



Henrik T. Cedergren, a jewelry retailer, installed Sweden's first telephone line. In 1883, now a building supplies contractor, he started construction of what was to become the world's largest telephone system. His business ideas were remarkably close to those in today's Internet services.

Sweden's Forgotten Telephone King

By Ronald Fagerfjäll

In December 1877, a young Stockholm jeweler, Henrik Cedergren, installed Sweden's first telephone line. It connected his home to the shop he had just taken over from his father. The line ran from Drottningholm 31 to Drottningholm 84. A telegraph contractor helped with the installation. This 100-meter line was the beginning of a new technological era and a century-long lead by Sweden's telecommunications industry.

And it was this young jeweler who was the entrepreneur behind Sweden's becoming a global telecom giant. No, it was not *Lars Magnus Ericsson*, the mechanic whose full name is well-known to all Swedes, and whose last name is famous in telecommunications worldwide. Technicians are often heroes; entrepreneurs and businessmen are rarely recognized ...

"Jeweler" is perhaps not the correct description of Henrik Cedergren. Two years before installing the historic phone line, he had graduated from the Technical Institute, a predecessor to the Royal Stockholm Institute of Technology. He was one of the first Swedes to receive an engineering degree from an institute that soon would attain university status, after the German model. He made study trips abroad, and was very familiar with the technical triumphs of his time.

Beside jewelry, Cedergren had gotten into the brick and construction business, and he thought of the efficiencies that could be gained if he could keep in close contact with employees by phone. But he soon realized that although more efficient construction would be fine, the really big business would be in telephony itself.

To better understand Cedergren's time and the technical wave on which he was surfing, one must look deeper at what was really happening in the world around him. Far too often, we make the common mistake of accepting legends of individuals, working alone, who make the great advances in science and technology.

ENTREPRENEUR SURFS A TECHNICAL WAVE

Telephony was quite well established when Cedergren strung his line. Its roots were in the optical signal system developed by the Romans. This was forgotten for centuries, but in the 1700s, semaphore systems were in use in many places.

In Sweden, a busy engineer, *A.N. Edelkrantz*, erected an optical telegraph system in the 1790s. And at that time, scientists and inventors were working to use electricity to carry signals. Several systems were developed in the early 1800s, but were never put to practical use. Governmental authorities were conservative and slow. There was little

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chance of commercializing large projects.

When *Captain Anton Ludvig Fabnehjelm*, of the Swedish Royal Navy's mechanical corps, demonstrated an electrical tele-

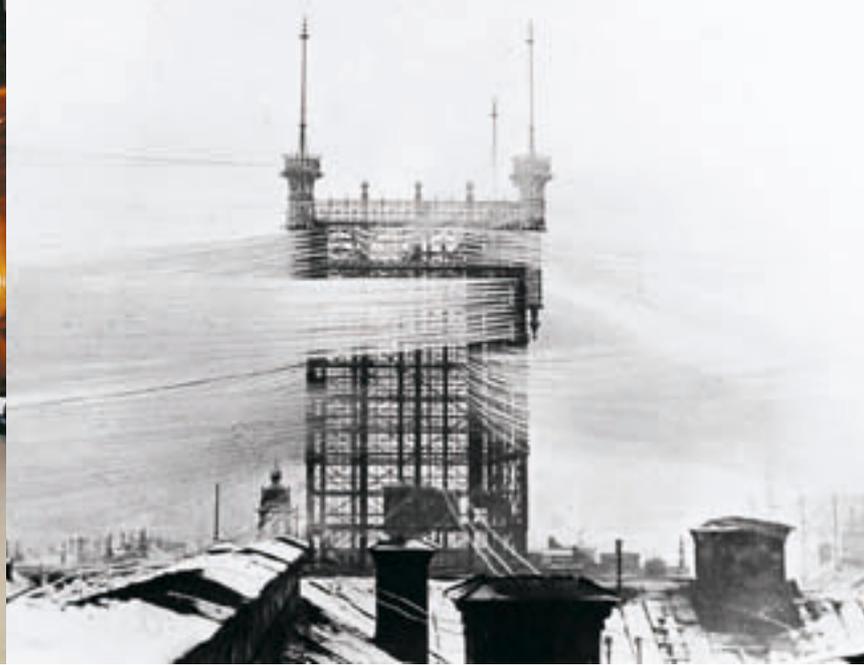
graph apparatus at the Royal Palace in 1846, it was hardly big news. It was only one of the many developments he demonstrated.

Not even American *Samuel F.B. Morse* was a pioneer, and he made his first telegraph device 11 years earlier. But

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The original board room of Telegrafverket is preserved at Telemuseum, the telecom museum in Stockholm. In the late 1800s, at every meeting, the board of directors undoubtedly discussed Henrik Cedergrén's latest competitive moves.



Henrik Cedergrén's central Telephone Tower on Malmkillnadsgatan was one of Stockholm's most spectacular tourist attractions.

Morse was the first to commercialize the telegraph. As a result of his business success, his system became the world standard. Telegraphy could then be later developed for teleprinting (Telex), telephotography (telephoto) and eventually to radio. It all involved a powerful wave of inventions and visions.

SWEDEN GETS THE TELEGRAPH ...

Carl Fredrik Akrell, the head of Sweden's state optical telegraph agency, was 70 years old in 1852 when he was assigned to install an electric telegraphic service. Thus, Sweden took up the technology rather early – and Akrell's telegraph administration, Telegrafverket, was modern in another sense: after several years of consideration, women were hired as telegraph operators. This was the first little step toward equality in the workplace.

The telephone was the product of all this. As early as the 1850s, a German teacher, *Philipp Reis*, had developed a system to send and receive voice. *Alexander Graham Bell* was one of the inventors who submitted a patent application in 1876 for the telephone. *Elisha Gray* was the other. The outcome was determined by who could commercialize the invention. At the time, young America was experiencing a tremendous spirit of entrepreneurship, and there was much venture capital available. The Bell company took the lead and quite rapidly bought concessions in many major world cities.

... AND THE TELEPHONE

As early as 1877, the new American telephone was demonstrated in Sweden, but only as a technology that would interest private business. The state Telegrafverket could not

see that this would be a future competitor to telegraphy. Even when the technology was developed enabling telephones to be connected via exchanges, the state agency did not believe that it could ever be used for other than short distances. There seemed to be too many technical barriers.

Eventually, Telegrafverket did invest in a telephone network covering government authorities and agencies – but it was used only to phone and check whether telegrams had been received.

It was a period in history when the Atlantic cable connected the new world with the old, and when the British Empire was held together by Morse code signals. The telegraph was respectable, while telephones were something for local hucksters and enthusiasts working in associations and clubs. This left the technology wide open to private visionary businessmen such as Cedergrén. The American Bell company did invest in Stockholm, but did not have concessions or long-term contracts. Bell faced competition from over 100 cooperative telephone associations, but mainly from the young Cedergrén, who founded a telephone service company.

LARS MAGNUS ERICSSON, SELF-MADE MAN

Sweden, this former agricultural nation, had been swept up in industrial development and new companies were being created everywhere. Among the new businessmen in the capital city was 31-year-old Lars Magnus Ericsson, a man who already had considerable achievements, despite an early life in poverty. He was fatherless at age 12, and as a teenager became a blacksmith apprentice.

At the age of 20, he got a job in an instrument com-



In 1887, Cedergren's company combined its smaller telephone stations into one central exchange. Located under the Telephone Tower, the exchange was one of the world's largest.



For quite some time, telegraphy remained the main method of long-distance communication. Seen here is a special railway telegraph used for many years.

pany, and two years later won a state stipendium enabling him to take electro-technical studies in Germany and Switzerland for four years.

If anyone still wonders about the importance of education, he or she should consider how a small stipend became the foundation of Sweden's most successful company of the 1900s. For, on his return home to Stockholm, the blacksmith who became a technician set up a mechanical engineering shop that would later carry his name, LM Ericsson. He started out by manufacturing telegraph apparatus and measurement instruments.

CEDERGREN, ERICSSON TEAM UP

But just as important as the stipend, was his contact with the young Cedergren. Ericsson supplied parts to the original telephone line on Drottningatan and to Cedergren's future large phone network. The down-to-earth instrument maker was at first somewhat doubtful about the young man's big plans. As a working mechanic, he shared the craftsman's distrust of "paper engineers". And neither he nor Cedergren had any practical experience in the telephone business.

Nevertheless, together they developed a telephone exchange, which was ready in 1882. The year before, Ericsson introduced his first wall apparatus and the desktop phone, the world's first to combine the mouthpiece and receiver in one unit. These were product improvements rather than inventions. Ericsson methodically improved his apparatus, which soon resulted in his gaining respect for producing the world's highest quality telephone products.

Cedergren formed the company Stockholms Allmänna Telefon AB in 1883, and that was the start of expansion of

the world's largest telephone system. Within just a few years, in 1885, relatively small Stockholm had more telephones and lines than any city in the world, including huge metropolises as New York, London, Paris and Berlin.

BELL PRICED OUT OF MARKET

Ericsson now established his first telephone factory. The Bell companies used American equipment, forcing Cedergren, the new challenger, to buy Swedish-made. Ericsson was able to compete because of the American-controlled company's strict price policy.

"I can do it for 100 kronor per subscriber," Cedergren told the Bell company when he offered his services. But Bell stuck firmly to its 200 kronor price, and was eventually priced out of the market, allowing Cedergren to take over in the latter part of the 1890s.

BUT BEFORE THAT, MUCH HAD OCCURRED.

Cedergren's company began with one exchange, located at Oxtorget (near Hötorget in central Stockholm). Expansion was very fast. In 1887, a number of smaller exchanges were centralized into a main station at Malmkillnadsgatan (near today's Riksbank). A large "telephone tower" was erected there, to carry the many overhead lines. It was a major attraction in the city for years.

However, Cedergren wisely understood that cables and wires must be located underground, and he was the first to develop special concrete conduits for this, modeled after American design.

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THE STATE FINALLY ANSWERS THE PHONE

If Cedergren's first insight was that telephones could get high traffic when connected in a local network, his next insight was long-distance traffic. The sound quality problem could be solved by using dual wires. Cedergren proposed to the Government that he could install such wires between a number of Sweden's larger cities.

This caused the telegraph administration to finally wake up. There was an old law on the books that prohibited private companies from installing telegraph lines. This law was cited, and Cedergren lost. But he was not defeated. He worked out an agreement with the authorities on mutual use of the lines in exchange for certain fees. Cedergren limited his own activities to Stockholm. The telegraph administration introduced Rikstelefon – the National Telephone – as a competitor to Cedergren. It also started its own production of equipment.

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Telephony was considered a natural monopoly, like water and electricity. But liberal politicians understood that Cedergren pushed down prices, despite building dual wire networks everywhere. *Sweden never gave a state or private company a monopoly.* In other capital cities, where Bell companies or a government agency alone handled telephone systems, expansion was much slower than in Stockholm, since subscriber rates were much higher. It would take Amsterdam another 50 years before that Dutch city would reach the number of subscribers that Cedergren's company and Rikstelefon had at the very start of the 1900s.

HOT COMPETITION FOR SUBSCRIBERS

Rikstelefon had to fight against a creative businessman who came up with a steady stream of new, interesting offers to lure subscribers away from his state-owned competitor. For example, a “36-kronor subscription”, including a number of free calls per year before call fees were charged, was offered in the new, well-situated Östermalm residential district.

Doctors were offered a special low rate, so that Cedergren could demonstrate the social value of his network. Some craftsmen and shops could get “star subscriptions” which meant that customers who phoned them were not charged against their free calls. Cedergren offered Rikstelefon subscribers a “10-öre telephone”. They could place calls on Cedergren's network and only pay the American equivalent of about five cents. All of this was the result of a new

technology to register calls. This enabled Cedergren to offer an imaginative array of bargains and inducements. Many of his ideas were remarkably close to those ones which form Internet services of year 2000.

This is amazingly similar to the competition that was launched in Sweden when Comvik entered the NMT mobile phone network in the early 1980s. Since then, competition in Sweden has exploded, with many local and foreign operating companies offering countless deals for mobile subscribers as well as for fixed lines. It would warm Cedergren's competitive heart.

The cooperative line use agreement between Cedergren and Televerket – as the state telegraph and telephone companies came to be called – ended in 1901. For a while, it was impossible to communicate between the two networks. A curious business resulted. “Conversation connectors” would buy subscriptions on each network, and offer to connect calls between the networks for a fee.

PIONEER IN FOREIGN PROJECTS

Henrik Cedergren was not only Sweden's undisputed Telephone King, but he was also a pioneer in foreign projects, most notably the Russian-Danish-Swedish Telephone Corporation in 1900. He was the leading businessman in Europe in this kind of international projects.

The present corporation was organized in 1896 when fresh capital was needed for a new factory complex and when the company started to export to Russia, Finland, Norway, Denmark, the Netherlands and England. Ericsson opened a factory in St. Petersburg in 1901, and in England in 1903.

The cooperation between Cedergren's company and LM Ericsson faltered in the 1890s when both Cedergren and Telegrafverket started their own manufacturing. Ericsson's establishing in St. Petersburg could have been the beginning of the company's moving out of Sweden if Cedergren didn't return to his old friend with new orders.

EPILOGUE:

LM Ericsson was able to buy Cedergren's telephone factory, in exchange for stock. The ownership connections were strengthened when Cedergren's company, Stockholms Allmänna Telefon AB, merged with LM Ericsson in 1918. Later, Stockholms Allmänna Telefon AB operation was sold to Televerket – which held a *de facto* Swedish “monopoly” until the 1980s.

Henrik Cedergren died in 1909. The Cedergren family's various financial problems enabled Ivar Kreuger – world-famous financier, “Match King” and swindler – to get control of LM Ericsson for a few years in the early 1930s.

But that's another story. □

Ronald Fagerfjäll
ronfager@home.se