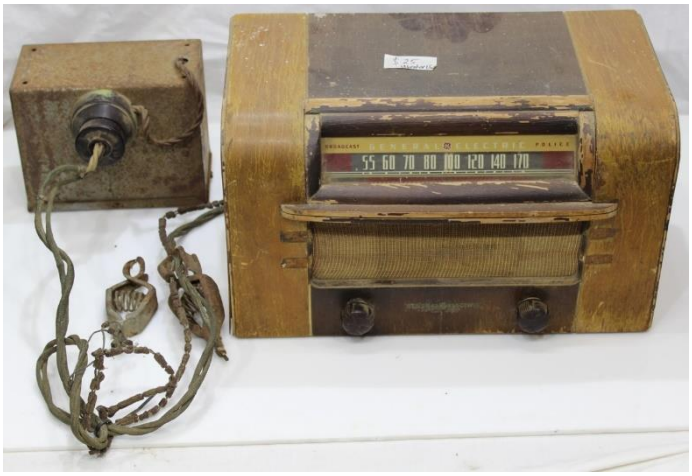
General Electric 1949 Farm Radio

By Graham Parslow

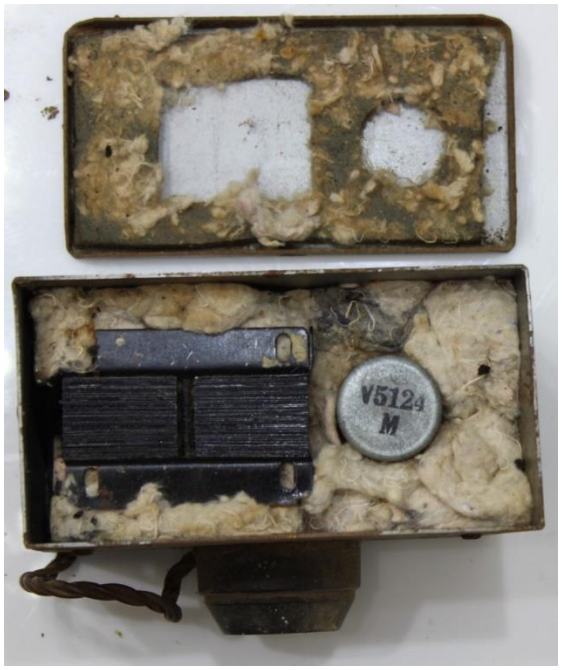
Radios from the US are rather rare in Vintage collections for two reasons. Most significantly Australia imposed high import duties on complete radios at the end of the 1920s to boost local production. For example, Healing stopped importing Atwater Kent radios and ramped up their manufacturing of radios in Melbourne. The other reason is that when radios moved on from battery power to mains power the US radios were inconvenient to adapt to 240 V. An exception to this is out-back station radios designed to run on 110 V AC as noted in the accompanying box.

The radio featured here has been dated to 1949 by the date stamp on the high tension filter choke. The stencilling at the front boldly proclaims General Electric, made in U.S.A. However, this is only part of the story because the radio is a hybrid of American and Australian components. Australian General Electric radios (and the contracted brand name Genalex) were commonly produced by AWA. In this case the radio began as a knocked-down kit from the US, thereby avoiding import duty on a whole radio. The kit apparently featured the case and the chassis populated with the tuning capacitor and front end coils for tuning and the local oscillator. No adaptation to 240V was needed because it was a 6V farm radio. The market for farm radio was large in the 1940s because few farms had mains power



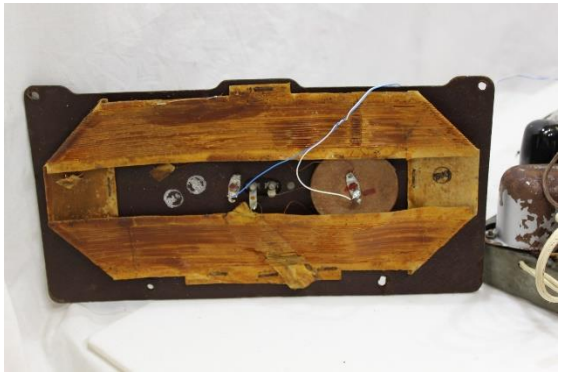
This radio was purchased in poor condition at an HRSA swap meet for $25. It was a project that waited patiently on a shelf for some years. The quandary was to decide the nature of the restoration. Ideally it would work again using its vibrator from a heavy duty 6V battery. The valve line-up and other componentry is close to the circuit of the 6 V Genalex model BC 920 car radio described in the AORSM circuits for 1947. That circuit shows a battery drain of 6 Amps at 6 V (36 W) and I had no batteries or power supply capable of such heavy-duty service.

The radio has no HT rectifier valve because the vibrator is a synchronous type that produces DC. The otherwise similar Genalex BC 920 car radio uses an asynchronous vibrator and a 6X5 rectifier. A minor consideration was that the cables to the battery and vibrator were in poor condition. Another consideration was that synchronous vibrators are notoriously unreliable. In the end I decided not to get a buzz out of the restoration by retaining the vibrator (pun intended). In this case the buzz may have been well muted due to the generous packing of the case with sound absorbing material.



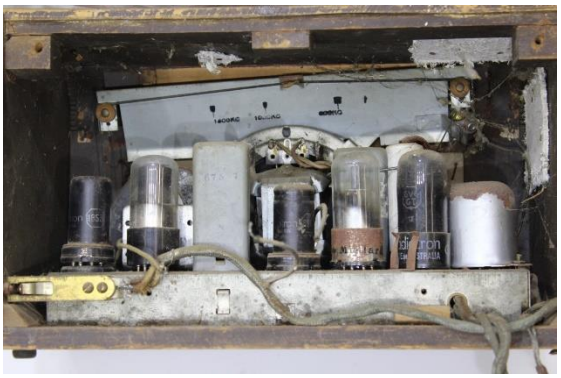
It is remarkable how deciding what should be done allows us to get on with a job.

The rear panel does double duty as an enclosure and a base for the loop antenna that is wound in the manner that Tony Maher adopted for his portable series of crystal sets.

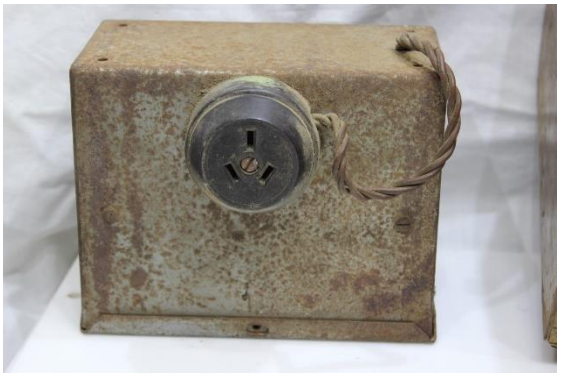


The antenna coil was open circuit and the single break was easily located and repaired. Provision is made for adding an external aerial and this would be essential in most locations, given that this radio has no RF amplifier stage.

The internal components presented in fair condition due to the protection afforded by the back panel. From left to right as seen from the rear the valves are types 1B53 (metal case), 6SA7GT oscillator-mixer, 6SK7GT IF amplifier (metal case), 6SQ7 detector audio amplifier and AVC then finally a 6V6GT beam tetrode for power output.



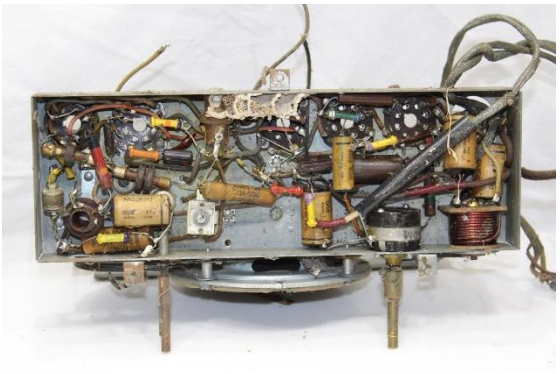
A gold 6.5mm mono audio socket can be seen at rear left mounted into the wooden case. This accepted output from a turntable to play records and switched the radio-feed out of circuit when a plug was inserted. The same stock of heavy braided shielded wire used for the pick-up connection was also used to connect 6V DC to the vibrator and return high tension from the vibrator. Those vibrator connections were made using an Australian general purpose 240V power plug and socket.



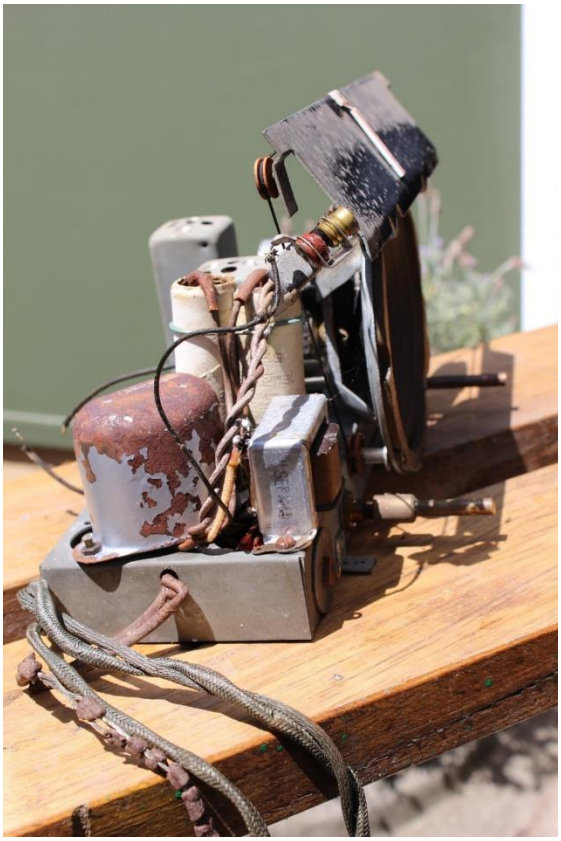
The risk that someone would plug that link into a mains socket, rather that the vibrator, was another reason to restore without the vibrator.

The tuning capacitor is a US type with extended capacitance that allows tuning from 550 to 1700 kHz. The radio retains the US dial calibrated with MW frequencies (i.e. no customisation with Australian call signs). As the dial shows, tuning between 1600 to 1700

kHz is where Americans could tune into police radio transmissions.



The first glimpse under the chassis revealed mostly Australian sourced parts and an empty mud-wasp nest. The heavy gauge enamelled wire coil at bottom right is in series with the 6 V battery positive lead connection to the valve heaters and vibrator. At both ends of this low voltage filter choke there are 0.1 µF 200 VW capacitors connected to earth. This conventional power filter would prevent any high voltage transients generated by the vibrator from affecting the lead-acid battery. It probably also suppresses any hash in the 6V line from being injected into the radio by the heater filaments. The radio was restored using 6.3 V AC for the heaters so this filter circuit was bypassed.

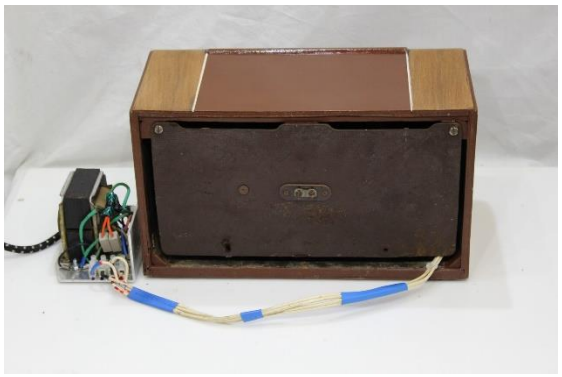


A thorough cleaning on top and below did not reveal any failed components. With no valves installed a variable HT DC supply was connected to the input of the HT filter choke and slowly ramped up from zero. It took little time to conclude that the high current drawn at low HT was due to failure of the two 16µF 525 VW Tecnico electrolytics cased in white cardboard. Because these were mounted above the chassis they formed part of the character of the radio. I wanted to regenerate these electrolytics rather than replace them. With patience I was able to regenerate them for reliable performance at 150V, but no higher. This was a limit I had not previously encountered with regeneration. The relevant Genalex circuit indicates that the filtered HT should be 210V so the electrolytics were replaced. The time had come to insert the valves and connect the heaters to 6.3 V AC. The transformer used drew 4 W without any load and 18 W with the valve filaments connected (all good). Applying HT was

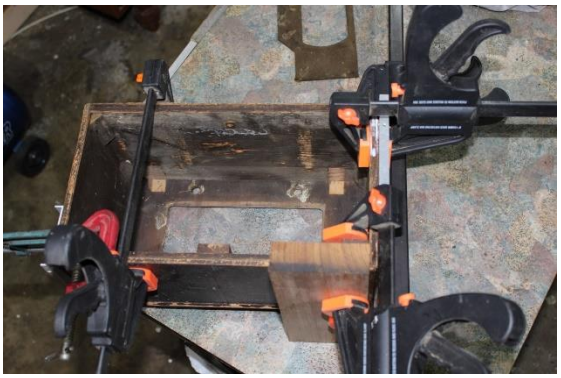
immediately gratifying. The radio worked well drawing 50mA at 200V.

Using a spare Astor Mickey transformer a power supply module was created to provide 6.3 V AC and 190 V DC that was full-wave rectified by two silicon diodes.

You may have noticed the 1B53 metal cased valve at the left of the chassis. It is there to handle overvoltage from the vibrator and has no function in the circuit when driven by mains-power that would be free of high spikes. The 1B53 is a gaseous-tube voltage regulator- effectively a zener diode of the valve era. The gas will break down and conduct if voltage exceeds safe values. I found very little about these types from web searches, but eventually encountered a useful description of the regulating action in *Electronics Its Easy Part 15* printed in *Electronics Today International* February 1975. That article also discusses the rather simple way that a barretter seen in some valve radios keeps current constant as voltage changes. A barretter is superficially a light globe, but it has an iron filament in a hydrogen atmosphere.



The original case is most easily described by the word *wonky*. Some replacement bits and generous PVA gluing restored physical integrity. There was little scope for anything but a complete sanding-back of the case surface. Accented sections were painted with near original colours. The whole case then had several coats of gloss polyurethane sprayed on.



The original General Electric decal at the front was destroyed by sanding, so a replacement was created using computer editing to generate an inverted image that was printed on clear acetate sheet.

This means that the printed surface is protected against scratches when the acetate sheet was glued to gold-metallised sheet to reflect the lettering as gold. An odd thing happened in this case when the glue from a glue-stick interacted with the dark toner from my laser printer. The background turned green! This is probably a pH effect on the structure of an organic dye, but rather than think deep chemical thoughts I simply accepted the logo being green.

Then I sat back to look at and listen to another satisfying project.

Farm Radios working from 110V AC

By Michael Justin

Who would have guessed 110 V radios manufactured in Australia? I learnt a very interesting thing about farm sets during our last caravan trip in north west NSW. Because of the arid land they have large stations rather than farms. Because of the number of buildings and the sometimes large distance between buildings a 24 V power supply was inadequate so a lot of these stations used 110 V generators and some companies in Australia manufactured 110 V radios for this market. ESM Radio in Sydney made the large 110 V console with push pull 6V6 output stage that I saw in Ivanhoe NSW.

It must have been cheaper to use an Australian power transformer made for 110 V than pay import duty for a US radio.