

**It started with a missing knob.....  
and ended with a Navy TCZ**



**A story by F6GTC,**

**Henri Jacob**

All started as I was looking for a receiver, but a historical one.

So I got a BC-348 for sale just beside my QTH, near Strasbourg.

The price is fine, it's a french "STTA" version, it looks quite original without drilled or engraved front plate, no mysterious upgrade, of course no FT-154 mounting, no original Dynamotor and

..... ***just one knob missing.***

Looking for the knob F6FMT told me he could provide one **with**.....:

- the BC-348 mounted on it,
- the ART-13 companion transmitter,
  - with the low frequency oscillator,
  - the CU-26 loading coil,
  - and the original power supply Col-211101,
  - ?

First reaction : " no thanks", .....and, some days later, passing over logic and good sense I made the trip picking up the knob..... and all the rest.

Now, some months later I try to write down that experience. There are many excellent pages on the Web about ART-13 and BC-348 restorations, mine wouldn't bring something new, so I'll only talk about the Collins 211101 power supply.

I hope you'll enjoy it and may it be a help for some "crazy guy" like me having the same project.

Henri F6GTC

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As I arrived home, the first thing was to upload all in the garage and my back really took conscience of the weight.

Although the id. plate of the power supply informs about the 320 lbs, it is only when I had to carry it that I realized what it really means.



All the transformers and filter chokes were removed for an "easier" handling and some of the wires had markings before disconnection.

I transported all in my shack and took breath.

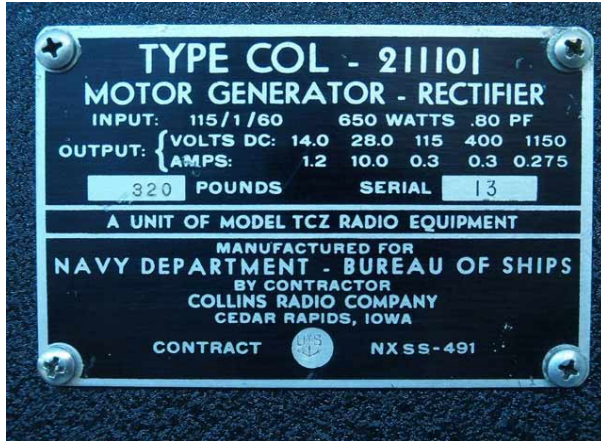
The first impression was "how can I make it work again?", the seller told me it worked (they all say that!). The list of the job to do seemed to be endless :

- cleaning
  - cleaning
  - cleaning *(yes 3 times)*
  - check the transformers
  - check the filter chokes
  - 2 tube clamps missing
  - 3 ugly holes in the front plate to fill up
  - 2 stand up missing on the front plate fuse enclosure
  - 2 notches in the cover plates
  - home made 28Vdc power supply
  - a Selenium rectifier.....ready for short cut
  - all painting with dents
  - all kind of screws missing
  - cord between PSU and transmitter to replace
  - no schematic
- and surely much more !

***All my fault, but, no regrets, no anger, just some apprehension.***

Here an accurater inventory.

ART-13 transmitter, Air Ministry tag, the front cover has a UTA tag (Union des Transports Aériens), a french airline company later absorbed by Air France.



Collins 211101 US Navy power supply stamp "DEC 28 1943" and serial #13.

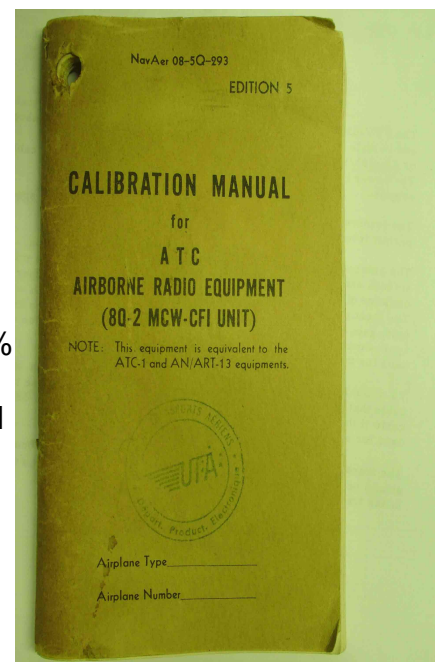


The receiver included in the lot is a working Wells Gardner BC-348-Q but with many modifications. I finally made the choice to restore the "STTA" BC-348 of Strasbourg because of its more original look.

The calibration manual with the UTA stamp and also the Air France manual for the ART-13 .

Not really 100% US Navy configuration and not 100% complete !

I was surprised that a transmitter imagined in the mid 40<sup>th</sup> has been in use so many years later in french Air France airplanes.

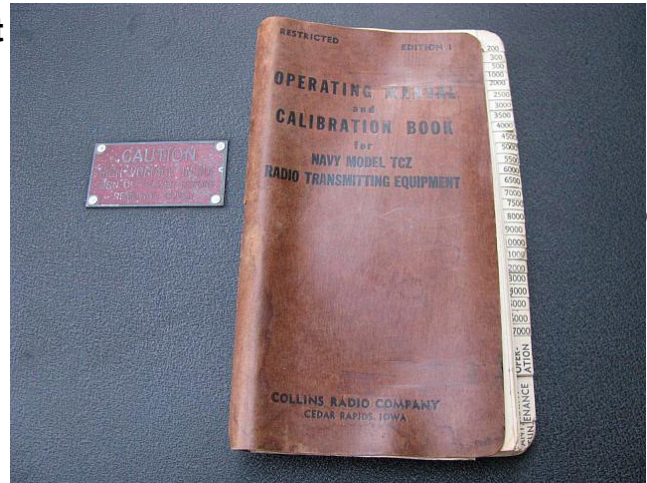




I found a three pages description about the AN/URT–TCZ , that was all.

**I still miss is the TCZ manual,  
so.....if somebody has one talking about  
COL-211101 P.S.U. or looking like that,  
please contact me for a copy !**

By chance I had some pictures with  
the wires connected so I started to mark all  
them, and took plenty of pictures,  
later I didn't regret it.



I spent hours and hours looking for some webpage about it and found some informations here:

<http://www.virhistory.com/navy/xmtr-ww2.htm>

and here:

<http://maritime.org/doc/ecat/cat-1177.htm>

and here:

<http://www.rkk-museum.ru/documents/archives/images/52c-44-01.pdf>

and here:

<http://vintageradio.com/gallery3/index.php/Ham-Radio/Navy-TCZ-ART-13-WWII-HF-Military-Transmitter>

and here:

<http://ussindyradio.org/usnrrgcartcz-1s.jpg>

but no way for a schematic.

I looked for forum discussions about it and noted some callsigns of people talking about.

It would be hard to find some informations or spare because of the low quantity produced, and the few which survived the war or ships duty period didn't always find a way out to a surplus market.

No way to find where it comes from and how it arrived in France.

I sent some e-mails with each time the fear of being boring with my questions but got always a fine answer, so I thank all for having been so patient !

I finally bought:

> the wiring at Robert's webshop, WA5CAB , thanks also to K4NYW who gave me the tip,  
and became:

> two versions of the original schematic, a special thanks to Todd, KA1KAQ

> and thanks to W1NZR "Brown", I got a picture of the tremendous Motor-Generator.

Cleaning transformers and filter chokes was easy, repainting them was a hard decision.

**"Repainted is repainted"** they say, I know, but I say that "rusty and ugly" before is also "rusty and ugly" long time after.

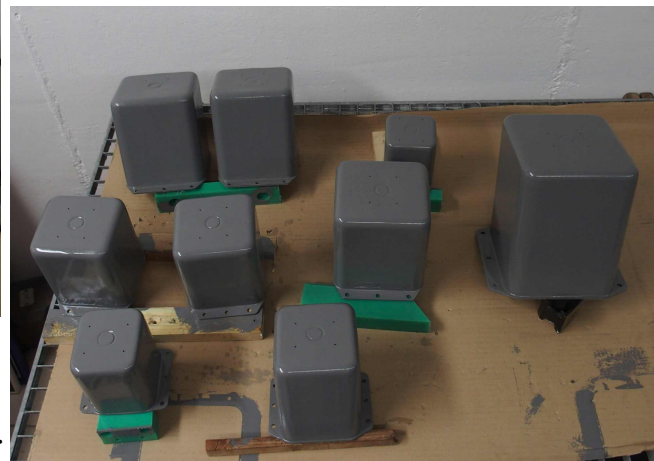
I don't plan to participate to any radio version of a motorcycle rat show (that by the way I adore) so I repainted all..... sorry.

It took some time to define the color so I first cleaned the pieces, searched a place that had been the most hidden from pollution and later UV radiation; for the transformers it was under the id. plates, and for the cabinet behind the front plate with the fuses. After that I took all outdoor at daylight but not in the sun and made a choice with help of a color bridge guide.

I finally decided for RAL 7039 for the transformers and RAL 7010 for the cabinet frame.



< Before, note the color differences, specially under the id. plate,

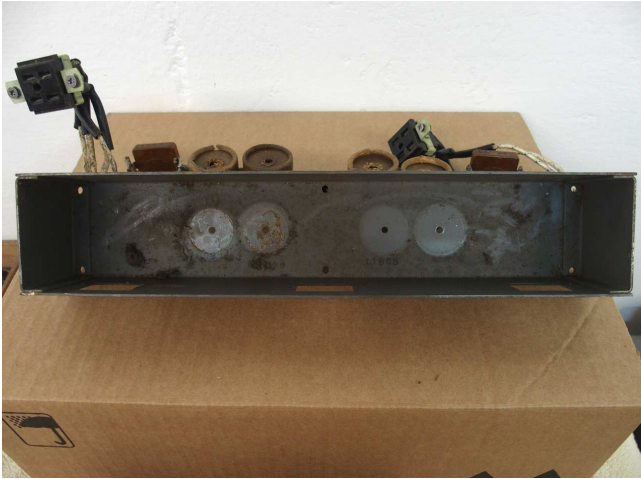


and after >

I also took a picture of each piece before painting to locate the place of the number "L18xx", "T18xx" stamped near the id. plate and I also noted the ref. numbers punched on the rear side near the connections that correspond almost to the part number on the id. plate.

For example: T1802, part number : 672 **N264** > punched ref. : 7973A and **N264**  
L1804, part number : 678 **N151** > punched ref. : 8165 and **N151**

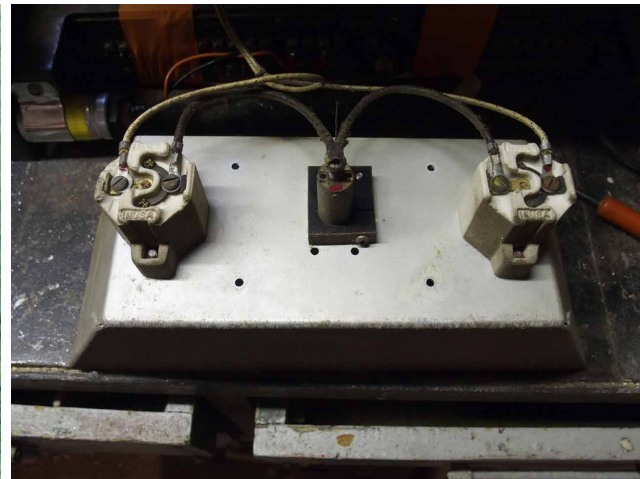




What I called the **"MG box"** with the Cinch Jones sockets, 115Vac for the motor, and 14Vdc and 28Vdc provided by the generator.



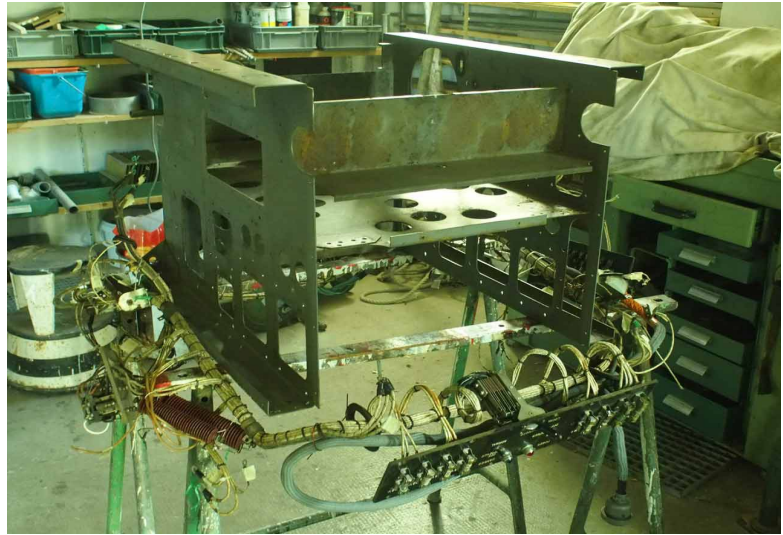
The rectifier tube support.



The heating lamps and temperature regulation assembly.

The wiring..... it can be easily removed in one piece thanks to its original conception.

*(That is pictured in an article by Nancy Gibbons Zook, called "Collins and the electronic beanstalk" ).*



The cabinet that needs some work.

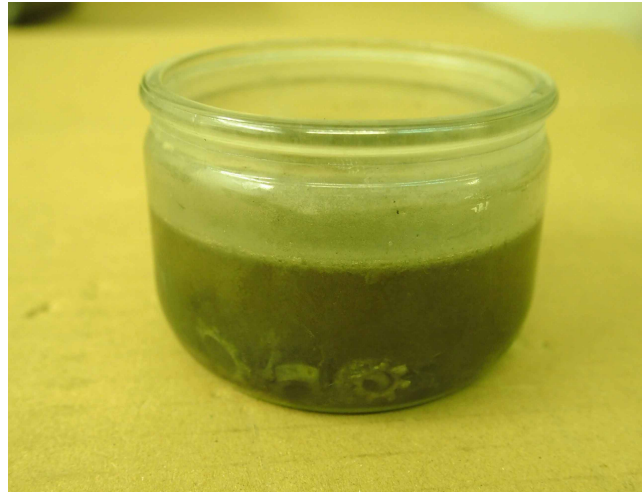


The wiring.





Cleaning the stainless screws, nuts, washers with caustic soda, beware of projections and note the color of the liquid .



Cleaning the wiring with carpet cleaner, it may look terrific but is efficient and the result is fine without damage for the cotton wire insulation.

Although It didn't remove all the dirt so I had to clean some small places after inserting all again in the cabinet.

**You understand now why I said "cleaning" three times on page 3 ?**



Just for compare :



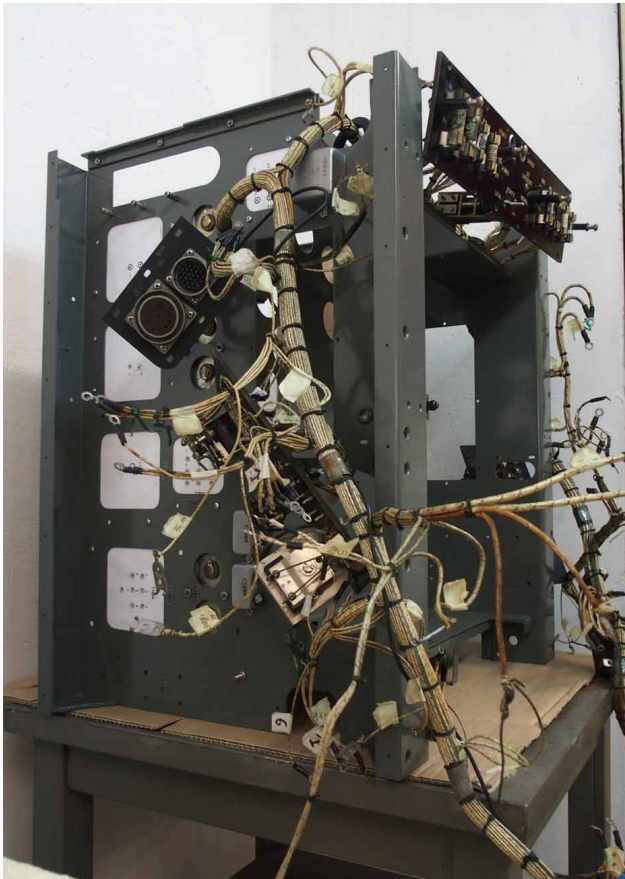
Before.....and .....after.

The wiring is just a master piece it could have a place as poster in some Modern Art Museum !



Two new stand up for the fuses enclosure.

Cabinet repainted >



Mounting again the wiring in the cabinet equipped with four wheels.

In place of the transformers or filter chokes I installed wood plates with the drawing of the connexions scale 1:1 for easier arranging of the wires and verifying of the schematic, the wires have been marked individually with small white tags.

Because of the weight, transformers and filter chokes will be mounted at the very end.





Temperature control assembly.



Front panel fresh lettering.



Restored "M-G" block .

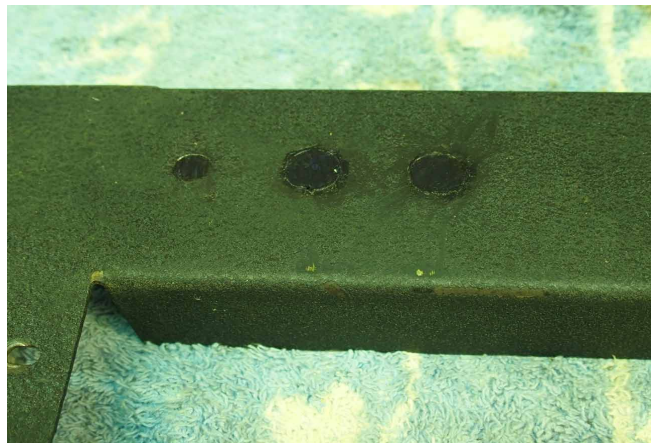
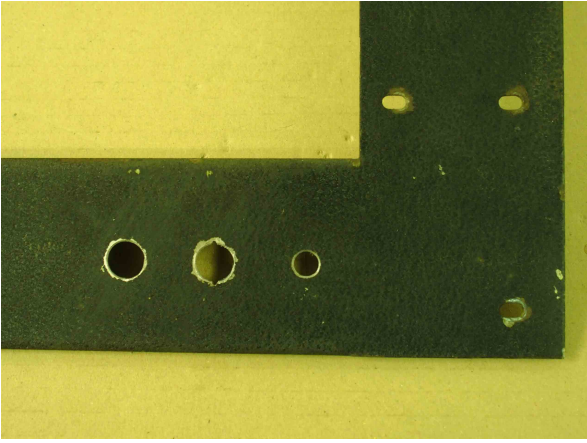


Rectifier tube assembly consisting here of two 866A and two SFR VH55A ( I plan to install four 3B28 rectifiers).

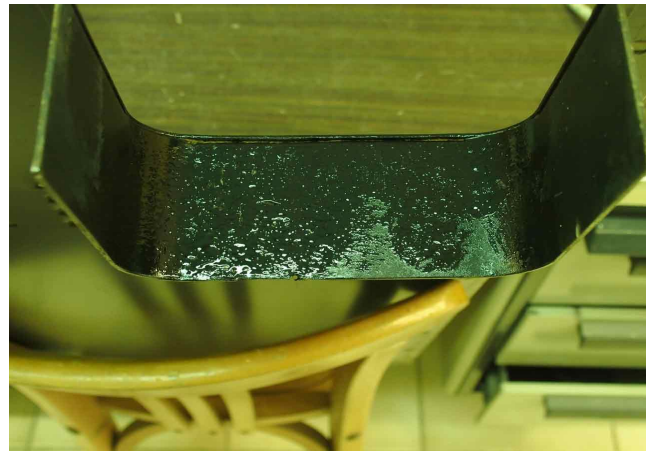
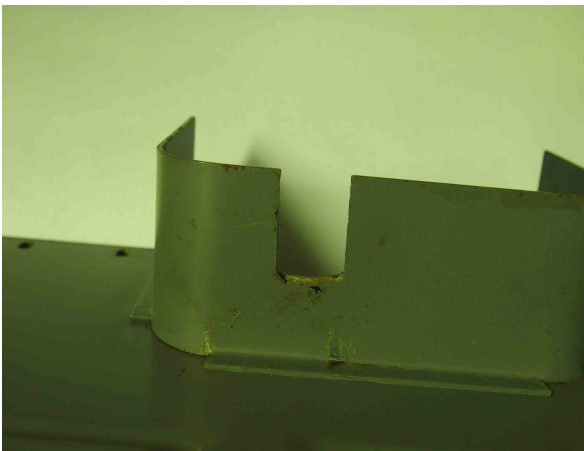


Scratched front plexiglass window before and after cleaning and taking off the scratch first with some steel wool and after that by long polishing with some scratch remover cream for cars.





Front panel with some holes closed with warm plastic glue, will have to be finished with touch up paint.

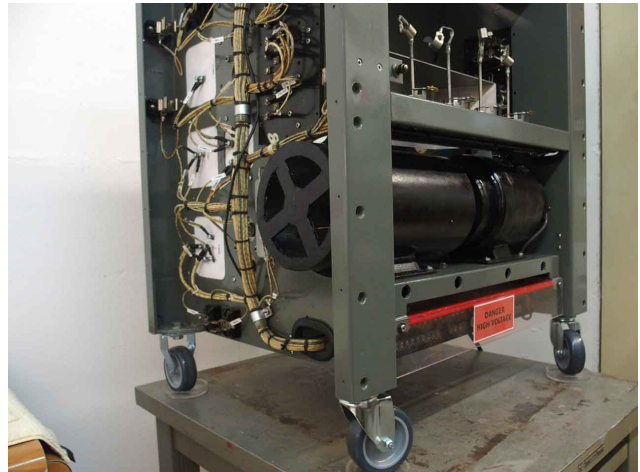
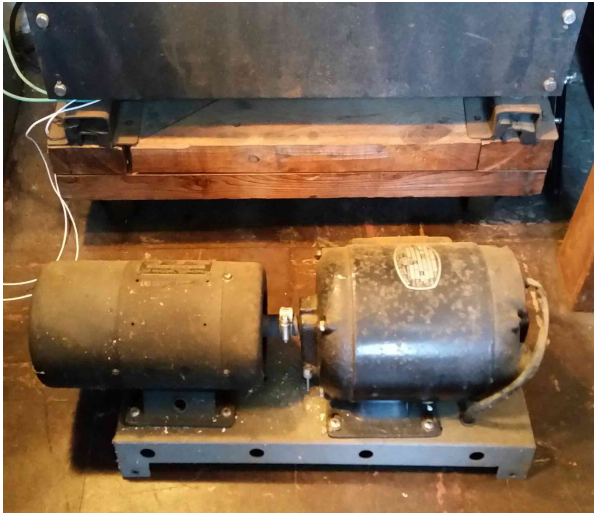


Side cover with cutting off before and after soldering a small of steel plate.



Side and rear covers, (2mm thick !) inside view.

Here the picture left of the original Motor Generator. Quite sure impossible to find one in Europe. I decide to make a "looking-like-motor-generator" with a modern power supply hidden inside, picture at the right.



Two Cinch Jones plugs for Line, 28Vdc, 14Vdc. The power supplies will be placed in the tube.



Selenium rectifier CR1801 had to be changed, two rectifier circuits were damaged. Picture of the original one (up) and the "new-simili-old-one" (down) with four 1N4007 rectifiers hidden inside the central tube.



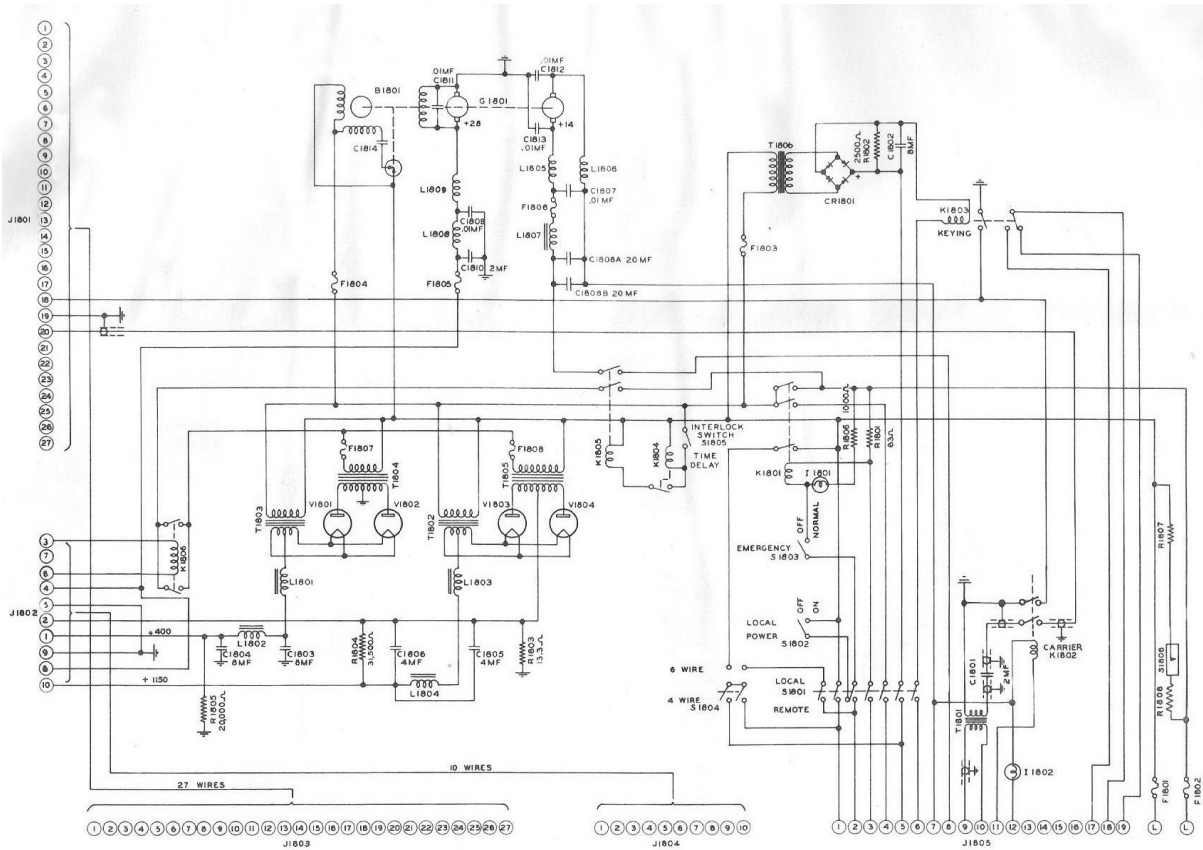
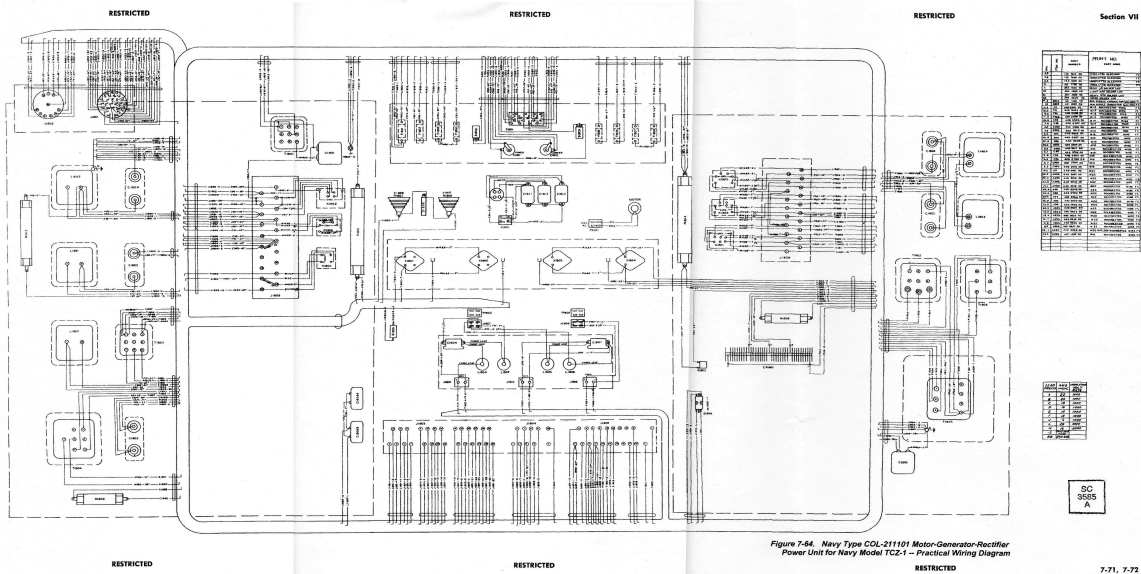


Fig. 90 A.C. Power Bay Schematic (Dwg. K1081C)

The so long sought schematic !



The wiring diagram (use maximum zoom for details).





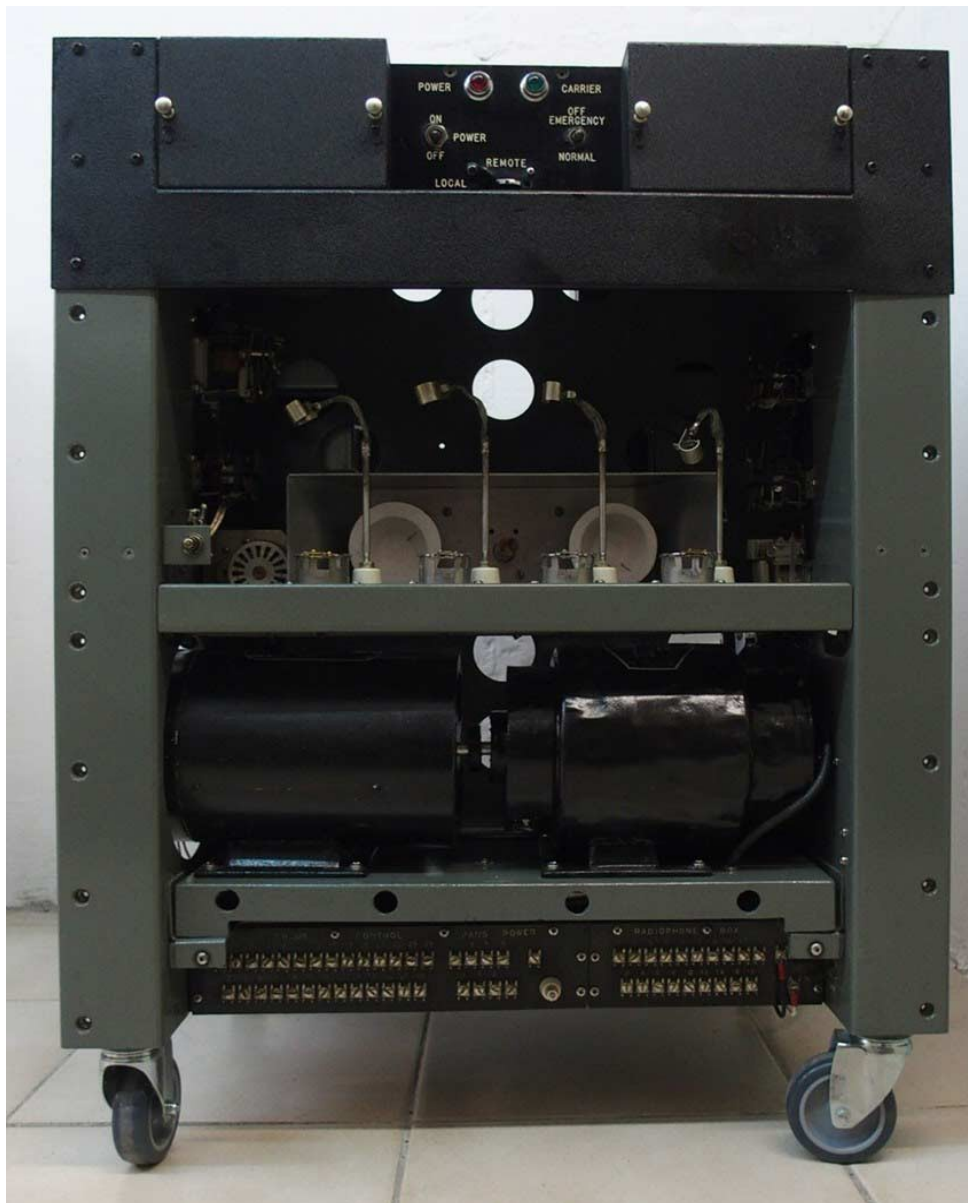
Rear view with mounted transformers and filter chokes.



Side views, note the resistors under glass tubes.



Two heating bulbs R1807 and R1808 only for the look. The round piece at the left behind the interlock switch is the time delay relay K1804 (36 sec.; supply freq. 50Hz).



Front view.

**Reminder: there are exactly 107 screws to remove if you want to take off all the front-top-side panels.....**





ART-13 / PSU cable, over-insulated HV wire and oversized 28Vdc wires .  
The cable is longer than the original one, so the transmitter can be positioned in a larger area.



The 28Vdc / 14A power supply hidden in the "generator", place enough for installing a small 12Vdc power supply, but no real interest for ham use.





Four 3B28 rectifier tubes.



Front with all covers fixed.



Ready for test .



All together again after about 250 hours of fun, Web search time not included.

After testing, the power supply is working fine, all voltages are like they should be and the T17 PTT switch and CW command are OK .  
A little bit stress but no smoke, no flash, nobody injured, no surprise.

Thank you Mr Collins !

Next job will be to chek up the transmitter and the receiver,  
but this is an other chapter.

That is the end of the story, no regrets. It was a very interesting project. I drove many miles, met fine people, spent a lot of time looking for informations and restoring the best I could with the tools and the knowledge I have.

It's surely not a museum worth item, I just tried to keep it alive.

It would not be fair to close without a very special thank to:

**my YL, Danielle**

for having been so patient during all that time I was away from her,  
one floor deeper,  
on Internet,  
in the garage,  
in the workshop,  
on the metal lathe,  
brushing,  
cleaning,  
painting,  
screwing,

**and forgetting so often that it was time for lunch or dinner !**

73 !  
Henri  
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