

# CONTACT

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## Smallest base station

The race is on to be the smallest in the mobile telephone industry. In addition to the terminal segment, the competition also covers radio base stations, which are shrinking rapidly in size. Ericsson is now a front-runner with a suitcase-size base station.

**12**

## Links the entire world

The Ericsson Mini-Link radio link is one of the most successful products in recent years. Riding on the wave of mobile telephony expansion, sales of the Mini-Link have multiplied.

**14**

## European Committee

When the Ericsson European Committee met for the first time, the male dominance among the union representatives from thirteen countries was overwhelming. Once annually, they meet with the CEO to exchange experiences and opinions.

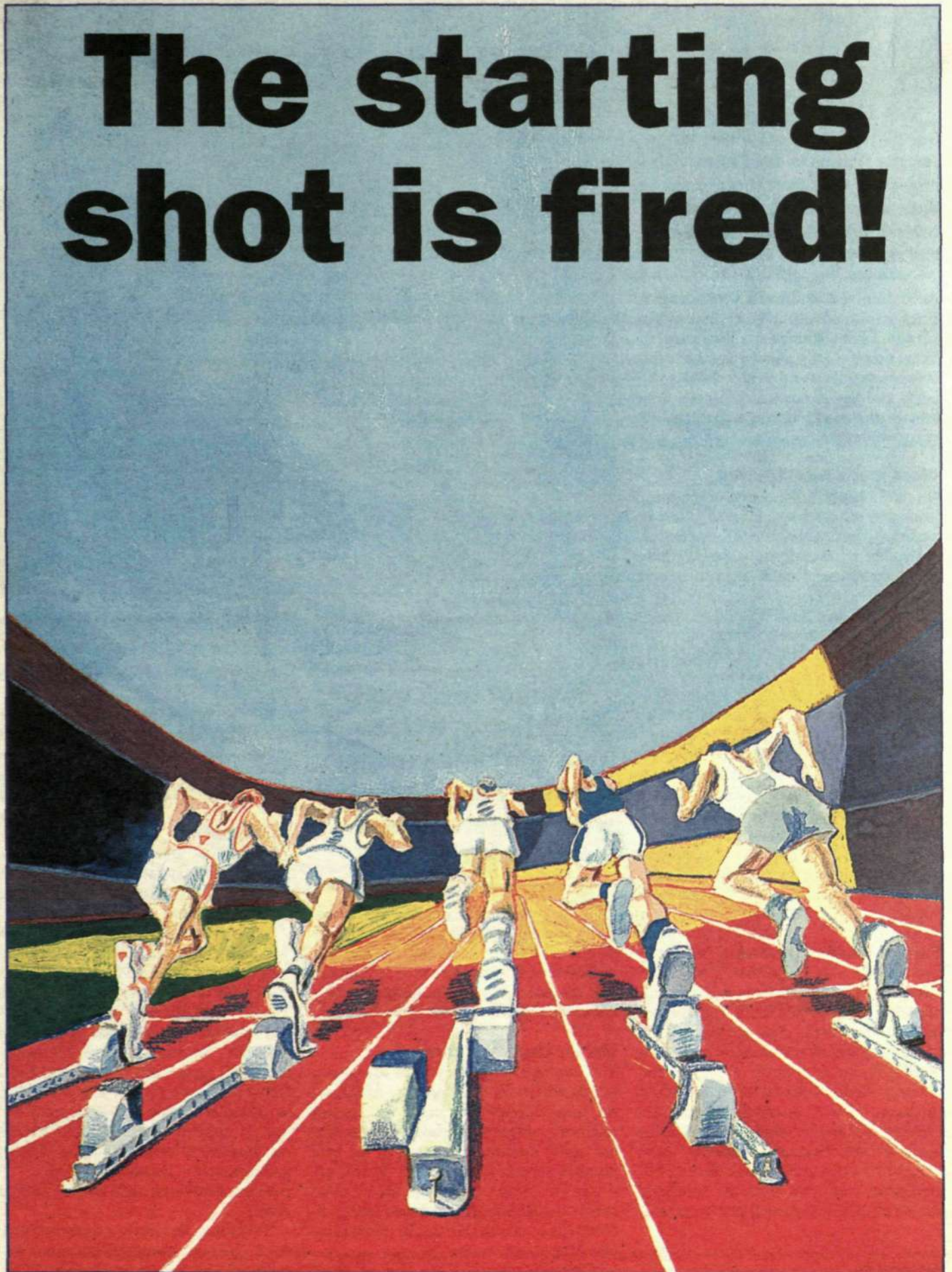
**15**

## Turnkey in Pakistan

Ericsson received a major network construction contract in Pakistan in 1991. At its peak, some 2,500 persons were involved in the project, in which Ericsson was responsible for the entire installation.

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# The starting shot is fired!



The Public Telecommunications Business Area is now undergoing a transformation to increase profitability and to be able to invest aggressively in product develop-

ment and market penetration. The starting shot has now been fired for a more quick-footed and aggressive Public Telecommunications.

**4-7**

# "Understanding customers is the key to the future"

**We must create a project culture! This was one of the principal messages conveyed by Bo Dimert at this autumn's first breakfast meeting with the Business Networks unit in Nacka Strand, Stockholm. Bo is the new manager of the Business Networks division of business area Business Networks.**

**With broad strokes of his marker pen, Dimert drew his vision for the future of this area. His message was that if we want to earn more money, we must establish priorities and focus on the right things.**

According to Bo Dimert, belonging to Ericsson is undoubtedly a tremendous strength. Lars Ramquist's currently famous quote – "It's about communication between people, the rest is technology" – is the real key to success. We have to be best in the world in the technology we choose to invest in.

## **Work more intelligently**

"In our industry, competition in the world market is razor sharp. Price pressure is enormous and margins are falling continuously. The trend is crystal clear. We have to reduce costs and simultaneously increase revenues," says Bo Dimert.

Dimert focused heavily on the time aspect. "Time is extremely important.

"We must work more intelligently. This does not mean longer working days, but working days with a better content." This is where his ideas about project culture entered the scene.

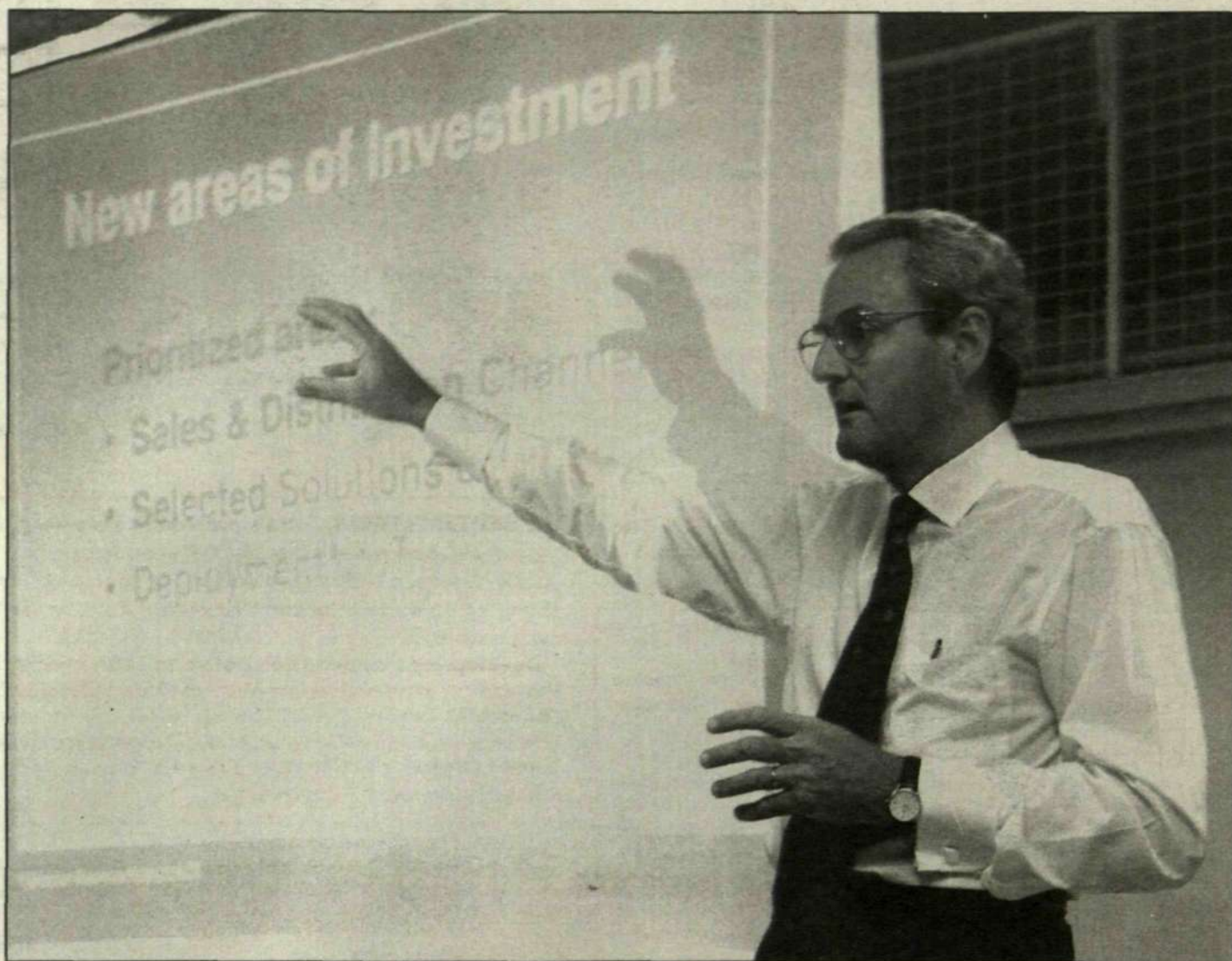
"Preferably, a project should take longer than 12 months and absolutely not more than 18 months! We must become much better at working in projects. When something else goes wrong and emergency action is required, this must never be allowed to damage project work. Other instances have to take over and cope with these problems.

## **Understanding customers**

Ericsson has a strong position in most areas of the communications sector, in terms of both technology and sales. The communication of speech, data and images via fixed and cordless connections is part our core business. Corporate customers and business users are central target groups for Ericsson. "The Corporation's combined expertise within this sphere is found in our business unit, Business Networks," said Dimert. "No-one understands these customers needs better than Business Networks. Understanding is the actual key to the future!

## **Selective**

"In addition to being more selective in our choice of the technical solutions in which to invest, we must be equally selective in choosing the customer categories to be addressed. We cannot be best for everybody, just as we cannot be best at everything," Dimert underlines.



Bo Dimert emphasizes that one of Business Networks' principal goals is to create added value for its customers and its partners.

Photo: Thord Andersson

## **"We must work more intelligently, which does not mean longer working days, but working days with a better content."**

Dimert proceeded to talk about Business Networks' plans for the years immediately ahead, in which it is assumed that margins will narrow. For this reason, it is essential that the efficiency of the business unit's market organizations is improved.

## **Better financial control**

The improved efficiency must also apply to administration and logistics. At the same time, development costs will remain relatively constant. Establishing priorities and using development funds in the best possible manner are important factors, according to Dimert. "In the future, we must assign greater importance to marketing activities and making sure that invested capital is turned over faster.

"Our investments in the coming years should be mainly concentrated on three areas: sales and distribution channels and products adapted to these channels, solutions and products within selected areas and a better internal use of IT."

The new business structure will be divided into four general channels, each of

which will be clearly defined and delineated.

In the future, the cost of Business Networks' indirect sales, which mainly involve volume products, must not exceed 10 percent of revenues. Accordingly, such sales must generate a substantial surplus.

## **Cost limit**

The business area's costs for traditional product and system sales, via mainly Ericsson channels, must not exceed 20 percent of revenues.

In the future, communications solutions within selected areas in which the business area can utilize its ability to create added value will be an important area of focus. To exemplify this area, Bo Dimert mentioned solutions of a so-called general nature (mobility, systems & network management, call centers and networking) and selected segment solutions within such areas as financial trading and emergency services. If correctly handled, such activities can generate a sufficient surplus, while simultaneously increasing respect for Business Networks' total know-how in the market.

"Providing service is a business, and it must yield a substantial contribution to revenues," Bo Dimert emphasizes. "This is one of our principal value-adding activities and there are many unexploited opportunities here. We must become better at marketing everything we have to sell, and most importantly we must charge for the services we provide."

Bo Dimert also devoted considerable

time to the currently precarious delivery situation. A completely new program of measures has been initiated to attain improvements.

"Resolving this issue is of vital importance to our future profitability. It is essential that we now quickly initiate measures to speed up outward deliveries," Dimert added.

## **What is happening now?**

"We are now appointing project teams to formulate proposals regarding a new and more efficient organization. According to

## **"Providing service is a business, and it must yield a substantial contribution to our revenues."**

our plans, an organizational proposal will be completed by December 1. Information on the matter will be released every third week. The aim is that the line organization engage in a continuous dialog with the project teams.

"However, we must not forget that we have our everyday duties to perform at the same time as the process of change proceeds," Bo Dimert stresses. "And perhaps most importantly: we must enjoy ourselves while we work!"

Thord Andersson

## Digital debut in Africa

Ericsson has received its first order for a digital mobile telephone system in Africa. The operator Nexus International has ordered a D-AMPS system for delivery to the Congo. Nexus, a wholly owned subsidiary of France Telecom, is installing a mobile telephone network in Brazzaville and Pointe Noire, the Congo's largest cities.

The order covers radio base stations and switching equipment. The system is scheduled to be operational in December this year. This will substantially increase the capacity for mobile telephony in the country, where there is already an analog system. Cyrus, a joint-venture of France Telecom and the Republic of Congo, is responsible for the project.

## Colorful phones

Ericsson's response to the colorful telephones being offered by competitors is the latest version of the GF337 mobile.

This autumn, buyers in the Nordic countries can personalize the style of their phones. The model's new flip-cover over the push-buttons can be affixed with photographs that can be exchanged. There are five different collections of five photos each - all by famous artists.



## Expanded network in the Philippines

The Filipino telephone operator Digitel has ordered an expansion of its fixed-wire network for SEK 425 million. Ericsson was awarded the order involving total responsibility for delivery of equipment and implementing the network.

Equipment to be delivered includes AXE switching for local and international telecom traffic, network supervision and equipment for transmission and cabling.

## 100 million lines of AXE

AXE has passed an important and notable milestone. Recently, the 100 millionth AXE line was delivered. This secures

AXE's position as the world's most used digital telephone switch. The number of installed lines has increased year after year. In 1994, Ericsson delivered 13.5 million lines, a 15-percent increase compared with a year earlier.

The largest AXE markets are Great Britain, Australia, China, Sweden and Mexico.

## Ericsson invests in Russia

During Telecom 95, Ericsson CEO Lars Ramqvist met with the Russian Minister of Communications Vladimir B. Bulgsk. The two executives signed an agreement which will be very important for Ericsson's future in the Russian market. The agreement means that Ericsson will become a member of the Telecommunications Forum, which is international, non-profit organization established by the Russian Postal and Tele Ministry and which is aimed at facilitating development of the Russian telecom network.

At the same time, a cooperation agreement was signed with AO Electrosviaz Tver, which is the tele operator in the Tver region northwest of Moscow. Within the framework of this agreement, an first order was also signed for AXE equipment valued at SEK 50 million.

Today, Ericsson is one of the leading suppliers of tele equipment in Russia, including a dominant position in mobile telephony.

## GSM system and phones to United Arab Emirates

Ericsson will deliver mobile telephones and a GSM network to the United Arab Emirates totaling SEK 160 million. The contract, signed with the operator Etisalat, covers a complete system, with new switches, base stations, operating and maintenance system plus 10,000 mobile phones. In a first phase, the network will be placed in operations on November 1 this year.

Etisalat and Ericsson have cooperated for many years, beginning in 1988 with the delivery of an analog TACS network to Etisalat.

# Ellemtel wholly owned



**ON SEPTEMBER 28, Telia's president, Lars Berg, and Lars Ramqvist from Ericsson signed an agreement whereby Ericsson takes over Telia's shares in Ellemtel and accordingly assumes full responsibility for operations as of October 1. The company is changing name to Ericsson Utveckling AB. Gunnar M Eriksson remains as president of the company.**

**Development cooperation between Telia and Ericsson does not cease as a result of this action. In stead a new joint venture is being started which will retain the old name "Ellemtel Utveckling AB." The company will focus mainly on developing new, advanced tele services and will have about 20 employees initially. Long term, the number is expected to grow to 150. Erik J Eriksen, Ellemtel's first president, and Gunnar M Eriksson, were present at the ceremony.**

## Product news at Telecom

**In conjunction with Telecom 95 in Geneva, Ericsson unveiled a number of interesting product innovations. Not unexpectedly, Ericsson displayed its strength particularly in radio communications.**

### High-speed modem

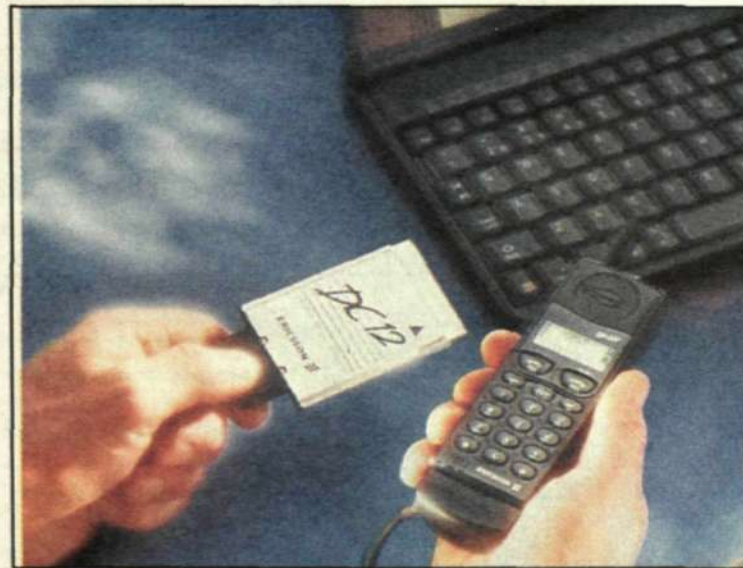
A new high-speed modem, 28,800 baud, has been developed for portable computers. Intended for telefax and data communications via an analog mobile telephone, the modem is a so-called PCMCIA type.

This means that the modem is not much larger than a credit card and can be inserted in a PCMCIA connection which today are increasingly common on portable computers.

### Phone for GSM/DECT

A pocket telephone that can be used in GSM and DECT systems was also displayed at Telecom.

It facilitates capitalizing on the benefits of both types of digital mobile systems. This means that the telephone can be used at



**DC12 is a new PCMCIA modem for portable computers.**

work, where there is a DECT system, and outside in a GSM network.

This combined GSM/DECT telephone automatically keeps track of what type of system that is available and switches between them. One of the first to order was Telia of Sweden, which will be using such telephones in field trials being carried out with Ericsson in Sweden.

### Personal telephone

CH337 is the designation of Ericsson's new telephone for American personal telephony in accordance with the PCS 1900 standard.

The telephone, which is part of the same series of other Ericsson pocket telephones, weighs only 193 grams and offers access to a multitude of services from the operators.

# CONTACT

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It is important that skilled personnel stay in the Group, says (l-r) Jan Hansson, Hans Ohlsson and Stefan Öfverholm.

## Positive transfer of personnel

**"One of our most important pursuits today is to meet the personnel needs of the Radio Communications business area with supernumerary personnel from Public Telecommunications, and to achieve this objective in a positive aura of mutual understanding," says Lars Åkesson, Personnel Manager of Radio Communications.**

"Our ability to utilize the resources and skills in the company can be a powerful force, and we can do just that by transferring operations and personnel within the family," explains Lars Wiklund, Personnel Manager of the Public Telecommunications business area.

The personnel needs of the Radio Communications business area are well known, particularly its growing need for qualified technicians.

Shortly after the recent summer vacation, a project group was formed to work with transfers of personnel from Public Telecommunications to Radio Communications.

"We started by asking department managers to review their personnel requirements and to specify in which professional categories their needs were the greatest," says Stefan Öfverholm, project manager for Radio.

"The statistical information we received was compiled and compared with the personnel surplus reported by Public Telecommunications."

"We need the skills and expertise that is available in Public Telecommunications, and we intend to make every effort to assist in solving the problems involved with their surplus personnel situation. In the future, Radio will expand both in Sweden and abroad. In the Stockholm area, we do not anticipate any significant expansion of activities in Kista, but we intend to establish operations in the southern Stockholm region," says Lars Åkesson.

### 1,550 people so far

"We have identified about 10 units that may eventually be transferred to Radio Communications. One unit in Nynäshamn with 32 employees has already been transferred and another will join them soon," says Hans Ohlsson, project manager for Public Telecommunications.

The greatest progress in the transfer project has been made in production, with some plants already transferred to Radio Communications, for example the pro-

duction activities of the Visby plant, which were transferred at year-end 1994. Operation of the Nynäshamn plant was transferred to Radio this past summer, and the Katrineholm plant will be transferred at year-end 1995. About 1,550 employees have already been transferred from Ericsson Telecom to Ericsson Radio Systems.

Many employees have also acted on their own and requested transfers to Radio Communications.

"Before the summer, more than 150 persons took the initiative in requesting transfers from Public Telecommunications to Radio Communications," says Jan Hansson, a member of the project group.

### Ericsson hat

The project group is now focusing on the surplus personnel situation of Public Telecommunications outside Sweden. Cutbacks may be necessary in some foreign companies, and the project group plans to contact Radio management personnel in different Ericsson companies abroad.

"In some markets, Radio Communications is in great need of resources," explains Stefan Öfverholm, emphasizing that no personnel will be transferred without coordination of such transfers by local management for Radio and the project group in Sweden.

"In cooperation with Public Telecommunications, we will now continue our work in Sweden, in parallel with increased efforts in Group subsidiaries abroad.

"It is important that everyone involved in the project, management and employees, put on an "Ericsson hat" and look at the grander scale in its entirety. Everyone should take part in the project with a positive outlook and try to see what is good for the Ericsson Group as a whole," says Hans Ohlsson.

"If we are able to complete this project as intended, we should achieve optimal utilization of the employee surplus in Public Telecommunications and the shortage in the Radio Communications. By recognizing and correcting the situation, we can ensure that skills and expertise available in the Ericsson Group remain in the Group and are not lost to external companies.

"For Ericsson Radio Systems, naturally, it is an advantage to gain access to experienced Ericsson personnel. And for Ericsson Telecom, it will be gratifying to know that their skills will continue to benefit the Ericsson Group," says Lars Wiklund.

by Gunilla Tamm and Isabel Werner

# Public Telecom goes on offensive

## Public Telecommunications is undergoing a transformation to increase profitability

**The starting shot has been fired for a quick-footed and aggressive Public Telecommunications.**

**"We intend to grow faster than the market and be a world leader in public telecommunications," says Anders Igel, head of the Public Telecommunications Business Area.**

The Public Telecommunications Business Area is now undergoing a transformation to increase profitability and to be able to invest aggressively in product development and market penetration.

"We are increasingly moving from being an engineering industry to being a know-how company, and the engineering industry elements we retain will become more sophisticated. Technical development has provided a large rationalization potential - we can do more with less resources. And we do not have to do everything ourselves," says Anders Igel.

"Our competitors are a step ahead in several respects in terms of rationalizing their operations and I will not yield with regard to implementing our action program. The market is changing rapidly, and our customers want cost-effective solutions. We will complete the action program as quickly as possible in order to look to the future. We will be more aggressive in our core operations, increase profitability and make decisions more rapidly."



### Close to customer

"We will be working much more closely with our customers, to ensure that we fulfill the demands they place on us, and to intercept signals as early as possible about the direction in which we should focus our product development. We shall be better than the competition in providing our customers with the solutions they need for their operations. This is necessary so that we can grow faster than the market," says Anders Igel.

"The market for fixed public networks will grow by 5-12 percent annually. Our ambition is to grow twice as fast in the immediate years ahead!"

Growth is occurring in such expanding markets as Asia where telecom networks are being installed and expanded and in the western world where existing networks are being digitized and where new operators are installing new networks in response to deregulation. In addition, there is a growing market worldwide for intelligent networks, modern access solutions and customer service.

AXE is the most installed digital switch in the world, with a strong position globally.

"The AXE system has been in place worldwide for many years, and we have strong local units who know the customers well. We have talented marketing personnel in the local companies and in Stockholm who are experienced with generating business over the entire world, and we have engineers with a unique expertise.

"We can be proud about having such a strong market position, that we have a presence in so many countries and have such a good system. AXE is still very profitable. It is the best digital system in the world, with a base architecture which can be continuously developed. Today, we cannot foresee any end to how AXE can be further developed," Anders Igel contends.

"We are now going to accelerate the pace of product development. Our ambitions include having copper, fiber and radio solutions in the access network. We will be the undisputed leading supplier of intelligent networks and will sharply increase our offering of various customer services."

### Just as large in broadband

"We are also investing heavily in broadband and SDH, with a partly new direction. Instead of trying to do everything ourselves, we will cooperate with external partners to complement our own products, and to be able to offer our customers total solutions," says Anders Igel.

The fastest-growing broadband markets today are cable-TV, which can be upgraded to more advanced interactive traffic, and data communications between companies. Ericsson recently received a major order in Italy, for example, for a broadband network based on products from Raynet.

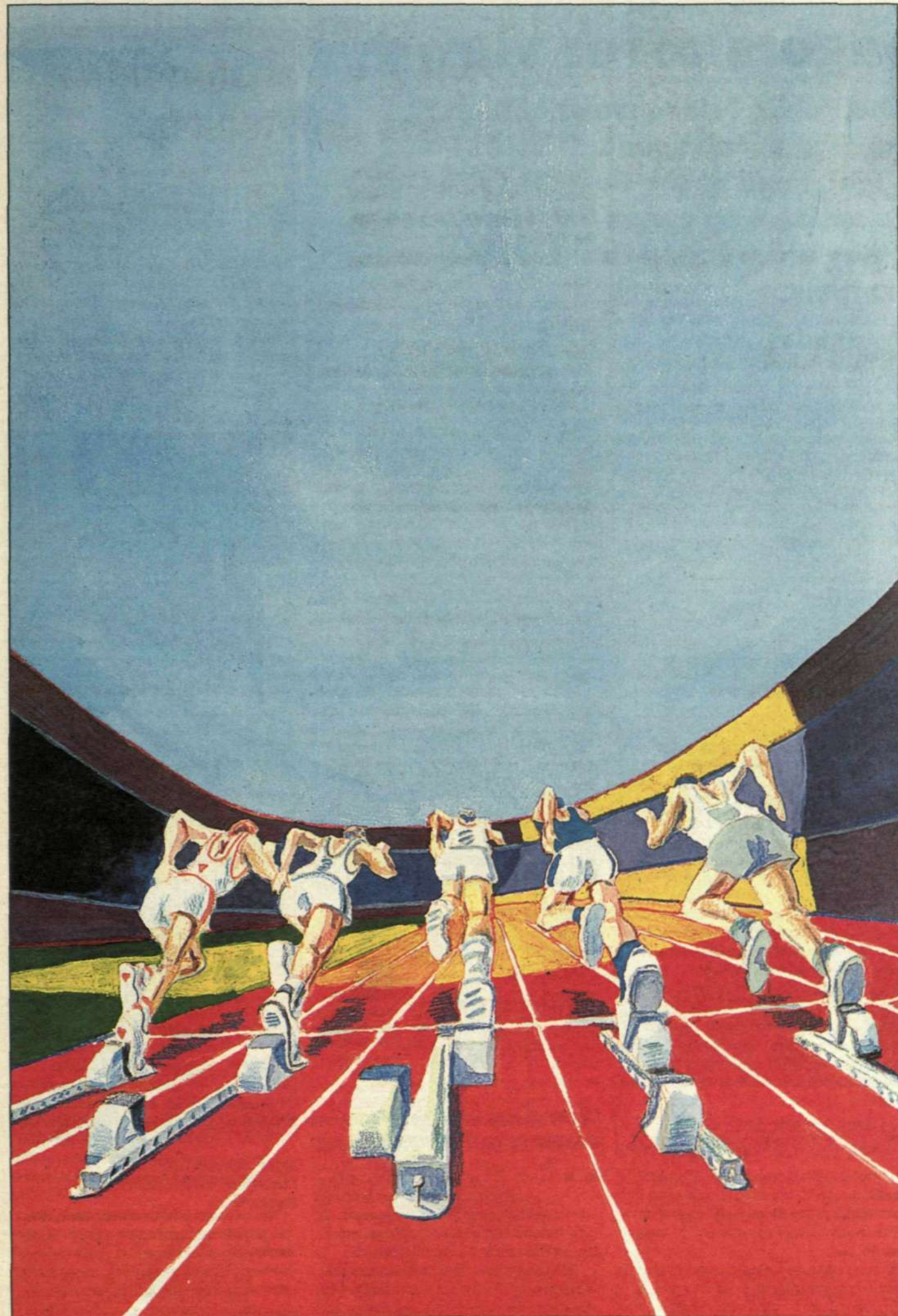
The focus within broadband is partly on systems for information highways, based on the new broadband system from Ellemtel, and partly on products in the access area.

"It is essential that we keep pace when the broadband market develops! Multimedia communications is a natural development of telephony and consequently one of our core operations. Increasingly, it requires broadband solutions. We intend to be as strong in broadband as we are in narrowband when the market gains speed in earnest," says Anders Igel.

### Set the example

Customer-orientation, personnel commitment and good measurement tools are cornerstones in the business area's ongoing quality assurance work.

"More work will be carried out in the line organization. Those working in the line should develop plans themselves about how they can improve their operations. We cannot have work groups sit-



The starting shot has been fired for a more quick-footed business area.

ting off to the sidelines carrying our studies and telling the line organization what has to be done. We are now giving people the mandate to carry out their work assignments themselves, and we will continually monitor how we are improving."

The business area established a system for monitoring financial performance which reflects the actual responsibility in the organization.

"This is an important instrument to ensure that we will be able to see the results

of our rationalization efforts in financial terms."

"We will face a need to continually improve ourselves," says Anders.

### At the forefront

"Ericsson Telecom shall set a good example, and demonstrate that we are serious. It will be apparent that we are much quicker on our feet."

"There will always be a need for fixed networks, particularly in an IT society. Of

course, there will be a need for mobile connections, but fixed will always be ahead of mobile in terms of broadband transmission.

"We are going to show the world just how good we are. We will be world-leading in fixed telecom networks."

"We are the ones who shall lay the foundation for the highway and access ramps for the new information society," promises Anders Igel.

Isabel Werner

## Scope of action program

During 1995-1996, the number of employees in the Public Telecommunications Business Area will be reduced by up to 6,000, from 30,000 to 24,000.

Primarily the time-to-customer flow will be rationalized.

The pace of product development within AXE is being accelerated, and efficiency improvements will be effected without a net reduction in the number of employees. In broadband, cooperation with external partners is being increased for product development.

In Sweden, 2,700 employees are affected within production. About 1,500 persons are affected in other operative and administrative operations in Sweden.

Operations that cannot be conducted competitively within Ericsson shall, if possible, be divested to external partners. Outsourcing could affect about 2,200 of the business area's employees in Sweden and, in addition, a considerable number outside Sweden.

As far as possible, the personnel reduction within the Public Telecommunications Business Area will be implemented through transfer to the Radio Communications Business Area. This applies in Sweden as well as outside Sweden.

The action program is part of the necessary rotation with Ericsson which was announced in June 1995. At that time, Group management stated that 20,000 of Ericsson's 80,000 employees would be required to change jobs in the immediate years ahead.

### Ericsson Telekom AB

The reductions will mainly affect the personnel in the Stockholm area. Administrative and operative activities outside production in Stockholm are being rationalized and may be the object of outsourcing.

### Elsewhere in Sweden:

- Nynäshamn plant has been transferred to Radio Communications
- Katrineholm (excluding connectors) is being transferred to Radio Communications
- Kristianstad is object for outsourcing
- Norrköping and Östersund take over all systems production (two production units were transferred to Radio Communications already in 1994)
- Visby plant being transferred to Radio Communications, and
- Söderhamn plant is being transferred to the Components Business Area.

### Outsourcing being investigated

- Component manufacture such as mechanical, plastic, connectors, circuit boards and relays
- Certain printed circuit assemblies and cabling
- Computer and telecommunications network
- Goods distribution
- Corporate printing house
- Graphics operations
- Calibration of test instruments

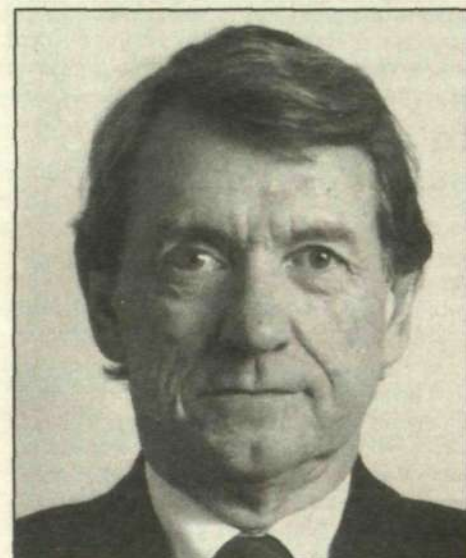
To facilitate the transfers between Public Telecommunications and Radio Communications, Radio Communications has decided to become established in southwest Stockholm.

# HOW WILL THE TURN-AROUND OCCUR?

## Eleven managers offer views

The "Turn-Around" in the Public Telecommunications Business Area is proceeding at full speed. CONTACT's interview with Anders Igel, head of the Business Area, on his vision of the future appears on pages 4-5. Here, eleven managers report how they are working to effect the turn-around in their organizations.

### Seeking solutions for a changeover to Radio



**LARS WIKLUND**  
Manager, BX Human Resources

"In the employee relations sector we are deeply involved in finding good solutions for changeovers from the Public Telecommunications Business Area to the Radio Business Area. Various task forces have been set up to discuss the profile for possible groups and individuals from Ericsson Telecom, and to analyze Ericsson Radio Systems' needs. The establishment of Ericsson Radio Systems in Southwest Stockholm is another current matter that we are working on, as well as the forms for a possible changeover between Business Areas.

### We are concentrating on core operations



**KARL-HENRIK SUNDSTRÖM**  
Manager, BX Business Control

"We are now examining what constitutes core operations for financial service, and which operations are peripheral. We are going to concentrate on our core operations and we are looking at operations (in the information technology area) that can be outsourced and those that can be eliminated. We are also looking at services that can be brought closer to line operations, to avoid possible duplication of work.

This naturally means that some information that has come from the financial service function in the past will be eliminated; the level of service may be lower.

### The division of labor may be changed



**KAJ JUUL-PEDERSEN**  
Manager, BX Strategy and Markets

"For BX Strategy and Markets we are discussing a change in the distribution of tasks within the group. This involves BX Strategy and Markets and the business units dealing with standards, information on competitors, and products and technologies (including laboratory operations) that will result in a transfer of assignments and personnel. In addition, we foresee some cutbacks in personnel and a more flexible organization.

### Working more closely with suppliers

"As reported earlier, Procurement has a number of strong programs that are designed to significantly reduce costs in the Public Telecommunications Business Area.

In the logistics field, we are introducing such comprehensive rationalization mea-



**HANS AHLINDER**  
Manager, BX Procurement

sures as direct deliveries to our large local companies and production units, as well as electronic ordering. We are minimizing our test costs through quality-control programs in supplier plants. This involves personnel cutbacks in the Incoming Quality Control service unit and in the respective local companies.

We have started a training program for our 30 largest suppliers in which we systematically review total costs and identify individual factors. Our suppliers will definitely have to live with the same cost-pressure we in the Public Telecommunications Business Area are experiencing from our customers!

### Changing administrative systems

"The program now under way is not affecting BX IT Productivity in the same way that it may be affecting other units, since our mission is to constantly try to ensure that IT supports increased productivity. But we have major changes ahead of us, primarily in Sweden. We have to change nearly all (90 of 120) of our administrative systems. The BX Management Team has decided to start with the "TTC" flow, from order entry up to and including invoicing (but excluding forwarding).

Negotiations are under way with Ericsson Data, among others, with respect to our agreements for 1996 and we are counting on cost reductions and simplified administrative procedures. We also expect to outsource the greater part of our local area network (LAN) operations during 1996.

The new contracts will mean stricter purchasing terms in our dealings with all suppliers, including Ericsson Data. Our



**ROLAND SJÖÖ**  
Manager, BX IT Productivity

long-term objective for LAN operations is to include it in leasing costs; it is a service that all operating units purchase from Ericsson Data or another outside supplier.

In addition, I would like to note that, for the time being, we are not using Windows 95 in Ericsson Telecom. A group policy is about to be issued.

A group security policy covering the use of the Internet is being distributed during October.

### Structural change



**ROLF NORDSTRÖM**  
Manager, BX Production Operations

"The process of change within Production Operations is continuing at a rapid pace. In Sweden, we have major tasks ahead of us involving the gradual transfer of AXE operations from Katrineholm to Norrköping at the same time that we have to prepare to increase capacity for the Radio Communications Business Area and its new products in Katrineholm.

The transfer of production from Ericsson Raynet to Norrköping is proceeding rapidly, as is also the case with DIAX and FUBA. This is imposing demands to develop expertise in such new areas of technology as cable television.

Outsourcing operations – our attempt to establish cooperation with partners in the components field and to create better in-

dustrial and commercial conditions – are proceeding according to plan, parallel with rationalization measures. Comparable programs involving both rationalization and outsourcing are under way in our various foreign companies.

Briefly stated, these activities involve a major structural change. In Sweden, in particular, this represents a substantial challenge to the organization, one in which we will implement the Focus program and keep our delivery machinery going. I am highly pleased by the enthusiasm and support that is being shown for this change – and I am convinced that, working together, we will succeed in meeting the challenge.

### Meeting demands for total solutions



**INGEMAR NILSSON**  
Manager, BX Business Unit Switching and Network Systems

"We will use pro-active marketing to influence customers at an early stage by offering network solutions comprising products and services that optimize customer benefits over both the short and long term.

Today, the Business Areas are working together to meet the new operators demands for total network solutions.

Because of declining market prices, we have to rationalize our operations in part by increasing the efficiency of product development and product handling. One example is the development of an improved software structure and the introduction of high-level language for programming in the AXE system.

The modernization of the system's hardware is another example. In addition, we are constantly increasing the functional content of the system, in part by offering ISDN services for which demand is now increasing.

We are adapting the product development organization to a new approach that is based in part on global areas of expertise. By organizing the expertise in one field and applying it to a few units, we are shortening lead times and raising levels of quality. In addition, we are taking advantage of all the initiatives taken in recent years to improve the quality of software programs.

To achieve similar improvements in handling the flow of customer orders we are establishing improvement programs for ETX in all local companies and introducing global control of our resources.

### Greater impact on the market



**BJÖRN HEMSTAD**  
Manager, BX Business Unit Broadband Network Systems

"Enabling Networking for the New Generation" is our vision and we have accepted Anders Igel's challenge to become as large in the field of broadband as we are in switching.

To fulfill this high ambition it is necessary to reduce costs substantially while increasing our impact on the market. This seems to involve an irreconcilable conflict – but with improved efficiency and a greater degree of external cooperation our goal can be achieved.

Our management team has devoted a great deal of energy to the balance between cost reductions and the resources needed to implement our business plan. We have begun an "Efficiency Now" program with the objective of taking steps that will enable us to enter 1996 with the proper level of costs.

The reduction in personnel in Sweden has largely been completed and a dialog in this area is under way with our subsidiaries.

This is a tough job for all of us but we intend to raise the level of our enthusiasm continuously. For what can be more attractive than creating tomorrow's telecommunications?

### Improving the properties of AXE 10



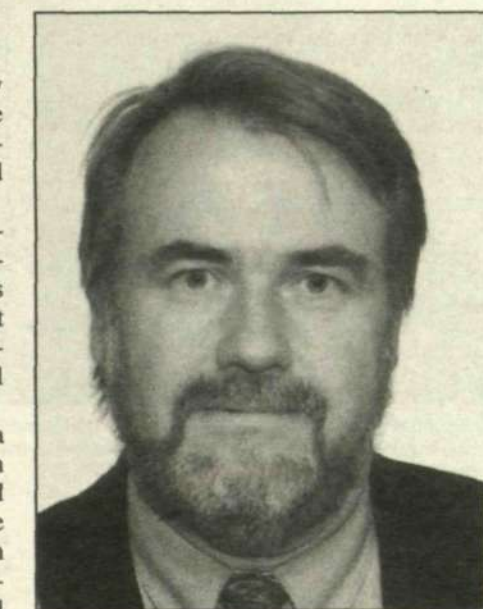
**LARS ANTMAN**  
Manager, Core Unit Basic Systems

"AXE 10 platform operations are being expanded substantially. The development of system architecture, the modernization of hardware, the introduction of open system interfaces and generally improved system properties are critically important to provide excellent competitiveness in all applications comprising the AXE 10 system.

The support activities for AXE 10 development processes are now being analyzed carefully. The objective is to rationalize and improve the efficiency of operations in this area.

A large number of possibilities are being studied. These include coordinating and changing organizations and operations.

### Streamlining and rationalizing operations



**LEIF JOHANSSON**  
Manager, BX Core Unit Basic Technology

"A large part of the planned re-dimensioning of operations has been implemented at this time, although much remains to be done. For example, our employees in Nynäshamn have been transferred to the factory operations of the Radio Communications Business Area.

We are now in a stage of intensive activity to streamline our operations and establish more efficient work forms, internally and externally. Our basic objectives have been set and the planning of activities and preparation of action plans are under way!

Our underlying efficiency is to be improved through streamlining, focusing on core businesses and simplifying operations. The number of employees is to be reduced from 360 as of September 1, 1995 to 250 at the end of 1996.

The Radio Communications Business Area is to be established on commercial terms as one of our principal customers. Our sales, amounting to approximately SEK 10 million in 1995, are to exceed SEK 45 million in 1996.

Approximately 25 employees, who account for about half of our "non-core operations" are to be released for tasks in our core operations. Their present operations are to be transferred to external suppliers.

By the end of 1996 at least half of our employees will measure up fully to the

profile of "future expertise requirements."

We will take steps to profile our operations so that we are perceived by customers as an attractive supplier, and by our employees as an attractive place to work, compared with other technical operations in the Public Telecommunications and Radio Communications Business Areas.

Our product portfolio will be streamlined by weeding out and standardizing existing and future lines of components and building systems.

There will be increased focus on studies and analyses of future potentially attractive basic technologies in order to improve our ability to recommend the proper choice of basic technologies in our product development programs.

### Train and authorize auditors to evaluate suppliers

"We will focus more sharply on audits of the commercial aspects of our operating systems, without doing the work of the line units.

Within this framework, we will be able to support the action program in many ways. For example, we will be able to follow up strategic projects dealing with product development and the improvement of operations.

Successful implementation of these projects is one of the prerequisites for achieving the rationalization measures that the action program requires in the areas of customer-order flow and design flow.



**CHRISTER AHNFALK**  
Manager, ETX Quality

We also plan to train and authorize auditors to be available for the increased evaluation of suppliers that will be necessary in connection with outsourcing, the decrease in qualification of components, and the greater use of "ship-to-stock" procedures.

Pages 4-5:

Anders Igel comments on the BX Turn-Around

# Remote upgrading - the way of the future

**Within Ericsson, a cadre of skilled technicians travel around and upgrade AXE switches by adding new and improved software. Soon they will be able to leave their vehicles in the garage and work from their home base.**

**With the help of a new methodology developed by Ericsson Ltd, in the U.K., it is possible to update switches via data communications.**

**The method, which during the summer was awarded Ericsson's prize for the best improvement project in 1994, generates considerable benefits for Ericsson and its customers.**

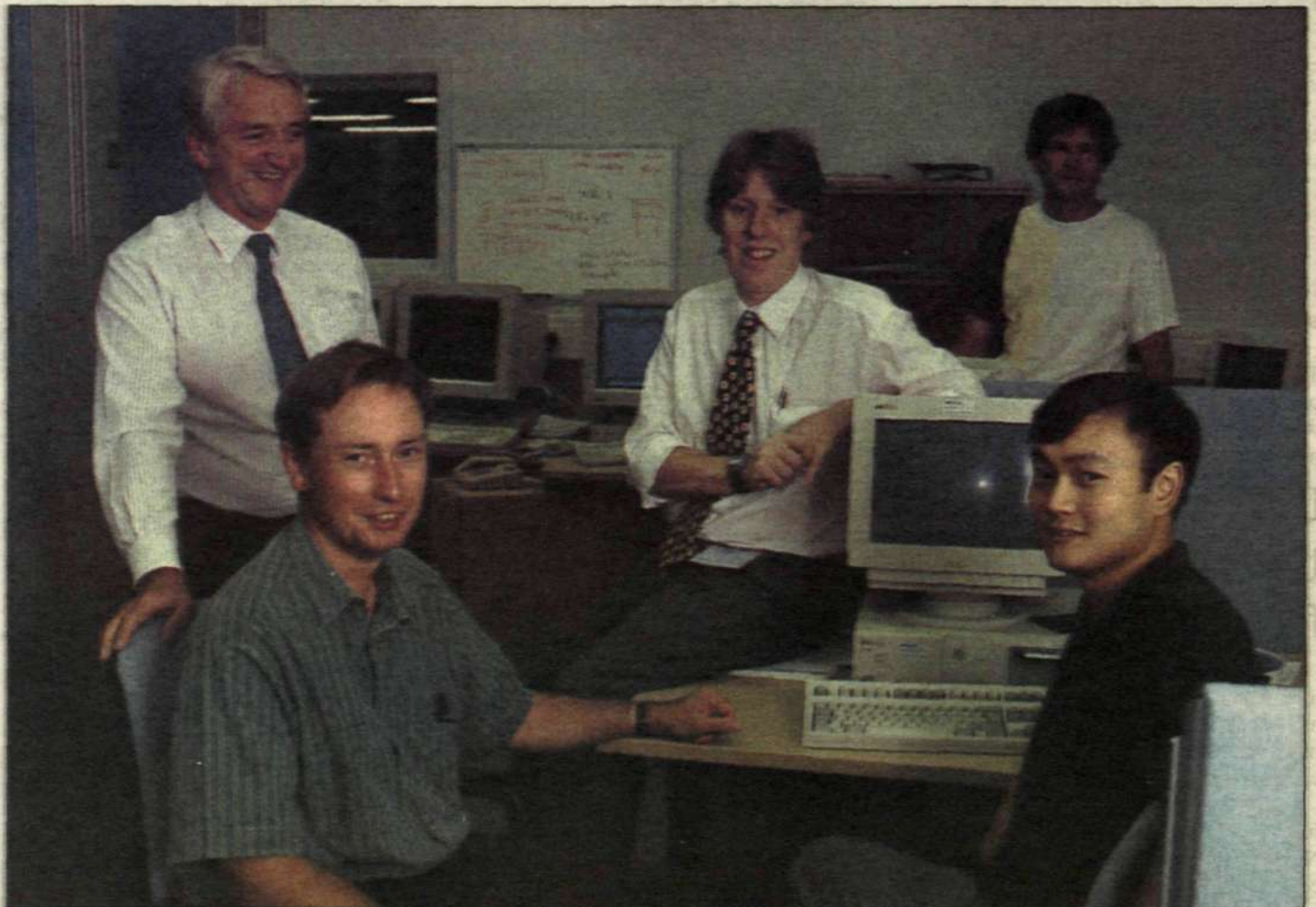
In fierce competition, a team from Ericsson Ltd. in Burgess Hill, won the prize for the best improvement project within Ericsson in the smaller projects category. However, the improvement attained by this project group is far from being small and may be of considerable significance to Ericsson and its customers in the future. The improvement consists of a more effective and more reliable method of implementing software upgrades in AXE switches.

"Today, 170 AXE stations are installed in the U.K. Since Ericsson continuously improves its software for the switches and adds new functions, upgrading the switches is a time-consuming and extensive process," says John Bancroft, head of technical customer service within Ericsson Ltd.

Traditionally, a team of technicians has traveled around the country to upgrade the switches on site. This involves hundreds of miles and many days of travel on British roads. Not only did this cost Ericsson Ltd large amounts of funds, it also meant that several highly qualified employees were seldom available at their workplaces in Burgess Hill, where the company is based and conducts its development operations.

## Trust

"We realized at an early stage that there must be a more efficient way of upgrading the switches. When we initiated our improvement project two years ago, we knew that BT already had an internal computer network that was used to manipulate data in the AXE10 switches. Our idea was to create a link between us at



Using a new methodology, developed at Ericsson Ltd in the UK, AXE-stations are upgraded by remote control. In June, the project was awarded with Ericsson's prize for best improvement 1994. Some of the team members: John Bancroft, Martin Sines, Mick Snowling, Photo: Lars-Göran Hedin

Ericsson and this computer network.

Putting this idea into practice was actually very easy. Principally, of course, it required very close cooperation with BT. The far-reaching and trustful relations we had developed with BT over the previous few years proved invaluable in this respect. So a project was started up involving the participation of Ericsson and BT. Mick Snowling from BT was the person who helped us get a foot in the operator's door."

## Resistance

"Naturally, there were people in our operations organization who questioned the necessity of admitting outsiders into our computer network," Mick Snowling explains. "But since remote-controlled upgrades would also yield substantial benefits for BT, we overcame this opposition.

From the operator's viewpoint, the most attractive aspect was the reduced time required to introduce new functions, and also the fact that this is a more inexpensive way to upgrade an AXE station," Mick adds.

"During the course of the project, our working relationship with BT's personnel was excellent. Work was characterized by openness and mutual trust. In other words, a very deep partnership between our two organizations was developed," John emphasizes.

When the project had progressed so far that a new methodology for remote-controlled upgrading had been developed, it was time for the method to be tested in reality. This was in March 1994, and a 40,000-line switch in Edinburgh was selected as the testing station.

"The first time we tested the system was at night. But we confronted a problem almost immediately - a fault in the existing software in the switch. This was when we discovered one of the major benefits of working in this way; that we now had the opportunity to quickly enlist the assistance of the expertise available at Burgess Hill. The program error was corrected the following day, which enabled us to complete the upgrade the second night.

"Conducting an upgrade via a computer line means that the personnel involved in

the procedure have access to their colleagues. The reverse is also true; those conducting the work, who are among the company's most qualified personnel, are at their workplace and not out traveling. Since there is a shortage of skilled personnel, this is a strong argument in favor of our new way of operating," John Bancroft explains.

The upgrade of the Edinburgh station also constituted a success for BT, and resulted in one third of all of its AXE stations being upgraded using the new methodology during the first round.

"And recently, we initiated a new round of major upgrades, which means that now that we have received the latest delivery of new software, we will be able to start up the first AM switches in the Ericsson world, with the help of the new methodology."

## Automated

One of the reasons why the new working method has been so successful is the upgrading process's high degree of automation. This is the result of a parallel improvement project, which now enables 95 percent of the entire upgrading process to be effected automatically.

"Our ultimate goal is to develop a process whereby the operator need simply press a function key on his keyboard and can then get on with eating his pizza, while the computers do his work for him!"

Until that time, Ericsson and BT can enjoy the excellent results of their improvement project: a four-week, or 33-percent, reduction in the time-to-customer period for new software upgrades, and a cost reduction of 47 percent.

Lars-Göran Hedin

## Two minutes of silence is enough

One of the prerequisites for the development of remote-controlled upgrade system was already available when Ericsson and BT started their work on the required methodology: the internal computer network at BT, which connected its 170 AXE stations to an operations center.

This is a so-called X.25 network, in which data is transferred at a speed of 48 kb/sec. In order to conduct its remote-controlled upgrades, Ericsson technicians

in Burgess Hill was granted access to this network.

"When we use the X.25 today, a station upgrade takes about two hours. That is the time required to transfer the new software to the switch. When this has been completed, the switch is closed down and then restarted using the newly installed software. The time the switch is out of operation is thereby limited to two-to-three minutes.

"The next stage in development will be to work via ISDN instead. This would result in faster data communications and thereby significantly reduce the time needed for loading the new software. Another attractive feature is that ISDN does not require the use of an existing computer network, such as BT's; instead, the methodology can be used in any part of the world where ISDN is available in the telecommunications network," says John T. Bancroft.

# Cordless revolution

**Important key-expertise areas within the Business Network Business Area can be said to be advantageously associated with regard to the advent of DRA 1900, the new public access solution for wireless connection according to the DECT (Digital European Cordless Telephony). This newcomer was introduced for the first time to the general public at Telecom 95 in Geneva. Interest among operators in this cost-effective and flexible solution is already very strong.**

The access network comprises almost 50 percent of the investment in a telecom network. To date, practically all solutions have been wire-related, which require ma-

## DRA 1900 – the future solution for public networks

for resources in terms of time and above all work. It is necessary for wire to be physically laid from the local exchange to each subscriber in the network.

"Today, a large part of the capital outlay for an access network is for excavation. New radio technology enables us to replace a large part of this with Ericsson content," is the contention of Håkan Österberg and Stefan Lindqvist at Ericsson Business Networks AB's Network Engineering (Z) Division in Sundbyberg. Both have participated in the project work which resulted in the new public radio access product, DRA 1900.

### Successful cooperation

Development has progressed through the close cooperation between the business units Business Mobile Networks in the Netherlands and Network Engineering and Construction in Sweden.

Cordless corporate communications according to DECT in the form of the product success, Freeset, has for sometime been the Netherlands company's big trump card. Network construction expertise within the Network Engineering Division is considerable, with broad experience in turnkey projects for established as well as new operators in various parts of the world. They jointly perceived the market opportunity whereby a utilization of each others' expertise would be mutually reinforcing.

The business area's production unit at Verkö in Karlskrona has also been assigned a central role. All components of the solution will eventually be produced and delivered from there.

### Rapid earning power

"Our goal is to be competitive with wired access solutions," Håkan asserts, pointing out that this is not just a niche product. DRA 1900 is a complete system solution, with all that it entails. Production volumes are expected to increase in pace with a growing interest in the market.

DRA 1900 replaces a large part of the fixed connection between exchange and subscriber by wireless means. Base stations, DECT access nodes, are set up, for example, on building roofs and constitute



Håkan Österberg and Stefan Lindqvist are two of the firebrands behind the cordless DRA 1900 public access solution. Photo: Anders Anjou

the network's points of distribution, with concentrated transmission via 2 mbit/s-links to equipment in the local station. In the other direction, the base stations communicate with transmitter/receiver units which are out-door-mounted by the subscribers. For the DECT-linked subscriber, there is no difference compared with a conventional wired network. A regular telephone, telefax or modem is still connected to a jack in the wall.

DRA 1900 can be a highly attractive option for the customer mainly in cities and larger communities – in short, anywhere a concentration of subscribers exists within a somewhat limited area. Each base station can link up to 600 subscribers within a radius of a few kilometers.

"The main difference, compared with wired networks, is that the operator can begin offering services and obtain a return on investment much sooner. It suffices merely to install base stations and their connections to the local station to be able to begin offering telephony," says Håkan Österberg. "A wired network must be physically built in place, which can take up to one year in a project of normal size."

Thus, during a protracted period, the customer has money invested without being able to transact business.

### Facilitates growth

DRA 1900 enables connection by stages to the local station. A considerable part of the investment in DRA 1900 is by the subscriber, with the installation only taking place when a subscriber in fact exists.

The system is highly flexible and has high capacity. The maximum capacity of 600 subscribers per access node does not constitute a limitation. If demand increases, it is a simple matter to set up more base stations. No additional frequency planning is required. The risk of becoming "walled in" is minimal.

"With DRA 1900, the operator has a much better possibility to follow the subscriber flow," says Stefan Lindqvist. "Relocating a subscriber becomes simpler, and linking additional subscribers within one household is problem-free."

Network supervision also becomes simpler. A fixed, wired network encom-



The base station (DECT access node) covers the requirements of up to 600 subscribers and has a range of a few kilometers.

passes numerous intersections and connections. Malfunctions can be difficult and expensive to remedy. With DRA 1900, the wire connection to the subscriber is replaced by a radio connection, requiring only supervision of the base stations and subscriber terminals. By means of a central operating and maintenance system, the network nodes can be easily monitored. If a malfunction occurs, the defect is easily located and remedied.

### Customers accumulating

DRA 1900 can now be said to be in the final stages of industrialization, Håkan and Stefan observe. Production in Karlskrona is starting up, as is marketing directed at Ericsson's local companies and prospective customers. At the recently concluded Telecom 95, DRA 1900 was introduced under corporate umbrella "access" at the Ericsson stand.

During Telecom 95, and during the customer presentations and seminars that were held, this innovation was the object of considerable interest. Operators are seeking new means of increasing their competitiveness, including rapid expansion of their networks. Several customers have already decided in favor of building networks with DRA 1900.

## Ericsson in the forefront

Although DECT has so far been a west European standard, more countries are expected to seek association. Eastern Europe and Southeast Asia are among the major growth markets for new telecom lines. Many of these countries are now making the necessary frequencies available.

Even competitors are committing to wireless communications based on various technologies. Others beside Ericsson are working in the DECT area, which is not a disadvantage, according to Håkan. That many actors are opting for this standard only demonstrates its worth. However, Ericsson is unquestionably in the front rank and is also one of the strongest driving forces in the standardization process within ETSI (European Telecommunications Standards Institute) which works with defining and standardizing a "window in the atmosphere" for fixed DECT communications.

The DECT standard supports ISDN and other data-processing services, which eventually will enable operators to offer new services. Subscriber mobility within his/her residence or the immediate vicinity could be another, later possibility.

"In the first instance, we are focusing on making available an optimal solution for fixed radio link-up," say Håkan and Stefan. "This will be the stable platform from which we can proceed. DECT technology has not existed for more than four to five years, which means that within this application area Ericsson is a true pioneer."

### Kari Malmström

The transceiver links the subscriber with the base station. Only the short distance to the subscriber's telephone jack is wired.



# Cooperation with Stanford CIS

**For the past year or so, Ericsson has engaged in close contact with Stanford University, in California. Ericsson Components' Micro-electronic Research Center) is the unit principally involved in cooperation with CIS, Stanford's Center for Integrated Systems. Accordingly, a delegation from Stanford recently visited Kista.**

Ericsson is one of several member companies supporting research activities at Stanford University's Center for Integrated Systems. Christer Jungsand, Executive Vice President of Ericsson Components, is a member of the CIS Board of Directors. Christer, Torkel Arnborg and Gunnar Björklund, the Micro Electronics Research Center, jointly hosted the Stanford guests during their visit to Sweden.

### Exchange program

A Student/Partner Information Exchange program, is conducted within the framework of this cooperation. The program enables researchers and students

from Stanford and researchers from the member companies to meet and exchange experiences and know-how from various projects. This is the background to the visit to Ericsson Components by four research students, accompanied by a professor.

CIS conducts research in four principal areas:

- system design
- circuits
- components and connections
- technology for the 21st Century

### Area-based projects

As a result of considerable interest in the various projects, the auditorium at Ericsson Components in Kista was filled. As part of the agenda for the half-day seminar, insight was provided into the research findings of a number of interesting projects in several different areas. For example, the developments of low-energy semiconductors.

Professor Robert W. Dutton, head of research at CIS, gave an account of the research conducted at the center. He then presented one of the projects, "Layout-based Extraction of IC Electrical Behavior Models."

During the remainder of the morning, the four research students presented the projects they are conducting under the guidan-

ce of various Stanford professors. In order of presentation, the projects were "Shape Stress and Electrical Leakage in LOCOS Isolation Structures for 256 Mb DRAM Cells" by Shin-Fen Huang, "Harmonic Balance Techniques for Semiconductor Device Simulation," by Boris Troyanovsky, "Bandpass A/D

Conversion for Wireless Applications" by Adrian Ong and "CMOS Technology Optimization For Low Voltage/Low Power Applications," by Zongjian Chen.

### Visit to Electrum

Following their lectures, the Stanford guests answered ques-

tions from the audience. Then it was time for a presentation of Ericsson, a visit to the Royal Institute of Technology's premises at the research center Electrum in Kista and various meetings with researchers from Ericsson.

**Text: Lars Bäck  
Photo: Anders Anjou**



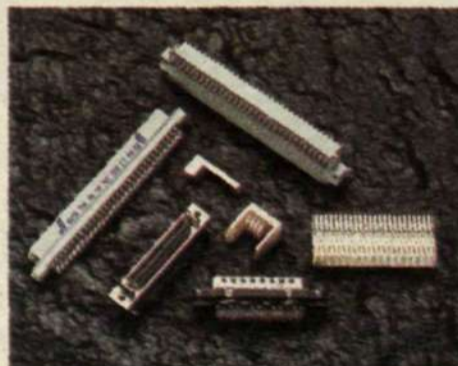
**Torkel Arnborg and Gunnar Björklund with their guests from Stanford CIS. From left: Torkel Arnborg, Adrian Ong, Shin-Fen Huang, Professor Robert W. Dutton, Boris Troyanovsky, Zongjian Chen and Gunnar Björklund.**



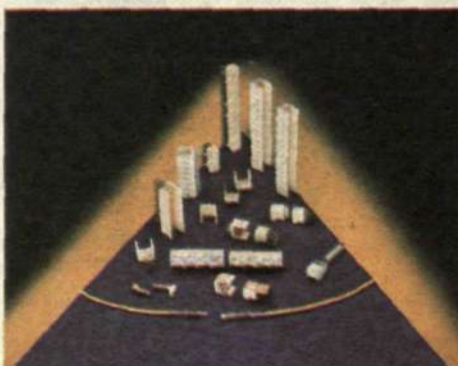
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BURNDY IDC MACHINE



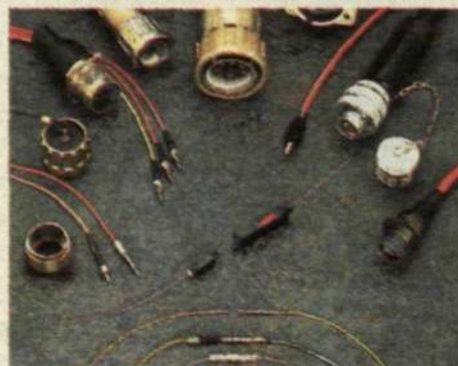
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# BURDENSOME YEAR FOR TRADE UNIONS

**Just over a year ago, the entire board of the Ericsson joint organization of trade unions died. The eleven board members were participating in a planning conference on board the Estonia on its final voyage. Invaluable union knowledge and experience was lost with them.**

"Despite all, we are proud that we coped," says Jan Hedlund, new chairman of the union joint organization and chairman of the local union at the Hägersten factory. At the time of the tragedy, he was second vice chairman of the local union and it was a natural step for him to assume responsibility as chairman. He was elected formally at the first membership meeting in December. Already in November, an interim board for the council was elected at a gathering of newly elected representatives from the local unions, deputy members of the old board and delegates from the four regions so that work could proceed as soon as possible.

#### Willing to serve

The joint organization of trade unions is a body for cooperation among all the engineering workers trade unions in Sweden and represents about 12,000 Ericsson employees. The board members also serve as employee representatives on the Board of Directors of Ericsson and seven of them were chairman of the local trade unions. The accident was a heavy blow for many of the trade unions. The local at the Hägersten factory lost its chairman and first vice chairman.

The board members who were lost were also responsible for the international union cooperation and had contacts with, for example, the trade union federations in the other EU countries.

"It has not been difficult to find new persons. It has gone better than expected," relates Jan Hedlund. "This is because we had a functional organ-

ization at the base level and that everyone understood the scope of the catastrophe and demonstrated a willingness and enthusiasm to serve.

"Everything is functioning today, but not as before. We have other contacts and different work methods and we are not exactly sure how this agrees with how it was in the past. It is likely that we have done many things less effectively than what we would have done."

#### Starting from scratch

A large amount of combined knowledge and experience was lost. Work within the joint organization had to be rebuilt from the bottom up. The personal contacts are the most difficult to replace.

"The formal elements of the work are easy to follow, but knowing to whom you should turn with regard to various issues and how to maintain relations with different persons takes a long time to develop.

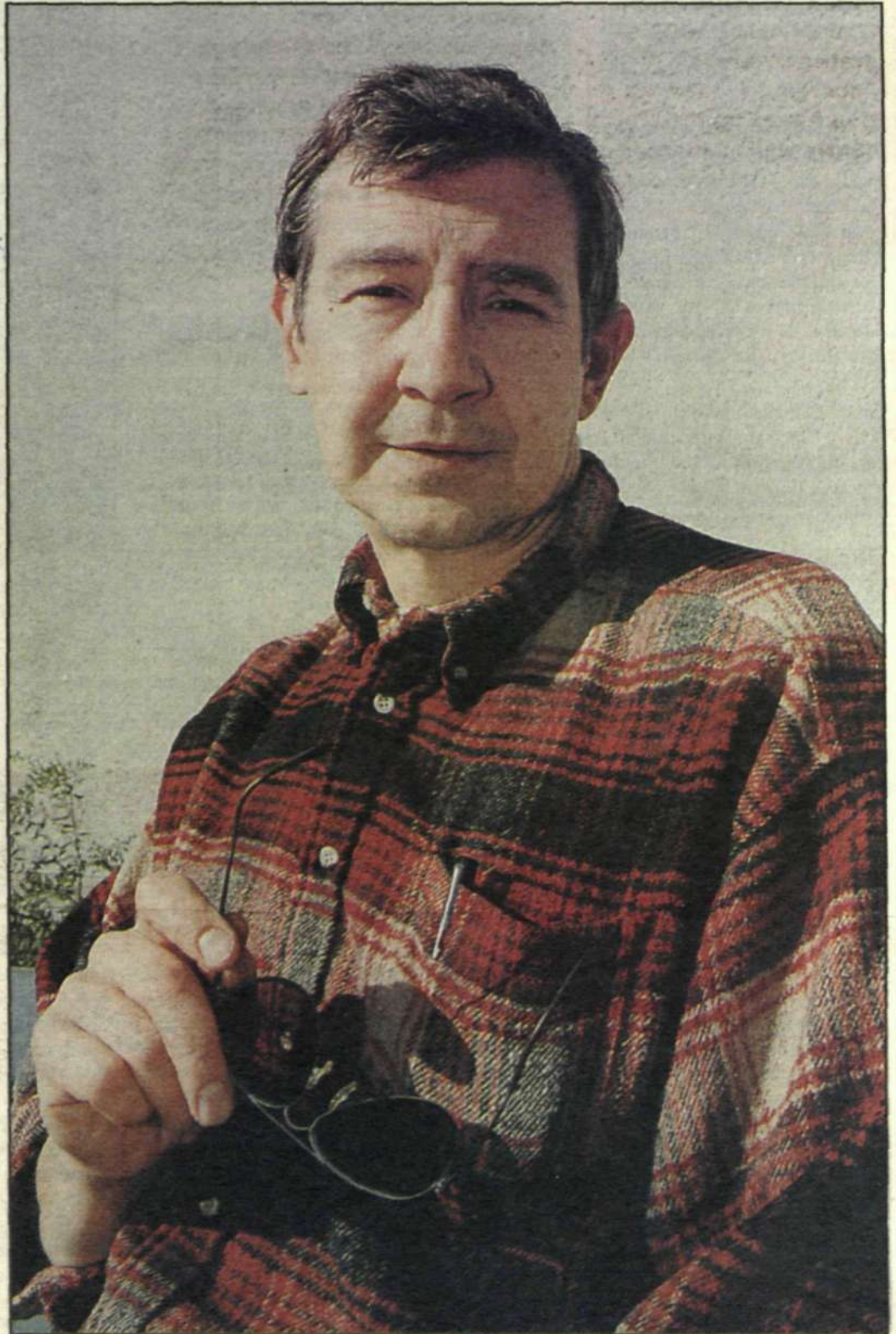
"If you try to see something positive about what happened, the local unions are now working more closely together. We have had to trust in one another for the knowledge that was lost."

In addition to rebuilding union cooperation, the grief for friends lost in the catastrophe has been a heavy burden. According to Jan Hedlund, those left behind have dealt with the grief largely through work.

"This is a good way of dealing with grief," says Jan. "In addition, we have had contact with the relatives of two of the victims from our own local union and therapy sessions organized by company healthcare. The company has been excellent in providing crisis support and we have received comfort and understanding from the national union headquarters.

"The decisive factor in succeeding to re-establish the activity again so rapidly was that there was so much competence in the trade union. We probably surprised the company by the speed with which we resolved matters."

Lena Granström



"Despite all, we are proud that we coped," says Jan Hedlund, new chairman of the union joint organization and chairman of the local union at the Hägersten factory. Photo: Peter Nordahl

## Ericsson and Marconi have agreed to cooperate in transport systems

**Ericsson and Marconi of Italy have signed a cooperation agreement under which the companies will develop, manufacture and market a common product portfolio for transport systems based on SDH (Synchronous Digital Hierarchy).**

The common product portfolio will comprise Ericsson and Marconi systems.

The agreement is exclusive. No other suppliers will be permitted access to the products in the portfolio.

Future development will be carried out cooperatively by the two companies. Production of the entire product portfolio will begin in Norrköping, Sweden. The product portfolio will be

marketed and sold mainly through Ericsson's subsidiaries worldwide, under the name ETNA, Ericsson Transport Network Architecture.

#### Long tradition

Marconi has years of experience in the transmission field. The company has conducted extensive development and production of SDH-based systems in recent years.

Prior to this accord, Ericsson had a distribution agreement with Marconi for individual products, but this agreement means that Ericsson now gains exclusive access to the entire product portfolio. Combining these with proprietary products creates a very strong product offering.

Recently, a number of cooperative ventures between various suppliers in the transport system area have been announced. The

Ericsson/Marconi cooperation can be considered one of the strongest.

"Marconi's effectiveness in design is particularly impressive," says Björn Hemstad, head of the Broadband Network Systems Business Unit. "This, combined with Ericsson's market presence, gives the cooperation its strength," he continues. Launch of the new product portfolio will begin immediately.

## More digital to Moscow

Earlier this year, Ericsson was awarded the largest order to date for mobile telephone systems in Russia. The customer, Vimpelcom, has now placed a repeat major order, by Russian standards, amounting to SEK 128 M. Ericsson will be delivering additional AMPS/D-AMPS equipment for Vimpelcom's network.

The new order comprises base stations and MiniLink radio links for the network to expand coverage to the Moscow suburbs. Currently, there are 15,000 subscribers in the Vimpelcom network, which makes it the market leader in mobile telephone services in the Moscow region.

## Chinese expansion

The analog mobile telephone network in Hunan Province in China is now being expanded. Based on the TACS standard, the network will serve more than 200,000 subscribers after the expansion. The decision to expand results in an order to Ericsson amounting to SEK 300 M.

In another contract, valued at SEK 245 M, Ericsson's customer in Liaoning Province, Liaoning Mobile Communications Company, has ordered TACS equipment to expand its network to accommodate 160,000 subscribers. Ericsson is also delivering GSM to the same operator in Liaoning and is the main supplier of switches to the fixed-wire network.

## Ericsson to Siberia

The Siberian city of Irkutsk, near Lake Bajkal in Russia, is well-known for its low temperatures. Despite the harsh climate, the city is an important business and tourist center which will now be able to offer digital mobile telephone services to visitors. Ericsson has received an SEK 20 M order for installation of an AMPS/D-AMPS network. This is the first phase in the establishment of mobile telephony in this remote region of Russia and expansion is planned in the near future. The system is scheduled to be in commercial operation in September.

Through selection of D-AMPS, subscribers are also provided roaming compatibility with other systems with the same standard in Russia and in the U.S.

# Ericsson takes the lead in radio-base stakes

**No sooner had Nokia triumphantly launched its "world's smallest GSM/DCS station," than Ericsson countered by introducing an even smaller station - with twice as much capacity! The prototype was first displayed at the Orlando Fair in the U.S., and more recently at Telecom 95 in Geneva. So the race continues, and the prize is the enormous market for the small base stations to be used in the new cellular personal telephony networks.**

A few years ago, the idea of portable base stations for mobile telephony would have been regarded as utopian, but they will soon become reality. Ericsson, Nokia and Motorola are all well advanced in the area, but according to the latest listings, Ericsson has the smallest station with the greatest capacity.

"Our station has a volume below 30 liters, which is significantly less than Motorola's and less than Nokia's," explains Niclas Forsvall, product manager for the new micro-station. "However, the decisive factor is that our station contains two transceivers (transmitter/receiver) while Nokia's has only one. In terms of traffic capacity, this means we offer three times as much, which means three times as much revenue - a very important factor for telecom operators."

### Have to be small

There are several reasons for pursuing reduced volume. The principal reason is that the base stations must facilitate quick and simple installation, at low site costs for operators, in the personal telephony networks of the future, PCN (Personal Communications Network) or PCS (Personal Communication Services).

The background is that both the PCN and the PCS networks are focusing on the mass mobile communications market. To succeed in their aims, increased cell density is required; meaning a large number of small cells and thus a large number of radio base stations. It must be easy to install these base stations on site and, for aesthetic reasons, they must also be small and discrete.

Today, PCS can be found in the U.K., Germany, Hong Kong and a few other countries. PCS is in the process of being installed in the U.S. and will soon reach Europe.

### Complement

Ericsson's new micro-station is a complement to the RBS 2000 "radio-base family" for GSM, DCS and PCS systems.

The idea is that the stations be capable of both indoor and outdoor use. They are significantly discrete to blend into an indoor environment and robust enough to withstand desert heat or snowstorms when used outdoors.

"In cities and other areas with dense mobile communications traffic, it will, for example, be possible to mount the new micro-base stations on building walls at a height of four to five meters," says project leader, Nils-Göran Larsson, while demonstrating that the station should be suspended a certain distance from the wall, to facilitate cooling, which



The prototype version of the world's smallest base station for mobile telephony is portable and weighs less than 25 kilograms. (above)



"Personal telephony networks require a number of small base stations that are easy to install on, for example, walls or posts," says Niclas Forsvall, product manager for the new micro-station for mobile telephony and formerly product manager for the briefcase size Mobitex station (left).

is the main problem arising from building extremely compact stations.

The idea is that the installation plate - equipped with such items as an antenna and cables - be mounted on site in advance, whereby the radio can then be hooked on quickly and smoothly. Should any faults occur in a station, the entire radio section is replaced. The current prototype version of the radio weighs less than 25 kilograms. However, the goal is to have reduced its weight even further by the time the product is ready for delivery in a year's time.

### Enthusiasts

Nils-Göran Larsson explained that the entire project was conducted by a small ten-person group from the GSM/DCS department, working in accordance with a design method that will be commonplace in the future. Nils-Göran and Alpo Öhman were jointly responsible for the mechanics and construction method and for the radio solution. Those selected for the project were "practical" employees accustomed to quickly producing concrete results.

The project proceeded rapidly. The decision to develop a product that could be displayed at Telecom 95, during the first week of October, was made at the beginning of 1995.

The basis for the project group's activities consisted of certain predetermined demands regarding size and capacity. In addition, they were to use as many features as possible from the RBS 2000.

Those responsible for the development of the radio, logic aspects and the filters, for ex-

ample, were assigned specific premises and tasks and asked to produce a solution. The deadline for completion of the physical components was mid-year, and while his colleagues were on vacation Neil Grant sat in his room and assembled the radio.

Thereafter Marco Neeser and Björn Nilsson verified that everything was functional. Lars Elfberg was responsible for systems integration. Two weeks ahead of schedule, he connected the station to a switch and made actual telephone calls.

The product is the result of cooperation between various Ericsson units. The ideas were derived from the latest Mobitex station and the Mini-Link radio link station. Ericsson Components contributed the power solution and Ericsson Radio Access accounted for the development of new filters.

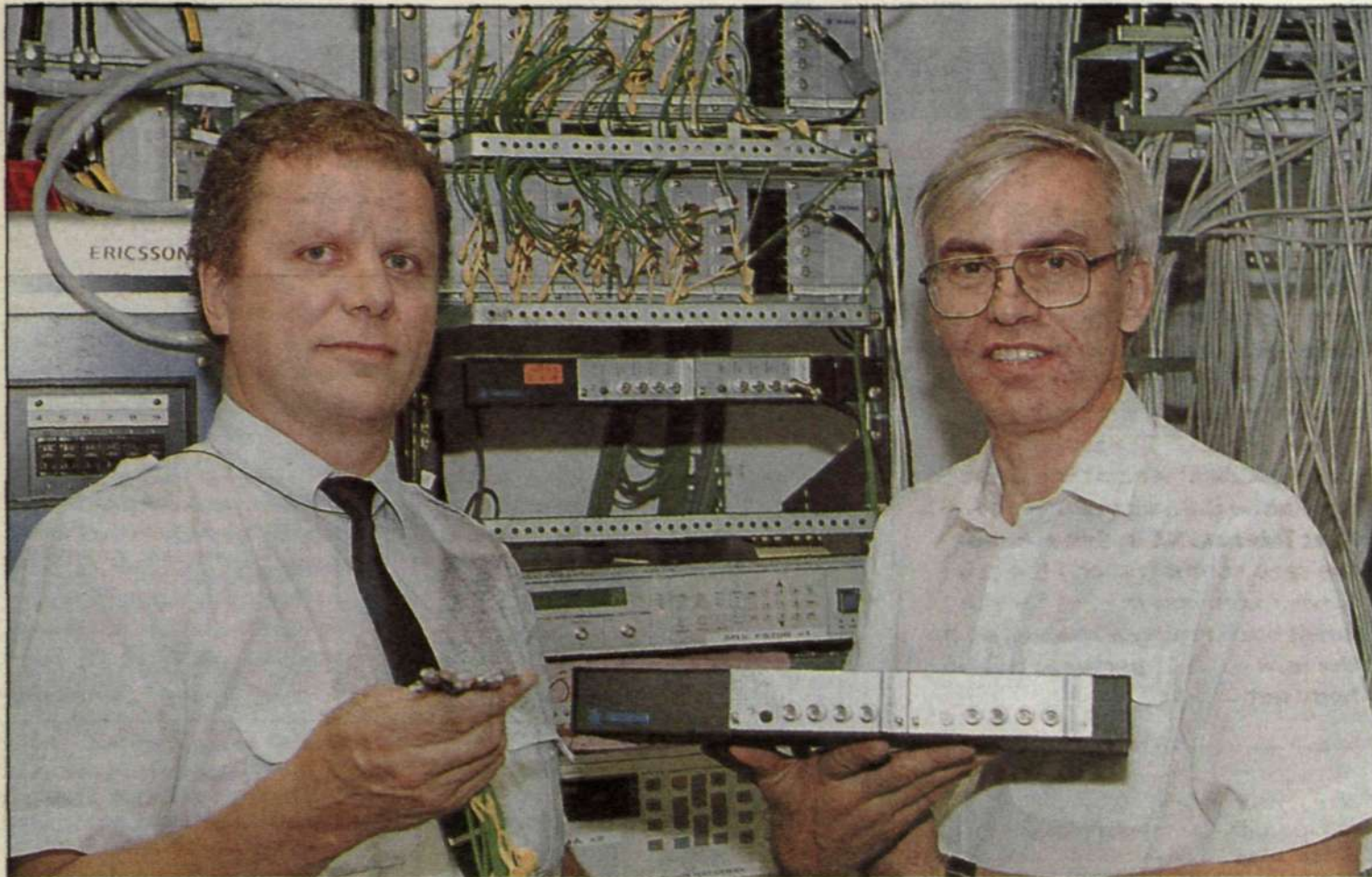
### No accident

The present appearance of the station is no accident. Firstly, it is designed to satisfy aesthetic demands - it has to be attractive - and secondly, it must be easy to use and be capable of deflecting heat, since the micro-station has no active cooling facility in the form of fans.

Given these requirements, it was necessary to optimally utilize the cooling space provided, whereby the components that generated least heat, such as the filters, were positioned in the middle and the heat-generating circuit cards by the outer walls.

"The next stage is to initiate the process of quickly getting the product out to the market," says Niclas Forsvall.

Lars Cederquist



By transmitting reference signals through a system that uses optical fibers, Carl-Helge Södergren and Allan Strömbert have eliminated interruptions and interference to measurement instruments in the GSM lab, an improvement that is yielding substantial savings in time and money. Carl-Helge displays the fiber and Allan shows the receiver unit. Photo: Anders Anjou

# Optical fibers provide interference-free tests

**As the GSM test laboratory continued to grow, test conditions worsened. Finally, everybody got tired of the continuous interruptions and interference, and a decision was made to find a new solution. Working in cooperation with the Swedish company Fiberdata, a system has been developed that uses optical fibers to provide crystal-clear reference signals.**

"Since we introduced the system a year ago, we have not experienced a single interruption caused by the reference signal," says Carl-Helge Södergren, manager of the laboratory.

A stable reference signal is a basic requirement for all measurement instruments in the test laboratory. The reference signal's deviations of 10 Mhz is the clock against which system frequencies are measured. Today's mobile telephone systems require highly meticulous measurement instruments and very small margins. If the reference signal is subject to disturbances, all test work is affected.

## Untenable situation

The GSM lab in Kista for testing the system integration of new radio base stations has traditionally

used coaxial cables between test sites, which were linked with galvanic connections. The reference signal was distributed from a central location to all test sites.

The system functioned satisfactorily in the beginning, when there were only a few test sites, each of which was equipped with a transmitter. However, when the lab was expanded to more than 30 test sites, with up to 16 transmitters each, in parallel with more stringent test requirements, the system virtually fell apart at the seams. The system picked up disturbances and transmitted them to all the sites and, in many cases, the entire lab was knocked out. The situation simply had to be changed.

## Optical fibers

Allan Strömbert of the GSM lab presented a proposal for the ideal solution. The lab needed interference-free distribution of 10Mhz to all measurement instruments and a 16Mhz signal between the AXE simulator and the radio base stations. Both reference signals should also be synchronized so that they wouldn't "operate" in relation to each other.

An idea was hatched to abandon the copper cables and test optical fibers. A market study was conducted and Fiberdata was selected; Fiberdata is a Swedish company that works with solutions to fiber optical problems.

Working in close cooperation, a solution was developed where-

by Fiberdata developed the prototype, but Ericsson owns the design. The new equipment was installed successively, in parallel with reconstruction of different test sites, and has now been in operation about one year.

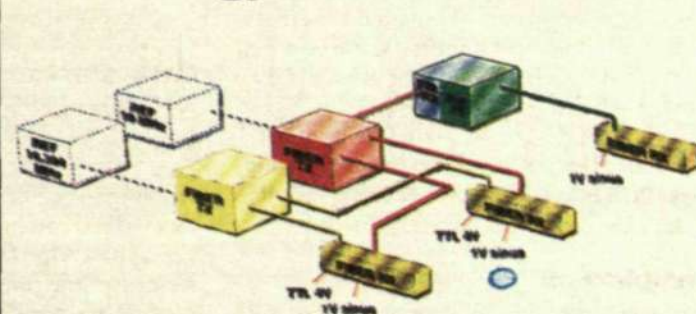
## Saved millions

"Since we installed the new system, we have not experienced a single malfunction that could be attributed to the clocks," says Carl-Helge Södergren. "No sud-

den stoppages, no restarts, or the like. And this has contributed to a significant improvement in the quality of testing," he continues.

Calculated in pure financial terms, the system has saved millions in the form of test hours that have not been lost. What this might mean indirectly, by not affecting or interrupting other projects, delays, etc., is more difficult to estimate, but the savings are almost certainly very substantial

## Technology works like a clock



■ The technical solution consists of a transmitter unit that receives signals on four different frequencies from stable oscillators and converts them to optical signals transmitted through a fiber optical cable. In the other end, a receiver unit converts the signals back to electrical signals, in this case, 10 or 16.384Mhz.

■ The entire system structure is modular and may be programmed to operate on different frequencies. The network

consists of a so-called star network based on a central unit, which means that eventual disturbances at one measurement station will not affect the other test sites.

■ GSM requirements on frequency accuracy are 0.05 ppm, while the receiver used in the lab operates at 0.00001 ppm.

■ Using a wired fiber network, the system could distribute signals over a larger area, for example, the entire Kista area.

## New prize to generate new ideas

**Patent issues are becoming increasingly important in Ericsson's business activities. In an effort to stimulate greater interest in and awareness of patent issues, Radio Communications has established a new prize for "Inventors of the Year."**

The prize will be awarded for the first time in November 1995. The winners are three inventors who have made significant contributions to secure Ericsson's future business success through patents.

"Inventors of the Year," as the new prize is known, will be awarded in conjunction with the Radio Communications board meeting on November 8. The prize consists of Ericsson shares, certificates and other forms of recognition. According to the by-laws, a jury will name up to three prize winners every year. The winners will be recognized for significant contributions in securing patents for inventions.

"There is a virtual patent war being waged on the market, and it is absolutely essential for us to acquire a strong patent portfolio that will enable us to stand on equal ground with our most aggressive competitors," says Göran Nordlundh, chairman of the jury.

The new prize is intended to develop and stimulate patent activities in general and to increase awareness of the growing importance of patents in securing freedom of action in product and market development.

Radio Communications took the first step about a year ago by conducting a training course for 15 engineers on the subject of patents and product know-how. After the course, the engineers were sent into the field to support business units in their everyday patent activities. A support center was also established in the Research Department.

Ericsson hopes the new prize will stimulate greater interest in patent issues, an area that has been assigned the highest priority, with extensive strategic importance, by Group management.

Ericsson corporate policy is focusing on more active patent operations in parallel with everyday activities. Ericsson is not seeking that one single brilliant invention, but rather the relevant patent protection that will provide Ericsson with product advantages, improved production economy and guarantee free access to future technologies.

by Lars Cederquist

# Radio link is world conquerer

**The Ericsson Mini-Link is clearly becoming the key to rapid expansion of telecom networks, particularly mobile networks. The link, which today is in use in 87 countries worldwide, is now being introduced as a new generation with even higher capacity, new functions and in an extremely compact design, which enables very rapid installation.**

The Mini-Link is the Ericsson "small-fry" which is in the process of conquering the entire

## Mini-Link has been sold to 87 countries

world. Mini-Link has proven to be a highly flexible tool for rapidly establishing telecom networks for fixed and mobile speech and data communications.

With Mini-Link, radio base-stations which are dozens of kilometers from one another can be linked by radio instead of through expensive, time-consuming cable-laying. The maximum range is 50 kilometers, before the earth's curvature makes its effect felt, but with the aid of repeater stations, networks can be expanded as requirements dictate.

### High frequency

A Mini-Link is a radio link, that is, a directional, two-way radio link between two points.

Vast amounts of information can be transmitted over the link, with the capacity of the latest version as much as 34 Mbit/second (desired number of 2Mbps-channels) which thus corresponds to more than 500 calls on conventional 64 Kbit-channels in fixed telephony.

The transmission, which is by high frequency, so-called microwave, at 7 to 38 GHz (1 GHz = 1,000 MHz), requires that no interference be present between the transmitting and receiving parties.

A heavy rain, as occurs with a tropical storm, can interfere with transmission, particularly in the higher frequency bands, which is why the most suitable system for countries with frequent rainy pe-



riods is the Mini-Link 7 at 7 GHz which, under such severe conditions, can perform satisfactorily at more than 30 kilometers distance whereas, for example, a 15-GHz signal reaches only 10 km.

A link consists of two Mini-Link terminals placed at suitable distance from each other. Each terminal consists, in turn, of two parts; an outdoor and an indoor segment.

The outdoor segment is the integrated antenna and radio, which is bolted in place on a mast, a roof or other suitable site, and directed toward the other antenna. The microwave beam forms an extremely narrow lobe, with all radio energy concentrated to within a few degrees, which is why interference from other area signals is negligible using only a small, 30-cm dish. This also means that frequencies can be reused cost-effectively within the network.

### Lightweight radio

The radio segment can either remain together with the antenna or be mounted directly to a wave conductor (thin metal tube which can confine and transmit microwaves).

The new radio units weigh no more than eight kilograms and can be managed with one hand when replacing or mounting the radio to the antenna which is fixed in place (can be replaced in less than one minute).

The radio, which consists of a microwave unit, which determines the frequency band, is linked via coaxial cable (in the new version, a single cable is adequate for power transmission as well as

traffic and monitoring) to the indoor segment, the access module. This contains the modem, MUXs (multiplex units for simultaneous transmission of several signals), reconnection functions, etc. Using a standard interface, the access module is adapted for linking with different types of networks.

### Fully compatible

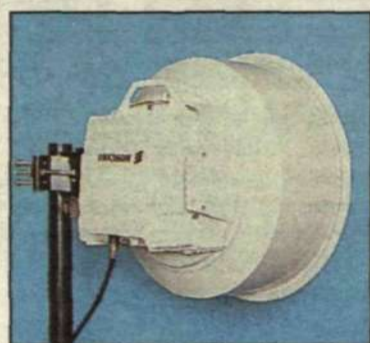
Mini-Link can be included in all types of telecom networks. In a mobile-telephone network, a link, that is, two "terminals," can comprise a connection between two base stations, or between one base station and a switch, etc. In a fixed network, the link can connect an AXE station with local stations.

In a corporate network, the main office can be connected via links to buildings in the proximity without the trouble of laying cables across the property of others or having to lease lines, with all the complications that entails.

In so-called "Radio in the Local Loop," RLL, in which copper wire from the local exchange to the subscribers is replaced by radio, communication from the local exchange to the radio base stations can take place by radio link. RLL networks can be rapidly established and. Mini-Link is also suitable for temporary networks, for examples, when natural disasters occur.

### Flexible build-up

Mini-Link networks can be configured in the manner desired. An access module can serve several terminals to simplify cable-



**The new Mini-Link features a highly compact design in which the radio segment is integrated with the antenna. Photo: Kent Eliasson**

laying, to save time and more efficiently utilize resources.

The module thus forms a node in the network from which traffic can be directed in different directions when linked toward (a maximum of four) different radio units operating at different frequencies.

Nor is it unusual to see several terminals mounted side by side on a roof or mast, pointed in different directions with redundancy (protected systems), if one unit malfunctions. Such an occurrence is extremely rare, with current statistics indicating an MTBF (Mean Time Between Failures) of not less than 30 years.

A Mini-Link network also has an integrated PC or TMOS-based operations and monitoring system which enables the operator to follow traffic, monitor whether any links is beginning to lose capacity, etc.

The Mini-Link concept is a closely integrated product family with one and the same operating system covering a large frequency area.

## Division within Ericsson Microwave

A division is being established for the product Mini-Link within Ericsson Microwave Systems AB, with head office in Mölndal. Through being entrusted with development, production and sales, the division has total responsibility for the product. A total of about 700 persons are working with Mini-Link, of which more than half are at the plant in Borås. Microwave and signal-handling expertise are traditionally of decisive significance for product development.

The Mini-Link concept was formulated about 20 years ago and during the 1990s has accounted for rapid sales growth and is now being sold in 87 countries worldwide. This rise is largely attributable to mobile telephony's strong expansion; the links are delivered to mobile telephone networks, both analog and digital. However, growth in sales of links to fixed networks continues.

Today's major customers are the new mobile telephone operators in, for example, Germany, Spain and Malaysia. The outlook for the coming PCS networks in the U.S. are highly promising, thus forming a possibility for Mini-Link to penetrate the U.S. market.

Ericsson's Mini-Link enjoys a leading position in the radio link area in which the major competitors are the U.S. DMC (Digital Microwave Cooperation), California Microwave, Alcatel and Siemens

## New Mini-Link generation unveiled

During the Telecom 95 fair in Geneva, Ericsson unveiled its Mini-Link E, a new generation which is the successor to Mini-Link C. The new version is compatible with the earlier one, that is, links can be replaced successively, with links belonging to different generations usable together.

Mini-Link E meets highly exacting requirements for increased capacity, 34 Mbps, rapid installation (heavy emphasis on reduced size, only about half the weight and size) and new functions. They are building on previous experience, capacity has been increased, more frequencies are covered to meet the role of a complete supplier (7 GHz for such applications as rainy countries), offers more functions, the frequency spectrum is utilized more efficiently, reduced volume, the product possesses exceptional functions, etc.

The E version is a refinement of the C version aimed at improved compatibility with modern mobile telephony networks.

Mini-Link E has been adapted to Ericsson's product system, for example, for mounting in the new, miniaturized radio base stations (in which space is allocated for transmission equipment) but is also designed to be installed independently.

# Trade union cooperation links all of Europe

From their soundproofed glass booths, interpreters from Germany, Spain, Sweden, France and Italy simultaneously interpreted the verbal exchanges when 24 trade union representatives (23 men and one woman) from 13 countries met in Stockholm on September 13-14. This was the first meeting of the Ericsson European Committee (EEC), which assembled to discuss Ericsson today and in the future.

"Today, nothing is predictable and we must be prepared to encounter constantly changing conditions," noted Britt Reigo, Ericsson's Senior Vice President, Corporate Human Resources and Organization, in her opening address at the meeting, where representatives of the various European trade unions met members of Corporate Management.

"The greatest threat to Ericsson is if we stand still."

## Permanent change

"The deregulation of the European market is leading to intensified competition, but if we are effective in our efforts to adapt to the new market conditions, no-one will be in a position to beat us. We aim to be the fastest, while providing the best quality and the highest skills. But the EU is a highly volatile environment, characterized by permanent change," noted Lars Ramqvist. Ericsson's President again underlined the fact that 20,000 people must be rotated within the organization during the next two years.

"This is one of the greatest challenges we face."

In addition, the entire personnel structure is changing. The salaried staff side is expanding, while less people are directly engaged in production.

"We are facing some tough challenges, we need to rationalize and we must develop new products," said Carl Wilhelm Ros, Ericsson's First Executive Vice President.

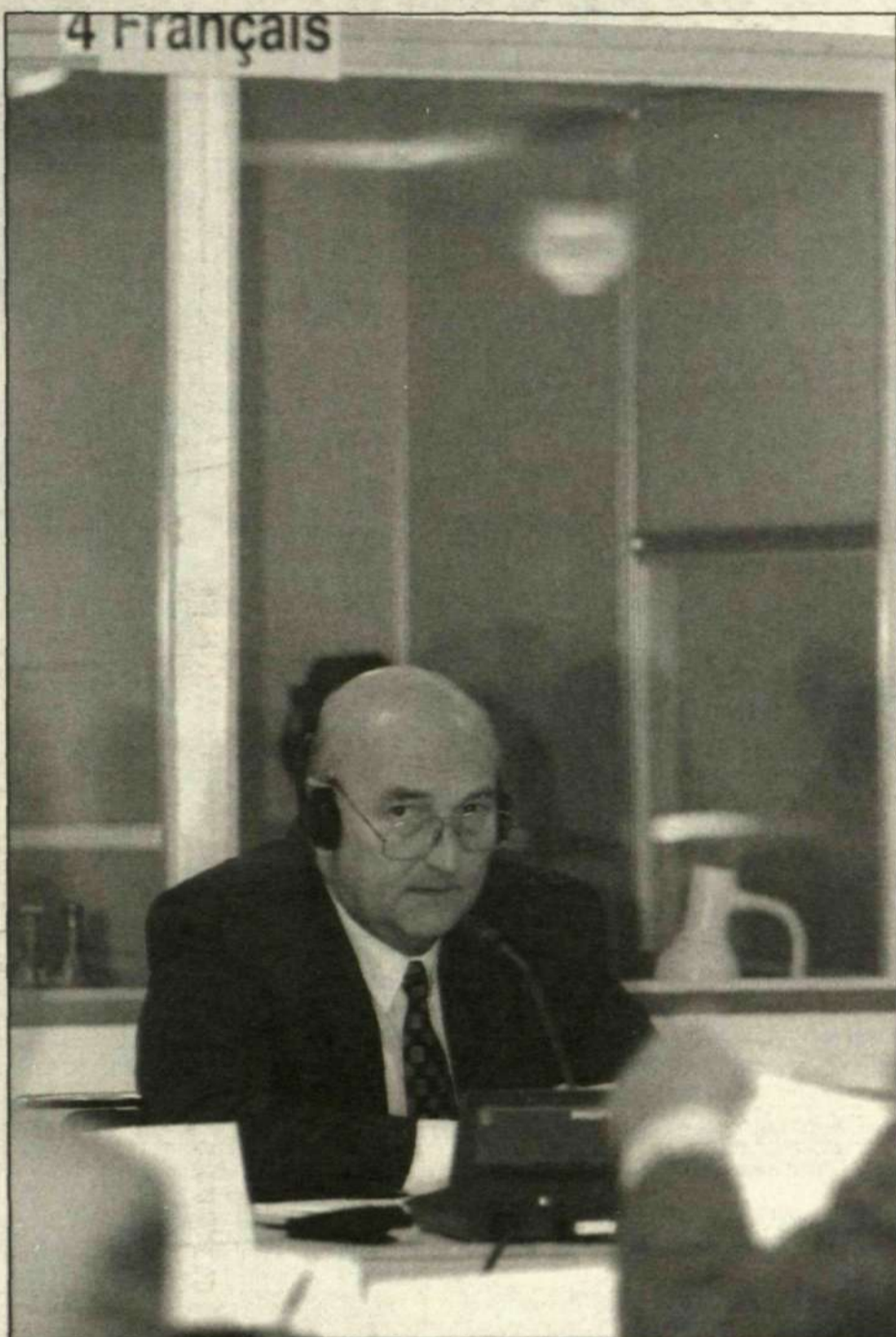
## Major potential

Anders Igel, head of the Public Telecommunications business area, informed delegates about the change in direction currently experienced within his business area.

"We must implement the changes needed as quickly as possible, and this cannot be done without the full acceptance of everyone concerned."

One trade union representative wondered if outsourcing meant that production would be taken from Ericsson and located in low-wage countries, or in plants that underpay their employees.

Responding, Lars Ramqvist underlined that this would definitely not be the case.



The Ericsson European Committee is essential if we are to be able to resolve problems together and cooperate across national borders," says Helmut Gratzl, from GPA in

Ericsson policy is to always hire a qualified workforce and the company has no intention of utilizing underpaid workers.

## Stronger through cooperation

"Several years ago, we manufactured our own screws – but why should we do that? It is much less expensive to use a supplier whose core operations are based on screw production. Such suppliers do the job better and more cheaply, since they are experts in their specialist areas and have all the advantages associated with volume production. The same applies to mechanical components," said Lars Ramqvist.

Ericsson's President also underlined the importance of establishing and maintaining good cooperation between trade unions in Europe and company managements.

"Those of you engaged in union work must help your companies' managements

and your colleagues to adapt to new conditions. Problems can only be resolved through cooperation."

## Promising start

"With the completion of the first meeting, we can conclude that the information provided and the ensuing discussions, were very useful and were carried out in the spirit intended. This bodes well for the future," noted Göran Whitelock, who participated in the signing of the EEC agreement, and who is now responsible for the coordination of the Committee's work.

"We are one company, and we must perceive Ericsson as a whole. The EEC is an important forum, within which we can exchange experiences and ideas," concluded Lars Ramqvist.

Isabel Werner

Photography: Peter Nordahl

## Views on the meeting

Mark Benjamin from AEEU in the United Kingdom:

"I am very pleased that this committee has been formed."

Lars Ramqvist is taking this initiative very seriously and has been extremely candid.

For the time being, we are trying to find a structure for the way in which we can work together and to set the tone for future meetings. We have to wait and see how the Committee develops in the years ahead.

One point we are looking for is an improvement in advance planning from the companies' side. Sometimes, the management style in some of the larger Ericsson subsidiaries can be excessively dictatorial, with a lot of talk about employee participation but little evidence of its existence."



Juan A. Carmona Ramon, UGT trade union in Spain:

"This is an important forum for communication between company management and the unions, to gain information about the company and

to establish contacts with union representatives in other Ericsson subsidiaries. Ramqvist has provided us with a global overview of Ericsson – the current situation and future possibilities. I am pleased that Ericsson is doing so well and that future prospects are bright."



Margaret McManamon, representative of Ericsson in Ireland:

"So far, I am very satisfied with the meeting. Ramqvist has shown the importance of meeting changes in the market and that we must be prepared for constant change. We cannot afford to stand still."

We must all participate in, and contribute to, the implementation of these changes."



Helmut Gratzl, GPA in Austria:

"We need such an instrument for European trade unions. This is essential if we are to be able to resolve problems together and cooperate across national borders."

This was a good start – you can't expect too much from a first meeting."



## EU directive behind new Ericsson Committee

At the beginning of January 1995, Ericsson entered into an agreement regarding trade union cooperation within the EU. The cooperation is to be conducted through a new body, the Ericsson European Committee (EEC). The EEC

will meet on an annual basis. Trade unions in countries where Ericsson maintains more than 150 employees will have the right to representation.

The initiative, which was taken by the union organizations, is based on an EU

directive which states that all companies with operations in several EU member countries shall formulate agreements to determine how communications are to be conducted between company managements and trade unions.

# Telephone sales boom in Pakistan

Some 123,000 new telephone lines are now fully operational in Lahore, Pakistan's second-largest city. The new lines are the result of a large-scale project in which Ericsson was responsible for planning, project management and implementation. The project is a successful demonstration of Ericsson's business concept.

A complete, up-and-running turnkey solution was supplied to the customer, PTC, the Pakistan Telecommunication Corporation. Strong demand from would-be subscribers meant that the system and the network reached maximum capacity as early as August this year – a truly gratifying result.

## Half million new lines installed

The contract between Ericsson and PTC, signed in December 1991, accounted for a substantial proportion PTC's huge investment in telecommunications infrastructure during the early 1990s. Some 500,000 new lines were installed throughout the country by foreign telecoms during this period.

### Demanding time schedule

The Ericsson project comprised AXE exchanges, transmission equipment and network installations worth slightly more than SEK 800 million (USD 138 million) at the 1991 exchange rate. The tendering and project planning were a joint operation involving the Public Telecommunications Business Area and what was at that time the Cable and Network Business Area. Since the customer had already stipulated at the competitive bidding stage that delivery should be completed by the end of March 1993, work commenced immediately and proceeded at a frantic pace.

"We met all the deadlines for exchanges and transmission equipment, and all stations were operational, tested and ready by the end of March 1993," relates Jan Hamrén of Ericsson Business Networks AB's Network Engineering Division. Jan was responsible for the network construction (outside plant) part of the project, and assumed responsibility for the entire project as of August 1, 1993. Robert Andersson of Ericsson Telecom, who had held overall responsibility until then, left Pakistan to handle other assignments as soon as the exchanges and transmission equipment had been installed.

### Deadlines unrealistic

However, the network construction work was still far from complete by the official deadline of March 31, 1993. The customer could not expect this deadline to be met, since Ericsson had already made clear when the contract was being drawn up that the allotted time was insufficient.

Ericsson's subcontractor for the network construction, Telecom Foundation, is a wholly owned subsidiary of PTC.

"At the time when contracts were to be drawn up, Telecom Foundation was a newly formed company that was not equipped to handle the enormous volume of work that faced us," notes Jan. "It took a while to estab-



Cable is laid from one of the 4,000 cable drums required for the network installation project.

lish an effective organization, resulting in delays during the crucial groundwork phase."

The workforce involved in the network construction project peaked at approximately 2,500. Telecom Foundation directly employed some 55 subcontractors to supplement its own organization. Up to 150 local Ericsson employees were involved in the network installation phase.

### Tons of soil excavated

The installations involved excavating and backfilling 206,088 loads, each containing four and a half m<sup>3</sup> of soil, most of which was dug up and shoveled back into place by hand, since manual labor is cheaper than machines in densely populated Pakistan. The congested streets also make it virtually impossible to move mechanical excavators into position.

The more technical processes, such as cable splicing and testing, necessitated extensive training of the local workforce. Ericsson provided on-site training for some 200 of the subcontractor's local installers, as well as local customer training for 20 PTC engineers in Lahore. In addition, two managers from PTC participated in a two-month training program in Sweden, while eight engineers received six weeks of training in Sweden. Personnel working on exchange installation received training both locally and at the Public Telecommunications Business Area's training institute in Ireland.

### Many obstacles

"Training is extremely important," underscores Jan. "A skilled workforce is essential

in order to meet deadlines and maintain high quality right from the start of a project."

Many obstacles were encountered during the outside-plant phases of the project. At times there were problems with delayed or irregular local material deliveries. Enormous inventories of cable drums sat and waited for the arrival of locally produced components needed for cable-drawing, such as PVC pipe, jointing chambers and poles.

All excavation work was put on hold from December 1993 to February 1994 as a result of political unrest arising from a general election, the accession to power of a new government and a change of regime in Punjab, the state of which Lahore is the capital. This was a major setback, since this time of year is the best for excavation work.

"For half of the year, roughly from September to March, the weather is extremely stable, making work conditions ideal," relates Jan. "By contrast, the summer is incredibly hot, with temperatures climbing to 45°C and torrential monsoon rains that can flood cable trenches and jointing chambers in a matter of seconds."

### Space at a premium

An additional problem was that local street conditions made no concessions to the Ericsson project. There is not much room left for cable trenches when every square meter is already occupied by people, cattle, sheep and goats, not to mention bicycles, heavily laden trucks and every other conceivable type of traffic.

"There have been cases where people rode their bicycles into cable trenches, lea-

ding to complaints. And those who already have telephones naturally think the trenches are unnecessary, while those who don't have telephones can't see their purpose," says Jan with a wry smile.

"Maybe there are more difficult places on earth to work on a project," he continues, "but it feels very satisfying in retrospect to have completed the project despite the challenging conditions. I was in Pakistan for three years and was involved in the project from the first pen-stroke of the mobilization phase to the start of the guarantee period."

### Home and dry

The guarantee period lasts 18 months, starting from June 25 this year. Ericsson has an agreement with the customer covering maintenance and support during this period. The supplier is responsible for any problems with materials or poorly executed work. The reward beckoning after this period is the Final Acceptance Certificate – verification that the customer is totally satisfied.

"It takes a while for success in a project of this scope to sink in," reflects Jan. "We completed an enormous project in an extremely densely populated area that also happens to be culturally sensitive. You can't just dig into the ground anywhere you please. You can unearth historical artifacts when you least expect it, so care is essential."

As the modern age encroaches increasingly rapidly on this ancient land, the need for basic telephone services is far from being met by completion of this single project. There are more projects to come.

Kari Malmström

## Facts about the Lahore project

■ The Lahore project comprises a transport network using fiber-optic cable and a 565 Mbit transmission system to link up 14 AXE10 local stations and a transit station. Total cable length is 116 km, divided among 19 routers (cross-connects).

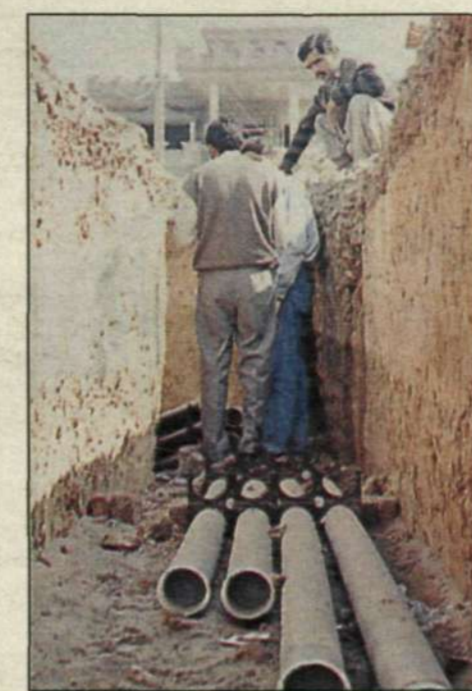
■ The project used 2,757,318 m of copper cable, corresponding to 466,724,070 m of paired cable or 11.67 times around the earth. The project also consumed 116,129 m of fiber-optic cable and more than 5 million meters of subscriber lines. Ericsson Cables in Hudiksvall delivered a total of 4,074 cable drums to the project, including 59 drums of fiber-optic cable.

■ Almost one million m<sup>3</sup> of earth and rock was excavated and backfilled. 1,400 jointing chambers were installed. 1.3 million meters of PVC pipe were laid.

■ Approximately 500 switch cabinets, 21,000 distribution points and a total of almost 2.4 million spliced cable pairs were installed.

■ The network part of the Lahore project was among the first to be documented using the ESS (Ericsson Support System) digital design system. The entire network and all installations were digitally mapped to facilitate production of the "as-built" documentation for delivery to the customer in digital form.

■ 580,000 kg, or slightly more than 2,000 m<sup>3</sup>, of AXE and transmission equipment was shipped to Pakistan.



PVC pipes are laid. The deep trenches were mostly excavated manually. There is room for network expansion in the level above the newly laid pipes.



Almost 21,000 poles were erected in various parts of Lahore, which has a population of five million.



The network installation project was managed by Jan Hamrén, seen here in front of Ericsson's project office in Lahore.

## Growth of mobile telephony continues

■ Can the world market for mobile telephony continue to grow at the same pace as during the past few years? Can the three leading suppliers, Ericsson, Motorola and Nokia, maintain their dominant position in the market? There seems little reason to believe that the global market will lose its momentum before the year 2000. Mobile telephone density remains low, averaging about 6 percent in developed countries. This means that there is still scope for substantial growth. According to Dataquest, 7.2 million mobile telephones were sold in Europe last year. Annual sales of 21.4 million units are forecast for 1999.

■ AT&T has decided to acquire most of Philips' assets and interests in the public telecommunications and GSM product areas. However, Philips has no plans for complete withdrawal from the communications area.

Philips has annual sales in excess of NLG 4 billion in this area, and plans to continue with more than half of its operations in its own name. The company intends to maintain or increase investment in such sectors as cordless telephones, fax machines, pagers and company switchboards.

■ Nokia's sales of mobile telephones and telecommunication equipment more than doubled between 1992 and 1994. During the past three years, the company has been transformed from a loss-making peripheral operation into a rapidly growing supplier of telecommunication equipment. It is planned to concentrate the Group into three divisions: Telecommunications – producing infrastructural equipment for wireline and mobile systems; Mobile Telephones – producing handsets; and Electronic Components and Cables – focusing on products closely linked to telecommunications.

In 1994, Nokia invested the equivalent of seven percent of its earnings in research and development, compared with Ericsson's more than 20 percent.

■ Qualcomm, the company that introduced CDMA technology, received a significant boost when PCS PrimeCo announced that it would be using Qualcomm's digital technology for personal telephony. However, there still remain numerous unanswered questions regarding Qualcomm, and it will be several years before it is clear whether the company has really won the battle for a share of the personal telephony market. During the years since the introduction of CDMA technology in 1989,

Qualcomm has toned down its claims regarding the capacity gains it provides. It was claimed at that time that the CDMA standard could handle 40 times as much traffic as analog systems, but this has now been revised downwards to ten times, and even this figure may be too high.

■ Will independence bring change to EDS? General Motors has announced that it plans to sell off EDS. During EDS' 11 years as a unit within GM, its annual sales have risen almost tenfold to USD 10.5 billion in 1994.

EDS, which pioneered the operation and maintenance of other companies' computer systems, now hopes to take large market shares in areas such as telecommunications, multimedia and on-line services. As



an independent company, EDS needs a partner with strength in telecommunications in view of the increasingly strong links between data-processing and telecommunications.

■ China was the world's fourth-largest single market for mobile telephony during the first six months of this year. Figures released by MPT show that China currently has 2.5 million mobile telephone subscribers. Only the U.S., Japan and the U.K. have more subscribers.

The People's Liberation Army intends to become China's third mobile telephone operator, with services planned for 14 cities by the end of next year. Lian-Tong, the second-largest operator, expects to have 3 million subscribers by the year 2000. Demand for mobile telephone services is strong in China, despite the fact that telephones are still expensive.

■ The sale of a 27-percent shareholding in the Czech company SPT Telecom to a Dutch-Swiss consortium opened up exciting prospects. SPT's network is considered to be the most problem-free in the region. PTT Telecom and Swiss Telecom were given the opportunity to become partners because they are relatively small telecoms that were not perceived as a threat to SPT's own future as a regional force in the telecommunications field.

Hungary is the only other country in eastern Europe where divestment of a state-owned telecom is currently in progress. It is expected that the government will shortly dispose of its remaining 40-percent shareholding in Matav.

Poland, Romania and Bulgaria have yet to reveal plans for the future of their state-owned telecoms. Intense interest is focused on Poland, the largest of these markets and regarded as potentially the most profitable.

■ Vietnam plans to abolish the state telecommunications monopoly and establish a rival, military-based telecom. The country plans to increase the number of telephone lines from the present figure of 0.33 to three per 100 inhabitants by the year 2000. In order to achieve this, investment amounting to USD 2 billion will be required during the next four years.

■ India is set to become one of the world's most open and competitive telecommunications markets. The government is considering seeking private bids for the installation and operation of 20 million telephone lines in India during the next five years. The aim is to triple the country's telephone density.

Bids are currently being invited for the rights to supply telecommunication products, including ordinary telephones, entertainment and data services, to a market amounting to almost one billion people.



Ericsson Components delivers millions of components to internal and external customers annually. To guarantee high quality, the products are final tested and measured before reaching the customer. No defects escape technical and human scrutiny at the final testing department within the Microelectronics business unit. About 25 million circuits will be tested during 1995.

# Checking on quality



Francisca Abatté scans components to determine if any of the legs were damaged following encapsulation. This visual inspection is preceded by an electrical inspection.

The final testing department, or final measurement department, within Microelectronics works exclusively with IC products from the two business centers which produce line circuits as well as Radio, ASIC's and industrial circuits.

"All products which they produce are sent to Malaysia or Taiwan. There, the silicon sheets are cut up and the circuits are sent back and measured here. During 1995, we will measure about 25 million circuits," says Lars-Erik Möllerström, who manages the final testing department.

There are four product groups within the final testing department, corresponding to the product lines within line circuits and industrial circuits. These groups receive the circuits returned to Sweden, measure them and ensure that they are packed and delivered.

"We deliver both internally within Ericsson and to external customers," says Lars-Erik Möllerström.

When a new product is developed by the design departments, the tests which the product must undergo are also developed. The choice of test systems is determined by the manner in which the product is designed. Accordingly, it is the design departments' test engineers who decide which test systems to apply.

On the other hand, the final testing department decides which testing equipment is required.

"Due to the strong volume growth, we are now studying whether testing can be

sub-contracted since there are limits to the quantity of testing equipment and new employees we can acquire. Accordingly, we are investigating if it is feasible to sub-contract testing in Taiwan," says Lars-Erik Möllerström.

It is mainly a matter of sub-contracting the testing of established, debugged and broken-in products. If this can be accomplished, then the testing department in Kista can concentrate on recently developed products.

A testing operation in Taiwan will yield numerous corporate-economic advantages. Mainly, transport will be reduced, and thereby lead-times, since silicon sheets are already being cut up in Taiwan and elsewhere. In addition, it is frequently a matter of being closer to end-customers in Southeast Asia.

In addition to the handling of increasing volumes created both by the growth of mobile telephony and of line-card circuits, there is a requirement for new, more advanced testing equipment.

The two new A565 testing systems purchased from Teradyne Inc. in the U.S. and delivered at the beginning of the year are an example. These were procured to enable testing of the new ACA3 circuits mounted on the line cards.

## Banding at Bredden

Even the banding of the delivered circuits is being altered. The conventional plastic tubing is being replaced increasingly by deliveries "on pallets" of circuits with legs



The Pick-and-Place handler (the accepted term in this context) places circuits on a tray and positions them for measurement. The process is wholly automated and can operate several hours unmanned. Susanne Fiebig-Halldén runs radio circuits and ASIC circuits for the business center for ASIC, terminals, power and IC circuits. Photo: Anders Anjou



Lars-Erik Möllerström, who manages the final testing department, observes tube components received from encapsulation facilities in the Far East.

on four sides, and taped. No banding/taping operations take place at Kista but instead are performed at Ericsson Electronic Distribution in Bredden, where the final testing department has located the taping machine they purchased. The taping machine also enables visual inspection and rated-pressure application, which eliminates the need for further manual inspection of the products.

Circuits are now being altered in various ways. In addition to having become more complex, the circuits' capsules are becoming more compact and, as a result, more difficult to measure and handle.

"This has made it necessary to add process steps that do not enhance the product. For example, scanning is performed exclusively to determine whether the legs of a circuit have been damaged," says Lars-Erik Möllerström.

"We first perform the electrical tests and then the physical scanning." "Since we do not consider this to be cost-effective, we work a great deal with static-process sensing, SPS. We perform test measurements and SPS measurements on about 75 percent of the products.



veral hours unmanned. Susanne Fiebig-Halldén runs radio circuits and ASIC circuits for the business center for ASIC, terminals, power and IC circuits. Photo: Anders Anjou

Through mechanical SPS, the final testing department can check that no damage was sustained earlier in the test. Test development is being conducted parallel with that of the product line.

"At the beginning of a project, many tests are performed. Certain of these tests are later discarded. Because the longer it takes for testing, the longer it takes for products to be completed."

"One innovation is that considerable work is being devoted to control of variables and parameter analysis. We can observe the dispersion from one production batch".

"This enables us to determine at an early stage that testing according to all parameters is unnecessary. In the future, it may be possible to already measure the silicon sheet, says Lars-Erik Möllerström.

All data from this work phase is made available to the product line. In this way, testing programs can be refined and upgraded.

"At the beginning of a project, many tests are performed. Certain of these tests are later discarded. Because the longer it takes for testing, the longer it takes for products to be completed."

## Test operators rotated

Within the final testing department, a development of the work organization is also in progress. In part, the purpose is to create career paths but also to counter the monotony of certain job tasks. The department presently has three main employee

categories, but an additional one will be created this autumn.

For some time, the test operators have operated the testing machines and handled packing and delivery. They rotate between the various machines and job tasks. There is also a production testing engineer who maintains contact with testing designers within the product line. Finally, there are the service and maintenance personnel who are responsible for the proper functioning of the machine equipment.

During the autumn, a new, fourth employee category will be trained - team leaders. These will not be foremen but will be responsible for planning the work, with a focus on rapid, efficient deliveries.

"The concept behind the creation of team leaders is to be able to delegate primary responsibility for each phase of daily testing operations".

He could just as well have said nightly testing operations. This is because the final testing department is in operation practically around the clock, like the Argus in Greek mythology. Operating in four shifts, seven days a week, except Friday and Saturday nights, the final testing department maintains its competent, vigilant Argus-eyed surveillance of circuits.

The final testing department is a vital part of the large-scale logistics system which, together with segments of the Microelectronics business unit, are the guarantors of high quality, and satisfied customers.

Lars Bäck

# Ericsson Infocom restructured

**Ericsson Infocom Consultants AB in Karlstad has undergone a restructuring. The company is simultaneously switching business areas and will become part of Business area Radio Communications.**

The restructuring means that the company will adopt a new operational focus - from broad consulting operations to more concentrated, yet greater product and system responsibility.

"Our goal is to become an integrated part of the business area with a specific, clearly defined responsibility with a limited number of operations areas," explains Lars Boman, the new president of Ericsson Infocom.



Lars Boman is the new President of Ericsson Infocom effective September 1. He moved directly from the Business Networks Business Area where he headed a business unit with global responsibility for corporate systems.

## Five areas

Based on the company's existing expertise and expressed need of customers within Radio Communications, five such areas have been defined:

- Network Interworking - with a focus on enabling the establishment of links between various network types through offering protocol products (Signal System no. 7), protocol converters and similar components.

- Radio Base Station Design Center, with a focus on assuming design responsibility for subsystems through offering development, management and support of certain components.

- Mobile Datacommunication - which concentrates on assuming design responsibility for network elements and

to serve as component center for network design and testing.

- Manufacturing systems - with a clear focus on production and information systems, which includes development, management, support, installations and training.

- Projectivity - with a clear focus on PROPS (in which Infocom has an explicit corporate responsibility) and to serve as an expertise center for project operations.

Text and Photo: Sven Carlsson

# Thousandth MDE delivered to Japan

**It sometimes happens that a product assumes an importance that far exceeds expectations at the time the first unit is delivered. A good example is MDE, Modulator Demodulator Equipment, a component of the base station for NTT's digital mobile telephone system, which today covers all of Japan. The thousandth MDE was delivered from the Gävle plant some time ago.**

MDE, which is a control and communications unit for the radio base station's digital signal was developed by Ericsson Microwave Systems in Mölndal. This development began in 1990, and in March three years later, the customer, Japanese NTT, placed its system in operation. The first small order has been followed by many and large orders.

"We deliver the MDE equipment, jointly with NEC and Mitsubishi, which covers Tokyo, Nagoya and Osaka. For Hokkaido in the north and Kyushu in the south, we are the exclusive MDE suppliers," relates Jan Landberger, who is the market-responsible person vis-a-vis NTT. There is presently a total of 6.5 million analog and digital subscribers in Japan, of which approximately half have selected NTT's system.

In Mölndal, development of MDE continues, with a staff of about 75 now working on this project. A continuous

cooperation is being maintained with NTT which also encompasses other products, an important development for the Japan unit as a whole.

The first delivery of a new product in the "MDE family" took place in June this year. This was the MDE half rate, which is a method whereby the band width is reduced by half in order to concentrate twice as many calls in the same frequency area.

MDE is manufactured at the Gävle plant. Today, there are 112 persons who work with MDE at the plant. At Ericsson Nippon K.K. there is a handful of employees who work with MDE and maintain daily contact with representatives from the customer.

There is heavy pressure on the Gävle plant to increase deliveries since NTT's system is growing rapidly.

Since the installation work is not handled by Ericsson personnel, the requirements in respect to complete deliveries are great. It is truly a matter of quality according to "Japanese standards."

When the MDE project was started up five years ago, it was assigned considerable importance, partly from a technical standpoint but also due to the cooperation with NTT. That MDE would also assume the status of a key product, with more than 1,000 units having been delivered to date, was a development that no one could foresee.

Gunilla Tamm

# You Have Been

We can see that Ericsson has been listening to us. The quality of the answers is certainly getting higher. And perhaps most of all Ericsson is focused on the customer and seeing things from the customers point of view.

These were some comments from customers at the annual AXE User Forum, a global customer network that meets to discuss joint issues related to AXE.

Stockholm was the meeting site for this year's AXE Users Forum which was attended by 16 participants representing 12 operators world-wide. Unlike the previous two years this years meeting seemed to have taken a new direction with a new openness between the operators and Ericsson. And while the IOG11 came under some sharp criticism many of the members felt that while it was not yet perfect it showed that Ericsson had been listening.

British Telecom's Geoff Martin one of the delegates at this year's AXE Forum had this to say about the recent criticism directed at the IOG11. "It is still critical to us and not as good as we want to see. But we can see improvements and we can see that Ericsson has been listening to us. And we have been able to measure it in the field. We have been impressed that Ericsson is aware that it has had problems and is doing something about it."

Overall the meeting was one that seemed much more positive than in years past. Rolf Johansson, newly elected chairman of the AXE Forum had this explanation. "We are seeing that Ericsson is focused on the customer now and for the first time they are seeing things from the customers point of view. I know that some design managers have been travelling around the world meeting with the customer and asking them what they need and require. This is a big improvement for Ericsson."

### More representatives

This years meeting like those of every three years was held in Stockholm. And unlike meetings of previous years this one was characterised by Ericsson's participation throughout the whole four days of meetings. This new involvement was planned as a new step in the relationship between Ericsson and its operators, says AXE chairman Rolf Johansson.

Rolf Johansson says there are numerous benefits to having Ericsson representative involved from the first day. Better efficiency is perhaps the most important he states. "Earlier we Forum members made presentations to each other on the quality in the switches or O&M and then we selected the presentations we wanted to make to Ericsson. This put enormous pressure on the members because we knew that Ericsson also wanted to give a lot of presentations for us such as upcoming products, what was going on in the company, etc. So we said why not let Ericsson in on the first day."

This years meeting will see a change of organisational leadership from Ericsson's side in regards to having responsibility for the Forum program and for ensuring that customer questions are answered. Veteran Ericsson professionals Lennart Berg and Hugo Österlund from the Customer Services unit within the Public Telecommunications Business Area were in charge of their last meeting. Next year's Forum will see two new faces - Göran Dahlström and Lotti-Steenbuch-Kvisterud also from the Customer Services unit of

### An explanation of IOG

■ APZ is a platform found in all AXE IO systems. It consists in itself of two systems: a guiding system, a "brain" and an IO system, "eyes, ears, fingers, etc." What customers are complaining about is the IO system known as IOG11.

Fault frequency in IOG11 has been high, and this is what Ericsson has worked on correcting.

### What Customers Want

- Do not just say "we have no plans" - tell us why
- Improve the software quality and keep your promises!
- You have to communicate better with us and with the local companies!
- Keep up with the commitment you have been showing
- Stay focused on the customer and listen to what we want

Public Telecommunications who were both in attendance at this years meeting.

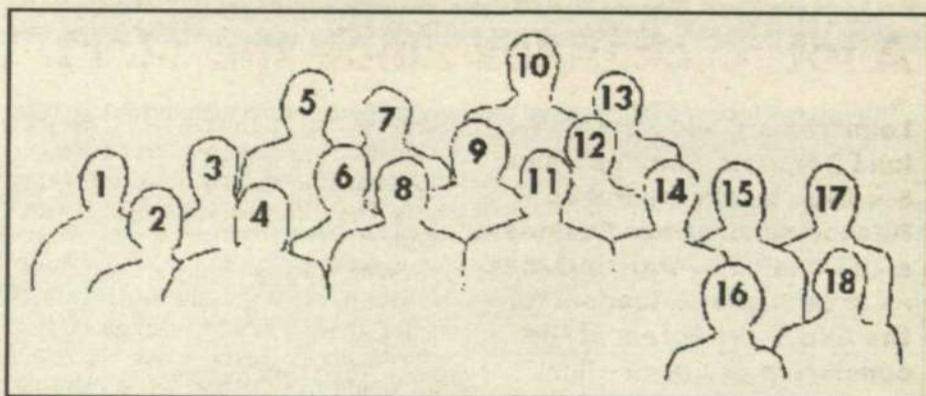
The previous two days of the meeting were characterised by Forum member presentations and discussions. Some of these presentations included AXE and IOG11 performance statistics, Application System Replacement methodology adopted in Telstra Field Trial of IOG11B-JS in Italy and the Achieved Improved Performance in AXE by Telstra and Ericsson.

The customer members who attend the annual Forum include operators who work with AXE and who hold positions of responsibility within operations and maintenance. To become a member requires being selected by Forum members. Participating at this year's Stockholm Forum were representatives from British Telecom, Cable & Wireless Great Britain, PLC, Hong Kong Telecom International, Tele Danmark, Swiss Telecom, Telecom Eirann, Telecom Finland, Telecom Italy, Telecom Malaysia, Telefonica, Telstra and Telia.

### Much more positive

The meeting this year was much more positive than some of those previously though not without criticism. For the most part the Ericsson answers to the preceding years questions were satisfactory though many of the delegates had this critical remark. "We don't like hearing Ericsson say we have no plans," says chairman Johansson. "We need to know why and what is the reason."

Telstra's Andrew Barany agrees: "We have said if the User Forum cannot influence you - we who are your Ericsson customers - then where do you get your ideas from? Surely from your customers and we are your customers. If we feel strongly about a particular need Ericsson needs to look at it and put it in as part of the company's plans."



Members of the AXE Users Forum that was held in Stockholm are clockwise from the left 1) Pat Naughton, Telecom Eireann, 2) Ismail Saleh, Telekom Malaysia, 3) Jouni Ikonen, Telecom Finland, 4) Andrew Barany, Telstra, 5) Asko Hakala, Telecom Finland, 6) Brian Basett, Cable & Wireless, 7) Geoffrey Martin, British Telecom, 8) Walter Suter, Swiss Telecom, 9) Ed Parker, Telstra, 10) Hugo Österlund, Ericsson, 11) Rolf Johansson, Telia, 12) Laili Lillhannus, Ericsson, 13) Mogens Larsen, Tele Danmark 14) Silvio Valeau, Telecom Italy 15) Erik Münster, Tele Danmark 16) Rosilawati Ayub, Telekom Malaysia 17) José Escanciano, Telefónica 18) Micky Chow, Hong Kong Telecom.

Between annual meetings the members of the Forum remain in contact to check-off how the matters in question are progressing. Global communications are maintained at different levels between the operators and Ericsson.

The co-ordinator in these matters is Forum chairman Rolf Johansson from Telia. Rolf is also one of the longest serving Forum member. Though the new chairman Rolf will continue as co-ordinator and he says, "Since the last meeting we have had three workshops which discussed IOG, function change and remote O&M."

### New relationship

One of the central themes at this years meeting was the new relationship between

Ericsson and its operators. Today's Ericsson and its operators are entering a new era as a type of minor partnership basis and not as a supplier and vendor. Geoff Martin of BT explains further: "This new relationship is something that I think we have been trying to work towards for years. But it is now becoming more common in our companies as well. Companies are trying to tie up one or two vendors which is a better way of working. And that new culture is even becoming a part of the AXE User Forum. Instead of us being argumentative with one another if you actually go into a partnership you gain more out of it."

And it must be in Ericsson's interest to have the world's Best Practice around the globe.

# Listening to Us

## Voices At the AXE Forum

### Mogens Larsen Tele - Danmark Telephone

"Software quality is one of the main issues this year - and at every meeting for that matter. However the IOG11 is not the issue it has been in the past because it looks like the updates are starting to work

Hanging devices are still a major problem, and although Ericsson has the tools to trace and get rid of the hangings without disturbing the customers, the main issue of the hangings are still software quality, and I am not sure how they are addressing that part of the problem.

### Geoff Martin BT - Worldwide Networks

"This year Ericsson seems to listening more to what we are saying and are able to respond with the answers that we are able to accept.

While the IOG11 is still not as good as we want to see, we can see that Ericsson has been listening to us.

I think what I have seen this year is that there has been big improvements but we have to keep on improving and maintain quality. Overall software quality is a big issue to us. We all know when we put in a new application system or a large update the performance is going to go down for the first few months. Improvements are then made and we are back where we started. This is a continuous circle and what we want to see is no degradation of performance following an application system change. What we want is to see that if an application is good it will continue to be good. I don't think Ericsson is putting the priority software quality. If software quality was a priority we would see improvements and we haven't seen improvements in that area."

Hugo and Lennart think that Ericsson has a very unique and exclusive opportunity to discuss and to talk to its customers about issues that they consider to be very important. It also gives a very direct feedback on performance and about how Ericsson can improve the relationship and also its products and communication. As for the customer he or she is getting direct link to Ericsson's development side.

"We also have a contact person in each of our local companies around the world," explains Hugo. "We introduced that a couple of years ago and these contacts get all the information that we have discussed here at the AXE Forum Meeting."

Is this users forum going to stay around? "Yes but, it really doesn't matter how the user forum develops and in what direction. Ericsson should be there no matter what."

For us the IOG11 is still a problem. We have a quite a number of exchanges to this GSO4 but still we are having some problems so I hope we can get solutions to these. We want to solve our problems not just keep upgrading our system. And software is still a problem especially hangings. We have asked for procedures because we can't be doing restarts every time there is a hanging.

What we want from Ericsson is to tell us what we are in for. Ericsson has to tell us why we should do something - not only that we need an upgrade. We want to know why and what are the improvements. More information than what is received now."

### Rolf Johansson - Telia

"Last year the IOG11 and software quality was the main issue and there was a lot of criticism. The biggest issue this year is still software quality. During the performance statistics presentation we saw whenever you have a drop in the curve and then the switch is upgraded the curve goes negative again. And then you have to work with it and put patches in and it drops again. Ericsson releases another package and it goes bad again. That trend has to be stopped. Ericsson must have much better software quality products are released.

Ericsson knows about this and I think the concept with a global application system and market application is a step in the right direction. For myself I think we in Sweden have too many market applications that Ericsson won't support and we are going to use a standard product line. We have to accept that Ericsson does not support all the products forever."

### Andrew Barany - TELSTRA

"The AXE Performance Improvements achieved recently in Telstra has been compared to the breaking of the 4 minute mile.

I would like to ask Ericsson to work together with us to break the 3 minute mile so we can be more competitive. From my point of view that we are trying to head towards a closer participation with Ericsson in the way we run our business.

And I certainly find it very successful in being able to talk to Ericsson on issues and get solutions quicker than what we did before. They see the benefits in providing and being more responsive.

We have certainly seen a lot of improvements overall in Ericsson but there are still problems with AXE which need looking at. Some of them are very important to our needs. Some of the facilities and functions should make it much easier to operate the switch."





# Make friends with your PC!



Cecilia Bäckström, technology department, has encountered a computer problem. Kalle Wickenberg is rapidly on hand to provide efficient assistance.



Advances in the Information Technology (IT) field are accelerating continually. Today, virtually everyone within Ericsson is in possession of a PC loaded with diverse programs and possibilities. Our efforts to acquaint ourselves with new things vary widely. Whichever your view, it should be remembered that the technology has not been developed for its own sake. The PC is an aid, a tool designed to help you work. Positive user support is a key prerequisite to ensuring that the investments made in IT will pay dividends in our business operations, and that in the long run they will also benefit our customers.

Customer benefit also has its place as the underlying concept in this area. Operating goals must govern investments in the IT area, underlines Glenn Unnerfalk, IT coordinator and head of Ericsson Business Communications support functions, PC Support and PC Network, based in Nacka Strand, Stockholm.

### User forum

"Computers are not difficult! Programs and applications must be made so user-friendly that everybody can use them. Otherwise, they are of no benefit to the company," continues Glenn. "The users, who can identify the needs to be met through their daily work, play a key role in the development work. Somewhere, in the middle of the organization, we should create some sort of user forum, where business needs and user requirements can be merged together, thereby enabling us to develop our IT environment."

However, the step between using a computer at your work station each day and having an active influence on operations as a whole is a big one. To make it easier for all users, and to resolve the problems which can arise, the support function, PC Support (formerly PC HelpDesk) in Nacka Strand is available.

"Anyone who gets into difficulties can always obtain assistance," notes Håkan Jansson, team leader for PC Support. "We prefer to talk about assignments, rather than problems. Among other undertakings, we install programs, provide advice, prior to investing in new PCs, assist in

the upgrading of both programs and hardware. Principally, we diagnose and correct faults occurring in hardware, meaning the machines themselves."

However, many of the questions also relate to the software, or programs, which do not always behave as one expects. Six months ago, to meet user needs, PC Support entered into an applications support agreement with Hewlett Packard. All employees within EBC in Stockholm can obtain immediate assistance in the event of problems by calling a direct number.

The PC Support team consists of five full-time members, a part-time member and a trainee. The team is supplemented by eight external consultants. The development of the Nacka Strand network has necessitated these extra resources in order to quickly start up new users.

### Joint network

Today, approximately 1,000 PCs are installed in Nacka strand and Sundbyberg (also a Stockholm suburb). At the time of the big move, when resources from Bollmora and large areas of Sundbyberg were incorporated within Nacka Strand, the opportunity was taken to clean up the mess of various network solutions that had been constructed over the years.

"Just 18 months ago, almost every unit had its own network solution," says Håkan Jansson, who also worked in Sundbyberg at one stage. "Today, we have just one network for virtually the whole of Business Communications, through which everyone can communicate with

each other. We are really quite proud of the way we have succeeded in building up such an efficient network environment in such a short time. Naturally, we have encountered certain teething problems, which have in turn created difficulties for users, but these to an overwhelming extent were of a temporary nature.

Nacka Strand and Sundbyberg handle data communications with each other via Ericsson Corporate Network (ECN). Today, it is possible to gain access to all joint information via any PC connected to the network. In addition, a link has been established with Gothenburg and another will shortly connect with Karlskrona. Sundbyberg can also share information with the local office in Sundsvall.

Today, the unit in Järfälla has its own network solution, which is not integrated with the others.

### Experts and beginners

"Computer maturity" is generally quite good, but naturally varies considerably," note both Glenn and Håkan. The organization consists of people with computer expertise ranging from substantial to absolute zero.

"What makes the job so stimulating and attractive is that we have so many technicians among the user population," says Håkan. "As a rule, they are very used to computers. Often, they possess more skills than ourselves, are still curious and want to test their own solutions. This provides us with a lot of good ideas."

Certain users are neither particularly interested nor motivated. Some simply want

Memo and handle their jobs perfectly well with just that. Others want simple programs, with no extra finesse. They consider the available, highly extensive range as confusing. The existence of PC-Support as a counseling resource is not generally known throughout all areas of the organization.

### Worth reading

"We can cope with most of the demands made of us, but people are unaware of it. We have not been particularly successful in communicating our skills. Recently, a brochure presenting PC-Support in some detail was distributed. Read it," urge Håkan and Glenn.

The brochure also describes the unit's services, policy issues and contract costs. The latter warrants a few minutes of thought.

Up until now, each unit and cost center has decided on its own support contract and has then paid per connected PC. A new feature this year is that the costs are instead based on cost per employee and the rates are the same for everybody. This may be considered somewhat unfair by certain units, but the administrative process is significantly simplified.

Machines and programs also represent costs, as do all the connections required to create electronic communication routes. For example, to connect a geographic unit to ECN costs in excess of SEK 25,000 per month.

So, make friends with your computer – it could be worth it!

Kari Malmström

## Towards the paperless office?

One effect of the expansion of IT operations is a decrease in the flow of paperborne information. This is important, particularly from an environmental viewpoint. However, if the PC is to replace paper and pens, then the tool must be perceived as a simplified improvement. Dreams of a paperless office are currently more of an illusion than reality.

"People like their paper," notes Glenn Unnerfalk, IT coordinator and head of the PC-Support and PC-Network support functions within Ericsson Business Networks in Nacka Strand, Stockholm.

"Longer term, however, we envisage an increasing amount of electronic storage. There is a clear need for more training in this area, otherwise there could be a problem when a user does not know how to access the information. Furthermore, it would be useful if an Ericsson standard for documentation was created in and for electronic media.

### Security

One of the many projects in which Glenn is concerned examines opportunities to present reference manuals electronically. He is also involved in a Group-wide project on IT security issues, and has created his own sub-project to investigate secure dial-up communications, an issue that is also important to remote/telecommunications.

In principle, effective September 1, the Business Communications Division at Nacka Strand no longer distributes any paperborne information. Instead, interested parties can obtain the information via so-called "Webs." A web is a library, within which information is stored layer upon layer. Using links, it is possible to skim through and find the required information.

### Availability

"The webs are based on one-to-many communication. As a former security manager, I would like to emphasize that internal information should only be made available to those persons for whom it is essential in their daily work. There is a certain disparity between availability and security," Glenn Unnerfalk points out, who in this context is more than willing to recommend Lotus Notes.

Lotus Notes is a group software program, which can be used to customize applications to meet the most varied requirements. About 100 Business Networks users have Notes and a full 75 of them use applications for conference room bookings at Nacka Strand. Via a simple mouse click on the screen, it is possible to find out which room is free at a specific time and on a specific date.

If you cannot decide, it is also possible to click up a small image of the room on your screen.

### Operating gain

Conference room bookings derive from a project implemented jointly with users. A problem existed and was quickly resolved.

With the help of computer technology, an improvement was achieved that has clearly benefited operations.

Other groups who could find Notes useful include geographically widespread project groups, who need to work together.

Increased training is essential if all personnel are to be capable of following IT developments in future.

During the explosive development of the IT area in recent years, it has been easy to make the mistake of investing first and analyzing actual needs later. User competence has not always kept up with the rate of investment in powerful new PCs and sophisticated programs. The time is now right to adopt a more coordinated approach to IT investments in future, based on clearly defined operating goals and with the focus firmly on benefits to the customer.

Kari Malmström



The core teams within PC Support and PC Network at Ericsson Business Networks pose around a bust of LM Ericsson at Hågelby Gärd, where a conference was recently held on future areas of focus. Standing, L to R: Glenn Unnerfalk, Håkan Jansson, Per Hagman, Anders Nilsson, Peter Jonkov, Pernilla Sturve. Sitting: Åsa Norman, Jörgen Johansson, Magnus Kalvik, Leif Eriksson and Claes Brameus.

Photo: Konny Dommauer.

# Chile is a vision of the future

There is probably no other country in the world today with a telecom market as deregulated as Chile's. About 10 companies are competing for the country's long-distance traffic, and the competition is as tough as it gets. All major companies want a piece of the Chilean market, a situation that has made it cheaper at times to call Sweden than to make a local call in Santiago.

"What is happening here is of interest to virtually all telecom markets," says Per Waller, president of Ericsson in Chile.

"The situation in Chile today is indicative of what market conditions will be throughout the world in the near future."

Virtually every large telecom operator in the world is competing in the Chilean market. Not because Chile as a telecom market is all that important per se; the country only has 13 million inhabitants. But Chile has probably come farther than any other country in the world in deregulating its telephone market. Eleven companies are jockeying for position in the country's long-distance market. And the competition is as tough as it gets. In the price war that broke out last year, it was cheaper to call Sweden from Chile than to make a local call in Santiago!

## Chile - a testing ground

The prices have stabilized now, but they are still only 25 percent of price levels in 1993. It is much cheaper to call Sweden from Chile than vice versa. But it hasn't been cheap for the competing companies involved, which have invested about USD 10 million during the course of just a few months in advertising and marketing.

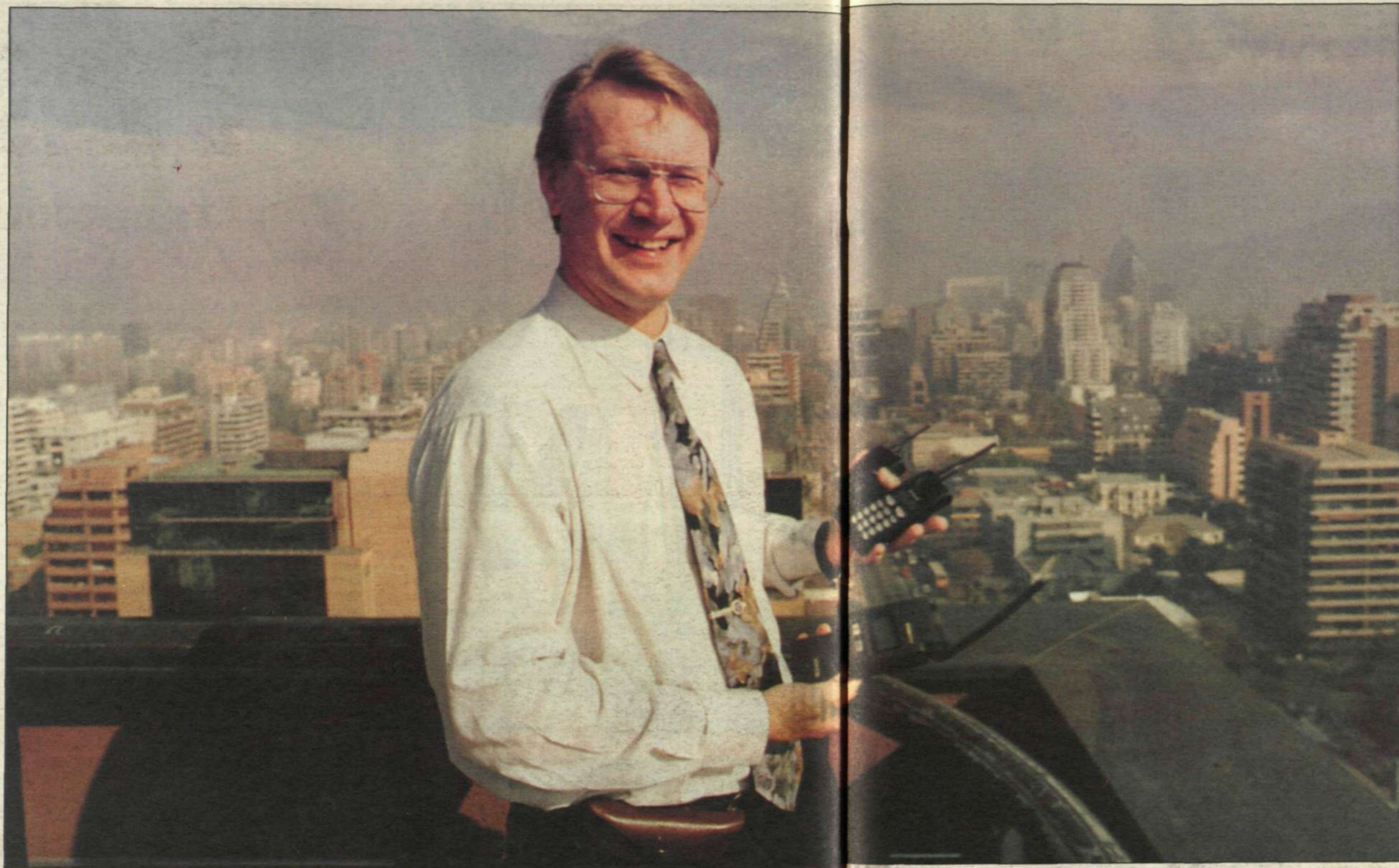
Chile is a testing ground. Everybody in Latin America is waiting to see what will happen in Chile, and then they will probably follow suit. Observers in Asia and Europe are also watching and waiting. "In a few years, many other countries will be in the same situation facing Chile today," says Per Waller, president of Compania Ericsson de Chile S.A.

Per Waller has also worked as president of Ericsson's subsidiary in Argentina and vice president of the Colombian company. Despite his experience in other Latin American countries, however, he considers his situation in Chile very special.

In Chile, all telephone companies compete with each other in virtually all areas. Companies that worked exclusively with long-distance traffic in the past are now also entering the market for local telephony, and companies that operated local traffic are investing heavily in long-distance and mobile communications, he says.

## Potential geographic center

There is a touch of the wild west over telephone traffic in Chile today. And that's just what Chilean politicians want. Chile, that "preposterous geography," as one Chilean author once wrote, is a narrow strip of land more than 5,000 km long, surrounded by the snowcapped Andes mountain range on one side and the chilly waters of the Pacific Ocean on the other. Strategies of the powers that be in Chile today are focused on making their isolated country a virtual geo-



Chile is the most deregulated telecom market in the world. In just a few years, many other countries throughout the world will be in the

graphic center. Chile will become the communications heart of Latin America - always close by, albeit far away in actual geographic proximity.

And they are well on the road to success, judging by the present situation. The tough competition has led to a drastic reduction in the cost of telephone calls and more rapid introduction of new technologies, compared with other markets. Chile has Latin America's first Mobitex network and will almost certainly be the first country in Latin America with PCS. The Chilean telecom network is one of the few completely digital networks in the world. Market penetration today is in the range of 13 percent, and the number of lines has doubled during the past three years to 1.7 million (coverage is still poor, however, in many parts of the country).

Things were completely different in the beginning. ITT monopolized telephone traffic in Chile until 1976. Ericsson's Chilean subsidiary was established in 1946, but operations were limited and, for many years, Chile was a marginal market for Ericsson (compared with many neighboring countries). It was not until 1983 that Ericsson received its first large order from Entel, the long-distance company.

Conditions have improved during recent years, and Ericsson is now concentrating strongly on the Chilean market.

"There is a wealth of opportunities, but it is also complicated to work with so many customers competing with each other. However, it's a challenge to build up an organization that can function under these conditions," Per Waller continues.

## Most modern network

When Per Waller started as President of the Chilean subsidiary two years ago, the company had one PC installed in the office! Today, there is a LAN network installed. It has dedicated nodes for Mobitex and Internet and all employees have their own e-mail addresses. Many are also equipped with small HP terminals that can be connected easily when they come into the office.

"I don't think any company in Chile has a more modern office network than Ericsson. The system allows us to lead by example, showing how we want to develop communications in the modern society, a subject of considerable interest to our customers."

"As a matter of fact, the company that supplied us with the equipment and ser-

vices wants us to be their showcase," Per says.

"It is important to practice what we preach," he continues.

By and large, Ericsson Chile has a new team today, and an important part of the subsidiary's modernization process is to develop the English language skills of its employees.

"In Chile and most other Latin American countries, very few people speak any language other than Spanish. However, if we are going to work on a global plane, we have to speak English," explains Per Waller (who speaks fluent Spanish). Many employees start their work days with an hour of English language instruction, therefore.

## Improved service at local level

The licenses for PCS will probably be awarded this autumn, which Per Waller considers vital to Ericsson's continued development in Chile.

"Our goal is to establish Ericsson as a supplier for PCS and D-AMPS. The areas in which Chile is concentrating are areas in which we excel."

An example of the radical changes that have taken place in the Chilean telecom

market is that Entel, the country's long-distance company, is now also investing in local telephony.

"It is important for us to reach end-users and offer complete service," says Alvaro Silva, President of Entel Phone, Entel's new local telephony company. He also pointed out that many of his company's customers want better service at the local level.

Initially, Entel plans to install 4,000 lines with Ericsson as its supplier. Telephone traffic will be started in November. Within the next 10 years, the number of lines will be increased to at least 30,000.

That is a target which may not seem particularly remarkable, but it should be noted that customers consist of companies that already use Entel for their long-distance traffic.

## New telecom company

According to present estimates, about 8,000 subscribers account for 40 percent of Chile's total telephone traffic.

Naturally, they represent a highly interesting group of customers.

"Development has been very rapid. We received permission in February to start local traffic operations and, in less than six

months, we have built up a completely new telecom company," says Alvaro Silva.

Entel's philosophy is to maintain relatively low prices that encourage customers to talk on the phone. But is it really profitable to enter the market? Alvaro Silva says, "Yes!"

"For us, it is extremely important to provide our customers with a complete range of services. Furthermore, there is no doubt that local telephony will also be a profitable business in the future," Mr. Silva says.

## Get in or get out

Like other telecom companies, Entel is concentrating on a very broad scale. The company is now developing its own fiber optical network and looks to multimedia as a very large market of the future. On the pedestrian streets of downtown Santiago, there are telephone booths already installed by two different companies, CTC and Manquehue. Entel plans to install its own telephone booths in the not-too-distant future. You have to be visible in the marketplace. Either get in, or get out!

"Only companies that invest seriously will have a chance to succeed," says Alvaro Silva.

David Isaksson



The big push for mobile telephony will come soon, as Chile becomes the first country in Latin America with PCS.

## Companies fighting for PCS licenses

By all estimates, Chile will be the first country in Latin America with PCS. The bid competition will begin this autumn for three licenses, and competing companies are already in the starting blocks.

However, while competitors still haven't even shown a functional system, Ericsson has had a demo system on location in Santiago for the past six months.

The development of mobile telephony in Chile has been slow, but the big push is expected now. Several of the market's leading players agree that mobile telephony is about to take off in the Chilean market.

"PCS could bring about major changes," says Gunnar Bergstedt, sales manager for PCS 1900 at Ericsson Chile.

Ericsson has been testing the European system, DCS 1800, for the past six months in Chile (the system that will be marketed is the PCS 1900). The system has been tested by top management personnel from several of Chile's leading telecom companies, as well as the Chilean under-secretary for telecom issues.

## Mobile telephony no success

Despite Chile's cutting edge position in the telecom industry, mobile telephony - so far, at least - has not been much of a success.

The first mobile network, owned by CTC, was started in 1989. Its coverage was limited to Santiago, Chile's capital city, and a small area around the coastal city of Valparaiso.

Since 1992, Bell South has operated a mobile network in Santiago and surrounding areas. There are two other networks (with a common infrastructure) serving the rest of Chile. They are owned by Entel/Motorola and VTR/South Western Bell. The total number of subscribers is between 100,000 and 130,000.

Gerardo Marti Cadevall is president and chief executive officer of CTC Celular, which operates one of Chile's networks. He admits that he is somewhat disappointed over the slow development of mobile telephony in Chile. Market penetration in the greater Santiago area is only 1.5 percent.

Nevertheless, CTC plans to invest in PCS. The company wants to offer its customers a national network, which it cannot do today.

By the year 2000, Gerardo Marti Cadevall estimates that there will be 500,000 mobile telephone subscribers in Chile. How many will be CTC customers?

"Competition is tough, but I don't think we'll have the sort of price war we experienced for international telephone traffic."

A decision will be made this autumn concerning which companies will be awarded PCS licenses. Once again, Chile will be the Latin American pioneer by granting the first PCS licenses on the continent. The importance of PCS in the eyes of government authorities is underscored by the fact that no licensing fees will be charged. Chile's economy has been sound for the past 10 years, with a favorable trade surplus.

Telex Chile is one of the companies trying hard to get a PCS license. The company has also served as host for the PCS installation on display by Ericsson for the past six months.

Telex Chile is one of the most aggressive companies competing in the Chilean telecom market for long-distance traffic and has built up its own nationwide network. The company has 23-25 percent of the country's long-distance traffic.

## Major investments

"Service and confidence are key concepts for us," explains Juan Eduardo Ibanes, Executive Chairman of Telex Chile. "We might not be the most inexpensive company, but we have a modern network and provide very good service," he continues.

Telex Chile took part in the initial investment in mobile telephony by Entel and Motorola in the late 1980s, but eventually sold its share and got out.

"We decided to concentrate on long-distance traffic, but we knew then we would get back into the mobile telephony market at a later date. Of course, it would be more expensive, but it would also give us the opportunity to work with more modern technology," Juan Eduardo Ibanes continues.

"The PCS system from Ericsson that we have tested is totally superior to present networks, and customers will also notice the difference," he says.

The CEO of Telex Chile believes the market can be highly profitable, but substantial investments will be required. During the next 5-10 years, total investments in different forms of radio communications in Chile will total approximately USD 800 million.

"PCS has a bright future, there's no doubt about it. We will see a sharp increase in mobile telephony over the next few years, and I believe that Telex Chile will be able to reach 320,000 subscribers within five years," concludes Juan Eduardo Ibanes.

# New applications for Mobitex

Latin America now has its first Mobitex network. The new network covers Chile's capital city Santiago. More are on the way. Taxi companies in Argentina's largest cities are considering Mobitex, and in Brazil, Banco do Brasil is testing a Mobitex network with several customers.

"Here in Latin America, we are finding applications for Mobitex that no one has considered before," says Jonathan Mytnik, who manages Mobitex marketing from his office in Chile.

The air is hot and humid at the Petrobras service station in the heart of Rio de Janeiro, between the lake and the glimmering beaches of Ipanemas. As we seek shade from the heat, bathers can be seen in the background.

Motorists stop at the station in never-ending stream to fill gas tanks and clean windshields before proffering their credit cards for payment. The purchase amount is registered and the information immediately sent to the bank, which completes the transaction.

At least this is how it is supposed to work, but in practice, the transaction between the bank and the service station can take several minutes. Telephone lines in Brazil are scarce, and every transaction takes considerable time.

## Fast transactions

In the future these and many other transactions will probably be handled by Mobitex. For the time being the system is only in the testing phase, but soon this and hundreds of other service stations across the country may be equipped for Mobitex.

"Interest is great both from Petrobras and several other large companies," says José Augusto, technical director at Cardlink, Ericsson's Mobitex partner in Brazil.

Cardlink has specialized in developing payment routines for banks, credit card companies and other customers. Currently Petrobras, Latin America's largest company, and Banco do Brasil are testing a system in which service stations are equipped



Jonathan Mytnik, who is a member of the Mobitex team in South America, demonstrates Mobitex for a Santiago salesman who is amazed by the speed.

with Mobitex terminals directly linked to the bank and by extension to the customer's account.

The future customer, however, is not Petrobras but Banco do Brasil. One of the reasons for the bank's great interest is the lack of telephone lines in Brazil. Today a telephone line costs between USD 4 and 6,000, and even when the line has been installed, communication is not exactly fast.

"This is just too good to be true! Over a dial-up line it can take as much as five minutes," exclaims João Paulo da Cunha Rose, the bank's chief project manager, upon seeing a demonstration of a credit-

card transaction over Mobitex which took a mere six seconds.

## Customers impressed

Over the next few months between 200 and 300 cardlink terminals will be tested. In addition to Petrobras, a lottery company and several shopping centers have shown great interest in implementing online systems using Mobitex. Ericsson is also working on developing contacts with other Brazilian banks and insurance companies, including Bradesco and Sul América Seguros.

"Ericsson's new compact base station is obviously one of the reasons for our success," relates Jonathan Mytnik. "Customers are impressed to say the least when they see that a briefcase-sized unit provides a fully functional base station and that it only takes about half an hour to complete the installation and start testing."

Latin America's first Mobitex network was opened in Chile in mid-1994. The network, which is called Trek, is operated by CTC Celular. Users include the Chilean police (carabineros) who are able to use Mobitex for on-the-spot checks on driving licenses, stolen vehicle reports, etc. accessing central databases.

New contracts are in the works. Recently a Mobitex network was sold to mobile telephone operator Telcel in Venezuela's capital Caracas, and a test network in Mexico will soon be taken into operation. Paraguay has also shown interest in Mobitex.

## Mobitex for security

The most interesting project apart from Brazil may soon become a reality in Argentina, where a number of taxi and bus

companies are considering Mobitex. A total of 20,000 buses and 50,000 taxis in Buenos Aires and other major cities may be equipped for Mobitex.

Although there are many interested parties, it is as yet unclear who will be the network operator.

One reason for this great interest is a rise in crime rates in the otherwise safe Argentina. Many taxi drivers have been the victims of robberies, with fatal outcomes in several cases.

"A Mobitex system would reduce the amount of cash drivers must handle, since passengers would then be able to use credit cards to pay fares, which would be immediately deducted from their accounts. This system would also make it possible to install an alarm in every taxi, a top priority among drivers," says Jonathan Mytnik.

## Satellite system

The vehicles will also be connected to a satellite-based system which makes it possible to track vehicle locations. Another option currently being evaluated would allow customers to purchase special taxi coupons in kiosks.

There is simply no limit to the number of ideas for Mobitex applications. Ericsson's Jonathan Mytnik believes that opportunities exist to develop many more applications for Mobitex than those thus far implemented in Europe.

"Personal safety is an increasingly important issue in Latin American countries," Jonathan points out. "Mobitex can make a crucial difference. There are simply no other alarm systems that can compete."

David Isacson

## Ericsson wins D-AMPS contract in Chile

Ericsson Chile has signed a contract with mobile telephone operator CTC Celular by which Ericsson will upgrade CTC's existing analog net to digital.

"This contract marks an important breakthrough, since we have not previously supplied mobile telephone equipment to Chile," says Ericsson's Per Waller with satisfaction.

The order, which is valued at USD 15 million, also has symbolic value, as the contract was won in competition with NEC, which has been CTC's supplier thus far.

The network, which will be taken into operation in February, consists of an exchange and 11 base stations (RBS 884). With this contract, CTC will create a du-

al network with PCS on the 800 MHz band, which will be needed to compete with the BellSouth/NorTel network, which is already digital.

"CTC needs to increase capacity, but the existing system has not functioned satisfactorily," explains Per Waller.

"This order confirms that Ericsson is currently able to deliver the very latest technology in competition with NEC and AT&T. This is also in line with our ambition to be a supplier in all key areas in radio communications."

New PCS orders may be forthcoming as early as this autumn. One of the companies that has applied for a license, VTR/South Western Bell, has chosen Ericsson as one of its two suppliers. Other operators are likely to do the same.

# 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 Anita Wilhelmsson at Ericsson Communications. Phone +46 871928 14.

## IN SWEDEN:

Ericsson Hewlett-Packard Telecommunications AB

### FE SYSTEM ADMINISTRATOR

FE needs a person that can maintain and develop the different types of software that finance use. Today we use three different systems, Agresso, MS Access and Hyperion. The latter is a reporting tool for us to be able to send our reports to Ericsson Corporate Finance.

The main task, at least in the beginning, will be Agresso system maintenance, e.g. new users, updating system tables, improve the system, educate users. We think that this part of the job will take 50% of the time. The second and major part of this position is to develop Finances capability to provide financial information to the rest of the organisation. Our main tool for this is a system that has been developed using MS Access. The system administrator will further develop this tool to meet the needs of the company.

Your personal attributes should be: Experienced in working in projects and preferably to lead them. Service minded. Autonomy & driving skills. A record of easiness for co-operation.

You should have skills in Microsoft Access product, knowledge and experience, on a level as average or above. You also must have good english, spoken and written.

It is an advantage to have knowledge in: Financial package, system administration e.g. Agresso, SAP R/3 other. Ingres database. MS SQL-server. MS Office, Word, Excel etc. UNIX-knowledge.

Contact: Teddy Berggren, 08-7193852 or Inger Agdahl, Human Resources, 08-7194761.

Ericsson Business Networks AB, Sundbyberg

### BUSINESS MANAGER

Our role is to provide customers with complete, cost effective and revenue generating solutions, tailored to their individual business needs. The solutions are based on appropriate products from the entire Ericsson product portfolio, as well as from third parties, complemented with our own customisation, engineering and turnkey implementation.

We need to expand our team, responsible for Multi-Service Access Networks, with a Business Manager prepared to take commercial responsibility for our solutions. Multi-Service Access is ranging from cable TV only to fully integrated cable TV and telecom/data services.

The position calls for a truly business oriented person with an open mind and significant sales, marketing and planning experience as well as in depth knowledge of telecommunication.

Contact: Mats Karemyr, +46 8 764 0773, memo: EBC.EBCMAKA eller Sixten Ekelund, +46 8 764 0820, EBC.EBCSEKE.

Ericsson Mobile Communications AB, Kista

### MARKETING MANAGER - CELLULAR DATA SYSTEMS

We are looking for a marketing manager for our newly created unit, Cellular Data Systems, within business unit Mobile Data.

The interest for mobile data is rising and new standards are evolving that will meet the demands for tomorrow's data user. CDPD is the first system that combines mobile telephony and packet data in AMPS/D-AMPS, similar solutions will be available for other cellular standards.

You will be responsible for Marketing and Sales for our mobile data products. Main responsibilities will be to, define and secure sales goals, promote new business and products, develop new and existing customers and develop your organisation. The work is very independent with extensi-

ve customer contacts both direct and through our subsidiaries.

The person we look for shall have extensive working experience in the field of marketing/sales of either telecommunication or data communication system. You should have management experience, be able to work independently, take own initiative and have good communication skills, both within the organisation as well as towards the customer. We are in the start up phase and the outlook for the future is very much dependent on your effort.

Contact: Anders Runevad, Cellular Data Systems, 08-7572640, memo: ECS.ECSARV, or Eva Jansson, Human Resources, 08-7571459, ECS.ECSEVAJ.

Ericsson Radio Systems AB

### BUSINESS DEVELOPMENT CONSULTANTS

At ERA/LY/G, dept for Professional Services, a unit for providing services to our customers (today's and tomorrow's) has been established. The main objectives for the unit is to help our customers with overall cost management of their operations as well as distribution and marketing strategies.

The initial focus for the unit will be to conduct a benchmarking study among mobile operators. This study will then be used to give input to our customers how they can increase their productivity.

To this unit we are looking for persons that will productify the services (product management and development) as well as handle the supply of the services. The applicants need to have very good communication skills, have documented experience from customer negotiations, process oriented, have an understanding of mobile network operations as well as be very market oriented.

Contact: Lars Sandström, 08-7641387, ERALASA or Lena Axhamre-Hellberg, 08-4045421, ERALEAX.

Ericsson Radio Systems AB

### MANAGER, BUSINESS DEVELOPMENT CONSULTANTS

At ERA/LY/G, dept for Professional Services, a unit for providing services to our customers (today's and tomorrow's) has been established. The main objectives for the unit is to help our customers with overall cost management of their operations as well as distribution and marketing strategies.

The initial focus for the unit will be to conduct a benchmarking study among mobile operators. This study will then be used to give input to our customers how they can increase their productivity.

To this unit we are looking for a manager that possess managerial skills, is people oriented and has good communication skills. Of course there is a clear advantage if the applicant has experience from mobile network operations (i.e. has been working for a mobile operator).

Contact: Lars Sandström, 08-7641387, memo: ERALASA or Lena Axhamre-Hellberg, 08-4045421, ERALEAX.

Ericsson Radio Systems AB

### MANAGER, SYSTEMS INTEGRATION SERVICES

At ERA/LY/G, dept for Professional Services, a unit for providing services to our customers (today's and tomorrow's) has been established. The main objectives for the unit is to develop and manage/control systems integration services in specific customer projects.

The focus of the unit will be to establish and package systems integration products as professional services, i.e. not "just" handling the systems integration part but also take an overall responsibility to handle the customer projects from establishing requirement specifications to the in-service state in a multi-vendor environment.

To this unit we are looking for a manager that possess managerial skills, is people oriented and has good communication skills. Of course there is a clear advantage if the applicant has experience from mobile network operations, systems integration for a mobile operator).

Contact: Lars Sandström, 08-7641387, memo: ERALASA or Lena Axhamre-Hellberg, 08-4045421, ERALEAX.

Ericsson Radio Systems AB, Kista

### PRODUCT MANAGERS RADIO ACCESS NETWORK

Business Unit Cellular System - American Standards (RMOA) offers products for PCS networks in the 800 and 1900 MHz frequency bands based on the digital D-AMPS specification. Our products are deployed in most parts of the world including north and south America, Asia, Oceania as well as Europe.

We are now looking for product managers to direct the further development of access network products. You will

be working with analysis of market requirements and competitors, definition of development strategies in product plans, ordering of R&D activities in our own organisation as well as at ETX and with external suppliers. Activities are carried out cooperation with our world wide marketing and development organisation.

### 1. AXE RELATED PRODUCTS

You will be responsible for AXE related products in the radio access network including transport network products as well as processors and interfaces in the base station. This position requires experience from AXE and/or transport network products.

### 2. RADIO NETWORK FUNCTIONALITY

You will be responsible for the defining of product- and development plans for air interface functions together with our system experts and marketing organisation. This position requires experience from product/project management, system design or similar.

You should have an academic degree and a background from telecom or cellular.

Contact: Ulf Hagström, 08-7570224, memo: ERAFLU. Appl. to: ERA/A/AH Britt Bosrup, Ericsson Radio Systems AB, 164 80 Stockholm. Intern: ERA.ERABUP.

Ericsson Radio Systems AB, Kista

### PRODUCT MANAGER - NETWORK APPLICATIONS

Business Unit Cellular Systems - American Standards (RMOA) offers our customers solutions for PCS networks in the 800 and 1900 MHz frequency bands based on the D-AMPS specifications. We are offering not only wide area mobility but also office, residential and fixed cellular applications.

The responsibility of a Product Manager, working with Network Applications, is to: Evaluate new business opportunities, by means of Business and Technical analysis and also define new product concepts jointly with the systems design organization and customers.

Strategic Product Planning at RMOA has now open positions for some well skilled and ambitious individuals to work in key positions as:

Product Manager - Switch Network Applications  
Product Manager - Future Appl. and Network Architecture  
Product Manager - Product Intelligence Analyst

The position as Product Manager implies responsibilities and authorities to secure and maintain Ericsson's position as a leading cellular systems provider. As a Product Manager, you will get opportunities to gain a wide cellular market knowledge and broad competence in advanced Telecom applications. You have an academic degree, Telecom background and working experience from Cellular Systems. The work entails international contacts and travel.

Contact: Stefan Manner, 08-7571742, memo: ERA.ERASM or send your application to KI/ERA/A/H Britt Bosrup, Ericsson Radio Systems AB, 164 80 Stockholm, memo: ERA.ERABUP.

Ericsson Radio Systems AB

### PRODUCT MANAGER NETWORK PROVISIONING SERVICES

RMOG are providing cellular systems all over the world based upon the GSM, NMT and TACS standards. Within the Customer Service unit LY we are now establishing a new unit responsible for services especially to new mobile operators regarding Planning, Engineering and Implementation of a mobile network.

It is a wide area of services including consultancy, establishment of a provisioning organisation for the operator to turnkey projects with total responsibility for building a mobile network. All services will be supported by qualified Information System tools and a comprehensive methodology. New customers all over the world demand Ericsson to provide these services and therefore this product area will soon contribute substantially to our Customer service sales.

You will be responsible for defining these products, order and control the development of the provisioning services and the evaluation and selection of associated Information System tools. You will also be responsible for our marketing message regarding these services and tools.

You should have some years experience of product management work or similar. Experience from operation of a telecom network or planning, engineering and implementation of a complex network is of utmost value. You should also have some experience from the IS/IT area and speak/write English fluently.

Contact: Robert Mathson, 08-7570132, memo: ERA.ERAROB Appl. to: KI/ERA/LYH Lena Axhamre-Hellberg, 08-4045421.

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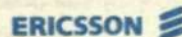


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**Ericsson Business Networks AB, Sundbyberg****SOLUTIONS MANAGER**

Our role is to provide customers with complete, cost effective and revenue generating solutions tailored to their individual business needs. The solutions are based on appropriate products from the entire Ericsson product portfolio, as well as from third parties, complemented with our own customisation, engineering and turnkey implementation.

We need to expand our team, responsible for Multi-Service Access Networks, with a Solutions Manager prepared to create and develop competitive solutions. Multi-Service Access is ranging from cable TV only to fully integrated cable TV and telecom/data services. We also use radio technology in our solutions.

The position calls for an enterprising, pragmatic person with a genuine interest in efficient solutions. Significant design and solutions experience as well in depth knowledge of telecommunication is an asset.

**Contact:** Mats Karemyr, +46 8 764 0773, memo: EBC.EBCMAKA eller Sixten Ekelund, +46 8 764 0820, EBC.EBCSEKE.

**Ericsson Software Technology AB****CONSULTANTS FOR QUALITY, PROJECT MANAGEMENT AND TEST**

Ericsson Software Technology AB in Sweden is made up of consultants in the field of telecommunication and information technology. We work primarily with development and handling of complex software systems, methods for design of generic and reusable IT-systems and customer adapted training. Ericsson Software Technology AB has approximately 550 employees. Right now we need to hire a number of new employees. Our headquarter is located in Karlskrona but we also have offices in Stockholm, Ronneby, Hässleholm and a subsidiary in Lund.

Ericsson Software Technology AB is wholly owned by Telefonaktiebolaget LM Ericsson.

Frameworks in Ronneby is a unit within Ericsson Software Technology AB. We work with methods for shortening leadtimes and improving quality in projects developing complex software systems. We work with project management, methodology for software reuse, test and we use e.g. CMM and ISO 9000. We are around ten consultants today and we need to expand. If you are Master of Engineering or a System Analyst in computer science, have experience from project management, working with quality or test and want to improve the methods used today. Then contact us immediately. We can offer you an interesting job in a very successful company. We work both in Sweden and abroad and the job will include travelling. Our business changes continuously and therefore you need to be able to cope with changes.

**Get in touch with us** and discuss your future with us!

Send your resume to: Ericsson Software Technology AB, Frameworks Att: Magnus Nilsson, Soft Center, S-372 25 Ronneby Sweden, + 46 457 775 00 e-mail: Magnus.Nilsson@ryepk.ericsson.se.

**Ericsson Radio Systems AB - Kista****1. CMS 88 SYSTEM****CHARACTERISTICS - MEASUREMENTS**

The RMOA system unit in Kista is responsible for CMS 88 system characteristics. Examples of characteristics are network capacity, processor load, speech quality, delay time and link throughput. The work comprises investigations, simulations and calculations as well as collecting feedback from test systems and commercial operation.

We are looking for a system engineer with a special interest in measurements. The work includes travelling, mainly to North America. A suitable background could be system engineer or tester. Experience from AXE or cellular is a requirement.

**Contact:** Anders Söderlund, 08-7570454. Appl. to: KI/ERA/AH Matti Hellgren personnel.

**Ericsson Telecom AB, Business Unit Switching and Network Systems Global Product Line Management, Network Intelligence****SYSTEM MANAGEMENT****NIP, APPLICATIONS**

We will extend our team for system management of Network Intelligence (NI) platforms with one person working in the area of NI platforms (NIP) for advanced network & service applications.

Your role will be to work Network architecture and NI platform aspects/requirements when introducing new advanced NI applications and services, such as UPT, VPN, CTM, Free numberplan etc. You will work closely together with product management, the design centres throughout the world in a systems management network, and even

strategic customers. The position will also give possibilities to be involved in investigations for fixed & mobile network convergence as well as migration of narrowband & broadband network services. You will have an excellent opportunity to extend your contact network and to gain competence in the area of Network Intelligence and the different NI platform products.

You are systems engineer, or similar, interesting to work with total solutions. Experience in IN, General network issues ("narrowband, broadband or mobile) as well broad implementation experience in AXE and other platforms are considered as merits.

**Contact:** Anders Blomgren, ETXT.ETXASB, +4687190473, Gunnar Gunnar Olsson, ETXT.ETXOLS, +4687191514 eller Ewa Brandt, Ewa Brandt, ETXT.ETXEWA, +4687198289.

**Ericsson Telecom AB, GPLM Customer Services****1. NETWORK OPERATION MANAGEMENT TRAINEES**

Consultancy Services Provisioning will expand and build a new unit for Network Operation services. To be able to handle new business opportunities we need to expand our capacity to operate networks on customer's behalf.

We are looking for motivated, open minded persons, who are looking for new challenges including hard work and travelling, with operational experiences in one or more of following areas:

AXE 10 Operational and Maintenance AXE 10 NMS knowledge XM or SMAS AXE 10 testing and/or trouble shooting

The Network Operation unit will offer Operational Services towards Operators world-wide. This means that we will operate a customer AXE network or parts of the Network.

We think you have a MSc/BSc in engineering or equivalent. Good leadership and communication skills in English are needed.

The trainees will be placed in our Network Management Centers we have or will have in Operation e.g. in Italy or Germany during 1-2 years on-the-job-training. The trainee period includes also an integrated course program. The objective is that the trainee should be able to work as Network Operation Manager after the trainee period.

**Contact:** Thomas Sonesson, 9 8398, ETXT.ETXSOON, Ewa Lundberg, 9 8991, ETXT.ETXWLU eller Gabriella Gerdin, 9 7930, ETXT.ETXGAB.

**Ericsson Telecom AB, Core Unit Basic Systems****PRODUCT MANAGEMENT AXE 10 PLATFORM**

Basic Systems Product Management Unit is responsible for the product management of the AXE 10 platform, i.e. processor/telecom operating systems and switching fabrics in world class.

To satisfy the continuous increased demands from mobile as well as fixed network applications, the AXE 10 platform is currently undergoing an intensive modernization program. This requires considerable more resources in the provisioning area but also in the product management area. The product management responsibility is to secure an optimal, business driven, control of the development and to establish strategic plans to meet future needs.

We have now several vacant product management positions. In general these can be characterized as product or process specialists positions aimed as support to the business responsible product managers.

A number of specialist areas are defined. A flexibility exists with respect to how these areas are manned, i.e. one person can act within one or several areas etc.

Examples of specialist areas:

- Industrialization
- Platform Network Management
- Control Systems
- Switching
- Business intelligence
- Patents
- Product substitution
- Open Systems technology
- I/O Systems

Do you have some experience from some of above or similar areas and would like to influence the directions of the AXE 10 platform development?

**Contact:** Jan Svennerholm, tel +46 8 719 11369, memo ETXT.ETXSVM, Agne Jönsson, +46 8 719 5089, ETXT.ETXAJN or Mats Bjerlöf (human resources), +46 8 719 9675, ETXT.ETXBJEL.

**Ericsson Telecom AB, Core Unit Basic Systems, Årsta****SUBSYSTEM RESPONSIBLE, GSS**

A new group switch in AXE-10 is being designed and soon will become a product. A new subsystem issue containing both the existing 64K Group Switch and the new UniSwitch is planned to be released.

We at section Switching Network Products - System Coordination are looking for You, a highly motivated person who is willing and capable to take the position of SUBSYSTEM RESPONSIBLE, GSS.

The work tasks are among others:

- Subsystem design and taking care of Product structures in PRIM - Primary product responsibility for the whole GSS - Vital technical decisions (PC-ANT) - In cooperation with product management creating Product roll-out plans, development plans, programs and strategies - Representing GSS in AXE-10 different forums - Participation in System management of the whole product area

This challenging position which entails international contacts and travel has a great development potential. Its importance will grow with introduction of the new switching techniques in AXE-10, especially in the mobile area.

We believe you have a good AXE-10 and/or general telecom competence, MSc degree or corresponding, preferably knowledge and experience in switch/AXE-10 design and/or verification.

You are fluent in English, written and oral, well organized, initiative taking, a driving force, can delegate work and you are capable of multitasking.

**Contact:** Martin Hatas (currently holding the position), 08-7190226, memo: ETXT.ETXMHAT or Kerstin Bergstrand (section manager) 08-7191212, ETXT.ETXKEJ.

**INTERNATIONAL****Ericsson Telecommunications PTE LTD, Singapore****SENIOR MARKETING MANAGER - VIETNAM**

Vietnam is currently one of the fastest growing economies in Asian Region. Vietnam Posts and Telecommunications (VNPT) has aggressive expansion plans. Global operators such as Telstra, Cable & Wireless and France Telecom are seeking Operators' Licences in the country.

The position requires the ability to commercially market and conceptually motivate different complete network solutions.

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

The position reports directly to the Managing Director of TKV Vietnam and ENO/ZC Singapore.

Ericsson Telecommunications PTE LTD, Singapore (ENO), has the regional marketing and sales responsibility for complete network solutions, primarily targeting at customers with a clear demand for total telecommunications solutions, systems integration and turnkey procurement. We strongly emphasize on Access Networks and in particular such based DECT and Cable TV/Multiservice Applications. We cover South-Asian and Southeast Asian markets. We report to Business Unit ZNEP within EBC and cooperate closely with ETX and regional local companies when we create network solutions.

**Contact:** Petri Markkanen, +65 3501 593, memo: ENO.ENOPM or Chua C L, +65 3501 560, ENO.ENOCC.

**Ericsson Mobile Communications AB, Kista****SALES AND MARKETING MANAGER - JAPAN**

We are looking for an experienced Sales and Marketing Manager who is interested in a two year assignment in Japan to build up our sales and marketing functions there.

Ericsson Mobile Communications has decided to enter the Japanese market with PDC-terminals. We will do that through a joint venture company together with a Japanese trading house in Tokyo, and we will be supported and collocated by other Ericsson Business Units working with Japan.

If you are an entrepreneurial Ericsson Sales and Marketing Manager and like challenges and want to be part of a project team ready to enter one of the toughest markets in the world, please **contact:** Göran Skyttevall, +46 8 404 53 49 or Åsa Jonzon Rundqvist, +46 8 404 51 66at Ericsson Mobile Communications AB, Kista, Sweden. Appl. to: Ericsson Mobile Communications AB, Yvonne Areflykt, 164 80 Stockholm, Sweden.

**LM Ericsson****TRAINING ENGINEER IN BRUSSELS**

The main responsibility is to support the Ericsson training centre in its ongoing process of building up the technical competence of its customers and internal staff.

The main tasks are: - Preparation & presentation of technical training on existing and new telecom applications for our technicians, sales and marketing personnel, dealers and customers. - Development & updating of training products. - Promotion of Ericsson image and its products.

As a suitable candidate you have 3-4 years experience of MD 110, excellent communication skills, flexibility, ready to travel locally and internationally, team and result oriented, initiative and self-motivation as well as fluent English and German language. (Other languages will be considered as an advantage). Your location will be based in Brussels.

**Contact:** Ulf Lundgren, +32 2 745 14 69 or fax +32 2 745 14 33.

**SUPPORT ENGINEERS FOR LONG TERM CONTRACT IN INDIA**

We are looking for support engineers for long term contract in India. The Indian market is expanding rapidly with the GSM system and you will be a member of the system support team at Ericsson in New Delhi. We are currently looking for support engineers with CME20 trouble shooting experience in the following areas:

**1. CME 20 SS and BSS SUPPORT ENGINEERS**

The basic qualifications for these open positions are at least three years system experience in AXE 10 and must be competent with AXE10 trouble shooting technologies in live switches. He/She must have in depth knowledge on system level and a good product knowledge on CME 20 SS and BSS, preferably with a support bias.

The candidates must demonstrate the ability to take initiative and find creative solutions to emerging problems and the commitment and ability to train and develop local staff. You should have a thorough and methodical approach to work, good analytical abilities and be able to work unsupervised. Working O&M(CME20) experience would be an advantage but not essential.

**2. CME 20 OSS SUPPORT ENGINEER**

The support engineer ideally should be experienced in the administration of UNIX systems and be familiar with AXE 10 operation and maintenance procedures.

You should have a thorough and methodical approach to work, good analytical abilities and be able to work unsupervised. The person should have at least two years working experience in technical supportive/customer facing activities. The successful candidate must have good communication skills both verbal/written. An interest and ability to understand customer requirements is essential, as major part of the duties will be to transfer knowledge and train customers in handling the administration of OSS. Working experience in customer support environment is desirable.

**3. O & M ENGINEERS**

With the rapid expansion of the GSM market in India, we urgently require Operation and Maintenance engineers working together with our new customers in India.

Operation and maintenance engineers will be primarily working together with the customers and will be responsible in setting up all maintenance routines for AXE10 and routines for monitoring the network performance. You will also help, assist and guide the customer in their day to day operational activities and help to establish proper reporting routines for In service Performance.

Suitable candidates must be able to work in all aspects/issues of system performance, operational reliability and at least 3 years of working experience in AXE10(CME 20) operational environment is desirable. The candidates should have good verbal and written command of English and be skilled in handling communication with the customers.

**Contact:** Finn Sorenson, memo: ETXS.ETXFNSN or Nalin Taylor, ETC.ETCNALT, +86 10 505 1190x 650.

**Ericsson LTD, United Kingdom****TACS (CMS8810) TECHNICAL SPECIALISTS & SOFTWARE DESIGNERS**

The newly formed TACS System & Development group at ETL/R Guildford, England is worldwide responsible for the TACS Mobile System. We are looking for AXE design professionals with the skills to contribute to this new group.

**1. CMS88 TECHNICAL EXPERTS**

Working within our TACS system Team you will be working with quick study technical reports, prestudies & feasibility studies. You will have regular contact with TACS product management and world wide local product management.

You will have significant AXE design experience, with a solid understanding of the CMS88 mobile system and particularly the MTS subsystem. Technical expertise and commercial awareness will be highly valued for this key role in supporting TACS customers worldwide.

**2. AXE SOFTWARE DESIGNERS**

Working within our MSC design team, you will be working with 'fast cycle time' projects, offering you exposure to the complete software design lifecycle: from pre-study to FOA. Should have all round AXE design & test knowledge, with good teambuilding abilities.

**Contact:** Clive Oates, +44 1483 305294, memo: ETL.ETL-CLOA fax : +44 1483 305364 or Helen Bennett, +44 1483 305118, ETL.ETLHNES, fax +44 1483 305090.

**Ericsson Inc - Radio Systems EUS/RG**

**STAFF ENGINEER, TECHNICAL SALES SUPPORT - PCS 1900**

The United States' explosive telecommunications field has created a tremendous market for Ericsson's CMS 40 product line for Personal Communications Services, in turn producing excellent career opportunities. Ericsson's high-energy and fast-paced PCS Group is looking for key players in supporting customers through the PCS Sales & Marketing Departments with internal and external customer presentations, answering technical questions and issues, and providing technical solutions to requests for proposals.

The Staff Engineer, Technical Sales Support - PCS 1900, will be responsible for important decisions regarding present and future technical and commercial issues of radio, switching, and networking of CMS 40, in addition to periodically contributing technical competitive market analysis.

This position will serve as a communication link between Ericsson departments involved with new product development and pricing strategies. They will also translate technical data into information usable by the Marketing Communications department while keeping the Sales & Marketing Department informed of new and advanced products.

Ideally, the Staff Engineer, Technical Sales Support - PCS 1900, will come from a switching, RF or networking background with at least six years in telecommunications and/or sales engineering. Four years experience with Ericsson's products is preferred, in addition to above average oral and written communication skills. This position requires extensive customer interface experience and excellent interpersonal skills in relating to technical and sales staff, and customers.

The Staff Engineer, Technical Sales Support - PCS 1900, must possess the ability to make comprehensive presentations and respond to technical/commercial issues regarding radio, switching, and networking aspects of the CMS 40 system. Knowledge of competitor's products in relation to comparison of price architecture, features, and system performance is vital. Domestic travel is frequent with some international travel.

**Contact:** Jeff Hooper, TechnicalSales Support Manager - PCS 1900, on (country code for USA) + 214 952-8648.

**Ericsson Data Services Nederland B.V., Rijen**

**GROUP MANAGER**

If you like a challenge, and are interested in achieving excellent customer service using the latest tools and methods, read on.

Ericsson Data Services Nederland B.V. (DSN) is looking for a versatile group manager for their Customer Support Centre and Operations group. DSN/D/O provides end-users of ETM (Holland) and European Ericsson companies with first line support for IT services on a number of different platforms and their applications e.g. IBM, Banyan-LAN, PC's, MS-Office, MD110. DSN/D/O provide the following services: Help desk, Problem Management, System Monitoring, Backups, Batch Runs and Management Information.

DSN/D/O is a dynamic group with a vision and a mission, who want a manager to lead the way, so that they will achieve 100% (customer) satisfaction.

Your main responsibilities will be: Set, deploy and achieve objectives for the group, and report the results. Recruit, hold appraisal talks, set competence and career planning with the staff. Set the budget and follow it, ensuring chargeable work is invoiced. Maintain processes, identify improvements and sponsor them. Define and deploy service level agreements. Acquire and implement tools and methods to support the processes.

You should have 2-3 years management experience. Some use of tools and methods: PDCA, Hoshin, Compass, Process Mapping, subjective measurements. You must be forward thinking, result oriented and have a customer service approach.

**Contact:** Jos Nieuwhof, +31-1612-29685, memo: DSN.DSNJONI, ECN 834-9685, Marilyn Atkins, +31 1612 29986, Memo: DSN.DSNMAAS, ECN 834-9986 or Rob Haest, +31 1612-29372, memo: ETM.ETMROHA (Personnel).

**Ericsson Schrack AG, Vienna**

**PRODUCT MANAGER TERMINALS - BUSINESSPHONE SYSTEMS**

Business Unit BusinessPhone is responsible for the worldwide sales, marketing and development of PBXs and key systems for small and medium sized companies within the business area Business Networks. Our products are successfully sold in more than 50 countries worldwide.

To the Product Management department we are looking for a Product Manager responsible for the product area Terminals. The product area consists of DECT based solutions for BusinessPhone systems and the associated system telephones to our BusinessPhone systems.

As Product Manager you will work with product strategies, consolidation of market requirements, business cases, product lifecycle management, product presentations and discussions with customers.

You have an academic degree and a general telecom background. Experience from business communications environment and DECT technology is an advantage. The work entails international contacts and travel.

**Contact:** Stefan Lindwall, +43 1 81100 6084, memo: SEA.SEALIND eller Gerhard Gindel, + 43 1 81100 4046, SEA.SEAGI.

**ETC-Ericsson (China) Company Limited**

**MARKET & PRICING SUPPORT**

The mayor responsibility in the position of Market & Pricing Support is to support and co-ordinate pricing of TACS &

GSM products within ETC and give recommendations for price policies.

Some of the key activities are as follows:

- Price comparisons and co-ordination between different contracts products and customers.
- Tactically and strategical pricing support at offer and contract.
- Support the marketing organisation in regions with experience previous offers by collecting and distributing latest contract information. Profitability calculations.
- Pricing of new products, commercial product launch informations.

Applicants should be experienced from Marketing and/or pricing of cellular products, preferably with good product knowledge of TACS and/or GSM products. Very good English verbal and written.

The successful candidate will be offered minimum one year assignment and will be based in Beijing.

**Contact:** Bo-Erik Dahlström, +86 10 505 1190, memo: ETC.ETCBEDA, Christer Ahlner, + 86 10 505 1190, ETC.ETCBCA. Appl. to: KI/ERA/LDH Hans Falk + 46 8 757 1402 or memoid: ERA.ERAHFA

**Ericsson Mobile Communications Company - BMC**

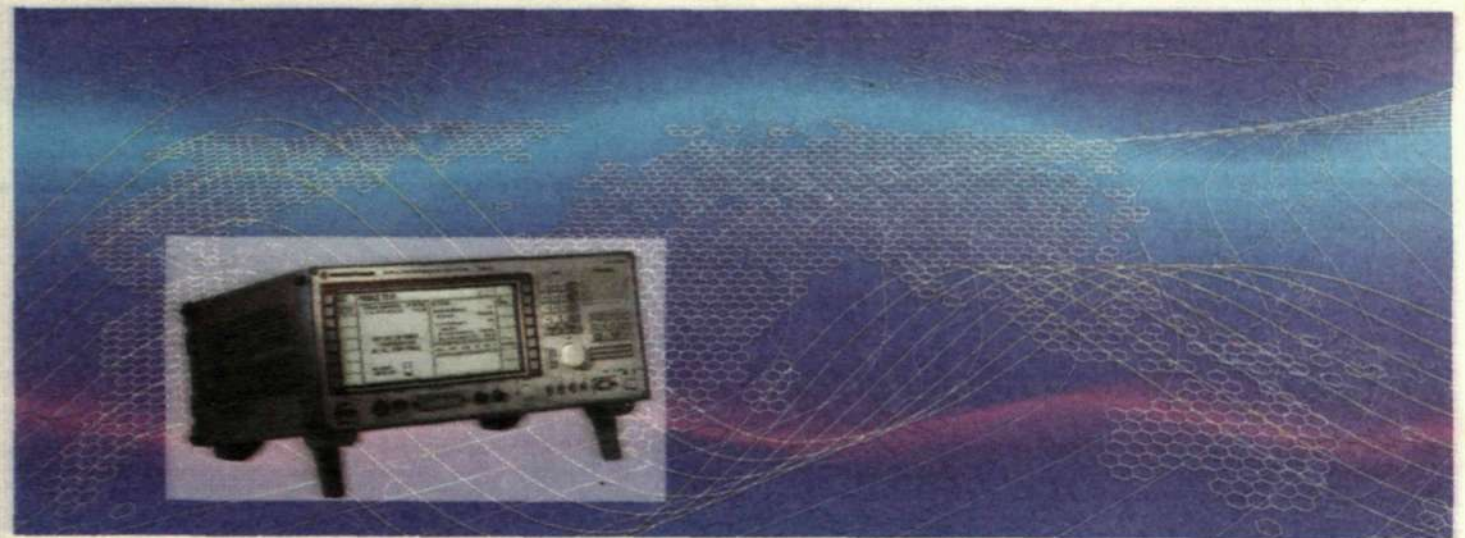
**PRODUCTION SHOP MANAGER - TERMINALS**

BMC is a newly formed Joint Venture Company between Ericsson and a local Chinese partner. The company is located in Beijing and will be responsible for marketing/sales and production of Mobile Systems, Terminals and Power Equipment.

You will be responsible for the production of GSM-terminals (Sofie Jane) in accordance with the process (Master concept) established in Kumla. Your production area consists of surface mounting, final assembling and package. You will have the personnel responsibility for about 50 employees. Your main task will be, together with the production management, to assure quality and delivery from the plant and furtheron develop modern methods to organize the production.

You shall have minimum engineer/technical college education, with proven experience from production management on this level. You shall have a flexible and patient personality with the capability to adjust yourself to new cultures. You shall have good command in English.

S.K.L



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

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

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

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

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

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

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The successful candidate will be offered minimum one year assignment in Beijing, China.

**Contact:** Lars Jälefors, Memo ECS.ECSLAJA, +46 19 584662, Magnus Ask, LME.LMEMASK, +46 8 719 7481, Bernt Hult in China, ETC.ETCBEH.

### PRODUCTION SHOP MANAGER - RBS SYSTEMS

You will be responsible for the production of GSM/RBS systems from Gävle and Power from EKA, in accordance with the process (Master concept) established in Gävle and Söderhamn. Your production area consists of surface mounting, final assembling and package. You will have the personnel responsibility for about 50 employees. Your main task will be, together with the production management, to assure quality and delivery from the plant and further develop modern methods to organize the production.

You shall have minimum engineer/technical college education, with proven experience from production management on this level. You shall have a flexible and patient personality with the capability to adjust yourself to new cultures. You shall have good command in English, written as well as spoken.

The successful candidate will be offered minimum one year assignment in Beijing, China.

**Contact:** Magnus Ask, Memo LME.LMEMASK, +46 8 719 7481, Bernt Hult in China, Memo ETC.ETCBEH.

**Regional Marketing Unit, Europe, Africa and the Americas**  
In the aim of further Customer Focus we are looking for

### ACCOUNT MANAGERS AFRICA

The Account Manager is a key person in the marketing organization. You are leading the business creation activities and are responsible for the long term customer relations. The key role will be to: Understand the customer's situation and support them with new solutions to increase their business competitiveness and profitability, market, sell and support Ericsson's total network solutions, elaborate on marketing and financial goals, strategies and plans for each account, control the business to ensure that elaborated goals are achieved, reach financial goals through pricing and other competitive tools as well as utilization of the organization.

You know our business, are well experienced in the marketing and sales field, are a good listener and are generally creative to further develop relations and business in close co-operation with your customer.

**Contact:** Lennart Aldestam, Manager Marketing Africa, 08-7199431 memo: ETXALD, or Barbro Södergren, Personnel, 08-7195775, ETXBASO.

**Ericsson S.A., Madrid**

### RPD EXPERIENCE SOFTWARE DESIGNER

The R&D center of Ericsson in Madrid, Spain, is strongly involved in development activities within GSM switching system projects (HLR, ILR, AUC). Currently, a new project, R6.1/R3 is under pre-study phase.

Within the scope of this project, we are looking for a 2-3 year experienced designer on RPD technology. His role will be two-fold: to set up RPD competence in our organization, and to be fully involved in the implementation of AUC functionality in RPD/AXE10.

This is a key position within or sub-project. 1-2 years expatriate contract is offered. You are expected to have good communication, cooperation and initiative skills.

**Contact:** Emilio Perez, EME.EMEPPSA, +34 1 339 2921 or Juan Navarro, EME.EMEMINA, +34 1 339 2912. Fax: +34 1 339 2890.

**Ericsson LTD**

### MOBILE SECTOR - ETL

The Mobile Sector at ETL in the UK is currently being established to manage all mobile business with Cellnet and BT. (Cellnet are one of the leading UK mobile operators who are jointly owned by BT/Securicor). The sector has total responsibility for all activities relating to these customers, including full 'P & L'.

Our established business is in the provision of GSM/Transit Switching to Cellnet as well as delivery against separate turnkey GSM contracts with the Isle of Man and Guernsey. We are however working jointly with Cellnet on a number of defined business development programmes including BSS market entry, Integration, Fixed Mobile Convergence and a joint feasibility study on Shrinking Time

to Market (from Network market analysis to delivery.)

If these activities are of interest, and you would like the chance to work with a young, innovative team and shape the way we do business, please review the specific vacancies listed below. We look forward to your application.  
Graham Constantine - Mobile Sector Director

### PRODUCT PROVISIONING MANAGER

As a member of the Mobile Sector management team, the Product Provisioning Manager is responsible for making a direct contribution to the business development and profitability of the sector. The manager works with his/her colleagues to develop and implement business strategy, objectives and improvement processes for the sector.

The 25-strong Product Provisioning group holds the ultimate responsibility for delivering a solution that meet the customer's specific requirements. To achieve this the Manager creates an internal infrastructure and strong external links, with other parts of the Ericsson group and third parties, in order to provide build management, validation, integration and support activities to effectively handle the range of existing and evolving mobile products.

The Manager also has responsibility for creating and implementing a network to provide product support and has regular direct contact with customers, in addition, members of the group may be based at customer sites on occasion.

Candidates will be required to be qualified to degree standard or equivalent professional qualification, have at least 3-4 years experience of operational activities in more than one area of telecoms, proven skills in managing people and delivering business results, experience of managing internal/external customers and experience of change management.

### PRODUCT HANDLING MANAGER - MOBILE - ETL/X UK

The Product Handling Manager is responsible for ensuring that customers are supplied with high quality products that meet their specific requirements. He/she manages the provision of efficient and effective build management and validation activities for the range of products supplied by the Mobile Business Sector.

The manager works closely with the Product and Project Management departments and plans and manages the projects with the product handling group.

Candidates will be required to be qualified to HND/BSC

in a technical subject, have at least 2-3 years experience of validation or configuration management activities and have management experience.

### SENIOR MARKETING CONSULTANT X 2 - MOBILE - ETL/X UK

The role of Senior Marketing Consultant is to create plans for and manage the implementation of key Business Development activities for the Mobile Business Sector.

Working as a member of the Marketing Team, the role contributes to the overall strategy and objectives of the Sector, has key customer interface and is responsible for ensuring that customer contact is managed to present correctly the Ericsson capability as a total solution supplier.

Developing new business with the customer in line with the overall business strategy of the Mobile Sector and determining customer requirements and, by analysis of network environments, producing a marketing plan and associated business cases which will be key parts of the role. Candidates must be educated to degree level in telecommunications or relevant subject, have commercial and or financial training and have three years experience in Marketing/Product Management with good knowledge of UK telecommunications business and Ericsson Culture.

**Contact:** Graham Constantine, ETL.ETLBGCE or Andrew Wyse, ETL.ETLLAWY.

**Ericsson Radio Systems AB**

Smart Communications Inc. who operate a TACS cellular network in Philippines are planning to contract Ericsson Telecommunications Inc. to perform a turnkey implementation in 2 of the regions in Philippines, as part of their rapid expansion plans. The scope of the project is likely to be around 50 RBS883 base base stations and 1MCS. The project organisation will be based in the northern part of Luzon Island, north of the capital Manila. If Ericsson are successful in gaining this contract then implementation is scheduled to start in January 1996 and be completed within the year; to meet this target, we are looking for the following personnel:

### 1. PROJECT MANAGER

The successful candidate will have a proven track record in managing large turnkey projects together with relevant cellular experience. The requirements are: To control and coordi-

# Shop Floor Quality



Efficiency and the right quality of products supplied at the right time are decisive to whether an operation is profitable or not. However, the way to achieve this is not always simple to figure out. Just as drums are needed to give an orchestra its rhythm, instruments are needed to keep production moving along at an efficient, profitable pace. With Ericsson's Shop Floor Quality, you will be getting an entire percussion section.

Ericsson Infocom Consultants AB develop and administer Shop Floor Quality products, effective systems that are vital for the production process.

We offer complete software systems for traceability (Bartrack), quality surveillance (QSP), test and repair handling (TIS).

The systems can be supplied separately or together with other packages from the Shop Floor Quality product range, with interfaces to Ericsson's other information systems.

**From development to training**  
Through our Manufacturing Systems department, we have at our disposal both resources and specialist competence in this area.

Therefore, we are able to offer along with our products:

- development and adaptation of solutions that are specific to the customer
- expert consultation
- support and maintenance
- training.

### 24-hours support

We work according to established Ericsson standards, using fully tested methods and modern IS/IT tools.

Our support function, which is currently available Monday through Friday between 6:00 a.m. and 10:00 p.m., will soon be extended to provide support round the clock - all year long.


### What else do you need to know?

For more information about Shop Floor Quality and how we at Ericsson Infocom can help to make your production more efficient, please get in touch with:

Lars Karlsson  
phone +46 54 29 42 50  
fax +46 54 29 40 01  
memo: EIN.EINKALA

Torbjörn Lundin  
phone +46 54 29 48 60  
fax +46 54 29 40 01  
memo: EIN.EINLUTO

Ericsson Infocom Consultants AB  
Box 1038, S-651 15 Karlstad, Sweden  
Phone +46 54 29 40 00  
Fax +46 54 29 40 01

**ERICSSON** 

nate all aspects of the project roll-out in line with the site acquisition plan, and to ensure that the agreed project milestones are met on time. To establish, maintain and communicate project plans, schedules and specifications. To ensure that adequate resources are deployed to meet the requirements of the program. To ensure that that implementation is made to the highest Ericsson quality standards. To manage an office consisting of the core project organisation.

**2. RBS INSTALLATION MANAGER**

The successful candidate will have a proven track record relating to RBS installation projects together with previous experience working with another cellular operator in a similar capacity and have an in-depth knowledge of installation procedures and planning, especially for Tacs RBS base stations. The requirements are: To control and coordinate RBS equipment installation, by ensuring that adequate resources are deployed with the necessary equipment, documentation and materials. To ensure that procedures and policies are in place for site requirements, installation methods and installation quality assurance.

**3. RBS INSTALLATION SUPERVISOR**

The successful candidate will have an excellent knowledge of applied RBS installation techniques and be able to lead and communicate at different levels. The requirements are: Planning of the material and processes. Involved in the installation work. Verification that the sites have the right conditions for installation. Control and supervision of the installation work in accordance with applicable instructions. Meet the set objectives and ensure the quality assurance.

**4. RBS COMMISSIONING MANAGER**

The successful candidate will have a proven track record relating to RBS commissioning projects together with previous experience working with another cellular operator in a similar capacity and have an in-depth knowledge of commissioning procedures and planning, especially for TACS RBS base stations. The requirements are: To control and coordinate RBS equipment commissioning, by ensuring that adequate resources are deployed with the necessary equipment, documentation and materials. To ensure that procedures and policies are in place for site requirements, commissioning methods and commissioning quality assurance.

**5. RBS COMMISSIONING SUPERVISOR**

The successful candidate will have an excellent knowledge of applied RBS commissioning techniques and be able to lead and communicate at different levels. The requirements are: Planning of the material and processes involved in the commissioning work. Control and supervision of the commissioning work in accordance with applicable instructions. Meet the set objectives for cut-over of sites and ensure the quality assurance.

**6. LOGISTICS MANAGER**

The successful candidate will have long experience in handling the logistics of large projects and control of a number of the required sub-contractors. Experience in areas outside Ericsson equipment such as site preparation and electro-mechanical equipment would be a distinct advantage. The requirements are: To ensure that material requirements for the project are met. To control the material flow into the country to the central warehouse. To ensure the correct material is distributed to and from warehouse and sites. To manage and control subcontractors for site preparation and transportation.

**7. TRANSMISSION MANAGER**

The successful candidate will have a proven track record relating to projects involving multiplex and digital microwave equipment, together with previous experience working with another operator in a similar capacity and have an in-depth knowledge of installation and commissioning procedures and planning. The requirements are: To control and coordinate transmission equipment installation and commissioning, by ensuring that adequate resources are deployed with the necessary equipment, documentation and materials. To ensure that procedures and policies are in place for site requirements, installation and commissioning methods and quality assurance.

**8. TRANSMISSION SUPERVISOR**

The successful candidate will have an excellent knowledge of applied transmission installation and commissioning techniques and be able to lead and communicate at different levels. The requirements are: Planning of the material and processes involved in the transmission work. Control and supervision of the implementation. Work in accordance with applicable instructions. Meet the set objectives for sites and ensure the quality assurance.

The turnkey commitment will be for 1 year covering the 12 months of 1996; this means that the managers should be in place for planning and preparation mid-November if possible.

Please send your CV's to Simon Murray at ENP, memoid: ENP.ENPSIM If you have some questions you can also contact Anders Åkeson at ERA in Stockholm memoid: ERA.ERAAKEA.

Ericsson Corporatia AO - ECR, Russia

**BRANCH MANAGER - ECR S:T PETERSBURG**

We are establishing Ericsson in S:t Petersburg in the form of a Branch Office to ECR in Moscow. The Branch Office will have the responsibility for our activities in the S:t Petersburg area. The main task is to establish and develop a sales organization for MD110 and Business Phone and to take a substantial market share in the area. We also need to establish an installation and service department for these products. Gradually other BZ products will be introduced. The office will also be used as a base for BR and BX activities as business requires. The office is currently planned to have a staff of around 10 people.

The person we are looking for has sales management experience, preferably with our Ericsson product portfolio. You shall be fluent in English and knowledge in the Russian language is a strong advantage.

Contact: Helmuth Kegl in Moscow, ECN 835222, Memo ECR.ECRHEKE Magnus Ask, +46 8 719 7481, Memo ETX.ETXMSAK. Apl. to HF/ETX/H Magnus Ask.

Ericsson LTD, United Kingdom

**LOCAL PRODUCT MANAGER - GSM SWITCHING**

We are a small team working with the world's most demanding and knowledgeable cellular operator, VODAFONE. As local product managers we arrange and hold technical presentations, analyse requirements, specify packet contents, answer technical questions and review contracts.

You should preferably have a good knowledge of mobile switching, knowledge of IN is a big advantage. An interest and the ability to understand the customer requirements is essential.

We can offer an interesting opportunity, technical negotiations with customers, commercial considerations, together with contacts with other technical experts and SPM. You will work in Guildford (40 mins from London) in beautiful Surrey, at the Cellular Systems and Special Networks Division.

Contact: Jonas Hermansson, ETLHERM, Product Management or Helen Bennett, ETLHNES, Personnel department at Guildford.

Ericsson LTD, United Kingdom

**EXPAT DESIGNER - CCS SOFTWARE DESIGN AND TEST**

Working as part of the software design and test team in the UK headquarters of Public Systems Division. Candidates with a knowledge of CCS-7 protocol would be preferable. AXE-10 experience is essential as is a knowledge of Ericsson processes. Candidates must also be able to work as part of a team and have good communication skills.

Contact: Paresh Joshi, Section Manager on ETL.ETLPHJI or Joanna Comber, Recruitment Administrator ETL.ETLIACR.

Ericsson Systems Expertise LTD, Cellular Design Division, Beech-Hill, Clonskeagh Dublin 4, IRELAND

**EXPERIENCED STAFF, CUSTOMER DELIVERY**

Have you ever thought about living in Ireland? This is a good opportunity for you to move to Dublin and work with the Cellular Design Division of EEI.

The Cellular Design Division is responsible for software development and customer support in CME20/BSC(GSM) in the CMS88/MRS (D-AMPS) Systems.

We are currently looking for experienced staff to reinforce our Customer delivery capability. Interested candidates are expected to have the following attributes: A minimum of 3 years experience in AXE10 S/W Design/Verification; good communication, co-operation and initiative skills; be able to work well in a team environment.

Positions will be offered on either a contract basis (2yrs + duration) or local contract.

Contact: Anne Marie O'Sullivan Personnel Manager, memo: EEI.EEIAOS e-mail: eeiaos@eei.ericsson.se Tel. + 353 1 272870 and /or Margaret Mananamon Contracts Manager EEI Memo: EEI.EEIMMM Tel. + 535 902 74601.

Ericsson Radio Systems AB, Kista

**CELLPLANNERS FOR LONG TERM CONTRACT IN INDIA**

We are looking for a cellplanner for a long term contract in Delhi, India. The Indian market is expanding rapidly and you will be a member of the Radio Network Design team at Ericsson in Delhi (ERI). The main part of the job is planning and tuning a GSM 900 network in Delhi together with market support for GSM 900 in other regions in India.

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

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

Ericsson Radio Systems AB, Kista

**MSC/BSC INSTALLATION AND TESTING SUPERVISORS TO TURKEY**

Due to the continuing success of the GSM cellular system sales to Turkey, we are looking for 2 Installations Supervisors and 2 Testing Supervisors for long term contract in Istanbul, Turkey.

Qualifications: Minimum 5 years installations/testing experience of AXE, preferably mobile systems, supervisor experience, structured and process oriented.

Contact: Peter Flygare, memo: ERAPEFL, +90 212 286 06 06 Mohammad Khattab, ERAMOKA, +90 212 286 06 06 or Ali Ercan, ECOM.ENKAOE, +90 212 655 36 04.

Ericsson GMBH, Germany

**1. PROJECT MANAGER VIAGCOM**

For our technical customer service, location Munich, we are urgently searching for a project manager viacom. The overall purpose is to manage the extensive and/or complex implementation in the network operation area. Additionally you will be responsible for the complete implementation, accounting and acceptance procedures as well as leading of assigned project members. Establishing of new service concepts for this area and corresponding price calculations also belong to your responsibility.

Following requirements are necessary to qualify for this job: A qualified telecommunication education or university degree (telecommunication, electro technics, computer), technical experience and knowledge, basics in logistic and administration, experience from a similar position (project manager, techn.mgr) experience in dealing with customer and colleagues and fluent in English (speech and writing). Furthermore, reliability, team spirit, organisation skills and ability to work on your own are required.

Contact: Ericsson GmbH, Business Networks, Duesseldorf/Germany, Mr. Dietrich Kunze, Technical Manager, +49 211 534 4250.

**2. NETWORK MANAGEMENT/PROJECT MANAGER**

Due to the foundation of our new dept. network operators we are urgently looking for a network manager for the project marketing in our local company in Duesseldorf. We offer you an interesting and ambitious position. The main authorities and tasks are: Conception of network management and accounting questions within large projects, preparation of offers, customer presentations, project related co-operation with business partners, know-how transfer of german requirements, ability to present it within ericsson or to external partners and to transfer the know-how into network solutions. As a suitable candidate, you have the following experiences and qualifications: Network management strategies and principles, network management systems of different suppliers, network management integration, billing and accounting systems, university degree in telecommunications engineering or MIS, English fluently and good ability to work under pressure. This position requires also initiative, good communication skills, ability to work in a team and organisational talent.

Contact: Ericsson GmbH, Business Networks, Duesseldorf, Germany Dr. Gerd Neumann, Mang. Network Operators, +49 211 534 4180.

**3. ACCOUNT MANAGER**

As network management/project manager additional experiences and qualifications are: Sales to key account customers, public networks (SSP, SCP, IN/VPN) and private networks (PBX, Protocols, Voice Networks), data communications (WAN; LAN), transport networks (ATM; SDH).

Contact: Dr. Gerd Neumann (see above).

Eritelcom S. A., France

**HARDWARE ENGINEER**

Eritelcom is looking for 1 confirmed Hardware designer from the Ericsson group for a 9/12 month period, or for 2 confirmed Hardware designers for a 6/9 month period.

Position : confirmed Hardware Engineer Objectives : design 1 or 2 boards in a PABX environment. This board(s) will provide the radio DECT functions as currently ensured by the Freeset system. Freeset is the DECT

Radio Exchange from EMN. PABX are those from Eritelcom (MD30 range). This job will consist therefore in: Reusing as far as possible the existing hardware blocks in the Freeset system and designing an "Interworking unit" (IWU) between Freeset architecture and PABX architecture.

This job will need to have lots of contacts with EMN. 3 months are planned for the design part, 3 other are planned for the testing part, 2 other for the documentation and the manufacturing test instructions. The engineer(s) will be assisted by a software engineer (IWU software). Of course hardware engineers in charge of MD30 will give support during this design activity.

Competences: Board design (interface or CPU) based on telecom components, practical approach of EMC in the design process and microprocessors 68xxx and 8051 if possible.

Availability : asap (october)  
Location : Malakoff (city very close to Paris).

Contact: Luc Turbet Delof, +33 1 41 17 29 14, Memo: EZF.EZFLTDC or Gilles Pichon, +33 1 41 17 29 50, EZF.EZFGPIC.

Ericsson Ltd, Guildford, UK

**SSF-AM DESIGNERS**

At ETL in Guildford we are developing the new SSF-AM for mobile IN. We require designers to work on the functional design and possibly follow into plex design. The assignment would be for 6-9 months starting ASAP.

TCAP/INAP/ASN.1 knowledge would be a bonus. Knowledge in AXE methods and design is a must.

Participants will gain AM experience and knowledge of mobile IN.

Contact: ETL/RU/HC Steve Foster. Memo: ETL.ETLSJFR or ETL/RP Helen Bennett. Memo: ETL.ETLHNES.

Ericsson Australia Pty, Melbourne

**MOBILE SUPPORT ENGINEER**

The Australian FSC supporting Telstra Mobilenet is expanding and require the services of a 2 support engineers. Telstra Mobilenet has a customer base of 2 million subscribers which makes them equal to the largest cellular operator in the world. The network currently consists of 15 GSM sites and 45 AMPS sites.

We require 2 support engineers to work within the GSM support area, one for SS trouble shooting and the other for BSC.

- Responsibilities:
- Trouble report analysis/solution development.
  - AS/CNA testing and support.
  - Development of local market corrections.
  - Delivery of software correction packages.
  - Liaison with customer reg. support and project issues.

Qualifications: Bachelor of Engineering or Computer science or equivalent experience, must be fluent with PLEXC and ASA210C, Must be competent with AXE10 trouble shooting techniques in live switches, mobile experience an advantage and GSM experience a definite advantage.

Contact: Tony Cooper, Manager Telecom FSC (EPA.EPAAYC), +61 393014524. Written application to Connie Malligeorgos for acknowledgement of application. (EPA.EPACMM)

Ericsson (China) Company Limited, ETC

**SYSTEM SUPPORT CHINA**

The Telecommunications market in China is dynamic and growing fast. The customers needs are changing. The demand for digital systems, mainly GSM, is urgent. Ericsson's history in China has been primarily in analogue mobile systems, the last years, (mainly TACS). Our challenge is to meet these urgent demands in the shortest possible time.

In order to meet this challenge, we need committed and motivated people with GSM experience. We have positions available as System Support Engineers.

The experience qualifications that are required include: Two or more years of well documented experience in at least one of the two areas above. The ability to take initiative and find creative solutions to emerging problems. Good communications skills in both the written and spoken word. A good command of English. The commitment and ability to train and develop local staff. Experience as a manager or project leader would be a valuable asset. Long term assignment will be available for both single or married candidates. Positions are based on a number of different locations within China. The candidate must be prepared to travel, in the work.

Contact persons: ERA/LDH Hans Falk, 08-7571402. Memo: ERA.ERAHFA or ETC Dan-E Grobecker, +86 1 5051190. Memo: ETC.ETCGROB. Appl. to: KJ/ERA/LDH Hans Falk, alt. fax +46 8 4045311 or memo: ERA.ERAHFA.



# CONTACT

Ericsson, HF/LME/I, Room 811023, S-126 25 Stockholm

## Fierce competitors become good partners

**Can competing companies cooperate and support the same research project?**

**"Of course," says Professor Robert W. Dutton, from Stanford University, who believes that it is the open dialogue between the institution's and corporate researchers that attracts the participation of competing companies.**

Ericsson, Motorola, Intel, Siemens, IBM, Texas Instruments and Philips are a few of the companies contributing to research activities at Stanford University's CIS unit.

"The corporate sector has discovered the benefits deriving from not keeping such a tight grip on their information.

### Joint research provides companies with more information.

Releasing a little of their own information and gaining access to that of others propels development," says Robert W. Dutton, professor and head of research at Stanford University's Center for Integrated Systems, CIS.

According to Dutton, the fact that several of CIS's member and supporting companies are competitors does not pose any real problem. No company has placed any specific demands regarding such aspects as secrecy when the open research projects are in progress.

"We try to make the research environment as open as possible. And the companies working with us have realized the benefits derived from having an open research atmosphere.

"On a few individual occasions, slight problems have arisen, but as long as we do not engage in company-specific research, it is possible to bridge the differences and resolve such problems."

#### Member companies

The companies comprising the corporate circle around CIS often become members as a result of personal and commercial contacts. There are several reasons why Ericsson is now a member company. According to Robert W Dutton, however, the main one is Ericsson's own expertise in microelectronics, which makes the company an attractive partner for Stanford.

"But naturally, it was an advantage that Ericsson cooperates with Texas Instruments, which has long been one of our partners. Moreover Torkel Arnborg is an old friend of mine." The focus of CIS's research is determined through interaction



**Professor Robert Dutton, from Stanford University, during a visit to Ericsson Components in Kista.**

**Photo: Anders Anjou**

between the institution and the associated companies.

"When we build up a research faculty and seek a new professorship in, for example, cordless communications, we must, naturally, finance such research. We therefore contact the supporting companies and secure support for the new field of research among the companies interested in the area."

Stanford is a private university and does not automatically receive federal funding for its research activities.

#### Realize ideas

Despite the need for money, the main objective of Stanford's research is not to create commercial products. Instead, the primary aim is resolve problems and realize ideas. The participating companies now understand that this manner of research creates "snowball effects."

"Microelectronics is an apt example of a technology in which research results can generate snowball effects. The results of research may create a spectrum of new opportunities and applications. This triggers the interest of our partners, who then provide support for the development of the research findings. Ultimately, the original field of research may result in commercial opportunities in the form of products and/or services."

Naturally, participating in this type of project is of value to Ericsson. However, the year-old partnership with Ericsson also provides new opportunities for exchange and development, Dutton explains.

"Ericsson is the leader in research and development within the telecommunications sector. Gaining insight into this area is of interest and value to our students."

**Text: Lars Bäck**

END  
LINE

LARS-GÖRAN HEDIN



### Cure for colorlessness

**N**ot too long ago I read about how a salesperson at one of Stockholm's more fashionable men's clothing stores could quickly identify an Ericsson customer by his sober tie. As a rule, Ericsson products follow the same pattern. They are often characterized by their strict and functional industrial design, but seldom could you call them colorful.

Now that the mobile telephone has moved Ericsson into the consumer market, there are many who are concerned about this fact – particularly after several competitors began to profile their fashionable phones.

Ericsson's response was unveiled just the other day. At Telecom 95 in Geneva, being able to affix small illustrations of famous artists to your pocket telephone was launched as a great new innovation. That is, if you happen to have the model with a flip-cover over the pushbuttons. And if you live in one of the Nordic countries. It appears that the rest of world is not ready to cope with such daring art fashion, as yet... Time and the sales figures will tell if this will become big or minor news in the mobile telephone world. We only hope that the market strategists at Ericsson Mobile Communications know what they are doing.

In any case, one cannot help wondering if this is all that Ericsson can do to "jazz up" its telephones. Today, most people should be aware that youth and women account for unexpectedly large share of pocket telephone purchases. Therefore, surely you need to offer more than being able to stick a pretty picture in a telephone. You need to take a complete approach, not just a single shot, in my opinion.

On the other hand, maybe it is not such a bad idea to have a pocket in the flip-cover. You can use it for other things than the art you buy in the tele store. A photo of your spouse and children, or such.

Too bad that there is not enough space on the flip-cover to list all of Ericsson's abbreviations and acronyms, so that you would have the code at hand when someone from the company calls and introduces themselves in the normal "Ericsson speak."