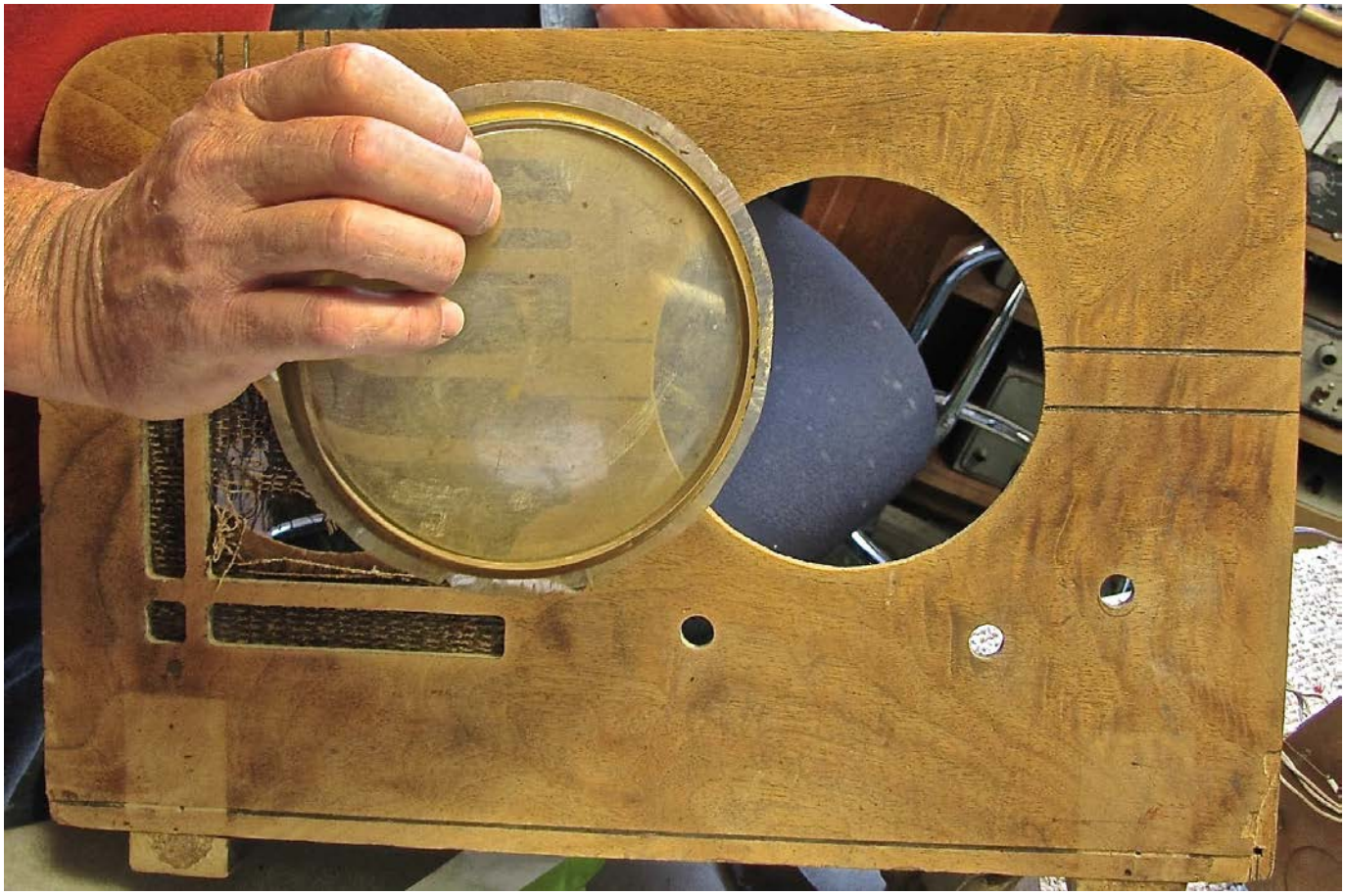
FAIRBANKS~ MORSE 1938 RADIO
RESTORATION – Model # 5-C
CALIFORNIA HISTORICAL RADIO SOCIETY
International Radio Restoration Contest Entry

March 15th 2014

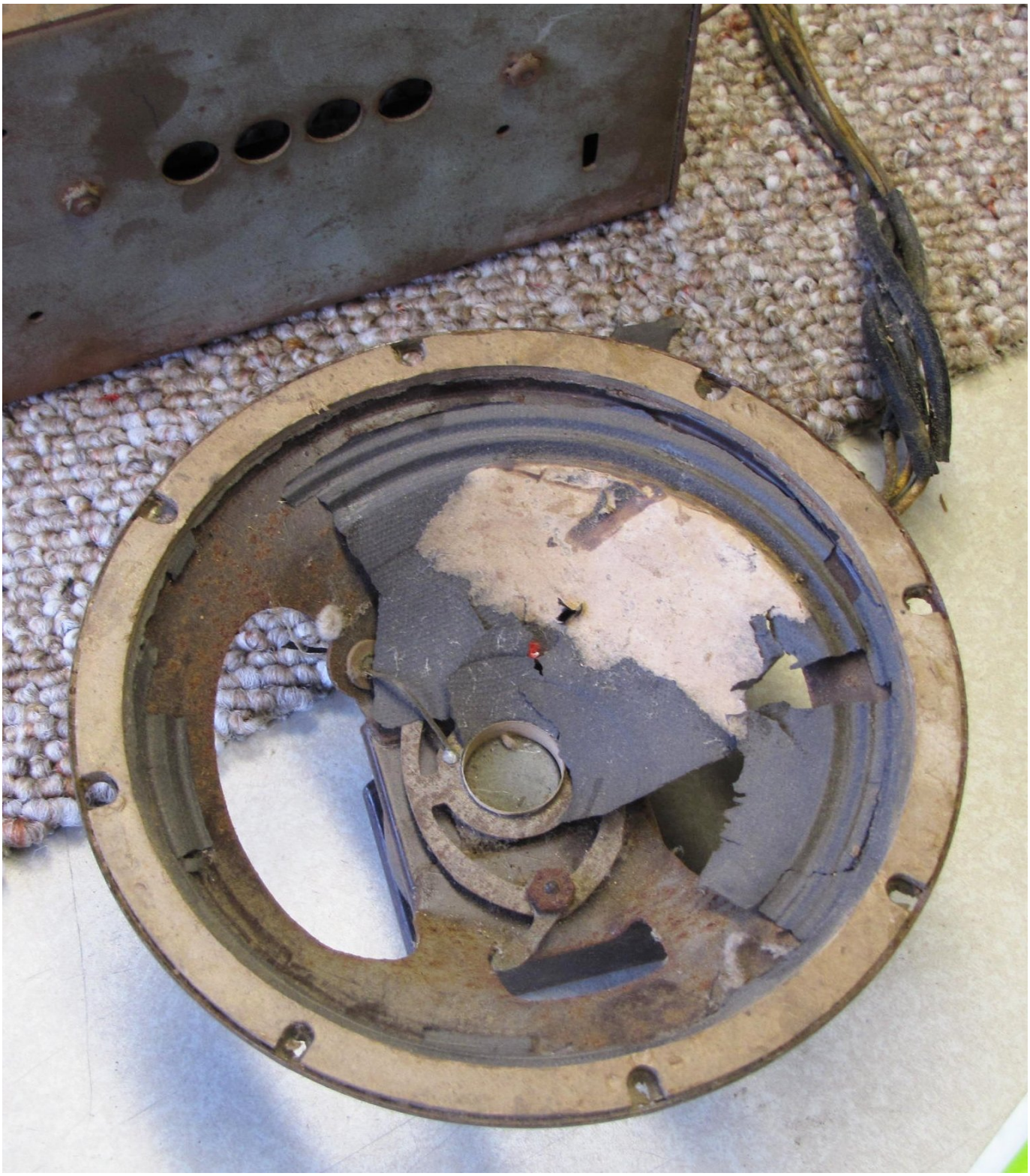
Restoration by : Cliff Farwell
This was a radio that I purchased for parts only.
It was in such poor condition and my objective was to obtain parts for another radio. After joining CHRS and learning more about these timeless treasures I decided to take this old radio and restore it to the best of my ability and enter your competition.

I started with the mechanics as this radio was not in working condition. I have compiled some photos that I took during the restoration. I have noted next to each photo what I had done to bring this radio back to life. It was been a lot of work but I feel the end result speaks volumes.

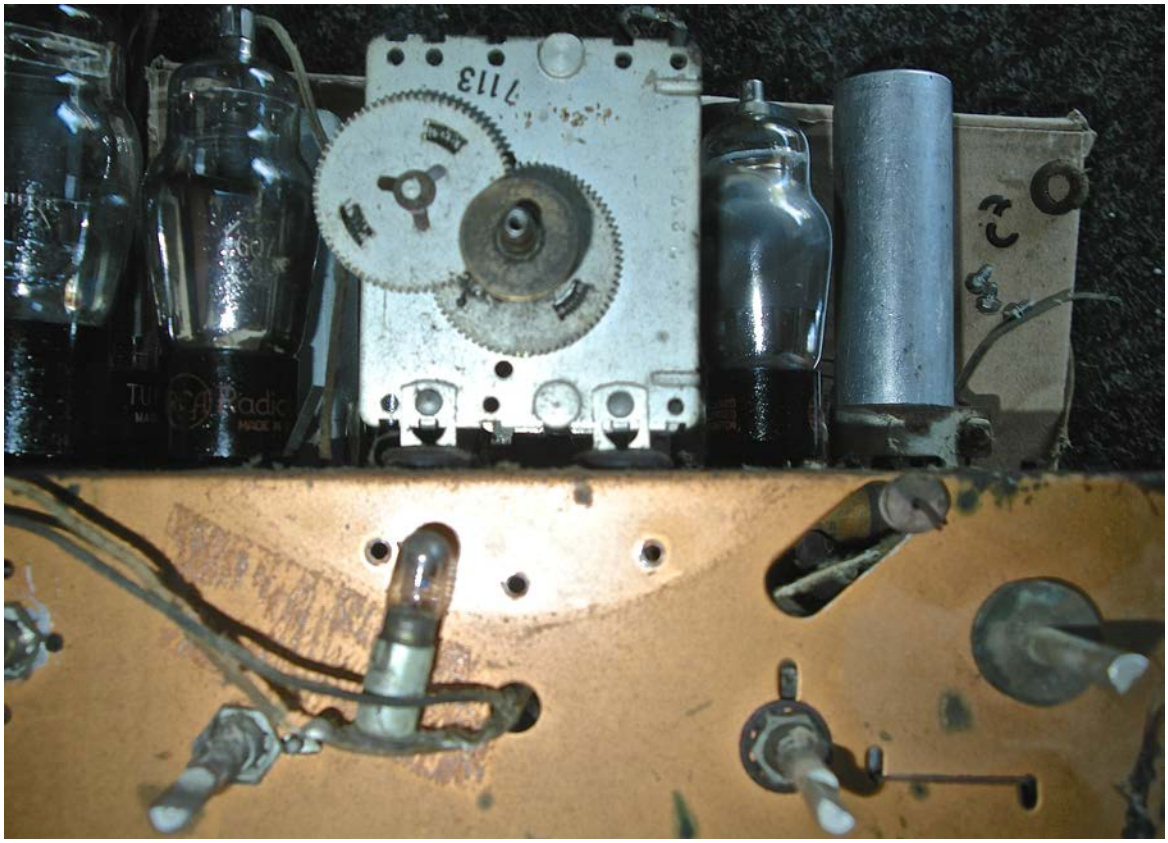


This is the initial condition of the cabinet and degraded dial cover.
Note the shredded speaker cloth below my hand.

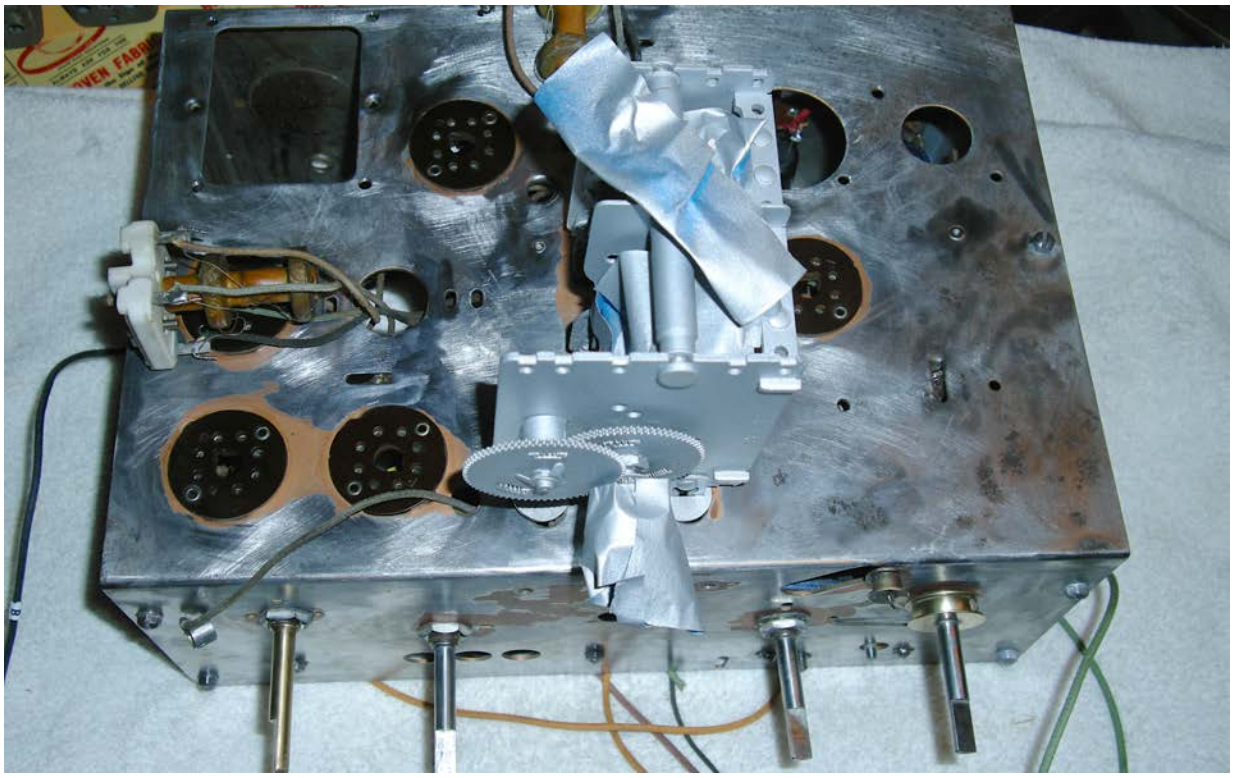
This is what the chassis looked like before restoration, with heavy corrosion.



This is the initial condition of the speaker found in the cabinet, obviously inoperable!



Here you see the shadow from the dial housing which has been removed along with the broken dial belt. A new belt was later installed.

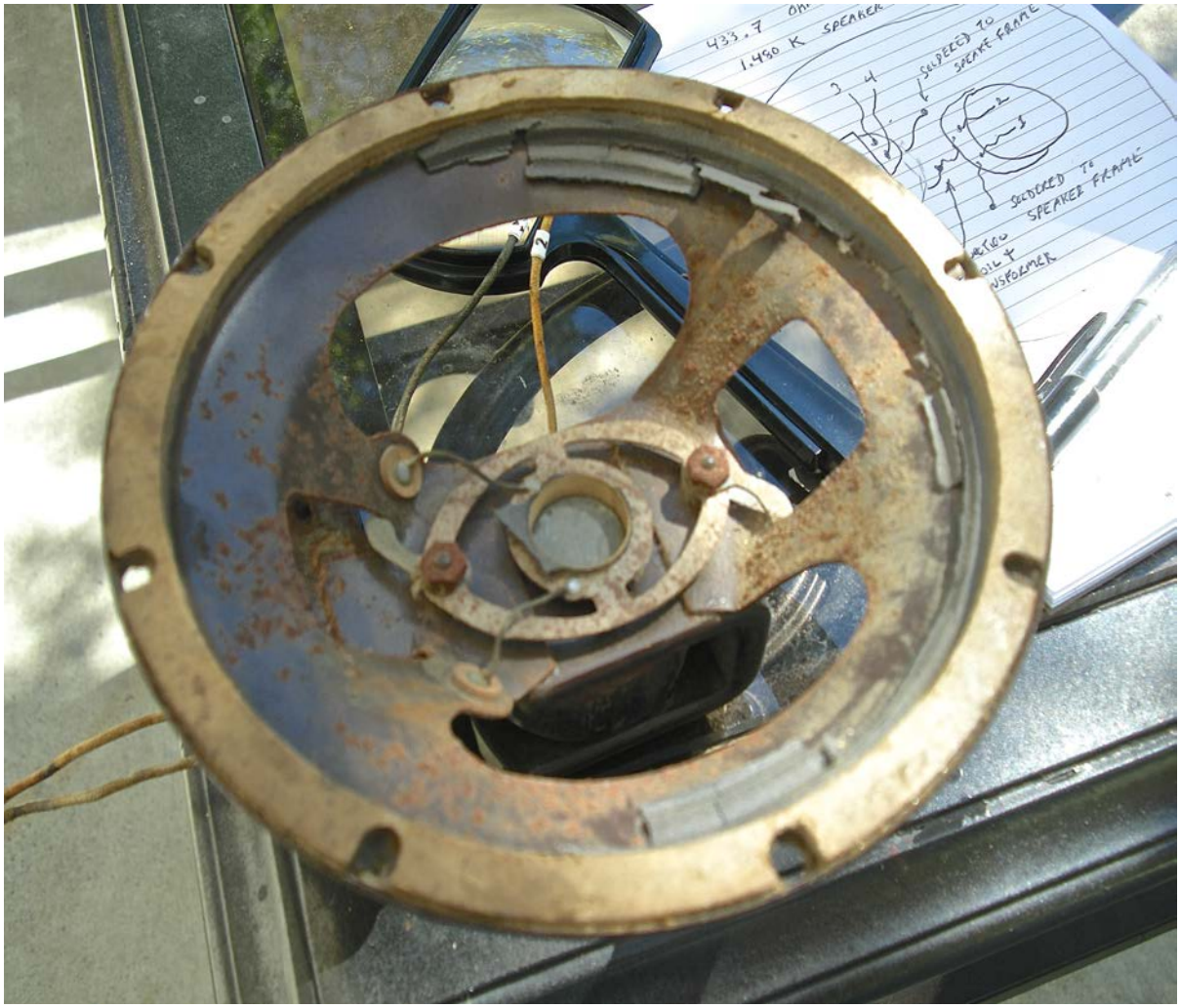


In this photo, the chassis is being stripped of old paint and rust.
The old power transformer was found to have an open primary winding and removed.

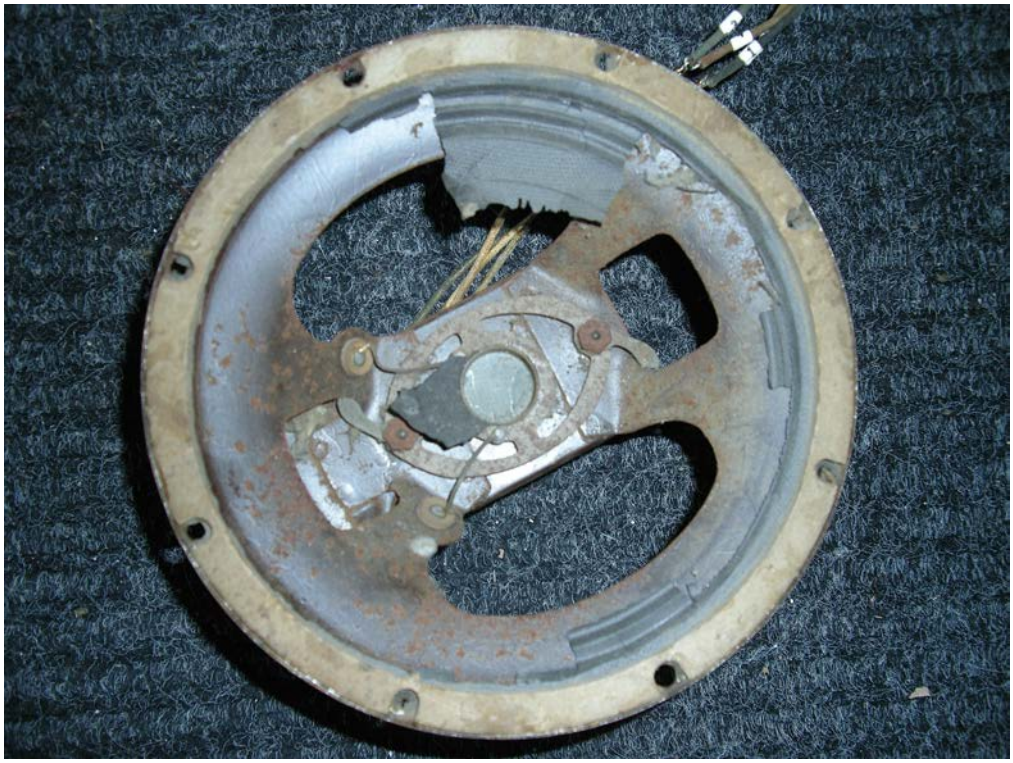
The tuning capacitor was subsequently removed and cleaned, to be re-installed after the chassis was cleaned and repainted. New tuner grommets were installed.

The rusted dial face housing and the old dial belt were removed for repainting and replacement.

After bead blasting the dial face housing was repainted with a satin white paint as per original including mounting screws.
The old rubber dial housing light grommets were replaced with new as shown in photo.

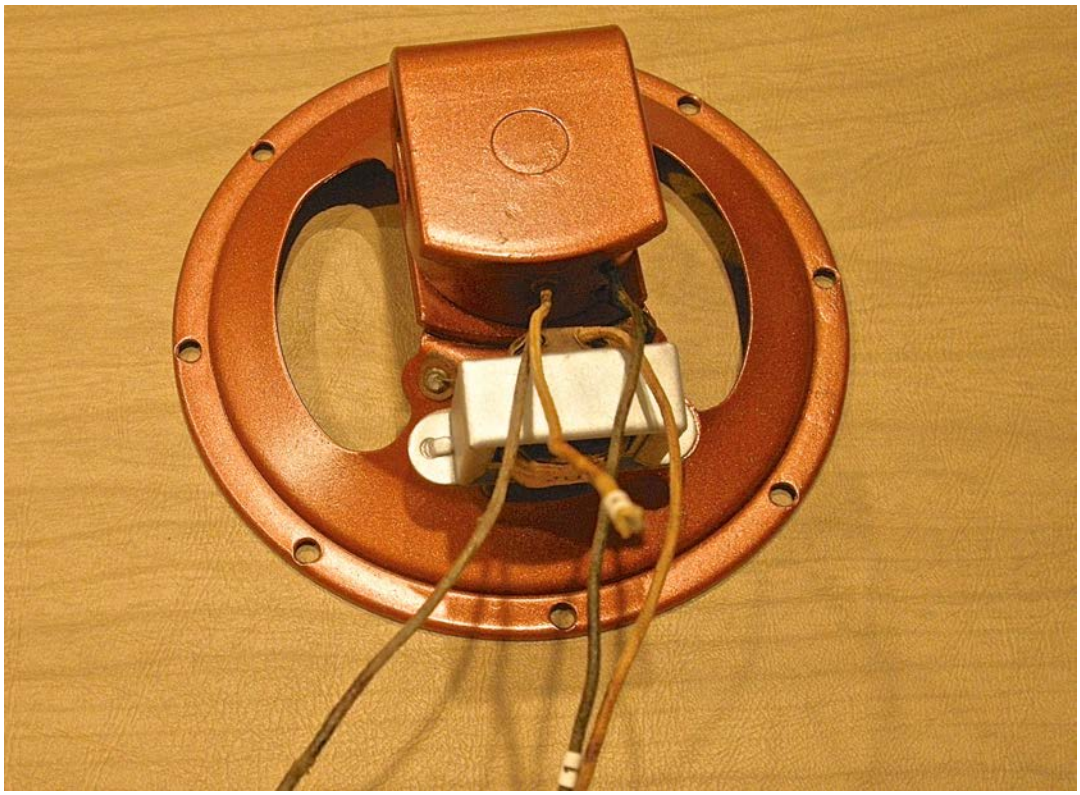


The speaker was rusted with the cone torn out.
The spider remained intact but later replaced with NOS (New Old Stock).
Fortunately, the speaker voice coil and transformer were tested and found in good condition.



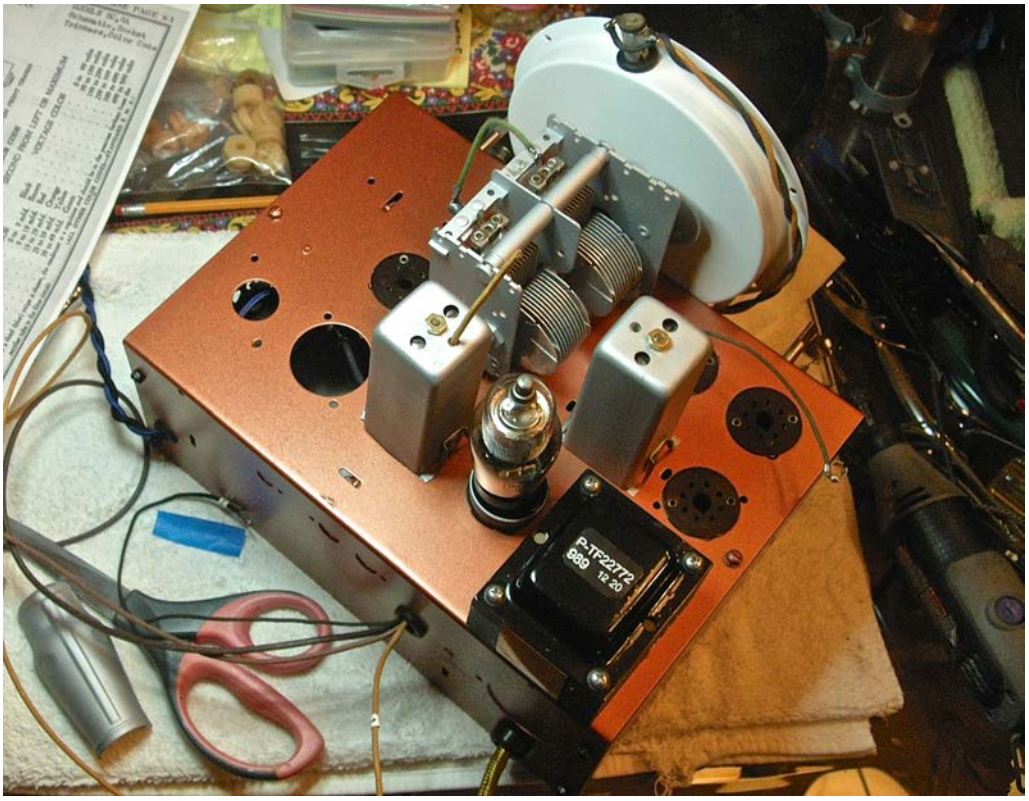
The speaker coil & transformer leads were wired tagged for future reference.

I sand blasted the speaker frame at a local engine machine Shop.
I then repainted the speaker frame prior to cone repair.



Speaker basket repainted. Transformer re-installed and speaker re-coned. A new spider was installed, sourced from NOS (New Old Stock).

Final step: Speaker gasket added to match original.



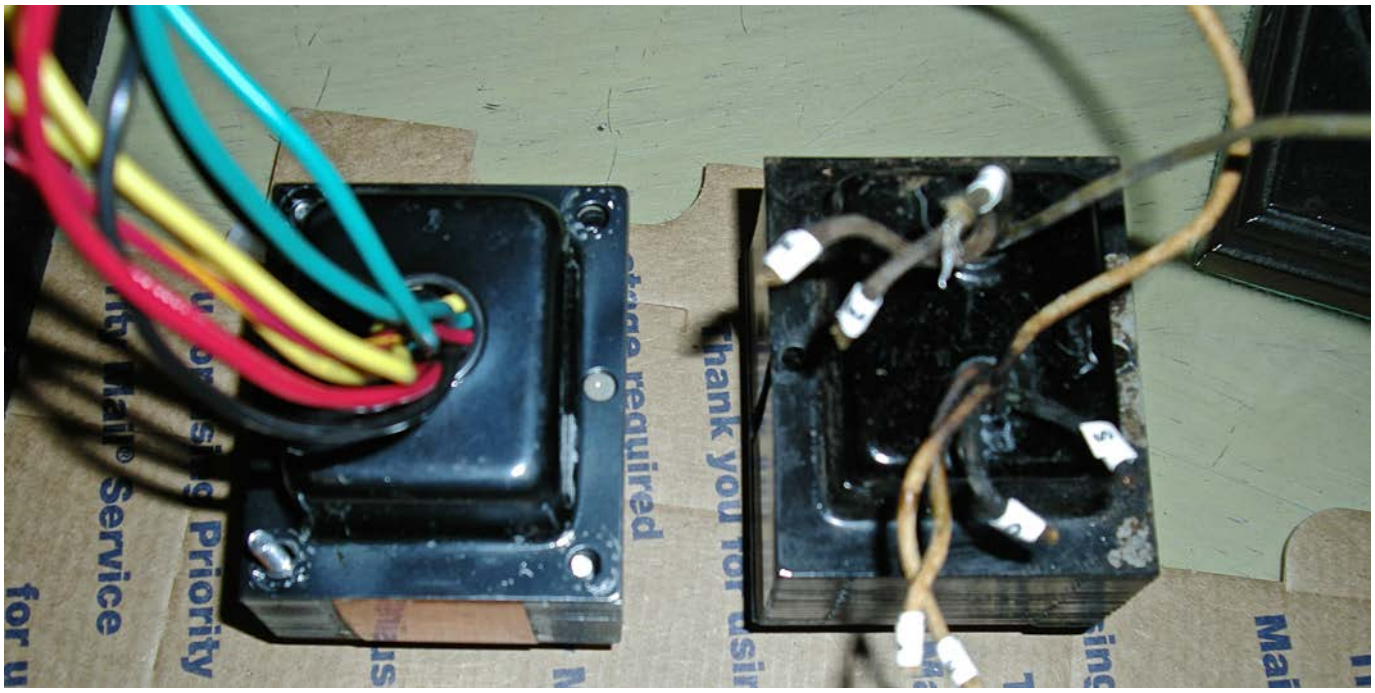
Painting, as with entire restoration was done by myself. An Awata spray gun was used to apply SEM etching primer and OMNI copper metallic matched paint. The new paint was color matched by a local auto body supply shop for the chassis finished coat.

I replaced the original power transformer with a replacement from the Antique Radio Supplies. The power cord was replaced with a gold cloth covered cord with a reproduction Bakelite plug.

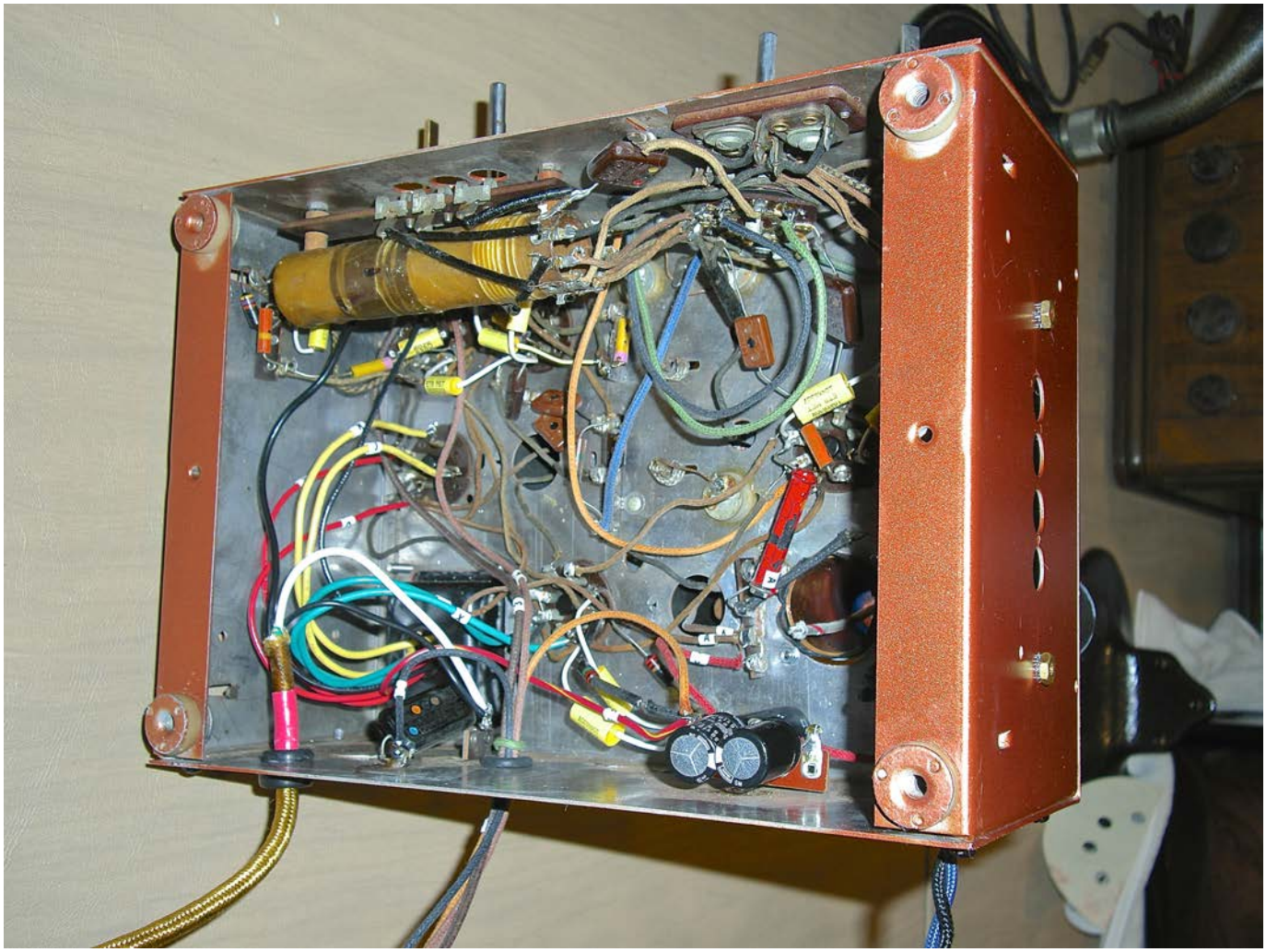
The tube shields were bead blasted as well and coated with a 1200* ceramic coating for heat and rust resistance. This was matched to the original metallic look.

After the tube shields were coated they were placed back into position covering the designated tubes.

False, “dummy “electrolytic filter capacitors cans were made for authentic appearance. They were stuffed with modern electrolytic capacitors. These housings are made of copper for grounding conductivity, and then wrapped with black insulating paper.



Close size match; new power pransformer next to original



Damaged exposed wires were replaced with reproduction insulated cloth covered wires. (Sundial Antique Wire Co.)

All electrical contacts were cleaned with electrical safe CRC solvent. The new power transformer was installed and tested with the rectifier 5Y3G tube removed. A 60 watt bulb was placed in series with the primary for initial testing.

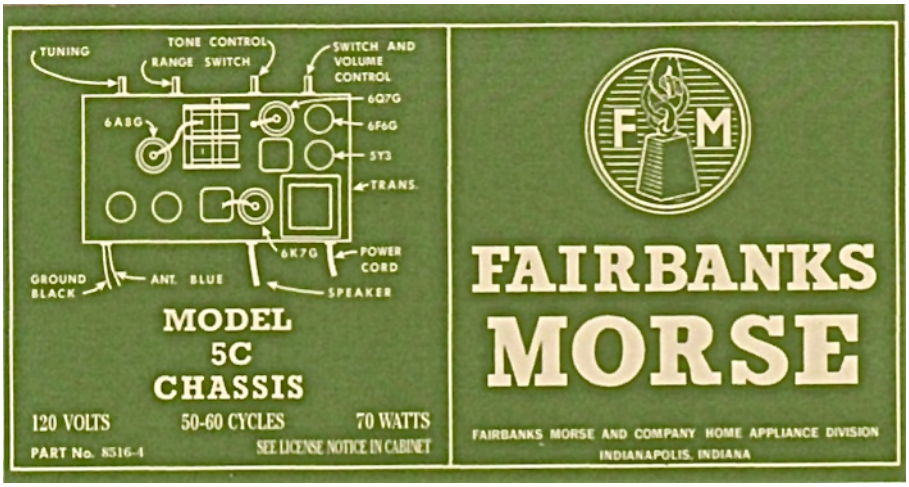
The old capacitors & electrolytics were all replaced with new ones.
All resistors were checked and passed the manufacturer specifications.

All tubes were tested with a Hickok tube tester. I discovered that several tubes needed to be replaced.

I am pointing to the rivets that I had to reproduce in order to secure the dial face. These were not salvageable or obtainable.

The old damaged dial face was replaced with a new reproduction made by Radio Graphics. The dial lights were rewired and the dial lights were replaced. The face was installed using machine screws and the heads were filed down as per old rivets to give a tight fit to the new dial face cover once the chassis was installed. I had also installed a new belt prior to the dial face being secured.

Before



Replica

The tube diagram decal for the Fairbanks Morse 5C was removed for the chassis restoration.

The Replicas were made by Graphics Radio

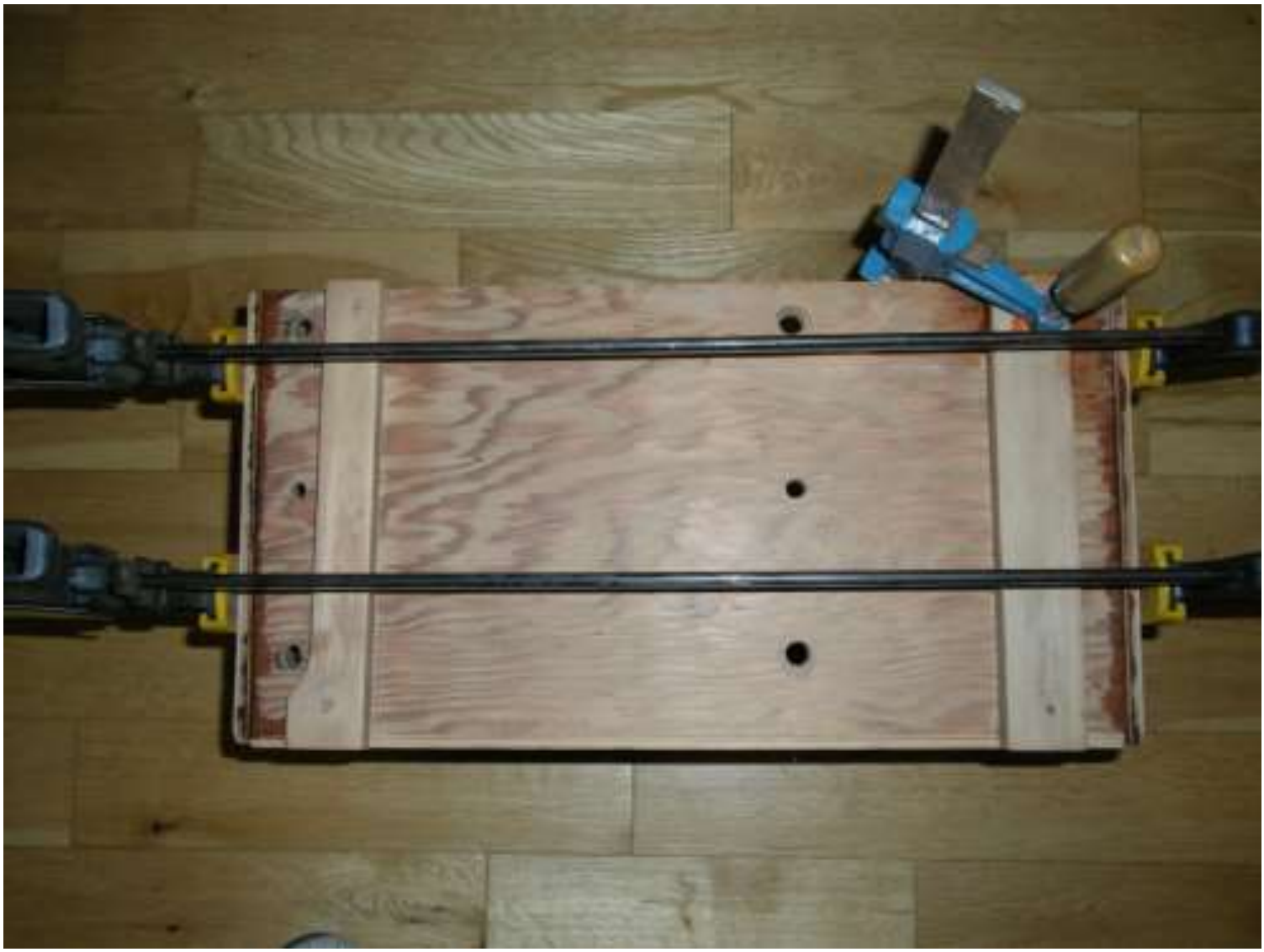
There were several steps to re-facing the body of this radio. The veneers were broken and chipped in many areas. The inside of the unit had a wasp nest, mud and had water damage.

I bleached the cabinet and stripped the inside and outside.

The cabinet needed to be resurfaced with new veneer and the under ply repaired. Both lower and right corners were severely damaged. The photos enclosed will show the process from beginning to end.

The lower corners were damaged on the face. The side panels required minimal veneer replacement.
The missing pieces were blended in with new veneers.
The front veneer had separated from the cabinet top as shown in the photo.

The interior of the cabinet had begun to separate.After the chassis was removed several wasp mud nests were revealed. A round slow speed wire brush was used to remove the wasp nests.



The cabinet base runners were secured and gluded and the old glides were removed and replaced with new glides.

The cabinet side ply's were re-glued and clamped to the cabinet base.
I then sanded and refinished the outside bottom of the cabinet.

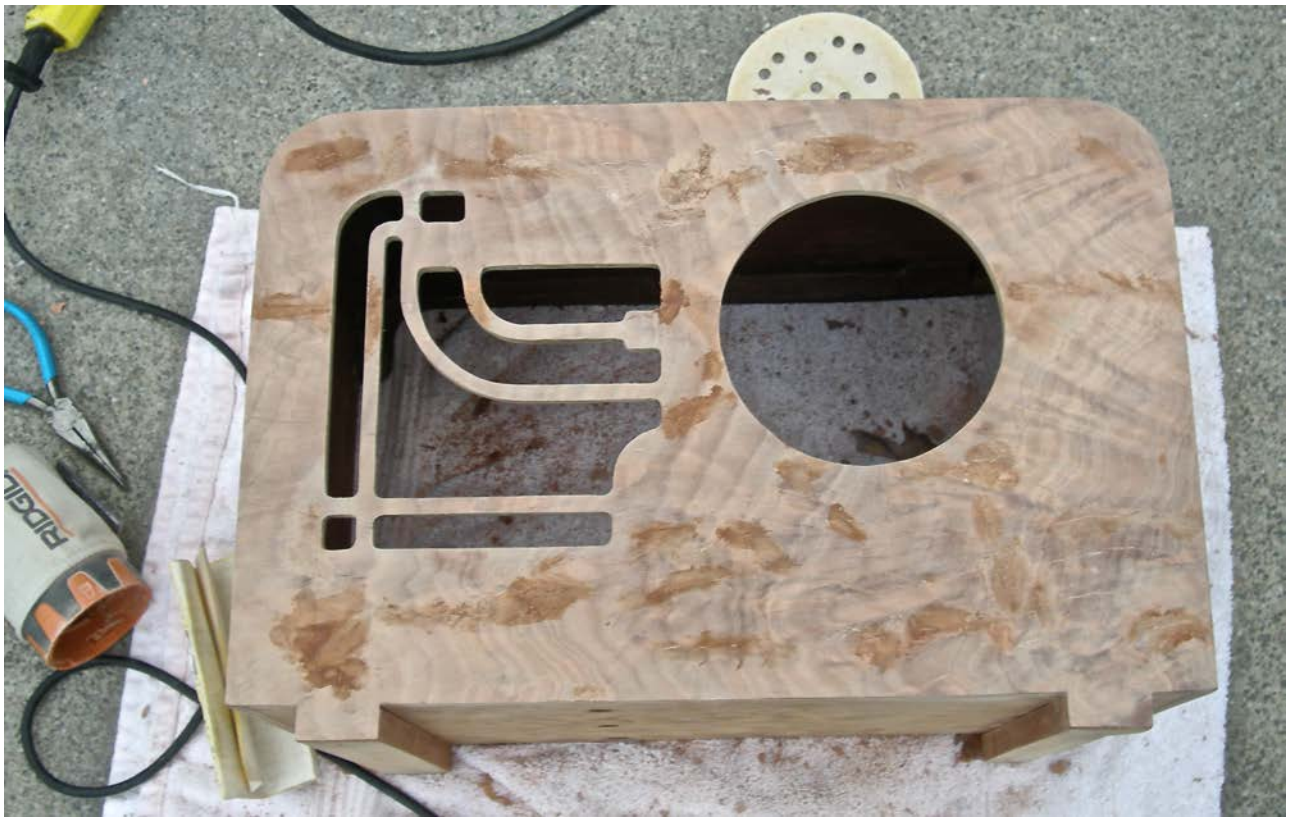
The interior seams were re-gluded on all sides including all corner reinforcement blocks. I completed the interior by sanding and refinishing with a coat of stain.

The existing front top ply was then clamped and re-gluded.

The veneer was so badly damaged that I decided to reface the cabinet. I choose a Fancy face crotch mahogany veneer that matched the original face pattern.
After the underlayment and old veneer was repaired, I applied Tie Bond III glue to both cabinet face and veneer and secured with a hot wood iron.

The new veneer I used was from Sauers & Co. processed veneer. This was a Crotch Mahogany book mark matched.
I have included an unfinished sample below.

Once the veneer was secured to the face the radio
I began the slow and tedious process of cutting the dial face, grill and chassis holes. This was very time consuming. I used a Dremel hand router with cutting and sanding bits.



The photographs on this page show the progressive cutting of the veneer to the original radio face cut outs.

There were several natural cracks in the veneer in which I filled and sanded. This took many steps to smooth out the surface.

I used a pine 1 x 4 as a jig guide for my Dremel router. The design grooves on the base and front of the cabinet face had to be hand cut with router to replicate the original design of the cabinet.

After routing the new grove lines into the new veneered face, and application of black lacquer to highlight.

I applied a brown cordovan toner to the two parallel grill frames as per original color scheme.

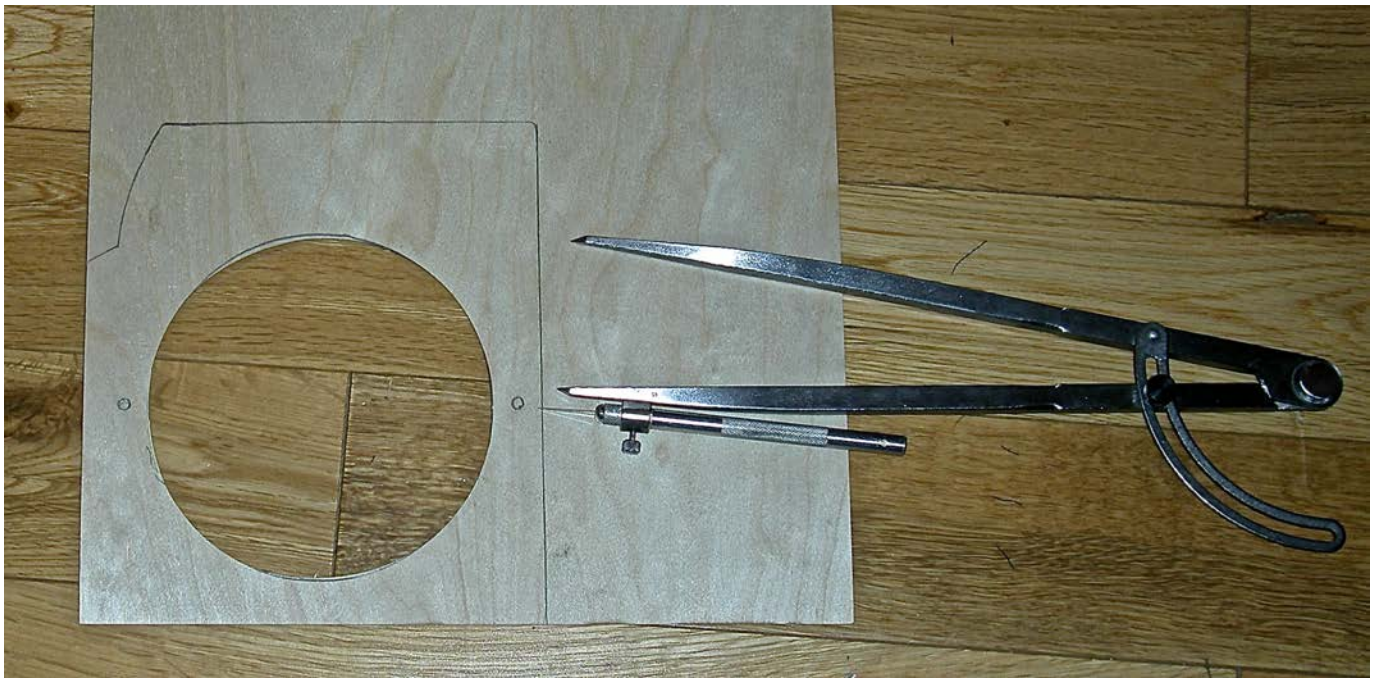
The feet were glued and air gun nailed into position.
Luckily I found the feet lying inside the cabinet.

The cabinet was sanded with 320 grit Norton sand paper.

An application of Mohawk grain filler was used to soften the pores of the wood prior to applying the lacquer finish. (Mohawk Lacquer).

Toners were used to blend the cabinet face into the old existing veneer.

Upon completion of spraying several coats of sanding sealer and satin lacquer, each coat was hand sanded. This took approx. 8 coats.
The final coat was rubbed out with rottenstone compound and light 3-1 oil. I found a chalk board eraser worker well. This helped give it a nice even finish.



The old grill cloth was totally destroyed.
I constructed a new backer board, using the old one as a pattern and replaced the grill cloth.

The speaker grill cloth was attached to a thin plywood backer-board with spray adhesive. The ply was cut by hand and fit to the cabinet as per original. Staples secure it in place.

I then secured the dial face cover after the brass escutcheon trim in place.

Awaiting the chassis, the cabinet is finished. The speaker grill cloth installed, escutcheon tacked in place with brass nails.

Chassis now completed, speaker re-coned and tested. Cabinet is repaired and refinished.

Cabinet ready for chassis installation

Cabinet complete, speaker is mounted and connected to the chassis circuit. Chassis is mounted with new grommets and bolted to the cabinet using original screw bolts. Decal has been replaced.

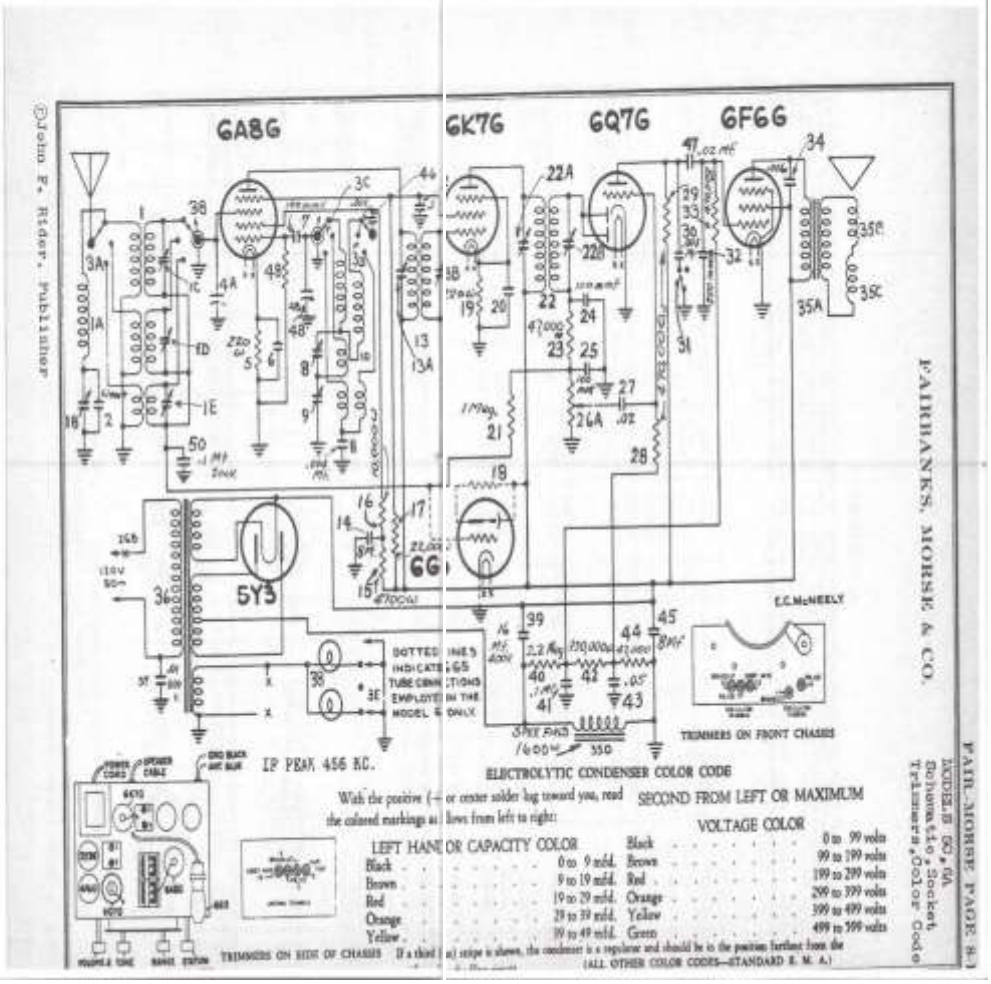
The missing knobs were found via the Antique Radio Forum and I purchased from a member. The knobs are backed with felt washer. Rosette screws were purchased from ANTIQUE RADIO SUPPLIES to secure the speaker as per original.

I aligned the radio at KRE (CHRS Headquarters), IFs at 456 KC as per the alignment instructions by the manufacturer.
This information was found Via the RIDER publications volume VIII Page 8-2 Fair –Morse Models 5C-6A

FINAL ASSEMBLY~ The Radio is completed!

REFERENCES & RESOURCES

Rider Publications
Hickock Tube Testers
Antique Electronic Supplies
U.S. Art Supply
Rockler Wood Working
Radio Graphics
Radio Daze
Antique Radio Forum-Barry
McDonald Renovation Radio
Sundial Antique Wire Supplies
Just Radio's
The Speaker Shop
Mohawk Finishing Supplies
Neds Auto Body Supplies
Martinez Engine & Machine
CHRS Workshop at KRE
Decals by Radio Daze



MODELS 5C, 6A
Alignment, Voltage
Resistance

FAIRBANKS, MORSE & CO.

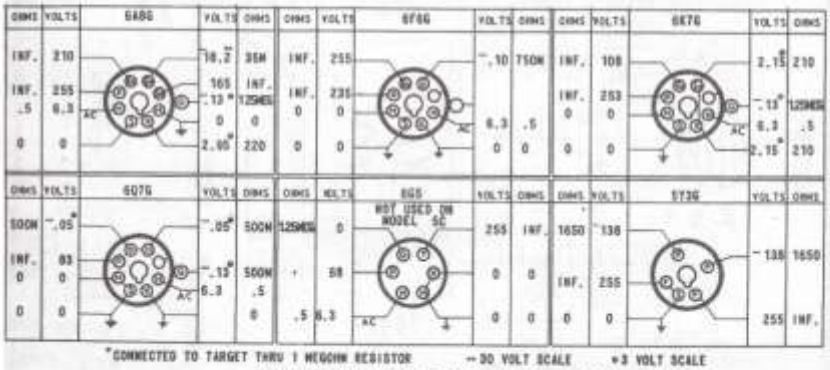
ALIGNMENT

The models 5C and 6A are AC operated, superheterodyne chassis with automatic volume control. These receivers operate on three bands —broadcast, police-amateur, and short wave, Figure 4. The 6A has the tuning eye, Figure 3 and 4; the 5C does not. Otherwise, the two chassis are identical.

Alignment procedure is given below in chart form, Figures 1 and 2. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected from the plate of the 6F6G tube to ground with a .1 mfd. condenser in series with one of the leads. When the hand tends to go off scale, reduce the input from the signal generator and keep the volume control at maximum. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the A. V. C. will operate and inaccurate alignment will result.

No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	550 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	550 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	550 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	550 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	550 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.6 MC	400 ohm Resistor	Police Amateur	5.6 MC	Police Osc.	6		Max.	
7	Antenna	5.6 MC	400 ohm Resistor	Police Amateur	5.6 MC	Police Osc.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking — Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Osc.	10		Max.	
11	Antenna	600 KC	200 mmfd. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking — Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC		+			*Check calibration at 6 MC— Padder is fixed.

FIGURE 2
ALIGNMENT CHART



VOLTAGE AND RESISTANCE ANALYSIS CHART

)John F. Rider, Publisher