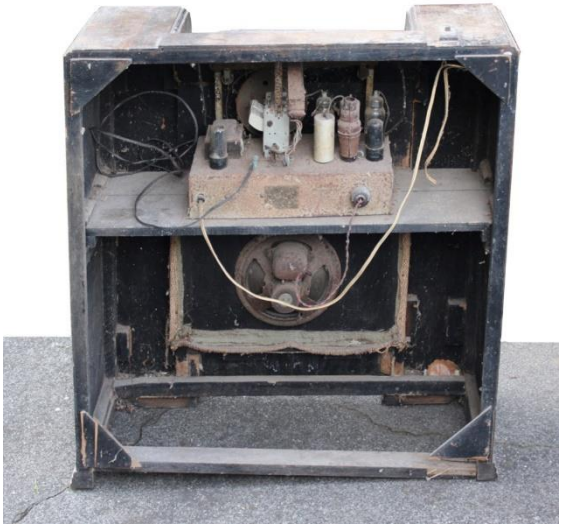
Democrat 1948 console

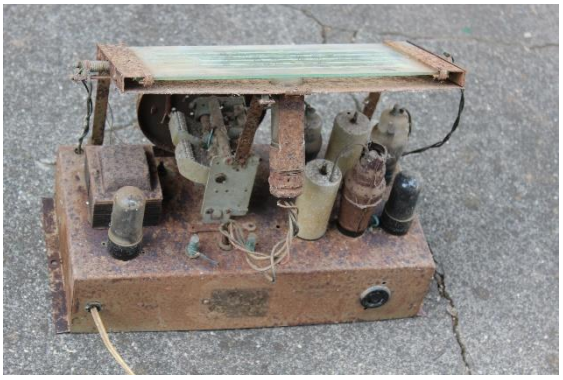
By Graham Parslow

This restoration was among the most demanding I have undertaken. It was collected from a carport where birds had left their calling cards and spiders had festooned the back with gossamer webs. It was a generic console with no identifying maker's insignia. The radio belonged to a dear friend's grandfather, otherwise it would have become firewood and parts (and not many of them). It was identified as a "Democrat" by HRSA member Ormond Randall who recognised the unique layout of the chassis as a product of A. W. Jackson Industries. Jacksons only used the Democrat brand in 1948 and 1949. This is in agreement with the date of January 1948 stamped on the HT Rola choke and the Rola speaker. In 1948 a Democrat branded 5-valve console in a different cabinet could be purchased for £21/15/- . This one would have

been made for retailers outside of the franchised Democrat distributors. From 1950 Jacksons manufactured under the brand names Precedent and Breville.



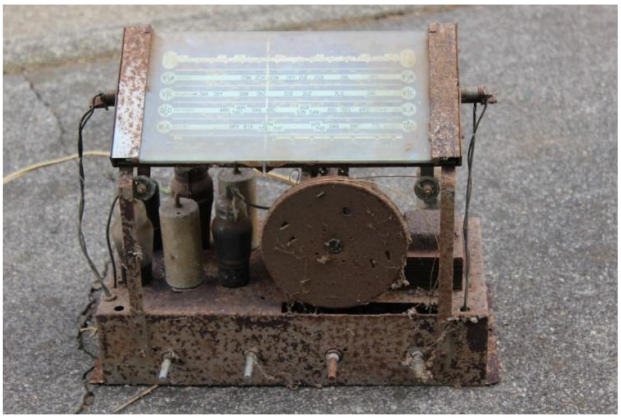
This was a project that I found daunting to commence, but as Confucius wisely said a journey of a thousand leagues begins with a single step. The first step was to remove the chassis.



Everything was seriously dirty and corroded. I was only going to find the motivation to continue if the chassis was made to look respectable. This required removing the valves, abrading the metal surfaces then painting. Abrading involved a metal scraper and Flexovit P240 cloth-backed wet and dry paper. The almost-indestructible cloth-backing lasts far longer than conventional wet and dry paper. When this paper clogs with rust it can be restored by washing with water.

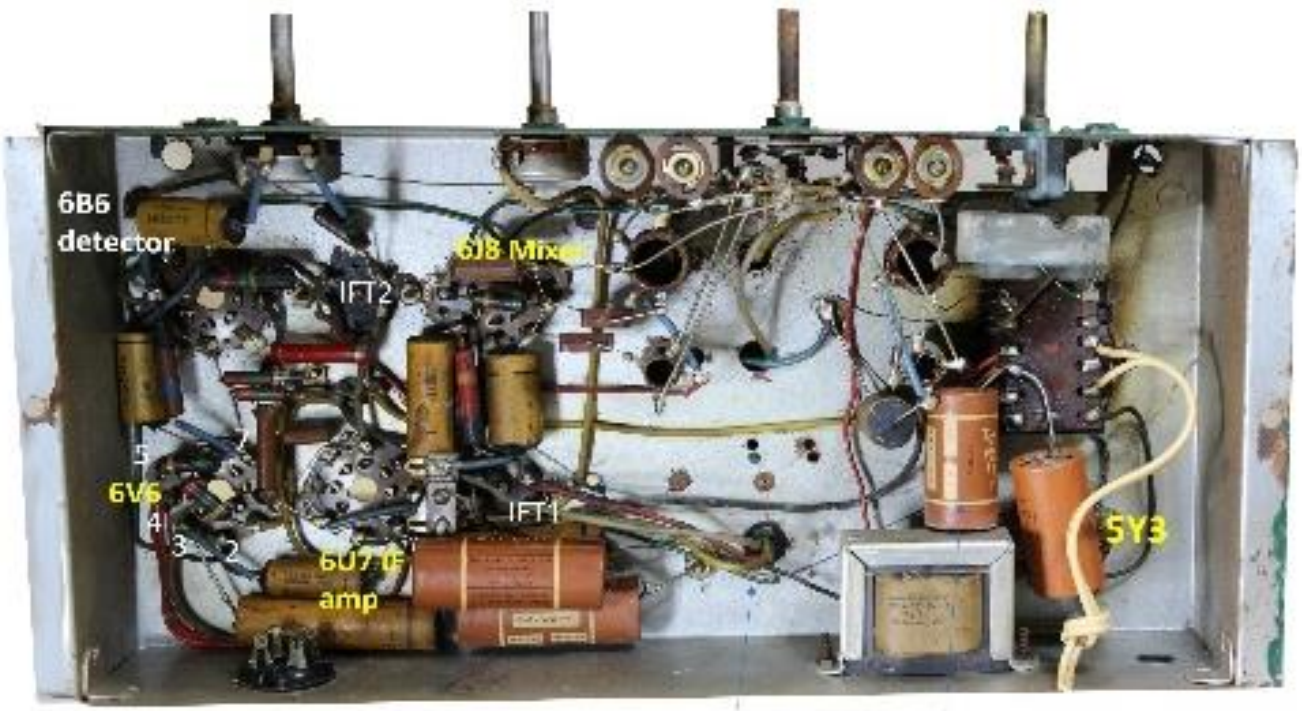
The main chassis was painted with Brunswick green, the dial backing plate with mission brown, the magic eye supporting bracket with black and the Goat shield and dial side-plates with chrome. A reproduction ARTS&P label was attached to the rear of the chassis. It had then begun to look like a tidy unit.

The front of the chassis was degraded by a broken dial string and rusty dial drum. By good luck I had an identical dial drum on my salvage shelf and the original went to the bin. Fortunately, the glass dial was in good condition.



It took a while to work out a functional stringing of the dial and what I came up with was unlikely to have been the original stringing. After getting it working I needed to increase the spring tension for reliable operation and that pulled the string over a ragged edge that cut the line. With file in hand that edge disappeared and the second stringing was far more quickly achieved. The Bakelite knobs were ultrasonically cleaned and it was time to start the electrical restoration.

The first assessment was a check of the transformer with no valves in place. The result was puzzling. What was certain was that the original transformer was headed for the bin. The 5V and 6.3V windings were fine, but the HT secondaries were producing 140V at both sides of the centre tap (far too low). The



6V6 pin 8 cathode earthed

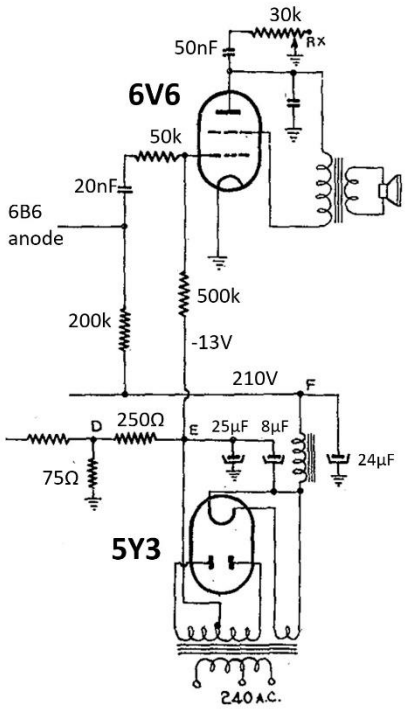
6U7 shielded

Magic eye

Back-bias bypass

transformer was also consuming 120W although there was no arcing or dreaded smoke. I have no explanation for this because I would expect shorted turns to affect one side of the secondary HT windings relative to the centre tap (not an even 140V each side as measured). By good luck I had a suitable replacement transformer on my salvage shelf.

The replacement transformer was larger, mounted vertically and required some metal work to install. The bonus was that the replacement was a better quality unit than the one it replaced. The original had the transformer wires terminated on a phenolic board immediately under the transformer body. This board was left in place and the flying leads from the replacement transformer were soldered to the appropriate lugs on the board.

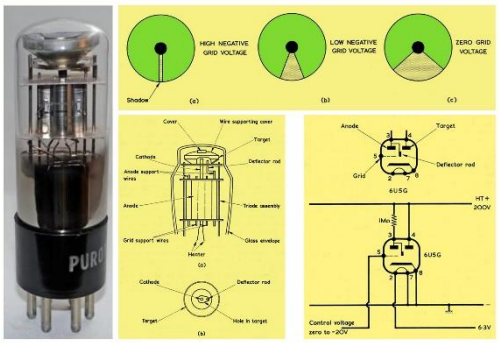


The under chassis photo included here shows the radio with the original transformer in place. An interesting set of connections that can be seen here is at the mains transformer centre tap of the secondary windings. There is the negative end of an 8µF 525VW electrolytic and the negative end of a 25µF 40VW electrolytic. The explanation is that the low voltage electrolytic is an AC bypass to the 250Ω plus 75Ω back-bias resistors connected to earth (see the circuit diagram). This is the only radio I have encountered with such a component. It would not function in the same way as a cathode-resistor bypass capacitor shunting audio frequencies, so it must be an additional ripple (hum) filter.

The circuit provided by Democrat shows the filtered HT as 210V and the 6V6 grid bias as -13V. In the restored radio with the replacement transformer the measured voltages were spot on at 210V and -13.5V. the restored radio consumed a very reasonable 43.4W.

The additional 4 valves in this radio are a 6J8 mixer, a 6U7 IF amplifier, a 6B6 audio preamplifier/detector and a 6U5 magic eye. The magic eye was factory fitted.

The magic eye for tuning radio receivers was invented in 1932 by Allen B. DuMont (https://en.wikipedia.org/wiki/Magic_eye_tube). Operation in this set is dependent on a negative voltage generated by a diode in the 6B6 detector valve. At my location most tuned stations generated negative 2 to 5V at



the diode. However, one close transmitter generated minus 23.8V. If you look at the diagram showing the function of the 6U5 you will see a 1M resistor shown in series with the deflector anode. For this radio I found that a 330kΩ resistor gave optimal operation.

The 6U5 in this radio was the common 6-pin version, but the diagram included here features the octal base version that is electrically identical. With reference to the octal version when the grid at pin 5 = 0V the anode passes current and the voltage at the anode drops due to the 330K resistor (1M in the diagram). V = RI by Ohm's Law. When a negative voltage is applied to the grid, conduction (current) decreases and the anode rises toward line HT voltage. This causes the deflector to close the eye and indicate that a station is tuned.

The phosphor in 6U5 valves degrades both through age and use (https://en.wikipedia.org/wiki/Phosphor). The original 6U5 in this set was not serviceable. Thank you to HRSA member Peter Schwegler for providing me with a good 6U5.

Restoration of function to the radio necessitated replacing an open circuit 250K resistor from HT to the anode of the 6B6 audio preamplifier. A new 6V6 output valve was also needed because the original 6V6 was dead (no output when signal was fed to the grid). The filter electrolytics were replaced with new ones.

The frame of the 8 inch Rola speaker was severely corroded. However, that was not the major reason that led to it being binned. The cone was poling, that is the voice coil was rubbing against the coil gap. Because no 8-inch was in my stock I replaced it with a 6-inch

Rola speaker complete with transformer from my salvage shelf. A new baffle board was cut to size and new speaker grille cloth installed at the front of the baffle.

The veneers at the side had lifted and were glued back on with PVA. The cabinet restoration involved stripping back to bare veneer and painting the black and brown feature sections. I used P40 Flexovit garnet paper to remove the old surface coating because it does not clog easily. No finer sanding is needed at this first stage. Two sprays with polyurethane consolidated the surface followed by reasonably aggressive sanding with Aluminium oxide – zinc stearate P180 no-clog sanding sheets. Next came 3 coats of satin polyurethane with sanding between coats using P240 no-clog sanding sheets.

The four knobs at the front have the functions volume, tone, wave change and tuning (no on-OFF). A home-installed 240V switch at the top of the cabinet was retained.

The end result was most satisfying.