

CONTACT

PUBLICATION FOR ERICSSON WORLDWIDE

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First circuit on target

The first silicon chip has been produced in Ericsson's new microelectronics plant. The first test circuits have thus become available sooner than expected.

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Japan coming on strong

Several years ago, Japan was uncharted on the Ericsson map. Now the country is on the way to becoming one of our most important markets. Sales in Japan during the first nine months of the year amounted to SEK 2.9 billion.

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Ericsson environment

Ericsson is currently working intensively on interior and exterior environmental issues. New offices that offer considerably improved environments for employees will soon be ready in Nacka.

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Profit not sufficient

Ericsson's profit in the first nine months amounted to SEK 3.5 billion. This was a sharp increase compared with a year earlier, but it is not sufficient, according to Gerhard Weise, chief controller, at Ericsson. The strong expansion of Ericsson requires even higher profitability, so the focus on cost-savings continues.

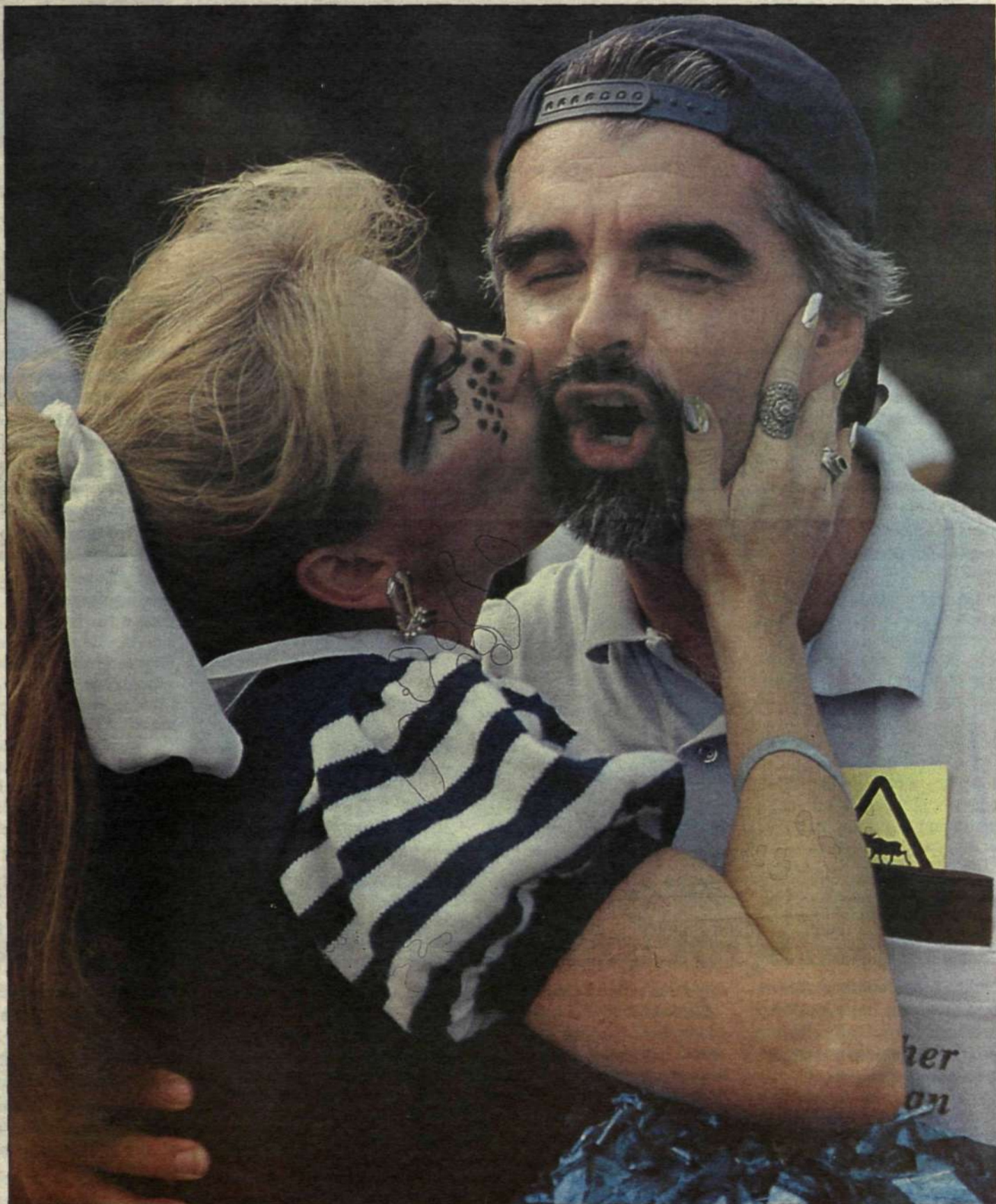
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Photo: Lars Göran Hedin

Go, America, Go!

In the presence of enthusiastic colleagues and an equally enthusiastic American cheering section, Bo Hedfors recently set in motion the organization for Ericsson's new "integrated" company in

the U.S. The company's 200 senior managers learned what the change involves at an "Ericsson Texas Olympics."

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French adopt ERMES pager

Ericsson has scored yet another success with its nationwide personal paging system based on the European ERMES standard. This time, it's France Telecom that wants to upgrade its earlier system with Ericsson technology.

In its field, ERMES, the European standard for nationwide personal paging systems, is the equivalent of the GSM system in mobile telephony. It is being introduced in many European

countries. To date, 14 national operators have purchased systems of this type, with 12 having selected Ericsson as the supplier. France is the company's twelfth "ERMES country."

Being upgraded

FTMR, France Telecom's subsidiary, received an ERMES license in 1993. The company has for some time been operating an Alphapage personal paging system that is now to be upgraded and provided with ERMES functions.

The system, which will cover all of France, is to be placed in service next year.

FTMR, France's leading personal paging system operator, has approximately 250,000 subscribers who are using Alphapage, Europage and Biplus d'Alphapage services.

Ericsson believes strongly in ERMES as a global standard. The system offers high speed, virtually unlimited capacity, low cost and high performance, as well as the potential for adding attractive new services.

Since an ERMES system can be operated from the same base station as a POCSAG system (an earlier common standard), operators can utilize investments they have already made.

Kista's first disc tested yielded approved chips!

The first silicon disc tested in Ericsson's new microelectronics plant in Kista yielded approved chips. Each chip on the disc, which has more than three million transistors, contains the largest functioning memory ever produced in Sweden.

The intensive and successful running-in of Ericsson's new microelectronics plant in Kista yielded approved chips in tests on October 28, well ahead of schedule. The plant's processes were scheduled to be fine-tuned to turn out the first silicon disc on December 20 — in time for Christmas.

The plant was built in record time. The first approved silicon chip was produced a year and seven months after the first blas-



A silicon disc covered with chips. The distance between chips is measured in thousandths of millimeters.

ting — a period that included construction, the installation of systems and equipment and the fine-tuning of processes. The

new facility will give Ericsson the capacity for advanced development work on microelectronics technology.

Three million transistors

The first VLSI (Very Large Scale Integrated) circuits contain 36 chips, each of which has three million transistors. The circuits have a pattern-width of a thousandth of a millimeter and were produced by means of so-called CMOS technology.

This is the same technology used in 16 M/bit computer memories. A 16 M/bit block on the test disc is of the Static Random Access Memory (SRAM) type, with 512,000 cells on a surface of 73 square millimeters. The dimensions of the chip are 16.2 mm. x 18.5 mm.

Inger Björklind Bengtsson

Cooperation with Nokia in transport networks

Nokia Telecommunications and Ericsson have signed a letter of intent covering cooperation in the field of transport networks.

The first step involves a so-called OEM (Original Equipment Manufacturer) agreement giving Ericsson the right to use Nokia's Synfonet line of products in Ericsson's products for transport networks. The first deliveries will be made next year. The OEM contract will be worth more than SEK 300 M to Nokia du-

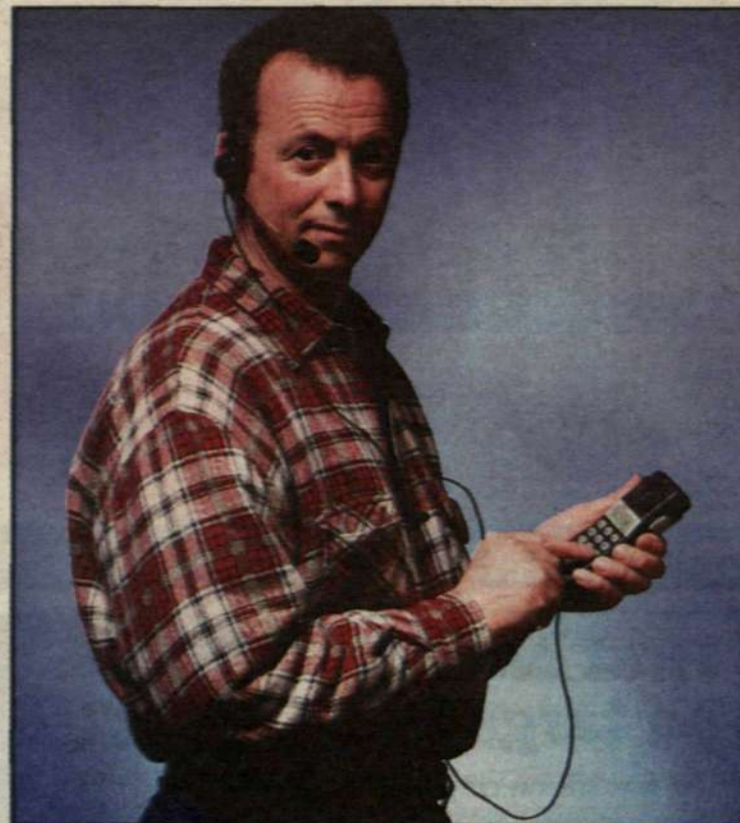
ring the next three years.

Plans call for the companies to cooperate in selecting and introducing additional functions in their products in the SDH field. Nokia and Ericsson will continue to develop products independently and their respective system approaches will be kept separate.

The parties have also agreed to evaluate the possibilities of expanding the exchange of products in the SDH field, which would make it possible to take advantage of the synergy effects

in the two companies' product portfolios.

Nokia has developed advanced access products for transport networks as well as network-control systems. Ericsson, for its part, has developed advanced systems for long-distance networks, as well as operating and network-control systems. Nokia products covered by the OEM agreement will be included in Ericsson's FMAS (Facility Management Application System) used in the operation and control of networks.



Freeset is light enough to be carried in a pocket or attached to one's belt. Users who have to keep their hands free can connect the units to a headset.

Freeset is No. 1 choice in Europe

When it was launched a year ago, Freeset was the first system in the market for cordless business exchanges based on the DECT standard. Since then, approximately 3,500 systems and 70,000 cordless telephones have been sold, equal to 55 percent of the European market for this equipment.

Freeset has now been approved in 14 European countries. France, where Ericsson's DECT system was approved early in October, is the most recent customer.

Freeset systems are sold through many different channels. In addition to Ericsson companies, a number of public telecommunications operators market

the product. This is the case in Denmark, Finland, the Netherlands, Norway, Spain and Sweden. Siemens has for some time had an agreement with Ericsson covering the sale of Freeset to its subscriber exchange customers. A similar agreement was recently signed with Mitel, a large British supplier of business exchanges, that will market Ericsson's system in Great Britain under the "Extensis" name.

"The DECT standard was established in Europe during 1994," says Albert Jokubaitis, president of Ericsson Business Mobile Networks BV, based in the Netherlands. "Today two thirds of all systems for cordless business communications that are sold in Europe are DECT systems. Ericsson is the leader in this market."

Telstra in U.K. selects Ericsson

Telstra, the Australian network operator, recently signed a contract with Ericsson covering the supply of infrastructure for its British telecommunications network. The initial phase of the contract is worth SEK 35 M.

Under terms of the contract with Telstra UK, Telstra's British subsidiary, Ericsson will supply AXE exchanges for local and trunk telecommunications traffic, making it possible for Telstra

to introduce national and international telecommunications services in Great Britain. These services will be reinforced with intelligent network services that will enable Telstra to offer customers a wide range of services.

"We are pleased with the selection of Ericsson as a supplier," Graham Markey, president of Telstra (UK) Ltd., says. "AXE's potentials and the benefits offered by intelligent networks give us an excellent platform for the start-up of our operations."

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Ericsson's systems are strong internationally

No Swedish technology effort can compare with AXE

After a 22-percent increase, Ericsson thus far in 1994 reports order bookings of SEK 60 billion.

"Order bookings rose for the third consecutive year. I personally regard this as the most stimulating figure among those we are presenting today" reported a notably satisfied Lars Ramqvist to the press at the traditional press conference held in conjunction with the release of the interim report.

Ericsson's development continues to be very positive. At the end of the first nine months, profits amounted to SEK 3.5 billion. Investments in mobile telephony have given the company a tremendous lift. The increase in sales of mobile telephone systems and terminals was a remarkable 72 percent.

"The breakthrough for Ericsson in Japan was important for this year's figures," noted Lars Ramqvist. "During the same period last year, Japanese sales amounted to SEK 80 million, but this year we are already up to SEK 2.9 billion! We now have four digital systems that provide coverage of the country's most important metropolitan areas.

"This is just the first phase of a major investment program on which our Japanese customers are embarking," Lars Ramqvist noted.

Strong systems

"Japan is now one of Ericsson's ten largest markets," Lars Ramqvist continued. "It is an important addition to the already impressive list of countries in which we operate. Ericsson systems are extremely strong in international competition today. We have sold AXE to 111 countries and mobile telephone systems to more than 70.

"We have every reason to be proud of our achievements in mobile communications. At the same time, we must be aware that AXE is still a very vital product. This year we expect to deliver between 14 and 15 million new lines. This puts AXE without rival as the best selling system in the world," Lars Ramqvist emphasized.

50,000 man years

"AXE also accounts for a very substantial portion of our R&D investments. In 1994, we are devoting more than 6,000 man years on research and development related to AXE10. To date we have invested about 50,000 man years. I do not believe that there is any other Swedish tech-

nology effort that can compare with these figures," Lars Ramqvist stated.

The Ericsson CEO also pointed out that the AXE switch has played a major role in the successful sales of mobile systems, an area where additional resources are being devoted to the application of Ericsson's successful switching technology.

Broadband a challenge

During the third quarter, Ericsson strengthened its competence in broadband technology. This was in part due to the acquisition of the U.S.-based company Raynet, in which Ericsson now holds a majority interest.

"This acquisition strengthens our position in local access," Lars Ramqvist explained. "With Raynet's help we can now provide new solutions based on copper, coaxial and fiber. Raynet's system technology strengthens our offering in both broadband and multimedia.

"I am a bit more optimistic now with regard to Ericsson's potential in broadband. Our competitors have not come much farther than us in developing new products.

"AXE is being used in several broadband trials around the world. It has been a difficult period. We must recognize that broadband is really a very complicated technology and that it will take time to find the answers to the many difficult technical questions.

"This is something that all suppliers are experiencing. Some of our competitors have been forced to drop out of broadband trials, but Ericsson is still in the running!" exulted Ramqvist.

Quality awards

Lars Ramqvist also took the opportunity to talk about Ericsson's advances with respect to quality. These advances are evident in many ways.

"Only a few years ago, we had difficulty with the quality of our systems," Lars Ramqvist noted. "But we made a major effort to



"The strong order bookings, now for the twelfth consecutive quarter, is the most positive element of the nine-month interim report," says Lars Ramqvist.

improve. Now we can see that several major AXE orders were a direct result of the fact that customers are satisfied with how we handle quality issues.

"I am also very proud that Ericsson companies in several countries have received awards for their quality efforts. Ericsson in Spain was one of three companies that received the European quality award, and our companies in the Netherlands and Denmark received the corresponding national awards. Now several other Ericsson companies are leading contenders for national quality awards," Lars Ramqvist reported.

EU referendum a victory

"In closing, I must of course comment on the outcome of the

EU referendum in Sweden," said Lars Ramqvist. "I regarded the referendum as decisive for both Sweden and Ericsson. At Ericsson, we have been persistent and invested heavily in Sweden, despite the fact that the domestic market accounts for only a small portion of our sales.

"If sales of defense systems and cable are excluded, there are not many percentage points left of the 10 percent that is Sweden's share of Ericsson's total sales. Thus Sweden, in terms of telecommunications, is a very small market for Ericsson," Lars Ramqvist noted.

Telecom in focus

"The EU, on the other hand, is a significantly larger market for Ericsson, and it is the EU that

will take the most important decisions on European telecommunications policy. The EU Commission has identified telecommunications as one of the most important industries right now, and the EU will lead the development of future telecommunications standards for Europe. The EU is also very proactive with regard to export subsidies for telecommunications equipment and other matters.

"Ericsson now joins the European community on the same terms as its principal European competitors. We can now become a full participant in the EU's efforts to promote telecommunications," Lars Ramqvist concluded.

**Text: Lars-Göran Hedin
Photo: Peter Nordahl**

Japanese mobile net expansion

The Japanese mobile teleoperator Kansai Digital Phone in Osaka has contracted for a substantial expansion of its mobile telephone system. The order includes hardware and software for switches and base stations valued at more than SEK 500 million.

Kansai Digital Phone operates a mobile network in the Osaka-Kobe-Kyoto region, which is Japan's second largest commercial center. The system was placed in commercial operation in May.

"Currently, there are 50,000 subscribers in the network. There has been record growth in an extremely tough competitive environment, with five large mobile nets in the region," relates Jonas Högberg, Marketing Manager at Ericsson Toshiba in Osaka.

The new expansion which will occur next year will further increase capacity in networks service the densely populated Osaka area.

"This is the first large expansion of the network and it demonstrates that we have the customer's confidence," says Mika Jahkola, General Manager of the Ericsson Toshiba in Osaka.

"The high service level we have maintained with the customer was advantageous in negotiations prior to the expansion. Our personnel who work with installations and start-up have worked tirelessly while at the same time demonstrating flexibility in their



work. Moreover, the fact that we accomplished our deliveries ahead of schedule on two occasions was very significant."

Growing rapidly

Japan is the second largest and most rapidly growing market for the Radio Communications business area. Ericsson has supplied digital mobile telephone systems based on the PDC standard to three operators in Japan: Tokyo Digital Phone, Central Japan Digital Phone and Kansai Digital Phone. A fourth network is also on order for Digital Tu-Ka Kyushu. The first three networks are already in commercial operation.

Gunilla Tamm

Ericsson is supplying equipment to four digital mobile telephone systems in Japan. They cover the key metropolitan regions in the country.

New Board Members from unions

At the meeting of the Ericsson Board of Directors last week, three new representatives of the trade unions were welcomed, one regular and two deputy members.

The three replace Claes Göran Larsson, Visby, Anders Olofsson, Östersund, and Per Arne Ragnar, Kumla, who were lost in the Estonia catastrophe.

The new members are Jan Hedlund, Stockholm, Christer Åkerlind, Östersund, and Christer Binning, Kumla.

Training subsidy

The Board also voted to contribute SEK 1 million for advanced training of representatives of the trade unions. The contribution was provided by the company to honor the memories of the eleven trade union representatives who were lost in the sinking of the Estonia.

Chinese mobile expansion

Ericsson has received another order for expansion of the mobile telephone network in the Chinese province of Hunan. This is the third expansion of the province's analog TACS network. Valued at SEK 320 million, the contract was signed with the Hunan Posts and Telecommunications Bureau.

This current expansion increases the capacity to serve 130,000 subscribers. Deliveries will be made next year.

Hunan's mobile network is one of the largest in China. It covers the most important cities in the province and is now being broadened to provide coverage to some rural areas.

Positive nine-month report

Ericsson's interim report for the first nine months shows continued favorable development.

Ericsson's order bookings for the first nine months of 1994 increased 22 percent to SEK 60,111 m. (SEK 49,210 m. in the corresponding period in 1993). Consolidated net sales rose 29 percent to SEK 54,574 m. (42,415). Pre-tax income for the period improved 88 percent to SEK 3,492 m. (1,855), including SEK 211 m. (loss: 22) in net capital gains. After actual taxes and estimated deferred taxes, and after full conversion, income per share was SEK 10.38 (4.23).

Order bookings in the third quarter were 30 percent higher than in the year-earlier period. Net sales also increased strongly during the third quarter. The

Radio Communications Business Area posted the strongest growth and accounted for more than half of net sales during the third quarter. The earnings improvement is attributable mainly to Radio Communications.

Ericsson's largest single market is the European Union, with 31 percent of total net sales. In terms of single countries, the U.S. is largest, with 12 percent of net sales, followed by Sweden, Italy, Great Britain, China and Japan.

Costs in relation to net sales were reduced somewhat, despite continued heavy investments in technical development, for further development of the AXE system for wired and mobile networks as well as new generations of systems and products.

The total number of employees, which increased 5,332 du-

ring the first nine months, is 74,929. The acquisition of Teli in Sweden resulted in the addition of 1,300 employees, while the divestment of Latincasa in Mexico eliminated 1,200.

OUTLOOK

The previous forecast that earnings for the full year will be significantly better than in the preceding year is unchanged.

BUSINESS AREAS

Public Telecommunications posted an increase in net sales, mainly in Sweden, China, Thailand and Spain. The increase in order bookings is attributable partly to the acquisition of Teli in Sweden, but significant orders were also received in Australia, Libya and China.

Radio Communications reports continued very strong in-

creases in net sales, particularly in systems and terminals for mobile telephony.

The most expansive markets are the U.S., Japan and Australia. Order bookings also rose sharply as a result of major orders in Australia, Great Britain, Malaysia, the U.S. and China.

Business Networks reports only a slight increase in net sales. Business network operations developed favorably in a number of markets such as China and Great Britain, while business switches and data networks faced heavy price pressures, particularly in some of the European markets.

This affects the business area's profitability and, consequently, an action program is under way. Order bookings rose, due partly to a major order in Lebanon.

Components increased net sales in all product areas. Order bookings also rose correspondingly.

Defense Systems reports a sharp increase in sales, while order bookings in comparison are somewhat lower as a result of major orders in the corresponding period a year earlier.

FINANCING

Ericsson's cash flow was strongly positive during the third quarter. The equity ratio improved, compared with the third quarter a year earlier, and is expected to improve further in the fourth quarter.

CAPITAL EXPENDITURES

Ericsson's investments in property, plant and equipment amounted to SEK 3,593 m. (2,514).



Kaj Juul-Pedersen, accepts award from Minister of Industry and Trade Mimi Jacobsen. The ceremony, hosted by Mayor Jens Kramer Mikkelsen (center), was held at the Copenhagen City Hall.

Ericsson is best in Danish quality

Thursday, November 10 was a triumphant day for Ericsson's in Denmark. On that day, Kaj Juul-Pedersen, President of LM Ericsson A/S, accepted the Danish quality award from Minister of Industry and Trade Mimi Jacobsen on behalf of the entire company.

Mimi Jacobsen stated that Ericsson shows great insight into the workings of TQM.

"The company applies the various fundamentals with great enthusiasm and skill and has achieved outstanding results in a number of areas," she says. "The jury has concluded, following the self assessment and the company visit, that LM Ericsson is a distinguished recipient of the Danish Quality Prize for 1994.

"The leadership in the company functions admirably and provides the desired result," the Minister reported. She also referred to Ericsson's strong results in terms of customers' satisfaction with the company.

In his acceptance speech, Kaj Juul-Pedersen heavily emphasized that the quality prize is the result of ten years of conscientious focus on quality throughout Ericsson.

"The prize in itself was not a goal for us," he said. "On the other hand, it motivates us to proceed with our quality efforts."

The award came as a great surprise at the Ericsson office. At the same moment as the prize was being awarded at City Hall, the internal newsletter was distributed throughout the entire facility, with the news of the prize blazoned across the front page. An atmosphere of celebration arose among all the employees.

In the newsletter, Kaj Juul-Pedersen dedicated the prize to all the employees within LMD, commenting that everyone "should feel a sense of pride. Without the efforts of the entire company, in small and large improvement projects, combined with the customer awareness shared by all in their daily work, LMD would not have received any prize. A quality prize is typically a team effort and reward".

On Monday morning, Kaj Juul-Pedersen called together all of the employees.

"Congratulations! You are all wonderful," Kaj exulted. He offered a special thanks to Carsten Andersen, who functioned as LMD's initial TQM champion and to his successor Henrik Landwehr. All the employees joined in a toast to one another, before returning to the daily routine and continuing improvement efforts. **Jens Ramskov**

Plants change business area

Effective January 1, 1995, the plants in Söderhamn and Visby, which currently are part of the Public Telecommunications Business Area, will change business area affiliation. The Söderhamn plant will become part of the Components Business Area. The Visby plant will become part of the Radio Communications Business Area.

The background to these changes is that production of AXE in recent years have been concentrated to the plants in Katrieholm, Kristianstad, Norrköping, Nynäshamn and Östersund.

For several years, the Söderhamn plant has produced mainly

products in the component area, whereby it is strategically correct that this plant in future become part of the Components Business Area.

Focus on mobile

In Visby, 80 percent of the total operations are today related to mobile telephone system products. The plant will now successively concentrate manufactu-

ring to systems for mobile telephony.

"It is more efficient and logical that each plant be part of the business area for which it manufactures products. Employees will not be affected by this organizational change," says Lars Wiklund, Vice President Human Resources, Public Telecommunications Business Area.

Joséphine Edwall-Björklund

New Aussie mobile order landed

Telecom Australia is proceeding with the expansion of its analog and digital mobile telephone networks. Ericsson has signed contracts valued at SEK 612 million covering supply of additional AMPS and GSM equipment. These orders raise the total bookings in Australia to SEK 1.6 billion.

Ericsson is the sole supplier of AMPS equipment to Telecom Australia and accounts for 90 percent of the deliveries this year to the GSM network. Deliveries under the new contracts will be made in the next few months.

The industry takes shape

Cable & Wireless will be the first foreign company to operate a public telenet in China. The company will invest SEK 2.5 billion to construct the net. This has also raised interest in the Chinese market among other western teleoperators.

■ **Nokia** increased its profits during the first eight months of the year to FIM 2.29 billion. This is a five-fold rise compared with the corresponding period a year earlier. Sales of mobile telephones rose 64 percent. Nokia's CEO Jorma Ollila projects that the world market for mobile telephones will increase between 50 and 80 percent during the next two years.

■ **DCS Communications** has contracted to acquire NKT Elektronik, a leading company in transmission technology. The company will serve as a base for DCS's European operations in the fiber-optic transmission segment.

■ **Siemens** is facing major challenges in telecommunications. The prices of transmission and switching equipment have fallen sharply during the past year in Germany, the company's largest market.

Deutsche Telekom has placed major orders outside the country. As with Alcatel, Siemens has been dramatically outclassed by Ericsson and Nokia in the market for mobile telephone systems and terminals.

Siemens recently opened a "software house" in India in a move intended to reduce software development costs.

■ **Alcatel** has acquired Telefónica's 13.2-percent shareholding in the Spanish subsidiary Alcatel Standard Eléctrica. The purchase is a result of the EU Commission's recommendation that Telefónica should cut the shareowner bond to its transmission equipment supplier.

Alcatel's strategy of entering into alliances with network operators contrasts sharply with the actions of the company's competitors among suppliers of tele equipment. Alcatel's goal is to reduce its dependence on sales on equipment, considering the declining margins in its operations.

■ The need for telecommunications technology in the former Eastern European countries is great. Investments in the range of USD 75-110 billion annually are required to build a modern structural base. France Telecom, Deutsche Telekom and US West have signed agreements with Russian partners to develop the country's long-distance network.

■ The American Bell Companies are now investigating the

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KJELL ERIKSSON

possibilities of selling their jointly owned research and development operations within Bellcore.

As a result, Bellcore would be freed from restrictions against development and production of tele equipment and software that have applied during the past ten years.

■ **GSM** has been the primary driving force behind the global growth in the number of mobile telephone subscribers. The GSM standard has been adopted by all countries in western Europe and is now on the way to becoming the predominant digital technology in countries outside western Europe.

There are good prospects that the new personal telephony operators in the U.S. will select the European standard based on GSM when they open their networks in 1995 and 1996.

■ Three competing alliances have been formed among international teleoperators. Each is trying to position itself on the market for "one-stop" international tele contracts with companies. The three alliances are **Concert, Worldsource/Unisource** and **Atlas**.

■ Growth in the global telecommunications market slowed sharply during 1993. Figures released by ITU show that total sales of tele equipment and tele services amounted to USD 575 billion, corresponding to an increase of only 1.8 percent, compared with 1992. The high point for the industry was the strong growth in mobile telephony, where the number of subscribers rose a full 47 percent during the year!



New columnist in Contact Kjell Eriksson will participate in Contact with a column covering major events in the Telecom World. Kjell works within Business Intelligence & Marketing Competence at Ericsson Telecom.

Collaborative venture with Stanford University

Ericsson has joined a collaborative venture with Stanford University as a member of CIS, the Center for Integrated Systems. The Center combines academic and industrial R&D in the key areas of information technology and microelectronics.

CIS members currently include fourteen different companies. Ericsson is the third European member. Other members include Texas Instruments, Hewlett-Packard and IBM.

CIS, part of Stanford's School of Engineering, concentrates on the conceptual design and feasibility of various systems, including software, CAD, design tools and the technology and manufacturing innovations necessary for the development and production of advanced new products.

The benefits of Ericsson's relationship with CIS are expected to be evident across all areas of the company's products, particularly those using wireless communications technology. The participation in CIS is being coordinated by Ericsson's Microelectronics Research Center.

(see also article on page 18)

Ericsson Data sells services to Atlas Copco

Atlas Copco has signed an agreement with L M Ericsson Data to outsource the group's data processing departments. The contract entails the immediate transfer of 12 data consultants to Ericsson Data, which will sell data consultancy services worth about SEK 30 million over three years.

"We view this agreement as a natural step in our IS/IT partnership with L M Ericsson Data AB," says Atlas Copco controller Lennart Johansson. "We now gain access to additional competence in the strategically important IS/IT area, while increasing our ability to concentrate our own resources to Atlas Copco's customers and core business."

L M Ericsson Data has about 1,000 employees and annual sales of approximately SEK 1.3 billion. The company has been Atlas Copco's principal supplier of DP operations and services for the past three years.

The new contract now broadens this cooperation in IS/IT.

Mobile multimedia to meet user needs

An unusual lab is taking shape at Ericsson Radio in Kista. Staff at the new lab, which is devoted to mobile multimedia, includes a psychologist whose task is to find out what users really need. "User requirements, not technology, must guide development," assert the visionaries at the User Applications Lab.

What are the possible applications of telecommunications? This is the question posed at Ericsson's newest research lab, the User Applications Lab (UAL) in Kista.

The research lab where user needs, not technology, guide development

Four projects have now been started which indicate the direction of future efforts: mobile multimedia, the mobile office, the personal assistant phone, which is a personal telephone capable of controlling various types of communication, and mobile electronic mail.

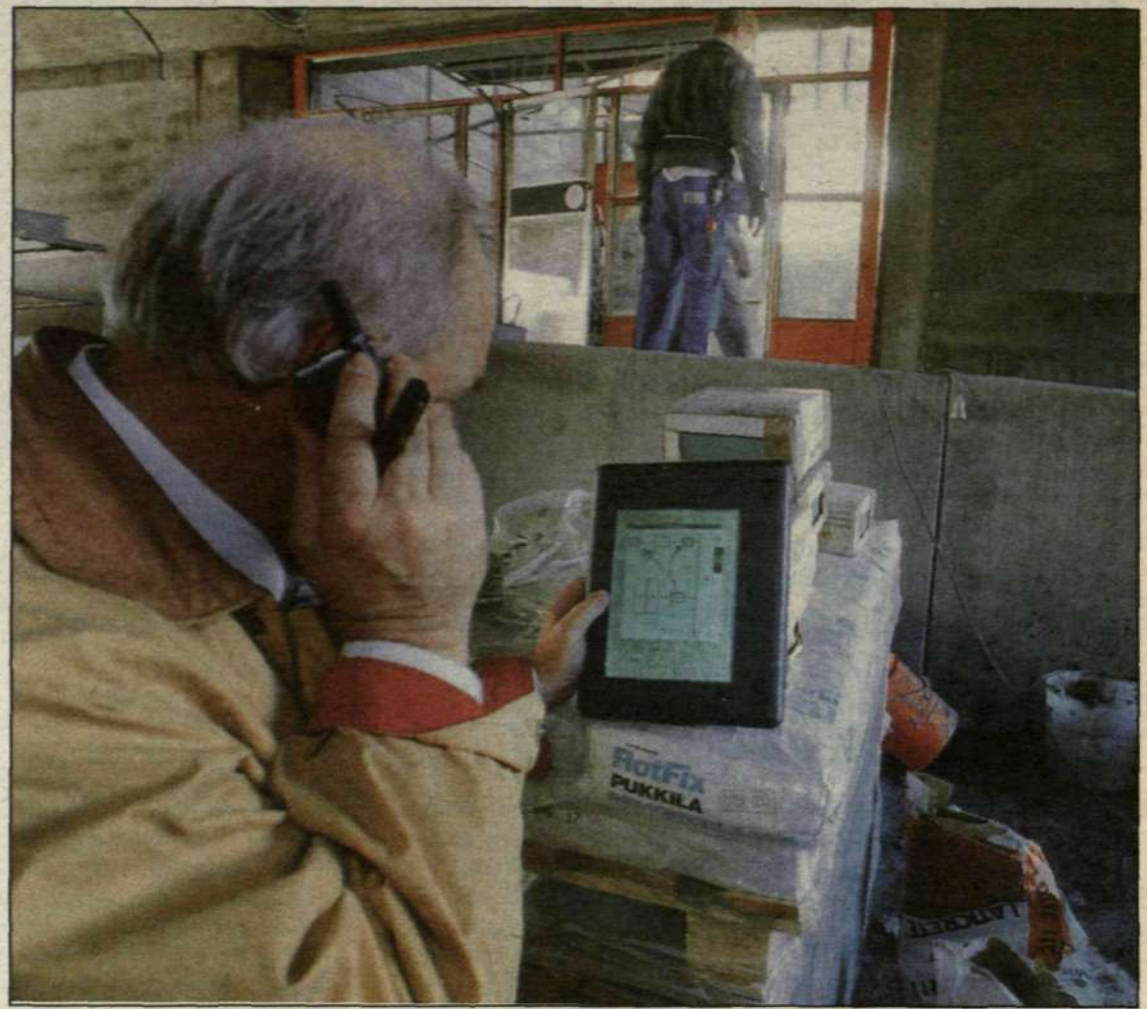
A mobile perspective

Mobility is a common ingredient, which is why the lab is part of the Radio Communications business area. The nine researchers have varied backgrounds, however. Several have worked with AXE. One comes directly from IBM, while others include a former Digital employee and a former employee of Swedish operator Telia, as well as a psychologist. Jan Swerup, who heads the lab, is the only one who has previously worked with radio communications.

The group's heterogeneous nature is viewed as a strength. Each staff member contributes unique skills to such far-reaching projects as mobile multimedia.

Working together

"We start from the user's situation and try to identify ways to make today's sophisticated telephones, computers, etc. work together in a simple manner," says Jan Swerup. "Thus we do not work with futuristic products, but rather with technology that is now or will soon be available."



REMOTE COLLABORATION. Ericsson's latest research lab is now developing multimedia technology for mobile users, such as a construction site supervisor. Using his portable computer, he can communicate with the architect at the head office, view blueprints on the screen and together with the architect directly manipulate the on-screen image.

UAL's task, however, is not to design new products but to develop prototypes, test and evaluate. The overall objective is to gather and make available knowledge about how to make products that mobile users need.

As in so many other cases, the driving force here is that the telecommunications market is in such a rapid state of change that opportunities for new products and services are being created every day.

Perfect product

What are the characteristics of a perfect multimedia product? Perfect, that is, for both mobile and stationary users, because in the most typical case, a mobile user will probably be communicating with a stationary user.

Consider a construction site, for example. A supervisor may have a problem that he needs to discuss with the HVA engineer and the architect at the head office. He may need a portable computer on which he can view blueprints. Perhaps he has a camera connected to the computer so that the architect at the head office can visualize the problem and understand exactly how it presents itself at the construction site. These are only a few possibilities.

Identifying problems

This is but one of the scenarios with which the lab's "visionary," Björn Jonsson, is working.

"We are looking at how telecommunications can provide assistance in practical situations. We identify a problem and try to consider it from the user's perspective," says Björn.

Freedom of choice

Another example is that both the sender and the recipient of a message should be able to choose the most suitable medium. Technology should create freedom of choice, not present obstacles. If it is most practical for the sender to send a message via e-mail and for the recipient to view it on a pager or hear it as voice mail, then this should be possible.

Today's telecom market is extremely diversified, with many different networks and operators.

Electronic assistants

"The solution may be that we need to develop applications as electronic assistants that are separate from the existing networks," Björn Jonsson explains. "These assistants then make use of what each network best provides and combine various network services in a package that suits the individual user."

Assistants can be made available by service providers who function in a manner similar to travel agents, who put together a package consisting of travel, hotel, rental car, etc. in accordance with the customers specifications.

But how do we know if this is what mobile multimedia users really want? Here UAL has entered virgin territory where there are no accepted methods except common sense for determining what the requirements are.

UAL will make use of reference groups. Initially these will consist of staff members plus a few other selected individuals, but eventually larger groups will be used.

Different users

There are also many different types of users, and one of the first tasks is to chart how people work. Where are users located? How much equipment can they carry? What supporting technology is required? How is the telephone used? How do different users organize their work?

The list of questions seems endless.



TECHNOLOGY
LARS CEDERQUIST



The interior of the EMC laboratory looks like something inspired by a space epic.

Photos: Peter Nordahl

Lab of the future opened

"Let the show begin," said Elmetel president Örjan Mattsson as he cut the ribbon to inaugurate the new EMC laboratory in Älvsjö on August 31. The lab equipment will guarantee that Ericsson's electronic products will meet future EU standards for electromagnetic radiation.

The show began when Elmetel's president pressed the magic button, and the fantastic new lab suddenly came to life.

The interior could be taken from a Star Trek film. The walls are covered with a dark green material designed to absorb electromagnetic radiation. In the middle of the room there is an antenna that would look right in place on a spacecraft. In front of the armored door there is a rotating platform on which the test object is placed, with a video camera in the corner monitoring the entire process.

"The laboratory has cost several million to build, but it is money well spent," says Örjan Mattsson.

Mats Timgren, who was project leader for the new lab, relates that the new broadband switch being developed by Elmetel requires this test equipment.

"It is extremely important that we can conduct the EMC (electro-magnetic compatibility) tests as early as possible in the design process," says Mats. "The new EU regulations also place increasingly stringent demands on suppliers with respect to safety."

The classic example is the man who was run over by his own car. He intended to open the garage door with a remote control. The door failed to open, and instead the car started.

This may seem to be an amusing story, but the fact is that it is essential to ensure that the products Ericsson sells meet high safety standards. They must not emit improper electromagnetic radiation, nor may they be affected by such energy. An EMC laboratory is required to meet these demands.

Welcome addition

The new lab is a welcome addition. "Having this equipment in the building, within easy reach of design engineers, is a real benefit," says Per Sjöberg, who worked closely with the project. "EMC testing is essential in designing the complicated systems with which we work."

One of the driving forces behind the project has been Helge Bodahl-Johnsen. He explains that the laboratory fulfills two important functions, which are to generate and register electromagnetic energy fields.

By subjecting an object to va-

rious types of energy fields, it is possible to study how the object will behave in a practical situation. Similarly, it is possible to measure the strength of the electromagnetic field emanating from the object and its propagation.

Up to one ton

The test procedure is that an object, usually a cabinet or a rack, is placed on the rotating table, which can take weights up to one ton. When the test object is in place, the power is turned on, and with the help of an antenna and a computer, the electromagnetic radiation generated by the object can be registered.

The object can also be rotated in order to provide information about where the radiation is strongest. The computer registers the intensity of radiation over a range from 30 megahertz to 18 gigahertz.

It is also possible to measure the object's resistance to interference by letting the antenna send out a powerful electromagnetic field with given characteristics. The room is fitted with signal attenuation equipment in the walls, floor and ceiling so that reflections will not distort the measurement.

The computer puts out a magnetic field according to the instructions it has been given during which time the test object's reaction is measured.

Lars-Erik Wretblad



Testing is directed from the control room. Using a computer, it is possible to create various types of energy fields around the object being tested and observe how it reacts in a given situation.



Elmetel president cut the ribbon at the inauguration of the new lab. Also shown are suppliers Lennart Hallberg, Ce-Bit, Martin Wiles, Rantec, Leif Gillgren Ce-Bit and Hanna Leena Mäkitalo, Euroshield.

Creating tailor-made telecom networks is an Ericsson specialty. Our ability to meet customer requirements is one of our most important competitive advantages. To achieve the anticipated end result requires a large amount of work in the project-planning phase. Now we are introducing a new tool to assist with this work. Ericsson Support System, or ESS, which was developed at Ericsson Network Engineering Ltd (now Ericsson Communications) in Singapore, enables us to offer customers the guaranteed best solution in every single case.

ESS makes its mark

Imagine being able to dramatically reduce the piles of paper, being freed from the need to refer to materials catalogs and price lists, no longer having to draw up a detailed plan of every node in a network project. Why not let your computer do the work instead?

After five years of development and subapplication trials in the field, ESS is now fully operational and provides a powerful support tool for projects such as the SEK 1.2 billion network construction project Ericsson has just embarked on in Lebanon.

Three stage rocket

The ESS concept could be described as a three-stage rocket. At the initial project-planning stage for a telecommunications network, the operator enters all the cartographical information into the computer, which converts all the information into digitalized data.

Stage two involves inputting a tentative network layout. The computer then suggests a network design suited to the actual project location.

During stage three, the construction phase, the system continues to monitor and update all information as work proceeds. After completion of the project, the system generates detailed documentation ready for handing over to the customer.

Digital drawing tables

In the Network Engineering unit at Ericsson Business Networks AB (EBC) in Sundbyberg is a room equipped with several tall drawing tables and a few compu-

ter workstations. Here is the secret of ESS' capacity to handle intricate details. For the drawing tables are not just any ordinary drawing tables. These are digital drawing tables that permit cartographical information to be stored in the system. Map after map is spread out on the tables and entered in the computer's coordinate system with the aid of an advanced type of mouse pointer.

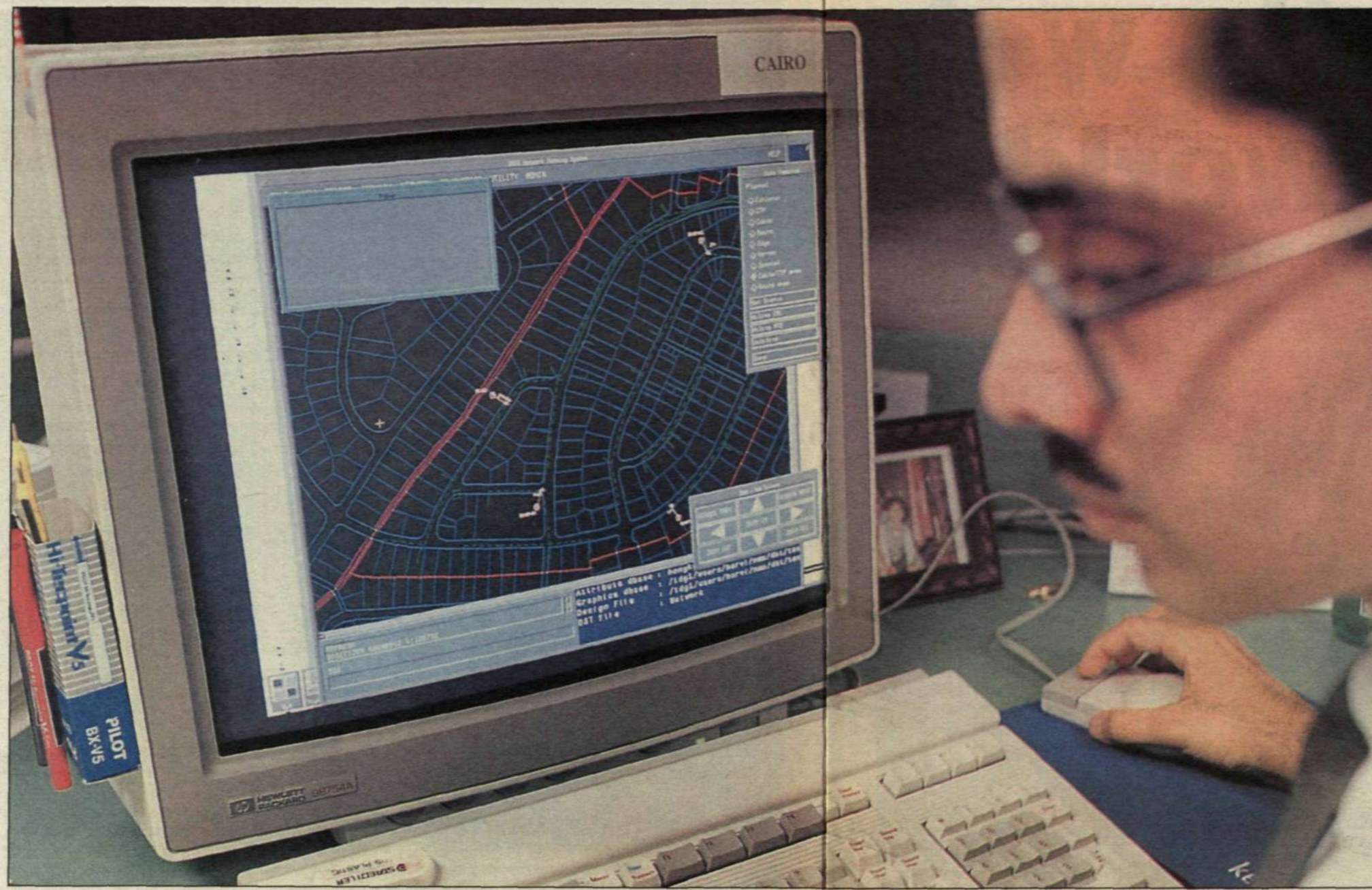
Data input

Already at this stage, the computer is being informed which lines on the map represent roads and which represent the walls of buildings, railway tracks, lakes and so on. The data input thus contains substantially more information than a mere graphical image of the area.

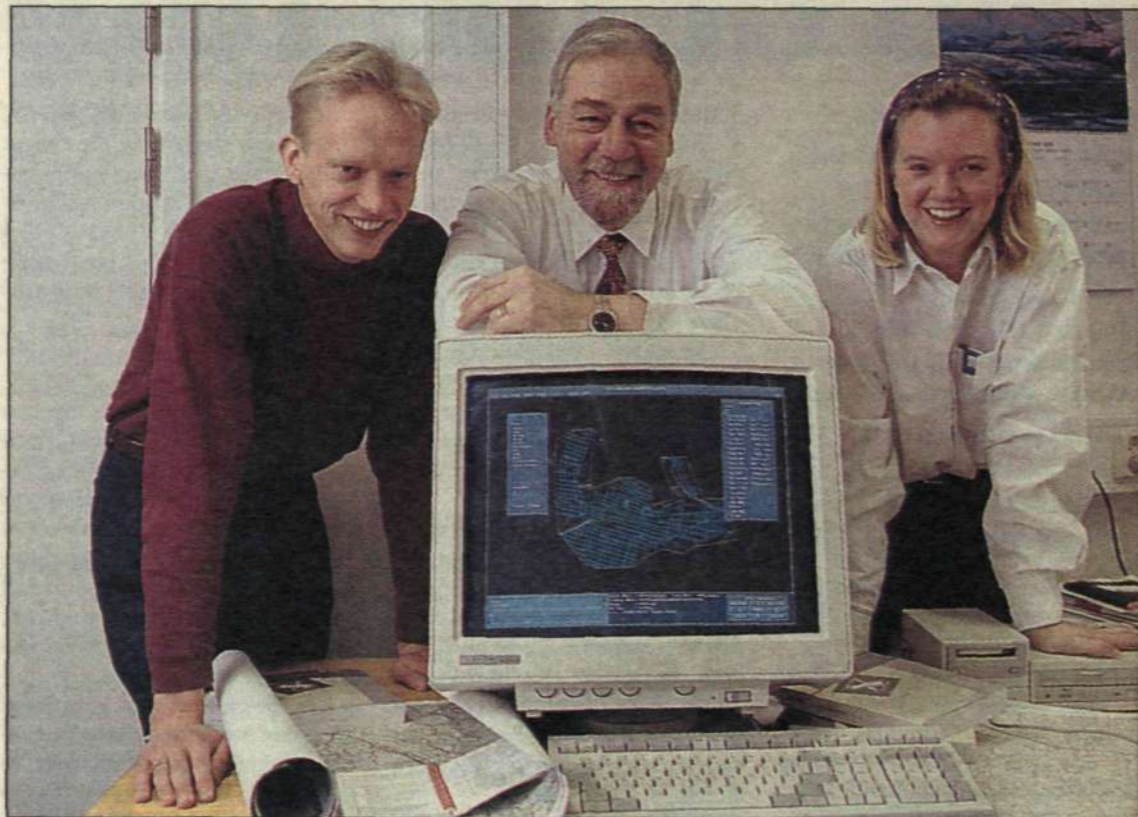
Lars Wahlgren is ESS system coordinator. Lars and his three colleagues Henrik Broén, Johanna Lidesjö and Krister Johansson make up the Application Technology unit, a support function within EBC's Network Engineering division. The Swedish unit serves as a resource providing support to ongoing projects in the field worldwide. It is also involved in project-planning work in Sweden.

Internal marketing

Another important task for Lars Wahlgren is internal marketing of the ESS help service. People throughout the organization need to be aware of the system so that appropriate use is made of it. Experience gained from practical application of the system will be continuously evaluated. Lars al-



Ericsson Support System (ESS) enables project planners to focus all their efforts on finding creative solutions to difficult problems when working on a telecommunications project. Every detail of the network,



Henrik Broén, Lars Wahlgren (system coordinator) and Johanna Lidesjö make up the support function within the Network Engineering division of Ericsson Business Networks. ESS helps them provide field support to telecommunications projects worldwide.

so handles coordination between his unit and the unit in Singapore, which is responsible for further development and fine-tuning of ESS.

Optimal solutions

"One of the main benefits of ESS is what we call optimization," reports Lars. "The customer always gets the best possible solution at the lowest possible price. The computer operator can access databases containing lists of materials, prices, and - most im-

portantly - all the basic engineering rules and rules for selecting materials in a network construction context. Once the maps of the project area have been input, the system has all the information it requires to rapidly work out a network solution."

The solution proposed by the system incorporates a level of detail extending right down to the individual subscriber, and is the best possible solution in 99 percent of cases. The exception can occur when there are factors

the computer is unaware of, such as major variations in height. But the computer essentially takes care of all the 'donkeywork' of routine calculations.

"The systems engineers' capabilities are freed for creative work," emphasizes Lars. "The human resources can be concentrated to the task of finding creative solutions to difficult problems during a project, such as borderline cases where the computer's suggestion may not necessarily be the best".

from a telephone switch down to an individual subscriber's telephone jack can easily be displayed on screen.

While the computer's suggestion may be a cost-effective solution, factors other than price can sometimes be more important.

"We still have a little way to go before we incorporate three dimensions. The computer does not calculate depth, so it can happen that it suggests laying copper cable across a ravine, where a radio link would be more suitable", Lars adds.

Updates easy

The computer's memory contains every detail of the network, from large telephone switches right down to the individual subscriber's telephone jack. There is never any problem with having to remember what cables were buried or equipment installed.

It is also extremely simple to update information as work proceeds. Any changes that are made to the original drawings are incorporated automatically, without the need to do any manual drawing. The documentation that is delivered to the customer is in all respects "as built," meaning that it corresponds with reality in every detail.

Refining the concept

Needless to say, one of the most important tasks for the group at Ericsson Business Networks is to cooperate with the Singapore company to continue developing and refining the ESS concept.

New functions have recently been incorporated into the system, enabling it to include radio links and transmission sections between telephone switches. The

objective is that, within a few years, ESS should provide comprehensive coverage of everything the Ericsson Group can produce that can form part of a telecommunications network.

Time-consuming work

"Another major challenge is the project to investigate the feasibility of scanning in cartographical information in future, instead of inputting it manually as at present," explains Henrik Broén of the Application Technology unit.

Using the mouse pointer to enter information is time-consuming work and requires additional equipment in the form of a drawing board. However, it is by no means a simple matter to enable the computer to interpret graphical information and scan in an image in which different lines mean different things.

Perfectly matched

With the backing of support systems like ESS, it becomes much easier to achieve our ambition of meeting every single customer's specific requirements.

As long as we use Ericsson Support System for all our project-planning work, we can be sure that all conceivable Ericsson products and design solutions will be perfectly matched to their intended application.

Of course it is also possible, by extension, to gain some pointers regarding the direction product development should proceed in and the customer needs we shall be trying to meet in future.

Karl Malmström

New network solution with AXE

Early in 1995, Ericsson's customers will have access to a new, powerful generation of products - AXE Transgate 2. The name is a collective designation for a package of applications, products and services which together provide a total network solution for the customer.

Included in the network solution are such features as IN (Intelligent Networks, which can handle services such as setting up a collect call when the caller dials 020), ISDN, advanced transit applications for both international and national applications, and systems that enable the network operator to give personal service to end-users.

Generates income

"The system makes it possible to create attractive, competitive network solutions, which in turn make our customers more competitive and help them generate more income," explains Björn Hemstad, manager of the Network Services Systems Business Unit at Ericsson Telecom.

As deregulation of markets proceeds, competition between telecom operators becomes keener. Several trends are clearly evident in the telecoms sector:

- Flattening out of network structures and creation of a more powerful class of transit switches (switches that handle traffic between different regions, countries or networks), resulting in more robust networks
- Increased competitiveness for network operators, who can offer a wider range of services and increasingly customized services.

Creating new services

"It is vital for us to be able to supply efficient, cost-saving network solutions that allow us to rapidly create new services for our customers. It is a prerequisite for our own success that we should enable our customers to operate competitively and profitably," says Björn Hemstad.

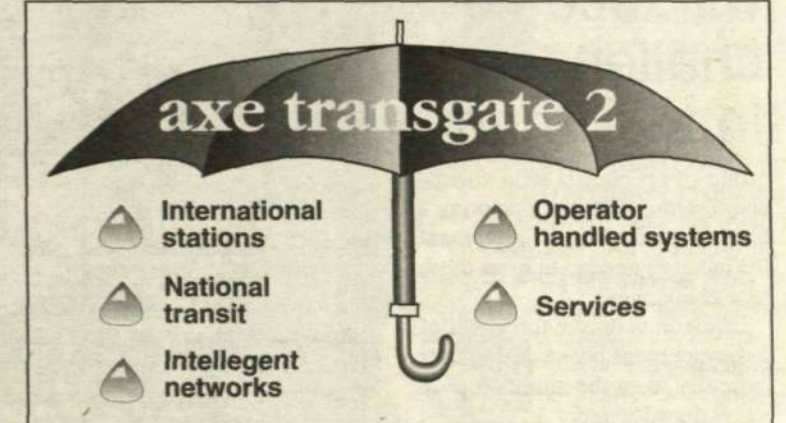
Lars Erixon, project coordinator for the launch of AXE Transgate 2, describes the proposed sales strategy: "We aim to capitalize on the capabilities of AXE Transgate 2 by selling upgrades to existing customers and focusing on new operators."

Cooperative venture

The launch started in autumn as a cooperative venture involving the Network Services Systems business unit, Ericsson Telecom's marketing units and local companies throughout the world. The objective is to create aware-



With high expectations before the launch of AXE Transgate 2: From left to right: Lars Erixon, Kjell Persson, Björn Hemstad, Anneli Sjögren and Anders Blomgren within Business Unit Network Services Systems. Foto: Joséphine Edwall-Björklund



AXE Transgate 2 collects a number of applications, products and services in a total solution for the customer's network under a common "umbrella".

ness of the product in the market and improve the level of knowledge within the sales companies about the capabilities of AXE Transgate 2.

"The local companies take care of sales, so we must give them the best possible support and information at every stage of the process," says Lars Erixon.

Customer satisfaction

Anneli Sjögren, project leader of the pricing and packaging project that is part of the run-up to the launch, comments on pricing strategy:

"Our price-setting strategy must reflect the change from hardware-oriented products to the increasing focus on software, which places a premium on customer satisfaction."

In the international switching segment, half the total number of switches in the world were sup-

plied by Ericsson, and the company has achieved extremely wide coverage of the IN segment.

Unique platform

"AXE Transgate 2 is a unique platform," comments Kjell Persson, head of Project Management. "It can handle a number of applications that can be freely combined using the same software. This facilitates operation and maintenance and simplifies subsequent system upgrades."

Many of Ericsson's customers are already aware of the new product release, and substantial orders have been received from several major operators. In Sweden, the recently privatized Telia (formerly the state-owned Swedish Telecommunications Administration) has registered its interest.

Marle Håkansson and Joséphine Edwall-Björklund

Network Services Systems

The unit's area of responsibility is the production of competitive systems and products for designing well-structured networks and advanced network services. The product portfolio includes:

- AXE for international and national transit applications
- Intelligent Networks
- Operator Services
- STP Signaling Transfer Points
- Local Stations for the North American Market

The spider in its web in a complex world

As a result of the increasingly deregulated telecommunications market, where the customer can choose among a number of independent telecom operators, we are facing an entirely new market situation. This in turn has brought major changes for Ericsson.

"This development has forced us to think along entirely new lines," says Ulf Holm, who has worked in project management for several years. He heads a

Product managers will face new challenges in the future

group of specialists who will be cooperating with the company's product managers to implement the changes needed to meet these new challenges.

Ericsson is on the threshold of a development phase that differs radically from the situation only a few decades ago.

"In those days, we were normally dealing with a single customer exercising a monopoly within a given market," explains Jan Gustafsson, who has extensive experience of Ericsson technology.

"Previously, we could sell telephone systems that would just sit there for 50 or 60 years performing the same function for the customer. But new technology has brought an explosive expansion of capabilities, changing everything."

Long-term planning

What impact will this changed work situation have on Ericsson employees?

"Now we shall have to put more effort into long-term planning and be even more sensitive to developments," replies Ulf Holm. "We have to be able to demonstrate that our products are profitable for the customer as well as being profitable for us."

"We also need to be 'on the ball' in the sense of moving more quickly on crucial and difficult strategic decisions. If we allow ourselves to 'travel a bit further up the road' before committing ourselves, we risk delays and misdirection of valuable resources."

In that case, how do you manage to 'look into the future'?

"By better information-gathering and a better dialog between



Members of the group working with Ericsson's product managers to ensure that the company continues to offer its customers saleable, state-of-the-art products. Seated, from left to right: Anna Hellvik, group leader Ulf Holm, Birgit Jansson. Standing, from left to right: Peter Baladi, Mikael Thulin, Jan Gustafsson and Jarl Höglund. Photo: Photo: Josef Benkovic



"The deregulation of the telecommunications market has forced us to think along entirely new lines," says Ulf Holm.

departments," answers Peter Baladi. "We have to develop tools and work practices that support global coordination. The sooner we start the preliminary studies, the more rapidly and economically we progress subsequently."

Fewer variants

Jarl Höglund, whose background is in developing business strategies, underscores that the Group needs to become increasingly business-oriented.

"We must become more skilled at analyzing and prioritizing

market segments. We also need to be better at concretizing both stated and unstated customer needs."

Jarl Höglund goes on to observe that Ericsson could benefit by reducing the number of product variants and selling more standard products instead, since this would in turn hold down service and maintenance costs.

Jan Gustafsson reinforces Jarl's view: "Above all, we must ensure that old products are replaced. We also need to have better control over a product's entire life-cycle. Product maintenance costs can be substantially reduced by limiting the number of existing generations of a given product type."

Clear role

Ulf Holm takes up the theme: "In our complex world, the product manager is like a spider in its web. It is essential to make the product manager's role clear. Those who are going to be making recommendations and taking decisions in future about the products Ericsson should focus on need to have a very clear understanding of their role."

"The product manager needs to have an explicitly stated ordering role. Nobody should be able to start development work until

detailed decision protocols, covering both the technical and the commercial aspects, have been produced."

Specifications

A complete set of requirement specifications must be available, so that everyone is aware of the extent to which the product is capable of meeting the original customer requirements. 'Customer-friendly,' easy-to-grasp product descriptions should also be available to potential new users.

In addition, the person selected as product owner should be given responsibility for the pro-

duct's profitability for the next five or ten years of its life.

"The product must remain profitable throughout its life-cycle," affirms Ulf Holm.

Guarantee

But won't all this emphasis on profitability have a negative impact on the customer? In other words, won't the customer be disappointed?

"Certainly not," says Ulf Holm emphatically. We make a profit by making our customers happy. Our efficiency is the customer's guarantee of a secure future with us.

Lars-Erik Wretblad

Better product managers key to more efficient work

Shorter lead times, time-consciousness and improved delivery precision have long been constituents of efficiency-enhancing programs. The next important part of the process is to improve the functioning of product management by applying the Product Management Process.

Product managers will increasingly have an even more central role in our company's operations than ever before. These changes naturally impose new require-

ments on our organization and our IS/IT system.

Within the Public Telecommunications Business Area, the group profiled in the accompanying article act as a catalyst to implement the Product Management Process. They also serve as a sounding board vis-à-vis the Radio and Business Communications Business Area and the Networks Business Area. The process owner in charge is Thomas Ivarson of LL/N.

We are here to sell!

Following a number of intensive months in the U.S., former director of technology Bo Hedfors admits to following in part a new belief. The man chiefly responsible for Ericsson's activities in the United States now allows "the market" more than any other factor to direct him in his everyday actions.

"When we form a major local company (MLC), we must be clear about why Ericsson is in the U.S. We are here to sell - our products, our services, our name and what we stand for!"

Some time ago, Business Week magazine described Ericsson as "the hottest player in telecommunications." This naturally places the company under an obligation but is also proof that Ericsson is becoming increasingly visible - even in the American theater of operation.

"But we have a long way to go before we are really well known as the leading international telecommunications company that we are," says Bo Hedfors. And it is because Ericsson needs to strengthen its corporate image that virtually all of the company's U.S. operations are now being reformed within one company. The new unit will be a complete Ericsson company, capable of offering all customer categories complete solutions.

"We are progressing wholly according to plan in the establishment of our new MLC. During the months which have passed, I have become convinced that the time really is ripe for such a move. My predecessors implemented the important task of preparing Ericsson's various operations for this change. This has included selling-in our corporate culture and Ericsson's common values to American customers.

Commitment

Contact spoke to Bo late one afternoon at the beginning of October. He had just returned to his provisional headquarters at Ericsson Network Systems offices following two days of presenting the new company's corporate message to 200 senior managers in Ericsson's U.S. organization. He is tired but obviously pleased with the fantastic response he received during the meeting.

"We have formulated three cornerstones for our new company, of which perhaps "Commitment"

Hedfors guides Ericsson right in the U.S.

is the most important. That is why it is very gratifying to note the strong commitment among those colleagues whose job now is to enthrone the remaining 4,700 employees to the concept of one common Ericsson company serving the U.S. market."

Customer focus

The second cornerstone for the new company is "Customer focus." Bosse Hedfors is clearly aware that the American market is one of the most demanding in the world. The market is characterized by rapid development and new products and services often undergo their baptism of fire in the U.S.

"To maintain our position over here, we must constantly focus on our customers, demonstrating to them the whole time that by working with Ericsson they can make money. To date, we have been quite successful in this respect, but we have to increase our efforts even more during the years immediately ahead, when completely new areas of the telecommunications field will be open for exploitation."

Bosse names multimedia and personal telephony as clear examples of how the U.S. market drives suppliers ahead

of itself in the race for new business.

Through the new company, Ericsson will present just one face to the market. This is the core point of the new organizational model presented by Lars Ramqvist in Sonthofen in 1990 and which led to the establishment of the Major Local Companies concept in Ericsson's main markets.

"The 'Sonthofen Model' is the third cornerstone in the construction of our new company," says Bosse. According to his interpretation of the model, this implies that the organization should be built up so that success - and failure, for that matter - can be measured at all levels!

Enormous

potential

When the new organization is properly up to speed in 1995, it will be a significantly strengthened Ericsson that is active in this the world's largest telecommunications market. "Here, there is enormous future potential," underlines Bosse.

"Where formerly we had several different companies conducting their separate operations, a new, united Ericsson will enable us to benefit from the combined size and

resources of the entire Group. For example, our professional sales teams in the land mobile radio area can give Motorola a completely different match now when they have the support of a multi-million-dollar company behind them!

"We know that our existing customers perceive the change in a very positive light. Many have asked us why haven't made this move a lot earlier, but I am convinced myself that we were correct to wait. The right time is

now. Today, the entire organization is behind this vital step!

Finally, Bosse couldn't help but express his admiration for the work completed to date to launch the new company.

Inside job

"It feels really satisfying to have handled everything ourselves, without having had to call in external consultants. There is so much know-how and motivation at our disposal that we didn't need to go outside the company for help!

"Another major advantage is that it is always easier and quicker to get things done when people have been involved in the creation of a project. We met an incredibly professional and motivated team at the kick-off meeting," noted Bosse.

"I am grateful to inherit the good work already achieved by my predecessors here. We now intend to focus our efforts 100 percent on continued teamwork and the development of a network between the various parts of Ericsson here in the U.S."

Lars-Göran Hedin



The new U.S. company will provide Ericsson with significantly improved visibility in the market. Other comparisons aside, perhaps the Ericsson logo will eventually become as synonymous with Sweden as the Dalecarlian horse. Photos: Lars-Göran Hedin and Jack Radgowsky

A winner from the start



Hopefully, the new U.S. organization is more seaworthy than the home-made craft that Bosse Hedfors' team assembled for the Texas Olympics. But the vessel somehow crossed the pool . . .

In early October, Bo Hedfors summoned the top 200 executives within Ericsson's U.S. organization to the 1994 Ericsson Texas Olympics. The event marked the kick-off for the Group's new U.S. organization.

On January 1, 1995, the last piece of the puzzle will be in place. Virtually all operations will then have been organized within Ericsson Inc. - which becomes one of Ericsson's Major Local Companies.

Bo Hedfors launched the new U.S. organization

The U.S. was Ericsson's largest single market in 1993. Major successes in the areas of mobile telephone systems, land mobile radio and mobile telephones, combined with AXE deliveries and upgrades, resulted in sales of USD 1 billion last year. However, sales were dispersed among several companies.

Despite the U.S. having for years been one of Ericsson's absolutely key markets, the Group has yet to form a "united front" there. This is about to change. A new epoch has begun for Ericsson in the U.S.

Rapid build-up

The guidelines for Ericsson's new U.S. organization were formulated as late as May this year. At that time, Bo Hedfors was assigned by Ericsson's corporate management to carry out a total reorganization during the remainder of the year, if possible. January 1, 1995 was the target date set for starting up the Major Local Company, within which the operations of the U.S. companies would be integrated.

"The U.S. is a country where things happen quickly, so it was no problem enlisting the support of the various company heads," Bo relates.

He established an "MLC Creation Team," using some of the key persons in the U.S. operations: George Fath, Joe Hagan, Ron Kirchenbauer, Mike Margolis and Anders Torstensson. The next step was the establishment of six sub-groups for a like number of key areas: legal-



The mood among 200 U.S. managers summoned to the Texas Olympics kick-off meeting was upbeat. Nor was there any lack of will to win.

/finance, communication, organization, financial systems, localization and TQM.

Firmly anchored

During this process, the business areas, business units and Group staff functions in Sweden have been kept informed and consulted. Lars Ramqvist is chairman of the steering committee, which is the ultimate supervisory group for this work.

The kick-off in Richardson, Texas, October 3 to 4 was the prelude to a broader anchoring of the new organization. The 200 top managers in the U.S. companies were assigned the task of introducing the new organization, its vi-



With teamwork and effective networks bridging former corporate boundaries, Ericsson is setting its sights on winning the vast American market. The Texas Olympics was a good start for the creation of the new U.S. association.

sions and purposes, to Ericsson's 4,700 employees in the U.S.

Clear vision

"From the beginning, our work was based on a simple but forceful vision: That Ericsson in the U.S. shall be the unquestioned choice of our customers and our employees!" Bo recognizes that such a vision is considerably more difficult to realize than to formulate!

"But this is the goal that Ericsson must attain to continue being an important player in this market, which probably is the most demanding in the world.

"The U.S. market is in constant transition. An intense global competition prevails among the opera-

tors here. The pulse of the market is very fast-paced - speed is a characteristic that the market prizes highly. Consequently, Ericsson must now concentrate its resources on becoming even faster in devising the solutions customers seek."

Complete program

One of Ericsson's strengths in the U.S. is its ability to offer customers a complete product program. This advantage becomes more obvious as Ericsson begins showing a single face vis-a-vis its customers. The new company's production encompasses Land Mobile Radio, radio base stations and mobile telephones from

Well positioned

"Overall, Ericsson is positioned very advantageously in the U.S. market. We have benefited from

Lynchburg, Virginia. In Richardson, Texas, AXE exchanges and software are developed for the American market, and Cypress, California is the center for subscriber exchanges (PBXs). Ericsson Components' American company in Richardson sells energy systems and components to U.S. operators, but also to other telecom manufacturers such as AT&T, Northern Telecom and Tellabs. All these various operations are now integrated into one company.

an upward trend, particularly in the mobile segment. Ericsson has a third of the mobile telephony market and has secured a real foothold in land mobile radio and mobile data.

"We were the first to make digital mobile telephones available to the market here, and since then, we have created a strong position," Bosse continues.

Creation by stages

At year-end, the retraining and merging of the Ericsson companies will be complete. This will be a multi-stage process.

First, Ericsson Business Communications, EBU, was merged with Ericsson GE Communica-



The groundbreaking for the new research center at Triangle Park was celebrated with customary American pomp and ceremony.

A center for development

Ericsson is often confronted with the U.S. market's own particular requirements. There, for example, the preference is for customized standards, with own proprietary specifications for telephone equipment. Accordingly, most of Ericsson's systems, products and services must be adapted to the U.S. market. This is the main task of Ericsson's different development centers in North America.

In the U.S., development operations are quite widespread. The four largest units are located in Lynchburg, Virginia; Raleigh, North Carolina; Richardson, Texas and Cypress, California. In addition, the development centers in Toronto, Canada and Saltillo, Mexico maintain an intensive cooperation with their U.S. colleagues.

Development work in the radio area are concentrated to the Lynchburg plant and at Research Triangle Park in Raleigh. Richardson is the center for AXE and

AXE applications. Business communications is the specialty at Cypress on the U.S. west coast. The cooperation that already existed between the different units is now strengthened through the formation of a common U.S. company.

The most rapid growth is at the development center at Research Triangle Park. Operations there have grown considerably. On September 19, the groundbreaking took place for a new research center, which will be the new premises for the present workforce of 330 persons, and a few hundred more. To date, Ericsson made do with rented premises, but now a three-story, 15,000-m² office complex is being created.

When the new center is completed in 1996, Triangle Park will be the center for all of Ericsson's radio operations in the U.S.

The theme of the inauguration, "Together we can," was well-chosen according to Bosse Hedfors in his concluding remarks at the ceremony.

"Together we can lead the telecom industry into the next century." LGH

sole market responsibility for Ericsson in the U.S.

"Two companies will remain outside the common organization. These are The Ericsson Corporation, TEC, in Washington, DC and New York, and Ericsson Messaging Systems (EMX) on Long Island, New York. TEC monitors Ericsson's interests vis-a-vis the U.S. authorities and maintains a central purchasing function for Ericsson in the U.S.

"Ericsson Messaging Systems will establish an image as an independent software company in the U.S.," Bosse concludes.

Text and photos: Lars Göran Hedén

Challenges in many areas

The U.S. market offers many exciting challenges to the new Ericsson company. This was established beyond dispute when the responsible managers for the various business segments reported on their respective areas.

Business Communications

"Presently, we are focusing on multimedia and mobility," Hans Lillebye relates. He regarded FreeSet, in the form of the DCT 900 and DCT 1900 systems, as one of Ericsson's major opportunities in the U.S. just now. With momentum provided by the mobility of the office, MD110 market shares can be increased.

By virtue of Business Communications having now become considerably larger, with operations more geographically dispersed, Ericsson's business exchanges will, simultaneously, secure access to improved, expanded distribution channels.

"A very positive cooperation has been entered into with Land Mobile Radio, and represents an approach we also intend to test with other business segments."

Mobile telephones:

"Mobile telephones have become a major item in the U.S.," explained Anders Torstensson. Ericsson's goal in this area is to establish itself as a large, quality supplier of mobile telephones for both cellular systems and personal telephones, PCS. Today, Ericsson is the third largest supplier of mobile telephones, with its sights set on capturing 25 percent of the market by 1996.

"Growth in the analog networks is at an annual rate of 8 million subscribers worldwide, with next year's digital-system market projected at about 1 million. To maintain our position in such an expanding market, Ericsson is increasing manufacturing capacity in the U.S. by 100 percent this year, and will double it again next year."

Components:

"Energy systems and microelectronics have good markets in the U.S.," Torbjörn Folkebrand related. "Ericsson's micro-components are sold to most of the major manufacturers, with AT&T and Northern Telecom in the lead. Many companies also buy laser modules for wide-band from Components, and the same applies to RF transistors and radio base stations."

"And today, we are also the sole supplier of energy systems to MFS Communications."

Land Mobile Radio:

George Fath was proud of the strong contest Ericsson GE in Lynchburg had provided Moto-



The U.S. market offers exciting challenges in all areas.

rola in one of the competitor's core areas. Starting at zero in 1988, Ericsson Land Mobile Radio Systems has now captured more than a third of the market.

"To date, procurement of the new generation digital police system has been under way in 10 countries. Nine of these chose Ericsson, none Motorola."

Fixed telecommunications networks:

"We have plenty of major challenges facing us in the fixed telecommunications network area," Mike Margolis admitted. "The preparation and implementation of a wide-band strategy is one of them." Cable TV operators in the U.S. will soon have the capability of carrying telecommunications over their networks. This opens a large new market in which Ericsson is advantageously positioned to offer complete network solutions.

Taking care of the large, new customer, MFS Communications, and providing them the service they expect from Ericsson, is one of the most important challenges.

"Another challenge facing us is to provide the new Ericsson company, Raynet, with sales and production support! In addition, the Canadian market is soon to be comprehensively deregulated, providing us with the possibility of also selling to Bell Canada."

Mobile telephone systems

"Our main challenge is to establish TDMA as the obvious technical choice for operators during the immediate years ahead. It is the one existing standard for commercial operations and will retain its preeminence for years to come," Jan Anders Dalenstam pointed out.

Capturing more than 30 percent of the market for PCS is another major challenge, as will be the exploiting of the business opportunities offered by AT&T's buy-out of McCaw.

"The acquisition means that other operators may no longer see fit to buy equipment from AT&T which, with Motorola, is Ericsson's main competitor in the U.S."

In the autumn of 1993 Ericsson formed a special environmental unit to deal with increasingly strict environmental regulations. One of the unit's objectives was to quickly produce an environmental manual for practical activities within the company. This manual can now be ordered. Other environmental news: Ericsson has adopted the environmental

Environmental action on a broad front



THE ENVIRONMENTAL MANUAL IS READY. It may be ordered in the form of a diskette, displayed here by Barbro Pettersson and Sten Hebert of Ericsson's Environmental Unit.

Ericsson's environmental manual, now completed, may be ordered from the Environmental Unit. It covers Ericsson's basic environmental policy and also deals with such details as the labeling of batteries, plastics and the like.

The manual is the tool designed to help Ericsson become an environment-friendly company. It is based on the 16 points formulated by the International Chamber of Commerce and thus ensures that the company will be following international environmental regulations.

It will, of course, be stored electronically, in line with the environmental policy, but may now be obtained on a diskette.

Manual prescribes rules both large and small

The manual contains six chapters. The first deals with such basic matters as environmental policy and interpretation of the policy and also contains a list of environmental laws and standards.

The second chapter is devoted to product development. This is viewed as the area in which there is the greatest potential for improvement today. The chapter contains instructions for the design of specifications for environmentally compatible materials and products, as well as specifications for labeling plastic parts, batteries and packaging.

Chapter three deals with production. It contains specifications relating to environmental issues involving chemicals and chemical products in manufacturing units, as well as specifications for internal environmental audits.

The fourth chapter, "Waste and scrap," provides instructions for handling electronic scrap and environmentally harmful waste.

The fifth chapter will contain specifications pertaining to the approval of suppliers and subcontractors. The final section applies to the purchase and sale of

properties and also presents instructions for handling environmental matters in offices. (See accompanying article.)

Regulations

Ericsson's new manual is based on the 16 points of the International Chamber of Commerce's environmental program. This program governs matters ranging from the requirement that a company have an environmental policy and manual to plans for handling scrap, the training of personnel, and checklists for product development.

In a letter to the Swedish Committee of the ICC, Lars Ramqvist, Ericsson's CEO, recently confirmed the company's affiliation with the program.

"Ericsson is hereby affiliating with the ICC's Business Charter for Sustainable Development," he wrote. "Sustainable development" means that a company produces for the present without jeopardizing the future.

Ericsson is now one of more than 1,000 companies throughout the world that have associated themselves with the ICC's rules. Membership does not involve a direct commitment but should be seen as an expression of willingness to deal seriously with environmental matters.

Guidelines

The 16 points provide companies with a guideline for structuring

regulations of the International Chamber of Commerce; Ericsson Radio has prepared a life-cycle analysis of the impact of base stations used in mobile telephony; and the new premises of Ericsson Business in Nacka are being planned as environment-friendly office facilities.



"We will create an environment-friendly office here in Nacka Strand," declare Ericsson's Annika Mårtensson and Björn Wahlberg, manager of technical operations for the Nacka Strand management company.

environmental programs, according to Sten Hebert, manager of Ericsson's Environmental Unit.

"Adaptation to the ICC program will also make it easier in the future for Ericsson to qualify for certification in accordance with the pending ISO 14,000 environmental standard," he says.

"For a company like Ericsson that operates internationally, membership is also an important factor in establishing a public profile."

Notable points in the ICC program include the following:

- Point 2, which deals with communicating the environmental policy within a company, with every manager being responsible for distributing information.
- Point 4, which deals with employee training, does not fo-

cus on all personnel but on key persons in such departments as purchasing and design.

- Point 5 prescribes that a company should estimate the environmental impact of a project before it is started.
- Point 6 deals, in part, with developing the tools that will make it possible to conduct life-cycle analyses of the company's products.
- Point 7 involves advising customers: informing and training them, as well as dealers and users, on how to handle, transport and store goods in an environmentally safe manner.
- Point 11 involves ensuring that contractors and suppliers follow applicable regulations. This is an immediate and complicated matter for

Ericsson and one that will require revised purchasing routines, among other considerations.

Text: Lars Cederquist
Photo: Anders Anjou

How to order the environment manual

The manual may be ordered in the form of a diskette containing the documents produced to date, plus a subscription for future updates.

Address orders to HF/LME/G. The documents are written in MS Word 2.0.
Cost: SEK 500.

Environment-friendly new office being built in Nacka Strand

In Nacka Strand, Ericsson's new environment-friendly office is being built? Here, just outside Stockholm, across the Royal Park with the water and the old coachman's cottage down by the shore. Here, the lovely natural environment is a constant reminder of environmental concerns. Here, Ericsson is constructing a building to house a management company that focuses on the environment.



At year-end Ericsson's Business Networks Business Area will begin to move into a brand new building in Nacka Strand. Approximately 1,000 persons will then leave their old premises in Sundbyberg and Bollmora to work in a newly developed area in which environmental concerns are ever-present.

The Nacka Strand management company has concentrated on using cold sea water to cool the building. To heat it, the company has built its own heating plant fired by low-sulphur oil that will reduce sulphur emissions by about 90 percent, compared with average oil-fired plants.

All the buildings in Nacka Strand are also equipped to sort waste in five categories: glass, paper, compostable materials, combustibles and environmentally harmful materials.

These are some of the features that will already be in place when Ericsson moves in. The rest will be up to the company.

"We will really try to achieve an environment-friendly office," Roland Sjö, who is responsible for the move to Nacka, and Annika Mårtensson, who is in charge of environmental matters, both say.

Instructions

"Based on Ericsson's environmental policy and EBC's objectives, we are now preparing instructions for Nacka Strand," Annika Mårtensson notes.

"The move gives us a unique opportunity to realize our objectives. But what are then needed are an action program and a new way of thinking and behaving in a number of areas, including the sorting and collection of waste, recycling, energy savings, the use of paper, the purchase of office supplies and furniture, etc."

"Our buyers will have a major responsibility when they select

At year-end approximately 1,000 persons will leave their offices in Sundbyberg and Bollmora to move into Ericsson's new office building in Nacka Strand. The newly developed area is one in which environmental concerns are ever-present.

Money and environment

Ericsson's environment manual lists a number of matters that should be considered in connection with an environment-friendly office. Many of them follow common sense rules, and also offer substantial financial savings.

Copying on both sides of a sheet of paper is one example. It is estimated that an office employee uses about 100 kilograms of paper per year.

The use of porcelain coffee mugs instead of plastic cups is another down-to-earth example of ways to save.

Demands on suppliers

Other matters are more complex. These include selecting the right furniture, the right computers and the right monitor screens. (They can differ substantially in terms of energy consumption.)

When new equipment is purchased, the company should also require that the supplier be prepared to take it back when it has served its purpose.

Other suggestions include purchasing color cassettes and tapes that can be refilled, as well as water-based paints, and collecting fluorescent tubes that contain environmentally harmful mercury.

Lars C

IT Festival demonstrated technology of the future

The kitchen of the future, the school of the future and the office, bedroom, living room, music, art and industrial technology of the future – all are on display at the Information Technology Festival that opened in Stockholm in the middle of October.

The Festival is designed to enable people to experience for themselves how, for example, one "surfs" in computer networks or how, in the school of the future, it will be possible to enter a three-dimensional human body.

The new information society is not as remote as one might believe when he or she hears such terms as "cyberspace," "IT," "virtual reality" (which involves donning a high-tech helmet), "ISDN," etc. Information technology "merely" involves using a computer to convert information (speech, text, images, film, music and the like) to "ones and zeroes," transmitting them over a network and re-creating the information at the receiving end.

The fact is that we are already living to a large extent in the "new" information society. It is also a fact that much of the "latest technology" has been around for a long time and that it takes a while for a technical innovation to capture the world.

It takes time

"It takes about 30 years from initial concept to industrialization, and this has been true for at least 400 years," Paul Saffo, of the Institute of the Future in Silicon Valley in California, maintained.

"Interactive TV was available in the Fifties. The copier was invented in 1938 but did not become indispensable in offices until the Sixties. Movable film had been available for ten years before anyone conceived the idea of making feature films around the turn of the century. (Earlier, people had been so fascinated by the possibility of seeing how something moved that they were content to see how a horse jumped or how a human being walked, etc. The point is that it is one thing to invent a technology, and quite another to find the right use for it.

Or, as Madeleine von Heland, an art expert, expressed it: "Artists and humanists are needed if something good is to come from information technology."

Arouse interest

The festival attempted to display information technology in a practical context, primarily to arouse the interest of young people in the natural sciences and technology. (Surveys indicate a declining interest in recent years.)

Various realistic environments had been constructed in Stockholm's Culture Building: a teenager's room with a picture telephone where a student could take a guitar lesson or perform some school assignments while at home, a kitchen in which recipes and clear instructions could be obtained from a video screen, a living room in which a viewer could enjoy "video on demand," selecting from a menu on the screen.

An office of the future ("virtual workplace") was on exhibit at the Technical



Being able to "fly" an American F18 Hornet fighter aircraft in an advanced simulator was probably the most popular activity. With this exhibit the Festival was successful in stimulating youthful interest in technology.

Museum. It featured a giant group computer in the form of a "live board," one and a half meters wide and one meter high, on which a person could write by means of a "light pen," sharing the screen with a number of users in other locations.

Computer supported school

There was also an entire hall given over to the computer-supported school of the future and, one flight up, Telia and the producers of "TV News" had built an editorial room in which young people could track down news via Internet and prepare their own news programs.

Visitors to the Museum could also try to fly a U.S. Air Force F18 Hornet fighter aircraft in a simulator. And they could see how Volvo saves time (one week instead of a year) and money by simulating

crash tests – instead of hoisting up actual cars with a crane and dropping them.

In all, there were more than 20 exhibits, a theatrical presentation ("Who took the remote control?"), as well as music crea-

ted electronically – there are computers that write notes and compose – and a number of seminars.

But did the festival really show the information society of the future? Or were

Sponsored by more than 50 companies

The Festival was arranged by the Swedish Academy of Engineering Sciences (IVA) to mark its seventy-fifth anniversary. It was sponsored by more than 50 companies, including Telia, the Postal Service, the IT Commission and Ericsson.

People from many fields were involved in the Festival. The Royal Institute of Technology, the Swedish School of Arts, Crafts and Design and the Multimedia Department of Stockholm University were responsible for the design of the exhibits, for example. IVA, which focuses actively on information technology, inspired the formation of the IT Commission, whose goal is to make Sweden the number one IT country by the year 2010. IVA has made a number of concrete proposals suggesting how this can be achieved. These include providing electronic mail in the public sector, creating a common computer strategy for the entire educational sector, expanding "remote" instruction facilities, etc.



hibit the Festival was successful in stimulating youthful interest in technology.

(are) these only visions that could have been viewed equally well in another manner?

Paul Saffo, who participated in the seminar on "Information technology – past, present and future," has his own theory:

"Technology itself does not create any changes; needs and cultural reactions to new technology are what drive developments."

Changes in areas of application

"Most inventions are not used in the way people initially thought they would be. People thought, for example, that large passenger aircraft represented a transitional stage and that everyone would soon be flying his or her own plane.

Television was for 20 years thought to offer the solution to the picture telephone

until it was determined in the early 1950s that it was best-suited for broadcasting."

Creating the future

"The simplest way to foresee the future is to create it yourself," Stig B Hagström, professor of physics and president of the Swedish Academy of Engineering Sciences, declared.

Hagström said that trying to guess what the future will be like is the wrong approach. "The future doesn't become," it is created."

"One has to have visions and dare to fail. Only if a person has a good chance of failing has he or she aimed high enough.

"A technical invention often begins as a fantasy, a young person's dream. Then one has to have an overall view, 'from atom to culture,' meaning that one sees the

whole 'chain' from technical solution to how the product can be used in the best way.

"I see a lack of the overall view in Sweden today and I do not understand how people can think that they can afford to work as 'fragmentarily' as many do," Prof. Hagström said.

'Crazy' ideas can be productive

Mattias Söderhielm, 23, a representative of the "hacker generation" (who assured his listeners that he himself was absolutely not a hacker), also spoke at the seminar. Söderhielm, a recent civil engineering graduate, had just spent a year at the Institute of the Future in Silicon Valley.

"People in Silicon Valley listen to the 'crazies' because they know that new ideas come from outside," Söderhielm

said. "The culture there derives from the hacker ethic (that all information should always be freely available, etc.). A person there is valued for his or her ideas, not based on who he or she may be."

Utilize creativity

Mattias could not resist a comparison with the situation in Sweden:

"Sweden has much to learn from California. If we are to be able to take the step from the industrial society to the knowledge-based society, we have to utilize our available creativity more effectively."

"What are needed are risk capital, a critical mass within a region – meaning enough people, companies, suppliers, etc. – and receptivity to new ideas."

Lars Cederquist



Ericsson Components presented a four-screen video show explaining the role of microelectronics in telecommunications. Visitors could also play an adventure game that unfolded in a microcircuit plant and test a picture telephone with multimedia functions.



The new virtual workplace developed by Xerox PARC and Intel was displayed for the first time in Sweden. It features a group computer with a large "pointer screen" and built-in video communications.



A home of the future was on display in the Culture Building.

Ericsson gains admittance to Stanford University

Ericsson's cooperative agreement with Stanford University in the U.S. is the latest example of numerous alliances with universities that provide access to critical technology for the future.

Through these cooperative agreements, Ericsson is able to retain its leadership in research and development in such important fields as digital signal processing, radio access, multimedia and microelectronics.

Today a significant proportion of the basic research on new communications technology is being conducted in the academic world. This is a world with which Ericsson is very familiar, as the company has always sought to maintain and cultivate good relations with professors and other researchers in technical fields related to Ericsson's core business areas.

In the past, relationships were established primarily with Swedish universities, but today contacts with the academic world are more global.

Strategic objectives

Ericsson's recently announced membership in Stanford University's Center for Integrated Systems (CIS) is the latest in a number of cooperative agreements with American universities. Recently a cooperative agreement in the field of microelectronics was also reached with Tokyo University. In addition, Ericsson has cooperative agreements with several European universities and technical institutes.

These agreements are a part of Ericsson's strategy to retain its leading position in new communications technology. Ericsson therefore carefully selects only leading universities with the objective of strengthening its own research efforts.

Cooperation philosophy

Ericsson's cooperation with universities should be regarded as one element in a philosophy of cooperation that also includes suppliers such as Texas Instruments, other manufacturers, Hewlett Packard for example, and even customers in some cases.

Collaboration with external partners is also a part of research and development efforts that demand substantial resources with



Stanford University is situated on the San Francisco peninsula. In 1992, enrollment was 13,293, of which 6,564 were students and 7,329 were researchers.

in the organization. Ericsson conducts research and development at more than 40 centers in 20 countries.

Of the company's 75,000 employees, some 14,000 or one in every five works with technical development.

Key technologies

The contacts currently maintained with universities and the various research projects in which the company is participating indicate the areas for future product development prioritized by Ericsson.

Digital signal processing is an important field, which reflects the major shift from analog to digital communications technology. Examples of this may be found in radio, line and broadband access.

Broadband focus

Broadband technology, which involves the transmission of large volumes of information, for example, images and data, is also the focus for an increasing number of research products.

These relate not only to switching and transport network infrastructure, but are also aimed at the next generation of terminals, which must be able to handle both voice, data and video services.

A parallel development is taking place in microelectronics in which the goal is to pack more and more intelligence and signal processing functions in smaller and smaller circuits.



Ericsson recently became a member of Stanford University's Center for Integrated Systems (CIS). Shown from the left are Gunnar Björklund and Torkel Amborg from the Microelectronics Research Center and Christer Jungssand, manager of Microelectronic Systems Technology at Ericsson Components. Christer is Ericsson's representative at CIS.

Eventually it will even be possible to fit an entire system on a single silicon chip.

Stanford University

In October it was announced that Ericsson had signed a cooperative agreement with Stanford University and that the company had been admitted as the 14th member of CIS.

Ericsson expects that cooperation with CIS will provide important benefits for all of the company's products and systems, particularly in the areas of microelectronics and radio technology.

Membership in CIS is coordinated by Ericsson's Microelectronics Center, which is a part of the Microelectronic Systems Technology core business unit.

"During the first year, the Microelectronics Research Center and CIS will devote their efforts to a number of areas of common interest, areas which are of great importance for the future development of telecommunications technology," says Gunnar Björklund, manager of the research center.

Integrated Circuits

Of particular interest are integrated circuits, IC-s, for radio and line circuits, as well as high-power components for high frequencies.

Other important research areas for radio frequency circuits are digital signal processing, radio design, low-power devices and last but not least technical CAD (TCAD), an area in which

Stanford has made substantial progress.

Radio technology

Considering the importance of radio technology for future generations of communications systems, it is not surprising that Ericsson even in this area has contacts with a number of universities. Today the company collaborates with Gothenburg, Linköping and Lund Universities in Sweden and in the U.S. with the University of California at Berkeley and at Davis, as well as Rutgers University.

Research is also in progress in a number of areas: cordless terminals for broadband communication and multimedia, modulation techniques, digital signal processing and antenna technology.

In several cases, Ericsson sponsors university professorships. Exchange programs with universities for students and Ericsson employees are quite common.

Swedish trend

A current trend in Sweden is that the Swedish National Board for Technical and Industrial Development (NUTEK) is coordinating contacts at the national level between industry and the universities. Subsidies can be granted for projects of national interest, and the universities are encouraged to participate. A consortium, Microelectronics for Mobile Communication, has been formed in which Ericsson participates, together with researchers from several Swedish universities.

Time is of the essence

One of the reasons that cooperation between Ericsson and Swedish and foreign universities has been expanded is the need to reduce development time from the initial research to a commercially viable product.

As Per Tjernlund at Ericsson Radio Systems expresses it: "We have had a relationship with universities since the 1970s, which started with the pioneer efforts in digital radio technology."

Ten years lead time

"Our collaboration with the universities started in 1978, but it was not until 1992 that the GSM specification was finalized. That corresponds to a lead time of more than ten years."

"In our current efforts to develop wireless broadband communications, we expect to have a commercial product available within six years. This means that the lead time will be cut in half - compared to GSM."

Good service knows no limits



"By exploiting the fact that one of the offices in Dallas, Melbourne or Rijen will always be open for business, the Customer Support unit will establish "Global Response Centers." This will result in more rapid and effective service," says Camilla Sundström, who heads the unit. Photo: Peter Nordahl

Exploiting the time zones enables Ericsson customers to obtain competent assistance at any hour of the day when malfunctions in AXE exchanges occur. Such a call will be received at the Dallas, Melbourne or Rijen office, depending on the hour of the day. The Customer Service unit and its head, Camilla Sundström, have received the go-ahead to begin working with "Global Response Centers."

According to Camilla Sundström: "My first thought when hearing about 'Global Response Centers' was 'aren't they already in place?'"

Since the first time Camilla Sundström heard GRC mentioned, she has had ample incentive to thoroughly explore the subject. Today, she is responsible for implementing the concept.

Selling service

"Our conviction is that the future lies in selling service, and this is a step in that direction. Earlier, we experienced shortcomings in service; customers were made to wait for such problems to be solved. With the GRC organization

Using the time zones, Ericsson can improve customer service

in place, service will become more rapid and efficient."

There are presently 450 persons worldwide who work with support at local "support centers." They have no proper contact with each other and, no matter how hard they work, full expertise cannot be provided around the clock. Malfunctions can arise anytime of the day and must be remedied at once.

Three global units

By linking the local service centers with the three global centers, qualified personnel will always be available. Manning will be by experts during normal working hours, with the global units assuming the load as the time axis shifts. The customer calls the local service department, but if this during the middle of the night in London, for example, and assistance is required for an urgent problem, the customer is connected automatically to Melbourne where daytime full-manning prevails.

"This system provides numerous gains," Camilla Sundström relates. "By shortening our response times, we will improve our service, and our image vis-a-vis the customers. Because working conditions will improve, the

retaining of competent personnel will be facilitated. In today's situation, employees frequently work unreasonably long hours, with many travel days, in order to maintain service. In addition, Ericsson is beginning to acquire new, global customers, companies with operations in many countries, which require uniformly good service everywhere.

"Another compelling factor is that we must maintain, and increase, service, without increasing costs. Moreover, we will be able to coordinate notifications of malfunctions in a way that was not possible before. The experience derived from malfunctions, and their solutions, will be accumulated in a database for use by all support personnel."

Fewer channels

Another advantage with GRC is that there will be fewer channels back to the product-development and design units, which is how the entire idea originated. Camilla Sundström describes how GRC came to be.

"About a year and a half ago, my boss at the time, Åke Enell, backed some young employees who had ideas for projects. One idea was to prevent several people from working on the same pro-



"The future lies in selling service," is the conviction of Camilla Sundström. "This is a step in that direction."

blem simultaneously, at various locations within the company, without cooperating and benefiting from each other's results.

Pilot project started

Close attention was paid to the computer industry, which had made rapid strides in this area, and a preliminary study was started up in summer 1994, which adapted the units to the telecommunications area. Those who participated in the preliminary study were from Ericsson in the U.S., Australia Canada and Sweden.

"We have now received the go-ahead to begin the pilot project. We will initiate operations

at all three global units, with support confined to a limited number of products, and utilizing personnel on-loan or employed strictly for the project. My immediate task will be to appoint the heads of the three global units; we will then plan for the first call to be connected in February 1995. The project will then be evaluated in September of the same year.

So far, only the Public Telecommunications business area is affected. "At a later stage, we hope to be able to cooperate with the Radio and Business Networks business areas."

Exacting requirements

Camilla Sundström recognizes that what lies ahead is no easy undertaking. One difficulty is to induce the personnel to keep each other continuously informed about new developments, and to develop the capability of transferring partly completed work to others for completion. The goals that have been set are highly exacting: "the highest customer-service requirement will become the global standard."

"We are convinced, however, that with Global Response Centers, the correct effort for the future has been chosen, and that our customers will derive maximum benefit."

Lena Granström

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

Compania Ericsson, Buenos Aires, Argentina

CELLPLANNING / RF-ENGINEERING

One of the AMPS/D-AMPS networks in Buenos Aires is owned and operated by Movistar which is our customer. The

system is rapidly expanding. Planning and tuning of the radio network is becoming more and more important. Therefore, we are expanding our organization at CEA with an experienced RF-Engineer in order to better meet our Customer's high requirements.

This position requires a technical education together with experience in cellplanning and good analytical skills and the ability to work independently and build a good professional relationship with the customer. Must be able to speak and write english. Spanish is desired.

Contact: Ulf Malmerberg, 08-7572949, Memo ERAUMG or Karin Enberg, personnel, ERARMOAA.

Ericsson Radio Systems AB, Bahrain

FSC MANAGER

We are looking for somebody with both managerial skills and qualified knowledge and experience of trouble shooting and fault fixing in AXE to manage the day activities of the FSC, work as a System Expert including Emergency Call outs from the customer.

Applicants should have experience from similar support activities of the FSC at ESO or FSC level, solid background in AXE SW testing, support or design, with proven trouble and fault fix ability. Very good verbal and written communication skills and ability to interface customer. Very good knowledge of AXE and Mobile Systems (CME 20). Experience of CME R4 is a plus.

Contact Conny Forsberg, 08-7575862, Memo ERACFT or Marie Zachrisson, personnel, 08-7572459, ERAMZN.

Ericsson Business Mobile Networks BV, Amsterdam Netherlands

PRODUCT MANAGER CORE PRODUCTS - MARKETING DEPT

You will be responsible for the product management of the CORE products as defined in the overall EMN product plan. He/she will generate detailed product requirements specifications, ensure a timely availability of products, prepare market introductions, define training, service and repair policies. Many of these activities are supported by multi functional project teams in which you actively participate or lead. You remain responsible for the product during its full life cycle.

Skills or experience in the area of product management and/or development of telecommunications equipment, preferably a working knowledge of the business cordless telephone market, excellent inter-personal relationship skills, excellent written and verbal communications skills, ability to coordinate multiple activities and resources without direct control over personnel, work independently with minimal supervision and maximum initiative. You have at least two years related telecommunications experience and preferably a BS degree in Electrical Engineering with emphasis on telecommunications.

Contact: E. Maresch, Fax +31 53 879125.

Ericsson Ltd, Burgess Hill, England

HR EXECUTIVE

This is a customer focused role supporting the Heads of key business sectors in a highly competitive market sector. The restructured HR team is consequently adopting a dynamic, proactive approach to personnel issues, focusing on resourcing, competency and management development and improving organisational effectiveness. Candidates must demonstrate the ability and credibility to make an immediate positive impact on the business. 5 years generalist experience in a commercial HR function is essential. Consulting and/or high-tech experience would be advantageous.

Please send CVs to Margaret Brooks, Group HR Director, Ericsson Ltd, TC, Ericsson Way, Burgess Hill, West Sussex, RH15 9UB, UK. United Kingdom.

Ericsson Toshiba Telecommunication Systems K.K., Japan

MARKETING MANAGER

ERJ has during 1994 successfully launched three complete Mobile Digital Systems as the first foreign company in the second biggest Mobile Telephone market in the world, JAPAN. The growth of Mobile Telephone users in Japan is forecasted to more than 1 million new subscribers per year! The competition is intense, however, opportunities for operators and vendors are almost unlimited.

We are looking for a Marketing Manager towards our biggest customer TDP (Tokyo Digital Phone) as current Marketing Manager has been assigned a new position within ERJ. TDP covers the KANTO area which includes TOKYO, KAWASAKI and YOKOHAMA. Approximately 40% of the Japanese Mobile Telephone subscribers will be in the KANTO area. The assignment will include responsibility of all commercial activities concerning TDP and supervising of a small team with local staff.

Experience of at least 3 years marketing and/or project leading of digital cellular systems or AXE towards advanced customers. As good and frequent communication with customers are of utmost importance in Japan, good personal qualities are required to build sincere and fruitful relationships with our customers. The successful candidate will be offered minimum two (2) years assignment with family or single status.

Contact: Kent Asai, +81 45 4750033, Memo NRJ.ERJ-KAYA, Lars Hagebris, +81 45 4750033, NRJ.ERJ.LAHA, Hans Jarne, 08-7572923, ERAHJAR eller Göran Henriksson, 08-7570705, ERAHENN.

Ericsson Telecom AB, BU Customer Services, TB

THREE MANAGERS LOCATED IN AUSTRALIA, HOLLAND AND USA

Our product area Customer Support is introducing the concept of three Global Response Centers and looking for managers who want to take the challenge to build and manage this new organization. Your role will be to start up and manage one of three GRC hubs, to develop customer support in cooperation with the other GRC-hub managers and

the manager of Customer Support at Bu Customer Services within BX and to establish links to local companies and other Ericsson entities regarding customer support matters.

You should have a great deal of pioneer spirits and enthusiasm for the task. Experience in customer support and telecoms environment, combined with a sound business understanding and ability to lead and develop a team are requested. Presentation and communication skills are paramount as well as initiative, tact and diplomacy.

Contact: Camilla Sundström, 08-7197139, Memo ETXT.ETXCSU or Kaisa Andersson, personnel, 08-7194241, ETXT.ETXKLAN.

Ericsson Radio Systems AB, Toronto, Canada

PROJECT MANAGER PCS1900

Ericsson has decided to develop the currently available CME20 system into a new productline CMS40 directly targeted to the North American PCS1900 market. Development is ongoing the first systems will be in operation in mid-95. For our operations in Canada we are now looking for a Customer Project Manager with experience from GSM projects. Being Customer Project Manager towards one customer in Canada who plans to have a GSM-based PCS1900 system in test operation starting in one city in mid-95. The system will be expanded to several cities in Canada during the fall of -95 and will be taken into full commercial service during 1996. The Customer Project Manager shall be the direct interface towards the customer in all aspects of Contract fulfillment. He/she shall plan and control all activities needed from different parts of the Ericsson organization in order to fulfil contracted obligations on time, within budget and to the customers best satisfaction.

The Customer Project Manager shall make use of resources from the local Ericsson organization in Canada but shall also transfer GSM knowledge to this organization during the execution of the Customer Project. Time of Assignment Jan95

Several years of experience within the Ericsson group is required as well as experience from project management of GSM system and excellent English in writing and verbally. French is desirable.

Contact: Thomas Knutsson, 08-7572539, Memo ERATKO or Gogo Landén, personnel, 08-7572242, ERAGOGO.

Ericsson (China) Company Limited - ETC

SUPPORT PERSONNEL - MOBILE SYSTEMS

The Chinese telecommunications market is one of the worlds most exiting markets today. The mobile market in China expands rapidly. The systems that are being installed were earlier only TACS, but now also GSM, AMPS and OSS. This is a new challenge for the existing support organization. We have a number of vacancies in our support organization at different locations in China.

You shall have a few years experience in system support on mobile systems as well as proven ability to solve complex technical problems and with trouble shooting experience. If you have the qualifications, feel the challenge and have the dedication - then we need you!

Contact: Henk Werkman in China, Memo ETC.ETCHEWE or HF/LME/DK Magnus Ask, Memo LME.LMEMASK, tph +46 8 719 7481. Please send your applications to Magnus Ask.

Ericsson Eurolab Deutschland GmbH, Herzogenrath, Germany

MTS AND ISUP EXPERTS

Ericsson Eurolab Deutschland GmbH is our young international research and development centre located in Herzogenrath near Aachen, Germany. Our Switching Section within the Mobile Network Department is responsible for the MTS subsystem and the software development and design for CME20 SS, CMS40 SS and ISUP requirement and development coordination in CME20 SS. Furthermore, we have the responsibility for the coordination and cooperation of the MTS and ISUP design centres in Aachen, Paris, Athens and Dallas.

As a suitable MTS Expert candidate, you should have deep knowledge of Mobile Telephony System (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. As a suitable ISUP Expert candidate you should have deep knowledge of ISUP, telecommunications, relevant specifications (e.g. CCITT) and the actual implementation in AXE (e.g. ISUP3+, ISUP4). The ISUP areas "Protocol Handling and C7 Signalling" and "Interface to other subsystems" (e.g.

Internal Position Offer Ericsson Eurolab Deutschland GmbH

Ericsson Eurolab Deutschland GmbH is our young international research and development centre located in Herzogenrath near Aachen. We focus our innovative and advanced activities on mobile and public communication in order to secure and extend our leading market position. In January 1991 young engineers started their work in the field of research and software development and testing. Today we are 300. And further expansion will take place in phases.

Our Switching Section within the Mobile Network Department is responsible for the MTS subsystem and the software development and design for CME20 SS, CMS40 SS and ISUP requirement and development coordination in CME20 SS. Furthermore we have the responsibility for the coordination and cooperation of the MTS and ISUP design activities in Aachen, Paris, Athens and Dallas.

At the moment we are 47 highly motivated and competent people to carry these responsibilities. Due to the expanding market situation of GSM and the importance of the described activities we are looking for

MTS and ISUP Experts

The general responsibility of these positions is software development in CME20 and CMS40.

As a suitable MTS Expert candidate, you have deep knowledge Mobile Telephony Systems (MTS), telecommunications, relevant specifications, (eg. ETSI, CCITT), mobile systems (eg. 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 (eg. TSS, TCS, CHS, STS)" are of special interest.

As a suitable ISUP Expert candidate, you have deep knowledge of ISUP telecommunications, relevant specifications (eg. CCITT) and the actual implementation in AXE (EG. isup 3+, ISUP 4). The ISUP areas "Protocol Handling and C7 Signalling" and "Interface to other subsystems (eg. MTS, TCS, CHS, CCS)" are of special interest.

All candidates should be Ericsson employees, have appropriate AXE 10 software design and testing 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 a good ability to work under pressure. Furthermore you are familiar with Ericsson's working and quality methods.

If you have any questions and/or are interested, please refer to your colleagues:

Ericsson Eurolab Deutschland GmbH

Human Resources
Ralf Mohr
Dial: 02407/575-163
Memo: EED.EEDMOR

Project Department
Jan van Hemert
Dial: 02407/575-263
Memo: EED.EEDJPH

MTS, TCS, CHS, CCS) are of special interest.

All candidates should be Ericsson employees, have appropriate AXE 10 software design and testing 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 a good ability to work under pressure. Furthermore, you are familiar with Ericssons' working and quality methods.

Contact: Ralf Mohr, personnel, Memo EED.EEDMOR or Jyri Andersson, EED.EEDJAA. Please address your application to: Ericsson Eurolab Deutschland GmbH, Ericsson Allee 1, D-52134 Herzogenrath, Germany.

Ericsson North America Inc., Richardson, USA

SYSTEMS TECHNOLOGY - ENGINEERING

Ericsson is providing new features and enhancements to the system through new application systems and releases in North America. Our group provides engineering support for the verification of these new products/releases through field trials and first office applications. Our main focus will be to bring in the new technology for the PCS systems into the North American market.

Required: Engineers with 4+ years' experience with verification and testing of RBS/BSC and/or MSC or AMPS/GSM systems. Cellplanning background with AMPS/GSM would be an advantage.

Contact: Manager, Forouz Firozi FAX: 214-952-8779 Memo ERU.ERUFFI or Rob Vestal, FAX: 214-952-8777, ERU.ERURJV.

Ericsson Communications Canada, Mississauga, Ontario

INTERNATIONAL ASSIGNMENT - MOBITEK

Ericsson runs a project with the goal to bring packaged Mobitek solutions, for today's services and applications, to the market. The Connectivity lab is the technical effort of the project.

We are now looking for two new members for the lab. You will work with identifying software and services that would be of interest to offer over Mobitek, establish relationship with software vendors, service providers, partners etc and ongoing consulting to partners. You will develop test documents and procedures and also work with test of shelf software over Mobitek. We also want you to work with standard committees to establish wireless extensions for common standards like NDIS and winsocket.

You must have good knowledge of the Mobitek system and general knowledge/interest of data communication, PC and LAN. It is required that you are fluent in English. The successful candidates will be offered a 6-months - one year assignment in Canada.

Contact: Magnus Kristersson, +1 905 629 6839, Memo EGC.EGCMKR or Eva Jansson, personal, 08-7571459, EC-SEVAJ.

Ericsson North America Inc., Richardson, USA

MFS Support Opportunities - EAU Customer Service

The recent signing of a global purchase agreement with Metropolitan Fiber Systems (MFS) has created opportunities for individuals to work in the MFS Support Group supporting the MFS Global Network.

Experienced engineers with at least 3 years of AXE support experience are needed. Experience in any of the following areas is highly desirable: AS26/36 (UK), AS353 (US), Power/Telecool, TMOS, Translations (exch.data), Operations & Maintenance.

One position will be based at MFS headquarters in Parsippany N.J., three positions will be based in Richardson, and three positions will be based in Stockholm.

If you are interested in pursuing these opportunities, please forward your internal application (summary of experience and educational credentials) to Betty Magness, EAU/HR, M/S O-HR, or by memo exublm. Please reference job number CS 94-185/MFS.

LM Ericsson Ltd, Dublin, Ireland

AXE ENGINEERS

Due to the continued expansion of the export activities of Business Area Switching, vacancies have arisen for experienced AXE Engineers at FSC 1 and FSC 2 level. Applications are invited from personnel who wish to work on the following:

- (a) The Maintenance of Product Lines and Global Application Systems.
- (b) The Design and Maintenance of the upgrade path between Product Lines and Global Application Systems.
- (c) The Design of upgrade paths for overseas markets.
- (d) The Testing and Commissioning of Application Systems for overseas markets.

Candidates should have a proven background in AXE Testing, Trouble-Shooting and upgrading. They should be capable of working to strict deadlines with minimal supervision and should possess good communication and inter-personal skills. We invite applications from personnel internally and externally who believe they have acquired sufficient expertise in the relevant areas to undertake the tasks listed above.

As a screening process based on applications received will take place, it may not be necessary to interview all applicants.

Applications for the above should be sent in writing to the undersigned before Friday 4th November, 1994. Margaret Gaffney, Personnel Officer, LM Ericsson Ltd., Beech Hill, Clonskeagh, Dublin 4.

Ericsson Eurolab Deutschland GmbH, EED/TP

QUALITY COORDINATOR CME 20 SS PHASE 5

Ericsson Eurolab Deutschland GmbH is our young research and development centre located in Aachen, Germany. Our project department is responsible for the Switching System (SS) node within Ericsson's GSM mobile network. CME 20 SS Phase 5 is the project in which Ericsson's next version of the GSM software will be developed. The general responsibility of this position is to set up a quality system for the mentioned project. The main authorities and tasks are to monitor the performance of the quality system by taking part in review meetings, project audits and exit/entry criteria meetings, measure the quality of design products, write quality reports, assist in writing and approving of exemption and support project management in all quality related activities. This position reports directly to the Project Manager.

As a suitable candidate, you are an Ericsson employee with appropriate AXE 10 software design and testing 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 a good ability to work under pressure. Furthermore you are familiar with Ericssons' working and quality methods.

Contact: Ralf Mohr, Memo EED.EEDMOR or Jan van Hemert, EED.EEDJPH. Please address your appl. to Ericsson Eurolab Deutschland GmbH, Human Resources, Ericsson Allee 1, D-52134 Herzogenrath, Germany.

Ericsson Research Canada, Training dept. Montreal

TECHNICAL TRAINING INSTRUCTORS

We are system provisioning responsible for CMS88/D which is one of the fastest growing areas in the telecommunications industry today and for years to come. We are looking for dynamic people who can develop and teach technical courses for LMC engineers. Previous teaching experience is not mandatory. We continuously train our employees in the technical and the training fields.

If you have 2 or 3 years of experience within AXE and/or CMS88 in Design and/or TAC functions, familiar with one or more of the following: PLEX, AXE SW, IOG11 O&M, RBS O&M, installation testing, ...etc and are interested in learning the new PCS technology then, LMC is the place to be.

Contact: Youssef Tannous, fax: +1 514 738-7869, Memo: LMC.LMCYOTA.

Ericsson (China) Company Limited, Beijing

PRODUCT MANAGER - SWITCHING

The Chinese telecommunication market is dynamic and growing fast. The rate of growth has attracted all major telecom suppliers to deploy important resources to secure a

share of the more than 100 million fixed lines planned for installations by the end of the decade. Ericsson (China) Company Ltd is building up competence to meet the apparent changes in customers requirements. The market place is now discussing the latest products including ISDN, ATM, Network Management systems, IN and Business Communication products. We have now an opening in Beijing for an experienced and competent product manager within switching. The suitable person should have a number of years experience within product management or product marketing of areas such as signalling, ISDN or operation and maintenance functions.

The candidate should most importantly be open minded to new cultures, enjoy travelling, have a large contact network at ETX and is good at product presentations and customers discussions.

Contact: Nael Salah, Memo ETC.ETCNAEL or Magnus Ask, personnel, 08-7197481, LMEMASK. Appl. to HF/LME/DK Magnus Ask

Ericsson Radio Systems AB, India

Ericsson's new market for GSM systems

The Government in India has finally released the GSM licenses - at first for the four large cities New Delhi, Bombay, Madras and Calcutta. Additional 36 licenses will be released for 18 different districts, that will cover the rest of the country. There is no Mobile Telephone in India today and it is still waiting time for a public telephone line. To be able to meet the Indian challenge will ERA/LN set up a new organisation with personnel both in Kista and in India. Positions open are: Area Managers, Technical Sales and Project Managers.

Qualifications: long experience from earlier positions within Mobile Telephone Systems and AXE in Sweden or abroad.

Contact: Anders Borneving, +46 8 7572692, Memo ER-AASBG or Hans Falk, personnel, +46 8 7571402, ERAHFA.

Ericsson Radio Systems AB, Moscow, Russia

AMPS / D-AMPS SYSTEM SUPPORT ENGINEER

Due to the continuing success of the AMPS Cellular system sales to the Russian Republics, the Field Support Centre in Moscow is further expanding. There are two positions open for contract support engineers. The FSC is part of the Global Support Organisation that has been set-up to support the AMPS system worldwide. The FSC is further supported in the GSO from the Technical Assistance Centre located in Dublin Ireland.

The successful candidates should have a minimum of three years AXE experience, worked in a support environment, good written/verbal skills in English, be customer ori-

Corporate Technical Editor/ Senior Technical Spokesperson

This new position at Corporate Relations, Ericsson Headquarters in Stockholm, includes assuming editorial responsibility for *Ericsson Review*, a high-quality customer magazine which describes the technologies underlying Ericsson's products, systems and services. The position also involves serving as spokesperson to the media and investor community concerning Ericsson technology.

Applicants should have a degree in engineering, with knowledge of Ericsson systems. Communications skills and the ability to translate highly technical language into understandable reports for non-technicians are considered essential for the position.

The position will be in Stockholm, with all communications conducted in English. It should be view as an opportunity to add greater value to a technical career. Qualified applicants from all Ericsson companies are welcome to apply.

The position reports to the Senior Vice President Corporate Relations, with functional reporting also to the Senior Vice President Corporate Technology.

Nils Ingvar Lundin
Corporate Relations

Anders Igel
Corporate Technology

For further information, please call Nils Ingvar Lundin, Corporate Relations. Phone +46 8 719 95 86 • Memoid: LME.LMENILN.



entated, self reliant and able to work independantly and ideally have cellular experience. Both these positions are available immediately, the ability to speak Russian would be an advantage but not mandatory.

Contact: Neil Urquhart, +46 8 7570475, Memo ERANLUT or Åke Freiholtz, +44 8 7573756, ERAAFZ.

Ericsson Ltd, System Syst.Dept., Telecom. Centre Burgess Hill, UK

CALL CENTRE SUPPORT ENGINEER

to carry out technical support and project activities to maintain a stable product for the European Market. Principal responsibilities: Fault resolution, Technical Support, Patch Correction, Evaluation of new equipment and facilities and Representing ETL at meetings.

Candidates should be educated to HNC/degree level, in telecomms or related field and have at least 3 years telecomms experience. Good communication skills are essential (written and verbal). This vacancy is available on a local or expatriate contract basis.

Contact: Jon Smith, Memo ETLJSH or Kirstie Free, personnel, ETLKEFE.

IN SWEDEN

Ericsson Telecom AB, Network Services Systems, TN

CONTRACTS MANAGER

Network Services Systems is responsible for a wide product offering including Intelligent Networks and services,

International & National Transit exchanges and advanced Operator Systems. An important element of our strategy is to complement our offering with sourced products and to establish or develop commercial relationships with other Ericsson units. As a result, a number of commercial agreements are currently being negotiated with various external vendors and within Ericsson. We are now looking for a contracts manager to be responsible for these negotiations.

The position will require frequent contacts with other vendors and with other Ericsson units. Experience of handling commercial agreements and contract negotiation skills are therefore prerequisites.

Contact: Anders Lundvall, 08-7193115, Memo ETTX.ETXDALL or Magnus Karlsson, 08-7199404, ETTX.ETXMAKN.

Ericsson Telecom AB, HF

SOLUTIONS DEVELOPMENT AND MARKETING

BX is aggressively working to expand our business. Our traditional customers are facing new threats and opportunities. New operators have very different requirements. Networking areas such as access and premises are expanding. We must therefore proactively develop an understanding of our present and potential customers' needs and present solutions to these needs, compliant with the future network trends.

BX marketing need support from an innovative and business oriented group of people who know the Ericsson product portfolio sufficiently well to put together and present the necessary solutions that will ensure our customers' improved profit. A deeper knowledge in specific applications or product areas is an advantage. You must be able to communicate effectively with customers and colleagues in English (additional languages are an asset) to understand,

specify, develop, present, implement and manage the solutions.

Contact: Torbjörn Johnson, 08-7193915, Olle Westerberg, 08-7194279, Bengt Svensson, 08-7190318 or Göran Rassmuson, 08-7191741.

Ericsson Hewlett Packard Telecommunications AB, Mölndal

MARCOM MANAGER

The Marketing Communication Unit is small, but effective group of people, with the mission to drive external communication of the company's strategy and plans. Your challenges are management responsibility of the unit, definition and implementation of the company's external communication programs, definition and implementation of sales tools for use by Ericsson local companies.

You have formal marketing education, experience from information or marcom management in similar environment, manage experience and you are fluent in English. You must have strong communication and leadership skills.

Contact: Sture Östlund, 031-673836 or Inger Agdahl, personnel, 08-7194761.

Ericsson Radio Systems AB, Kista

PRODUCT MANAGERS CMS40 - PCS1900

CMS40 is expected to become one of the main cellular systems in North and possibly South America. LX/J is a new unit within RMOG, responsible to convert market demands into product requirements towards R&D units. You will be working with product strategy, product plans and should follow the standardization work. You will have contact with Local Product Managers, design departments and customers in the field. Positions as Product Manager for Switching System, Base Station System, Operation & Support and CMS 40 System are now open.

You have at least M.Sc. degree or equivalent and a few years experience from Product Management or Marketing. Knowledge from the US market is a plus. You are analytical, open minded and willing to travel. You have good written and oral communication skills, especially in English.

Contact: Ali Pourtaheri, 08-7573365, Memo ERAAPI or Cristel Ehrenkrona, personnel, 08-7573236. ERACRI.

Ericsson Radio Systems AB, Kista

PRODUCT MANAGER - SERVICES

Our great success is due solely to the efficient use of our systems and the profitability of our customers. We are now looking for a Product Manager for Professional Services. As such you will have three main responsibilities: develop the Global Service Organization (GSO), initiate development projects and coordinate global resources.

We would like you to have mobile systems operator experience, especially within the operation & maintenance field. You need to understand technical issues while working on a strategic level, you should be willing to travel, like to work with people and possess good communication skills.

MANAGER - VALUE ADDED SERVICES

Your overall purpose is to manage the unit consisting of 9 people and be responsible for Product Management of the competence areas Training, HW-Repair and Professional Services. A vital part of the work is to maintain and further develop the Global Service Organization (GSO).

If you feel you are the right person for the job, you possess good communication skills, have 6-8 years experience within the telecommunications industry as well as managerial experience and have preferably worked for an operator or at an Ericsson local company, dealing directly with our customers.

Contact: Per Nygren, 08-7572803, Memo ERAPYR or Ulf Uddsten, 08-7573012, ERAULFU. Appl. to KI/ERA/AH Britt Bosrup, ERARMOAA.

Ericsson Radio Systems AB, Kista

PRODUCT MANAGER PATENTS

Business Unit for Cellular Systems - American Standards (RMOA) offer products for PCS networks in the 800 and 1900 MHz frequency bands based on the digital D-AMPS specification. Patents is an important product area that offers interesting opportunities for enhancing our business. Your responsibility includes, eg, to define patent strategies, create and maintain a patent portfolio for cross-licensing negotiations with other companies, prioritize patent applications, profitability analysis, secure patent activities within our development projects and analysis of competitor patent portfolios. Many of the activities are done in cooperation

with our development organization, various patent organizations, external law firms and of course our own patent project managers at RMOA.

Contact: Magnus Isaksson, 08-7572678 or Mats Blumenberg, 08-7573310. Appl. to KI/ERA/AH Britt Bosrup, Memo ERARMOAA.

Ericsson Telecom, Core Unit Basic Systems, Årsta

EXPERIENCED AXE TROUBLE SHOOTER

We are a section of 15 people working with support and maintenance of the APZ control system. We are working with APZ problems from all markets, currently we support six different APZ source systems. In the section we have a team responsible for trouble shooting. The main activities are TR analysis, writing of AC's and to help out on site when problems can't be analysed properly at home.

We are looking for an experienced AXE trouble shooter who is interested to widen his or hers knowledge in the APZ area. We can offer a work that is dynamic and flexible with the possibility to work with many interesting problems. New tools, new programming languages and operative systems are challenges for the right person.

Contact: Timo Forsman, 08-7196015 Memo ETTX.ETXTIMO or Arne Bergman, 08-7195067, ETTX.ETXARBE.

Ericsson Telecom AB, Local Switching Systems, Int. & Maintenance, TN

SYSTEM CONSOLIDATION & IMPLEMENTATION SPECIALIST

You will be responsible for methodology and processes for the Consolidation phase and the Implementation phases: AS-Verification, AS-Modification and AS-Demonstration. You will ensure that the processes are as effective as possible by participating in the feasibility studies of our projects and also follow up each project to identify Opportunities for Improvement. You will keep close contact with the local companies, our strategic partners and our project managers to be keen on suggestions for improvement. You will stay up to date with new technology to identify required changes in methodology and processes.

You should be a senior tester with a lot of experience in the field of Consolidation & Implementation. You are quality oriented and have good skills in English, both verbal and writing.

Contact: Ulf Hagström, 08-7195058, Memo ETTX.ETXHAGS.

Ericsson Telecom AB, Transport Network Systems, Kungens Kurva

TEST CASE DESIGNER - SDH NETWORK

As a Test Case Designer you will have the following responsibilities and tasks: Define and develop Test Cases for network requirements, participate in inspections of requirements in terms of testability and in development of test strategies, analyse and prototype different subnetwork solutions, create and maintain the traceability between the test cases and the network requirements in the database and have an overall view of the functionality, performance and requirements on every product included in the network.

Suitable applicants should have 1 or 2 years experience in system verification or good knowledge in telecommunication or computer network, familiar with UNIX and have good oral and written skills in English language. If you have knowledge in SDH it is a great advantage. As an introduction to the job, internal courses about our products and the SDH technology is planned to be given by us.

Contact: Berndt Westman, 08-7195545, Memo ETTX.ETXBERE or Annette Averstad, personnel, 08-7198332, ETTX.ETXAVA.

Internal Position Offer Ericsson Eurolab Deutschland GmbH

Ericsson Eurolab Deutschland GmbH is our young international research and development centre located in Herzogenrath near Aachen. We focus our innovative and advanced activities on mobile and public communication in order to secure and extend our leading market position. In January 1991 young engineers started their work in the field of research and software development and testing. Today we are 300. And further expansion will take place in phases.

Our project department is responsible for the Switching Systems (SS) node within Ericsson's GSM mobile network. The 20 department members are responsible for all projects on SS level. This requires the management and coordination of design recourses in six to eight different European countries. CME 20 SS Phase 5 is the project in which Ericsson's next version of the GSM software will be developed. Due to the importance of this project and the general growth of our project department we are looking for the

Quality Coordinator CME 20 SS Phase 5

The general responsibility of this position is to set up a quality system for the mentioned project. The main authorities and tasks are:

- monitor the performance of the quality system by taking part in reviewing meetings, project audits and exit/entry criteria meetings
- measure the quality of design products
- write quality reports
- assist in writing and approving of exemption requests
- support project management in all quality related activities

This position reports directly to the Project Department Manager.

As a suitable candidate, you are an Ericsson employee, should have appropriate AXE 10 software design and testing 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 a good ability to work under pressure. Furthermore you are familiar with Ericsson's working and quality methods.

If you have any questions and/or are interested, please refer to your colleagues until the 18.11 1994:

Ericsson Eurolab Deutschland GmbH

Human Resources
Ralf Mohr
Dial: 02407/575-163
Memo: EED.EEDMOR

Project Department
Jan van Hemert
Dial: 02407/575-263
Memo: EED.EEDJPH

Short of staff?

Place an ad in Contact – the best channel for international Ericsson recruitments. Order through Birgitta Michels, memoid LME.LMEBIMI.



BURNDY IDC CONNECTORS



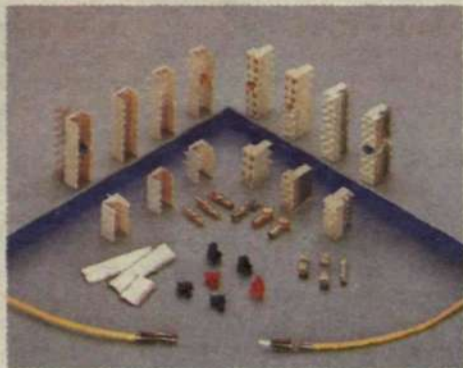
BURNDY IDC MACHINE



SOURIAU/BURNDY PRESS-FIT CONNECTORS



MILLIPACS™ 1 (2 mm spacing)



MILLIPACS™ 2 (2 mm spacing)



SOURIAU FIBRE OPTIC CONNECTORS

FCI connects the world of telecommunications.

Framatome Connectors International is one of the world biggest manufacturer of electrical connectors. Our assortment is one of the broadest in the market. We have connectors for telecom, computers, heavy and light industry,

aircraft, military, marine, nuclear plant, automotive, consumer electronics and electrical power. We have the resources to offer you either a standard connector or a customer designed solution.

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France 33 (1) 39 49 21 83

Germany 49 (211) 92 540
Great Britain 44 (582) 47 57 57
Hong Kong 852 510 81 31
India 91 (484) 310 132
Italy 39 (11) 451 96 11



Japan 81 44 210 16 12
Mexico 52 (5) 576 23 00
Netherlands 31 (10) 459 63 99
Singapore 65 749 12 32
Spain 34 (3) 771 40 12

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U.S.A. 1 (203) 838 44 44

New Release



Light from the underside!

Citizen Electronics new innovative surface mountable **LED CL-230** is intended to be mounted on the PCB to illuminate the opposite side through a hole. See figure below. Total height of the PCB is minimized to almost nothing. The LED is available in most common colors.



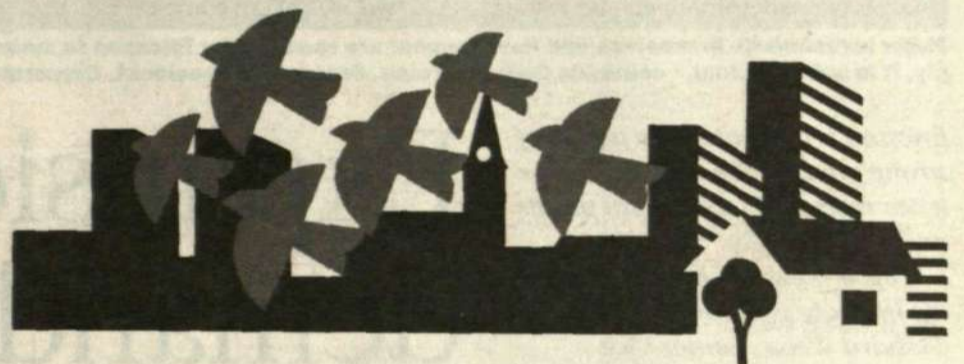
Size 3,2 x 1,6 x 1,1 mm.
(LxWxH)

Do not hesitate to call us for further info and samples.

Tel 08-359255



Fax 08-355151



Ericsson Accommodation is moving to new offices

As of December 5, Ericsson Accommodation will be located at new offices, at Årstaängsvägen 1 B.

We hope this will make it easier for you who often visit Ericsson Accommodation and the Guest Service Centre. We will have a common reception desk and we will be adjacent to each other. Combined, we will form Ericsson Guest Support.

Competence Development Services (ETX/TK)

Our reception desk will also serve visitors to Competence Development Services.

You are most welcome to contact us!

Here are our new telephone and fax numbers:

Reception: Telephone 08-681 35 50 Fax 08-681 35 00
Memoid:LME.LMEGUEST

Visitors' address: Årstaängsvägen 1B, Marievik, Stockholm
Postal address: Telefonaktiebolaget L M Ericsson, Accommodation Services, S-126 25 Stockholm, Sweden

Internal address: MV/LME/LB

Hotel reservations: Telephone 08-681 35 90 Fax 08-681 35 85
Memoid:LME.LMEHOTEL

Apartment rentals: Telephone 08-681 35 59 Fax 08-719 65 36
Memoid: LME.LMEFLAT

Payment Service: Telephone 08-681 00 00 (switchboard)
Fax 08-681 35 71
Memoid: LME.INTR

Expatriates' housing: Telephone 08-681 00 00 (switchboard)
Fax 08-681 35 71

ERICSSON



CONTACT

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



Major investments in research and development are required for Ericsson to maintain its long-term competitiveness. Although such investment has increased sharply, it is not sufficient," contends Gerhard Weise, Senior Vice President, Corporate Financial Control, at Ericsson. Photo: Gunnar Ask

Ericsson is currently in a period of strong growth. The nine-month interim report also shows that profits are rising sharply.

"This is pleasing, but the size of the increase is not sufficient," says Gerhard Weise, Senior Vice President, Corporate Financial Control, at Ericsson. In order to maintain long-term competitiveness, higher earnings are required to cover investments in research and development. Cash flow, which has been negative during the past three years, is another critical factor for Ericsson.

As Senior Vice President, Corporate Financial Control, Gerhard Weise is responsible for providing the figures for Ericsson's year-end financial statements and interim reports. His task is also to raise a warning flag when the figures merit specific attention. With the nine-month report in hand, Gerhard is now sounding a warning - despite the profit increase of 88 percent compared with the preceding year and the continued sharp rise in order bookings and net sales.

"This is good," says Gerhard, "but not quite good enough."

Profits not sufficient

"SEK 3.5 billion in profits during the first nine months is a very favorable outcome. But, if you place these figures in relation to the demands facing Ericsson just now, even higher profitability is required. To maintain our competitiveness, profits must be twice as large," he contends.

Expansion demands higher profitability

Critical review indicates that profit level is not sufficient

"Ericsson now has a very competitive product portfolio. To ensure that it can sustain this position in the future, very heavy investments in research and development are required. Accordingly, corporate management is seeking even higher earnings figures."

Competitors more profitable

"Another group which is looking for higher earnings are the shareholders. Ericsson's return - measured as profit in relation to paid-in capital - is still too low, compared with several other companies in the industry.

"The fact that several of our competitors are reporting higher returns than Ericsson is a warning signal that we must view seriously," Gerhard urges.

"When we consider the shareholders, we must remember that in recent years they have contributed more money than

what they have received in dividends. The convertible debenture issue last year generated SEK 2.2 billion from the shareholders, while dividends during the past two years totaled SEK 1.7 billion. Moreover, we should not forget that we invested more than 15 times this amount in research and development than in share dividends."

Negative cash flow

Ericsson's cash flow is still negative, as it has been during the past three years. This concerns Gerhard Weise, despite the mitigating circumstance of the sharp expansion.

"A negative cash flow is a sign of weakness. If it continues for an extended period, such as in our case, it is an obstacle to future expansion. Accordingly, we must achieve a positive cash flow this year, and be able to maintain it in the immediate years ahead," Gerhard says.

"We must build reserves now for the downside of the business cycle which will come at the end of the 1990s!

"One of the reasons that the cash flow is negative is that we have large sums tied-up in current assets, which at September 30 amounted to SEK 50 billion, mainly in accounts receivable and inventories. This item in the balance sheet has risen by SEK 4 billion since year-end 1993 and is now at a much too high a level in relation to consolidated net sales.

In order to contribute to achieving a positive cash flow, we must now reduce inventories and accounts receivable so that we can release this capital!"

Continued cost awareness

In recent years Ericsson has been characterized by cost-cutting and rationalization measures. TRIM and TQM are examples of activities which have been applied on a broad front to tackle the problem of high costs.

"Without these cost-cutting measures, Ericsson would most probably be facing more difficult problems today, but we are far from reaching the goal as yet," Gerhard says. He emphasizes that the ongoing price reductions on Ericsson's products continually place new demands on cost-efficiency and cost-savings.

"We must continually increase our efforts to improve net margins. This demands that we all, jointly and within each unit, intensify efforts to reduce costs.

"We must not forget that our competitors are also carrying our rationalization programs. This becomes bitterly apparent when others win the bidding for new contracts because they could offer lower prices than our own!"

Text Lars-Göran Hedin