

CHANNEL

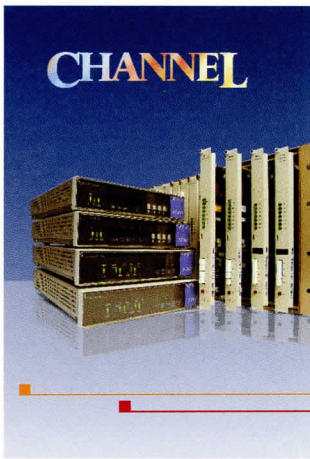
Nokia Data Communications



Arrival of
New Leased
Line Modems

Turkey on Line

first edition
November 1988



The front cover shows the new leased line modems available in both stand alone and rack mounted form.

Introducing Channel

This is the first issue of our international customer magazine, Channel. It is published not only for our customers but for all others who share a mutual interest in data communications equipment for all lines of business.

With Channel we would like to take you behind the scenes and keep you up to date with developments in our products and services. Channel also tells about how Nokia Data Communication supplies its equipment to different countries and also takes a look at individual applications designed for specific needs.

Since the life-span of data communications equipment is very short, product launches and modifications in existing products are frequent. Channel is one way of informing you of these changes. We want you to be the first one to capitalize on the achievements of our R&D activities.

To give you a complete picture of Nokia Data Communications we will also print corporate news items like appointments and other changes inside the company. Also events such as international fairs, seminars and meetings are among the topics.

Channel appears quarterly. It acts as an information forum between you and us. We are only too pleased to provide you with more information on any of the topics featured in this magazine. Furthermore, we welcome your opinions and ideas about this magazine. We hope you enjoy Channel.

Greetings from

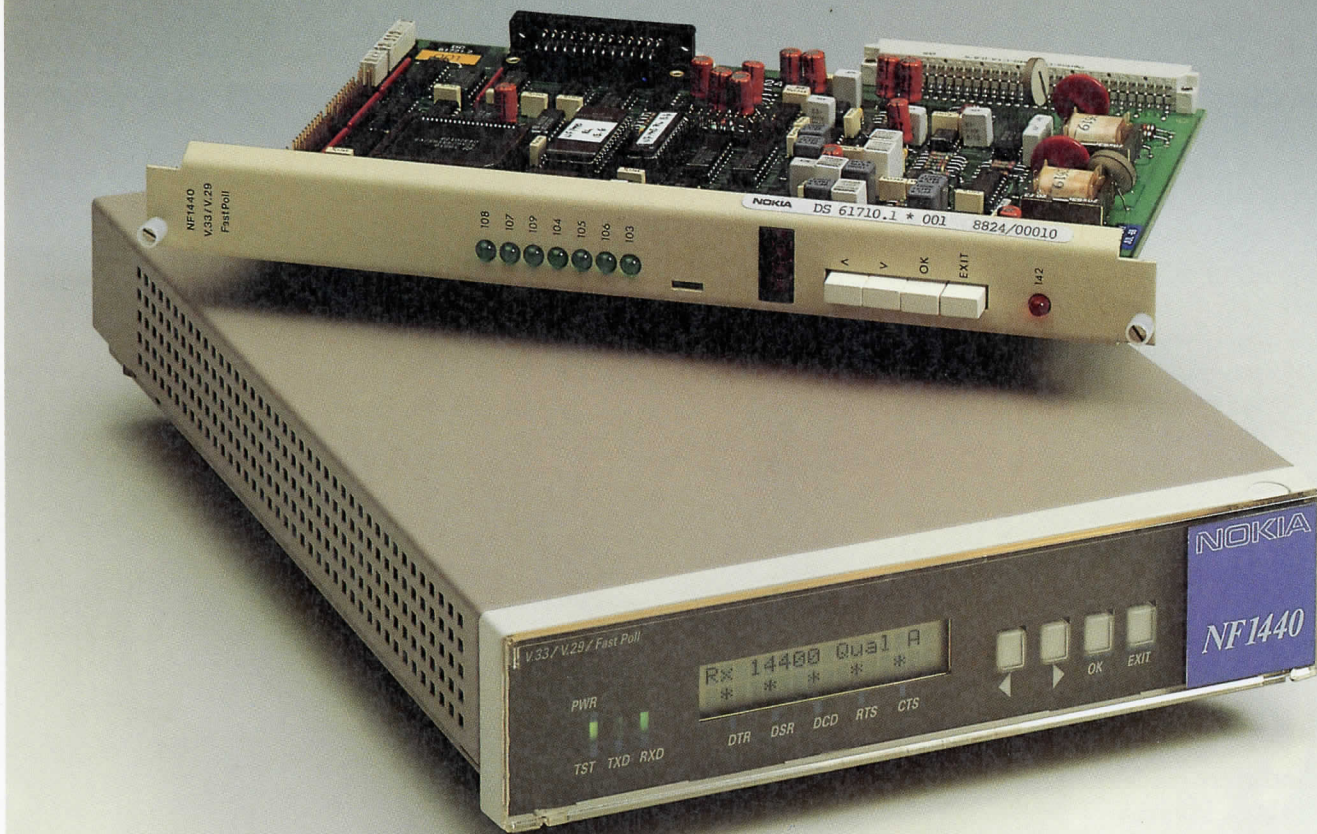
the staff of Nokia Data Communications

October 5th – a milestone in leased line modems

by Heikki Mäkijärvi

Nokia Data Communications launched new leased line modems on 5th of October, 1988. New modems, bearing the names N- and NF-series modems, are the latest achievement in the long history of Nokia's leased line modems. Four new units, all in both stand alone and card modem form, partly complement, partly compensate the already wide range of leased line modems. As a result, Nokia Data Communications now offers a complete range of high performance leased line modems for all standard applications.

There were several reasons for designing new modems: a growing demand for higher speeds in multipoint operation, for example, brought out the new NF1440, 14400 bps multipoint modem – the first of its kind on the market. Furthermore, there



were some gaps in the range of rack mounted modems; now those gaps are filled. In addition, there is growing competition from two directions: new services and digitalization threaten the entire leased line market, while new LSI-products are forcing the prices down. To ensure Nokia's long-term competitiveness, Nokia's new modems combine Nokia's know-how of modem design with the semi-custom circuit design and digital signal processors. Standard modem circuits did not satisfy Nokia's high standards of performance and quality.

All new modems are based on the same basic modem development. The details are built according to specific requirements in every case, but without compromise on reliability and high performance. Now the modems meet all line requirements and are ready to

meet any competition from other vendors.

There are two new product families: N-series modems are multispeed point-to-point modems, the NF-series completes Nokia's range of multifunction modems. With the NF-series there are now modems operating on both multipoint and point-to-point applications from 4800 bps to 14400 bps, the highest CCITT-defined speed. The new products are:

NF1440: 14400 to 4800 bps multipoint/point-to-point modem

NF960: 9600 to 4800 bps multipoint/point-to-point modem

The multipoint operation has two alternative fast polls, 14 ms and 30 ms. The 14 ms fast poll on 14400 bps line speeds requires expertise in algorithms and digital



As tension mounts Heikki Mäkijärvi and Lauri Luomi, architects of the new leased line modems, unveil the products.

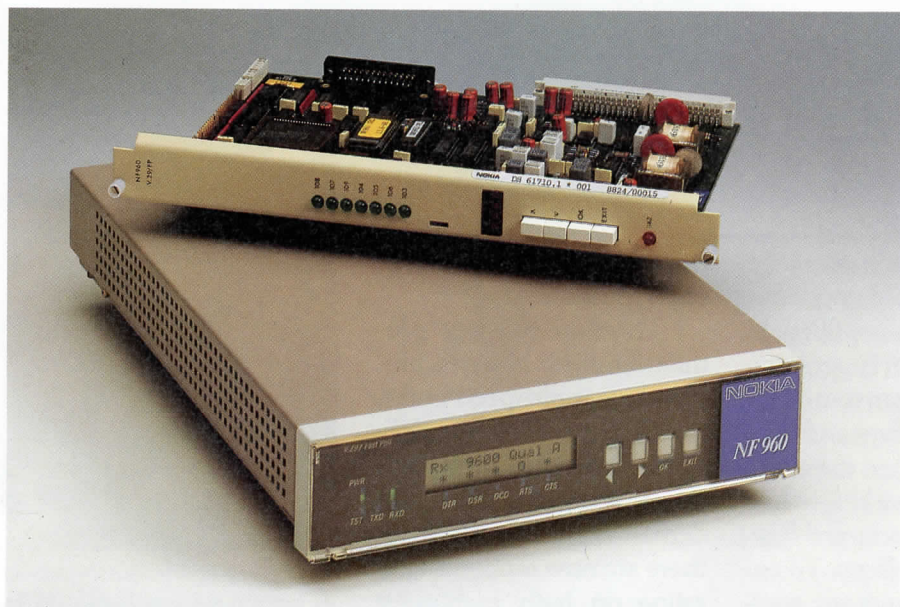
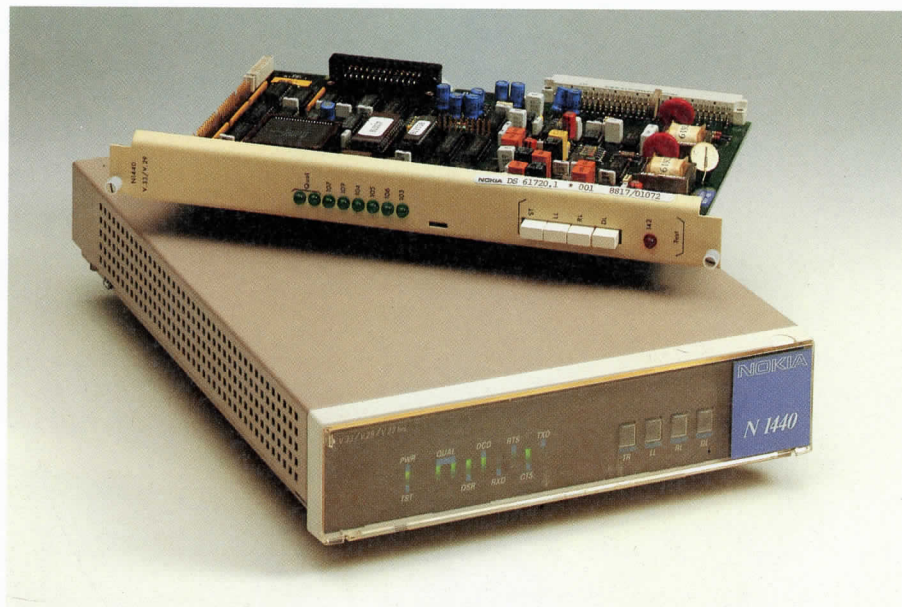


Here admiring the new N- and NF-series modems are Danny Ral from S.A. Muxum Data Communications N.V. of Belgium and Wil Vermeer from Muxum Data Communicatie B.V. of the Netherlands.

signal processing – specialties of Nokia. The multi-point operation contains also other valuable features: combination of transmission rate and fast poll time can be different even in each slave modem, the master modem detects and operates with them without interruptions. Furthermore the modems are equipped with versatile test functions to support the independent testing of any network configuration. The point-to-point operation is completely CCITT-compatible with V.33/V.29 recommendations. The wide range of operations and other modes are controlled via informative front-panel operation. Easy-to-use, menu driven operation is used with an alphanumeric display unit.

The N-series modems are special point-to-point modems with a real multi-speed operation: all models support speeds from 2400 bps up to the nominal speed, all compatible with the relevant CCITT recommendations. The multi-speed operation is efficient in applications, where the speed is changed as the system grows. Especially in networks with varying speed support, N-series modems offer an economic way of building the central end with a single modem model. The CCITT compatible modem models are:

N1440: 14400 to 2400 bps
point-to-point modem
(V.33/V.29/V.27bis)
N960: 9600 to 2400 bps
point-to-point modem
(V.29/V.27bis)





Nokia Data Communications and Sweden's Televerket expand cooperation

Signing of the new agreement. Front row from left to right: Olof Fahlen of the Swedish Telecommunications Administration, Folke Ahlbäck of Nokia, Sven Hedberg of the Swedish Telecommunications Administration, and Egon Cronhjort of Nokia. Standing in the back row from left to right are Lauri Luomi of Nokia, Mikael Perman of the Swedish Telecommunication Administration, Veikko Ahoniemi of Nokia, Berndt Wiklund, Rune Swalbring, Lars Thelander, Birger Roslund and Benny Wahlberg of the Swedish Telecommunications Administration, and Jörgen Holmström and Jussi Hakonen of Nokia.

The recent agreement signed by Nokia Data Communications and the Swedish Telecommunications Administration makes Televerket the representative of Nokia's modems, multiplexers and digital network equipment for Sweden.

Over the years Nokia has already been a major supplier of data communications equipment to Televerket. More than half of the modems sold by Televerket have been developed and manufactured by Nokia. The equipment has consisted mainly of base-

band modems for local connections and modems for leased, long-distance connections.

When entering into this agreement it was decided to expand Televerket's product range. Now statistical multiplexers, the new NokiaMux family, belong to Televerket's full range of Nokia products.

Televerket has an efficient field organization covering the whole of Sweden and giving excellent customer service to its customers. Following the liberalization of the Swedish data com-

munications market, Televerket decided to concentrate on one supplier of data communications' equipment and so chose to develop its cooperation with Nokia. In this way Televerket is determined to maintain its position as a market leader also in the future. By combining their strengths Televerket and Nokia have the best possible prerequisites for continuous success on the Swedish market.

Nokia Data Communications – an expert in its own right

In a nutshell our aim is to meet users' needs by developing, manufacturing and supplying products that facilitate effective use of telecommunications networks for data communications purposes.

Part of the Nokia Group

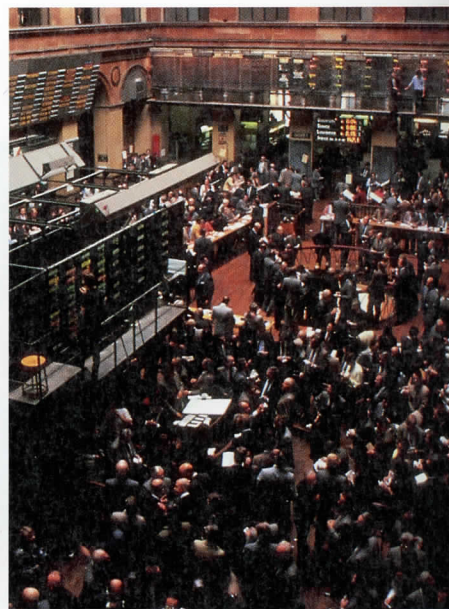
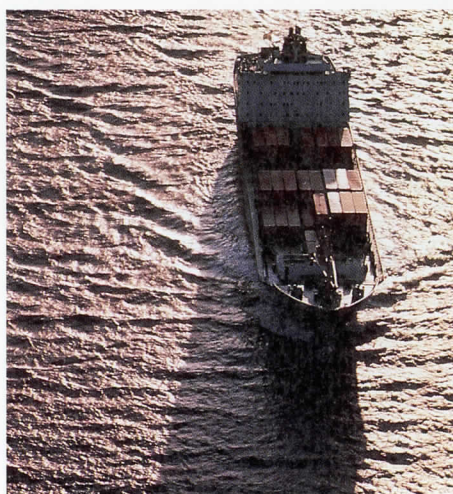
Nokia Data Communications is part of the Nokia Group whose 1987 sales were USD 5.2 billion and whose stocks are officially quoted on the stock markets of Helsinki, Stockholm, London, Paris and Frankfurt. Nokia has 45,000 employees, the majority of which are working outside Finland. 65 % of Nokia's sales are in the electronics sector – namely information systems, telecommunication systems, fibreoptics, colour televisions and mobile telephones.

Nokia Data Communications – a major international player

Nokia Data Communications specializes in modems, multiplexers and digital network equipment. Our factory produces over 100,000 standard pieces of equipment a year. Annual growth is around 20%.

Nokia Data Communications exports its products to over 30 countries around the world; Iceland to Australia, the States to Japan. We are already the market leader in Portugal, Ireland, Turkey, Sweden, Denmark, and of course, Finland. While Europe still forms our major market area we have also recently gained strong footholds in Hong Kong, Singapore and other Asian countries.

The achievements during the years of rapid progress have not come easily. In the first years of operating as a modems division for Nokia Electronics, resources were limited. A group of less than five people answered for the R&D. As Folke Ahlbäck, Nokia Data Communications' general manager



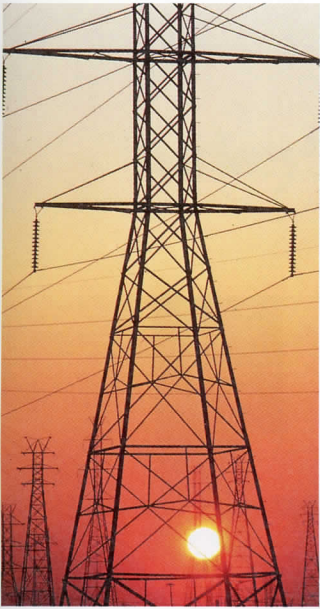
says, we can see two stages in development. Typical of the first stage was experimentation, learning, adopting and concentrating on the needs of the domestic market. The second stage opened a straight road towards growth. This growth meant also penetration into international markets.

In 1976 Nokia's modems division signed a contract with the Nordic countries concerning the Nordic Public Data Network. Nokia developed equipment especially for this network. The task of building a network covering the Nordic countries opened a gateway into other important agreements. Sweden's and Norway's PTTs were the first export customers to choose Nokia modems. In 1981 the Austrian PTT with Kapsch AG and the Swiss PTT with Zellweger Telecommunications AG made long-term agreements concerning the purchase of Nokia modems. The same year Nokia's modems division began to use the

name Nokia Data Communications, which we still use today.

Nokia Data Communications soon earned a reputation in Scandinavia and other European markets as a manufacturer and supplier of high-quality data communications equipment. It was time to look even further afield and enter into the Asian markets. The Hong Kong telephone company, the first customer in this region, purchased Nokia's 1200 bps V.22 and 4800 bps V.27 modems. Singapore Telecoms followed Hong Kong's example and ordered the 2400 bps V.26 leased line modem. Taiwan, Thailand and Indonesia, to name a few countries, also chose Nokia modems. In 1985 Nissho Electronics opened the way to the vast Japanese modem market. Nokia Data Communications could be content with its progress.

Despite differences in market sizes, we consider every country equally important. We strive for excellent



service in everyday business operations. As an example of commitment to customer service, Nokia developed a specific modem based on the needs of the Danish farming industry. The modem is known as the DS 3565 or as we call it, the farmer modem, which has also been modified into different versions to fit other purposes.

Not only the PTTs have benefited from Nokia's knowledge. Also large single customers with wide networks have received the personal customer service and quality products that one would expect from a leading supplier of data communications equipment. The idea is to create products according to customers' needs and to offer a complete package from installation to maintenance.

Liberalization of market areas has meant a great deal to Nokia. The possibility to enter into free markets means competition but also opportunities. The Danish local telephone compa-

nies, for example, represent Nokia's products. The advantages are mutual, Nokia gains good contacts covering the whole of Denmark and the telephone companies possess a complete range of high quality products with the best technology and the best MTBF figures.

Modern technology

Nokia has all the relevant data communications know-how inside its own company. The high level of Digital Signal Processing (DSP) expertise has enabled the development of high speed modems and the production of more complex equipment. 10 years of echo-cancelling, first developed for the 2400 bps full-duplex baseband on 2-wire lines according to CCITT V.26ter, then for the 1200 bps to 19200 bps 2-wire baseband and later for the V.32 9600 bps dial-up modem, has signified reliability of data transmission for users of Nokia's products.

High speed technology has enabled mass production of a 9600 bps fast poll modem, which has attained excellent performance values. Now statistical multiplexers have opened a new opportunity in the wide area network business. Modern technology such as computer-aided design, computer-aided engineering and surface mounted technology is used extensively to develop equipment according to the latest demands. DSP-know-how, echo-cancelling, high transmission rates and other features of Nokia modems are planned in accordance with CCITT-standards, the most important De Facto as well as Bell standards.

So how does Nokia Data Communications succeed in individual market areas? The answer is through R&D and customer service. As Folke Ahlbäck says, our most vital trump cards in competition are the high quality of planning, manufacturing and customer service. Close and long-term cooperation is a way of life with data communications customers.

The basic product is planned taking specific market needs into consideration. The minor modifications often needed in projects are made together with the customer, says Risto Särkilahti, head of the R&D department. This is the best way to modify a Nokia product so it functions optimally in a specific country or network. We are well acquainted with European as well as Asian data communication environments. We understand the background for demands customers impose on our equipment. Our flexible production adapts to necessary changes to make equipment suitable for varying countries and even varying users.

The bottom line is customer satisfaction. We are fortunate enough to have the standard of products and services that customers value. We have worked hard in applying the right combination of resources which best suit the project in question. Our growing family of customers would suggest we are on the right track. The representatives benefit from products that sell well. The user benefits from equipment that functions without problems.

VIS – a young and dynamic distributor in Turkey



by Kari Lahtinen

Vis Veri İletişim Sistemleri Sanayi Ve Ticaret, commonly known as VIS, was founded in late 1986 to distribute Nokia Data Communications' products. There was need for a data-com company with good customer services and VIS was a response to that demand. Mr Ali Yurtsever, general manager for VIS, has led the company for almost two years, having extensive knowledge of data communications equipment and of the Turkish market.

Prior to the establishment of VIS, Nokia had already sold 3500 dial-up modems to the Turkish PTT after beating off tough competition. The name of Nokia was introduced but not yet widely known to datacom users in Turkey.

In 1987, in its first year of operation, VIS already made its mark. In 1988 it won the sales performance competition for Nokia's Asia-Pacific distributors. For 1989 sales are expected to double, in which case VIS will be one of the top distributors for Nokia.



In a short space of time VIS has earned a reputation for excellent customer service.

A few months ago VIS moved into new office premises. The new office is modern and efficient, the number of staff already exceeds fifteen. The three key persons developing the company are Mr Ali Yurtsever, who also takes care of sales, Mr Mehmet Özkal running the technical department and Mr Mesut Tatlipinar taking care of financial matters.

In addition to the dominating position in dial-up modems, VIS has captured the major part of the 64 kbps modem market being the first company to introduce both domestic and international 64 kbps high-speed data channels. The Nokia ECM 24, error correcting auto-dial modem has been one of the best-sellers together with the equally renowned Nokia DS 3540 9600 bps and DS 3648

4800 bps leased line modems. Of course many other modem models are sold to Turkish customers; to internationally well-known companies like IBM, NCR, Reuters, Hoechst, Procter & Gamble and so on. The biggest data communications user group, however, is the Turkish banks, 17 of which are already users of Nokia modems.

The key factors behind the success of VIS have been a professional team with a high level of know-how, the strong belief in one's accomplishments, Nokia's high-quality products and, of course, a generous helping of hard work.

Turkey's Imar Bankasi moves on-line



In the corridor next to the EDP centre of Imar Bank in Istanbul, Turkey, stacks of familiar white and blue coloured boxes welcome visitors and indicate that something big and important is happening. The newly arrived packages are a delivery of Nokia modems.

The "On-line project", as it is called, is being realized. Imar Bankasi has been planning its own network covering their offices in Turkey. The countdown for the project began two years ago when the targets and the timetables were fixed, the project staff was appointed and the task initiated. That was when the project leaders compared possible solutions, made studies, invited vendors to submit quotations, sifted through every detail and finally came to important decisive conclusions.

The on-line project has been divided into three sub-projects, the computer centre, network and branch offices.

Moving on-line naturally requires sufficient computer power in the head of-



Mr Ali Yurtsever and Mr Mehmet Aksayan provide Turkish datacom users with high-performance Nokia modems.

fice and that was the first thing to put in order. The new mainframe with communication controllers, big capacity disk drives and other necessary peripherals replaced the well served previous one.

Next the branch offices were provided with terminals and computers capable of both on-line and off-line processing.

The biggest part of the project, the networking of almost 40 branches all over Turkey, was also the most demanding. The requirements not only for today, but also for years ahead, required basically synchronous data transmission. But because office automation is becoming more and more common and is typically asynchronous, this also had to be kept in mind when planning the network. Re-

liability is a way of life for banking networks, therefore a back-up system was one of the most vital specifications.

Nokia's distributor in Turkey, Vis Veri Iletisim Sistemleri Sanayi Ve Ticaret A.S., was innovative and submitted the winning proposal.

The backbone of the network between the three cities of Istanbul, Ankara and Adana, was proposed as a triangular form using a statistical multiplexer network with rerouting capability. To guarantee the error free data transmission the best-known 9600 bps modem, Nokia's DS 3540, was selected for trunk connections. Izmir, one of the major cities in Turkey would be connected by point-to-point multiplexers supported by Nokia's 4800 bps, DS 3648

Premio Smau Industrial Design Competition

An international fair in the field of electronics is held yearly in Italy. Known as the Smau fair, this is one of the most acknowledged Italian fairs and was held this year from September 28th to October 3rd in Milan.

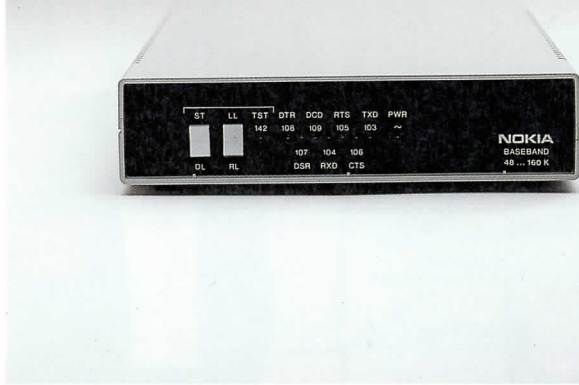
Not only are operational qualities a necessity in electronics, but also high quality design is admired and valued. Therefore this competition focuses on the best industrial design of the year. Only about 20 products get to the "grand finale" after being evaluated by the judges. And a Nokia modem did just that.



This year's competition was the first time ever a modem was among the competing equipment. The modem in question, Nokia's VB 312, is an easy-to-use modem for dial-up lines with auto-dial capability. It is compatible with CCITT V.21 and V.22 recommendations. Thanks to its attractive form and easy installa-

tion, the VB 312 fits well into a stylish office environment.

Choosing only one product from 20 stylish winners is never easy. This time victory went to IBM. Congratulations to IBM!



64 kbps baseband, the next step for Imar Bankasi?

modems. All the branch offices are to be connected to the nodes by error correcting auto-dial modems, DS 3681, over leased lines. But the DS 3681 is also capable of providing back-up over dial-up lines and asynch/synch conversion thus fulfilling all the requirements for the network.

The network will actually serve two banks, Imar Bank and Adabank, which belong to the same banking group. The previous network was based on 4-wire point-to-point connections between the EDP centre and branch offices. The network solution was too sensitive to disturbances and expensive due to high leased line costs.

Mr Mehmet Aksayan, EDP manager, claims that the new network will in just five years save the amount equal to the purchasing price in lower line rental costs. Mr Mehmet Aksayan, the architect of the project, relies on VIS' efficient pro-

fessional services and Nokia's modems.

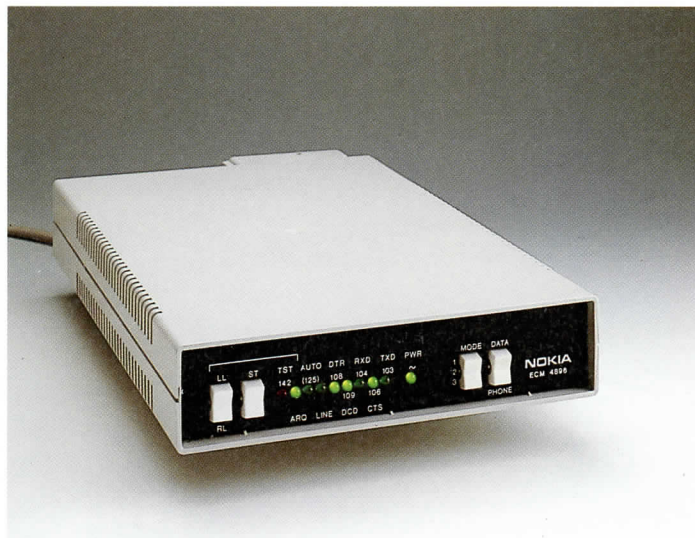
"The least of my worries are Nokia modems, because I know they will operate perfectly from the very beginning", he says. The current network plan will be completed in a few months and the network will be fully operational in early 1989. As always, a network solution is not permanent but is changing continuously. This naturally demands flexibility and close cooperation between the customer and supplier. The first modifications for Imar bankasi have already been made to optimize the function of their network.

"The future will almost certainly require higher transmission speeds and we are already thinking 64 kbps high-speed links for the backbone network", says Mr Aksayan.

New order from Swiss PTT

by Kari Horko

The Swiss PTT has recently awarded a new contract to Nokia Data Communications together with our distributor in Switzerland, Zellweger Telecommunications, for the supply of V.32 modems. The decision was made for the brand-new ECM 4896M, which includes MNP error correction in addition to the previous LABP-protocol. Another important point in the decision was the fact that Nokia had the only real multimode



modem including downward compatibility with V.22 and V.22bis modems. Deliveries of this new modem type started in June 1988. With this new contract the Swiss PTT is now

one of the major customers of Nokia Data Communications.

Datacom seminar in Kuala Lumpur

A data communications seminar for 65 major users was held at the Hilton Hotel in Kuala Lumpur, Malaysia on 1st September, 1988.

The main topics of the seminar were:

1. High-speed dial-up modems
2. High-speed data transmission in digital networks
3. Advance statistical multiplexers in networking
4. Multidrop networks

The seminar was arranged by Innovest Systems & Services, local representative for Nokia's data communications equipment, and Nokia Data Communications. This successful seminar was opened by Mr G.Lau, ma-



naging director of Innovest S&S, who emphasized the importance of networking and network management systems in the future. Mr Adrian Yong, general manager of Innovest S&S presented ISS' activities.

From Nokia Data Communications presentations

were given by Mr Risto Särkilahti, R&D director, Mr Heikki Santaniemi, development manager and Mr Kari Lahtinen, sales manager for the Asia-Pacific region.

Appointments in Nokia Data Communications

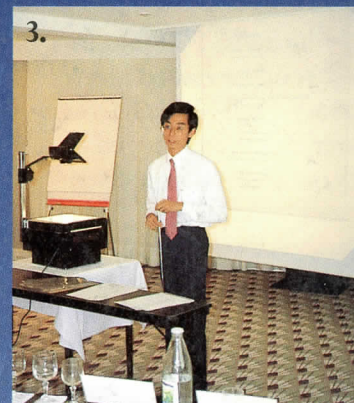
Mr Hemmi Piirainen has been appointed production manager responsible for product manufacturing in our Rusko factory based in Oulu in northern Finland. He formerly held the post of product manager.

Mr Jussi Hakonen returned to Helsinki from his assignment in Oulu. He is now head of the quality control department of Nokia Data Communications.

Mr Antti Rasilo moved from the quality assurance department to head of the materials department. He is responsible for production control and for purchasing operations.

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1988 Marketing Seminar in Cannes



1. The Hotel Martinez, located on Cannes' beautiful Boulevard de la Croisette on the French Riviera, was the centre of events for Nokia Data Communications' 1988 marketing seminar.

2. Mr Sven Hedberg from the Swedish Telecommunications Administration gave us a thorough view of trends in Sweden.

3. Mr Francis Ng from Nokia's Singapore office informed us about the present situation on the Asian markets.

4. "Victory for Shoden Corporation of Japan!"

5. The three companies awarded certificates for outstanding marketing were, Shoden Corp. of Japan represented by Mr Hayasaka, Zellweger Telecommunications AG of Switzerland represented by Mr Dumont and Datico SpA of Italy represented by Mr Picinelli and Mr Giovannetti.

6. Mr Petter Langum from Elektrisk Produktion A/S of Norway expresses his appreciation on behalf of all representatives to Nokia Data Communications for a thoroughly successful seminar.