

CLASSIC RADIOS

A 1934 MODEL GULBRANSEN

by RAY KELLY

When re-arranging my collection I dragged out my Gulbransen console and decided to give it a shot of 240 volts A.C. To my dismay all I could get from it was a strangled gurgle on the strongest station in my locality (3MP). So it became necessary to remove the innards from the cabinet and locate the problem.

This radio has a typical 1934 cabinet - rather narrow with pronounced vertical lines and it uses a small peep-hole dial escutcheon. It can be dated by the 'A' prefix on the patents licence plate, together with other clues, although I could not find a serial number on the chassis.

The chassis is quite small for the circuit, measuring 13" by 8", and very neatly wired. The coils and power transformer are embossed with the Gulbransen brand and the loudspeaker is quite unusual here in Australia. It resembles the American Utah speakers, and I suspect that it is an example of the short-lived Emmco speakers, which were well designed but suffered some production problems. It is an 8-inch electrodynamic with external spider, and is branded 'Gulbransen, made in Australia'. The chassis is spray-painted bronze.

After a quick examination I discovered that the circuit of this radio was not on our files, and that the set was in a nearly-original condition. Electrolytics and a couple of paper capacitors had been replaced in quite a professional way, but the wiring had not been disturbed. I found two problems: First, the volume control was so stiff that I could not move it, although the element was intact. It was a Marquis brand wire-wound potentiometer which may not have been original but would have been made around the time that the set was made. The lubricant used had turned into something like varnish, and I had to remove the back cover and the circlip that held the shaft in place, then persuade the wiper assembly to come out, and clean off most of the sticky lubricant. After re-assembly I discovered the second and real

problem - an open-circuit 650-ohm wire-wound resistor in the cathode of the 6F7.

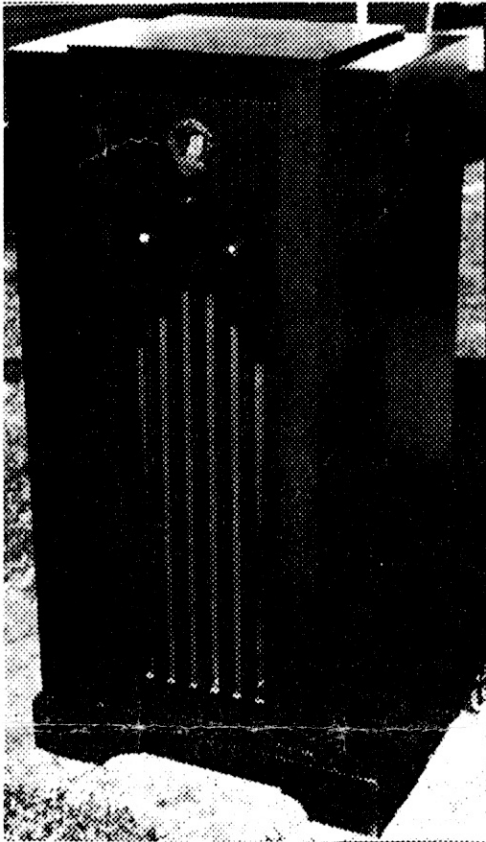
Now I had time to examine the circuit, which has a few interesting features. The most striking one is the use of a type 6F7 valve as a combined I.F. amplifier and plate detector. This must have set a challenge for the designer, as it was not easy to vary the bias of the I.F. amplifier and keep the triode section of the 6F7 near plate current cut-off, since both sections of the valve share a common cathode. His solution was to place the volume control in the cathode stream of the R.F. and mixer valves only, with the I.F. amplifier operating at something approaching full gain. This seems to work fairly well, although I think that the plate detector distorts a little more than most.

The oscillator circuit of the mixer valve is not exactly unusual from our point in time, but it possibly was unusual in 1934. It uses a modified Hartley circuit with the padder capacitor serving the dual purpose of providing grid bias for the oscillator, together with the parallel 100k resistance.

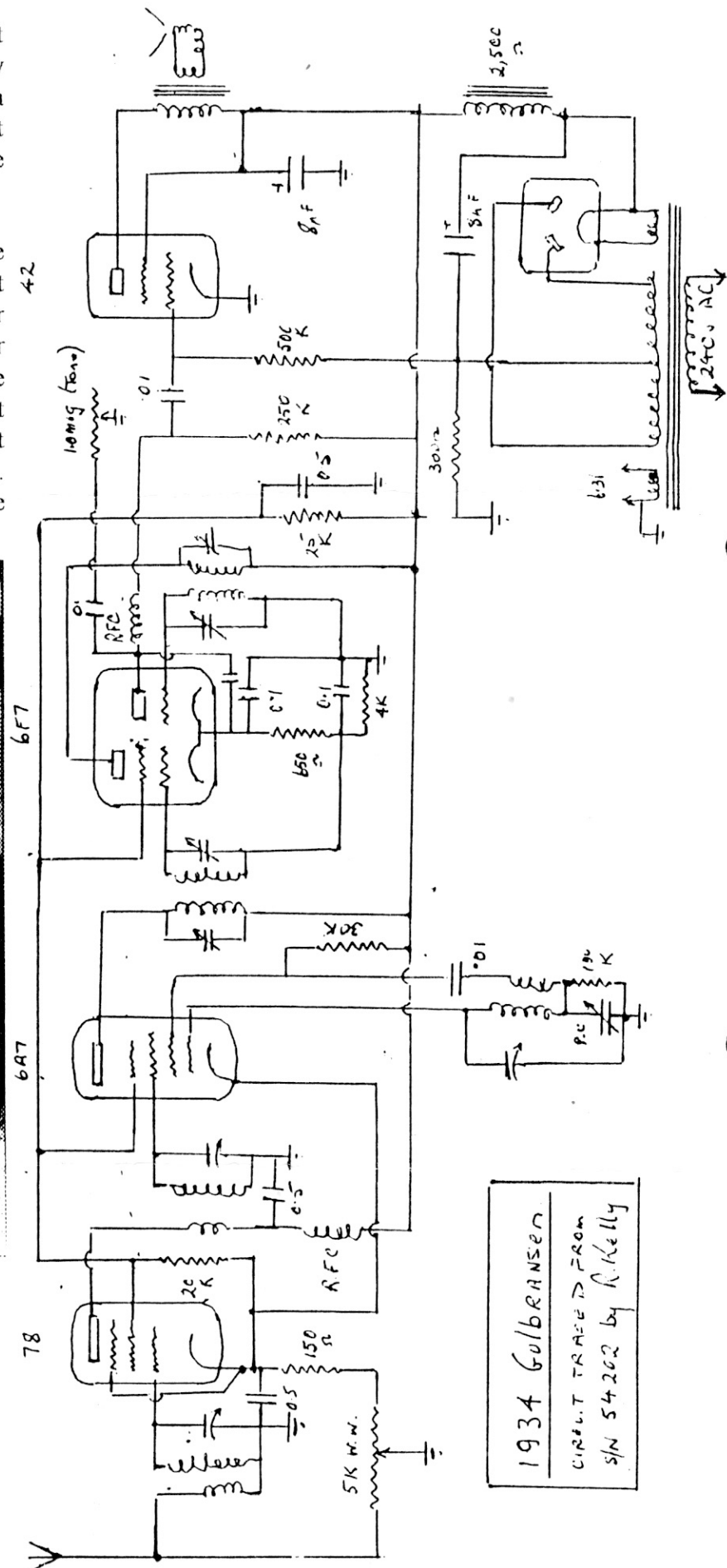
According to my information Gulbransen were using an intermediate frequency of 200kHz at about this time and sure enough a quick check with my test oscillator gave a peak at this frequency. This may have influenced the designer to use the 6F7 in order to enable him to use an R.F. amplifier in a 5-valve set. While a band-pass tuner would have been another option, the cost of components would have been about the same, without the benefits of the R.F. amplifier. Sensitivity was still a big selling point in 1934. For those who are too young to remember, early superhets used a low intermediate frequency and unless sufficient selectivity was provided ahead of the mixer, it was possible to tune the same station on two or more places on the dial because the receiver responded to any signals that it could detect which were spaced either above or below the mixer's oscillator frequency. Once an

intermediate frequency of about 455kHz was adopted as an industry standard, this was no longer a problem on the broadcast band, but it was still very evident on the international short-wave band.

Working on the set is made a little difficult because terminals just do not exist. Leads are brought out for aerial and earth, while the loudspeaker is permanently wired in. Furthermore two coils are mounted on a bracket beneath the chassis to save space, but they do obscure some of the wiring. However it is a lovely radio, and one that I treasure.



The 1934 Gulbransen console.
Photo by Ray Kelly.



1934 Gulbransen
CIRCUIT TRACED FROM
S/N 54202 by R. Kelly