From the Workbench

Useful Steps in the restoration of a valve radio

A Presentation by Chris Ratcliff at the May 2019 meeting of the HRSASA

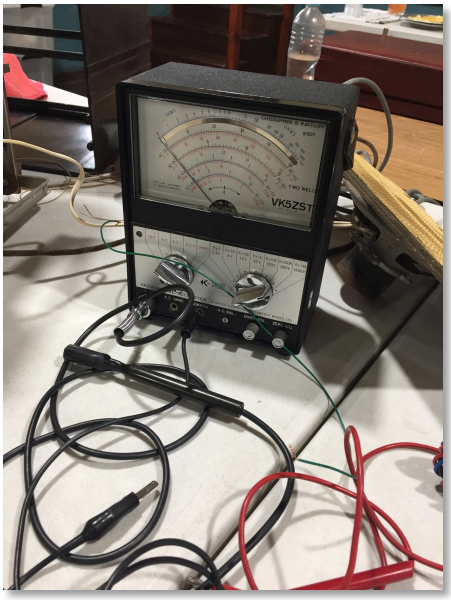
In this presentation, Chris used two 1948 model HMV C23A mantle radios – One was completed and the other was undergoing repairs, so we were able to see “before” and “after” demonstrations of the processes.

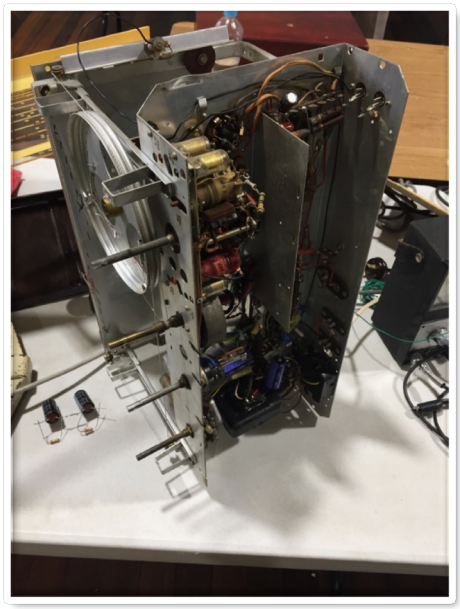
The Chassis:

- Remove loose debris; dirt and foreign objects
- Check for broken/loose wiring and replace where it has badly deteriorated.
- Fit a fuse to the ACTIVE power input line
- Fit an EARTH connection to the chassis adjacent to the NEUTRAL and ACTIVE terminals
- Whenever possible, fit new insulating rubber grommets to the 4 feet of the tuning gang. *In this HMV it was very difficult! It involved removal of the whole tuning assembly (including replacement of the 2.5 metres of dial cord) and coil re-alignment afterwards!! The alternative was difficult removal of the dial drum, and then re-stringing as well!!*

Some Useful/Desirable Equipment:

- Bench-top Power Supply *(Isolated power supply with variable voltage if possible)*
- Multi-meter *(Pictured here is my VTVM or Vacuum-tube Volt Meter)*
- Signal Generator
- CRO *(Cathode-ray Oscilloscope)*
- Spectrum Analyser
- Digital Frequency Counter

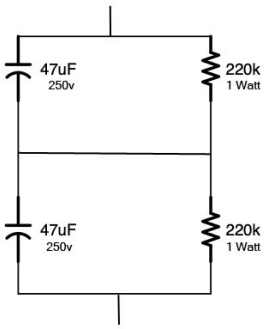


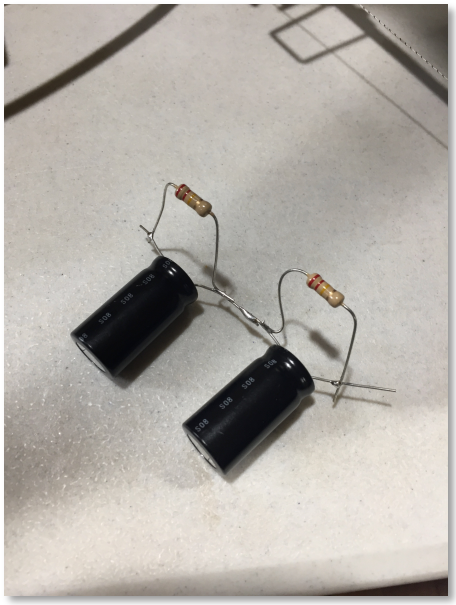


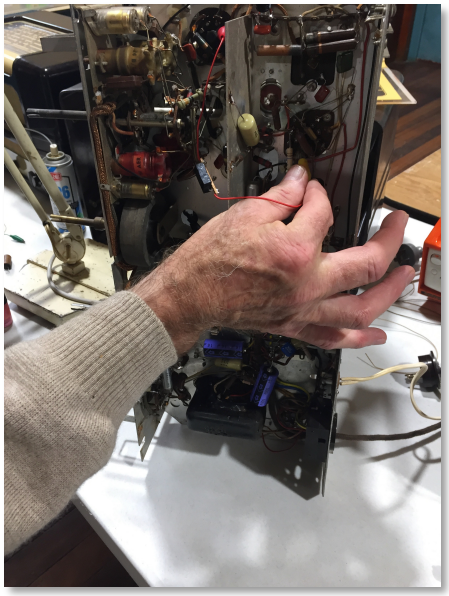
Cleaning the Chassis:
(HINT: To be done on a hot day!)
For this process, place chassis on its side with the power transformer upwards

- Use Handy Andy cleaning liquid with an old toothbrush or long-bristle brush
- Clean ONLY the chassis. Do NOT get any components wet, especially the transformer
- Scrub away the dust and grime from the metal surface with the brush and Handy Andy
- Rinse off with plain water using a fine spray bottle and wipe with old rags to remove dirt and grime.
- Rinse off thoroughly as Handy Andy will attack aluminium
- Place chassis outside in the sun (and any breeze) to dry completely. Do NOT use hairdryer or heat-gun as you could damage wax coated components.

Making your own replacement components:
(Pictured on right) This HMV radio required a 25uF x 500v capacitor – These can be quite expensive so here's a quick way to make your own using two electrolytics in series with a "bleed resistor".







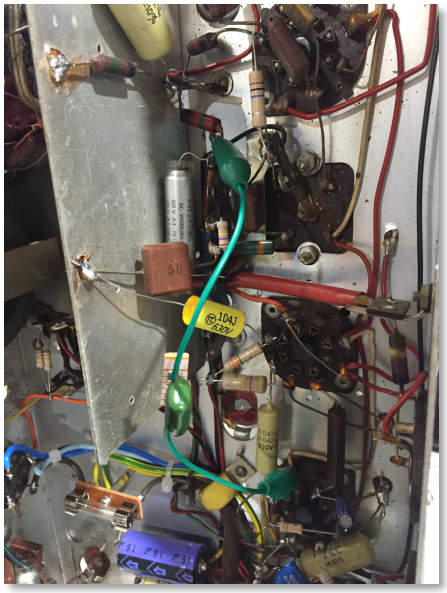
Fault Finding – Part 1:
Testing Tool: Use a 100pF capacitor (with a couple of extension leads with clips soldered on)

- Connect I end to the ANODE pin of the mixer valve (pictured on left)
- Wave or Wand the other end near the output of the IF valve in this case an EBF35 and listen for oscillation through the speaker…. If so then you can assume that they are both working O.K.
- If not, go back and check for bad solder joints or perished wiring (replace) and try again.

Fault Finding – Part 2

In this photo I have used a green 0.047nF x 600v capacitor with 2 leads and clips as a testing tool. (Picture on right)

- This tool is used to test the audio amplification part of the radio
- Attach one end to the valve heater line
- Attach the other end to the control grid of the OUTPUT valve (in this case, a 6V6)
- You should hear a strong hum from the speaker
- If a hum is present then you can assume that:
    - Power amp is O.K.
    - Output trans is O.K.
    - Speaker is O.K.
- Again, if nothing is heard, check all wiring and solder joints for small breaks and repair then re-test.



Fault Finding – Part 2 (Continued)

Still using the green capacitor testing tool (as above)

- Leave one end attached to the valve heater line
- Then attach end 2 to the control grid of the signal amplifier
- You should get a LOUDER signal – If so its O.K.

Finishing up – Restoring Bakelite

- NEVER use harsh abrasives, or chemical cleaners on Bakelite
- Gently wash the Bakelite shell (with dial glass removed) with warm mildly soapy water or a damp cloth, to remove greases and oils
- When completely dry, apply Kitten brand (or similar) No 1 grade cutting compound car polish
- Follow directions on the tin to apply correctly
- Cutting car polish removes the top, often oxidised layer of the Bakelite and you can finish up with a luxurious shine like new.
- Do NOT try to wash dial glass as many are old fashioned “water transfers” and will wash off if wet. Screen-printed or painted dial glasses can be cleaned but check first on a corner or hidden bit of text.