

History of
French Telecommunications

by
Eli M. Noam

Professor and Director

Center for Telecommunications and Information Studies

Columbia University

809 Uris Hall, New York, NY 10027

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France: Telecommunications History

History

In no other West European country are telecommunications as tightly controlled by the central government as they are in France, where government organizations are the principal developer, customer, export promoter, regulator, and (at least for a time) the primary equipment producer. This tendency has been particularly pronounced _____ the Mitterrand presidency, when the socialist government sought to link domestic reform with technological renaissance.

Origins and history of postal service

The university of Paris operated a messenger service in the 13th century (Stephan, 185:627). [von Stephan, Heinrich 1859. Geschichte der Preussischen Post von ihrem Ursprunge bis auf die Gegenwart Berlin]. A government role emerged in 1464 when : Louis XI established a courier service for official use. By 1622, relatively late, France established regular postal routes for public use. In 1725, the government made the entire public transportation system, including the postal service, into an exclusive domain of the government. It commonly leased postal routes to private operators which was very profitable arrangement for the state finances. In 1790 transportation of persons and parcels, but not of letters was partially liberalized. In 1794 (the third year of the Republic) the establishment of private posts except for letters and small packages was made free to everyone. Soon, however, governmental postal service revenue dropped with the emerging free competition, and the government found it necessary to require a 10% tax on the receipts of private posts (Stephan, 1859:663). Furthermore,

letter rates were considerably increased, in some instances five-fold, and still further in the following year.

Napoleon, always in need of revenue, in a decree of 1804 reestablished the governmental monopoly and lowered postal rates somewhat, but still considerably above the original rates.

Napoleon also centralized the administration and established a system of postal inspectors in every department. This governmental monopoly was zealously enforced, with 750 violations prosecuted in the year 1805 alone

The high rates, which were maintained after the B _____ reestablishment, led to considerable profits for the state. Total revenues in 1827 were 24,800,000 francs. By 1847, they increased to 53 million, with profits of 17.8 million francs, on expenses of 35.5 million francs. In 1857, profits were 19.6 million francs on expenses of 36.4 million francs. In absolute terms these profits were very high. According to Heinrich von Stephan, later Germany's Postmaster General, the French profits were the highest of all European postal administrations, though not as a percentage of expenses. (Stephan, 1859:630)

Telegraphy

The principle of optical telegraphy goes back to ships using flags, fire, and smoke signals.

In the 18th century, French, German, and British adventurers tried to develop reliable optical telegraph systems. Claude Chappe, formerly a priest, and subsequently an experimental physicist, developed such a system. His brother Ignace Chappe, who was a member of various revolutionary bodies, introduced in 1792 a proposal in the legislative

assembly, which approved a route from Paris to Lille. Chappe had called his invention a "tachygraphe," for "rapid writer," but this was changed into the term "telegraphe" for "distance writer," and this Greek-Latin designation has remained until today. The route to Lille was completed in 1794, and included 22 stations. Signals were conveyed by various positions of arms on windmill-like stations located on hill-tops at intervals of 6 to 12 miles. In 1803 the route reached Brussels and a few years later Amsterdam. In 1798 another Chappe brother established a line to the German and Swiss borders. Milan was reached in 1805, and Venice in 1810. The Napoleonic wars at the time made rapid communications important. After the Bourbon restoration, the systems continued to expand within France. In 1845, there were 535 optical telegraph stations in France, reaching from Paris to 29 cities. The Chappe optical telegraph system, or variants thereof, were also used in England, Scandinavia, Prussia, and Austria.

A message from Paris to Lille, a distance of 225 kilometers, was relayed by 22 stations, and required several 2 minutes for transmission. The Chappe system was complicated and required a skilled operator. The British optical system was simpler but slower. Signals on the Chappe telegraph could be transmitted at a rate of one signal every 16 seconds; because of this slow rate, elaborate codes existed for standard phrases and expressions, which also protected the secrecy of the official messages. Transmission at night or in bad weather service was not possible.

The system was plagued with problems. It was an unusual day when a French telegraph line was able to transmit six telegrams of 20-30 words. For all of France's lines, a maximum of about 7,000 dispatches annually was about capacity. It was therefore not surprising that military,

diplomatic and, administrative messages of the state had absolute priority. Initially, no private messages at all were transmitted on the dysr system. A privately oriented company was created by Alexander Ferrier in 1833. However, his demonstrations failed and the efforts ended. However, it pointed to the possibility of the development of private optical telegraphy.

Almost immediately, such efforts were outlawed by an 1836 law which declared the telegraph a government monopoly. A French legislator under King Louis Philippe argued: "Governments have always kept to themselves the exclusive use of things which, if fallen into bad hands, could threaten public and private safety: poisons and explosive are given out only under the state authority, and certainly the telegraph, in bad hands, could become the most dangerous weapon. Just imagine what could have happened if the passing success of the Lyons silk workers' insurrection had been known in all corners of the nation at once."(Brock, 1981). [Brock, Gerald W. 1981. The Telecommunications Industry: The Dynamic of Market Structure, Harvard University Cambridge, MA.] The law provided for substantial fines for unauthorized transmission. Succeeding governments, of whatever color, did not significantly vary from this principle.

The French government monopoly over telecommunications was thus established by law even before the introduction of electric telegraphy, thereby assuring that attempts to establish a commercial Morse telegraph system would not be possible. Soon thereafter, an explicit ban on private electric telegraph lines was declared when the advent of the railroad led to an attempt to create a private telegraph between Versy and Saint Germain. But even though private entry was made impossible,

the government itself was reluctant to enter electrical telegraphy because it feared harming its own elaborate optical telegraphic system.

The advent of the electric telegraph threatened state power: "No, the electric telegram is not a sound invention. It will be always at the mercy of the slightest disruption, wild youth, drunkards, bums, etc.... All the electric telegraph needs are those destructive elements within only a few meters to a wire over which supervision is impossible.... The visual telegram, on the contrary, has its tower, its high walls, its gate well guarded from inside by strong armed men." [Alletier, p. 100] [Die Telegraphenstation Koeln-Flittard, Eine Kleine Geschichte der Nachrichtentechnik 1983 Rheinisch-Westfaelische Wirtschaftsaarchiv zu Koeln, Koeln.]

Eventually, however, the French government constructed an electrical telegraphic system, which was operated and controlled by the national police until 1878, primarily for government and only secondarily for public use. By 1853, optical telegraphs were discontinued

The low capacity of optical telegraphy and the relative high cost of operation were factors in its rapid demise when the electrical telegraph was introduced. In the United States, the Morse system, simple in design, operated since 1845 and grew rapidly, both geographically and by the number of competitors. In England, the Cooke and Wheatstone system of needle telegraph was introduced operationally in 1837. Public telegraphy was introduced by the Electric Telegraph Company, a private operator chartered by Parliament, which began operation in 1848 as the first European electric telegraph service. In Germany, Werner Siemens was instrumental in promoting a Prussian governmental telegraph line in 1848

from Berlin to Frankfurt where the newly constituted and historic German Parliament was meeting.

In France, the telegraph network was originally reserved solely for the state. But in 1851, Louis Napoleon Bonaparte allowed access to private users, who had to prove their identity and could not send coded messages (Bertho, 1904). [Bertho, Catherine, et al., ed. 1984. Histoire des Telecommunications en France. Toulouse.] Such control was gradually relaxed, though state control was still able to be used against, for example, opposition newspapers.

Until 1880, international submarine telegraph cables were dominated by England. Given its colonial rivalries with Britain, France found its dependence intolerable. French colonies often had to use English lines to communicate with Paris. Meanwhile, attempts by French companies to enter the submarine cable market ended in failure or in buy-outs by American or English companies. To overcome English domination, the Ministry of Posts and Telegraph began to invest in several cable companies.

The Early Telephone

Telephony required the permission of the state after it made its appearance at the Paris World's Fair of 1878 (Holcombe, 1911). [Holcombe, A.N. 1911. Public Ownership of Telephone on the continent of Europe, Boston.] In contrast to Germany, where the Postmaster General, von Stephan, seized with enthusiasm on the new invention, French authorities moved more hesitantly.

The Third Republic was pushing for economic liberalism in areas of public services, usually through concessions to private companies. The telephone fell into this framework, and in the summer of 1879 the Ministry announced its decision to award concessions to companies which requested them. Operating conditions for private telephony were issued in 1879, according to which all construction had to be performed by state engineers who were compensated by the private concessionaries. Concessions were not exclusive and lasted for only 5 years; a 10% royalty payment was required, and the government could purchase telephone equipment from the concessionaries at an agreed upon or arbitrated price. At the same time, there was no rate regulation. The concessionaries thus had both incentives and ability to try to recoup their investment as soon as possible. During 1879, three operations were licensed, those by Edison, Gower, and Blake-Bell. However, before construction began, the franchises were transferred and by 1880, all were merged into the Societe General de Telephone (SGT), a process of consolidation based on the three groups realizing that collaboration was in their mutual self-interest, as well as that of the Paris municipalities' who wished to avoid multiple and unsightly wire networks. Thus, the interests of the private firms and of the government coincided to reduce inter-firm rivalry from the very beginning.

In the first five years SGT, which had capital of 25 million francs, expanded rapidly (Bertho, 1984). But the terms of the concession, including the division of responsibility between SGT and the PTT, and the fact that after 1884 the concession was renewed for only 4 years, resulted in SGT's halting of further investment. The condition of the network deteriorated.

The Paris exchange was opened in 1881. Development of the telephone system, however, was quite slow because of the uncertainties involved. It is small wonder that telephone service was of a limited quality, was expensive, and was generally viewed as unsatisfactory. The viable policy options were to increase the government's role, or to provide telephone companies with the opportunity to expand and develop. The French government chose a third policy, that of increased restrictions on the private operations, without strengthening its own role as an operator.

By 1882, the French government realized that the SGT was inclined only to provide services to the dozen or so large French cities. This again raised questions as to the state's role. In consequence, Parliament decided in 1882 to support telephone construction by the French government in various medium sized cities, but the allocation was only one quarter of a million francs. In 1884, the existing private licenses were up for renewal and the French government extended them, without a clear-cut policy of its own, for another 5-year period. By 1885, it became mandatory to link the local exchanges by long-distance connections. Now, the telegraph authorities sensed the potential for competition, and undertook construction themselves, aiming for a division of responsibility in which local service would be private and long distance interconnections public. In the following years, French policy kept changing. In 1887, Grannet, the minister in charge of telegraphy, introduced a bill to strengthen private telephony, arguing that this would alleviate the backward condition of French telephony, and eliminate the stalemate between government and private interests. His successor, however, opposed the plan. The public considered, with some justification, the French telephone system to have become a complete mess within

less than ten years. By 1889, the French Chamber of Deputies rejected the Grannet plan, largely on the argument that private telephony would jeopardize the financial soundness of the state telegraph system (Holcombe, 1911).

Soon, the State decided to take over the entire network, backed by a coalition of dissatisfied business users, small towns, and leftist republicans. The arguments in opposition included the fear of too much state power, and the reluctance for the state to financially support a luxury for the few. Nevertheless, the French National Assembly approved the Law of Nationalization in 1889, at the end of the second 5-year concession period, fired by the national enthusiasm of the revolution's centennial. (Bertho, 1984:60-64).

Nationalization and its after effects

The SGT refused to surrender its property peacefully, and it was taken by force: compensation was paid later. At the time, there were only 8500 subscribers, of which only 2000 were outside of Paris (Nouvion, 1984) [Nouvion, Mireille 1984. "L'Automatisation du reseau telephonique francais." Revue Francaise des Telecommunications. (January), 76-85.]

After extensive court action, the company received about 11 million francs, twice the amount the telegraph authority had been willing to pay, but less than the company demanded. Control of the telephones and telegraph became lodged in the undersecretary of state for the postal and telegraph service.

Having taken over the private operation, the government faced the question what to do with it. The telephone held no priority in general economic development. The government was not prepared to make the significant investment that was necessary to finance construction. It had, over two generations, built up an extraordinarily high level of debt (Holcombe, 1911). Hence, it was reluctant to engage in heavy investments for telephone service systems, which would be recouped only slowly. Instead, it devised a system in which the users and potential subscribers were forced to extend an interest-free loan to the government which was to be eventually repaid from the profits derived from their own payments. Furthermore, subscribers had to purchase the telephone set themselves, to save money for the state. This was the origin of the liberal subscriber equipment in France, which was widely touted in the 1980s. This system of financing was also expanded to the long-distance transmission. French subscribers, had to pay in advance for the network, or not having telephone service at all. Local systems resembled a cooperative in that they united the first group of subscribers, who had paid for the construction of the network. As in other cooperative ventures, problems arose about the conditions under which newcomers were admitted to a system that had been paid by the original subscribers.

The system of financing also proved problematical when it came to the replacement of obsolete equipment or of other improvements. By the year 1900, the term "telephone crisis" was used again. The system was congested, antiquated, unreliable, and expensive.

There were only 30,000 telephones in the entire country in 1900! In comparison, in 1909, there were 27,000 telephone lines in the 100 hotels of New York City alone (Attelien, date:1066).

A number of improvements were achieved by A. Millerand, [CHECK SPELLING] a Socialist who became minister of the French PTT. Millerand established a new system of financing of telephone expansion out of public revenue, rather than subscriber fees, but was unsuccessful in obtaining appropriation by Parliament. Even the French business community, in short-sighted fashion, opposed the quest for appropriation, with the chamber of commerce arguing that construction had to be financed not by government budget appropriation but by greater internal economies of PTT operations. Shortly thereafter, Millerand was dropped from the cabinet.

In the early years of the century, service remained abysmal. There was one line only between Paris and Marseilles, and during the 12-month period in 1905/06, it had 204 interruptions with an average duration of 14.5 hours. Between Paris and Lyons, where there were 5 lines, with 550 interruptions of an average duration of 10.5 hours (Holcombe, 1911:302). Local exchanges were enormously congested. In Paris, the average time it took an operator to make a local connection was almost 2 minutes in 1905. By 1906, the government considered the situation an emergency and passed a special law to provide funds to alleviate the situation. The Post and Telegraph Department was transferred from the Ministry of Commerce and Industry to the Ministry of Public Works. Nineteen million francs were authorized, but they had to be spent within the same budget year, leading to insufficient planning and excessive cost. Millerand, back in the government, [check] instituted labor relations reform for PTT workers, introducing 8-hour days, security of tenure, overtime payment and full payment during illness. Despite these reforms, he was expelled from the Socialist party when he fell into disfavor.

World War I and its destructiveness led to further deterioration of the telephone network. French industry was inadequate to improve the situation (Bertho, 1984:137-38). The companies that were involved in telephone equipment were either manufacturers of general electrical machinery, small companies involved in electromechanics, or subsidiaries of foreign firms. In 1920, when talks began on equipping the Paris network, Western Electric, Siemens, Ericsson, and ITT each sought the business. ITT bought two French manufacturing firms, created a large research laboratory in Paris, and studied in depth the needs of the French network. In consequence, it obtained the major French orders for automatic central offices. This gave it a strong position in the French market. But this dominance created resentment in the 1930s and after the War, and led to policies to build up French industry to be able to overcome ITT's position.

Given the vast sums necessary to run the telephone network, by the early 1920s a debate sprang up on whether the network should be denationalized. Along with this debate came two offers to take over the network. The first was from ITT, which offered to own and operate the entire network, The second was by the Societe Industrielle des Telephones (SIT) (Bertho, 1984). In November 1921, a law was proposed which would mandate the studying of denationalization. Louis Deschamps, who had advocated privatization of various government monopolies, including the telephone, became PTT Minister. But none of his successors sought denationalization, due to the difficulty of the project, as well as opposition by PTT employee associations.

Instead, the reform of the PTT proceeded in a different way. From 1923 on, the PTT was to be run like an industrial and commercial enterprise, with a separate budget, and the need to cover all its own costs from its receipts. This was, at least, the theory. In reality, the efforts at reform petered out.

In 1920 the PTT awarded the concession for international radio-electric links from France to the private company CSF. (Compagnie Sans Fils) which operated Radio France. The PTT itself did not use the network due to lack of necessary funds to maintain and expand it to include French colonies, the lack of qualified technicians who knew how to operate these stations, and the inability of the PTT to compete against a private company. But the concession to CSF caused a vigorous debate: since the international radio-electric link was a promising area, the labor unions and the political opposition were against turning over this sector to a private company (Bertho, 1984).

PTT relations with Radio France were generally poor. PTT links and those of Radio France were at times in competition. Nevertheless, France between the wars built up a decent wireless network which included PTT link to Africa and Indochina, military links to Central and Northern Europe, and Radio France links to most of the world, thanks to a 60 million franc station opened in 1923.

Meanwhile, the domestic telephone network made a slow _____ . The first long distance cables in France using the Pupin coil was the Paris-Strasbourg route, put into service in 1924 (1984:79). The first automatic electromechanical Strowger switch was experimentally introduced in Nice in 1913. At that time the PTT also ordered

semi-automatic systems from the French company LMT (Le Mat_riel T_l_phonique), using Western Electric's rotary technology. The first such exchange was opened in Angers in 1915 (Nouvion, 1984:80).

[Nouvion, Mireille. "L'Automatisation du reseau telephonique francais," in Revue Francaise des Telecommunications, January 1984, pp. 76-85.

By 1923, the average wait for an interurban connection was five hours. In June 1923, in answer to this problem, the government adopted a separate budget for the PTT, as an annex to the general budget, which allowed it special loans. In addition, a modernization plan was approved for the telephone network. Between 1924 and 1934, the average annual increase in subscribers was 45,000 (between 1919 and 1923, it had been 25,000 per year). The deflationary policy of 1934 and 1935, not to mention the outbreak of the Second World War, however, caused extreme budgetary restrictions on the PTT.

During the pre-war period, switching technologies and manufacturing came to dominate the industry. In 1938, switching equipment accounted for 80% of the turnover of the main companies involved in public telephony, with transmission providing only about 10% (Nouvion, 1984). The automation of the Paris network started in 1925, and led to major industrial struggles over procurement contracts. The competing firms included the French Compagnie des T_l_phones Thomson-Houston and the Soci_t_ Industrielle du T_l_phone (SIT), both of which proposed a Strowger system. LMT, which had in the meantime been bought by ITT, proposed a rotary system, and the Ericsson subsidiary proposed its own method. Also in contention was the French Compagnie G_n_rale de

Télégraphie et de Téléphonie, but its system was dependent on a patent held by Siemens, and the French government did not want Paris telephones to be dependent on German technology.

At the time, ITT had experienced several setbacks in Europe, with Germany and England choosing the Strowger system. Although Spain had opted for exclusive use of ITT's rotary system in 1924, if France did not also choose that system, the Spanish could have changed their minds. With so much at stake, ITT hedged its bets and bought the Thomson-Houston telephone division in 1926 (later to become CGCT), thus giving it a stronger position for the French procurement. This was done just as Thomson-Houston had patented the new R6 switching system, and thus reduced the French equipment development presence.

For technical reasons having to do with the condition and needs of the existing network, the Strowger system was eliminated from competition, and the project was awarded in 1926 to LMT (the ITT subsidiary), due to the simplicity of the rotary system. Other factors were its promise to build a large manufacturing facility, the favorable cost of the proposed system, and the agreement that LMT would surrender all its rights and processes to any other company designated by the PTT. These designated companies were the Soci_té Grammont, which withdrew in 1931 due to financial problems, and Ericsson.

The R6 system was not dead, however. PTT orders for the R6, particularly for rural exchanges, went to Thomson-Houston -- ITT's other subsidiary -- which was considered "more French" than LMT. The PTT also had to extend a license for the R6 to SIT. This marks the low point for French switching technology firms, and the high point for ITT. A few

years later, in 1932, the large French electrical firm Compagnie Generale de Electricite (CGE) took control of SIT, and sought unsuccessfully to forge links with the American firm Automatic Electric of Chicago. This marked the beginning of CGE's long march against ITT, with the help of the French government, which led, more than half a century later, in 1986 to its taking control over ITT's worldwide telecommunications operations.

Between 1924 and 1934, the annual rate of increase in the number of lines was 7.6%. Due to budgetary restrictions, however, this rate fell to 2.6% between 1935 and 1939. The number of lines served by automatic systems rose from 3.6 % in 1926 to 45.6% in 1938. The same 1938 figure for Germany was 84.9%, and for the U.K., 54%. While telephone penetration in France rose, it was still very low: 3.7 per 100 inhabitants in 1938, compared to 4.6 in the U.K., 15 in Germany (Nouvion, 1984:84), and X [FIND] in the United States. Even that figure for France is misleading, because of the imbalance in favor of Paris.

By 1936, only a tiny handful of the French departments had a telephone density that was above 5 telephones per 100 inhabitants (Bertho, 1984). In many of them, the density was less than 2.