

## Telegraphy signs receiver with paper tape printing

To the teachers Luiz Carlos Gomes and Gentil Bruscatto

Synopsis of the restoration of a receiver Telegraphy with printing ink signals of Morse code on paper tape, more equipment didactic physics laboratory at the Military College of Porto Alegre. The receiver was imported by the company "O. Meister, "the city of Rio de Janeiro.

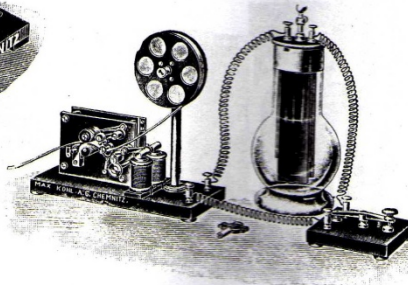
The device is restored practically equal to code 95,151, center and right of the figure, taken from catalog sales famous instrument factory Max Kohl founded in 1876 and located in Chemnitz, Germany.

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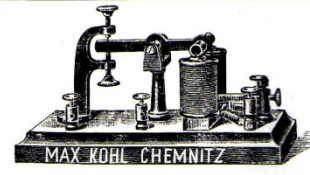
Max Kohl, Aktiengesellschaft, Chemnitz.



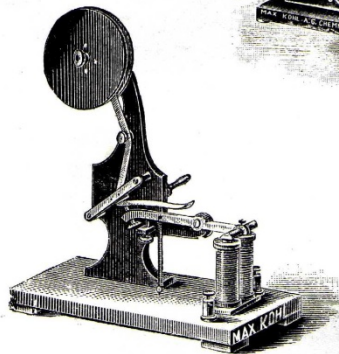
95 147 A. 1:6.



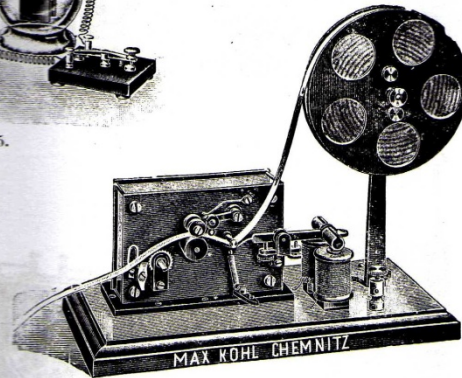
95 149. 1:5.



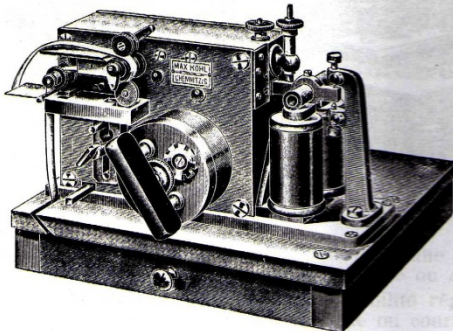
95 153. 1:3.



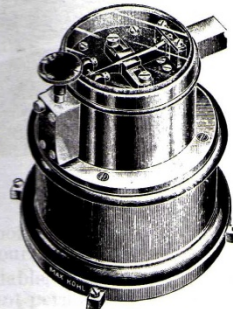
95 148. 1:4.



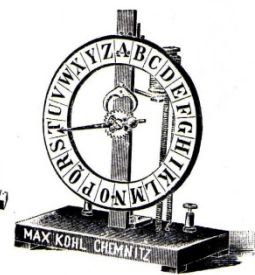
95 151. 1:4.



95 152. 1:5.



95 154. 1:5.



95 147 B. 1:6.

### Télégraphie électro-magnétique.

- 95 147. Télégraphe à cadran, Figures A et B, comportant un manipulateur et un récepteur à lettres visibles à distance . . . . .
- 95 148. Télégraphe Morse, Figure, petit modèle avec mouvement à main . . . . .
- 95 149. Télégraphe Morse pour écoles, traçant les signes en couleur, avec mouvement d'horlogerie à découvert, manipulateur et pile à immersion, Figure. Description . . . . .
- 95 150. — Le même, sans la pile . . . . .
- 95 151. Récepteur Morse, encreur à molette, Figure, avec mouvement d'horlogerie sous verre, sur planchette acajou (voir Gan-Man. Fig. 847; Gan-Rein. Fig. 925) . . . . .

## 1. Before Samuel Morse

In passing from the eighteenth century to the early nineteenth century, Galvani , Volta, Coulomb , Oersted , Ampere , Faraday , and others , discovered the practical and theoretical principles of electromagnetism. While science gave great steps, the spanish physician Francisco Salvá, proved that the voltaic currents could be used for outputting. It was the year 1800. Thus, Salvá is considered the pioneer in the practical application of electricity for communication purposes.

In 1812, the German Samuel von Sömmering, reached 3 miles away with a telegraph. Already in 1837 the German physicists Gauss and Webber, patented a telegraph 5 magnetic needles.

However, was the American painter Samuel Finlay Breese Morse, who invented a practical system with a switch, an electromagnet and only one wire. In 1832, Morse designed the construction of a telegraph recorder unit and established the principles for its code of points, lines and intervals, based on the presence or absence of electrical impulses.

After introducing several improvements on the device, Morse transmitted in 1844, the first telegram from Washington to Baltimore, a distance of 64 km, using his code. This system allowed a large development Morse telegraph. In 1852 had 64,000 kilometers of telegraph lines in the world.

## **2. The Telegraph's Evolution**

In 1848, English Wheatstone built the first telegraph ABC, with one wire and an electromagnet, which had a record indicating the letters received. In 1851, Wheatstone modified the model to print letters on a strip of paper. In 1855, Englishman Davis Hughes invented in the USA ticker, where each key corresponds to a letter.

Wheatstone continued to improve the telegraph, Morse particular. One of the improvements is the inclusion, in 1858, a paper tape punch, allowing reaching almost six hundred words per minute.

The glory of the Italian Guglielmo Marconi was to create a global network of transmitting and receiving signals from wireless telegraph, which allowed its use in navigation. Marconi , in 1904 , said that " the signal to be used by vessels requesting assistance will be CQD ... " In July 1908 the sign was replaced by SOS.

In popular usage , SOS was associated with phrases such as " Save Our Seamen " , save our sailors , " Save Our Ship" save our ship , "Survivors On Shore " surviving on the coast , or the most remembered , " Save Our Souls" save our souls . Nevertheless, these sentences came after as a way to help remember the letters: being a code, SOS has no meaning by itself.

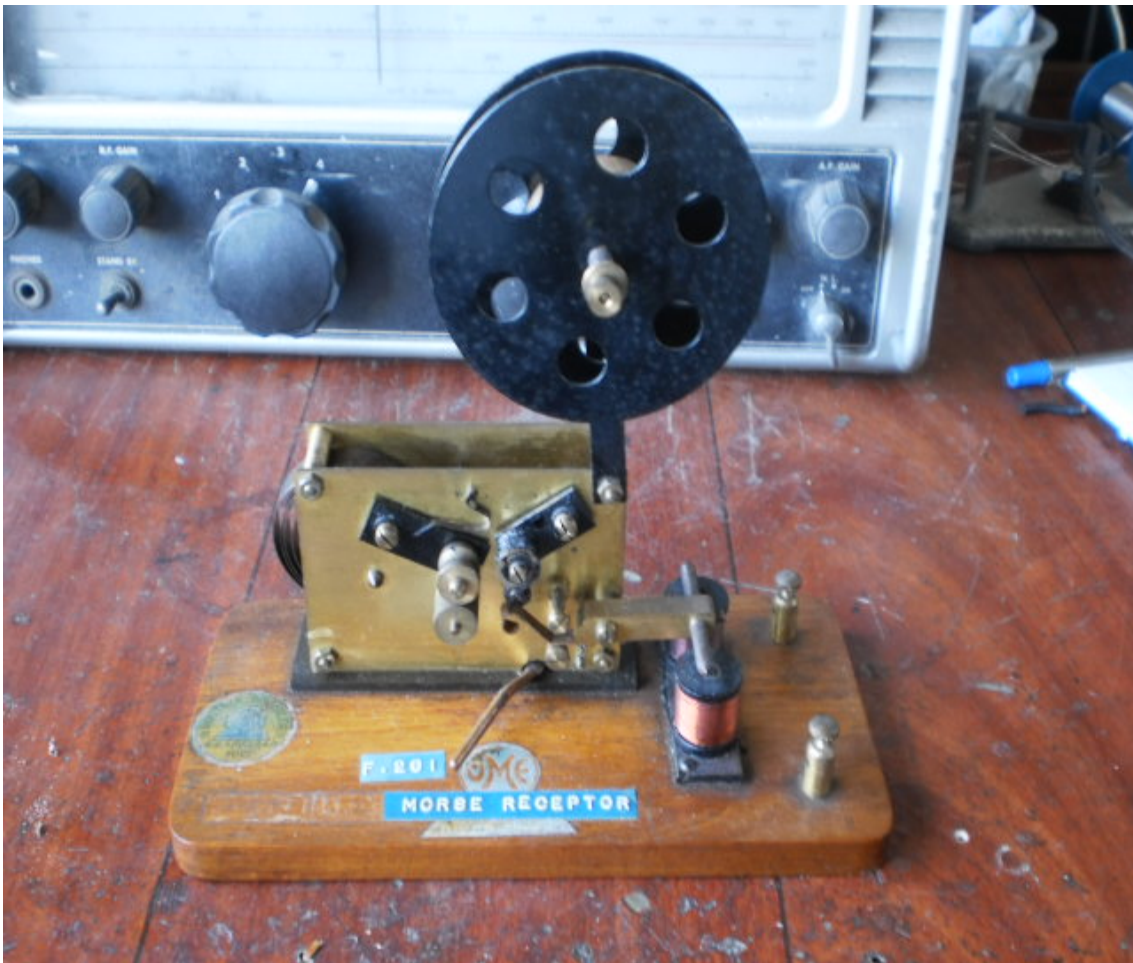
Parallel with the development of a worldwide network of telegraph between 1895 and 1900, the first signs of human voice was transmitted from the experiences of Landell de Moura. Thus, Began the era of radio.

The registers used devices systems very similar to the original Morse apparatus, which recorded the encoded signals on a tape moving paper.

In the system Wheatstone the dots and dashes were printed with short and long signals on a strip of paper moving through a small wheel soaked in ink and moved by the electromagnet from the receiver. Some registration systems were mechanically producing perforations on paper.

### 3. The telegraphy receptor of signals device Morse on paper strip

When received, the receiver was with the mechanical system of rotation (rope clock) without operation. I asked D'Darlou Arisbo, a skilled restorer of all that is in the mechanic area so I solved the problem.



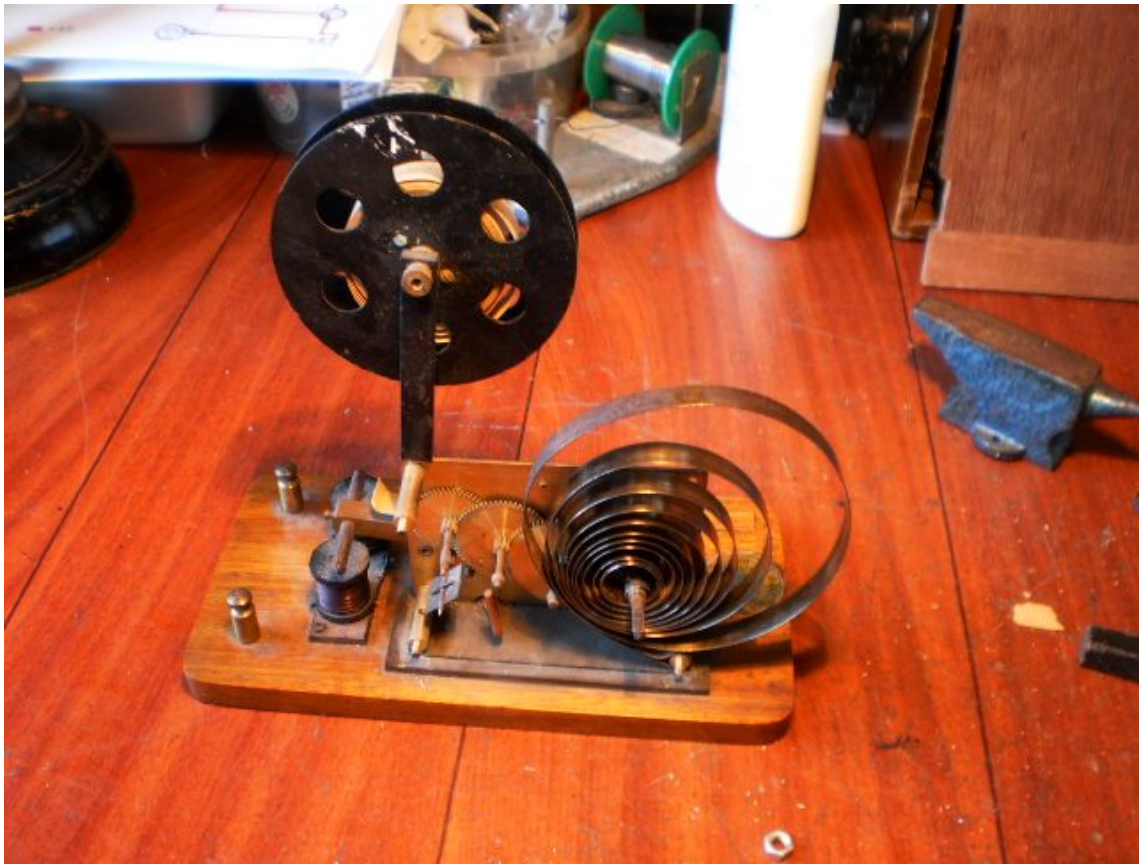
The brother soon found that the end of the spring, where there is a hole for the fixing shaft was broken (photo). In other words, the rope broke it was so forced. We started with the opening of the gearbox to allow access and removal of the spring.







The spring was removed from inside the machine. A new tip was prepared and heated to soften the steel and to allow making a new hole. The next step was extremely delicate and difficult, because the spring had to be replaced and engaged the shaft without desenrolasse (photo below).



## 4.Circuit and Functioning

After the repair the machine's mechanical rope, joined the group two more parts: a former handler telegraphy and a DC power source. The first was found in the acquis of the Museum of Radio: telegraph equipment built by Material Factory Transmissions Brazilian Army in 1941. It is an oscillator with a valve 12A7, used for teaching Morse code to the military during the Second World War (photos below). This equipment, for sure, our Father Dario Reis D'Arispo learned the first lines of the transmission and reception of telegraphy. This equipment had been restored electronically by the coach and partner of many antique radios, Sérgio de Moraes Caon.

The simple removal of the "lid" of the box, gave the set a handler original and fully functioning.



The supply current for the circuit was supplied in the same way as for the restoration of other equipment centenarians Military College, as the coil Ruhmkorff: a source with 6 volts DC and 10 A which was partly assembled by the late friend Ari Zwirtes.

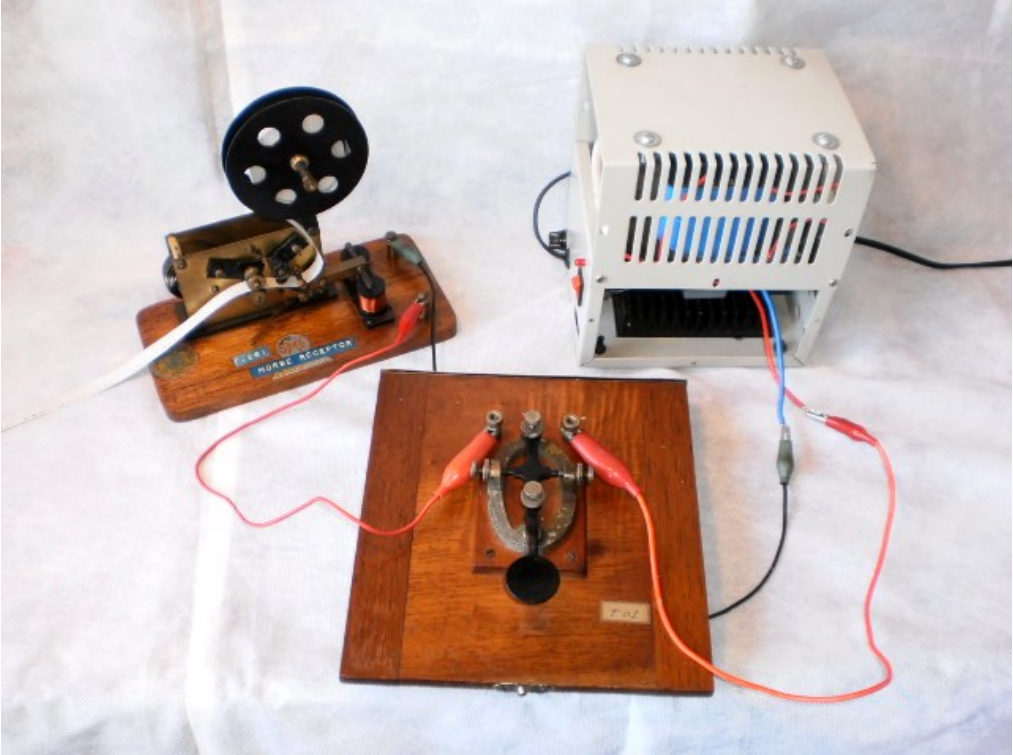
One problem was noticed before the final test: a paper tape on the receiver and with many decades of existence was totally dry and breaking easily. The solution was cheap and quick: buy rolls of coil carnival, which by chance and luck absolute, has the same width as the original tape! And the Ink? After some experiments and failures, was used to refill ink in the old fountain pens.





Following pictures:

- 1. Set prompt and efficient: source - handler - recipient of telegraphy;
- 2. Machine rope passing paper tape and and printing signs.

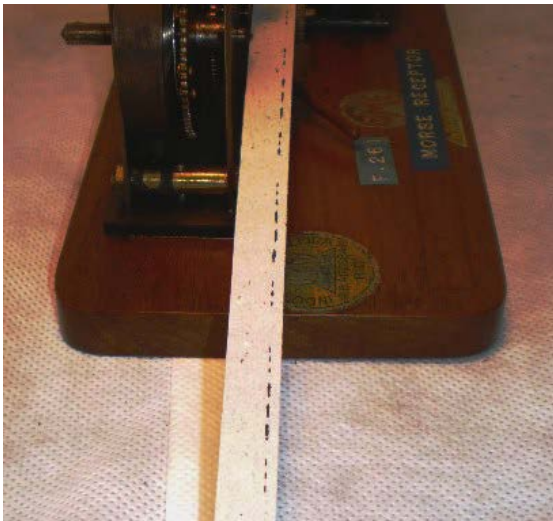




Finally, the traditional oil application on the basis of mahogany wood.

In the side photo, the final state of the receiver to the ink-printing telegraphy signals of Morse code on paper tape.

In conclusion, rewarding and successful results. From an equipment absolutely dead, the restoration brought life and another example of the history of telegraph transmission.



And as it couldn't be left over, it remains a try from this badly-educated telegrapher.

If we depend on your skills to pass on three points, three dashes and three dots, code SOS, will be better just screaming Save Our Souls.

DALTRO D'ARISBO OCTUBER/2013

[www.museudoradio.com](http://www.museudoradio.com)

Sources:

[http://www.del.ufms.br/PCI\\_T1/G9/TrabalhoTelegrafo/TelegrafoIndexMurilo.htm](http://www.del.ufms.br/PCI_T1/G9/TrabalhoTelegrafo/TelegrafoIndexMurilo.htm)

<http://energiaelectrica.no.sapo.pt/histelec.htm>