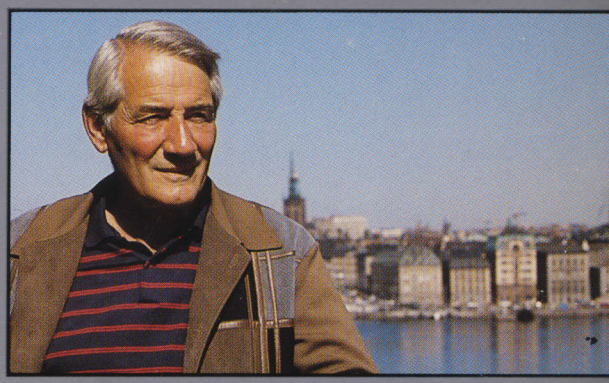
SWEDEN IN FACT 1987



CHIEF EDITOR: GUSTAF OLIVECRO

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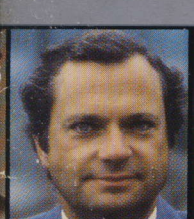
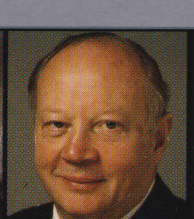


The King and his palaces

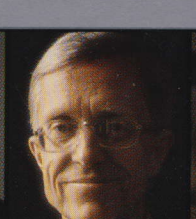
The Queen: ever more loved

Greta Garbo: talks to Fact

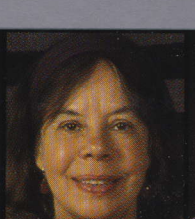
The Zarah revival: TV drama is ahead



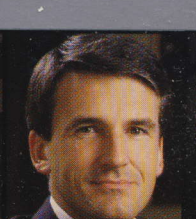
Man of the Year: Hans Werthén



Makes Nobel funds grow: Stig Ramel

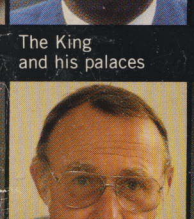


Top 1986 designer: Karin Björquist

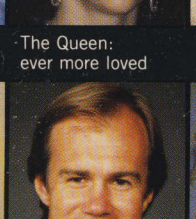


Shaking the tree: Bernt Magnusson

Still **the** Group Peter Wallenb

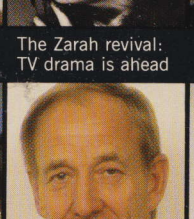


Invades 19 lands: Ikea's Kamprad



A young conqueror: Stefan Persson, H&M

Björn Borg: Now great in fashion



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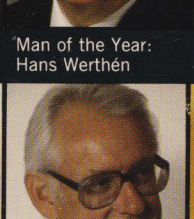

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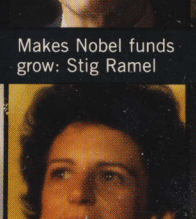


Symbol of women power: Antonia

New Saab frontiers Sten Gustafsson

The robot emperor: Asea's Barnevik

Pehr Gyllenha "Still Number

This is Sweden in Fact

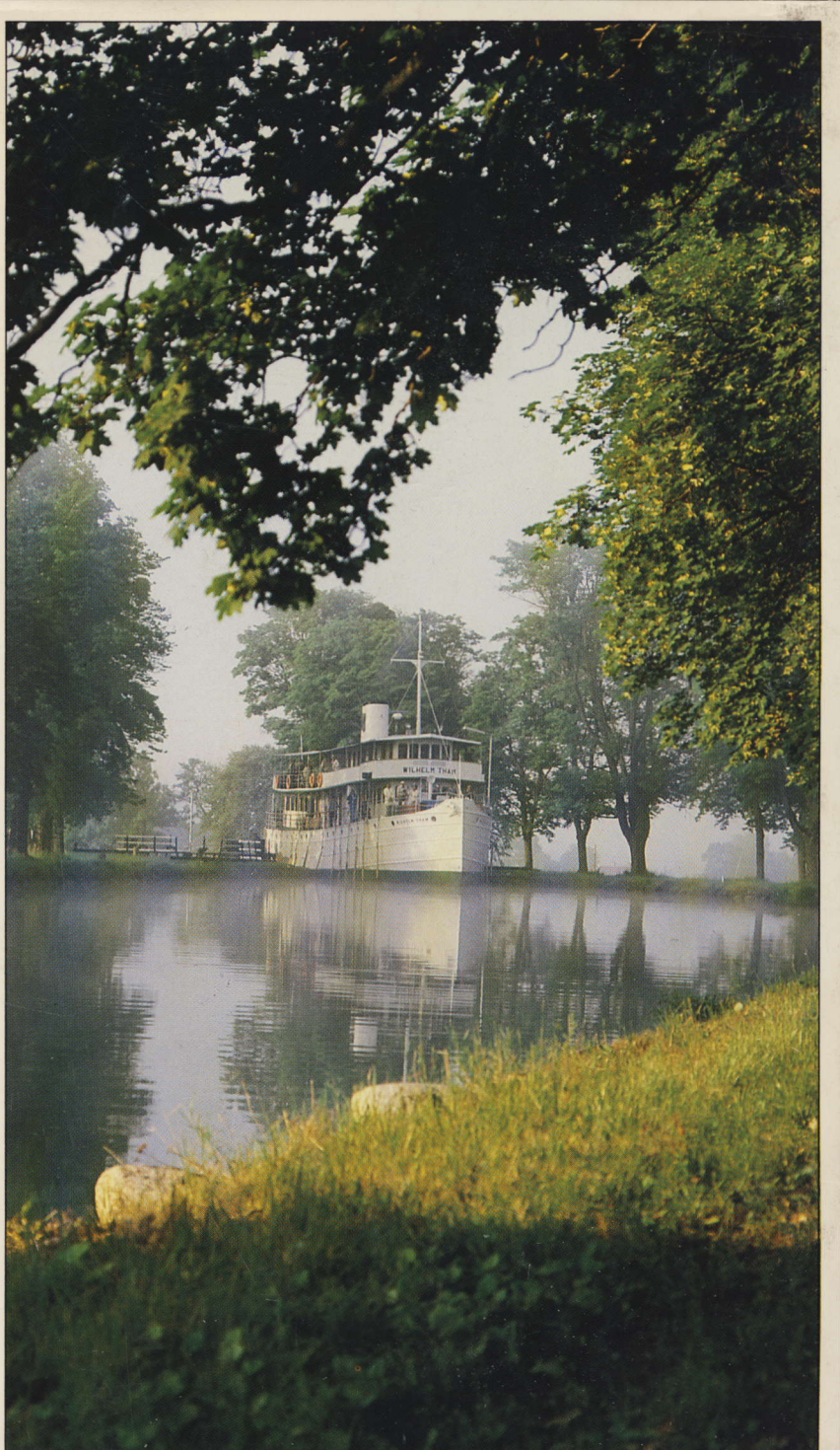
Never before have so many outstanding journalists, commentators and specialists teamed up to present a complete book on Sweden – Sweden as it is today.

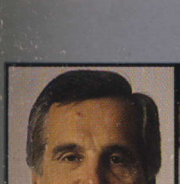
Sweden in Fact covers an astonishingly broad range of Swedish life – from art to the inevitable taxes, from winning athletes to business winners.

Here are just a few of the exciting topics:

- The young financial lions and how they amass wealth in a country run by "socialists."
- The world-famous companies that are setting world-record profits.
- The Stockholm stock market that has boomed 600% in the 1980s.
- The Swedish woman: beauty and talent, past and present.
- How to invest, and what's in the business crystal ball.
- How to enjoy being a tourist in the "Provinces of the Year" – the most northerly and most southerly.
- Who's who – and what's what – in Sweden's top 300 companies.
- Important names, lists, addresses of companies, official agencies.

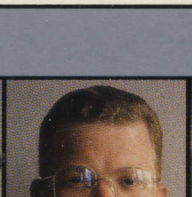
Sweden in Fact will be an essential handbook, and an entertaining guidebook, to the fascinating world of Sweden.

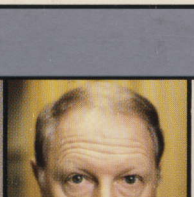


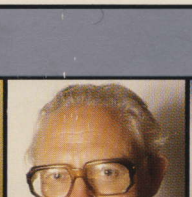

Set for new leaps: Anders Wall Group


Rich and safe: Erik Penser


Rich and fading: Refaat El-Sayed


Rich in exile: Fredrik Lundberg


He made the banks jump: Bengt Dennis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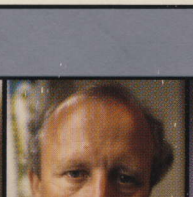
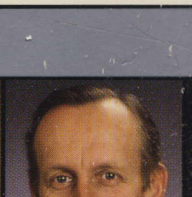

Ian Wachtmeister analyzes Sweden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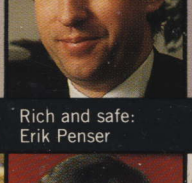
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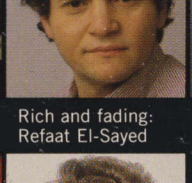
Spending 100 billion: Thorngren, Televerket

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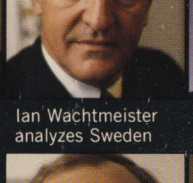

Tax expert Tolstoy: "Bet on Sweden!"


Sigvard Tomner: More R&D, please


Lars Orup rev 1986 key eve

Televerket commits SEK 25,000 million to a national optical-fiber network

Swedish technology has put telecommunications here in the forefront of systems being installed elsewhere – the US, Europe, or Japan.

Business, industry and, increasingly, homes are served by versatile digitized electronic networks.

In automobile, even leisure boat, as well as office or factory, the entire gamut of telephone, telefax, teleprinter, video, or computer data services are in place and working. Ericsson AXE digital switchboards – more software than hardware – automating the networks are a world standard for advanced as well as Third World nations urgently up-grading their telephone systems.

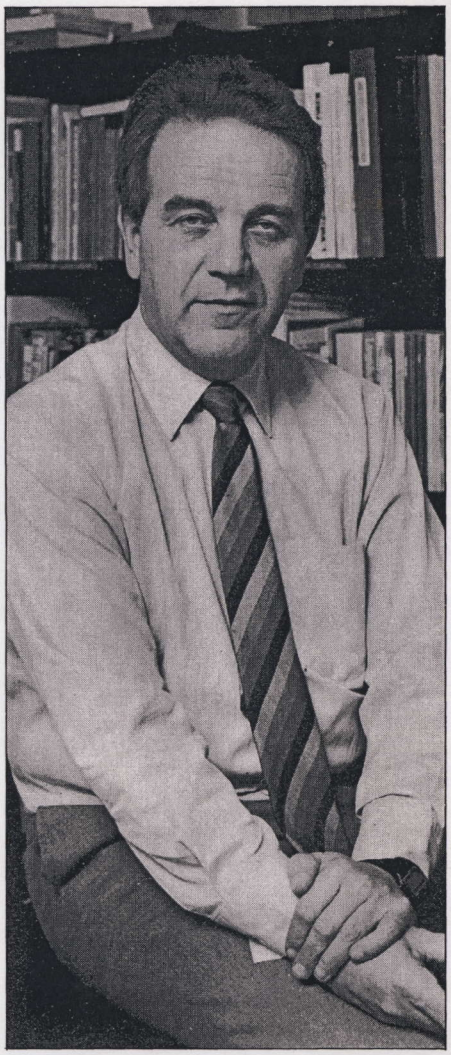
Launch problems recently plague expansion of the space satellite linking option. Terrestial networks are substituting optical-fiber webs of capacity immensely greater than familiar metal wire cables. Televerket, the Swedish national telecommunications agency, has committed SEK 25,000 million to a national optical-fiber web. By 1988, trunk lines will extend from the Arctic to Malmö; pilot systems have been installed in the Stockholm-Gothenburg region since 1985 (see map).

Bertil Thorngren, Televerket director responsible for planning, says local area optical fiber hook-ups will follow in the 1990s. (Ericsson R&D already focusses on devices for switching, amplifying and processing light for optical local-area nets: integrated optical circuits, laser diodes, LEDs, and photo detectors.

Replacing the entire metal wire network over the next decade represents an overall investment of around SEK 100,000 million. "In other words, about equivalent to the worth of the Swedish timber industry," Bertil Thorngren says.

"Telecommunications traffic is growing by 15 per cent annually. This means that in five years we must install as much capacity as we built up over the past century.

"The biggest cost is not the trunk lines but local links to individual users. We plan to bring the benefits of the main optical-fiber network to the door of every home."



Bertil Thorngren, Televerket planning director, cites need to build up in five years the same capacity that had previously required 100 years.

"Fortunately, this does not mean replacing every single wire link. Optoelectronic components allow us to get a lot more use of the existing system. Thus even districts with few people can benefit soon from the incoming optical-fiber trunk web."

As of 1986, Televerket had digitised about 50 per cent of the old telephone system; this put ample capacity in hand for immediate demand. Of the two million desks in Sweden that might use them, almost 700,000 already have some sort of data terminal; by 1990, upwards of one million are expected to be using computer peripherals communicating over t "telephone" network.

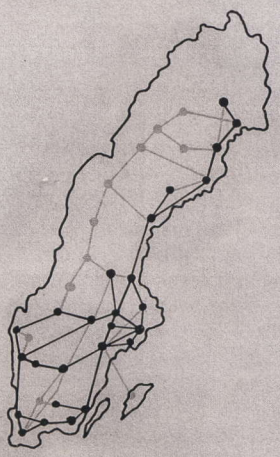
"Probably we will have five or computers on-line to each termina says Bertil Thorngren. "This v mean perhaps 200,000 on-line comp ter connections by 1990." That wou be double the number projected other European countries.

"The rate of increase here is es mated at 30–40 per cent a year. At t same time, we will have two milli telephones connected to the (digitise AXE switchboards in 1990. C investments in the optical-fiber net a transmission eletronics, will give us t capacity to connect two million da terminals at that time."

Digitising the system is a cheap way to add capacity and simplif expanding into all forms of data co munication. It will be ready, for exa ple, if and when the long await "home computer era" arrives – pop lar use of machines which match t performance of office computer s tems, scaled down in size and price.

In addition to the terrestial netwo

The optical-fiber web



The expansion of the optical-fibe network between 1985 and 1988, the year of completion.

Televerket is also involved in several telecommunications satellite projects. Next to be launched is the polar-orbit "Tele-X", scheduled for 1987. It will relay TV and other transmissions to the Nordic Region.

"We share the costs with the other Nordic countries," says Bertil Thorngren. "There is a common misperception that satellites are in competition with the optical-fiber cable nets, and *vice versa*. This is not so. One might liken the optical-fiber option to the volume transport role of Jumbo jets in commercial aviation. The telecommunications satellite is then the helicopter; limited capacity and more expensive.

"However, the satellite has that helicopter flexibility to 'land' the signals almost anywhere they are needed. You cannot use Jumbo jets for helicopters, or the other way round. Both telecommunications options are needed. So that Televerket combines the optical-fiber net with the Tele-X satellite project. Both are necessary for a comprehensive system of the future." ■

Pleased with the technical revolution: Tony Hagström, Televerket director general.

Rifa opto-electronics devices herald communication at the speed of light

Light beams are speeding past electronics as the incredibly fast and versatile human and machine communicator of the future. Light is teamed with electronics in transitional devices and systems called "opto-electronic".

Laser technology helps make possible one of the world's most extensive optical-fiber telecom "trunk line" networks, targeted for completion in Sweden in 1988 (see article at left). This is while the Ericsson programmable AXE digital switching systems (still called "exchanges" from the electric telephone era) are up-grading conventional telecommunications worldwide.

Light beams can be manipulated eletronically to carry vastly more information than wires. Glass or plastic fiber cables began evolving in the 1950s, laser technology in the 1970s. After Ericsson developed its own laser system in 1979, opto-electronic component development was transferred to Rifa, Ericsson's components subsidiary.

Rifa opto-eletronics department development director, engineer Tsviatko Ganev, explains that the company can bring to bear expertise in very high speed electronic switches. New materials such as gallium-arsenide (a by-product of Swedish sulphide ores) are transforming the classic silicon transistor; for example.

This is the "GaAs" element in Rifa's breakthrough optical signal receiver, the InGaAsP ("Indium-gallium arsenide-phosphide") detector. It can route light-beam digital data transmissions upwards of 500 megabits (Mbits). This enabled Ericsson to develop and to sell to the US an optical fiber cable of record length (2,500 km). This twin-line system handles 565 Mbits per second. Future capacity is spoken of in giga (one thousand million) bits per second.

In 1986, Rifa announced a laboratory prototype of a solid-state optical switch matrix which can route light signals from any of eight input channels to any of eight outputs. It has 64 switching elements on a single chip.

An incoming optical cable with a capacity equivalent to more than 100,000 phone channels can be connected to one of the optical outputs. Not even the most advanced eletronic telephone exchanges could achieve this in the foreseeable future, experts say. The laboratory prototypes of opto-electronic solid state switches today are the building blocks for the telephone exchanges in the next century.

Lars Ramqvist, president of AB Rifa, founded in 1941. Annual sales of about 1,300 million kr; 2,500 employees. Exports: 49 per cent. Board chairman: Arne Mohlin, Ericsson production director.

How has Rifa kept ahead of R&D rivals? "Here, in the same laboratory complex, we have concentrated research talent and know-how not only in opto-electronics but also spanning departments specializing in fast electronic circuits."

Tsviatko Ganev says that the switch matrix eletronically manipulates light at the rate of more than 8,000 million times per second. It is such inconceivable speeds that drive research in the US, Japan and Europe towards "intelligent" computer systems using purely optical switching.

"What is happening now might be likened to the promise of integrated circuits 25 years ago," says Ganev. "Then, technicians dreamed of the possibilities if 40,000 transistors could be linked. It seemed impossible. Today, we put 200,000 transistors on a chip.

"We begin to glimpse where opto-eletronics are taking us. What is needed is a technological vault... we must finally abandon our fixation on the electric current. We must begin thinking in terms of pure light!" ■