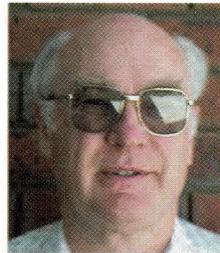


VINTAGE RADIO

By RODNEY CHAMPNESS, VK3UG



A piece of 1920s history: the Atwater Kent Model 32

The Atwater Kent is a very collectable 7-valve TRF receiver from the mid 1920s. It's a simple set but boasted some interesting technical features, as we shall see.

It's not often that anyone gets a chance to work on one of these classic sets from the 1920s. A friend who was looking after a deceased estate asked if I would check the set out to ensure it was in good order. By doing this, it was hoped that a better price would be achieved when it was sold.

As might be expected, I jumped at the chance to get my paws on such a receiver.

The previous owner had apparently overhauled the set quite some time before and it was reputed to be in working order. However, my friend

wasn't prepared to take a punt on this, hence my involvement.

These old Atwater Kent radios are a joy to behold and feature an attractive polished wooden cabinet, single control tuning and four tuned RF stages. The tuning capacitors are beautifully made and are coupled together by flexible metal bands to provide the single knob tuning. Getting that lot to track could be a problem, as described later in the article.

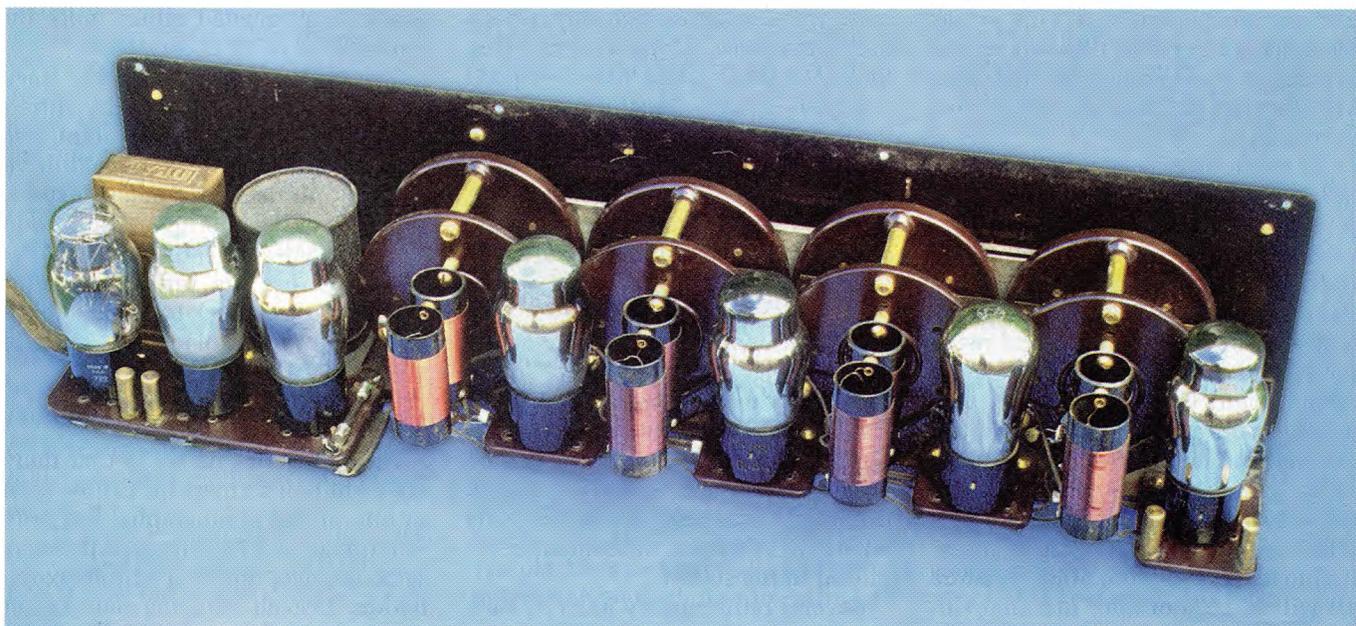
Twin-filament rheostats and an on/off switch completed the range of controls.

This set featured no less than seven valves. There are four stages of RF amplification, a grid leak detector and two transformer-coupled audio stages feeding the loudspeaker. All stages are triodes, with no neutralisation on the RF stages. They are kept stable by the use of a resistor in series with each RF stage grid and because the valves had such low gain.

Restoration work

Some of the 01A (or 201A) valves now fitted to the set were higher than those originally supplied, so the valves were withdrawn before the chassis was removed from the cabinet. I didn't want to knock the top off the valves as

BELOW: the chassis is easy to work on, with all parts readily accessible. Only one part (a 3M Ω resistor) proved to be defective.





The set was in excellent condition for its age and came complete with an E-model Atwater Kent loudspeaker.

they are rather hard to replace these days. The audio output valve in this set is a 71A which is a triode with a gain of three (wow). It can require upwards of -40V of bias too.

The instructions with the set said to consult the valve manufacturer's data if you changed the output valve, to determine the HT voltage required and also the bias voltage. This would have made life rather difficult for the average user as he/she wouldn't have known what size bias or HT batteries to obtain.

As might be expected for a set this old, quite a few parts had been replaced over the years. These parts included the valves and a couple of fixed components. The only component that proved to be defective on this occasion was the 3M Ω grid resistor on the detector, which had gone open circuit. This was replaced with a miniature resistor, which I hid under the filament centre-tap resistor.

The remaining components in this set proved to be in very good order, with the capacitors showing no measurable leakage and the other resistors all within 20% of their nominal val-

ues. The circuit diagram that I obtained had a number of errors in the component values used. The circuit diagram (with corrections) is shown in Fig.1.

The second audio transformer had been replaced with an AWA 3.5:1 ratio unit. Quite obviously, it wasn't original and it had only been attached to the frame using a single bolt, which had come loose. Although a unit that looked original would have been preferable, the AWA transformer would have to do. It was remounted using two machine screws, nuts and washers and the wiring to it tidied up. This remedial work greatly improved the appearance of the replacement unit.

Valve socket corrosion

Further inspection of the chassis revealed that the metal wipers on the socket of the 71A valve were black from corrosion. To fix this, the valve was removed and the corrosion sanded off the socket contacts. This simple procedure ensured good contacts when the valve was subsequently replaced in the socket.

Several rather messy joins in vari-

ous cables were also tidied up and sheathed with new insulation. The individual leads in the battery cable were then identified and fitted with white plastic tape markers. The function of each wire was noted using a marker pen, so that they could later be easily identified.

The moment of truth

Before applying power, I did a final check of both audio transformers and the general wiring but could find nothing else that might be amiss. I am always very cautious with such old sets, as the valves, in particular, are very hard to replace.

The Atwater Kent required several supply rails, as follows: A = 5-6V; B = 22.5V and 67.5V; and -9V for the C bias. By the way, the 71A triode can be used with a B+ voltage of up to 180V but this would require -40V of bias. Finally, an aerial and earth were connected and it was time for the big test.

With the power applied, the valves lit up nicely and I was able to tune in quite a few stations across the band. Here in Benalla (Victoria), a total of 15 stations were audible in daylight but not all were of "entertainment quality". I wondered how well the tuning tracked with four tuned stages and decided to carry out a couple of experiments.

First, I found a small ferrite rod and slid it into each of the eight coil formers to assess what the tracking was like on various parts of the band. All except the first tuned circuit appeared to track quite well. Obviously, the first tuned stage needed either more inductance or more capacitance.

The tuning capacitor in this stage did not appear to mesh any differently to the others, so no point was seen in fiddling with the ganged-drive system to correct the problem. Instead, some careful experimentation soon showed that connecting a 6.8pF capacitor across the tuning capacitor gave almost perfect tracking. That's not bad for a set made in 1926 and now over 70 years old.

Eight coil formers

An oddity of this set is that there are eight coil formers (as can be seen in one of the photographs) but only four tuned circuits. Although this may seem strange, there's a simple explanation. Instead of using one former

ATWATER KENT Model 32

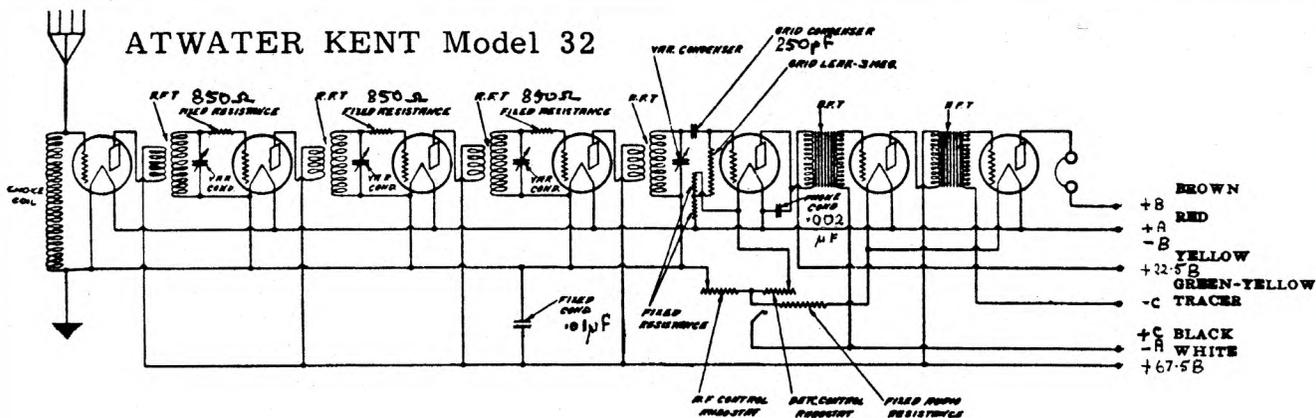


Fig.1: the Atwater Kent is a TRF receiver with seven triode valves and four tuned stages.

for each tuned circuit, the Atwater Kent uses two coil formers with series wound coils. The plate winding for each stage is mounted inside one of the coils. I have no idea why they did that, as it seems like extra work to me.

By the way, the set came complete with an Atwater Kent E-model speaker and – would you believe it? – the original installation and operations manual (see photos).

Summary

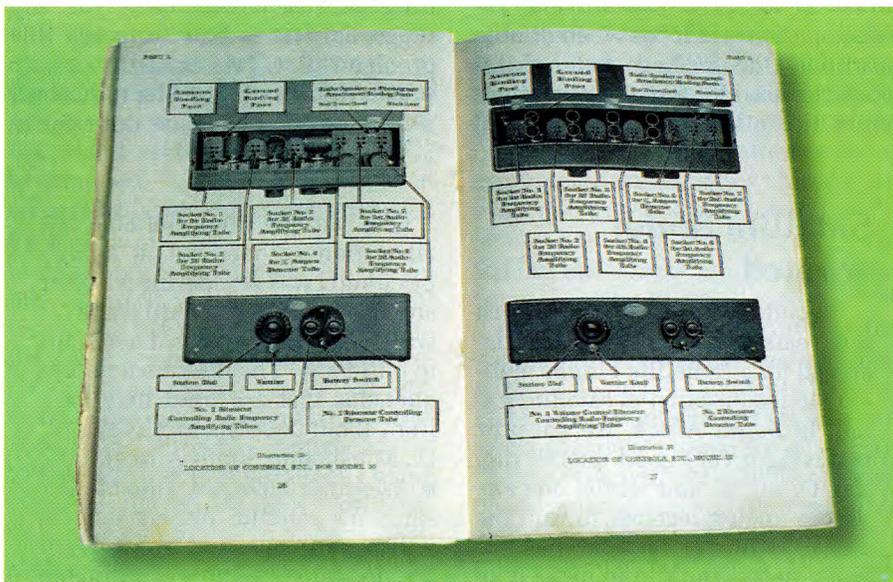
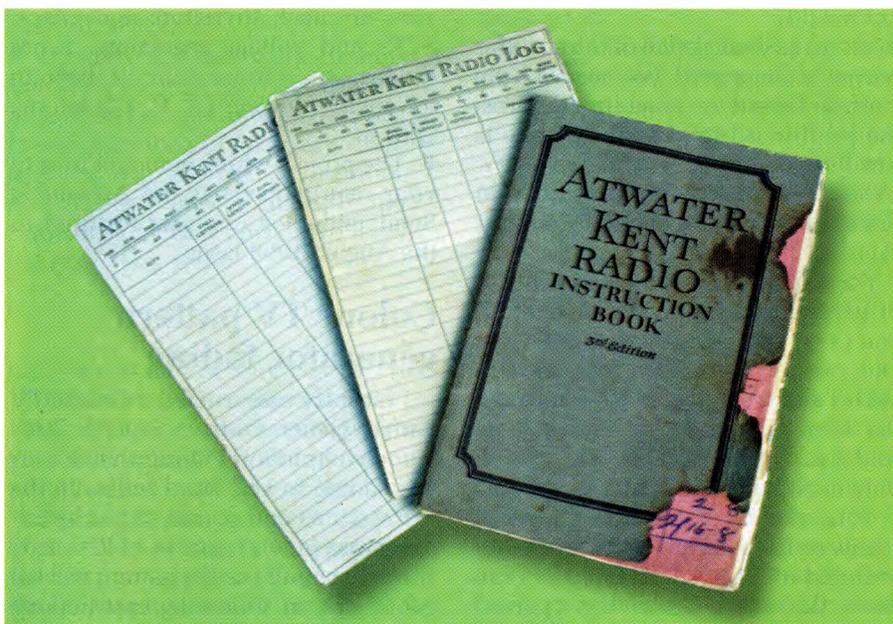
As can be seen from the circuit diagram, the set is remarkably simple (like most of that era). It doesn't use neutralisation as other manufacturers had the patent on that, so each triode stage had to be made stable in its own right. This was done by using series grid resistors and low gain triodes.

The set uses four single-gang tuning capacitors which are ganged together using flexible metal bands. Its tracking is remarkably good, even without any trimming capacitors. The set is stable, uses good quality components throughout, is visually appealing and works well for its type. Neutralised triodes would have been better performers but if you can't use them due to patent problems, you just do your best.

Performance

Finally, the set's performance could be compared to the Astor "football" of the 1940s. This set used two valves in a TRF circuit with reflexing. They are both classics of their individual types and eras.

All in all, the old Atwater Kent is a very collectable set and I understand that it now has a new home. **SC**



The old Atwater Kent radio receiver even came complete with its original instruction manual. It's rare to find a receiver like that after all this time.