

## SCOTT Philharmonic Restoration

In the year 2015, I received a fabulous donation from Dr. Carlos Degrazia. They were "NOS" valves, radio books and several historical receivers. One was the SCOTT Philharmonic, a massive chassis in three parts, heavy and chrome. I had never seen an old receiver of that size, with so many valves and various parts!

### 1. Identification

There are at least three Scott Philharmonic models, listed at [www.radiomuseum.org](http://www.radiomuseum.org). This is the Philharmonic Chrome Chassis Pointer dial, manufactured in 1937 by E.H. Scott Laboratories Inc., USA. It has thirty valves! A mastodon in size and weight. The research also reported that this chrome-plated chassis was marketed without a chassis: three chrome chassis and exposed chassis. Despite the size and weight, it was imposing!

### 2. The circuit

This is a super-heterodyne rectifier with two 5U4 valves, two RF amplification stages (2 x 6U7), four IF amplifier valves (3 x 6K7 and a 6B8), four audio amplifiers (4 x 6J5) and dual push-pull output (4 valves 6L6). Anyway, what a valve receiver did with five or six valves, this giant used two to four times more at each stage.

### 3. The function of the valves

Tube	N°	Function
6U7	2	RF Amplifier
6L7	3	2 output + 1 converter
6B8	4	4th IF Amplifier; Record Signal Diode; RFAGC *; IFAGC *
6K7	3	Intermediate Frequency
6J5	6	3 AF; AF e Inverter; Oscillator, Exp. Driver
6J7	1	Record Scratch Control
6H6	2	Diode; Exp. Record
6E5	2	Tuner Indicator
VR 150	1	Voltage Regulator
6L6	4	2 x Push-pull
5U4	2	Retificator
Total	30	

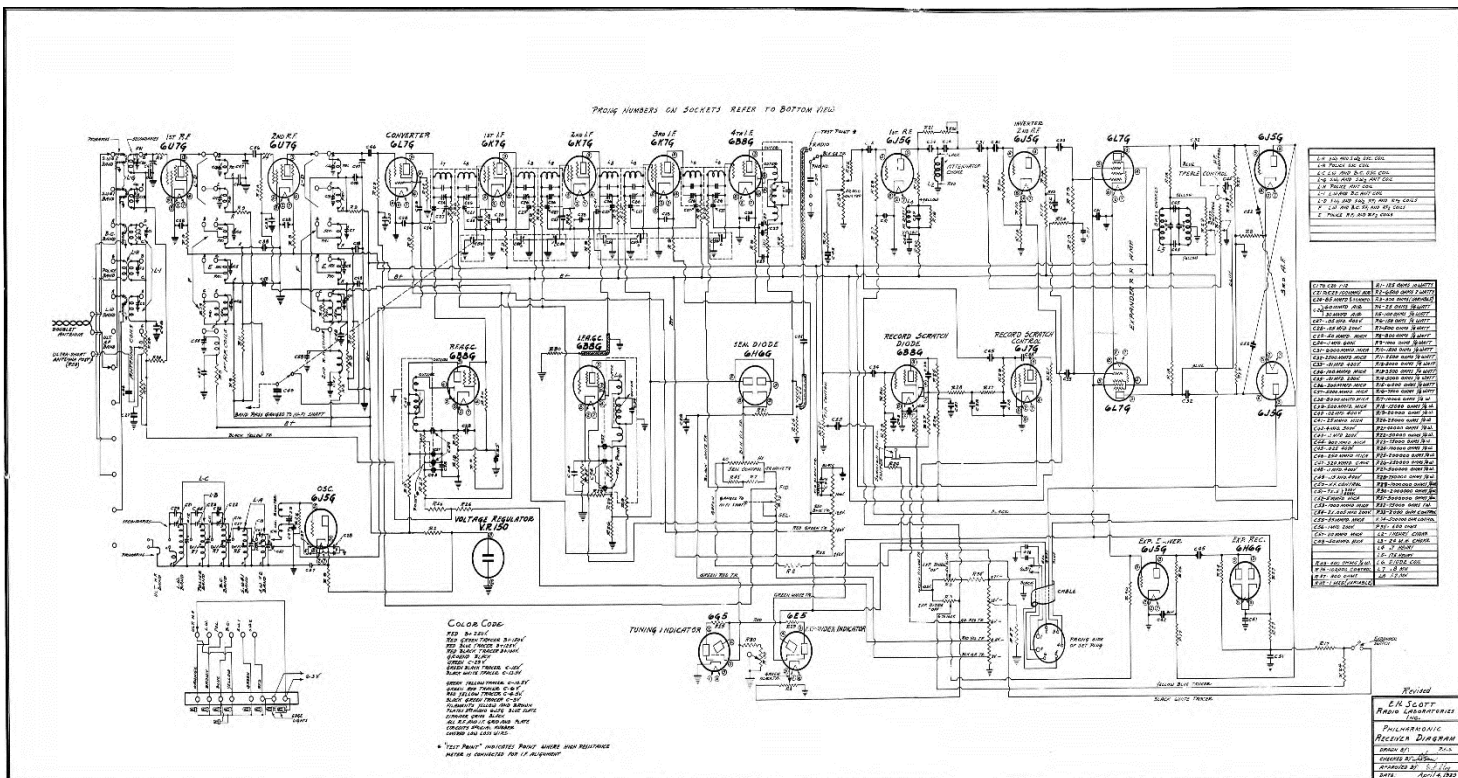
\* Radio Frequency Automatic Gain Control / Intermediate Frequency Automatic Gain Control



Thankfully, most valves, after testing, showed good emission.

#### 4. The scheme

The scheme is as big as badly plotted. Had to be printed on two pages! It can be found at <http://www.nostalgiaair.org/> or at [www.radiomuseum.org](http://www.radiomuseum.org).



#### 5. The beginning

The state of the three chassis received was poor, with some capacitors and other deteriorated components. The original chrome plated in scale and oxidation. There was no dial and the pointer was an "S". He had been kept in a garage for many years.



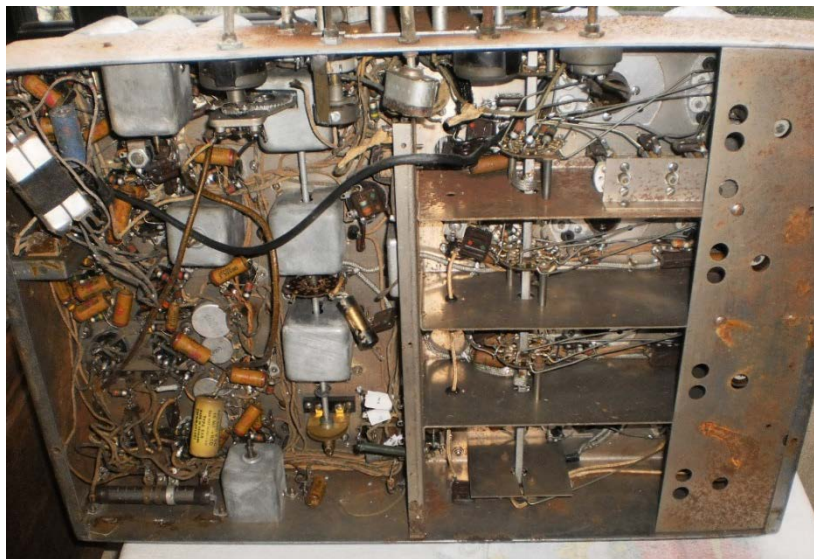


The rectifying chassis, output with dual push-pull and driver transformer.

In the photos below, the chassis of radiofrequency, oscillation, FI and audio frequency.





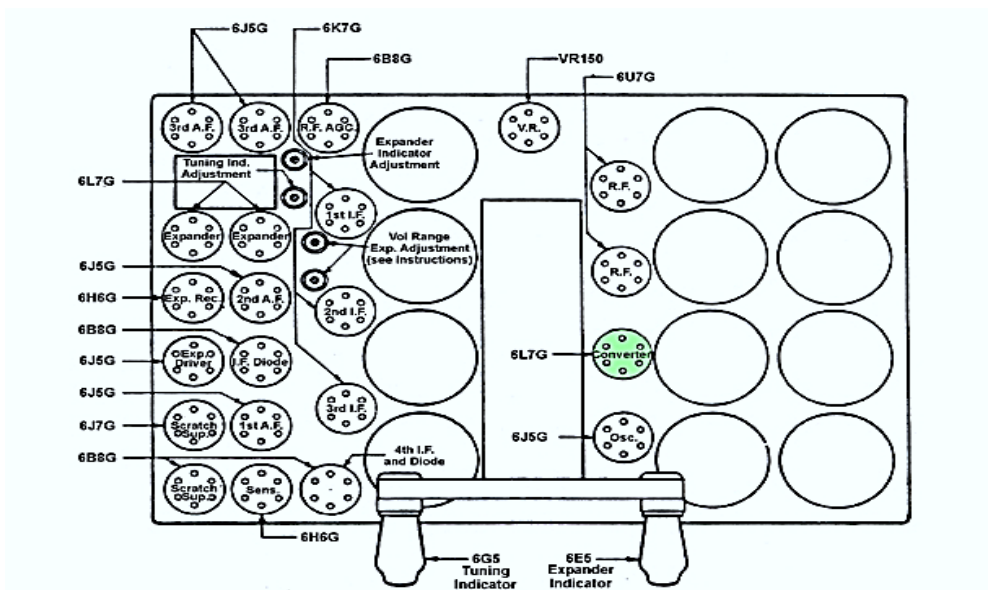
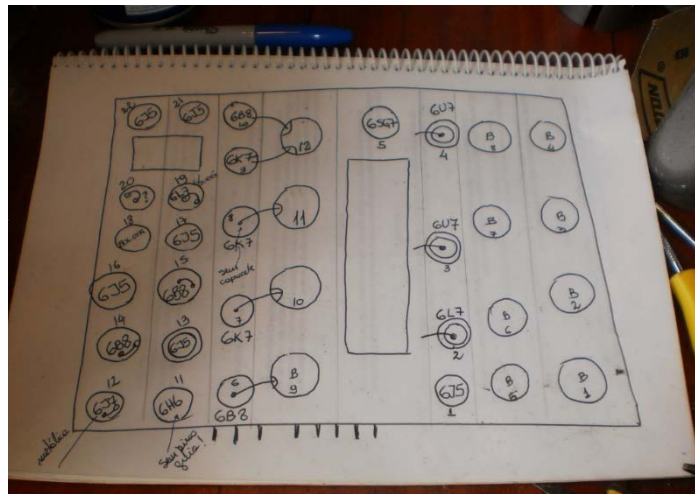




The status of the connecting cable between the receiver chassis and the speaker chassis.

## 6. Search and annotations

The Scott, besides gigantism, had several functions or stages that I had never seen before. I had to start scoring and researching.

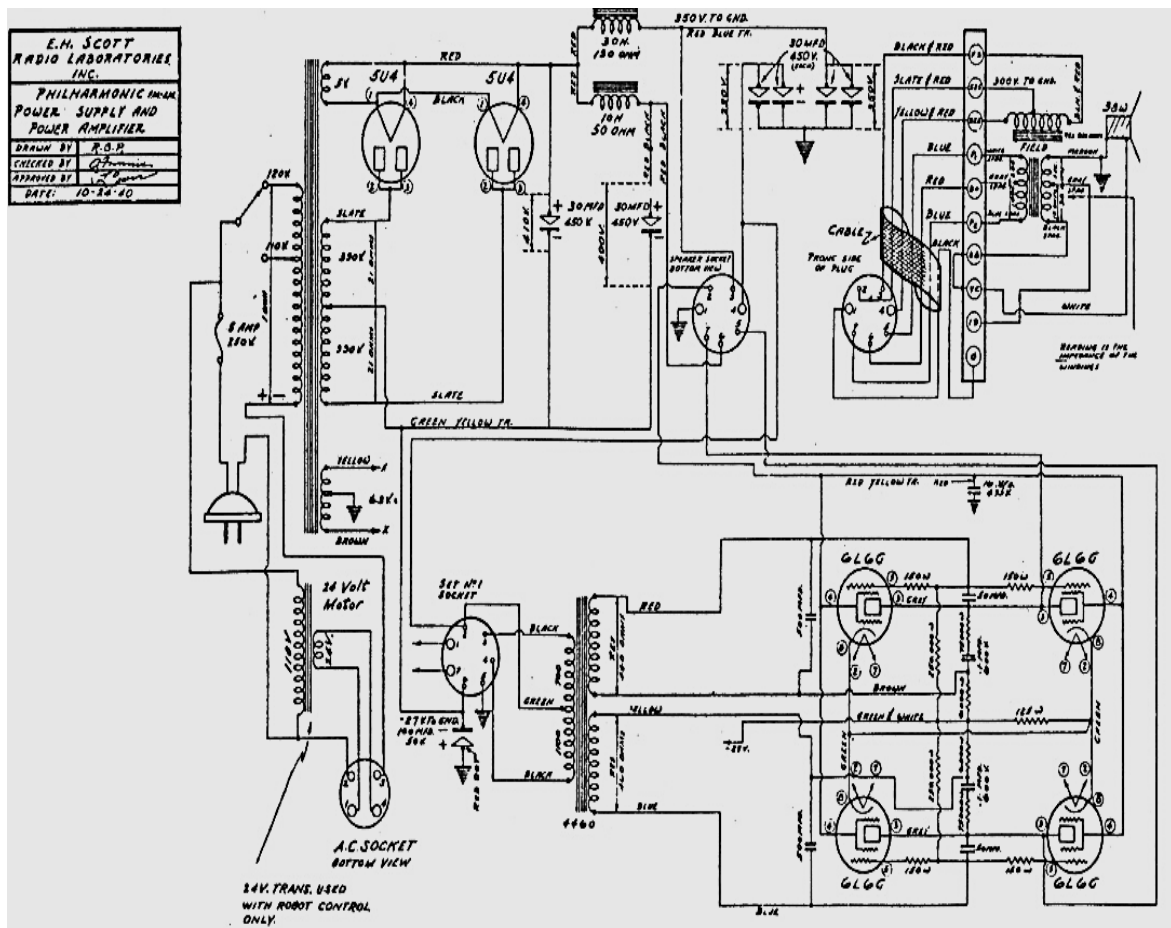


Courtesy <http://ehscott.ning.com/>

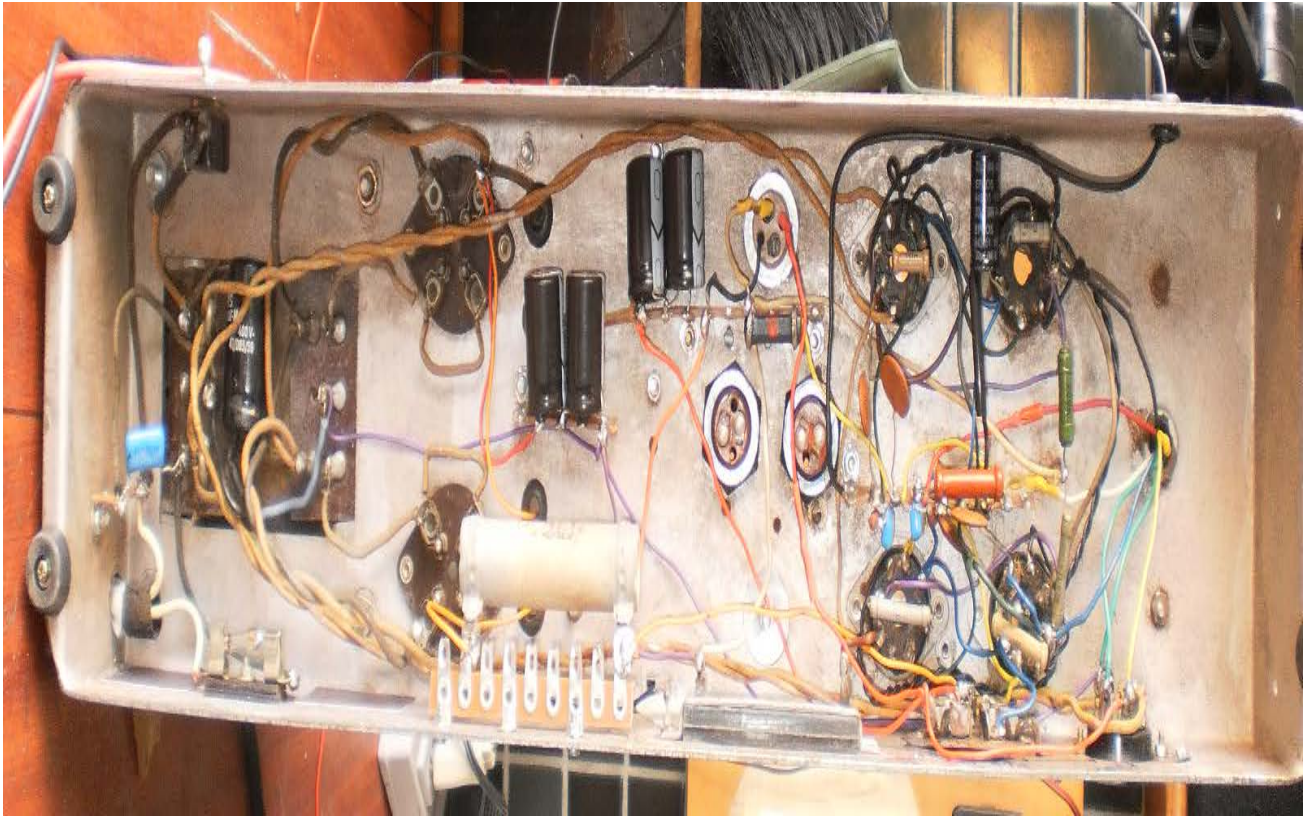


## 7. Rectification and output chassis

The rectification consists of two 5U4 valves, two "filter shock" and 5 electrolytic coils. The schematic capacitors: one of 30mf x 450V before the shocks and with the negative one in the CT and, after, four in the same value, connected to the ground. Replaced by new 33mF x 450V insulation (the maximum voltage value here in the trade), there were sparks and noise ... The direct current generated was up to 600V, probably because the input voltage was rated at 110VAC and not for the current voltage of 127 VAC, as well as the time at which the transformer was exposed. The solution was to use electrolytic pairs of 80 mF x 450V connected in series, which represents 40mF x 900V. The idea was reminded me by friend Jean-Yves Bourget, Quebec. A nonexistent crash was installed; the driver reset and the driver reset all connections. In these comings and goings, two multitests burned. Luckily, they were under warranty! At the end, and with dynamic test, the voltage supplied to the receiving chassis was in the order of 280 VDC. Below, the schematic of the rectifying chassis, transformer driver and two push-pull output (four 6L6 valves).

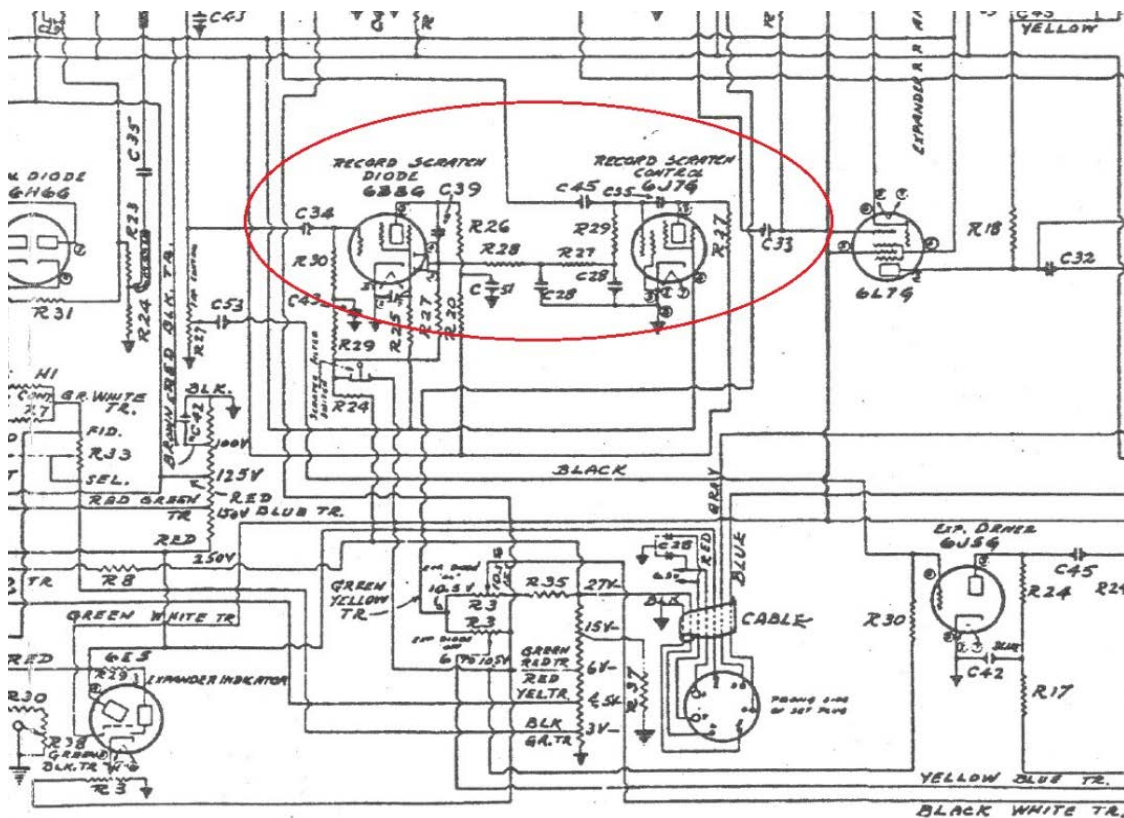


In the photos below, the rectification and exit chassis, in final phase of restoration.





## 8. Greater difficulties



Scratch control and Diode Record Scratch Diode

I had never worked on a radio with *Scratch*, *Record Diode Scratch*, *RFAGC* (Radio Frequency Automatic Gain Control) or *IFAGC* (Intermediate Frequency Automatic Gain Control). The assistance of EH Scott Radio Enthusiasts (<http://ehscott.ning.com/>) was instrumental in these stages of restoration.

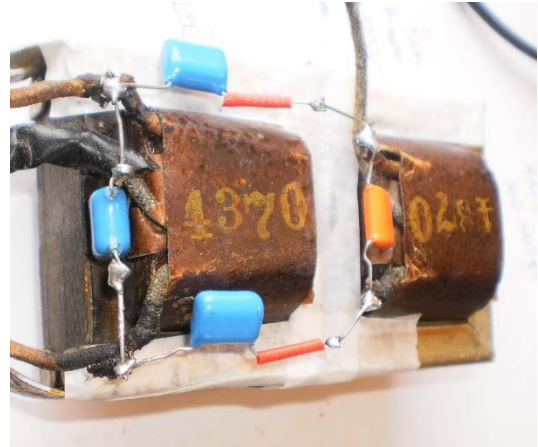
For example and indicated in the photo above, Norman warned me well that half of the 6H6 valve used as a sensitivity diode was connected to a noise suppressor. This was not demonstrated in the schemes.

## 9. Changing critical capacitors

Aside from the electrolytics of the rectifying chassis, I did not count, nor did I remember how many capacitors I had to change. They go from 30.







## 10. The dial

The dial of the Philharmonic, one of the most beautiful I've seen on the radio, was broken (initial photos). With the help of his friend Fabiano Duelli, a new one was made in acrylic. If anyone needs the art, I have it in PDF file.



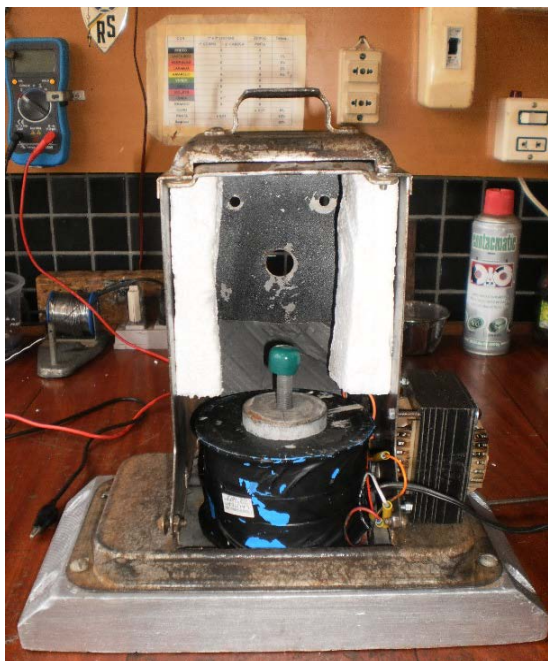


## 11. The Speaker

I received the Philharmonic's speaker without the cone. It had been completely destroyed by moths and time. Unfortunately, no AF restorer in Porto Alegre was able to repair the cone while maintaining AF as electrodynamic (without permanent magnet).

The solution was to restore the cone as a permanent magnet AF and place the magnetizing coil (the filter shock) next to the output chassis.

The original output transformer was shorted and I had to wrap another. It was put on the outside of the chassis. The photos below explain the situation better.





## 12. Painting and finishing

The tradition of this Scott model was chrome chassis. What I received was with the chrome plating completely deteriorated, as can also be seen below in the valves and coils protections.



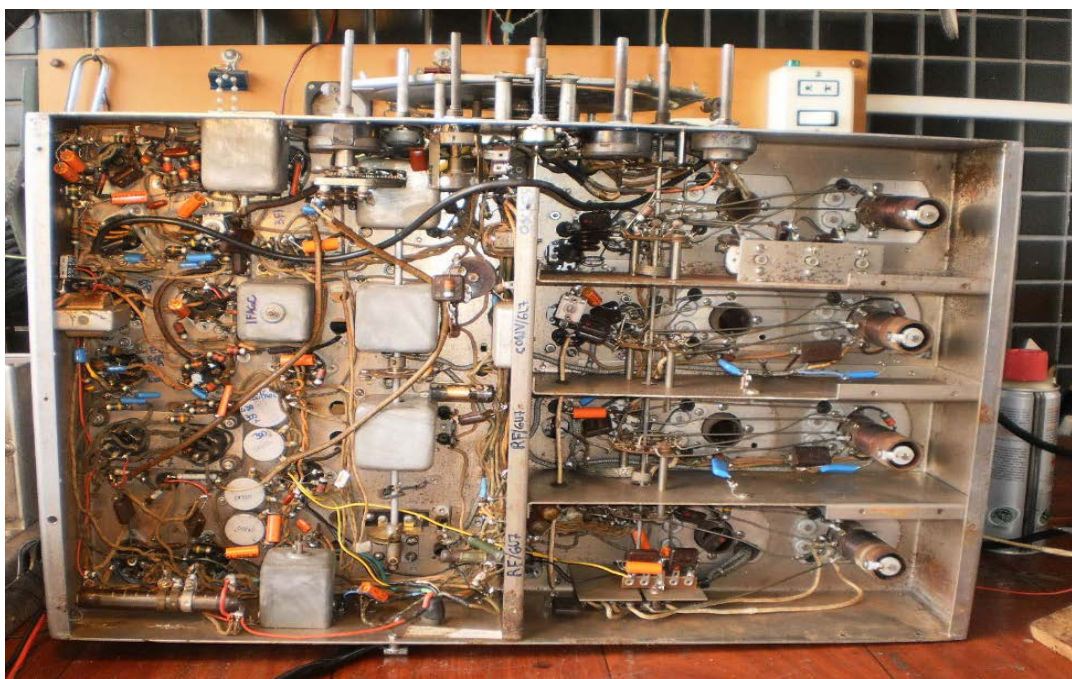
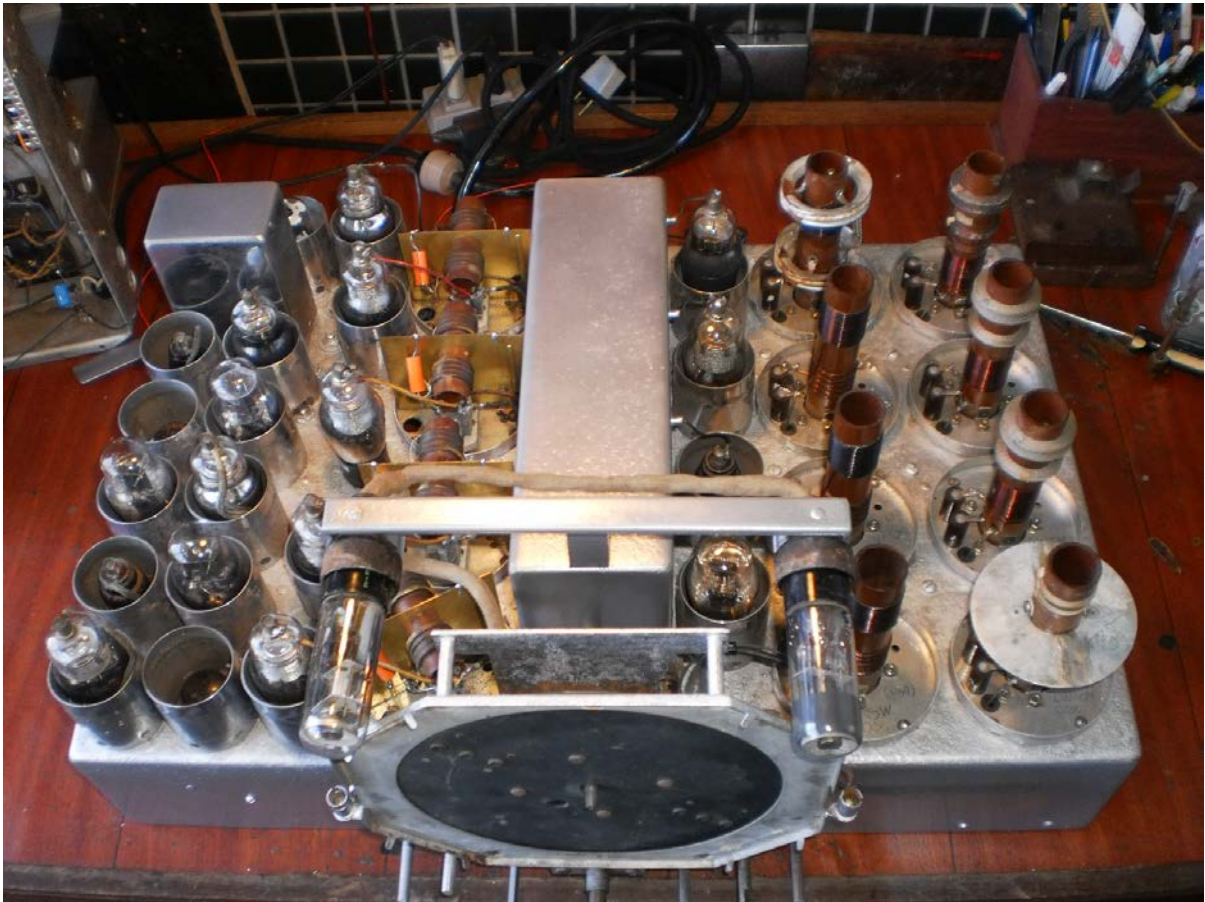
Chroming these parts and chassis was a time-consuming and time-consuming task. Therefore, I decided to clean the metals with a steel brush, take a shower and paint with spray.





### 13. Final

After 3 months of hard work, the Scott Philharmonic came to life, working with a lot of quality and a volume of "church wreck", disturbing the neighborhood.







The rectifying chassis. Behind, the speaker set, output transformer and filter shock.



The receiver chassis, ready.



**14. Thanks:**

EH Scott Radio Enthusiasts <http://ehscott.ning.com/>

Jean-Yves Bourget, Lèvy, Quebec

Fabiano Duelli, Belo Horizonte, MG

**MUSEU DO RÁDIO**

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

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***Daltro D'Arísbo***