

# THE ATWATER KENT 20C

The Atwater Kent brandname was very widely known in the 1920's, not only in the company's home country (the USA) but here in Australasia as well. And one of the classic A-K radio receivers was the model 20C, released in 1925.

One of the most respected names in early American radio manufacturing is that of Arthur Atwater Kent. At the beginning of the century, he had become a very successful maker of automobile electrical components, featuring high quality metal pressings and Bakelite mouldings. In 1907, he invented the single spark, automatic advance ignition system, still in use today.

When radio 'took off' in the early 1920's, his specialist market in automotive components was falling off, but he was in a good position to make finely finished superior radio components including variometers and transformers.

## Radios without cabinets

Atwater Kent's Bakelite mouldings were beautifully finished and their rich brown colour became, together with polished metal work, almost a trade mark. By 1923 he was assembling his products into built-up radios.

These early receivers were not given cabinets, but the components were mounted on polished mahogany bases. Known as 'Breadboards', they are today highly sought-after by collectors, and to see one is to understand why. Apart from the novel construction, the combination of lacquered mahogany with finely finished Bakelite and metal, makes a very attractive combination. Few, if any, were sold in this part of the world.

The most successful Breadboard was the Model 10, comprising two RF stages, a grid leak detector and two audio stages. Mr Kent refused to pay royalties to the Hazeltine Corporation for rights to Neutrodyne patents, so his receivers used simple grid resistor stabilisation. His factory, located in Philadelphia, did make some receivers using

only two tuning controls, but the standard at this time was the classic three tuning control receiver, produced by literally hundreds of manufacturers.

By the end of 1924, the public were ready for less technical looking radios, so Atwater Kent took the model 10 and put it into a simple mahogany cabinet, naming it the model 20, which sold well.

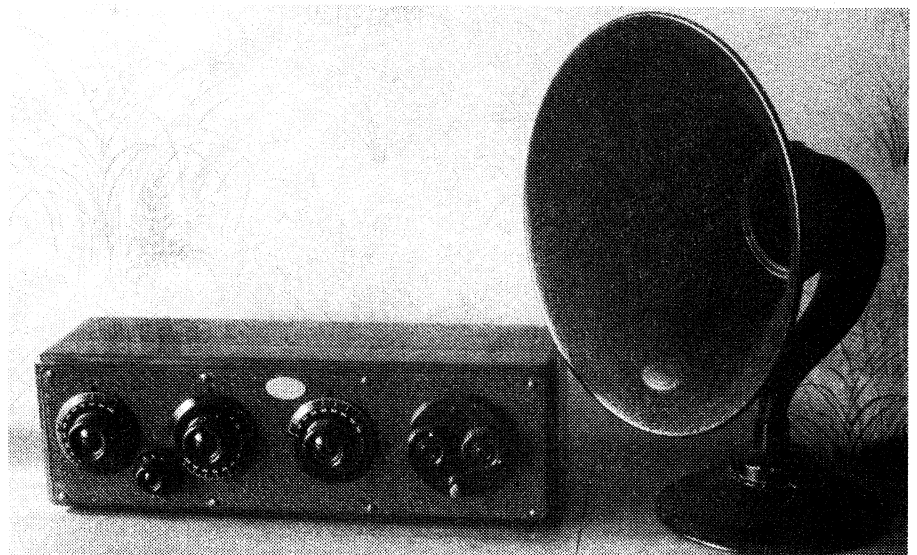
Most manufacturers used engraved Bakelite or Formica front panels, giving their radios the appearance of laboratory instruments. These panels were expensive and created production bottle-necks. With his usual flair for creating attractive equipment efficiently, Mr Kent produced instead, a metal panel sprayed in a fine wrinkle grey/brown paint, which nicely complimented the mahogany cabinet.

His good marketing instincts told him that a compact radio would appeal to lady customers, so he compressed the cabinet of the model 20 down to 50cm long by 15cm depth and height. Only half the height of the model 20, it was, at the time, probably the smallest 5-valve radio on the market. Called the Model 20 Compact (20C) part no. 7570, it was an immediate success and by the end of 1925 some 163,000 had been made.

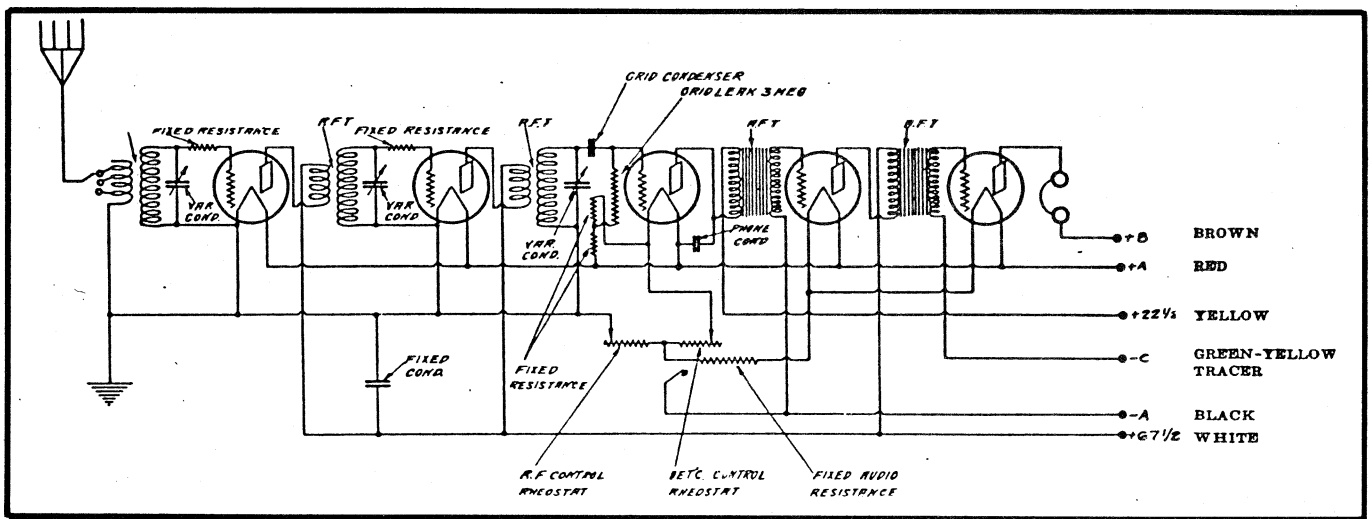
At this stage, RCA introduced a far-reaching change in valve manufacture, and consequently, US radio receivers for 1926 had to be modified.

At its introduction in 1923, the standard American triode had a bayonet base with four stubby pins. The change for the 1926 season was to substitute the more familiar long-pin base, with filament pins of greater diameter than those for grid and anode. Sockets for these new UX201A valves could be cheaper and have greater pin contact area than the previous UV style.

This change is a very good indicator of the age of early battery receivers. If the valve sockets are of the long pin



*Fig.1: The Atwater Kent 20C was an attractive, well-proportioned and beautifully finished receiver.*



The circuit for the Atwater Kent model 20C MkII, part number 7960.

pattern with larger diameter filament pins, the radio is post 1925. There is no mistaking UV sockets. They have a skirt that surrounds the valve base, with a slot or channel for the bayonet pin and the contacts are visible from the top. The post-1925 or UX style of 201A will fit either socket, but of course, the much rarer UV based valves are not interchangeable.

### Changes for 1926

Naturally, A-K soon made the socket changes, the new 1926 20C having the catalogue number 7960. This is the version most likely to be found in Australasia. When production ceased in 1927, by which time single knob tuning had become general, 63,000 had been sold.

Other modifications were included in the 7960 pattern. The filament circuits were altered so that the audio valves were not controlled by a rheostat, but ran at the full 5.0 volts. The biasing was also rearranged so that higher HT voltage could be applied to the output stage.

Another change was in the first audio transformer. Originally, the two transformers were of the same pattern, in narrow cylindrical cans. Their construction was of a type that disappeared during the mid 1920's. Called descriptively 'hedgehogs', they were a development of the traditional induction coil and an obvious construction method for an erstwhile automotive electrical manufacturer.

The core was a bundle of soft iron wires centred in a bobbin containing the two windings, and the ends of the iron wires were fanned out and brought round over the outside of the bobbin to close the magnetic circuit. Again using automotive practice, the assembly was sealed in pitch.

In the 7960 model, the transformer connecting the detector to the first audio stage was changed to the more familiar pattern using silicon steel laminations, and requiring a larger diameter can.

The reason for this change was probably that the iron wire core produced insufficient inductance for an adequate bass response when fed from a grid leak detector. As the following second audio stage would have been less demanding, the iron wire core would have been adequate. This retention of earlier components is a characteristic of A-K receivers. In every model can be found earlier style components. New design in Mr Kent's receivers was a steady evolution, more so than with most manufacturers.

### Unshielded RF coils

There were no shields around the RF coils. Instead, they were mounted at the

rear of their associated tuning capacitors and to minimise coupling, were orientated so that they were mutually at right angles.

Neurodyne royalties increased the price of a neutralised receiver by as much as 25%. Always an astute businessman, Atwater Kent continued using the cheaper grid resistor stabilisation of his receivers. The 800 ohm resistors were inductively wound, with resistance wire on small pieces of fibre mounted on the rear of the tuning capacitors. It is likely that careful positioning of the coils and the inductive nature of the resistors contributed largely to stabilisation.

To cater for varying aerials, the primary winding of the antenna coil was tapped and connected to a neat little three-position rotary switch. The three tuning knobs were engraved 0-100 and

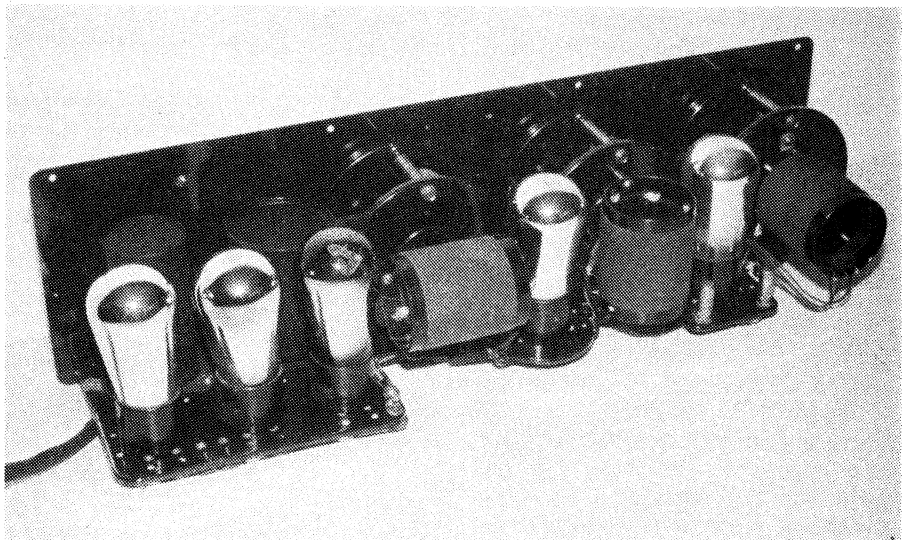


Fig.2: There wasn't much wasted room inside – a very early example of steel chassis construction.

as can be seen from the position of the centre one in the photograph, with no stops on the tuning capacitors, they could be rotated through 360°.

A-K eye appeal can be seen in the two filament rheostats controlling receiver gain, which were combined with the on/off switch in a stylish unit —much more attractive than conventional knobs. The remaining feature of the front panel was the little name plate. These should be polished with care because, typically, they were gold plates!

Few other components were needed in these early radios. There was an

0.3uF HT bypass capacitor, and a couple of mica capacitors in the detector. A short piece of resistance wire of about one ohm was used as a filament resistor, reducing the voltage to five whilst it simultaneously provided bias for the first audio stage.

As grid leak detectors are at their most sensitive with a small positive grid bias, a tapped wireound resistor across the filament line provided a suitable return point for the grid leak resistor. Most grid leaks of this era were removable and were of similar size and appearance to glass automotive fuses.

No radio of this era was complete without a horn speaker. Normally these horns, which were driven by oversized headphone type units, were made of wood, paper mache or very commonly, spun aluminium.

Not so Atwater Kent's horns. He considered these materials to be inferior and all his horns, including the type 'L' illustrated, were made from pressed steel and weighed considerably more than their contemporaries. Finished in dark brown winkle enamel, the type L horn speaker is a fitting companion to the 20C receiver.