

# CONTACT

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## Billions of kronor to gain

Through better coordination and planning, Ericsson can save billions of kronor in its purchasing operations. Jan Tufvesson is being assigned Group responsibility for purchasing, as one of the staff managers in Anders Igel's new Corporate Technology organization.

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## German order for Mobitex

Ericsson's system for mobile data communications, Mobitex, has captured another market. This time, a new German operator plans to construct a nationwide Mobitex network.

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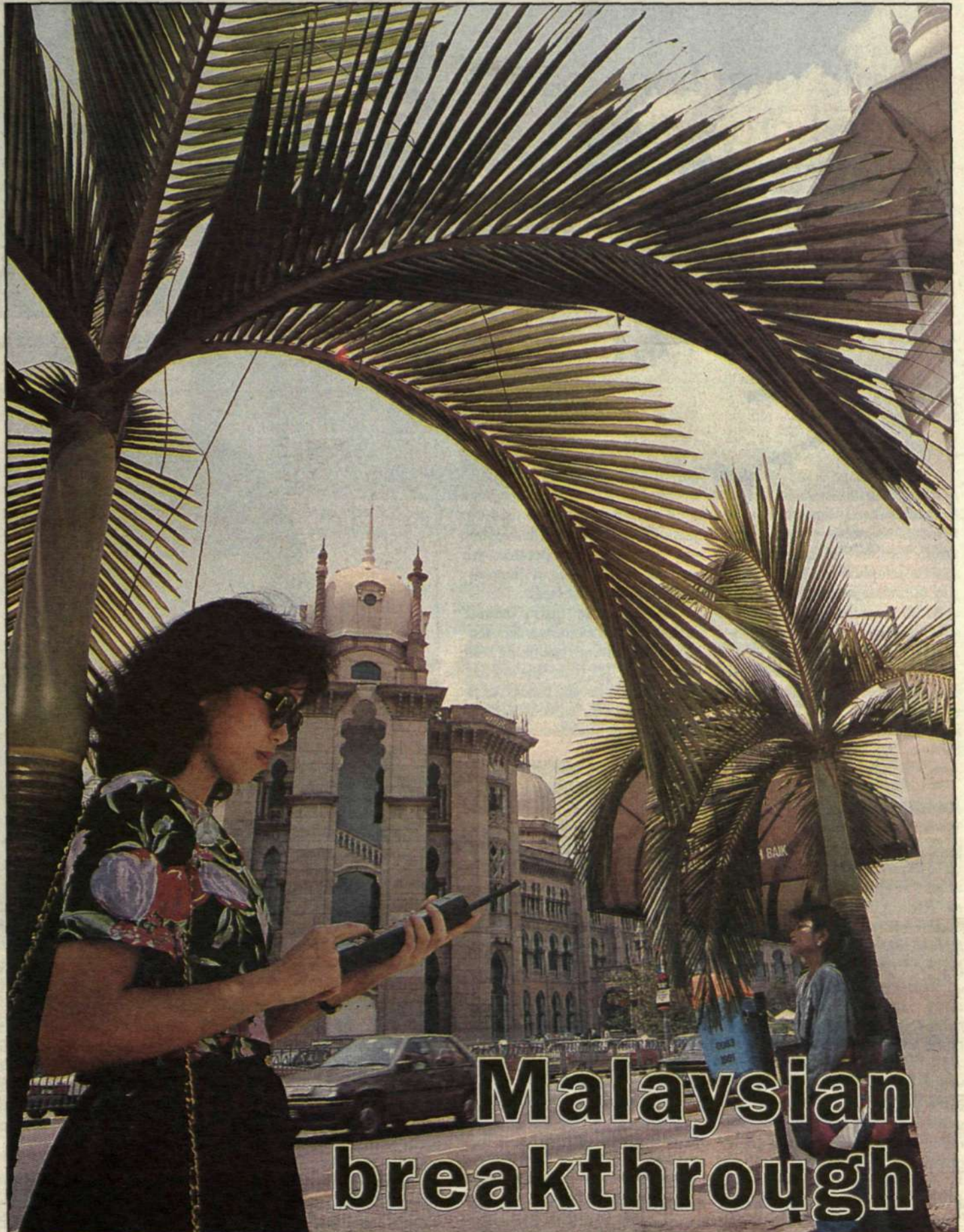
## Expertise in miniature

The Microelectronics Business Unit in the Components Business Area is Ericsson's spearhead for the design, production and sales of microelectronics.

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## A tour of the mini-fab

Ericsson's new factory for the production of microcircuits is known in the industry as a "mini-fab." This facility in mini-format costs SEK 1 billion, but is small in terms of the number of employees. In contrast, the level of education is high on the factory floor.

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## Malaysian breakthrough

Malaysia is one of Ericsson's most important mobile telephony markets.

Breakthrough for a new technology. One of the largest radio orders ever. An order from Malaysia increases Ericsson's chances of becoming the leader in another attractive radio market. The order

is for a radio-based fixed cellular network that will facilitate a rapid and cost-effective expansion of the country's telecommunications.

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# The mobile sales success

## Mobile telephone sales exceed projections

**Sales of mobile telephones have skyrocketed in recent months. The trend is attributed to several factors. The digital systems, particularly GSM, have accelerated. At the same time, more operators are intensifying their marketing of the analog mobile system. Private persons are being attracted as subscribers with promises of low local-call rates and other incentives.**

It appears that all projections for the mobile telephone market have been exceeded in recent months. The suppliers' and market analysts' forecasts were far off the mark, particularly for GSM.

"GSM has spread like wildfire recently," says Johan Siberg to Contact. Johan is the president of Ericsson Mobile Communications, the unit responsible for mobile telephones within Ericsson. He relates that sales now exceed all expectations and at the same time the base for future sales is increasing rapidly.

"More and more countries are selecting GSM as the digital standard, particularly countries in Southeast Asia, as well as in Europe, the Middle East, South Africa and in Australia."

### Analog marketing

While the digital wildfire gains pace, the analog system continues to attract market interest. This is attributable to operators such as Telia in Sweden intensifying their marketing efforts to sell analog mobile telephones to the private sector.

"This has occurred through using such offers as free local calls, low rates during low-traffic hours and similar incentives."

England is one of the countries where operators have succeeded using this strategy to increase the number of analog subscribers parallel with the accelerating sales of the digital system.

"Possibly these successes are an indication that the concept of 'mobility' has become a central

theme for private persons much more quickly than we have previously anticipated."

### Troublesome pricing

In Sweden and many other countries, it has become difficult to gain a grip on pricing of mobile telephones. The market is a jungle of various offers in which the manufacturers of mobile telephones as well as the operators are making a wide range of "incredible" offers to customers.

"The operators' heavy interest in this market demonstrates that mobile telephones are being sold like razors. They are not interested in the razors. It's the blades, or in this instance the calls, which generate the high revenues."

### Shortage of components

Growth in mobile telephony, measured by number of subscribers and system capacity, continues to rise sharply. Naturally, this places heavy pressure on suppliers of mobile telephones, particularly of pocket phones, which currently are predominant on the market. The pressure is so heavy that the supply of telephones has become a problem.

"The manufacturers of telephones have been experiencing expansion difficulties, but a greater problem is the supply of components. It appears that all manufacturers foresaw a sharp increase in sales, but that the components industry did not view the situation seriously."

The consensus in the industry is that access to components will no longer be a problem next year.



Ericsson is expanding its capacity in Kumla and Lynchburg to cope with the rising demand for mobile telephones. production is also being started in Linköping.



"Mobility has become a central concept for people," says Johan Siberg. Photo: Lennart Kaltea

Until then, the positive effect is that the annual decline in the price of mobile telephones, in the range of 15-20 percent, has been temporarily halted.

"The price trend will gain pace again next year, when balance is regained in supply and demand," Johan contends.

For Ericsson, mobile telephones have become an increasing

important segment of its operations. This year, Johan Siberg anticipates that Ericsson will manufacture two and a half times as many telephones as last year. And in 1995, he expects a similar increase.

### Expanded capacity

"We are expanding capacity at the factories in Kumla, Sweden

and Lynchburg, Virginia and we are now starting production in Linköping, Sweden," reports Johan. Currently, we are focusing on the newest generation, Jane, but Sandra is also selling well."

Jane, the flagship of Ericsson's range, has been introduced for an increasing number of standards this year.

First, there was the European analog standard, ETACS, then the American AMPS, followed by NMT, GSM and the most recent digital AMPS in the so-called dual mode for the U.S. market.

"We are now working on the last standard, for Japan. A launch is also under way in this market."

### Looking back

The successes with mobile telephones could be called a nice birthday present for Ericsson's radio operations, which celebrate a 75th anniversary this year. Today, when developments in the field are steadily accelerating, it is difficult to comprehend that this is a technology which basically has existed for an entire generation.

"It definitely makes you stop and reflect a moment," says Johan, "that our successes are actually the result of 75 years of collective know-how in the field of radio communications. We should be very thankful to the radio pioneers of the early 1990s," according to Johan.

Lars-Göran Hedin

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# Billions to save through improved purchasing

Materials and components presently account for between 70 and 95 percent of Ericsson's manufacturing costs. Most are purchased from external suppliers. There are billions to be saved through more efficient handling of the development and purchasing processes.

This is the opinion of Jan Tufvesson, who is presently assuming responsibility for Group purchasing operations within Ericsson. He is one of Anders Igel's staff managers in the newly organized Corporate Technology function.

The Ericsson business area that has progressed farthest with organizing purchasing operations is Radio Communications. During a period of six years, purchasing director Jan Tufvesson has raised the status of purchasing-related matters to the highest level within the business area.

"Purchasing has received a strong support from the organization in recent years. Within Radio Communications, management has emphasized the strategic importance of purchasing matters," says Jan Tufvesson.

It is not simply a matter of saving billions through more prudent purchases but also of safeguarding access to important key components, raw materials semi-finished products, etc.

Within the business area, the purchasing function of today is the result of a six-year change process. It is the experience from this work that Jan Tufvesson now has the opportunity of applying at Group level.

"It is a thrilling challenge that will give rise to many opportunities for future team-work. And it is my hope that these efforts will soon be reflected in Ericsson's balance sheet," Jan continues.

## Cooperation

Jan emphasizes that the new purchasing organization he intends creating shall build on the organization already existing in the various business areas. And cooperation with these units is the method he will adopt in developing operations.

"I am convinced that we will work well together," Jan asserts. He has already received strong support from numerous sources when it became known that he would assume the role of Group coordinator in this area.

"My ideas are sufficiently well-known in purchasing circles, therefore I interpret this support as a strong vote of confidence for implementing them throughout the organization, as was done earlier within Radio Communications.

The motivation for the change activities that Jan conducted within Radio Communications was to increase profitability throughout the organization. The method is simple: Do it right

## Jan Tufvesson will coordinate Ericsson's purchasing

from the beginning! To accomplish this, Jan formulated two key concepts for purchasing operations: Interaction at an early stage and cross-functional cooperation.

### At an early stage

"For example, it is important that purchasing decisions be reached at an early stage and suppliers selected. The longer you wait, the less freedom of action you have," Jan provides a concrete example:

"A buyer assigned to negotiate with a supplier on the price of a component which is already designed into a product has very little room for negotiation. Or conversely, a supplier may have valuable inputs as to how a component should be designed to not only fulfill its intended function but to also be simple to manufacture."

### Simple principles

The basis for all new designs must be to satisfy customer requirements. The new products or processes that Ericsson is focusing on must correspond to customer needs. Only when the customer is satisfied can the work be considered complete.

Jan Tufvesson propounds five simple principles which all Group functions should follow:

- Common regulations
- Interaction at an early stage
- Cross-functional cooperation
- Decentralization of work and responsibility
- Coordination

"To be able to apply these principles requires that all parties involved be aware of the basic regulations and that they be properly educated and qualified for their work," Jan explains. "Interaction at an early stage and cross-functional cooperation are facilitated if we are in proximity to



Taking charge of purchasing. Jan Tufvesson is newly assigned as the responsible manager for coordinating Ericsson's purchasing activities. He will be one of the new staff manager in Anders Igel's Corporate Technology unit. Photo: Gunnar Ask

each other. We require aids which are supportive – and, preferably, to work with the same tools, systems, networks, software, etc."

### Higher status

What is purchasing, actually?

The procurement of components and materials for our factories is the answer that many would give.

"That is by no means the entire truth," says Jan Tufvesson. His point of view is that buyers formerly had low status and were hidden away somewhere in the production organization. At that time, Ericsson purchased mostly raw materials, to which value additions were made within the company. Buyers had little influence on cost levels. At that time, there was little reason to involve purchasing at an early stage.

"In today's situation, buyers must be accorded considerably higher status in recognition of their efforts being incomparably more valuable," Jan adds. "Currently, purchased material frequently comprises 90 percent of Ericsson's total manufacturing costs. These are usually specially manufactured components – frequently produced exclusively for Ericsson, ready-to-use accessories, sub-systems, etc."

Frequently, we have only a few suppliers to choose among, because our requirements are so

high, or our reluctance, due to cost considerations, to have a component developed by more than one supplier. Interaction at an early stage and cross-functional cooperation thereby enter the picture – we must negotiate prior to selecting a supplier!"

### Three levels

At Radio Communications, purchasing is organized at three levels; factory purchases, purchasing units that are closely related to development engineering and, finally, a joint unit for support and management.

Jan defines factory purchases as providing material and components for production. Each factory has full responsibility for this function.

"Then there are purchasing units assigned to each business unit. These are responsible for maintaining close contact with the development segment and which also ensure that we fulfill the requirement for interaction at an early stage and cross-functional cooperation. Accordingly, they also work interactively when project needs arise."

The joint unit is a central purchasing function headed by a purchasing director, with a steering group comprised of most of the business unit managers, the accounting manager, the production director and the business area manager.

"One of the central purchasing function's most important jobs is to provide support for acquiring outside technology. This requires a sufficiently high position to enable establishing contacts with the corporate management level of supplier companies."

### Whole-hearted support

In assuming Group-wide responsibility for purchasing operations, Jan is aware of his dependence on support from within the organization.

"I want to build a purchasing organization based on the principles I have described, but I can't do it alone. On the contrary, I will need the whole-hearted support of mainly the business area managers." In this respect, Jan is hoping to receive the same support from the other business areas that he has already received within Radio Communications. The Group's business area managers must also resolutely close ranks behind him, but Jan does not feel that this will be a problem.

"Their operations are where the results will be reflected! Through improved purchasing, interaction at an early stage and cross-functional cooperation, Ericsson can save billions of kronor annually, and all business units can benefit from the proceeds generated."

Lars-Göran Hedin



# Breakthrough for Mobitex in Germany

**The German consortium Gesellschaft für Datenfunk mbH (GfD) has selected Ericsson's Mobitex technology for a new nation-wide public mobile data network for which the company was recently awarded a license. This order signifies a breakthrough in the important German market.**

The contract with GfD, which is valued at DEM 115 million (SEK 500 million), calls for delivery and installation of a complete Mobitex network. The network will be ready to provide the first services in the spring.

GfD are planning to invest approximately DEM 530 million (SEK 2.5 billion) in building the

new network and providing services.

"We chose Mobitex because it is established technology with numerous European references," relates Friedel Tischler, GfD chief executive officer.

"There is a wide variety of radio modems, connectivity products and applications currently available for Mobitex from many suppliers. Mobitex users all over the world have proven the reliability of these products and shown that Mobitex applications are profitable investments. We are looking to the large installed base of Mobitex applications in Europe to help us to jump-start the German market," says Friedel Tischler.

#### Large project

Ericsson will deliver and install all base stations and switches for the new network. "Ericsson

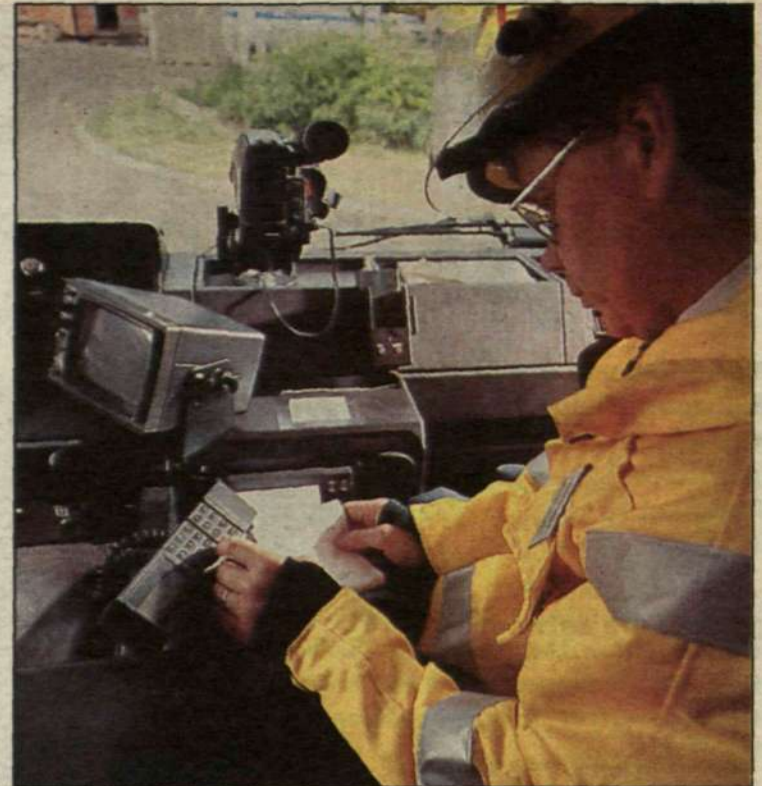
GmbH has demonstrated in other dealings with us their ability to manage large projects," explains Friedel Tischler. "So for us it made good business sense to let Ericsson provide a complete network."

"This order is particularly gratifying, because the GfD consortium represents several very demanding customers in the energy and telecom sectors," says Göran Berntsson, manager for the Mobile Data Division of Ericsson Mobile Communications.

"For European users, this means wide coverage for Mobitex. Operators across Europe will be able to interconnect their networks and take full advantage of international roaming."

#### Large market

GfD foresees a potential market of 600,000 users by the year 2000. To exploit this potential,



**Mobitex is spreading in Europe. Now even German trucking companies, taxis and other users will be able to take advantage of this form of mobile data communication.**

the new operator will deploy its network rapidly.

The first phase, which will provide initial services by spring 1995, will start in the Rhein-Ruhr region and provide coverage of major population centers, industrial areas and main roads. By April 1996, coverage will extend to 60 percent of the German population. When the network is completed at the end of 1997, it will cover 80 percent of the geo-

graphical area and 90 percent of the population. The number of base stations in the completed network will exceed 1,500.

Members of the GfD consortium include previous Ericsson customers Mannesmann, Compagnie Financière pour le Radiotéléphone (COFIRA) and RAM Mobile Data.

Mobitex networks are currently in operation in twelve countries on four continents.

## A milestone for Ericsson in Hungary

**Ericsson Technika Kft in Hungary has signed a contract with Monor Telephone Company calling for delivery of an AXE system, power equipment and cross-connectors.**

**The contract is valued at SEK 64 million (HUF 800 million).**

Monor Telephone Company is a Hungarian-American joint venture company that holds one of the concessions issued to private companies for local telephony in Hungary.

"Because this contract is the first from a private operator, it is a milestone for Ericsson in Hungary," says Gunnar Grahn, who works in Market Operations Europe within the Public Telecommunications business area.

The Hungarian customer is the regional operator in the Monor area near Budapest.

#### 31 villages

With this contract, the need for telephone communications in 31 villages in the area will be satisfied. Installation will begin in September of this year, and the first phase will be completed before year-end. The remaining subscriber lines will be installed in June 1995.

As one of the leading suppliers of telecommunications equipment in Hungary, Ericsson is contributing to a rapid modernization of the country's wireline and mobile telecommunications networks.

To date, more than half a million AXE lines have been taken into operation.

Earlier this year, Ericsson received an order for an RAS 1000 system, a radio-based subscriber



**The need for more extensive telecommunications is vast in Hungary. Many people must still rely on coin-operated telephones.**

network that will cover the Budapest area. Ericsson has also supplied two of the country's mobile telephone systems, NMT 450 and GSM.

Ericsson received the first orders from Hungary in the late

1960s. The first AXE order was received in 1989.

An Ericsson company was opened in Hungary in 1991. President of the company, which currently has about 450 employees, is Istvan Fodor.

## New agreement with Liaoning

**Ericsson recently signed an framework agreement with China's Liaoning province calling for the expansion of the telecommunications network.**

The agreement includes delivery of AXE equipment, intelligent networks, mobile telephone systems and transport network products based on SDH technology (Synchronous Digital Hierarchy). The contract also calls for the delivery of ATM equipment for the new generation of telephone services that demand high transmission speeds. Deliveries are spread over a two-year period starting in 1996. Discussions concerning financing will be initiated shortly.

This is the fourth framework agreement that Ericsson has signed with Liaoning Post and Telecommunication Administration.

## Oman to expand network

Ericsson has received a contract for a complete project in Oman valued at SEK 200 million. The contract concerns expansion of Oman's telephone network in rural areas. Products will be supplied by the Business Communications and Network and the Public Telecommunications business areas. The customer is GTO, General Telecommunications Organization, telephone operator in Oman.

"With this contract, Ericsson strengthens its position in the gulf region," says Gustav Magnusson, who works in Market Operation Asia and the Middle East in the Public Telecommunications business area. The contract calls for the development, planning and construction of a total communications solution, based on Ericsson's AXE switches and transmission equipment.

## Land mobile radio to Korea

Ericsson will supply an EDACS land mobile radio system to the Korea Electric Power Company, KEPCO. The system will be used to improve service in the power net in the Seoul area. KEPCO sees the installation of the EDACS system as the first step in upgrading the company's nation-wide communications system.

Samsung Electronics Corporation of Korea is responsible for the contract, but

it is Ericsson that will deliver equipment and provide maintenance services.

"This contract is the beginning of a long-term cooperation," says Staffan Svensson, Vice President for Land Mobile Radio International within Ericsson Radio.

"We are convinced that our global successes as supplier for power companies will be repeated with KEPCO."



# Giant contract from Malaysia

Malaysia is one of Ericsson's most important markets in Southeast Asia. Ericsson Radio recently landed an order for a fixed cellular network valued at SEK 3.4 billion. The network, which is based on the AMPS/D-AMPS standard, marks the unveiling of an entirely new service, in which radio communication replaces cables in the subscriber network.

The first area in Malaysia to receive the new service is the vacationers' island, Langawi, where an exchange and two radio-base stations have already been installed. The work is now being accelerated in order that at least 1,000 subscribers will have home or office connection by Christmas.

The Ericsson system of building fixed networks using cellular radio technology is wholly automated. It utilizes the latest TDMA technology (Time Division Multiple Access) in order to satisfy public network requirements.

Although initially, the network will use both analog and digital technology, the goal is to wholly adopt digital technology.

Vijay Kumar, president of Syarikat Telephone Wireless (STW), who ordered the system, notes how rapidly such a system can be installed:

"The fixed cellular network can thus meet the heavy demand. This new method of offering telecom services is also a cost-effective alternative to traditional wire telephony."

## Breakthrough

"This is a decisive breakthrough for the application of AMPS/D-AMPS in a fixed cellular network", comments Kurt Hellström, head of the Radio Communications Business Area.

"With STW taking the lead by introducing the technology in Malaysia, this order will serve as a milestone for fixed-network radio communications in the Asian region."



Malaysia is one of the Southeast Asian countries where Ericsson has enjoyed its greatest success in mobile telephony. Now, radio technology will also be used to expand the country's fixed telephone network.

Having wireless telephony at home or work signifies a major step forward. The STW project is one of the world's largest of its type. It is believed that cellular telephony will further the growth of telecommunications in both Asia and South America.

"We consider it beneficial that Ericsson has chosen to develop its products for the Malaysian market," says Olle Ulvenholm, who heads Ericsson operations in Malaysia. The building of a fixed cellular network is an important part of the government's "Vision 2020" program, and we are proud to make a contribution.

The Group had earlier delivered "regular" AMPS/D-AMPS standard mobile-telephone systems to several countries. More than five million subscribers in 25 countries throughout the world are presently being served by means of such systems from Ericsson, which is the world's leading supplier, with 32 percent of the North American market and 56 percent of the remainder of the world.

## Ericsson has been in Malaysia since 1965

Ericsson has been in Malaysia since 1965, first involved in a long term cooperation with the operator Jabatan Telekom Malaysia.

Now, the group is working together with Telekom Malaysia Berhad, as a supplier of digital AXE-switches and of the mobile telephone system ATUR, which is based on the NMT450 standard. Other important customers are Celcom (Cellular Communications Network), operating a mobile telephone system of the E-TACS standard and Mobikom, who is running a digital mobile telephone system (D-AMPS).

The Group's operations in Malaysia are concentrated in two different companies, Ericsson Telecommunications Sdn Bhd and Perwira



Ericsson Sdn Bhd. Both are joint-venture companies together with the Malaysian company Lembaga Tabung Angkatan Tentera.

Working closely together, the two companies employ in total 700 persons. Most of these are highly educated engineers or qualified technicians.

## Digital to Malaysia

Ericsson has received a large digital, mobile-telephony equipment order from Malaysia. The order is valued at SEK 350 million and was placed by Celcom Cellular Communications Network.

By virtue of this order, Ericsson becomes the principal supplier of equipment for Celcom's digital mobile-telephone system. The system operates on the 900-Hz band. Celcom has been operating an analog E-TACS network with more than 350,000 subscribers. Here also, Ericsson has been the principal supplier.

Now, by expanding a digital system, Celcom can increase its network capacity considerably. The investment is part of Celcom's plan to wholly digitalize the infrastructure of its telecommunications. This will be Malaysia's first wholly digital telephone network.

## AXE to Sichuan

Ericsson will deliver AXE equipment and operating-support systems to the Chinese province of Sichuan. A letter of intent for a framework agreement was recently signed with Chongqing Telecom Bureau covering the deliveries, which include equipment valued at about SEK 1.3 billion. Chongqing Telecom Bureau is the public telephone operator in Chongqing, one of the largest cities in Sichuan province, in southwest China. The new agreement strengthens Ericsson's positions in this province.

## Factory in Mexico sold

Ericsson has sold its controlling share in the Mexican cable company, Conductores Latinca S.A. de C.V. The buyer is a local Mexican industrial group.

Latinca, whose head office is in Mexico City, with manufacturing at San Luis Potosi, has annual sales of SEK 650 million, with 1,200 employees. With this sale, the company has now divested the last of the cable companies formerly operated in Latin America. The purchase amount is SEK 450 million, yielding Ericsson a capital gain of almost SEK 240,000.

## Lebanon buys GSM

Ericsson has obtained an order to deliver a GSM network that will encompass all of Lebanon. The contract was signed with the Lebanese company, F.T.M.L. and the Ministry of Public Telecommunications. This is a "build, operate and turn-over contract," which means that the network is to be built, operated and, after a time, transferred to the customer.

The network will be placed in operation in December 1994, with 30,000 subscribers being served initially.

Lebanon is one of the first Middle East countries to opt in favor of having a GSM network installed.

The modernization of telecommunications is a vital link in the rebuilding of the country's infrastructure, following many years of civil war.

## Lithuania new AXE-country

LM Ericsson A/S Danmark has landed an order from Lithuania to deliver AXE equipment, SDH-based transport network products and optic-fiber cable. The order was placed by Telekomas, the country's public telephone operator, and is valued at SEK 22 million.

With this order, Ericsson has sold the AXE system to no fewer than 111 different world markets. Other newly arrived

markets for AXE include Qatar, Laos and Andorra.

LM Ericsson A/S in Denmark is responsible for the operations in Lithuania. The office in Vilnius is under Danish management. The employees are local residents. This, however, is not the Group's first establishment in the country - telephone equipment was delivered to Lithuania already in 1919.





Rod Olsen, Group Executive Director, Finance, at Cable & Wireless and Anders Igel, Senior Vice President, Technology, sign the Corporate Relationship Agreement.

# New partner in strategic development

**A Corporate Relationship Agreement was signed at the end of August between the British telecommunications operator Cable & Wireless and Ericsson. Under the agreement, Cable & Wireless has designated Ericsson as a strategic partner and supplier of telecommunications products and services.**

"This is a very positive development in the relations between Cable & Wireless and Ericsson, and the intentions of the agreement will be followed up at Corporate levels on a regular basis," says Anders Igel, Senior Vice President, Technology, who signed the agreement with Rod Olsen, Group Executive Director, Finance, at Cable & Wireless.

#### Huge benefits

Commenting on the agreement, Rod Olsen said:

## Corporate Relationship agreement with Cable & Wireless

"Such agreements with our suppliers promise huge benefits for Cable & Wireless. They will not only lead to financial savings but, through the development of a closer relationship between Cable & Wireless and our suppliers, should allow us to more easily anticipate, and meet, the demands of our customers."

#### Gratifying

The decision by Cable & Wireless to select strategic partners represents a major change in the company's purchasing approach.

"One reason for selecting strategic partners is that Cable &

Wireless is moving away from old-style confrontational purchaser-supplier relationships to avoid the time-consuming procedures of open bidding. Instead, the company wants to improve management of strategic supply item purchase through close, continual relationships with suppliers who handle delivery and maintenance of the telenet," contends Rolf Bäckström, responsible for business development and international operators within Ericsson Telecom's marketing unit, Business Development and Marketing.

"It is gratifying that Cable & Wireless selected us, and we will ensure that they will not be disappointed, by demonstrating that Ericsson is a partner to rely on," adds Mr Bäckström.

#### Good cooperation

The realization of the Corporate Relationship Agreement is attributable partly to Ericsson UK's good cooperation with Cable & Wireless. Ericsson has been one of Cable & Wireless' main suppliers for many years.

"Until now we have been strong in mobile telephony. Hopefully, with the signing of this agreement, we can also strengthen our position in the public telecommunications segment," says Rolf Bäckström.

**Joséphine Edwall-Björklund**

## Cable & Wireless in brief

- Head office and parent company are located in London
- Approximately 40,000 employees
- Major operations are in Europe, the Far East and the Caribbean. In recent years, activities in the Middle East and Africa have gained importance.
- Annual sales in 1993 amounted to about GBP 5 billion (approx. SEK 60 bn).

## Breakthrough in Romania

**Ericsson has obtained two strategically important contracts in Romania for equipment for wireline public telecommunication.**

Ericsson has signed its first contract with Romtelcom RA, the Romanian telecom operator. The order is valued at SEK 40 million and includes delivery and installation of AXE switches, SDH-based transport network equipment, fiber-optical cable and Minilink radiolink equipment for the Maramures area in the north of the country.

The second contract was signed with SNCFR, the Romanian state railway. This order covers SDH-based transport network equipment and fiber cable for linking Bucharest and Ploiesti as the first step in the development of a modern telecom network for the railway.

Ericsson had earlier supplied the country's only mobile-telephone system.

With a population of 23 million, a low telephone density and an economy which has reached a turning point, Romania could become an important market in the years ahead.

## New cooperation within multimedia

**Ericsson Business Networks AB and Data Construction AB have signed a distribution agreement stipulating that Data Construction and its associated companies are to distribute products from Ericsson in the Nordic region.**

The agreement entitles Data Construction, through its dealer network, to distribute and market Ericsson products for multimedia and data communication within the area of corporate communications.

"One of the fastest-growing segments today is the integration of voice, data and video, namely multimedia. Ericsson is far advanced in this area and already has products to offer," says Berndt Långström, president of Data Construction AB.

"Through the cooperation with Ericsson, our product line is broadened to include strongly competitive products of high quality, which strengthens our

offerings to customers," adds Krister Aronsson, marketing manager for Data Construction AB.

"We chose Data Construction as a distributor because of their commitment and thorough knowledge of networks and communications. Data Construction offers its dealers and their customers a comprehensive commitment; not just sales but also training, service and advice," says Anders Berghagen, who is responsible for indirect sales at Ericsson Business Networks AB.

This is the first distributor agreement that Ericsson has signed with a member of the LAN Group International.

The LAN Group International was established in 1988 and consists of 12 distribution companies within the networks and communications area. One of the group's objectives is to advance the development of new market segments and to exchange experience related to suppliers and customers.

## Continued strength in Denmark

Denmark's leading GSM operator, Tele Danmark Mobil, has ordered radio base stations, switches and software from L.M. Ericsson A.S. valued at SEK 300 million. Ericsson thereby continues as Tele Danmark Mobil's exclusive supplier of radio base stations and switches.

The inflow of subscribers to Tele Danmark's Mobile network

has been extremely heavy during the year, with this trend expected to continue in the immediate years ahead.

Ericsson enables the operator to increase capacity and to also expand indoor coverage for pocket phones sooner than had been anticipated. New services and functions will also be introduced.

## Qatar Ericsson's 110th AXE market

Ericsson has obtained an order from Qatar Telecommunication Corporation (Q-TEL) covering delivery of AXE equipment to Qatar. The overall value of the order is approximately SEK 52 million (USD 6.6 million). The order marks the 110th market in which Ericsson has sold the AXE system.

Other new AXE markets include South Africa and Laos, where Ericsson is presently installing mobile telephone systems (GSM), and Andorra.



# Stellan points the way to better information systems

**Stellan Nennerfeldt, Ericsson Radio Systems, has received an exciting assignment from Ericsson's head of technology, Anders Igel. He will assume responsibility for information systems and technology - IT - within the reorganized Corporate Function Technology.**

**"There is much to do in this area, says Stellan to Contact. Ericsson, one of the world's leading companies in IT, has not always been particularly adept at exploiting the opportunities offered by Information Technology within its own operations.**

Today, much effort is being devoted to improving the various operational processes within Ericsson. A critical aspect of the work frequently consists of creating better methods of handling information and of finding ways of enhancing the value of the information to be handled. Coping successfully with this requires that a sound infrastructure exist. Often, such an infrastructure is lacking.

"Accordingly, Ericsson's future information systems must be rebuilt from the foundation. We must begin from scratch, otherwise the risk is great that it will go wrong," Stellan Nennerfeldt explains.

Stellan is responsible for information matters within the Radio Communications Business Area and, since October 1, is also responsible for Group-wide IT, as information technology are normally referred to.

## Shoemaker's son

"Ericsson is actually an IT company, and one of the foremost in the world," Stellan continues. "Telecommunications is of course one of the most vital elements in modern IT solutions. The company is developing and selling increasingly more sophisticated solutions in this area, but we are far from being so accomplished in our own activities."

"The adage about a shoemaker's son not having the best shoes really applies. Accordingly, there is enormous potential for improvement, a potential that we intend to thoroughly exploit," Stellan promises.

## Infrastructure

"The first area in need of a thorough review is the information-handling infrastructure at Ericsson today. By that I mean, in principle, all the systems we utilize for information handling, but most of all those that move laterally through the company, irrespective of organizational boundaries and similar.

Stellan lists four important points which require immediate attention:

- To ensure that all the information-handling networks we utilize can actually communicate with each other.
- To improve our e-mail, that is,

**"There is much to be done within Ericsson in this area"**

to develop a more powerful and modern successor to Memo.

- To create a uniform method of document handling within Ericsson.

- To upgrade information security — both in the matter of authorized distribution and to safeguard against loss of data.

"These four points are fundamental to the work we are now beginning. Their common denominator is the enormous significance they have for the Group's competitiveness. In other words, there is much to be gained from more efficient, more secure information handling."

## Group standards

For Stellan, standardization is another important issue. He emphasizes that a number of Group-wide standards actually will be established in the area. At the same time, however, he does not want the work limited exclusively to measures that promote competitiveness.

"Before expending effort to standardize IT solutions, we must question whether they are strategically important for the Group. Otherwise, standardization could easily become an end in itself and become a dead end. The work must be limited if we are to have a chance of reforming the information systems."

## Three groups

For many people, information systems may be an unclear concept. Consequently, Stellan prefers to divide IT into three main groups, in order to make it more concrete and easily understood.

"Firstly, there are the product-related support systems. For example, these may consist of development tools." Stellan prefers to regard these as a part of the product families that utilize



**Stellan Nennerfeldt is responsible for information technology productivity within the reorganized Corporate Function Technology.**  
Photo: Peter Nordahl

them. System responsibility should reside with those having responsibility for the products.

The next major group are functions of a general nature, such as order-entry, inventory-control and invoicing systems; systems for financial-control, data, wages and salaries, etc.

"In this group, there is frequently an overriding need for standardization and coordination. Systems which can contribute to increased competitiveness are to be standardized to a considerably greater extent than previously.

The third group are the functional systems which are used on a more local basis. These are to be created and purchased by the units using them but, here as well, the regulations for IT standardization established by the group must be duly observed. Investments in such systems must be treated like any other in-

vestment, that is, they must yield a return, either in increased productivity, shorter lead-times or higher quality.

"We have professionals within the company with the responsibility of standardizing the infrastructure and who can lend assistance to developing improved systems within all three groups," Stellan notes. In this instance, he is referring to the new core unit for information technology, EIT, which will assume an increasingly important role in the future.

## TQM

"Improved information systems can be used as leverage for an effective rationalization of Ericsson's operations. Accordingly, the efforts devoted to examining this area go hand in hand with the Group focus on TQM, Total Quality Management, Stellan points out.

"Just as with TQM, the important point now is to identify the best solutions for various tasks and then ensure that they are disseminated throughout Ericsson. If this can be managed, we have a real chance to improve in this area but, at the same time, we must take care that we don't overturn all that we have today.

## Priority areas

Instead, Stellan wants to choose discriminatingly among the really critical areas and begin there.

"And, while we are at it, we intend to rebuild through evolution rather than revolution. This way we derive advantage from the knowledge-base which is "in place" for various systems and solutions. And the most important aspect of all, we can link IT more closely to the way Ericsson works."

**Lars-Göran Hedin**



# Masters of miniaturization

The future of microelectronics is made in Kista

**Mastery of microelectronics is essential in the information age. Systems are increasingly being built on silicon wafers - chips.**

**The design, development, manufacture and marketing of chips is the task of Ericsson's microelectronics center in Kista.**

Microelectronics has a long history of development at Ericsson. Today's microelectronic technology, which has evolved since the late 1960s from the former Ericsson company RIFA, is the foundation for many of the successes that we experience today.

## Based in Kista

Ericsson's competence center for microelectronics is located in Kista, north of Stockholm. The center is composed of two main units. There is one core unit for applied research and development which is responsible for the development of microelectronics devices. Responsibility for design, production and marketing of microelectronic components rests with a business unit with a profit requirement.

This unit, which is called Business Unit Microelectronic Access Devices, has evolved from the original microelectronics tradition established with Rifa and more recently through Ericsson Components.

## Found everywhere

Open an AXE station, a radio base station, a mobile telephone, a subscriber exchange or virtually any other Ericsson product, and you will probably find microelectronic devices manufactured by this business unit.

"We have a central position within Ericsson today, which is very exciting. We have very good insight into systems development in the various business units," says business unit manager Sigrun Hjelmquist.

"Our responsibility includes a deep involvement in Ericsson's systems strategies and contributing our expertise in components. Thus we work closely with sys-



The nearly 700 employees in the microelectronics business unit certainly have some of the most exciting jobs within Ericsson. Shown in the photo are Sigrun Hjelmquist, manager of the microelectronics business unit at Ericsson Components, together with Per Nilsson, Helen Nylund, Ulla Carlén and Staffan Robertsson.

tems development in the various business areas. Our design engineers devote an increasing amount of time to visiting customers, both internal and external," relates Sigrun.

## The entire chain

Remaining competitive in microelectronics makes demands on both design, manufacturing and marketing. The microelectronics business unit is involved in the entire chain, as well as in development and purchasing.

"What is interesting about our business unit is the balance between remaining a strategically important internal supplier for Ericsson, while fulfilling the requirements of being competitive and profitable. We know that Ericsson is dependent on not only expertise in electronic design, but also its own microelectronics manufacturing capacity," says Sigrun.

## External customers

"The business unit's customers are found primarily within Ericsson but also externally. We compete on equal terms with other suppliers, but it is especially important that we are competitive for Ericsson customers. Ericsson is dependent on powerful microelectronics, but cost is important. It is our obligation to conduct business on market terms," Sigrun observes.

The external market provides important input that probably

would not reach Ericsson through other channels. The volumes generated by external sales are also essential for maintaining cost efficiency and competitiveness. External customers include other systems manufacturers. Ericsson companies, however, account for 60 percent of sales.

## Two product areas

"Our operations consist of two principal product areas: the development and manufacture of silicon chips and the development and manufacture of modules, such as hybrids, resistor networks, opto-modules and RF transistors. In some modules, such as RF power transistors, Ericsson's own chips are used.

In pace with the increasing focus on micro-construction and miniaturization, the importance of semiconductor components and modules increases.

## Millions of resistors

Over the past 20 years, the unit has delivered about 200 million resistor networks and, during the past 15 years, some 50 million subscriber line interface circuits (SLIC), 30 million terminal circuits, one million RF transistors and 100,000 opto-modules.

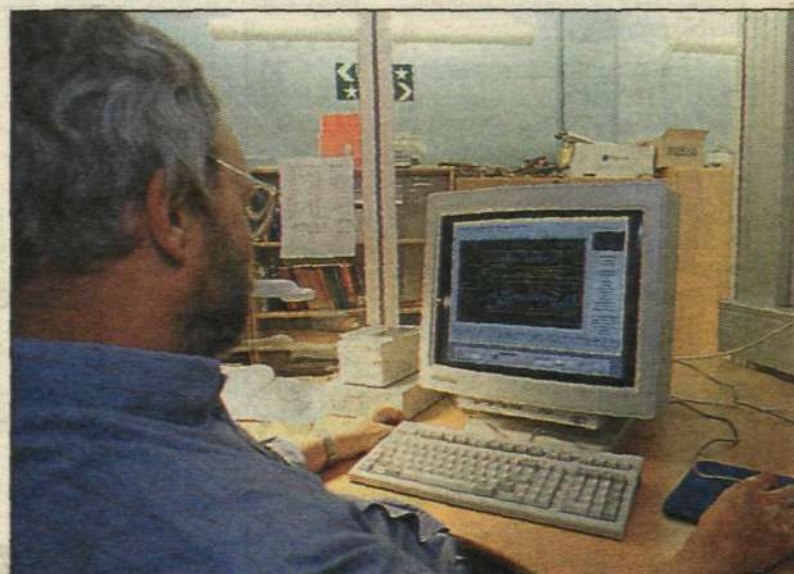
There is every indication that demand for broadband services, data communication and multimedia will result in even greater demand for components.

Inger Björklind Bengtsson



Photos: Anders Anjou

CLIC, which is a complete line function that receives ring signals and connects calls, is a big seller in China and other countries. Business Center Hybrids and Resistor Networks.



Hans Johansson designs the next generation of subscriber line interface circuits (SLIC) at the Line Circuits Design Center.



Industrial robots handle the chips in the lithographic process in the yellow room.



Ulrika Aunes optimizes laser modules at the Business Center Opto and RF Power Transistors.

## Microelectronic components

The line circuit SLIC (subscriber line interface) has been the mainstay in operations over the past ten years and still holds its position as the global market leader. This circuit handles the connection of the subscriber line in the telephone station. The SLIC is constantly being refined to meet new demands, not the least tomorrow's broadband networks. The circuit was first designed in 1979 in a joint effort by Ericsson and Eltemtel.

The complete line interface circuit is a hybrid circuit that provides all line functions for accepting ring signals, connecting calls and handling analog/digital conversion between the subscriber and the exchange.

Opto-components handle an increasingly large portion of the processing of speech, data and images for tomorrow's integrated broadband networks, the SDH and PDH transport networks.

RF power transistors are created to meet requirements in mobile telephony for transmission of large volumes of information in both analog and digital systems operating at high power, high temperatures and high frequencies.

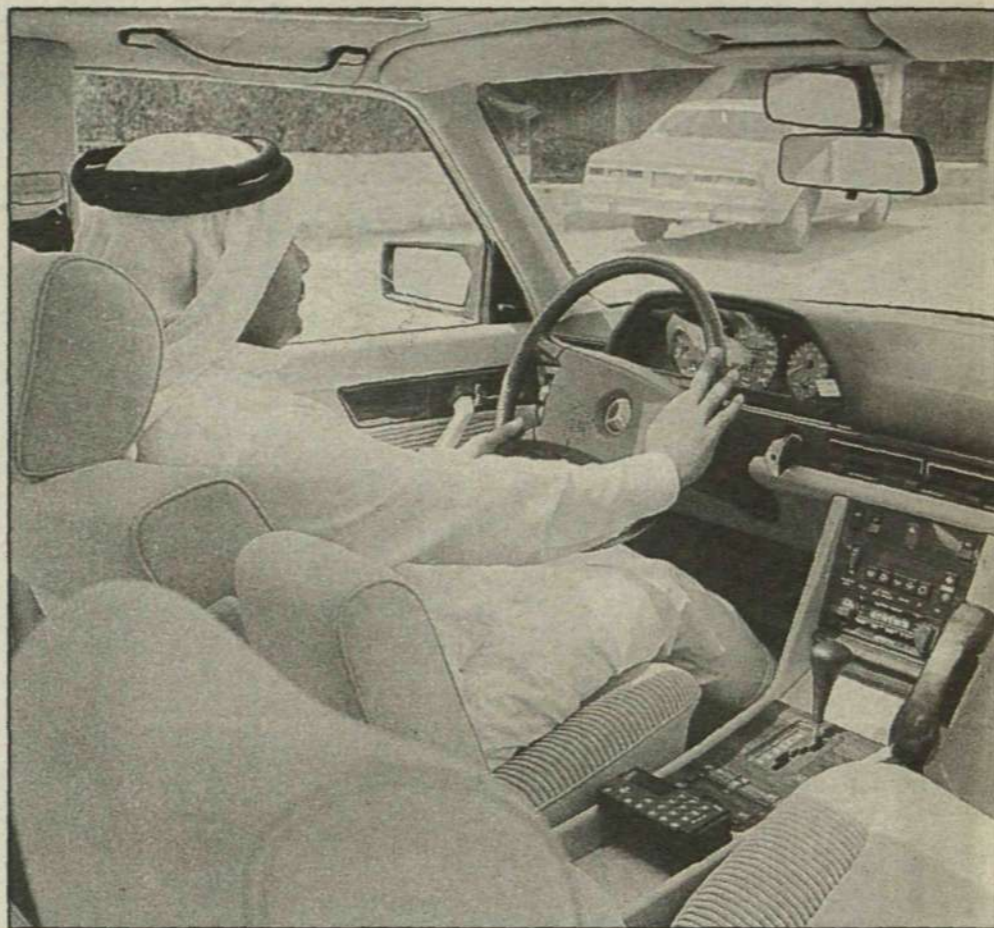
Resistor networks are based on a thick-film circuit which can be adjusted to match different voltages or trimmed exactly to a specific resistance.

ASIC Application-specific integrated circuits are designed for specific purposes.





An early automatic mobile telephone from 1968.



One of the first mobile telephone systems based on the NMT 450 standard was sold to Saudi Arabia in 1981.



Sweden's first radio announcer was Hjalmar Carlsson, shown here at the controls during a radio broadcast from SRA. The broadcasts were sent from 1922 to 1925.

# From broadcasting to mobile phones

As mobile telephony continues to grow at an unprecedented rate, Ericsson Radio celebrates its 75th anniversary. A review of ERA's history shows that it basically reflects the history of radio technology. This history stretches from 1922, when Svenska Radioaktiebolaget began the first radio broadcasts in Sweden three evenings a week, up until the 1990s, when Ericsson introduced the world's most advanced mobile telephones.

At the beginning of the century, radio communication was a new technology that was developing rapidly. L M Ericsson was following this new technology with great interest and, together with AGA, ASEA and three financial institutions, established Svenska Radioaktiebolaget on September 19, 1919.

In the early years, the company mainly manufactured radio stations for Swedish Telecom and the Royal Swedish Navy. From 1922, SRA conducted radio broadcasts three nights a week with music and news. These continued until AB Radio-tjänst (Radio Sweden) was established in 1925.

### LME takes over

In autumn 1927, L M Ericsson became the principal owner of SRA and the company's operations were organized in broadcast radio, marine ra-

## Ericsson Radio notes 75-year anniversary

dio and telephone divisions. (The latter was transferred to LME in 1931.) The broadcast radio division was the largest, with manufacturing of radio sets (Radiola), gramophones and speaker systems. Transmission materials were also an important product area which continued until 1956.

In 1929, foreign markets began to open, and the first major radio network was sold to Mexico.

### Experiments with TV

In 1935, SRA constructed a television transmitter and later that year, on November 20, was responsible for the first TV broadcasts in Sweden. The public was able to see these first transmissions at several newspaper offices in Stockholm. This was no more than a test, however, as the technology still had several hurdles to conquer.

During the war, SRA developed defense communications for the Swedish Air Force, field radio stations for the Army and mobile radio for the police and other authorities. In the 1950s, production was again concentrated on civil applications, and in 1954 SRA was able to offer the first TV receiver - a floor-standing model



The latest generation of mobile telephones from Ericsson are small, easy to use and based on extremely sophisticated technology.

with a 17" picture tube. (Subsequent models included a 21" table model.)

Radio and TV operations were sold in 1964 to AGA.

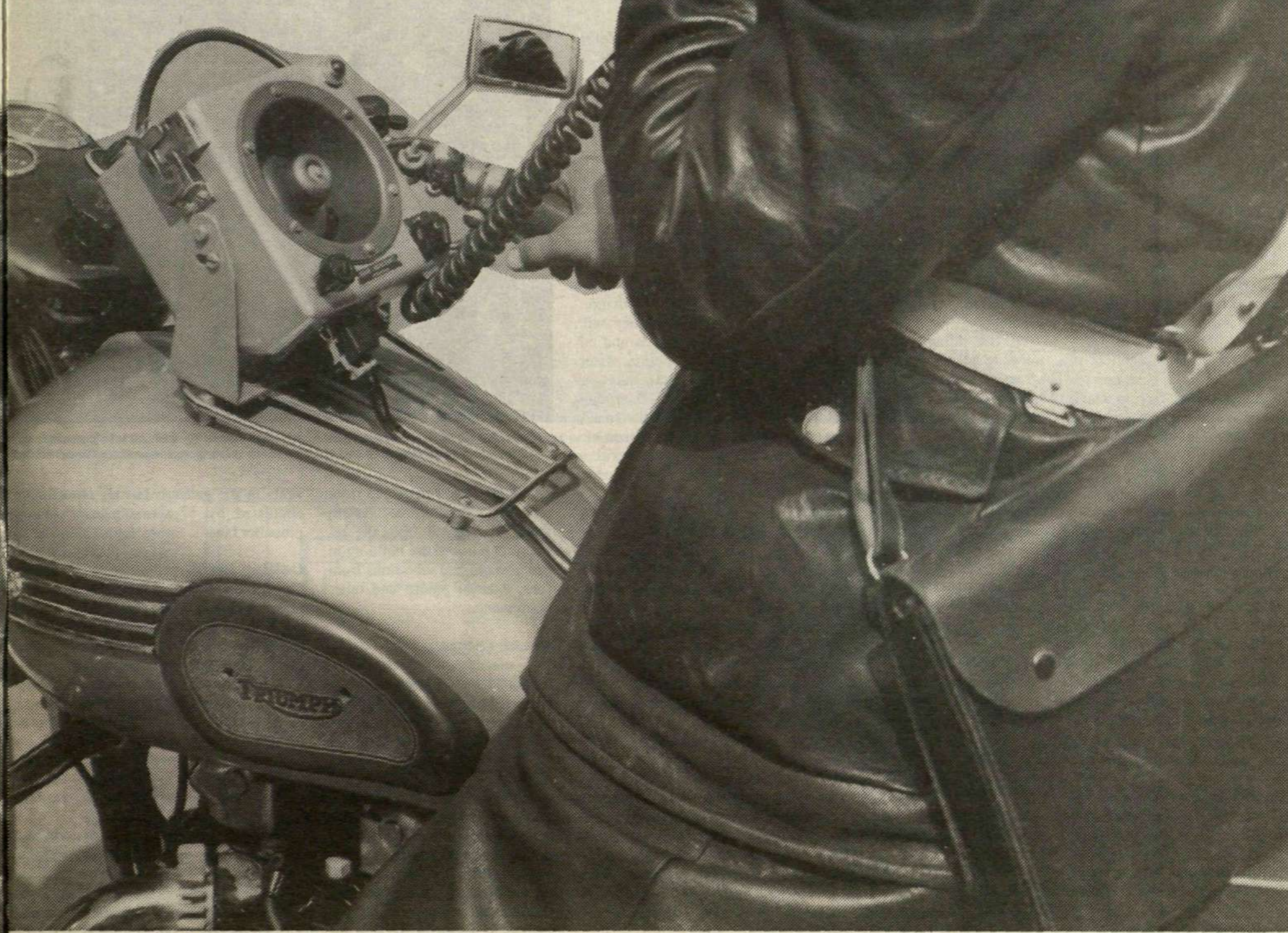
As early as 1956, SRA and Swedish Telecom had started the world's first automatic mobile telephone system in Stockholm and Gothenburg. The commercial breakthrough has

however, was not until 1981 with the introduction of the Nordic mobile telephone system NMT 450.

History since that date is a sharply rising curve. Today Ericsson is the world leader in mobile telephone systems with about 41 percent of all subscribers using Ericsson systems.



In the post-war period, intensive ef-



forts were devoted to developing communications radio, such as this radio from 1954 used by the police.



# The world's most modern chip fab

**Ericsson new plant for complex silicon ICs - which is the showpiece of microelectronics at Ericsson - rests on a solid foundation. Although subway trains and high-way traffic pass nearby, not even the slightest vibration disturbs the sensitive manufacturing processes.**

The plant was built in order to provide Ericsson with advanced development capacity for the latest microelectronics technology. The plant is state-of-the-art in its field and enables Ericsson to create the most optimal solutions in microelectronics.

Microelectronics is essential for most Ericsson product areas, from today's AXE systems and digital mobile telephones, to the broadband switches that will make such multimedia visions as videoconferencing and interactive TV a reality.

## Cooperative agreement

The manufacturing process comes from Texas Instruments. The first cooperative agreement between Ericsson and Texas Instruments was signed in 1987. Knowledge has been transferred to the new plant by some 30 engineers, who have worked at Texas Instruments in Dallas in periods varying from six months to two and a half years.

Of the plant's 120 employees, many have skills in physics technology. Some have doctorates or masters degrees in technology. Semiconductor technology requires highly skilled workers. When trimming of the plant is complete next summer, slightly more than one hundred persons will be employed.

The production equipment in the new facility is designed for 0.5 micron technology, in which the width of the leads in the silicon circuits are one half a thousandth of a millimeter. In the future, the plant will be able to handle 0.35 micron circuits. Currently, the circuits produced in the older production facility in Kista have a dimension of 1.5 microns.

In the new plant, the most advanced chips in the BiCMOS process will be manufactured in a 600-stage process. It will be possible to put over one million gates on each chip, corresponding to about four million transistors.

## Prototype plant

In the current configuration, the plant will have a capacity of 10,000 six-inch wafers each year. If required, additional process equipment can be installed to bring the plant to a maximum capacity of 20,000 wafers a



From the visitor's gallery, production can be viewed through large windows and on monitors.

year. It can also be upgraded to eight-inch wafers.

## Prototype plant

Today, however, the plant is more than a fabrication facility for sub-micron production. It is a prototype plant that will shorten lead times in the development of new products. It will also be used for experimental purposes for the development of circuits for demonstrations, laboratory tests, process development and the verification of new technology.

The overriding goal for Ericsson is to ensure the availability of semiconductor technology and expertise in order to enhance functionality, shorten lead times

and reduce costs in future telecommunications systems.

## Rapid construction

It took less than 16 months to build this minifab, which because it is the newest in the world, is also currently the world's most sophisticated. Work on the foundation began on March 15, 1993. On August 18, 1994, the plant was inaugurated.

## High technology

The entire facility is a demonstration of high technology, with integrated clean rooms and advanced systems for air, water, electricity, gases and acids, as well as the very latest production equipment. For the manufacture of advanced silicon circuits, the most important criteria are cleanliness and freedom from vibrations.

## On solid rock

The plant is constructed on bedrock to which it has been anchored with 120 concrete pillars for maximum stability. The bedrock in Kista is layered, making it particularly suited for absorbing vibration from the surroundings.

The floor, which is 50 cm thick and supported by the 120 pillars, is molded in a waffle-like pattern so that air can pass through the openings. The plant where the silicon wafers are processed has virtually no floor vibration, less than 3 µm per second, which meets the requirements for 0.5 and 0.35 micron technology.

A silicon chip is formed on a silicon wafer in a number of layers of conducting and insulating material. It takes two months to transform an untreated silicon wafer into a wafer full of chips on which dimensions are measured in thousandths of a millimeter.



The entire plant is a demonstration of high technology, with an integrated clean room and advanced systems for air, water, gases and acids, as well as the very latest production equipment in the industry. Cleanliness and freedom from vibration are the two most important parameters for advanced semiconductor manufacturing.

The bedrock, pillars and floor form a vibration-free system which is isolated from the remaining parts of the building in order to prevent vibrations from fans, exhaust pumps and other equipment.

## Clean room

The manufacture of semiconductors demands absolute cleanliness. The entire factory is built as a clean room. All surfaces are covered with epoxy or stainless steel which repulse unwanted particles.

The plant's ventilation system circulates 1.3 million cubic meters of air per hour. This means that the air in the facility is changed 400 times per hour. 10 percent of the total volume is expelled through a chimney, and 10 percent is taken in through air

vents in the gallery. The air is circulated by 17 vibrationless propeller fans.

## Ceiling level

The ceiling level acts as a giant pressure chamber that forces air down through a ceiling filter to the process level. The ceiling contains 1,500 filter panels with a filter efficiency of 99.9999995 percent for particles larger than 0.1 µm. After filtration, the air in the clean room contains less than one particle per cubic foot.

Fifteen specially designed rafters, each five meters high and 36 meters long, ensure that the vibration in the filter ceiling is less than 3 mm.

## Support level

Air, electricity, water, chemicals and gas are the media required

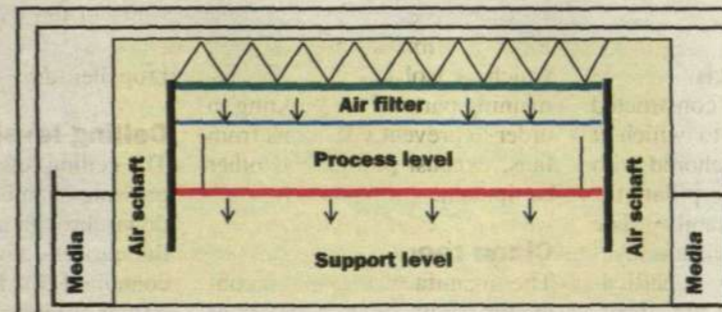
for the manufacture of silicon. On the process level, there are vacuum pumps that supply these so-called media, which are distributed from a level below the factory, called the support level.

All explosive media are placed in special rooms external to the production plant.

The support level also contains the scrubber, which cleans the air before it is released into the environment. The floor of the support level is separated from the pillars and walls and rests on one meter of special gravel that attenuates vibrations.

## Wholly automated

The manufacture of silicon circuits takes place in process steps in very advanced and wholly automated special equipment for submicron technology.



## The plant is a giant air purification system

Air is forced from the ceiling level through 1,500 filter panels to the process level and the grated floor. Seventeen vibrationless turbo fans recirculate the air through air shafts to the ceiling filters.

The process equipment is divided between and placed in special process areas: lithography, depositing, measuring, etching and wafer rinsing. Each process area is isolated by glass walls in order to maintain the required cleanliness.

A silicon chip is formed on a silicon wafer in a number of layers of conducting and insulating material. It takes two months to transform an untreated silicon wafer into a wafer full of chips.

The silicon wafer undergoes 650 or 450 process stages, de-

pending on whether it is a BiCMOS or a CMOS process. These processes entail 26 and 18 masking layers, respectively. Step by step, each layer is built up.

## Testing phase

Processing of the first circuit began on July 1 this year and will be completed on December 20, just before Christmas. During the period until summer 1995, the plant will be in the test phase. Testing and type approval of the equipment and processes will be performed. Thereafter, Ericsson systems developers will demonstrate what the future holds in store with Ericsson's major investment in microelectronics in Kista.

Inger Björklind Bengtsson  
Anders Anjou (photo)



A model in the visitor's gallery shows the plant's construction, with pillars, a waffle-like floor, clean rooms, air shafts, the filter ceiling with specially designed rafters and the various level.



The ceiling level acts as a giant pressure chamber, which forces air through the filter ceiling to the process level.



The plant's ventilation system circulates 1.3 million cubic meters of air each hour. This means that the air in the plant is changed 400 times per hour.



The floor, which is 50 cm thick and supported by 120 pillars, is molded in a waffle-like pattern so that air can pass through the holes.



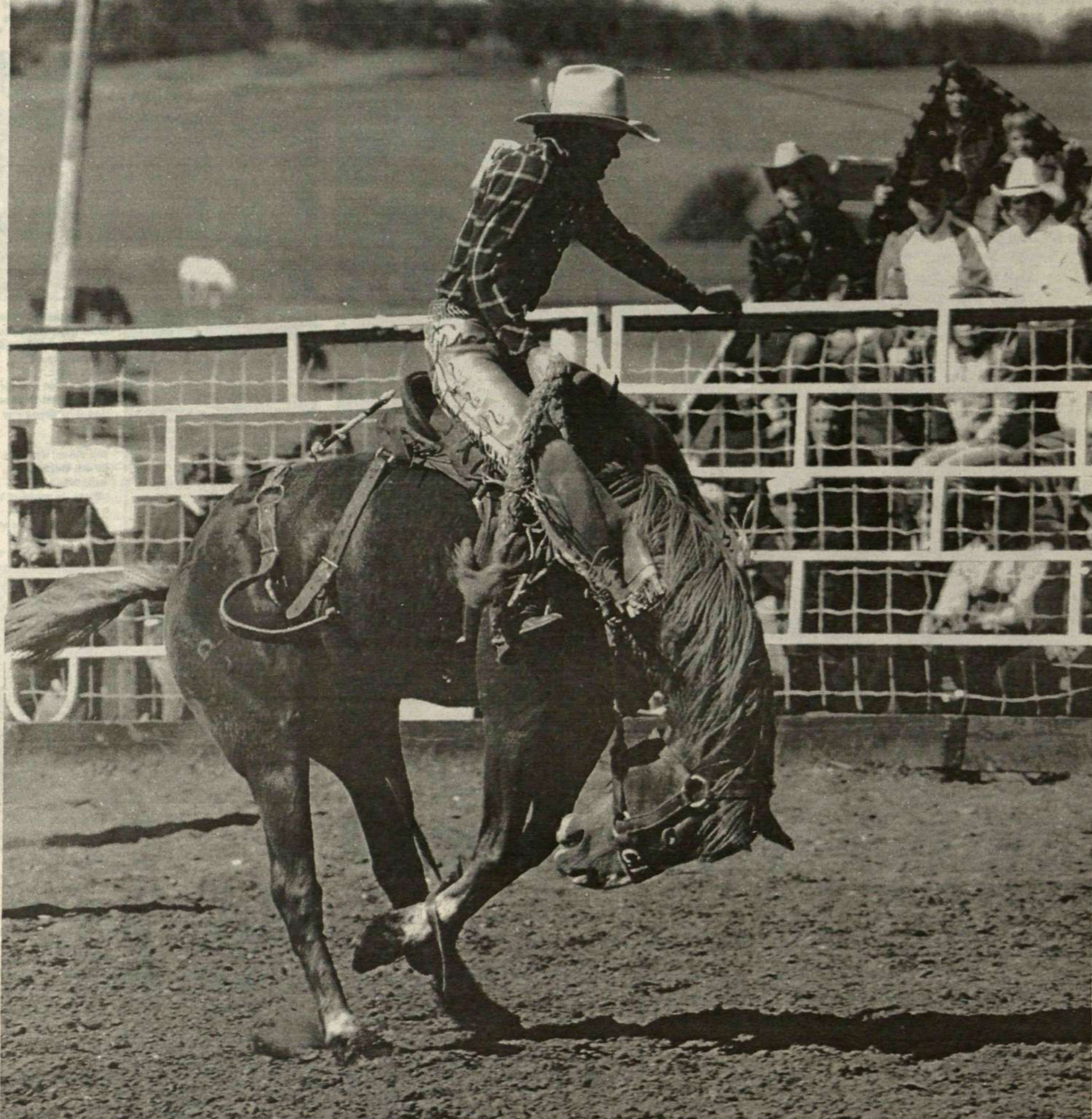
The support level with the supporting pillars for the grated floor on the clean rooms. This level contains the distribution system for resin, air, electricity, gases and chemicals. The floor of the support level is separated from the pillars and walls and rests on a one-meter layer of special gravel that absorbs vibration from the bedrock.



In an ion implanter, foreign substances, the so-called doping agents (arsenic, boron and phosphorous) are injected in the silicon wafer. These doping agents make the silicon electrically active and form components, such as diodes and transistors, in the silicon.



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# Business Networks takes a major step forward in China

A festive atmosphere prevailed at the official opening of the new joint-venture company Beijing Ericsson Communication Systems Company Ltd. (BEC) held on August 19 in "The Great Hall of the People" in China's capital.

In this enormous palace, adjacent to the Square of Heavenly Peace, where as many as 15,000 people can gather, Ericsson had three beautifully appointed areas at their disposal named after the provinces of Inner Mongolia, Hupei and Hainan.

More than 200 special guests from business and government circles participated in the event, which was covered by several media branches.

## Inauguration of joint-venture company in Beijing

Chinese TV assigned the official opening lengthy coverage in its news program the same day.

### Largest joint-venture

To date, Beijing Ericsson Communication Systems Company Ltd. is Ericsson's largest jointly owned company in China, beginning with more than 500 employees. Gunnar Wenneberg is president.

The company is 55-percent Ericsson-owned, with 45 percent owned by our partner Beijing Wire Communication Plant (BWCP), a company which, in turn, is owned by the city of Beijing. BEC is presently manufacturing and selling MD110 business exchanges at an annual rate of 300,000 lines.

### Million MD110 lines

In addition to the joint-venture company established within the Radio and Public Telecommunications areas, there is the Business Networks area which, through its own company, is securely established in the expanding Chinese market.

Business exchanges of MD110 type have been sold in China since the mid 1980s. Despite a tough bidding struggle with virtually all leading competitors, Ericsson now has a customer platform with more than 1,000,000 MD110 lines sold in China. The new joint-venture company is thus starting from a



Gunnar Wenneberg, President of Beijing Ericsson Communication Systems Company Ltd. in front of the company's factory building where the sales office has now also been located.



Rolf Ericsson, Vice President of Ericsson Business Networks AB, was the subject of Chinese TV coverage in his introductory speech in "The Great Hall of the People."

high level and already enjoys a leading market position.

### Honored guests

Included on the panel at the formal inauguration ceremony was Lü Xin Kui, Vice Minister for the Ministry of Electronics, and Li Run Wu, Deputy Mayor of the city of Beijing. Others in attendance included Sweden's Chargé d'affaires Lars Olof Lindgren and Rolf Eriksson, Vice President of Ericsson Business Networks AB and Bao Yu Tong, CEO of BWCP and Board Chairman of BEC.

The guests included several key employees from Ericsson

(China) Company Ltd and Ericsson Communications (Hong Kong) Ltd.

### Successful cooperation

Bao Yu Tong said in his introductory address: "We already initiated our very successful cooperation with Ericsson six years ago. When the technology exchange and license-manufacturing agreement between Ericsson and BWCP was signed on July 5, 1988, we obtained access to the world's best digital PBX system. The MD110's level of technology, quality and service have contributed to it having attained market leadership."



In resounding Chinese, Gunnar Wenneberg (far left) proposes a toast to the future of China. Others include, from left, Rolf Eriksson, Lü Xin Kui, Li Run Wu, Bao Yu Tong and a Chinese waitress.

Rolf Ericsson, a BEC Board member, asserted:

"I am proud of the progress made in our excellent cooperation. Despite our baby being only a few weeks old, we are experienced parents."

"We can take the proper measures to ensure a successful future for our offspring. This is Ericsson's largest joint-venture company in China. If we continue to increase sales, we will remain the largest."

### Speech in Chinese

To everyone's surprise, Gunnar Wenneberg initiated the banquet which followed by welcoming

the guests and proposing a toast to the new company's future in Chinese. He continued his highly acclaimed performance in Chinese and stated:

"With such parents, the new company's future is bright. Already from the beginning the baby appears to be full-grown. In a few years we will have an even stronger market position."

"Of course, much can happen along the way, but all indicators point to China securing a higher position among Ericsson's markets than its present fifth-place ranking."

Text and photos: Thord Andersson



# New company in China off to a flying start

**When Beijing Ericsson Communication Systems Company Ltd (BEC) began operations on July 1 with a workforce of more than 500, this virtually doubled the number of Ericsson employees in China.**

The company occupies a modern industrial building within the large factory area belonging to our partner, Beijing Wire Communication Plant (BWCP), and encompassing more than 5,000 employees. The area is located on the Beijing's outskirts in proximity to the new six-lane highway to the airport. Stout guards maintain an alert vigil to ensure that only authorized personnel bearing proper identification gain admittance.

**Made in China**

MD110 exchanges are being manufactured in a two-floor facility at a rate of 25,000 per month. Components for PC cards are supplied in complete kits from Karlskrona. Everything else is manufactured in-house in China. This encompasses about 90 percent of the manufacturing content.

The same modern SMD machines for automatic surface mounting that are used in Karlskrona are also used in China. Overall, the proportion of manual labor is greater than in Karlskrona.

Moreover elements of the BusinessPhone program will soon be produced at the Ericsson plant, as will termination products for the Erinet series on behalf of Ericsson Cable. The company also markets Eripax products and eventually will also begin selling microwave links.

One floor will be renovated and furnished as offices. The intention is to concentrate all employees under one roof. The exceptions, of course, are the permanent sales and service personnel already in place in most of China's 30 provinces.

**Absorbed 512**

When it established the company, Ericsson took over 512 persons from BWCP. Only four persons came from Ericsson: Gunnar Wenneberg, who is President, Marketing Manager Ulf Jerving, Controller Stig Len-



Florence Peng from Ericsson in Taiwan has the job of recruiting secretaries with language skills.



The entrance to the area in which the new company is located.

nart Lindström and Phil Canfield, who heads service and maintenance. The company's Vice President is Duan Qi.

Bao Yo Tong, who is BWCP's CEO, is the company's Board Chairman. Despite the fact that communication with the Chinese is relatively uncomplicated, the language problem must somehow be solved. Among the first actions taken was to interview all Chinese employees to obtain an overall assessment of their competence. This was handled through Chinese interviewers who had been retained by Christian Ahlner, personnel director at Ericsson (China) Company Ltd.

The results disclosed the presence of many well-educated persons, many who had studied at universities, but also many with no specific educational background. In China to date, education has not been rewarded in terms of higher pay. Accordingly, the wage and salary level throughout the company is relatively uniform. The intention is to eventu-

ally alter the system and to reward competence and excellence of performance.

However, this must occur in gradual stages. Until now, group rather than individual accomplishments have been the ideal in China. This is an area where careful regard for the culture must be exercised.

In regard to knowledge of English: 47 percent had none at all, 35 percent very little, 17 percent good and 1 percent excellent.

One of those who is highly qualified is a 27 year-old engineer, Ye Hiao. As a consequence, he has secured a key role and participates in negotiations with customers and the authorities, and in internal company communications. Ye Hiao also made an important contribution as an interpreter at the company's official opening held at "The Great Hall of the People."

**Two telephone lines**

So far, communications arrangements have been less than perfect. The first two international telephone lines were hooked up to the office the same day as the company's official opening on August 19. Within hours, these lines were carrying almost uninterrupted traffic, and also func-



Coffee is served during a late-evening meeting at the Beijing Lido Hotel. Seated around the table, from left, are Stig Lennart Lindström, Gunnar Wenneberg, Ulf Jerving, Stephen Young, Åke Jungars, Rolf Ericsson and Phil Canfield.

tioned well for telefaxing to from Sweden.

MEMO is a more difficult proposition. So far, this capability is available only at an extra office in room 2419 of the Beijing Lido hotel. The company's Swedish employees are living at the same hotel until they obtain permanent living quarters.

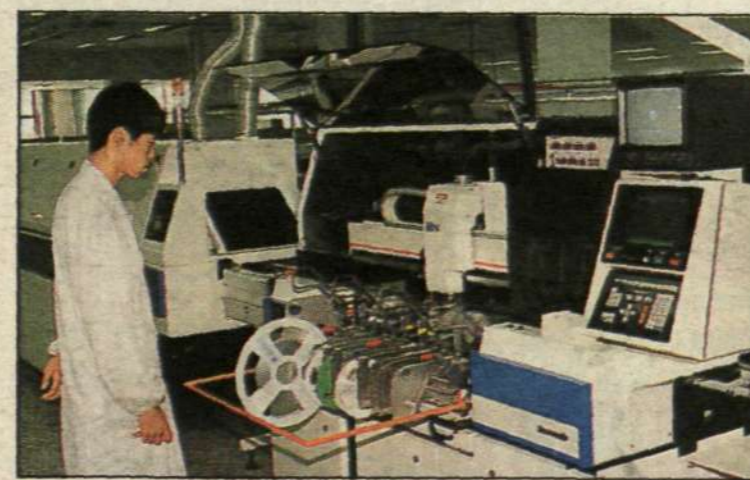
This extra office will serve a highly important function for a long time to come. (At night, the factory area is in total darkness and hence unsuitable.) Bearing in mind the time difference (six hours earlier than Sweden), the evenings can be utilized for tele-

phoning and communicating over MEMO. All members of the management group work 15-16 hour days. During the present initial phase, the number of tasks to be performed is unending. Everything must be built up from the foundation. There is a true pioneering spirit here.

I listen momentarily to an evening meeting that is in progress, in which Rolf Ericsson and Åke Jungars from Bollmora and representatives from Hong Kong participate. Everything is open for discussion. This includes the details of taking over inventories, personnel, sales organization,



PC-cards are painstakingly inspected. The quality requirements are identical to those of the Karlskrona plant.



The same machines used for automatic surface-mounting of components on PC-cards for MD110 exchanges in China as in Karlskrona.

receiving customer orders and advances.

**Handwritten invoices**

"Although we have the situation under control, there are of course disruptions as we now proceed to take over," says Gunnar Wenneberg. "The main problem is faulty administrative systems." Bookkeeping and other accounting functions are done in part by hand. Handwritten invoices are the norm.

Stig Lennart Lindström is working hard to implement effective accounting systems, purchase computers and train employees.

For the present, this is a round-the-clock job.

This also involves learning how the market functions and of gradually introducing our way of thinking. For Ulf Jerving, this is a tough but inspiring job.

It has fallen to Phil Canfield, in addition to his regular duties, to assume responsibility for planning and furnishing the new office. He has started up a project aimed at improving the standard of the building.

**Learn English**

One of the major problems is, of course, that practically no one



Duan Qi, right, is Gunnar Wenneberg's second-in-command. Ye Hiao provides language expertise as they examine English-language documents.

speaks English. Florence Peng, who was recruited from Ericsson in Taiwan, has a vital role in this regard. Her task is to employ competent interpreters and translators, and secretaries with the required language skills. Later during the autumn, a voluntary training program aimed at encouraging employees to learn English will be started.

**Step-by-step**

"To attain advancement in our company requires that one speak English," Gunnar Wenneberg emphasizes. "However, it is important to bear in mind that in

China everything proceeds step-by-step, and that haste should be avoided. The Chinese have a saying: Every journey begins with a single step."



Text and photos: Thord Andersson

**The path to an operational plant**

**84** The first contract for an MD110 in China is signed. The customers are the Ministry of Metallurgy and a government-owned oil company.

**85** Deliveries to the first customers are completed. This amounts to some 5,000 lines. Ericsson Communications (Hong Kong) Ltd is established with the aim of marketing the MD110 in China.

**86** A break-through order for a nationwide network of 25,000 MD110 lines is obtained from the government agency CESEC.

**87** Companies worldwide were invited by the Ministry of Electronics to bid on technology transfers in the PBX area. More than 20 companies participate, with know-how offers extended to 10 selected plants. Ericsson is one of six winning suppliers.

**88** A technology transfer agreement is signed in July with Beijing Wire Communication Plant (BWCP), thereby licensing it for MD110 production. Continued sales successes for MD110 systems, which are still being delivered from Sweden.

**89** The contract between Ericsson and BWCP is approved in April. BWCP prepares for large-scale production. The first MD110 produced in China is delivered during the autumn.

**90** The proportion of MD110s produced in China increases rapidly. During the year, 32,000 lines are delivered, some of which are from Sweden.

**91** Sales rise by more than 100 percent during the year, totaling 67,000 lines. The most important customer segments include the mining industry.

**92** Government agencies and major companies throughout the country are buying MD110. Sales double once again, reaching 150,000.

**93** Negotiations to establish a joint-venture company are initiated with BWCP. An agreement is also concluded entitling BWCP to manufacture BusinessPhone products. MD110 sales increase to 250,000.

**94** The agreement to establish a joint-venture is signed on June 8. The company, Beijing Ericsson Communication Systems Company Ltd (BEC) is majority-owned by Ericsson, and has more than 500 employees. Operations start up in July. Sales for the year are estimated at more than 300,000 MD110 lines.



# 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

Business Area Public Telecommunications, Guangdong, China

### MARKETING MANAGER - TRANSPORT NETWORKS

We are presently building up our marketing organization for Transport Networks in China. As Marketing Manager-Transport Networks you will be responsible for developing Transport Networks business in the Guangdong Province. You will lead the preparation of tenders and you will independently, or in group, carry out technical and commercial presentations and negotiations. You will build up a local organization for Transport Networks and you will develop local staff.

The qualified applicant shall have relevant Bachelors or Masters Degree and minimum five years experience within transmission and network management products and applications. You must also have international marketing experience. The successful candidate will be offered minimum one year assignment with family or as single status, and will be based in Guangzhou in southern China.

Contact: Dagfinn Danielsen, Memo ETX.ETXDF or Magnus Ask, personnel, 08-7197481, LMEMASK. Appl. to HF/LME/DK Magnus Ask.

Ericsson Mobile Communications AB, Warsaw, Poland

### BUSINESS MANAGER POLAND, MOBILE RADIO

Installations of the first EDACS system in Poland is about to be finished and we are planning for future expansions and after sales services. The Business Manager will take the full business responsibility for our Polish EDACS operations. You will be leading the local EDACS team and you report to the Managing Director of our Polish company as well as to Ericsson Mobile Communications in Stockholm. Your areas of responsibility will cover marketing, sales, technical sales support, implementation and after sales services.

The positions call for a University degree in Engineering or Business Administration. It is important with experience from system sales, that you can work independently and that you are truly business oriented. Apart from System sales experience you will probably benefit from a background in any other area of a sales company's operations. A good knowledge in English is necessary and fluency in Polish highly desirable.

Contact: Jerzy Gryn, 00948 2 6593355, Per Karlom, 08-7572238 or Eva Jansson, personnel, 08-7571459.

Ericsson Telecom AB, Warsaw, Poland

### MARKETING

We are looking for a marketing person representing both Ericsson Telecom (ETX) and Ericsson Business Networks (EBC/Z) at the local Ericsson office in Warsaw, Poland to act as a liaison officer between Principals and the Polish market, monitor the market development especially with reference to business opportunities in public telecommunications, identify and pursue business prospects and create and maintain close contacts on different levels with Public Telecom Operators and other authorities influencing the telecom business. All with the aim to get system, products and services of ETX/EBC established as laid down in the market plan. Given the dual responsibility it is desired that you have a broad experience of public telecommunication

including marketing of systems e.g. AXE 10, services and preferably complex projects for non traditional operators. Knowledge of the Polish business culture and language is an advantage.

The marketing function is placed within the organisation of the Ericsson subsidiary in Warsaw, reporting to the General Manager of this office. Market and business activities are reported directly to respective Area Manager of ETX/C and EBC/ZD.

Contact: Torsten Pålsson, 08-7192150 or Helene Palm, personnel, 08-7197971.

Ericsson Research Canada, Training dept. Montreal

### TECHNICAL TRAINING INSTRUCTOR

Teach AXE technical training courses such as AXE Software, IOG11, RBS, EMRP etc, develop new courses and adapt existing ones to reflect the latest changes in CMS8800/D, act as a liaison between the training department and other technical departments within EMC and Ericsson.

3-5 years of experience in AXE technical training preferably within CMS88.

Contact: Youssef Tannous, 514 3452789, Memo LMC.LMCYOTA.

Ericsson Telecom AB, Bus. Development and Marketing, Telecom Standards and Regulations, HF

### INFORMATION TECHNOLOGY

Telecom Standards & Regulation is the name for the total Ericsson activity in international standards organizations and regulatory bodies, it engages hundreds of experts and a number of co-ordinators in BR, BX, BZ and MLC:s. Within this area in Ericsson there is a pressing need for more active involvement in IT standards and regulation. We are looking for a person to be the focal point in Ericsson for IT-related standards for telecom products. This implies responsibility for Ericsson policy, directives and guidelines, co-ordination of involvement in external activities, to represent Ericsson in national, international and governmental bodies, to harmonize general positions in various bodies, where Ericsson

is represented, in order to promote a unified Ericsson image, promote, facilitate and support establishment and maintenance of co-ordination networks for IT and open systems issues.

We expect the applicant to have good experience in the IT-area and know-how about the Ericsson organization. The applicant is expected to take initiatives and work pro-actively.

Contact: Björn Troili, 08-7190906, Tom Lindström, 08-7195338 or Maud Grahn Markkanen, personnel, 08-7194487.

Business Area Radio Communications, Beijing, China

### OPEN POSITIONS - NETWORK ENGINEERS

The Chinese telecommunications market is one of the worlds most exiting markets today. We are now building up a team that will be responsible for development of competence and resources within the field of Network engineering. You will work closely with the rest of the Cellular Network team, the implementation support in Beijing and the local offices in China. We need:

#### 1. SYSTEM ENGINEERS

to ensure that methods for tuning and optimisation of cellular systems are customised and implemented, both for radio and network. You will work either with CMS88 or CME20 and have close contact with ERA in Stockholm. You will provide technical support to the system engineers at the local offices with emphasis on system functionality (TACS/GSM/PCN) and new products/functions, support in PRC during network optimisation activities, act as an extension of ERA network engineering group and develop and conduct Cellular Network O&M courses.

#### 2. RADIO NETWORK ENGINEER

to coordinate and supervise the cellplanning activities at the local offices and develop Cellplanning related training courses, see to that map digitising and predictions are carried out in accordance to project specifications, support during special projects, keep record of on-going projects and develop and conduct advanced cellplanning courses. You will be responsible for a small group taking care of propagation predictions and map digitising.

## The second Ericsson SDL/SDT Users Seminar Sånga-Säby, 11-12 October

For the second time Telelogic has the privilege to invite you and Ericsson colleagues around the globe to a two-day joint seminar that is focused on user issues. You bring your experiences and suggestions. We will bring the latest product news and our thoughts on future development.

We are sure that the presentations will be of uttermost interest, but the main objective of the seminar is still to make it possible for you and your colleagues to exchange experiences with each other.

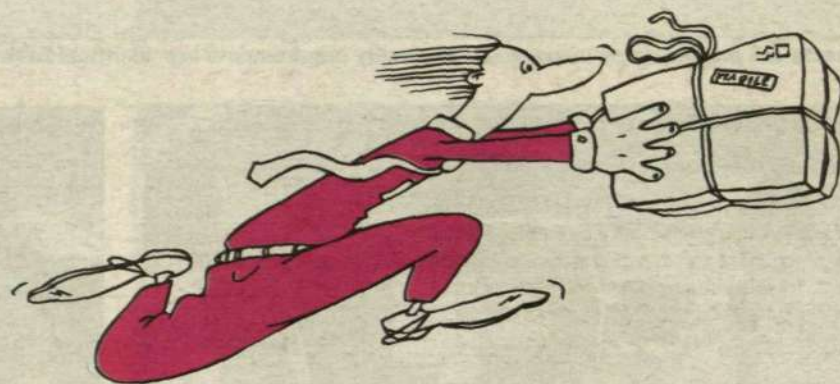
If you are interested in attending this seminar, please contact us on one of the numbers below and we will send you all the details.



Telelogic AB, P O Box 4128, S-203 12 Malmö, Sweden,  
Phone +46-40 17 47 00, Fax: +46-40 17 47 47

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EHL International AB  
Box 134  
S-191 22 Sollentuna  
Sweden  
Tel +46-8-967030  
Fax +46-8-355151



### 3. FIELD MEASUREMENT ENGINEER

to develop methods for cluster and drive tests, see to that radio signal strength measurements using REGUS/TEMS performed according to project specifications, that post-processing of measurement data is performed, that digitising engineer obtains required RF measurement data, provide customer support and transfer RF-measurement know-how to local Ericsson offices.

You should have an open mind to other cultures, enjoy travelling and be prepared and confident to make presentations in front of small and large groups of people. We believe your background is from radio network design, system development or AXE testing/verification. Experience from Cellular Operation and Maintenance is highly valued.

**Contact:** Henrik Tholsby, Memo ECOM.ECHTHOL or Magnus Ask, personnel, +46 8 719 7481, Memo LME.LMEMASK. Please send applications to HF/LME/DK Magnus Ask.

### Ericsson Telecom AB, Telecom Standards & Regulations, HF

### BUSINESS DEVELOPMENT AND MARKETING

Telecom Standards & Regulations is the name for the total BX activity in international standardisation organisation and regulatory bodies. It engages almost a hundred technical experts and a small number of coordinators in each BU, CU and MO. Within this area, there is a growing need for BX to act in a coordinated manner in an extremely rapidly changing environment. We are looking for a person to be the focal point for BX in this area. This implies responsibility for BX internal directives and guidelines, building and supporting internal workflow and methods for Telecom Standards & Regulations coordination covering BU/CU, MO and MLC's, responsibility for and/or formal handling of regulatory issues that BX must adapt/react to, to represent BX in different Ericsson internal groups and/or external organizations.

We expect the application to have good experience in different BX-activities and products. The applicant is expected to take initiatives and work pro-actively.

**Contact:** Björn Trolli, 08-7190906, ETXBTI, Tom Lindström, 08-7195338, ETXTOMI or Maud Grahm Markkanen, personnel, 08-7194487, ETXMGH.

### Business Area Public Telecommunications, Guangdong, China

### MARKETING MANAGER - TRANSPORT NETWORKS

We are presently building up our marketing organization for Transport Networks in China. As Marketing Manager you will be responsible for developing our business in the Guangdong Province.

You will lead the preparation of tenders and you will independently, or in group, carry out technical and commercial presentations and negotiations. You will build up a local organization for Transport Networks and you will develop local staff.

The qualified applicant shall have relevant Bachelors or Masters Degree and minimum five years experience within transmission and network management products and applications. You must also have international marketing experience. The successful candidate will be offered minimum one year assignment with family or as single status, and will be based in Guangzhou in southern China.

**Contact:** Dagfinn Danielsen, Memo ETX.ETXDF or Magnus Ask, personnel, 08-7197481, LMEMASK. Appl. to HF/LME/DK Magnus Ask.

### Nanjing Ericsson Communication Co Ltd, Nanjing, China

### MANAGER RBS IMPLEMENTATION

ENC is a Joint Venture company responsible for Ericsson's activities in Central China. The position as Manager RBS Implementation will be part of the Operations Division and you will be responsible for the organization and coordination of RBS installation and commissioning.

You will liaise with the customer and ensure that the customer is fully conversant with the procedures and that he fulfill the installation and testing accordingly. You will supervise an own organization consisting of both Local and Expatriate Supervisors.

You shall have previous experience from managing RBS implementations in international operations.

The successful candidate will be offered minimum one year assignment and will be based in Nanjing in the Jiangsu province.

**Contact:** Ola Mårtensson, Memo ETC.ETCOLAM or Hans Falk, personnel, 08-7571402, ERA.ERAHFA. Appl. to KI/ERA/LDH Hans Falk.

### Business Area Radio Communications

### IMPLEMENTATION SUPPORT EXPERTS - CHINA

We are establishing a new function within our Operations organization in China which will be responsible support of the implementation of mobile systems. A high level of system competence is required for both Switching and Radio to be able to support both old and new mobile technology. We need to recruit a few experienced experts in these areas with an interest in longterm assignment (minimum one year) in Beijing, China.

The persons we look for shall have extensive competence in RBS 883 and 885, or extensive competence in AS (installation testing and trouble shooting) and AS methods and acceptance.

**Contact:** Dan-Erik Grobecker, Memoid ETC.ETCGROB or KI/ERA/LDH Hans Falk, Memoid ERA.ERAHFA, tph +46 8 757 1402. Please send your applications to Hans Falk.

### Ericsson General Electric Co, Toronto, Canada

### MARKETING MANAGER

The PCS market place is rapidly taking off both in US and Canada and will be a formidable challenge. Presently we are discussing with potential customers around projects likely to be in the air in the 95-96 timeframe. Main tasks will be customer presentations, tender preparation, create relations with potential PCS customers, negotiate and finalize agreements, prepare and carry out marketing strategies, budgets and forecasts.

**Contact:** Tomas Mikaelsson 08-7571148 or Mats Lundberg, 08-4042685. Appl. to KI/ERA/LFH Gogo Landån.

### Guangzhou Ericsson Communication Co Ltd - GEC

### PRODUCTION MANAGER - GUANGZHOU, CHINA

GEC is a Joint Venture Company with responsibility for Business Area Radio Communications operations in the Guangdong province in southern China. The position will report to the President of GEC, Sören Boman, and as Production Manager you will be responsible for the continuous development of the Production Organization.

Presently GEC is producing E-TACS Radiobase stations for the Chinese market and production will expand and will also cover Radiobase stations for GSM Mobile telephone systems. You will also be responsible for functions for purchasing, material planning, stores, import/export, packing and transport. A key responsibility is training and development of local staff.

You shall have technical competence and experience from a Manager position for RBS production. You shall be able to analyse and investigate upcoming technical problems in the production. The successful candidate will be offered minimum one year assignment with family or as single status, and will be based in Guangzhou in southern China.

**Contact:** Magnus Ask, 08-7197481, Memo LMEMASK.

### Ericsson Ltd., Burgess Hill, United Kingdom

### MARKETING MANAGER - SPEECH APPLICATION BUSINESS UNIT

ROLE: To manage all marketing activities for the Speech Application Business Unit for BT and global, establishing links to Ericsson worldwide.

Candidates must be able to lead and develop a team, have marketing skills and experience in the telecoms environment, combined with a sound business understanding. Presentation skills are paramount as well as initiative, tact and diplomacy. A technical overview of speech applications in telecoms systems is essential.

**Contact:** Jane Roberts, personnel, +44 444 234567, Memo ETLJANE or Phil Twist, +44 444 234020, ETLPMT.

### Ericsson Radio Systems AB, Kista

### GSM SUPPORT ENGINEERS TO SOUTH AFRICA

The South Africa market has developed to be one of ERAs most important markets in Africa. We need to find the engineers that are prepared for a challenge. Your job is to get the Field Support Centre well established and working. You will support MTN, who is one of the GSM operators in South Africa. Positions as SS-, System- and OSS-expert are still vacant and waiting for your application.

You have worked the last two years with similar assign-

ments and good knowledge of GSM. You are open-minded and customer oriented.

**Contact:** Lars Skoglund, 08-7573653, Memo ERASKOG, Sven Sandström, 08-4042261, ERASVSA or Fredrik Wijkander, +27 11 4476440, ERAFRW. Application to KI/ERA/LPH Marie Zachrisson.

### Ericsson Mobile Communications AB, Warsaw, Poland

### BUSINESS MANAGER POLAND, MOBILE RADIO

Installations of the first EDACS system in Poland is about to be finished and we are planning for future expansions and after sales services. The Business Manager will take the full business responsibility for our Polish EDACS operations. You will be leading the local EDACS team and you report to the Managing Director of our Polish company as well as to Ericsson Mobile Communications in Stockholm. Your areas of responsibility will cover marketing, sales, technical sales support, implementation and after sales services.

The positions call for a University degree in Engineering or Business Administration. It is important with experience from system sales, that you can work independently and that you are truly business oriented. Apart from System sales experience you will probably benefit from a background in any other area of a sales company's operations. A good knowledge in English is necessary and fluency in Polish highly desirable.

**Contact:** Jerzy Gryn, 00948 2 6593355, Per Karlbom, 08-7572238 or Eva Jansson, personnel, 08-7571459.

### GSM Support personnel to sunny Greece

Two vacancies will open up during 1994 for CME 20 System Experts at Ericsson Hellas at our Field Support Centre. The Support Centre is responsible for System Support towards Panafon, one of the two Greek mobile telephone operators. The Greek GSM organisation is very new and currently consists of a dozen people, half of which are working in the FSC. The Greek GSM market has taken off quickly with a very strong growth and offers a challenging and dynamic environment with very good opportunities for close contacts with the customer. We are working very closely with the Ericsson Support Office at ETL in Guildford so the jobs include quite a lot of travelling to England.

#### Position 1, FSC Manager

We are looking for somebody with both managerial skills and qualified knowledge and experience of trouble shooting and fault fixing in AXE. The job consists of: Managing the day to day activities of the FSC. Work as System Expert, including Emergency Call outs from the customer Act as technical liaison between Ericsson and the customer

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

#### Position 2, System Expert for CME 20 SS

We are looking for someone with solid experience of AXE trouble shooting. The prime task is to support the customers GSM Switching System, but the job will also cover the other CME 20 nodes.

The job consists of: Work as System Expert, including Emergency Call outs from the customer Act as technical liaison and consultant between Ericsson and the customer for the CME 20 SS. Handle trouble reports, customer SW audits and SW upgrades for the Customer.

Applicants should have: Solid background in AXE SW testing, support or design, with proven trouble shooting and fault fixing ability. Very good knowledge of AXE and at good knowledge of Mobile Systems (CME 20 or other). Experience of CME 20 R4 is a plus.

**Contact:** Michael Westberg (ETG/R/MC, +30 94 300106) or Mohamad Khattab (ETG/R/TC +30 94 300026) or Mikael Stejler (ERA/LF/PGC +46 8 7570886)

### Ericsson Telecom AB, Warsaw, Poland

### MARKETING

We are looking for a marketing person representing both Ericsson Telecom (ETX) and Ericsson Business Networks (EBC/Z) at the local Ericsson office in Warsaw, Poland to act as a liaison officer between Principals and the Polish market, monitor the market development especially with reference to business opportunities in public telecommunica-

tions, identify and pursue business prospects and create and maintain close contacts on different levels with Public Telecom Operators and other authorities influencing the telecom business. All with the aim to get system, products and services of ETX/EBC established as laid down in the market plan. Given the dual responsibility it is desired that you have a broad experience of public telecommunication including marketing of systems e.g. AXE 10, services and preferably complex projects for non traditional operators. Knowledge of the Polish business culture and language is an advantage.

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**Contact:** Torsten Pålsson, 08-7192150 or Helene Palm, personnel, 08-7197971.

### PEM - Perwira Ericsson Sdn Bhd - Malaysia

### CELL PLANNER TO MALAYSIA

For an immediate assignment to work for RMOA's activities in Malaysia we need an experienced cellplanner. It will mainly be work for the upcoming fixed cellular AMPS Network to be implemented nationwide in Malaysia. Some work is also needed for the already in operation AMPS/D-AMPS cellular network.

For further information please call Bo Mejner in Malaysia +60/3/5591821 or Ulf Malmerberg in Kista +46 8 7572949

### Ericsson (China) Company Limited - ETC, Beijing, China

### ADMINISTRATION MANAGER

Our activities in the Peoples Republic of China is expanding rapidly. To be able to handle this expansion we need to recruit an experienced Administration Manager for our head office in Beijing. You will be responsible for all types of administrative matters such as office premises, cars/transportation, accommodation for expatriates and travel. You will also update and develop administrative routines and systems. Training and development of local staff is a key responsibility.

The qualified applicant must have management experience from an administrative or similar position. Knowledge of administrative routines and systems as well as very good command of the english language are other important qualifications. You must also be able to handle the pressure and demands that is placed on this function as a result of the rapidly growing organization. The successful candidate will be offered minimum one year assignment with family or as single status.

**Contact:** Lars Ahlborn in China, Memo ETC.ETCLARS or HF/LME/DK Magnus Ask, Memo LME.LMEMASK, tph +46 8 719 7481. Please send your applications to Magnus Ask.

### Ericsson Systems Expertise Ltd., Ireland, International Customer Training Centre, Dublin.

### ACCOUNT MANAGER (Long-term contract)

The Marketing and Customer Services unit within Ericsson Systems Expertise Ltd. has a vacancy for an experienced Ericsson staff member to work as an Account Manager in the International Customer Training Centre in Dun Laoghaire, Dublin. The successful candidate will be responsible for dealing with existing internal Ericsson and end-customer accounts, generating new business and working to strict budget and time deadlines. He/she will deal with all levels of management at home and abroad and will be an enthusiastic self-starter with maturity and confidence. Extensive foreign travel will be required. The position will report to the Sales manager, Tom Walsh.

- Skills/knowledge required:
- Degree in Marketing or Engineering
  - Good writing and presentation skills
  - Fluency in written and spoken English
  - Fluency in another major language
  - Self-motivation
  - Team orientation
  - Knowledge of Ericsson products and services
  - Knowledge of the Ericsson organisation

The International Customer Training Centre develops and delivers courses in AXE 10 and in a number of the latest Ericsson products, including AMPHION, MXE, ATM etc. Ericsson Systems Expertise Ltd. is also the Ericsson competence centre for Computer-Based Training

If you are interested in this position please contact either Tom Walsh, Sales Manager, EEI.EEITWH or Margaret McManamon, Contracts Manager, EEI.EEIMMM.



# EDT seeks quality award

The Swedish Quality Award (SQA) is the Swedish equivalent of the leading international quality awards. Ericsson subsidiary L M Ericsson Data AB (EDT) is now attempting to win the award for 1994.

President Bengt Bolin believes that the decision to participate in this competition will be decisive for EDT's future.

"This shows our customers that we are totally committed to quality, and it will have a significant impact on our company culture."

Improvement efforts within Ericsson are intensive at present. Following the certification of all major and medium-sized companies in accordance with ISO 9000, work continues on many fronts to improve quality and increase customer awareness.

TQM, Total Quality Management, has become a way of life in most companies. "Continuous improvement" and "focus on the customer" are concepts that have been infused in the organization down to the lowest levels.

A number of Ericsson companies have set exceptionally high goals for quality efforts. These companies have vowed to win

## The Swedish Quality Award 1994 - a forward step in EDT's quality work

one of the leading quality awards, either an international one, such as the Malcom Baldrige Prize awarded in the U.S. or the European Quality Award, or a national prize.

In Sweden, L M Ericsson Data is one of these companies. By seeking the Swedish Quality Award, the company takes a major step forward in its quality work.

"We are now entering a new and very exciting phase," says president Bengt Bolin. He sees the application as a means of confirming that EDT's quality efforts thus far have been successful, but even more importantly, it provides a unique opportunity to achieve new improvements.

### Early start with ISO

EDT already has a long history of being one of the leading Ericsson companies with respect to quality. In 1992, the company became the first Swedish data services company to receive ISO 9001 certification.

Long before that, actually ever since the company was established in 1985, quality and customer benefit have been given high priority.

Eight years ago, independent evaluations began of the reliability as a service provider of 120 different companies in the data

services industry. EDT has always been given high ranks in these evaluations.

"For the past four years, we have been ranked best in the country," reports Bengt Bolin with pride.

Another tool for improving quality that has been in use from the start is the so-called "split sheet." This is a form that documents goals for each unit. One column describes the goals that have been established for the unit, the measurements that will be used to determine if they have been attained, etc. The other column contains the actual measurement results.

"This tool originated at Volvo," relates Erik Strömberg, who is responsible for TQM at EDT. Because it has been used from the start, it is possible to trace development over time in various areas.

"In this way, we can study how various aspects of our operations have improved over time."

### First steps

EDT began working with TQM in early 1992. Three large projects were initiated to gain experience with the methodology.

Improvement suggestions, measuring quality and EDT's systems administration in Östersund were the three targets for these first TQM efforts. The projects were successful, producing such results as a more structured organization for improvement suggestions, which through various measures were lifted from a lethargic 10 per quarter to a lively level of 110 well-considered suggestions.

"Bengt started it off by meeting with all employees. There were 15 meetings with 50 employees at each meeting. Bengt's message was crystal-clear: We were going to further improve the quality of EDT's service offerings and put the focus on customer benefit in all activities," Erik relates.

### Shifting into overdrive

"The first projects whetted our appetite," says Erik Strömberg. In 1993, the TQM program started in full scale and "shifted into overdrive," as he expresses it.

"Bengt started it off by meeting with all employees. There were 15 meetings with 50 employees at each meeting. Bengt's message was crystal-clear: We were going to further improve the quality of EDT's service offerings and put the focus on customer benefit in all activities," Erik relates.

"Everyone must realize that what we are offering customers really does provide more value for money," says Bengt Bolin.

By encouraging everyone to participate in TQM, he hopes to be able to achieve a change of culture in the entire company.

### Committed at the roots

All cost centers within the company are required to conduct at least one full improvement project each year.

"This meant that we quickly initiated 78 improvement projects," says Erik. As the champion of TQM at EDT, he is one of those who, together with president Bengt Bolin and quality manager Hans Eklund, has been a driving force in quality efforts.

Bengt Bolin is satisfied with the results TQM has achieved thus far.

"The atmosphere in the company has become exciting, and I find that I now seldom need to persuade others. Managers at all levels also feel a strong pressure to prioritize improvement efforts. My task as president is now to provide direction for the company."

"For that matter," adds Bengt, "a leader can never just put pressure on from the top. There must be commitment at the roots of the organization."

### Significant savings

TQM began as a natural extension of EDT's long-term efforts to improve efficiency, which started in the mid-1980s. Perhaps this is why improvement programs were started so quickly on so many different fronts. Many practical results have provided added incentive.

"Thus far, we have seen that improvement teams have generated significant savings in our own operations," says Bengt, who estimates that the return on improvement measures is about 10 times greater than the cost of implementing them.

"And we haven't even begun to count what we save for our customers," Bengt notes.

### Comparing key ratios

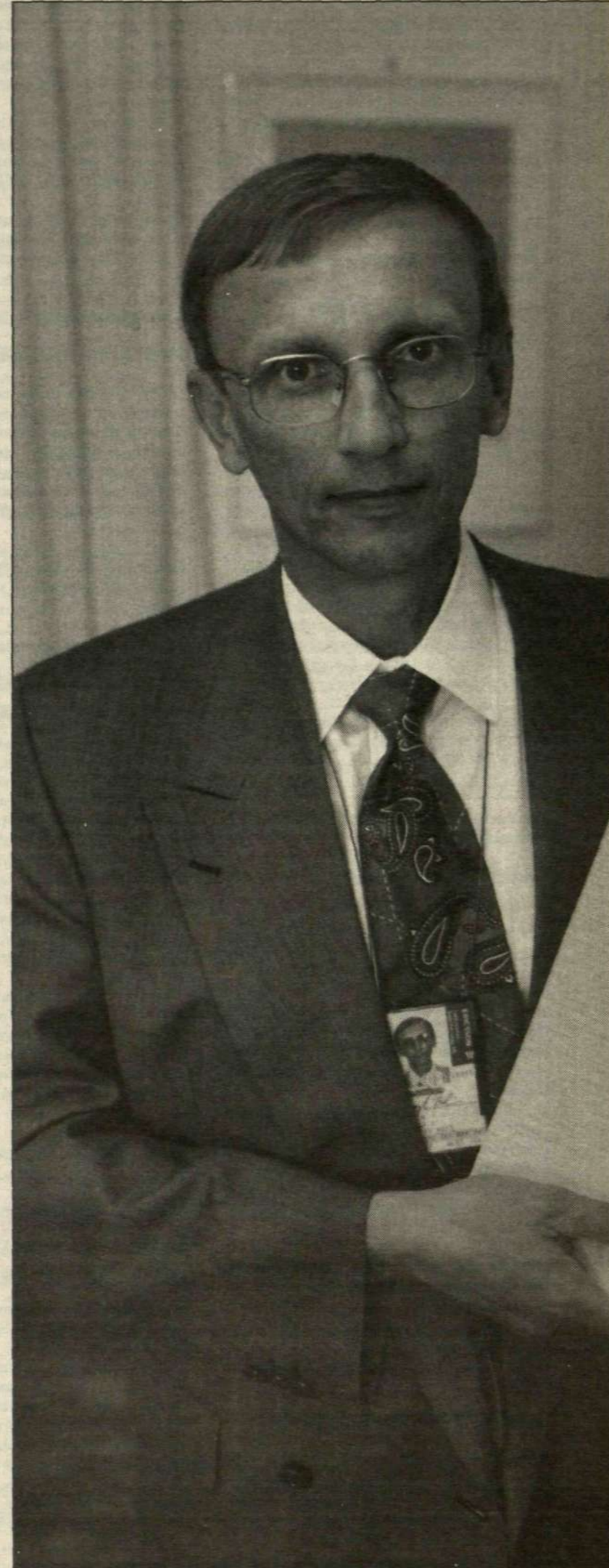
An important effect of TQM is that it is now possible to compare L M Ericsson Data with other companies.

"With TQM, we obtain measurements and other data that provide an excellent description of the company's performance," explains Erik Strömberg. "This year, we are concentrating on various types of comparisons to determine how we stand in relation to other companies in the industry and within Ericsson."

"We have a tough assignment at EDT," Erik continues. "Each year, we must identify prioritized areas where management's requirement is a 25-percent improvement on an annual basis!"

### Natural step

Submitting an application for the Swedish Quality Award is a natural step, according to Bengt and Erik. They both regard the



"Regardless of whether or not we win the Swedish Quality Award, we will continue to emphasize quality and continuous improvement," assures Bengt Bolin, president of L M Ericsson Data.

application as a lever that can further lift the level of quality in the company.

"Our own informal reviews in preparing the application and estimates of where we stand in relation to SQA's various criteria indicate that we were at a level of

about 500 points at the beginning of this year. To win, we need at least 750 points," says Erik. "With the work on the application itself, as well as various follow-ups, we may have lifted the company to that level. That will be a matter for the SQA jury to



Helena Lemmert displays the specially designed case, which holds a Newton handheld computer, a modem and a NMT 900 mobile phone.

decide. We will know in October whether or not Ericsson Data has gone on to the final round," says Erik.

"But regardless of the result, we will continue to emphasize quality and improvement," Bengt Bolin emphasizes.

## A major step forward

An application for the Swedish Quality Award is a 60-page document. It takes 50 to 150 man-days to write. Because so many managers and most executive managers have participated in this work, the application itself represents a major step forward for L M Ericsson Data.

Self-assessment is a useful tool in quality work. The best possible form of self assessment are the criteria established for the leading quality awards. Therefore virtually every company can advance its quality efforts significantly by setting the goal to at least apply for a quality award.

This was the reasoning when L M Ericsson (EDT) decided that 1994 would be the year the company applied for the Swedish Quality Award (SQA).

The first step consisted of discussions and informal reviews of how various parts of the company's operations measured up to the criteria by which the quality award is judged.

### Formal assessment

These informal self-assessments were followed by formal assessments in two stages, first internally and then with the assistance of external judges. The results provide a comprehensive evaluation of EDT's operations and showed the strengths and weaknesses.

Each manager received a report with plus and minus scores, which was then analyzed to determine what needed to be improved and what might merely need to be more accurately described in the final application submitted to SQA. The result of these analyses was a number of new improvement projects, in some cases conducted jointly by various units.

### All units apply

It is important to involve as many employees as possible in preparing the application. For this reason, it was decided that each EDT unit would prepare its own version of the application.

"The work done in applying for the quality award has really increased everyone's involvement throughout the company," says Bengt Bolin. "There were many problems for which solutions were found once the problem had been identified."

"At the same time, it should be remembered that it is not only a matter of finding minus scores and correcting them," Bengt adds. "It is equally important to recognize the positive results and learn to realize that we have strengths that can be better utilized."

Text: Lars-Göran Hedin



Among those trying out the new equipment for opinion surveys was Mona Sahlin, secretary of the Swedish Democratic Party.

## Mobile technology for computer polling

A new method for opinion polling was tested recently in Sundsvall in northern Sweden. Ten students were equipped with a specially designed case containing an Apple Newton PDA, a modem and an NMT 900 mobile phone. Some 4,000 persons were interviewed about their opinions on Sweden's recent national elections and the upcoming referendum on membership in the EU. The results were sent to a mainframe, which provided a continuous display at a square in the middle of Sundsvall.

The municipalities of northern Sweden are investing heavily in information technology. One example of this is the use of new technology for conducting opinion polls. Using mobile computers instead of questionnaires provides quick results that can be continuously updated.

The first computer poll, which was conducted during an election campaign week in early August, drew an enormous response and attracted the attention of both the public and the media.

### Checking the screen

By checking a box yes or no on the screen of a handheld computer, 4,000 residents Sundsvall and nearby Timrå could express their opinions about the election and Sweden's membership in the EU. The responses were registered and transmitted periodically via a modem connected to a NMT 900 mobile phone to a cen-



Helena Lemmert displays the specially designed case, which holds a Newton handheld computer, a modem and a NMT 900 mobile phone.

ter computer. The computer transformed the data into diagrams shown on a large screen located at the square in the middle of the city.

### Will be marketed

The device that made it possible to connect the portable computer to the mobile phone was a PC interface from Ericsson.

The project is a joint effort involving Ericsson, Swedish mobi-

le operator Telia Mobitel, the Mid-Sweden University, the Center for Communications Science, Apple Computer and others.

The response far exceeded our expectations. Now it is a question of marketing the computer polling concept," says Ingmar Fagerström from Mid Sweden University.

Lyonel Abainza  
Photo: Roland Lundqvist



# Broadband — a hot and new market

**At the beginning of the year, a new business unit was created within Ericsson's Public Telecommunications business area. Business Unit ATM Broadband currently employs about 200 people who are located in Årsta and at Ellemtel. The average age is low, less than 35, reflecting the interest among young persons for this "hot" product area.**

"We have made considerable progress in organizing the new unit," says Björn Olsson, manager of the ATM Broadband business unit.

"At the moment we are working hard on the field tests for which we have received contracts in Germany, Sweden, Italy, Spain and France. At the same time, we are trying to look towards the future to create a position that allows us to take advantage of what we believe will be new marketing opportunities," relates Björn Olsson.

## Cohesive team

One of the greatest challenges in creating a new business unit is to gather employees from different organizations, each with their own culture, and to create a cohesive team.

"We are constantly striving to improve relationships within our organization," says Björn. "And when I say our organization, I mean everyone who works with our products, regardless of whether they are working at an Ericsson company or design center on the other side of the globe, in Årsta or at Ellemtel. The entire organization comprises about 1,500 persons."

## Fragmented market

Although the broadband business unit sometimes gives the impression of being somewhat disorganized, this is not simply because it is a new unit. The market for broadband products is one of the most difficult to predict in the entire telecommunications industry. No one really knows how it will develop or when it will blossom. This creates considerable uncertainty on the part of both suppliers and customers. There is uncertainty with regard to where to invest and pressure to develop products quickly.

No one wants to "miss the bus," and because no one knows when it will leave, everyone wants to be as well prepared as possible right now.

## In the forefront

"Thanks to Ellemtel, Ericsson has for many years been in the forefront in various technical development projects in the broad-

band field," says Gunnar Wranne, who is responsible for marketing and project management at the ATM Broadband business unit.

"We have been very successful in a number of RACE projects devoted to ATM over the years," he relates.

The future for broadband appeared relatively clear until a few years ago. Field tests would be held from 1994 to 1996, followed by evaluation. Volume sales would not be attained before the beginning of the next decade. But something happened.

Over the past five years, all western economies have been affected by the deregulation of markets, the elimination of monopolies and the privatization of public companies. The telecommunications industry has been no exception.

## Adapting to reality

When the changes in the market began to be evident, a major restructuring of Ericsson's Public Telecommunications business area was undertaken.

The largest Ericsson companies, the Major Local Companies (MLC), were given total responsibility for their respective markets. In Sweden, the organization was decentralized, through the formation of Business Units (BU) and Core Units (CU). The objective was to more clearly delineate responsibility for different product areas and customers. This resulted in a matrix organization, in which business units not only encompass employees in Sweden but also those who work with the same products in various Ericsson companies around the world.

For the ATM Broadband business unit, this means that the responsibility for customers now rests with Major Local Companies in the U.S., Germany, Italy, the U.K, Sweden, etc.

Equipment is now delivered to customers through a cooperation effort involving the business units and core units. In order to keep track of the flow of payments, this is effected through a series of internal orders between the various units. MLC places an order with BU, which in turn pla-



**What does the broadband package contain? What advantages does the new broadband technology provide and what services will it offer? These are the questions facing Björn Olsson, manager ATM Broadband, the business unit within Public Telecommunications charged with maintaining Ericsson's position in broadband.**

ces an order with CU. Thus, for example, development work may be ordered from Ellemtel and production from Supply.

## In a hurry

Why does it seem that everyone in the broadband market is in such a hurry?

"Market deregulation increases competition, and the greatest competitive advantage for operators is the rapid introduction of new services for end-users," explains Gunnar Wranne.

"Quick access to products that make this possible is equally important for the traditional operators as it is for new players, such as cable TV companies. The end-users in their turn, which may be medium-sized companies, want to use these new services to gain a competitive advantage. Thus time has become a significantly more important factor than previously."

All players in the telecommunications market began watching each other and trying to guess which services in which areas would be the first to provide a profitable market.

It has become increasingly important to be present everywhere, over as broad a range as possible, in order to be prepared for the changes that will occur when the market takes off.

## Stirred up

This trend has naturally stirred up suppliers. No one wants to wait. Everyone wants to have products in the pipeline. Today it is a point of pride among many operators to be field testing broadband. It shows that they are in the running.

The data communications industry has taken advantage of this situation and is now supplying operators with various types of ATM products.

The ATM Broadband business unit is also allied with a number of partners outside Ericsson. This is because Ericsson does not have the resources to develop all the products and systems needed for the future within a reasonable time frame.

## System specialist

Ericsson's foremost skill lies in systems construction, in creating a whole from the parts. Only a few suppliers in the world have this competence.

"But to be able to create a whole from the parts, everyone working with the products must cooperate to a significantly higher degree than previously," Björn Olsson emphasizes. "How well we work together is an extremely important factor for success. It may even determine whether or not we "catch the bus" when the market opens up.

**Helena Lidén**



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## Success in China is a culture issue

**"Having international experience and common sense are prerequisites for anyone who wants to succeed here," according to Gunnar Wenneberg, President of Beijing Ericsson Communication Systems Company Ltd. (BEC), Ericsson's new Chinese joint venture. He was previously employed at Ericsson Radio Electronics (ERE) in Mölndal, Sweden.**

Gunnar studied technical physics at the Chalmers Institute of Technology, in Gothenburg, before joining ERE in Mölndal in 1968. Following such positions as systems engineer and project leader, he made the transition to the marketing side

**"Speaking the language is a virtues here," says the manager of Ericsson's new joint venture**

of operations. He has managed sales departments and sections for both new and established products. Further education in business studies, administration and management gradually led him to new career advancement within Ericsson. Most recently, he was in charge of a department engaged in the export of micro wave links outside Europe. "Not exactly the narrowest of jobs," according to Gunnar.

### Speaks Chinese

Gunnar Wenneberg has journeyed to China since 1985, although the presidency of BEC is his first permanent position in the country. As a result of his interest in languages and culture, Gunnar is now able, for example, to hold speeches in Chinese.

"During my ten years of journeying in China, I gradually accumulated a few phrases here and there, and learned a couple of language symbols at a time. I'm really fascinated by the Chinese language. Due to a purely mathematical interest, I decided to try to break its code of symbols. When I succeeded in doing that, I added to my knowledge through more formal studies."

Gunnar believes that his knowledge of Chinese is at an intermediate level. He is not fluent in the language, and cannot read everything he sees in newspapers, but he manages to get a full grasp of complete contexts. He proved this by picking up a school book and reading an item about a journey to Shanghai.

"To be able to read a newspaper properly, you must know at least 3,000 symbols," Gunnar claims, adding that he knows slightly more than 2,000.



**Gunnar Wenneberg has been working with the Chinese market since 1985. Now he is in charge of the Beijing Ericsson Communication Systems Ltd. He has learnt enough of the Chinese language to be able to carry out a normal conversation.**

"If you can speak the country's language, you make fewer mistakes."

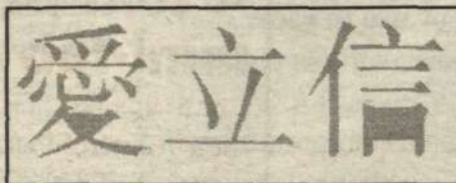
### Avoid impatience

Applying the Western brand of eagerness to negotiations is impossible here. Impatient people always lose out in the end.

You also have to be able to read between the lines, especially if the opposite party shows signs of hesitation. The people here are open, curious and eager to learn – on the whole, very sympathetic."

Like many other newcomers to China, Gunnar is now waiting to be assigned accommodations. There is a queue of 100 people for every new apartment.

Even with good contacts, people have to wait at least three to four months. Meanwhile, Gunnar Wenneberg is staying in the Beijing Lido Holiday Inn.



**Ericsson - written in chinese**

Gunnar explains that having a long-term approach is important in China. In 1992, Ericsson celebrated its hundredth anniversary of operations in China – the first telephones were sold in Shanghai in 1892. With the exception of interruptions for world wars, Ericsson has continuously conducted business in the country. This is something that customers appreciate. For the Chinese, taking a long-term perspective is a virtue.

**Text and photography:  
Thord Andersson**

END  
**LINE**  
LARS-GÖRAN HEDIN



*Recognition is a quality issue*

Just over a year ago, I wrote in this column that it can be difficult for people in Ericsson to show each other the recognition deserved for excellent work. At that time, I had just visited Texas Instruments in Dallas, and Ericsson's own plant in Lynchburg, Virginia – two places where the art of recognizing excellent work is practiced as a natural means of encouraging employees to perform even better.

A year has passed since then and very little has changed. There has been some talk of introducing systems for rewarding employees for well-performed improvement work, for example. However, no concrete results have yet become noticeable, at least to my knowledge.

Just the other day, I was reminded of the true importance of this matter. I had the honor of attending one of the most major events in Ericsson's modern history. The occasion was a visit by seven quality auditors from the European Quality Award (EQA) to our Spanish company, Ericsson S.A. Just imagine! Our Spanish company is one of five finalists being visited by the EQA judges.

One question that the judges returned to time and again related to the occasion and the manner in which employee efforts were most recently acknowledged by their manager – and whether the employees themselves had shown any recognition of good efforts by the manager! The best response those questioned could make was that they had received a kind word, or a pat on their shoulder – but nobody could think of anything more concrete.

So bear this in mind, all of you hoping to receive a quality award in future. Start by rewarding a deserving employee! It doesn't have to be in the form of jingling coins. In many cases, it's enough to acknowledge a performance in a manner that is noticed by others. This is one way of doing it:

Pia Rehnberg, who works in Corporate Relations is a real pillar of the company. When things are most stressful, due to the preparation of interim reports and the like, Pia's workload is enormous. But she still manages to do an excellent job. Her input for Contact is also invaluable. We need more people like Pia in Ericsson, in my opinion.