.**

CMD 55/57 - first in GSM and PCN/PCS mobile and base station testing

Rohde & Schwarz has a long track record of innovation. And a worldwide reputation for excellence. With our broad expertise as a leading manufacturer of analog and digital telecommunications testers, coverage measurement systems and signal generation and analysis instruments, you would expect first-rate test equipment for development, production, service and type approval of GSM and PCN/PCS. And that's just what you get.

First-rate, and first to market. Like the CMD 55 and CMD 57 - first in the field for GSM and PCN/DCS 1800. And now for the US PCS/DCS 1900 standard. These are the smallest, lightest testers on the market. And the first. Easy to use and packed with powerful features. Like

advanced user guidance for unparalleled ease of use. Autotest routines that allow complete testing of a radio telephone without operator intervention. And module tests, indispensable for service work. Plus the distinction of being the only tester on the market that can measure power ramps to GSM specs (more than 72 dB dynamic). And finally high-speed remote control for high production throughput. All this backed by the full service and expertise of a market leader.

Interested? Send a brief note to Flygfältsgatan 15, S-12830 Skarpnäck, Sweden or fax us on +46 8 94 19 78 or call us on +46 8 683 67 00. We'll make sure you get the information you need.





# The fine art of selling service – at a profit

Sales of service amounting to SEK 1.8 billion in 1996 and SEK 3 billion in 1996. That's the objective the Customer Services unit has set.

"Beginning to sell services involves a completely new corporate culture, a new way of thinking," says Hugo Österlund, one of the arrangers of the Customer Services Seminar in January.

## Customer Services aims high: SEK 3 bn in sales in 1996

needs and wishes. Ideally, a supplier can even be a step ahead.

Ericsson can cooperate with customers through alliances, partnerships and risk-sharing. The basic requirement is that customers have confidence in Ericsson and Ericsson's products.

"If we participate in the customers' processes, we can present various solutions that will result in increased profitability," Hugo Österlund points out.

### Business opportunities

"Our services are designed to produce increased revenues for customers and help them control costs, and we help customers create new business opportunities. But we have to be better at demonstrating customer benefits so that we can be paid for our services. Our pricing must be related to the value we create for customers."

The Customer Services unit in Stockholm is supporting the local companies in product development, skills development and the marketing of services.

The unit has issued a handbook containing specific advice and a

news bulletin is published quarterly to exchange information among companies. This is a joint venture of the Public Telecommunications, Radio Communications and Business Network business areas.

### Specific advice

In addition, the unit will create a data base in which companies will be able to quickly access analyses of competitors, sales arguments and case studies of successful bids and transactions.

"We have to inventory our total expertise so that we can meet the needs of the market and we have to ensure that we are not late in developing the services that will be demanded in the very near future," says Eva Lundberg, manager of consulting operations in Customer Services.

### Get going

"What is needed is an international Customer Services forum," says Åke Enell, the manager of Customer Services. "We are operating in an area with a great potential. Sales of service are what count today, now that products and systems are becoming increasingly standardized."

"AT&T and Northern Telecom, who are our competitors, have comparable programs. And among Ericsson companies out in the field more and voices are being heard asking for a strong joint effort in the field of customer services. So all we have to do is to get going. Within two or three years we expect to have sales of about SEK 5 billion. That's not something we want to miss out on."

**Text: Isabel Werner and My Spangenberg**  
**Photo: Peter Nordahl**



Three sellers of services with their sights on a high target – SEK 3 billion in sales in 1996. Left to right: Hugo Österlund, Eva Lundberg and Åke Enell, all with Customer Services.

## Sell services is a new way of thinking

**It is nothing new for doctors, hairdressers and bankers to sell their services, but it is still something of a novelty for technology companies.**

**It is true, of course, that technology companies have always provided service to their customers, but there is a difference between giving service and selling services at a profit.**

During the last week in January, Ericsson Telecom's Customer Service unit held its first seminar in Stockholm.

The first guest speaker on the seminar program was Laurie Young, a strategy consultant specialising in the marketing of services, who spoke about developing marketable services.

### Market saturation

However sound a product may be, the market for it reaches satu-

ration point. There is a limit to how many people want or need to purchase a product, and after this limit is reached, the sales curve turns sharply downwards. Laurie Young warned that this pattern could be repeated in the telecom sector and must be planned for accordingly.

When the market becomes saturated with products, income can be generated from the sale of services.

### Designing services

For services to be profitable, they must be designed just as meticulously as physical products.

"Throughout the company, there must be a uniform commitment to service and a uniform service profile linked to the company brand, and the behaviour of people throughout the whole organization must embody the brand values," emphasizes Laurie Young.

This highlights the key difference between selling a product and selling a service – that the service is inseparable from the person selling it. In Laurie Young's words: "It is essential to have good relations with your customers if you expect them to purchase services from you."

**Both good news and bad**  
So how do customers regard Ericsson? To find out, Laurie Young surveyed industry friends and acquaintances throughout the world, at senior levels in telecommunication companies.

Customers feel that Ericsson keeps its promises and delivers on time, as well as being solid, reliable and strong. Ericsson also excels at establishing sound working relationships that function well and get the job done without people wasting their time on the golf course.

That's the good news. The bad news is that Ericsson

is insufficiently visible to line managers trying to sell new added value services and products. "They don't exactly buzz around us in swarms." And also that Ericsson responds to stated needs instead of anticipating future needs.

### Foresee needs

"It is very important not to be content with merely giving the customer what he wants – you must be discerning enough to find out what he needs," explains Laurie Young.

A customer comment he often hears is: "What I need is a friend who will work closely with me and understand my needs."

Laurie Young believes there are more emotional needs associated with services than with products.

"The new purchaser of a service is nervous, vulnerable and under stress, so it is vital for the salesperson to be able to cope



– It is not enough to give the customer what he wants. You also have to figure out what he needs, says Laurie Young, consultant specialised in marketing of services.

with these reactions and make the customer feel secure.

"If you understand and satisfy the customer's emotional needs, then you really are adding value," concludes Laurie Young.

**Isabel Werner**

## Managers address topic of production beyond 2000

The production and plant managers from 10 Ericsson companies in 12 countries gathered in Saltsjöbaden, outside Stockholm, to discuss Ericsson's production beyond the year 2000. Senior executives within corporate management responsible for production, led by the newly appointed technology and production executive Håkan Jansson, joined in the discussions.

Concurrently with the production seminar, some 20 purchasing managers from around the world also held a seminar, hosted by Jan Tufvesson, Ericsson's head of purchasing. Parts of the programs for both seminars were combined.

Bo Landin, Senior Vice President Corporate Markets, opened the seminar with a presentation of a market scenario for the year 2000.

### Products will change

Håkan Jansson provided his view of how products will change in the future and Leif Clausson from Prolab in Älvsjö provide breathtaking insight into how components and assembly techniques will develop in the future.

In conclusion, Jan Tufvesson presented his vision of how production and purchasing must change during the next five years.

### Must keep pace

Major changes are required to ensure that Ericsson keeps pace with a more rapidly accelerating development. The customer's continuing demands for lower prices and shorter and reliable delivery times are increasing. At the same time, technology is making it possible to produce increasingly smaller and more powerful hardware. As a consequence, not much of today's production organization will be the same in five years.

### Igel mapped the course

During the third day of the seminar, the focus was solely on the Public Telecommunications Business Area and its new organization. Anders Igel explained that Ericsson Telecom will be one among other companies in the business area and that he would be supporting a significantly stronger production coordination than was previously the case.

### Group sessions

Much of the activity at the seminar involved two group sessions. One focused on preparing a description of what Ericsson's global production apparatus will look like in the year 2000. The second involved the matter of how Ericsson can move ahead to such a new organization.

There were heated discussions when the results of these group sessions were presented, but agreement was finally reached between the four participating work groups. A high degree of unanimity between the groups could be noted.

Concurrently with the production seminar, some 20 purchasing managers from around the world also held a seminar, hosted by Jan Tufvesson, Ericsson's head of purchasing. Parts of the programs for both seminars were combined.

### Closer coordination

The need for closer coordination between production units was one of the issues about which everyone was in agreement. Similarly, all agreed that the flexibility of the production organization must be increased, and that measures must be taken to reduce the amount for capital tied-up in production.

There will be a need to concentrate production to fewer units but, on the other hand, new plants will be needed in the future, in order to penetrate certain markets.

Håkan Jansson summarized the results of the group sessions. He was satisfied with the results, emphasizing work must now begin to develop many of the ideas further. This work will be carried out during the spring, when a number of work groups will be appointed to further develop upon the ideas and outcome of the efforts at Saltsjöbaden. At the next production seminar, a new strategy for production in the year 2000 will be presented.

## FOUR VIEWS ON SELLING SERVICES

### Erwin Leichtie, Manager of Customer Services for Ericsson in Mexico:

When you begin to sell services, the relationship with customers changes. You are able to become a consultant to customers and help them custom-tailor solutions for their customers.

It is difficult to get customers to pay for something they received without charge earlier, and in the beginning you have to be prepared for a cool reception.

But you can get them to accept the idea that it is only right to pay for services in areas where they are not competitive, or in fields outside their core operations. In



the introductory stage, we have to make major selling efforts. We simply have to go out and listen to customers.

Since we began to sell services we have been able to demonstrate the amount of profits we are actually generating for customers.

Pricing is difficult, but we have to learn to set prices based on the value to the customer of the service we are providing, not on our cost of producing it.

### Wietse van der Val, responsible for the departments Software Engineering and Services in the Netherlands:

It is vitally important that the corporate management should take key strategic decisions defining the approach to the marketing and sale of services.

We need to speak the same language throughout the company as far as service is concerned, and share a common viewpoint regarding the types of services we propose to sell and the prices we intend to charge the customers. At present, all the different business units have their own individual ways of handling



the marketing and sales of services.

Since services are based on knowledge, we must select the areas of competence on which we intend to invest well in advance - based of course on the customer needs.

At present, we have too few personnel and experience in the areas of marketing and product management to define and implement the service products in a professional way.

If we do not take clear strategic decisions now, we shall be left behind, looking at our competitors.

### Fredrik Winterlind, Marketing and Customer Services Product Manager for Ericsson in the U.S.:

We have been selling services for two years. In the beginning, the internal resistance to charging market prices was greater than the customers' resistance to paying for them. Some of those who sell products think it's obvious that service goes with the product and that you should "give away" service as a means of selling the product.



They often do not understand the enormous sums they are giving away. They may think that they are giving away a hundred thousand dollars on an order amounting to two million – and that certainly isn't dangerous. But in practice several million dollars worth of service may be involved over the life of the contract.

Pricing is not really difficult; there is already an efficient market for services in the U.S. We

compare our prices with those of other companies are charging, and ours are competitive. I am very optimistic about the future of our service sales.

### Rob Hacker, responsible for delivery of customer services in Australia:

We have only recently begun promoting services, and we already account for a significant percent of sales for the Public Telecommunications business area in Australia.

The complexity of systems and networks is increasing rapidly and the need for faster introduction of new features increases. It



is highly evident that we will need to help our customers with a service range to enable them achieve this evolution at best value.

The most important prerequisite for being able to sell services is to demonstrate to customers that we do in fact provide added value, and that we can help to reduce the customer's costs and improve their use of their products. We have been quite successful in this regard in Australia.

The seminar concluded with a tour of the Kumla plant. Björn Boström, production manager, provided information about developments in the manufacture of mobile telephones.

# CONTACT

Ericsson, HF/LME/A, Room 811051, S-126 25 Stockholm

## A mademoiselle visits the cold 'Northerners'

*Marie-Line Binesse is an attractive young Frenchwoman on her second visit to Sweden. She is working on a temporary basis at Ericsson Language Services, translating AXE documents. Sweden is cold and Swedes are reserved, she thinks – but they become more attractive the better you get to know them.*

"I was trained as a technical translator and 'terminologist,' the job I now hold at MET Communications in Paris," Marie-Line says. "This time, I will be in Stockholm for two weeks, handling machine translations of technical documentation for AXE exchanges into French. We do not have any equipment of this type in the company in Paris."

A huge number of documents – 3,000 – have to be translated and each one contains between two and 40 pages. Marie-Line was in Stockholm for three months last autumn for training on the translation equipment. The city did not make a very good impression on her then.

"The weather was dismal and I found it hard to get used to the darkness so early in the afternoon. And the city was nearly deserted after five o'clock. I can understand why everyone wanted to be home; it was just too cold to be outside!"

### Reserved Swedes

This time, Marie-Line has been able to enjoy some bright, beautiful spring days and she can believe the Swedes who claim that Stockholm is an entirely different city during the summer. The inhabitants, too, seem more attractive the longer you know them. In the beginning, Marie-Line thought it was hard to get to know us.

"You are a little reserved, you find it hard to communicate and be spontaneous. But when one gets to know you, you are very nice. My colleagues here at Ericsson Language Service have become my friends and we also get together after working hours. They always speak English when I am along, even among

themselves, so that I won't feel left out."

When she is not working or spending time with friends Marie-Line likes to draw and paint, perform in amateur theatricals and dance to rock music, preferably with her boyfriend.

"I have tried to persuade him to begin to jitterbug, but he won't do it; he is afraid I will hurt myself," Marie-Line says with a laugh. She doesn't seem to have given up hope of winning her friend over.

### A poem to her

Bertil Edin and Marie-Line shared office space for a week and she inspired him to express what he thought of the friendly atmosphere and companionship without saying so directly.

### Silence

The atmosphere in the work place in Sweden dif-

fers greatly from that in France. In France, only the boss has a private office. The other employees share offices for two or more persons. The level of sound is always high, sometimes close to shouting.

"Here, I have sometimes wondered if I was working alone, it was so quiet," Marie-Line says. "People sit in their own offices and work by themselves. Sometimes they take a break and get together to drink coffee and chat."

### Coming back

Marie-Line will probably be returning to Stockholm for two-week

periods now and then. When the translation of the AXE documentation is completed, other documents may be waiting.

"But my goal is not to stay here and work for a long time," she says. "I have my family and my boyfriend in France – that's where I want to live."

Lena Granström



Marie-Line Binesse, a French translator and terminologist at MET Communications in Paris, works at Ericsson Language Service from time to time. Photo: Peter Nordahl

GUEST  
**COLUMN**  
BERTIL EDIN

### To Marie-Line

We meet each other in a room  
where toilsome work is done.  
Or is it maybe in a tomb  
without a glimpse of sun?

You lead your life, and I lead mine,  
but, oh, how different.  
Mine rather dismal, yours is fine.  
That's it. That's what I meant.

That's what I meant, for that I knew  
– you Breton princess dear –  
when I beheld the sight of you  
and liked to have you near.

We work with words, yet hardly speak;  
we haven't got the time.  
We sit together for a week  
in silence deep, sublime.

Oh, Marie-Line, release us please,  
our tacitness reduce.  
I'd like to talk with you, at ease,  
about your France, la douce.

About what counts and matters most,  
when kindred souls we are.  
– Or maybe drink each other's toast  
before we cross the bar.

Rejoicing at our languages,  
their sweet and mellow sounds.  
Their French and British beautiness  
might seem to know no bounds.

Bertil Edin  
March 9, 1995

## Poem to a colleague

In the Number 15 issue of Swedish "Kontakten" last year, Lars-Göran Hedin paid a very appreciative tribute to his associate Pia Rehnberg. I have been thinking about his words during the past week, and about his suggestion that we should recognize proficient colleagues more often.

Thus challenged, I wanted to say something to a fellow-worker from MET in Paris who has been with us for two short periods. But when one is under heavy stress, due to nearly impossible conditions for meaningful work, one does not converse in a foreign language. One of my colleagues experienced the same thing. The poor girl, Marie-Line from Paris, had to sit and listen to us swear – outwardly and inwardly – about the pressure of time and translations of sentences that meander like writhing snakes. And, just in case our cup was not filled to the brim, we also had to deal with balky machines.

Accordingly, I thought it would nice if I, as a representative of the