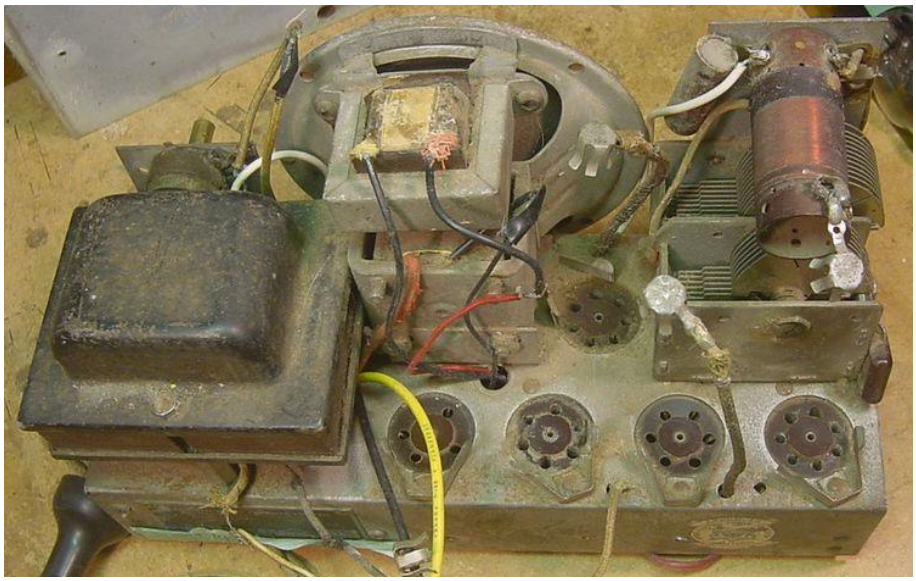
Re-building a Rogers Type 563 Chassis – Gerry O'Hara

This small Rogers 5 tube chassis, Type 563, dating from the 1933-1934 model year was acquired at a CVRS meeting in Burnaby earlier this year. The tube line-up is a 6A7S pentagrid converter, 88S (or 78S) IF amplifier pentode (at 465kHz), a 6B7S duo-diode-pentode second detector/AGC and first AF, an 89S AF output pentode and an 84S full-wave rectifier. This chassis type was used in Rogers Models 910, 911, 912, 915 and 916. The cabinet as-found was in not too bad a condition, though was lacking two small escutcheons for the tuning and volume controls and knobs. There were four small screw holes present where the front panel escutcheons would have been secured.

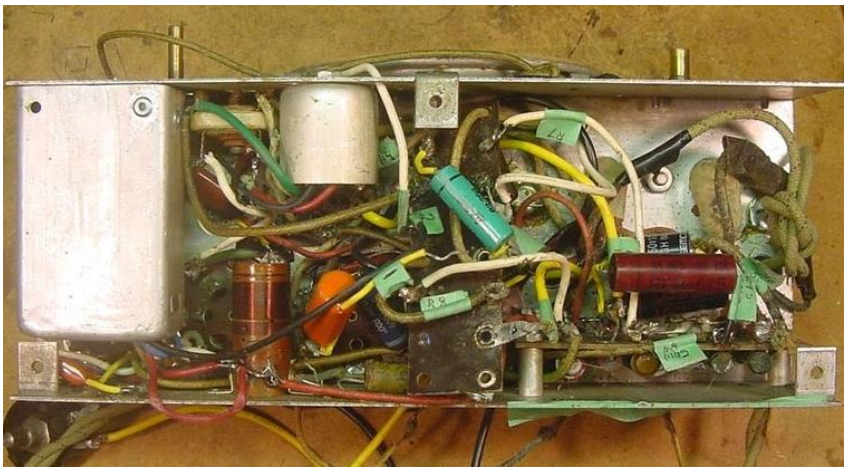
The chassis was a fine example of 'rats nest' construction at its worst – made worse by poor repair attempts over the years – this set has obviously had a hard life, with many of the original passive components having been replaced, including the wiring, one of the IF transformers and its AF output transformer. Whoever had made the last attempt at getting it to work had spent some time tracing and labelling various wires, but must have given up (not surprisingly given the mess!) – the form of construction used meant there were many wires running all over the underside of the chassis to two tagstrips that contained most of the resistors and capacitors. One of these ran transversely across the chassis obscuring the wiring layout beneath. Also, many of the replacement wires looked like they belonged in a washing machine, being 14 gauge, thickly-insulated types. These had suffered many soldering iron contacts, melting the insulation through to the copper wires beneath, as had several of the (replacement) capacitors. Most of the soldered joints were dry, or the stranded wires had frayed around them, making them messy and subject to shorting. On closer-inspection several mistakes in the wiring were noted and the two tagstrips (which were really only Paxolin insulation strips with holes to take the tag-leads of resistors for support) were in very poor condition. All-in-all a real mess!
So, what to do? – re-store the original form of construction, re-build or give up and chuck into the dumpster? Not wishing to give up on any radio, the correct schematic was located in the Radio College of Canada (RCC) data, and after a few minutes of assessing this and getting very confused with what wire went where, it was obvious why someone had identified many of the wires (and components) with

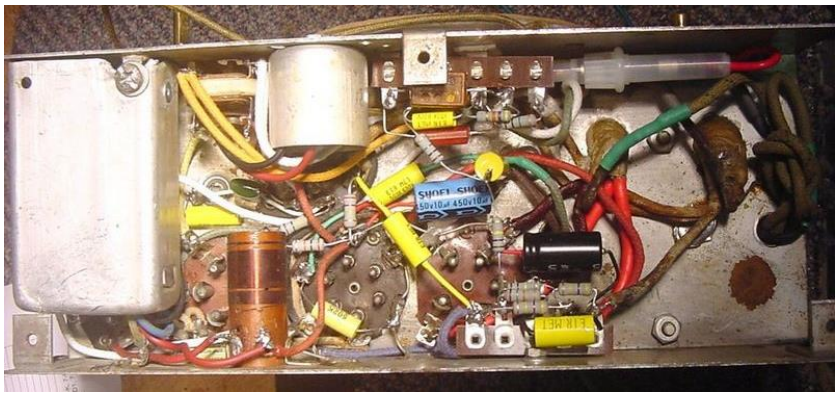
small labels made from masking tape. It was decided to strip everything out from beneath the chassis and start again with (mostly) all-new wiring and passive components. The first job was to take out the first IF transformer (the large oblong box under the chassis) to allow access to the converter and IF stages. This transformer had been riveted in place, with one rivet in a very awkward spot, resulting in some mangling of the case before it came free. However. once out, this allowed good access to the 6A7S and 88S tube bases. The two tagstrips and under-chassis wiring were then chopped-out. The two (previously-replaced) 10uf electrolytics were tested and found to be were ok, so these were re-used, along with one of the silver mica caps: all the other capacitors and resistors in the set were discarded, all either being in poor physical condition or testing out of tolerance.



The power transformer was then tested – it worked. It has a nominal 300-0-300 volt and two 6.2 volt windings (the 84S rectifier is a 6.3 volt filament). However, it was noted that the high voltage winding was not balanced around its centre-tap, being more like 285-0-305 volts – this could either be poor tolerance during manufacture or a shorted winding. The transformer was powered-up and left running (no load) for a half hour or so and it was still cool, so it was decided to press on with

the re-build. The wires emerging from the power transformer are wrapped in what looks like bandages, however, some of this looked suspiciously fibrous, possibly containing asbestos. Not being able to remove this without dismantling the transformer, it was 'stabilized' in-situ by applying several coats of clear nail varnish.

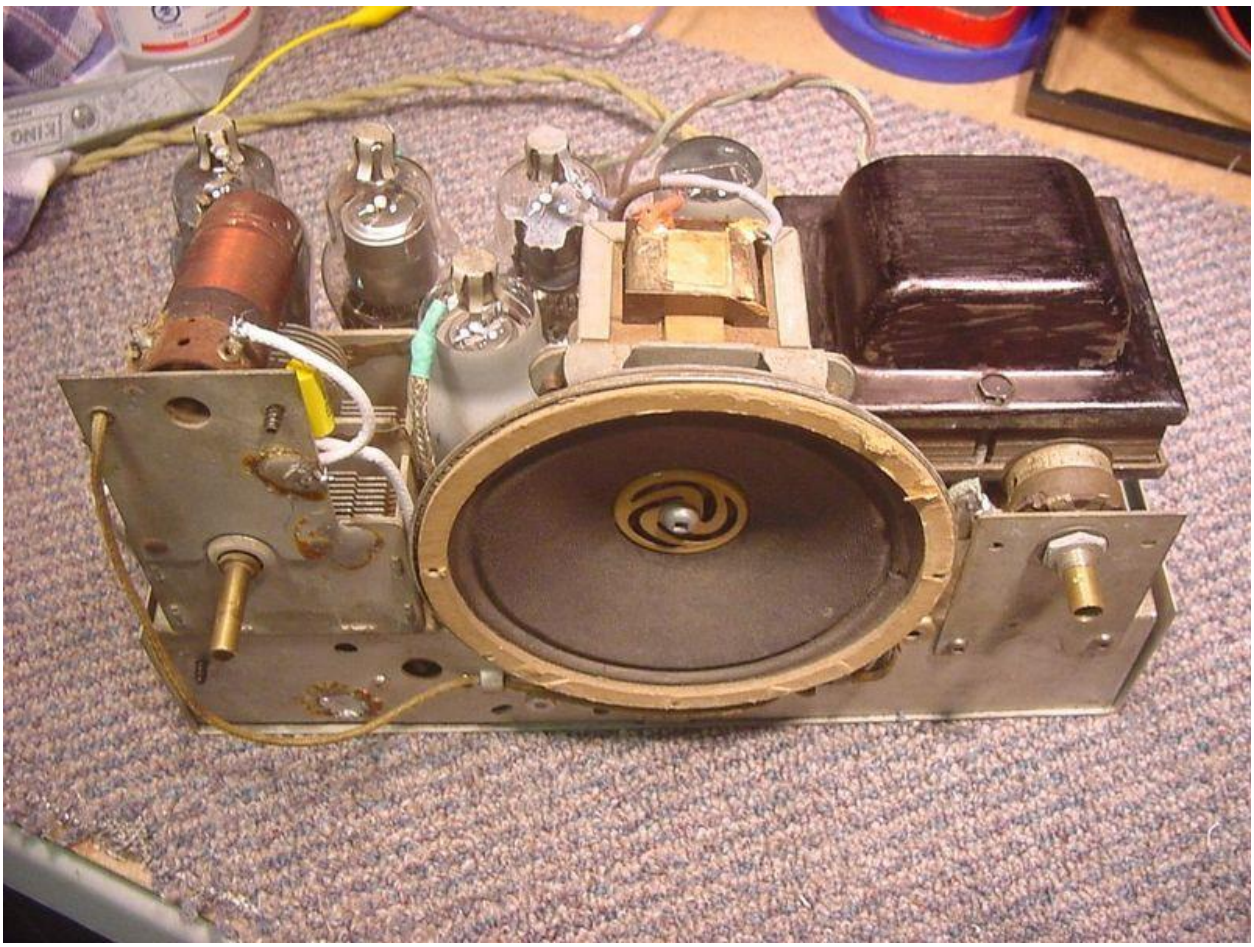




Components and re-wiring began at the front-end of the set (6A7S) and worked back towards the AF stages and finally the power supply. It was noticed that the colours on the insulated wiring emerging from the two IF transformers were incorrect – concluding that these were possibly both replacement items, this being supported by the crude way they had been re-mounted to the chassis. The secondary of the second IF transformer (the small round metal can beneath the chassis) was found to be open-circuit and this was tracked-down to the fine coil wire becoming detached from the thicker lead-out wire – fairly easy to repair, though a bit fiddly. For expediency (rather than authenticity), it was decided to mount as many of the new components as possible directly to the tube bases, minimizing the number of wires beneath the chassis – this arrangement also makes for a more easily-understood layout when servicing in the future. Two small tagstrips were still needed however, one serving to mount the AF and AGC resistors and capacitors, the other the bias supply resistors and filter capacitors in the power supply. New metal-film resistors were used throughout, along with polypropylene, polyester or 'Mylar' capacitors, a couple of 'NOS' silver micas, plus the two 10uf electrolytics recovered from the 'rats nest' (this chassis appears not to have had can-type electrolytics fitted – unusual for an early-1930's design). The 'washing machine' wiring was replaced with new cloth-cover wiring. Heat-shrink tubing was used to tidy-up frayed-ends on the little remnant original wiring, eg. to the speaker field coil and AF output transformer, plus some of the power-transformer wiring. A 1 Amp line fuse was installed beneath the chassis as some added protection. In order not to miss replacing anything in the re-build, all the components were pre-selected from stock and placed in a 'parts bin' on the workbench, ticking off each one on the schematic as it was installed, together with notes on any replaced wiring (otherwise it is all too easy to miss connecting something up). A layout diagram was not drawn as the circuit is fairly

simple, and it was decided where things should go as the re-build went along, minimizing leads lengths and number of grounding-points. Only one of the grid leads (top-cap connections) was replaced – the others were re-furbished using heat-shrink tubing.

The result is a chassis that works well and which can now be serviced relatively easily, albeit not that



original-looking underneath. The set worked first time on applying power (rather cautiously with a variac) and appears very sensitive, even without any re-alignment. The set was kept running for a couple of hours and the transformer reached a temperature around 64C – a bit on the hot side – and was very slowly still creeping-up higher. It ran cooler when it was fed 105v from a variac. The set was still working ok, but it was decided to switch off and only assign the set to 'light duties' – max an hour on or so - or fork out for a new transformer, use a 'bucking' transformer, high-wattage series resistor or use the 'dual zener trick' in the primary. In the end, a pair of back-to-back 5W 12v zener diodes were installed in the transformer primary circuit, lowering the primary voltage to around 105v and the transformer runs much cooler.

Some slight re-furbishing of the cabinet was carried out (although it was in pretty good shape) - limited to toning-in some scuffs and scratches with a touch-up pen and then a quick polish. Also installed a scrap of cloth over inside of the speaker aperture grill.

In use, it was noticed that the set has some heterodynes present when tuning-in stations and it was suspected that this was due to the RF, IF and detector tubes being un-metalized types (these should be 6A7S, 88S (or78S) and 6B7S types). A metal 'Goat' shield was fitted to the converter tube and tried metallized tubes in place of the remaining plain glass tubes – this cured the heterodyning dead.

The exact same model radio is present in the display area of the SPARC museum and the dials from that set were scanned, tweaked in Photoshop and printed on glossy photo-paper. After cutting the dials out, a black marker pen was run around the edges to prevent the white paper showing through and the repro dials simply stuck onto the cabinet front with Pritt-Stick and model train rail tacks! Also attached is a photo of the originals – look a bit scruffy by comparison... A pair of the correct knobs were obtained from a driend at the CVRS and the set now looks very original (except under the chassis).

By the way, the dials have a purplish tint on the photos taken under artificial light but appear solid black in reality.