Origins of the Organization of Telecommunications in France

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Paper presented at the seminar on "French Telecommunications : from the traditional model to current changes in regulation and industry"

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ORIGINS OF THE ORGANIZATION OF TELECOMMUNICATIONS' BUSINESS IN FRANCE - 1794-1986

To understand the History of Telecommunications in France, one must consider on the one hand a technical field, the Telecommunication's side; And on the other hand a group of actors who share the tasks within that technical scope : state, civil service, private capital, French or foreign companies, and even elected authorities or trade unions. The whole makes an apparatus, at the same time stable in its structures and mobile in the detail of the sharing of tasks and markets which, little by little have not ceased to change since 1794, when the first telegraph lines where created; All this constitutes, by the piling of successive layers, the special situation of French Telecoms in 1987.

Lines of force of an evolution

The technical field itself has bounds endlessly redefined. The word "Telecommunications" was invented by E. Estaunié Director of the Higher School of Telegraphy in 1904. It covers, at the 19th century, semaphore telegraph (since 1794), electric telegraph, telephone, radio transmissions to which should be added, in the twenties, a large part of wireless and television and, after the 2nd world war, teleinformatics, telematics and cabled networks. But the definition of the field that covers the word Telecommunications is, in itself, a gamble. Practically speaking, an act of 1837, reformulated by a decree of 1851 about electrical telegraphy, defines all the matter that will depend on the ministry of PTT and therefore traces the bounds between Telecommunications - in its classical meaning - and what is going to be called "audiovisual", which is progressively making difference with it.

Thus, around 1919, PTT unions fought to have radiotelegraphy accepted among the techniques aimed at by 1837 Act, and therefore depended from the PTT. In return, the unions will be unable to prevent on the setting of legal and reglementary measures specific to radio and television.

On the technical field thus defined, the sharing of tasks between intervening parties shows, on the one side constant data whom one can think belong to the deep structures of French Telecoms history; and on the other side, of unceasing changes which happened rather on the periphery, that is for international links or when new techniques appeared.

But, in a hundred and fifty years, what has not changed in the structures of French Telecoms is the splitting between the main networks carrier and equipment manufacturers. ~~constructors~~. There seems to be there a ~~deep~~ consensus : never - save exceptional cases - did the state become a manufactur ~~constructor~~ ; and never - apart from a brief period of ten years at the very beginning of telephone - was the national network, (telegraph first, then telephone) let to private initiative and private capital.

Yet, at the outskirts of this principal apparatus, arrangements between public and private initiative are more numerous than usually believed. French "capacity to invent new institutions" is rather good. Between 1852 and 1925, successively appear three types of intervening parties : first, concessionary private stock companies; then subsidiaries of the State, private companies but state owned; eventually non-profit-making associations depending on the 1901 Act. These entities take over either peripheral

technical sectors - in particular international links like telegraphic submarine cables around 1860, radio-telegraphic links in 1922, or new techniques - telephone in 1871, or operations demanding an alliance with leisure industry (theatrophone about 1880 - or wireless in the twenties) ...

Their part could, beyond, evolue over the years : thus the place of the PTT subsidiaries in the strategy of development of Telecoms is quite different in 1913 - when the thing was to occupy those strategic battlements abandoned by the French private investors - then in 1960 when these subsidiaries ensured a French presence in newly independent countries.

National industry, still remains a prerogative of private initiative; most of the time, during the last hundred and fifty years, it lives a confliotual but tight relation with "the" carrier = the civil service, whose worry about national independence in the technical field meet with the interest of French industrialists to dispose of captive markets. Thus, from the twenties, starts developing a sector of public scientific research whose organization is fairly well dispersed but whose results are important; arrangements are set out to transfer these results to national industry.

Lastly, inside the sphere belonging to public administration one can also notice an evolution. Entire sectors of activity are transferred from one ministry to the other : so the radio, initiated by the Army and the Navy, is taken back to the PTT scope in 1919, but partly taken off in 1944 to the ministry of information. Similarly, the shape of the civil service is changing : the direction of Telegraph belonged to the Ministry of the Interior in 1850;

it was amalgamated with the direction of Post that came itself from the Treasury in 1878 to for the ministry of PTT; the latter at its turn, was given a special status through its own budget in 1923 and was supposed, since that time, to develop its own "industrial and commercial" characteristics.

All these evolutions combined together and, on the whole one can consider that the legal and institutional organization of telecoms in France waspermanently since 1837, the object of more or less important adjustments. The origin of these adjustments was double : they task their origin first in the technical evolutions, as we saw it, but also in the political evolutions of the country. When a technical change imposed a status to a new technique, the solution depended largely on the present government and its culture : the second Empire interested in accelerating the industrialization of the country, the 3rd Republic called "business Republic", the liberal government of 1920 or the left-wing union of 1924, won't make the same choices. But this statement had to be modified by the following one. Thus, the very liberal concessions granted by government in 1922, were carried out in a very planned way after the return of the left-wing Union in 1924; similarly, nationalization of the telephone in 1889, was not accompanied, in the following years, by a financing plan that should have been its necessary corollary, the "business Republic" feeling obviously reluctant to make the State assume directly a part in business. This statement brought to assume that a certain number of balances, which proved to be lasting in the sharing of the tasks, expressed in fact some common assent of the whole French society and of the partners involved.

This basic stability seemed to have two reasons. It came first from the technical and economical characteristics which, apparently, limited the number of imaginable scenarios and brought all countries to rather similar models of organization : the building of natural monopolies seemed, for instance, an objective data and asks for the question to which the US and in European nations answer, according to their own political and cultural traditions. Concerning this, one ca remark some important likenesses in the evolution of the main European countries : Great Britain, like France has known for telegraph as well as for telephone, periods of concessions followed by nationalizations; similarly, in France like in Italy, in the twenties, one sees the apparatus of public intervening be deeply removed just when depression was shaking economies.

Second reason, inside the nation one could ask oneself if there were'nt a convergence of interests between partners whose strategies should have apparently been opposed. So, it has to be understood that, in France, the PTT unions plead continuously for the taking over by a civil service of the operating of all networks and services of Telecoms which, they say, guarantees employment. But, "in front", economical and industrial circles don't offer an united front line in the defence of the principle of free-trade. Interest of potential candidates to the operating of these networks could clash with interest of these networks' potential customers, that is to say all the other French companies, even to the interest of some telecom equipment builders, for instance those who supply the civil service ... Consequently, in 1889, one sees the Chambers of Commerce of some French cities organize petitions demanding nationalization of the telephone networks.

Taking into account all these data, it is possible to split the institutional and economic evolution of French telecoms into three periods. The first one goes from 1794 to 1852; then are voted fundamental Acts and were set out the essential data of the task's sharing : civil service operates the network; industry builds equipment. The second period goes from 1852 to 1925. It's characterized by a variation of techniques to which answers a real institutional inventivity. From that time date concessionary companies, state subsidiaries, non-profit-making associations created by a 1901 Act. The third period, between 1925 and 1975, is characterized by a activity ruling over all the other ones : the telephone, and a close union between administration running the service, public research and national industry in a clear will of national independence. During this period, the changing of institutions that seemed to be needed by an evolution of techniques has been realized by mobilization of already existing apparatus or by its internal transformation instead of by important judicial changes.

THE THREE AGES OF FRENCH TELECOMS

I. The setting out of fundamental texts

History of telecom in France has to go back to the semaphore telegraph of Claude Chappe. That device does not belong to the technical generation born with electricity, but it leaves to frenoh Telecoms a governing body and a fundamental text of law. A governing body : between 1794 and 1852 a network of semaphores is set out that links Paris to the main limits of the kingdom. This network is run by a board of the ministry of the interior. It carried exclusively dispatches of military and political interest and its access is not open to the public. Around 1853, a strong pressure was exerted in economic spheres which wish to have at their disposal a faster system of communication than the stage-coach. This pressure takes different shapes. Some businessmen organize improvised semaphore by asking some millers to place the wings of their mill in a well determined position; others spread a sheet at the top of a hill ... News to transmit is almost always similar : allow their correspondant abroad to take knowledge of the goverment's bonds quotation in order to speculate in writing before the arrival of the official quotation. In 1836, one of these cases shows off the lack of legal disposition ruling the status of the telegraph. Speculators from Bordeaux bribe people operating the line Paris-Bordeaux, in order to be secretly conveyed stock exchange's quotations. It was impossible to sentence these frauds for want of an act establishing a state monopoly on the telegraph. This act is voted in 1837. Its only article stipulates that : "It is forbidden to anyone to transmit signals from one place to another by telegraph or by any other means, without an authorization ..." This article, which has the simplicity and the power of grand judicial texts of the nineteenth century, will be recovered almost without changes in the PTT's statute book and will remain in force till 1987.

As a matter of fact, the 1987 Act had two consequences : on one side it confirms a "de facto" monopoly held, then, by the governing body to run the network; on the other side it foresees an opportunity to authorise. Remark : the Act does not say a word about equipment building.

In 1837, the question of opening the network to public was raised. King Louis Philippe's government, exposed to a series of republican plots, refused, invoking police reasons. But anyway, the traffic allowed by the technique of semaphore telegraph was too slow and too irregular to be profitable. So, it was not difficult for the government to dismiss the case of the business spheres.

The birth of electrical telegraph challenged this balance. Sam Morse has a show of his prototype as early as 1837, but electrical telegraph develops very slowly till Napoleon III. On the contrary, the latter makes it an instrument of his policy of industrial modernization. In 1852, he confirms (for police reasons) that running the telegraph belongs to the board of telegraph therefore, to the ministry of the interior; but he opens it to business traffic and to private persons, making a reason that french merchants and manufacturers should'nt be deprived of an instruments used by their british rivals. This was made at the cost of a real cultural revolution within the board of telegraphs, which depended on the ministry of the interior, and which had, at once , to accept the idea that it was selling a service and consequently to ensure a commercial quality of service, have a tariff's policy, etc.

Regarding the building of telegraph equipment, it depends on some parisian firms, specialized in clock making or precision instruments, and with which the administration of telegraph places preferential orders, opposing, as much as it could, the acquisition of foreign equipment.

2. The time of innovation

The decree of 1852 that opens networks to the public, as the 1837 Act, provides authorization opportunities. Nevertheless, these opportunities are only used in a very marginal way, essentially at the beginning of the development of electrical telegraph, when the public network was still very restricted, and in no case were these lines open to public. Those "press wires" installed during the 3rd Republic for Havas Agency or some big newpapers, are in this category and will always remain an exception.

a. concessionary companies for submarine cables.

Indeed, the first important exception to the actual monopoly held by the direction of telegraphs comes from telegraphic submarine lines. This is a sector of telegraph operating which develops after 1851, when the first cable was laid across the Channel; it presents some peculiarities : submarine telegraph cables carries a business traffic for whose dispatches the customers are ready to pay a very high price; they demand important investments which can be redeemed only over a long period, and whose laying needs some minimum help from the public powers. Thus, in Great Britain, land of the frèe-trade, government accepts to lend battleships to the company formed to build the first transatlantic cable and to guarantee its loans. All that plays in favour of systematic call up to private capital for the greatest projects.

In France, Empero Napoleon III bestows on Jacob Britt, an Englishman, a concession for the laying and the running of a cable under the Channel, that King Louis-Philippe had refused. Later on, submarine cables offer the example of a parallel development by a public and a private sector.

The civil service runs the lines between the mother country and the colonies, mainly Algeria (under the reign of Napoleon III), black Africa (when the map of the cables follow the progression of colonization after 1880) and Indo-China. Similarly, concessionary companies are formed to operate the links towards industrialized countries which are, on one side able to offer a profit-earning traffic and for which, on the other side the french civil service cannot personally work stations on a foreign soil.

. Concessions link by link.

And that's why, during all Napoleon III's reign, the first french submarine cables network appeals largely to concessionary firms whose stock is very often partly gathered on foreign markets and, especially, british and north american ones.

For France does'nt own, as Great Britain, an experienced banking structure, liable to finance far-reaching cable-laying operations and, what's more, technically risky (1848-50 in the Channel, 1856 in the Mediterranean, 1858-65 in the Atlantic Ocean they end in failure). One can find, indeed, the main names of bank and business at the time : bankers Rothschild and Erlanger (French financier installed in London), Senator Pouyer-Quertier, Secretary of state for treasure in 1871 and 1878, in the government when Thiers was Prime Minister. But the first french cable firms (Channel 1859, Transatlantic 1869 and 1873) went bankrupt and that seems to justify concealment from french investors; thus, up to 1878, most submarine cable-laying operations conceded in France were financed by foreign investors.

b. Public-private : the sharing of the tasks.

After 1879, a new policy takes form, aiming to increase the share of public sector and to tighten the links between the state and concessionary companies. In january 1879, the new republican majority at the Parliament, starts a policy of public works and of commercial and colonial expansion. Submarine cables integrate in that ambitions policy. Administration technical departments, set into place since 1864, are getting stronger; authorities take over the mediterranean network in 1879; between 1890 and 1906, West Indies are granted six new cables; in 1893, cable for New-Caledonia, in 1895, cables for Madagascar and Indochina, add up to the cables linking already the mother country to French possessions on the western coast of Africa. Just before 1914, state owned french network will be the longest in the world with 31 000 km of cables compared to 2 000 for Great Britain and Germany who, besides, have important networks operated by private companies.

. Downfall of concessionary firms.

This state offensive is largely favoured by the deficiencies of concessionary firms and French investors. In 1884, then in 1905, the Army got excited when it found out that strategic links on the coast of French occidental Africa, conceded to the Western African Company and to the Direct Spanish Company, were about to be bought by the British.

Concerning transatlantic link, both two first companies founded to operate a cable ending Brest, have successively disappeared : the Erlanger Company has been sold by an american competitor and, in 1895, the cable-Pouyer-New-York Cy (or Pouyer-Quertier Cy) also went bankrupt.

. A sole and state-aided company.

On the spur of public powers, then, takes up an original disposition where the whole international telegraphic submarine links is attributed to one concessionary firm. The "Société française des câbles sous-marins", which operated since 1888 the West-Indies lines, renamed for the occasion "Compagnie française des câbles télégraphiques", is the tool of this mutation. An agreement signed with the PTT assigns to that new company the belongings coming from the Compagnie Pouyer-Quertier. It gets an annual subsidy, in return for which it contracts to lay and operate a certain number of new links : a transatlantic link from 1900, then several links to West-Indies and Indo-China. At the turn of the century, the "Cie française de câbles télégraphiques" owns a 42 million francs-stock, operates 44 000 khm cables, gets 1-2 million francs per year public funds (whether for official dispatches traffic or under the shape of grant).

In 1913, comes the first PTT subsidiary, in 1911, the State sells out the "South American Telegraph Cy", english concessionnary of Dakar-Pernambouc cable, and in 1913 reconstitutes the company as a state subsidiary under the name of "Companie française du câble sud-américain". The latter is a direct ancestor to contemporary firms gathered inside the "Cogecom" holding. The founding of these two companies marks the end of directly liberal inspired tries One must remark that, at the same period, in Great Britain, public backing is not less important : in 1904, it gives a subvention of 12 million francs to its companies, and France helps its own by 12 million francs.

2. An other type of concession ..another failure : telephone

During the first ten years of its life in France, telephone is also developed by concessionary firms. In 1877, the first telephone show was made at the Science Academy. During the summer of 1879, tne minister of PTT edits the list of duties that each company, eager to obtain a concession for running a telephone network, has to respect. Right away, public powers make the choice to exploit opportunities offered by the already existing legal dispositions.

Why that choice ? For two main reasons : one institutional, the other technical. One could have imagined to trust, straight away, like it was done in Germany, the chance of developing the telephone to the telegraph civil service. But in 1879, in France, the latter was in a weak situation. The melting of the Post Office and of the Telegraph, under the authority of the same minister has been effective since 1878. It has been considered by the Board of telegraphs like a taming and a taking of precedence of the Post Office, which is commercially more powerful and thought to be nearer to the republican government than the Board of telegraphs, considered as bonapartiste. A movement of sorting out by executives and particularly by engineers starts. In the following twenty years, the character of the Board of Telegraphs, inside the civil service, will fade off to that point that it will completely disappear of hierarchy maps, spread as it was between attributions devolved to the different "chiefs of electrical services". Thus, Telegraph engineers are not in a position to put forward any kind of monopoly.

Besides, telephone during its first years, faces the problem of amplification which will be solved in reasonably commercial operating conditions only after the introduction of the "Pupin coils" in 1910. It is, actually, composed of urban networks, similarly to other techniques that develop at the same moment : lighting, distribution of gas, water, transport (trams). Common assent around the idea that a network which feeds the whole country has a strategic value, does not really play at the beginning of the telephone. On the contrary, temptation is strong to apply on the telephone one of the models which keeps going the development of urban networks : the concession available for the whole city. Opportunity foreseen in the judicial disposition in service (1836 Act and 1851 decree) and, besides, fluently used for submarine telegraphy.

As soon as 1879, three companies, each of them backed by different letters patent (Bell, Edison, Cower) obtain an authorization for Paris. Since that time, difficulties of development are directly linked to the opposition existing beween the culture of the writers of the concession (inclined to limit the duration and to insert severe conditions protecting the state's rights) and the investor's entrepreneurial logic.

Thus, terms of the concession reflect directly the french political culture. Ministers or members of Parliament appear to deprive for a long time State of its prerogatives. All concession to a private firm arouses, at once, suspicion of partiality more or less interested. Consequently, the terms of the first concession are harsh : it lasts only four years and is renewable; infrastructures have to be lain by the Board of telegraph's own staff, important fees are owed to the State.

On the operating side, challenge between the three companies has disappeared even before the agreement's signature. Tenderers have united in the lap of the "Société générale des téléphones" which, thus, finds itself into the position of a monopolist from Paris City. Besides, it takes over one of the most important electrical equipment builders in France, the firm Rattier; and so it sets into a situation of exclusive domination on the french territory, leaving no other alternative to the cities which refuse dictatorship of the "Société générale des téléphones" than to appeal to the Board of telegraphes.

Thus, very quickly, the situation got worse. Concession is reconducted apparently without problems after four years but, from 1885, the "Société générale des télégraphes" foreseeing it won't be reconducted another time stops practically to invest money. The quality of its service, already strongly contested by users - in particular parisian business users - lowers and its position of monopoly is publicly denounced.

Solution would be to grant longer concessions assuring, thus, capital holders the return of their investments. The Société générale des téléphones is very near to obtain it, for it signs in 1886 with the minister of finance F. Granet a concession for 35 years. According to this, the firms transfers to the State all its networks. It mutes into a contractor with a concession for all networks including those built by the State. The State will be allowed to redeem the concession only after ten years; it keeps the right to operate long-distance lines of which no one at the time - except perhaps Theodore Vail in the United States -is conscious that they represent the real value of the network.

But hardly had the argument been signed that the minister is dismissed and that a political storm - whose real motives are, no doubt, fairly far from the telephone -starts off against its signers. Feeling that the case is bad, the new minister refuses to sign it again. The case goes into court, then it comes back to parliament where it ends with the voting of an act pronouncing the nationalization of telephone.

One thing, at least has played in favour of this nationalization : the working of a whole sery of city councils accepting the principe of state operating ... and the small interest for middle-sized cities - which had a non-profit making reputation - from the Société générale du téléphone. Thus, in 1884, Rheims wanted to have its own urban network built by the Board of telephone. It is the first in a sery of cities in the north and the west of France. So it constituted, in challenge with the private sector, a public sector which served a counter-model and makes technically understandable the idea of operating by a civil service. In 1889, nationalization is preceded by a campaign of petitions by the Chambers of Trade of the cities opposed to possibly hand their network to the Société générale des téléphones. Besides, a "committee of Paris phone users" shows a resolute hostility to administration by that former company and demands also nationalization.

But, as soon as nationalization has been voted, the republic, liberal in its principles - is'nt it nicknamed the "business republic" ? - feels reluctant to transform the ministry of PTT into a contractor. The telephone went through little and bad development for several reasons, whose first is the adoption of an unadapted system of fund raising.

France does not bring out centralized fund raising to ensure the growing of telephone networks and asks local collectivities to advance the money necessary to the construction of urban networks, one by one. Cities, towns and "departements" (counties) ask the help of small banks. One of the consequences of this extremely decentralized type of financing is that the national telephone network is going to be built through scores of very small local networks that give it too sparse a structure. For the same reason, it is very difficult to finance interurban links, for no local collectivity really feels responsible for them. Eventually, these provincial "big wheels" who decide the allocation of funds have a culture that is not predisposed, once their own needs fulfilled, to finance the development of communication networks with an image of a luxury product largely identified to the licencious culture of urban France during the "Belle époque"; neither did that product inserts into the circuits of communication of rural France, nor in the influence networks of these VIPs.

. 1922 : The liberal temptation

Badly financed, mismanaged, in 1920 French telephone is in such a poor situation of technical crisis that the decision of nationalization from 1889 seems about to be questioned. Three factors are playing in that direction. First, the ideological atmosphere. Elections of 1920 brought to power a conservative majority and the planned economy excesses, during the war, give audience to the theories of liberal economists; besides, with the technical evolution of telephone, the authorities have to face important investments : one must install automatic switch boards in large cities (the first one has been set in place in 1913), but war has delayed the general fitting plan - and also long distance cables with electronical amplifiers. Thus, it appears clearly that the organization on the spot, based on a civil service technically feeble and on an out-of-fashion fund-raising system, is unable to cope with it. But, at the same time, IT & T is trying to set foot in Europe. The Behn brothers offer to France, as they do to Spain and Belgium, to take over the whole of the country's telephone problem, fittings and operating together.

Reaction of the french authorities : the idea of a total concession is, at once, brushed aside; for says a minister : "it does not fit with the republican traditions of the nation". Both problems of the building of an industrial sector and of the general of the network's operating are handled separately.

One starts with the reorganizing of the telephone operating status. An investment plan, important for the time, meant to finance the laying of amplified cables and the installation of automatic switchboards is voted. At that occasion, one parts the budget of the PTT from the general budget of the State; one also introduces administration rules, different from those of an usual public administration - creation of an sinking - fund for instance - that would give it an "industrial and commercial" nature. Yet, the Post and the Telegraph-Telephone accounts remain more or less intermingled.

But, at the same time, government wants to know who is going to take advantage of its orders. The care is clear : one has to patronize French industry or even, which is somewhat different, technical control and employment in the country. The cable sector and the automatic switchboard sector are treated in a different way. Electronical amplified cables, which cover the whole country are - just like the telegraph - supposed to be strategic by the Army. In the sphere of industry, and in the violently anti-german atmosphere of after the first world war, danger equals Siemens. Thus, the French Board of Telephone will select, a small electronic firm, which has got remarkable scientific research workers and engineers SAT; SAT will, in concert with the Board of Telephone, develop a French technique of amplified cables, by accepting, in particular, to buy, during several years at a very expensive prices, prototype cables which work very badly.

Electronic switching, on the contrary, for it concerns urban networks, is not supposed to be strategical. Now, France does not have its proper powerful telephone industry : the PTT suppliers are Swedish company Ericsson or Thomson-Houston English Telephone Company or again small firms of little political influence. Well then, ITT adopts a policy perfectly apt to soothe the politicians' possible fears, these decision-making politicians who do not wish to be accused of selling away national interests. The Behn brothers make their proposal look as french as possible. They buy two plants in France, they exploit patents of a french engineer esteemed by his colleagues and, finally, start a research lab to which they entrust a young French engineer.

Between these American-turned-French and German propositions, the minister of PTT does not hesitate : between 1923 and 1939, he orders most of the successive generations of the telephone switchboards to ITT's plants. But that unshared rule cautions in itself the germs of its own dispute : The Board engineers develop, on principle, an hostility to an almost sole and powerful supplier.

Regarding internal Board's mutation, inaugurated by 1923 budget, it encounters quickly its limits. By means of Depression which reduces global telephone takings and, then, makes to defend the need to invest and modernize, the Treasure takes back its rule on the PTT budget; the latter is, in fact if not in right, again strictly limited and tends to be again treated like on ordinary service.

3. Radio and associations

Insertion of radio in the French Telecom's organization was also done in such a negotiated way.

The problem was lain after 1896, when G. Marconi made a sending exhibition, at sea, in front of the British Post Office engineers. In France, there is a sphere of scientists and technicians interested in it. In 1890, E. Branly, Professor of physics at the Institut Catholique, submits to the Science Academy his "cohéreur" first known apparatus to materialize a telegraphic signal transmitted by hertzian way; in 1898, Eugène Ducretet, a scientific equipment builder, realizes a transmission between the Eiffel tower and the Panthéon. These initiatives are relayed by the public powers. But, around 1900, it is the Army which, in France, is technically innovative; it is interested in aviation as in automobile and E. Ferrié, a young captain, protects the beginnings of wireless telegraphy. In particular, he installs a set at the top of the Eiffel tower for military transmissions, which allows him to keep in touch with the expeditionary force sent to Morocco in 1906. Similarly, the Navy, the department of lighthouses and buoys the ministry of colonies equip their own station networks. Besides, Marconi leads a large scale commercial and technical war to monopolize the most immediately profit-earning market, links between ships at sea.

In 1902, an incident reveals the problem : the ministry of PTT takes legal action against Mr Popp who has set up, without an authorization, a station at the Cape de la Hague, to communicate with ships at sea; that was done under the name of a "Société française des télégraphes et téléphones sans fil" which tries to impose a "fait accompli".

Besides, the Compagnie générale d'Electricité, specialized in high voltage currents, redeems german patents and tries to set foot on the market of radiotelegraphy.

Measures have to be taken to specify, on one side, the sharing of tasks within the public administration and, on the other side, to make possible a contingent commercial development. First, the technical ministries (Army, Navy, Colonies ...) are allowed to keep only their own networks; radiotelegraphy is considered as being in the field of techniques aimed by the 1837 Act and the 1851 decree; its operating is given to the ministry of PTT which refuses to grant concessions to running companies.

. **Concession of international radiotelegraphic links**

Just after the first world war nevertheless, PTT are no longer able to hold these extreme positions. Pressure by French radio firms is too strong. During the war, these have developed very strong technical and industrial abilities and have to return to civilian activities. The conservative government elected after the war is ready to listen to them. In 1920, minister P. Deschamp signs with the President of the Société française radioélectrique (SFR) a concession that gives to one of its subsidiaries, the Société Radio-France the right to operate profit-earning international radiotelegraphic lines, in particular the transatlantic line, the Board keeping the right to operate lines of little commercial interest but considered as strategic, especially towards the colonies. The signing of this agreement provokes a swift debate in Parliament;

left-wing parties, helped by the PTT-unions, protest against that sharing where they see the start of the public service decline. One has to remark that it is precisely at the beginning of the 20 th century when the expression "public service" enters into the French political glossary. Before, it belonged to law vocabulary. The unions, and especially civil servants unions authorized after 1884, gave it a new meaning. The CGT, before the 1st world war, elaborates an argument where meet the interest of the PTT's staff (put to the greatest extent the PTT powers to stretch as much as possible a field where employment is protected ... and relatively powerful unions) and the general interest; the "public service" being supposed to take into account the interest of all the French, in particular small users ... as soon as the twenties, this argument, which will remain stable and politically efficient up to our days, acquire great efficiency.

The Deschamps-Girardeau agreement is signed but it is considerably emptied of its content in the following years, partly by the left-wing government in 1924. These political choices meet the natural tendency of an institution -in the circunstances the ministry of PTT - not to leave its prerogatives. Never did Radio France on one side, and those who watched the execution of the agreement on the other side, really play the game. In 1953, at the end of the concession, the State redeemed all the firm's equipment, totally obsolete.

. RADIODIFFUSION

The birth of radiodiffusion can be situated in the same context of reconversion of a powerful war industry into civilian activities. It starts with a certain legal emptiness, or rather, in the refusal of the authorities to take an immediate decision. In 1922, two private industrialists (a politician somewhat journalist and a radio equipment builder) created radio stations while the PTT Training School set up its own station. Till 1939, there was a coexistence and a competition between a network of state-owned stations and the private ones. Between 1924 and 1926 a sery of more or less formal decisions established that radiodiffusion must enter into the field of techniques concerned by the 1837 Act and the 1851 decree and that the minister of PTT was qualified to grant authorizations ... or to let its own administration exploit these opportunities. In fact, it proved that the radio political problem was rather a programme problem and that most decisions about radiodiffusion were being taken at the level of the Prime Minister. It was that tendancy to favour the control of programmes which made the whole French radiodiffusion, after its nationalization by means of war (1939), to be taken under the wing of a ministry of information created recently. But between 1922 and 1939, the PTT were in charge of developing the state owned radio stations network, which broadcasted in competition with private radio stations. It put that technical ministry in front of entirely new responsabilities : how to run programmes ?

In the first time, the problem was lain in a fairly decentralized way : the technique allowed to the stations broadcasting locally. In every big city in France, PTT agents, passionned by radio, started, sometimes of their own, the first public radio stations and formed with associations of listeners - depending from the 1901 Act - that is to say non - profit making associations - to administrate programmes. These associations allowed, in particular, to pay artists and announcers for which no budget section was foreseen in the civil service. But they also permitted, through the composition of their board of directors, to associate closely local VIPs to the watching of the public stations broadcasting. And the recovery by the government of the content of the public stations programmes - phenomenon which marks the whole 1922-1939 period - will be done very largely through the changing of the associations' rules and of their board of directors.

3. 1945-1980 : reutilize or transform institutions ?

The period going from 1945 to 1980 seemed to be marked by less institutionnal creativeness, perhaps because the working institutions fulfilled the needs.

a. Public research and national industry

To understand that "after-war period", one has to keep in mind that the spectacular period of connecting new subscribers, which took place between 1975 and 1905, was preceded by a long period of maturation, when the mastering of techniques and the building of a network apt to stand that subscribers' connecting policy were the main concern.

During all that period, the DGT showed an unrivalled technical vitality and the authorities had to take decisions regulating that spontaneous economic growth.

It was characterized by three facts. First - the dominating importance of research and of industrial policy; second, the changing role of the subsidiaries; third, the deep internal evolution in the Direction générale des Télécommunications (DGT) at a moment of accelerated growth of the telephone network, after 1975.

It was true that the new appearing techniques do not create entirely new services but, for most of them, renew the network carrying an ancient service : telephone. Among the two expanding techniques in that period were the satellites (1962) and submarine telephone cables : their development was entirely operated by the PTT. And if no one argued about the right to renew entirely for that its submarine cables service, on the other hand its intervention was considered excessive in the field of satellites whose - if it kept research for satellites and receving stations - it had to leave in 196. the designing and the launching of rockets, a task that was to be given to another public service, the National Center for Space Surveys.

However, the hold of the public service did not have a monopoly, nor did it try to obtain it. During all this period, for instance, telex owed the essential part of its development to the vitality of a firm : Sagem. Before the second world war, the teleprinter market was entirely dominated by Creed, a british firm of equipment.

Paradoxically, the german invasion was an opportunity to develop, with the help of the Army, French equipment put on the market immediately after the war. For that, Sagem profited by the relatively liberal judicial and reglementary French apparatus, about terminals whose sales depended on private initiative, in competition occasionaly with the civil service. This disposition had very ancient roots : in 1889, when the Société générale des téléphones was nationalized, assemblers who had to set up the users' installations were proposed the choice between becoming civil servants or to be their own boss. From this moment, they started to develop a job of assemblers, at the fringe of the public network and strongly arguing with the civil service to oblige it to stick to its activities of installation and maintenance of domestic users, all PABX being set by private installers. Since the seventies, one can observe a freeing from that sector by the civil service, the latter having, for instance, stopped to sell teleprinters.

The most important industrial problem, after the second world war, does not depend on terminals or users' installations but on the network's equipment, switching and transmission which are characterized by the fact that they need very heavy research investments. Still, between the two world wars, some potential of public research was being developped, but in a rather scattered way, each technical branch being equipped with its own institutions. Thus, the development of the radio was backed on one side by CSF's industrial labs and, on the other side by a public center the National lab for radio electricity; the latter concentrating rather on thè phenòmena of wave propagation and international standards; mastering the techniques of

electronic amplification had passed through a direct collaboration with the PTT long distance lines department (created in the twenties) and its main supplier, SAT. Besides, the control of electromechanical switchboards was largely supported by the growing of the Research and technical control department which can call, in case of need, upon the small laboratory occupying the former Higher School of Telegraphy.

After the war, one of the characteristics of French development - was the creation and reinforcement of the main research public centers; very often the idea went back to 1934-36, and the projects were renewed by the goverment of Vichy when one analysed the french defeat in face of the german army like a lack of power and freedom for the technicians. Between 1944 and 1974 a consensus survived to all forms of government and, the 4th Republic just like the gaullist State developped large public research centers in all fields : data processing, atomic research, health ... Telecommunications were no exception to the rule. The CNET, Centre national d'études des télécommunications, was established in 1944 by the Vichy government and its existence confirmed at the Liberation. Little by little, it integrated all the former different centers. Its links with the French industry were very tight. About switching, for instance, all happened as if civil service engineers had made a bet to develop an entirely French technique in the public laboratories and then, to transfer the know how to CGE, a French company. Since 1955, that firm was headed by Ambroise Roux (engineer of the Mines, a state corps) and had made a large part of his career at the minister of industry's departmental staff. Besides, CGE had a strong experience of public markets for it has been one of EdF's (Electricité de France = the electricity corporation)

favoured suppliers when that corporation started, after the war, an enormous effort to equip France in hydro-electrical dams. After unsuccessful tries for the last electromechanical generations (L43), the CNET-CGE alliance worked perfectly in the sixties, when the question was to make ready the first generation of electronic switchboards. These were entirely conceived in the CNET labs, by civil service engineers, and partly developped by mixed - public and private stock -firms, practicaly localized in the same place than the public research center, industrial adjustment, marketing and sales depending, then, totally from the builder.

That characteristic model is not, nevertheless, exclusive. Thus, MT20, the other type of french electronic switchboard at the beginning of the seventies, was developped without any intervention by the public research center, in the Thomson's labs; which company was, then, specialized in supplying the Army.

Similarly, some kind of interior market organization set up after the war. Mixed stock firms were created whose goal was to put in common patents corresponding to new equipment ordered by public administration, to share development expenses and markets between its members. The first one, Sotelec, concerned in switching equipment, was found before Liberation by some french industrialists, scared at the perspective of seeing foreign builders force their way in, as themselves were in a poor position after four years of occupation; and it took shape in 1947. Its working was backed by the successive socialists and

gaullists governments. It was followed, in 1958, by a similar organization for commutation : Socotel, which never reached to the same efficiency. All that philosophy of relations between public and private sectors was clearly summoned after 1974.

Of course, there are real results. That model allowed France to acquire skills in sectors where it was entirely dominated before the war : public switching; amplified cables and, when they appear, to master new techniques (satellites); then, it gave very strong technical bases to the development of the telephone network which, after 1975, helped France to come back into the main body of developped countries for telephone. But it was over expansive in passing equipment orders. In 1974, it looked as if government wanted to return to a more classical doctrine about competition between its suppliers.

2. The new role of the subsidiaries

The second characteristic of that after - war period was the new role devolved to the PTT subsidiaries. They were used to face a large scale of new situations. Thus, during decolonization, some of them helped to maintain a French presence, under the form of privately owned companies, in recently decolonized countries. Another subsidiary had the clear but unofficial duty to allow the DGT (Direction générale des Télécommunications : Board of Telephone) to create its own up to date informatic systems at a time when the civil service salaries were too low to recruit data processing operators. Thus, in a first time, DGT was one of its subsidiaries most important patrons. Later, the firm evolued towards a diversification of its customers; thus, becoming one of the first French firms in the matter ... Other subsidiaries were created when teleinformation processing got developped, to associate public funds to potential clients. The result of that diversification in the sixties and the seventies is that, to-day, DGT gets alongside a holding whose capacities are numerous. One of these firms owned a packet switching network that covered the whole territory and could perhaps be a rival to DGT. Another one took part to financial operations recently elaborated by banks and data processing firms to create value added services; other ones, then, intend to tender for supplying services to foreign countries.

C. DGT's cultural revolution

The second characteristic of this after-war period is the institutionnal evolution of the DGT itself. We saw that, in the twenties, the political power considered impossible to change the legal status of the firm operating a telephone network and that, seeing the urgency of evolution imposed by techniques, it had nevertheless realized important status adjustments, creating the supplementary budget. In 1975, a fairly similar phenomenon happened. Telephone equipment of the country became a priority for the goverment which, for that voted important supplies. The question was : to operate these sums does one have to create a national telephone company, being given self-governing opportunities, or could the DGT, with its very administrative status of ministry department, do it ? and at what price ? In 1967, V. Giscard d'Estaing, then a member of Parliament proposed a bill to create a telephone company. But it was rather a symbolical action, because, for some years the telephone equipment of the country was already being built in a very satisfactory way, but at the price of a cultural revolution inside the ministry of PTT; the latter asked very little change in the rules, but, on the other hand, an enormous evolution in habits ... outside as well as inside the Telecoms. The first thing to do was a clear partition between Post Office and Telecoms, wished by those administrating both departments, but meeting the continual opposition of the trade - unions as grouping both activities seemed to be a guarantee against a possible privatization and had advantages for the staff.

Little by little, the accounts of the Telecoms were separated from those of the Post Office. An accountancy similar to that of a private firm was introduced, in parallel with classical public administration accountancy. A system of dashboards was adopted to lead the growth. Above all, since 1968, Telecoms might borrow on international markets through financing companies created especially for that. This self-government still had strong limits. For instance, tariffs were fixed one for all every year by the Treasury and the Parliament, just like the scale of salary and opportunities of recruitment; which lined the Telecoms staff management up to that of hospitals or to that of the taxes department. But if these limits tended to be felt like very penalizing in a surrounding of challenge and evolution, they did not oppose the effort to equip the country with telephone. And, in the seventies, that succeeded within the classical administrative frame, simply refit.

CONCLUSION

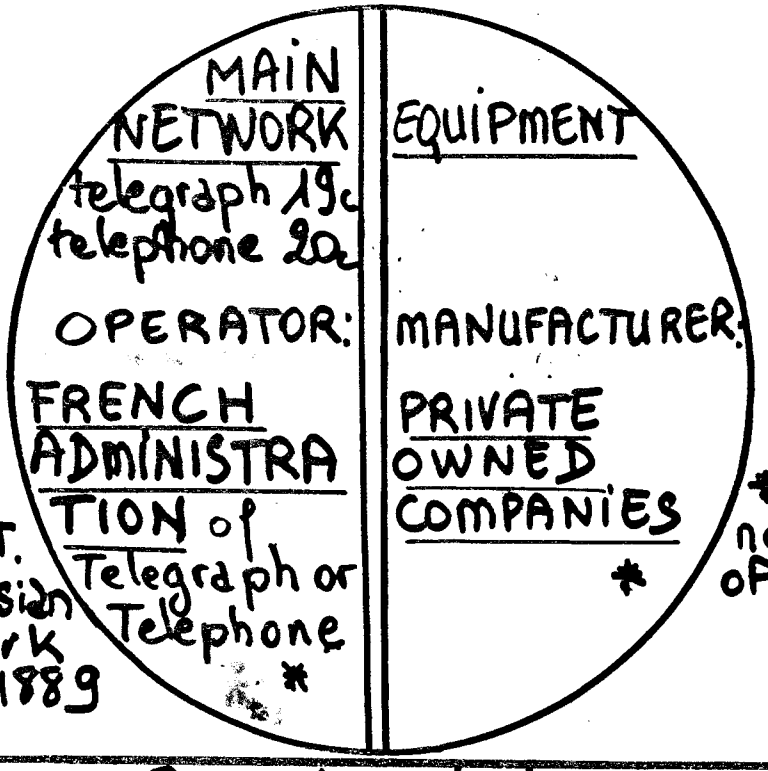
What conclusion can we draw from that vast panorama ?

First, that history is not an exact science and that it was never used to foresee the future. And as G.B. Shaw said : "Man has learned from history that man never learns from history". But let us make at least two remarks. Finally, France was not spare of modifications in the judicial reglementary conditions that framed the development of telecommunications. But, when a decision is about to be taken, it is difficult to forecast which disposition will remain stable and permanent and which are those that quickly will be balanced by an application resolutely opposed to the spirit of their promoters. Everything happens as if the whole system evolved by looking some kind of movement harmonious arrangement. Thus, big changes were systematically carried out "above" what was foreseen : the concession of the telephone networks was drafted in such a way that it did not really put a manufacturer into good conditions to return his investments; the supplementary budget of 1923 lost all the "industrial and commercial" dynamism that it should have given to the Post Office as well as to the Telecoms, for want of having been loyally applied by the Treasury; the growth in the seventies occured without giving any clear statute and self-government to the Telecoms.

On the other hand, discreet decisions and settings "on the fringe" may last and become decisive : so was the creation of the subsidiaries or the development of public research...

As usual, no reform is without consequence. Something always subsisted which contributed to build, by successive layers, the now a days institutionnal landscape of Telecoms in France. However, what remained is not, necessarily what its promoters forecasted.

1.1. THE SHARING OF TASKS BETWEEN PRIVATE COMPANIES OR STATE OWNED COMPANIES : A CONSENSUS



* one exception: the private S.G.T. operate the parisian telephone network between 1879 & 1889

* one exception nationalizations of 1982 - 1987.

This share of tasks between public-owned companies and private owned companies in telecommunication in France has existed as a consensus for 150 years

1.2. EXCEPTIONS

- Exceptions exist. They are important in that they give the system flexibility and stability

- Exceptions concern:
  - new technology
  - international telecommu-nications

- They are of 3 kinds:
  1) FRANCHISED COMPANIES
  2) ASSOCIATIONS (non-profit organizations)
  3) SUBSIDIARIES OF THE P.T.T. (State owned operator)

1) FRANCHISED COMPANIES

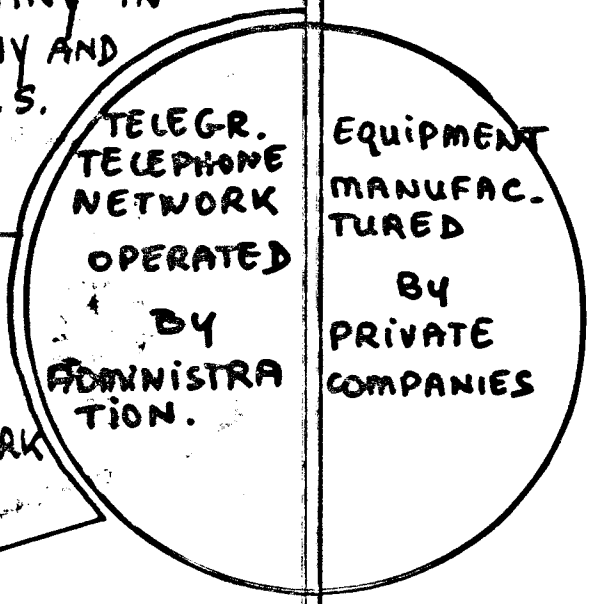
PRIVATE OWNED COMPANIES

1850 1RST FRANCHISED COMPANY (SUBMARINE TELEGRAPHY)

1865-1911. MANY FRANCHISED COMPANIES IN SUBMARINE TELEGRAPHY.

1922 FRANCHISED COMPANY IN WIRELESS TELEGRAPHY AND TELEPHONY TO THE U.S.

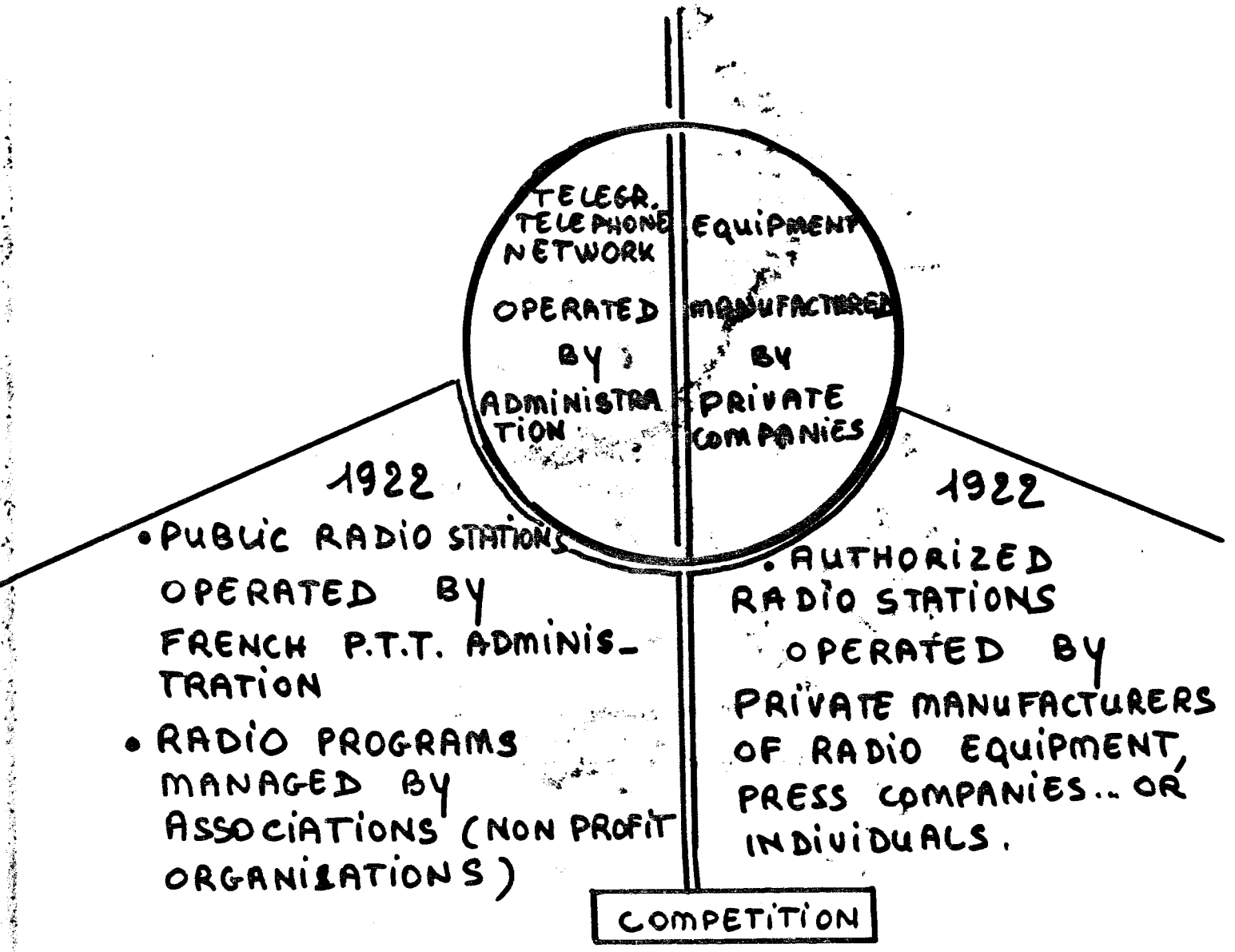
1879-1889. FRANCHISED COMPANY FOR THE TELEPHONE NETWORK IN PARIS *



UNDER THE LAW OF 1837, WHICH IS STILL VALID, THE GVNT. MAY GRANT FRANCHISES TO PRIVATE OPERATORS

* 1889 NATIONALIZATION. THIS COMPANY WAS OPERATING IN COMPETITION WITH THE ADMINISTRATION OF TELEGRAPH WHICH OPERATED SOME

2) ASSOCIATIONS (non profit organisations)

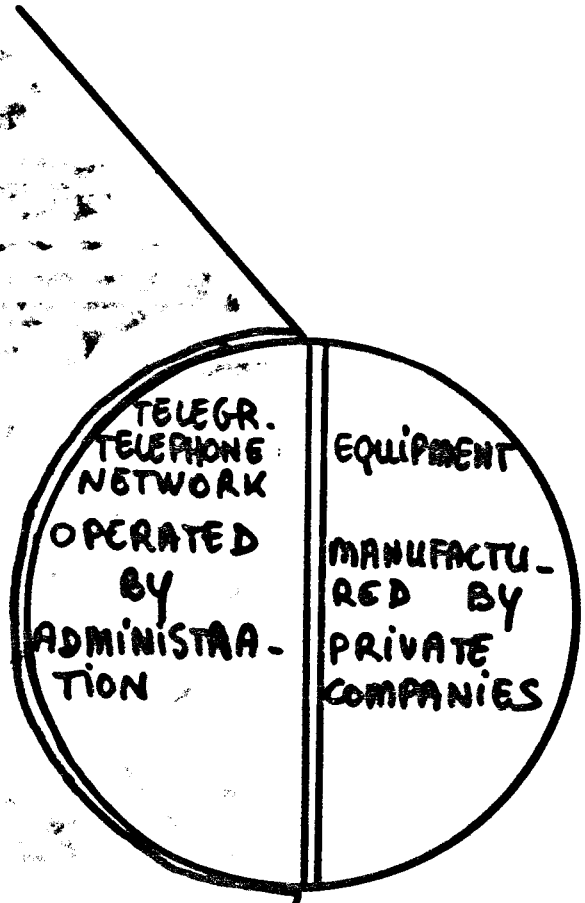


BETWEEN 1922 AND 1939 COMPETITION EXISTS BETWEEN STATE OWNED RADIO STATIONS OPERATED BY THE P.T.T. ADMINISTRATION TROUGH ASSOCIATIONS (NON PROFIT ORGANISATIONS) AND PRIVATELY OWNED RADIO STATIONS ; SOME OF THE LATTER WERE OWNED BY PRIVATE MANUFACTURERS OF RADIO EQUIPMENT.

3) SUBSIDIARIES

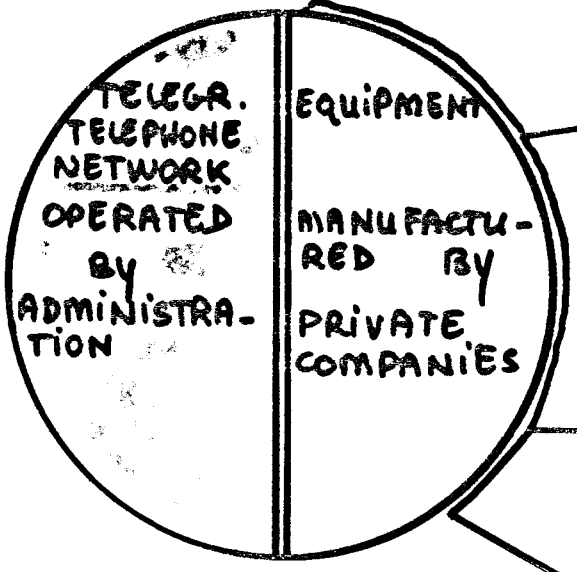
OPERATING

- 1913. Creation of the 1RST subsidiary of P.T.T. (for submarine telegraphy)
- Since the late 1950's to the late 1960's ...
  Subsidiaries have been used to maintain French presence in former colonies
- 1970's
  a subsidiary is created for providing computer services for the Telecom. operating administration (D.G.T.)
- 1978
  a special subsidiary is created in a joint venture with the customers companies in developping a packet-switched net work (TRANSPAC)
- 1980
  subsidiaries operating in foreign countries, marketing new services, operating very specific services, ... all in a competitive environment.



IN 1986 THE SUBSIDIARIES OF P.T.T., THE FIRST OF WHICH WHERE CREATED IN 1913, WERE PLACED UNDER THE CONTROL OF A HOLDING COMPANY: COGECOM (ANNUAL REVENUES: 4 BILLIONS FF; FRENCH TELECOM ≠ 100 BILLIONS FF)

C.P.E : CUSTOMER PREMISER EQUIPMENT.



- since 1889 small companies have provided and maintened PABX's
- An exemple : since 1944 Telex terminals are manufactured, sold, rented, maintened by a private company (SAGEM)
- Recently customers were permitted to buy téléphone sets from many differents vendors

SINCE 1889 CUSTOMER PREMISER EQUIPMENTS HAVE BEEN MANUFACTURED AND SOLD BY PRIVATE COMPANIES WHICH SOMETIMES HAVE BEEN IN COMPETITION WITH ADMINISTRATION

INTERNAL EVOLUTION OF THE P.T.T. ADMINISTRATION.

- **1837** TELEGRAPH NETWORK IS OPERATED BY A "DEPARTEMENT OF TELEGRAPHY, WHICH IS PART OF MINISTRY OF POLICE, AND MAINLY USED FOR POLITICAL, ADMINISTRATIVE AND MILITARY PURPOSES.
- **1851** NETWORK OPEN TO PUBLIC USE AND OPERATED BY DEPT. OF TELEGRAPHY.
- **1922** ITT WAS DENIED A FRANCHISE TO OPERATE THE TELEPHONE NETWORK
- **1923** THE P.T.T. BUDGET WAS SEPARATED FROM THE GENERAL STATE BUDGET - THE DEVELOPMENT OF TELEPHONE NETWORK IS TO BE FINANCED BY ITS OWN REVENUES
- **1969** A PROJECT TO SET UP A NATIONAL TELEPHONE COMPANY INTRODUCED TO THE PARLIAMENT

SINCE 1969 AND ESPECIALLY 1975
FRENCH ADMINISTRATION HAS EXPERIENCED A FAST GROWTH, THANKS TO A "CULTURAL REVOLUTION"

- CREATION OF FINANCING
- ACCOUNTING SEPARATED FROM THE POSTAL SERVICE
- MODERN MANAGEMENT

- **1987** DGT REQUEST A REPORT ON THE STATUS OF THE STATE OWNED COMPANY

TELECOMMUNICATIONS RESEARCH

1. 1920-1944 : RESEARCH SPREAD AMONG DIFFERENT CENTERS, EACH ONE SPECIALIZED IN A GIVEN TECHNOLOGY

2. 1944-1974 : IN SEARCH OF NATIONAL INDEPENDANCE OF TECHNOLOGY : THE EXEMPLE OF SWITCHING INDUSTRY.

A) Reinforcement of public research with the creation of the C.N.E.T. in 1944.

B) Transfer of technologies from the CNET to french Telecommunications manufacturers

- SOTELEC (SWITCHING INDUSTRY) 1947
- SOCOTEL (TRANSMISSION) 1958

- JOINT-VENTURE C.G.E - CNET to develop electronic switchboards

c) Independant private research: Thomson and the electronic switching system MT20.

3. 1974-1987 DIFFICUTIES IN MAINTING COMPETITION FOR THE SUPPLY OF SWITCHING SYSTEMS

A) 1974 : 2 suppliers, C.G.E & THOMSON

B) 1982-84 : After the nationalization of CGE, Thomson and CGE's telecom. are joined : the new company is a very dominant supplier for the French Telecom administration

8 bis

TELECOMMUNICATION RESEARCH

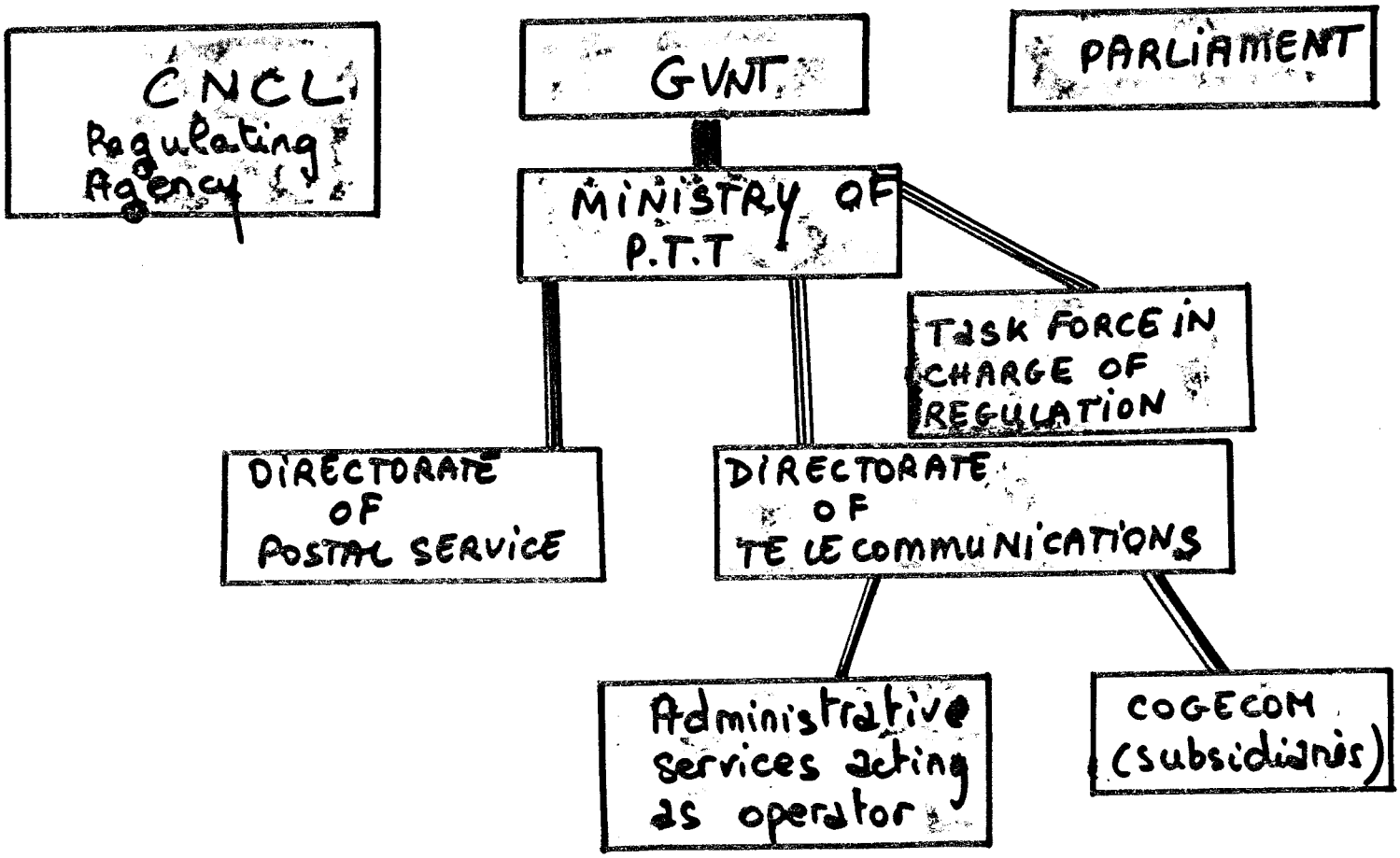
c) JANUARY I 1987 : CGE TOOK over ITT Telecom through its subsidiary Alcatel

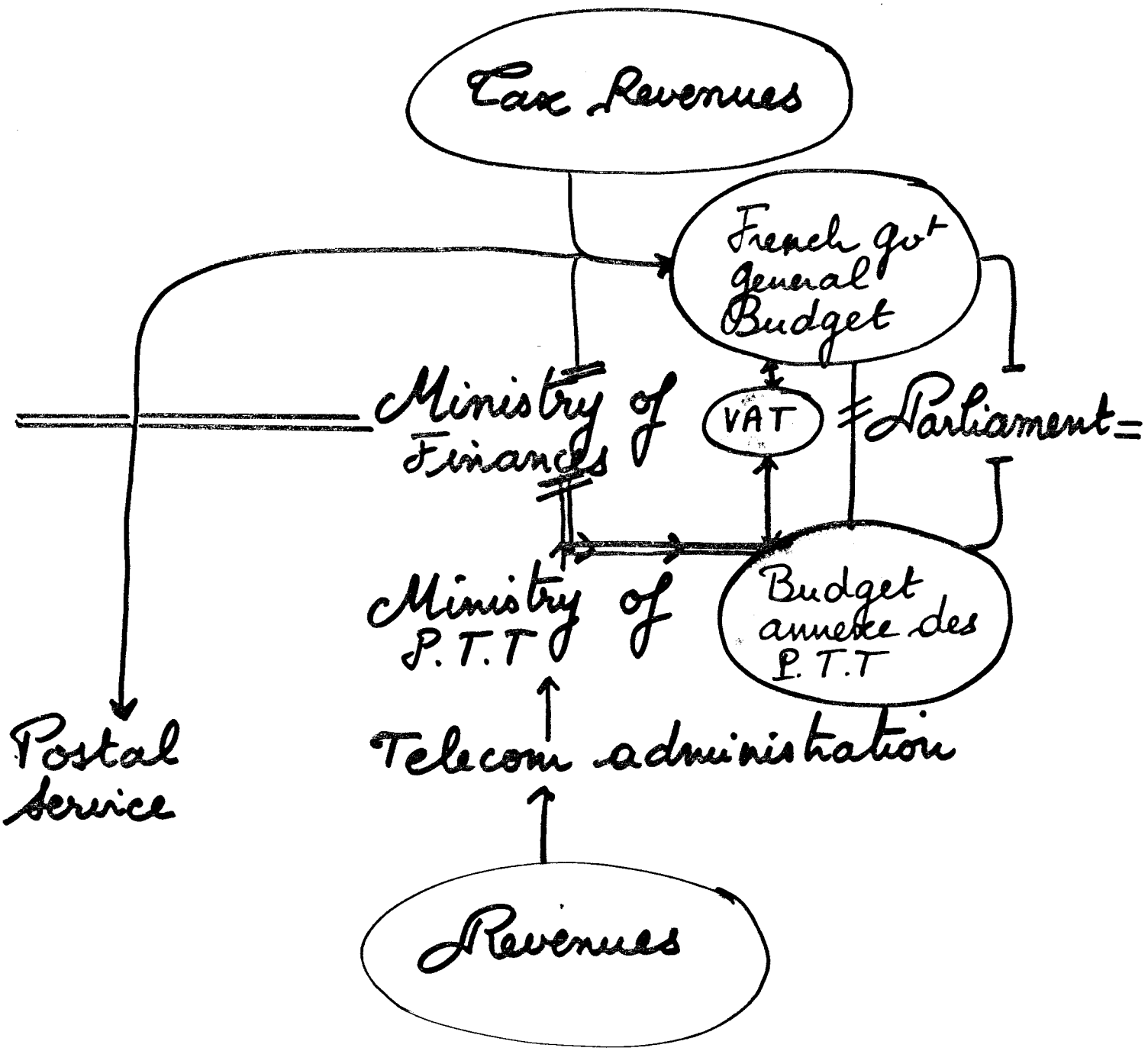
4. 1944 ... INDEPENDANT RESEARCH AND DEVELOPMENT: TELEXE AND THE SAGEM COMPANY.

CONFLICTS BETWEEN PUBLIC/STATE OWNED ORGANISATIONS FOR THE OPERATION OF TRANSMISSION FACILITIES

- 1917 - P.T.T. Unions fought for the law of 1837 to apply to the wireless (and, after, broadcasting) activities.
- After 1922. Broadcasting licenses were granted by P.T.T.
- After 1939. Broadcasting was placed under the control of the ministry of information
- After 1959. Broadcasting transmission facilities were taken away from the P.T.T. to be operated by the Public Broadcasting company itself
- 1986 D.G.T. got back into the broadcasting business by providing transmission facilities to private TV and radio-station

WHO DOES WHAT ?




Tax Revenues
French gov't general Budget
Ministry of Finances
VAT
Parliament
Ministry of P.T.T
Budget annexe des P.T.T
Postal service
Telecom administration
Revenues