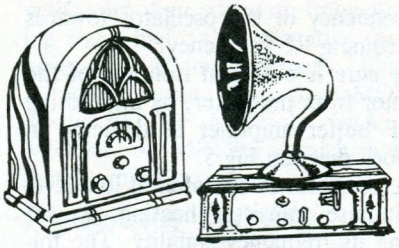
Vintage Radio

by PETER LANKSHEAR



A 50 year old (trans)portable

From the earliest days of broadcasting, the idea of carrying a radio around has appealed to the enthusiast. Some pioneering efforts even went to the extent of filling up the back seat of the family car with equipment, but by the mid 1920's self-contained 'portable' radios began to appear. By 1938 they reached the fully practical stage, with valves whose 1.4V filaments could be operated from dry batteries.

'Portable' was a specific term in the days of valve radios. It referred to equipment which was powered by self contained batteries, had a carrying handle, and usually, a fabric covered wooden case. Note that I have deliberately omitted any reference to size!

Today, quite different classifications apply. Most radios, regardless of intended use, have internal batteries, and many are so small that they need no handles at all. The majority are so easily carried about that the term portable has become meaningless.

During 1930, the US Radio Industry followed a trend already set in Europe by introducing a range of battery powered valves with 2.0 volt filaments. These were a considerable advance on the existing 5.0 and 3.0 volt battery valves and became the American RMA (Radio Manufacturers' Association) standard for most of the decade. They could be lit from a single lead-acid secondary cell, but they were especially intended for use with the then-recently introduced air depolarised batteries.

Designed for applications requiring a modest current drain for long periods, 'air-cell batteries' as they were called, had two cells each producing 1.25 volts when new. They were about the size of a car battery and relied on atmospheric oxygen circulating through the carbon positive electrodes for depolarisation. Standard practice was to use two switchable resistors in the valve filament circuit to cope with the excess voltage, with a change to the lower value resistor as the battery aged.

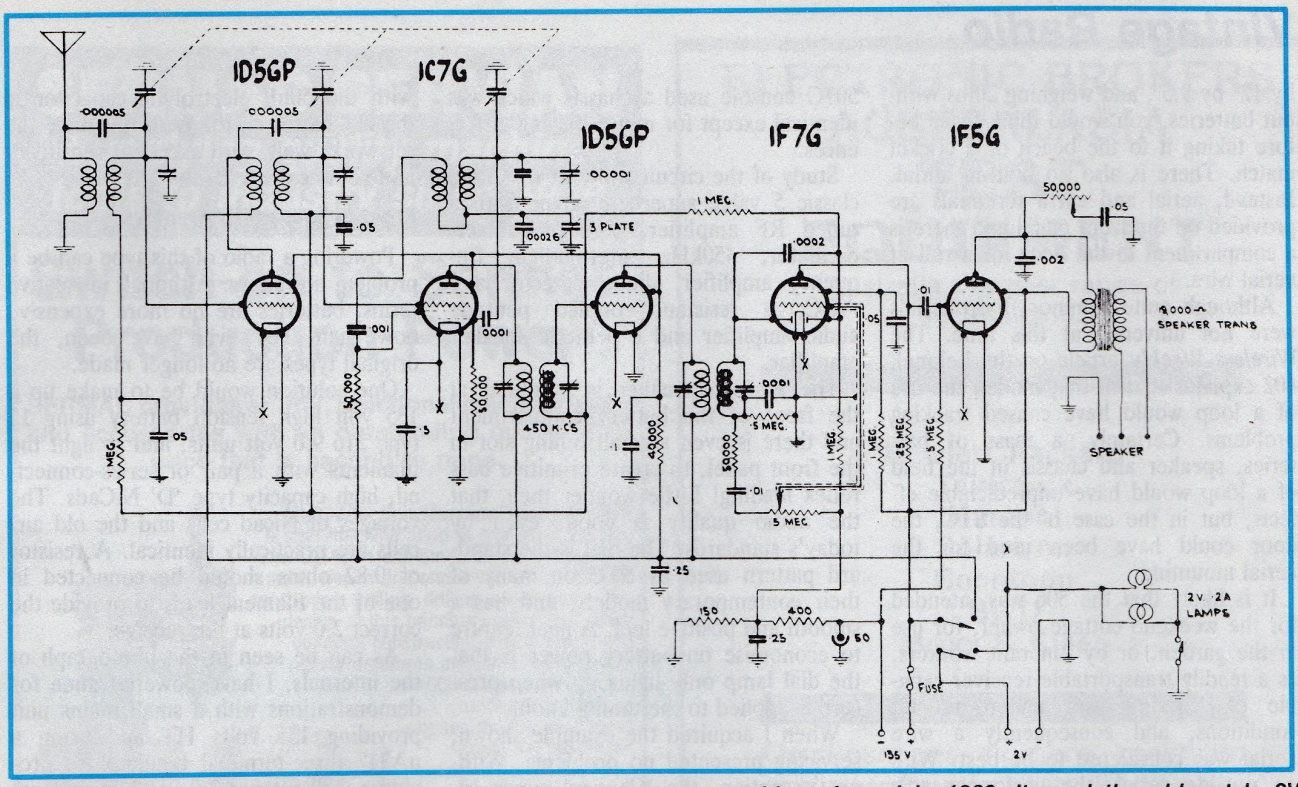
Ideal for fixed locations where their life matched that of a set of HT or 'B' batteries, air-cells were far too large for portable radios. On the other hand dry cells were not very suitable for 2.0 volt filaments. 1.5 volts from a single cell was insufficient, whilst two cells in series produced an uneconomic 50% excess voltage, and to cope with a drain in the vicinity of half an ampere, large cells were necessary for prolonged operation without voltage drop from polarisation.

For portables, rechargeable lead-acid cells were used. Although standard in Europe, at best they were inconvenient. Not only did they perversely need recharging at the wrong time, but they were heavy, large, and had short lives if neglected.

1.4V filaments

The real breakthrough as far as truly portable battery-operated valve radios were concerned came in 1938, with the introduction of the first series of 1.4 volt low consumption valves. A single large dry cell could now power the fila-

Portability, 1939 style! The batteries were housed behind the speaker grille. Instead of a loop aerial, a coil of wire was unwound and suspended from a suitable tree or building.



The circuit schematic for the STC model 506 5-valve battery portable, released in 1939. It used the older-style 2V filament valves, in a fairly standard superhet configuration.

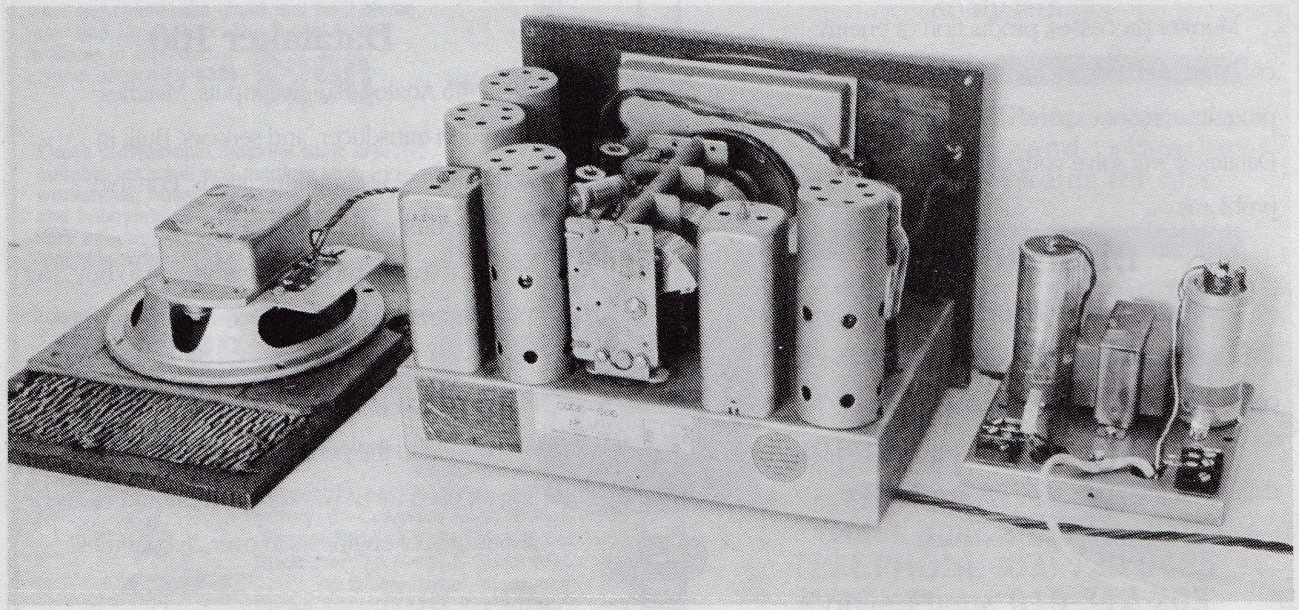
ments, and portable receivers at last became a reasonable size and weight.

Australian radio manufacturers responded with a wide range of portables. The Australian Trade Annuals tell the story. For 1937, there is mention of only one portable, the Lekmek 402, a 4 valve kitset featured at the time by *EA*'s ancestor, *Wireless Weekly*. The following year two portables were included, but the 1939 Annual details no fewer than 15 different models, including the STC model 506 featured in this article. However, a few manufacturers, including STC, did not use the new valves.

The reason for the delay is not certain, but all of the STC battery receivers for 1939 retained the 2.0 volt type. As the Australasian distributors, STC used Raytheon valves, and there may have been delays in the supply of the 1.4 volt series from America.

No loop aerial

The STC 506 is in reality, one of the old style 2 volt battery portables. At 15"



Inside the case there was this compact and neat chassis, using full-size components and a substantial loudspeaker. At the right is the author's mains power supply.

by 12" by 9.5", and weighing 20lbs without batteries, you would think twice before taking it to the beach or a cricket match. There is also no built-in aerial. Instead, aerial and earth terminals are provided on the front panel and there is a compartment in the door for a roll of aerial wire.

Although quite common, loop aerials were not universal at this time. The *Wireless Weekly* article on the Lekmek 402 explains that in that model, the use of a loop would have caused tracking problems. Certainly, a mass of batteries, speaker and chassis in the field of a loop would have unpredictable effects, but in the case of the STC, the door could have been used for the aerial mounting.

It is likely that the 506 was intended for the weekend cottage owner, for use in the garden, or by itinerant workers, as a readily transportable receiver capable of working well under difficult conditions, and consequently a wire aerial was considered to be best. With an outside aerial, the performance is quite impressive and equal to a good domestic receiver. In fact, the STC 507G console used a chassis which was identical except for minor biasing differences.

Study of the circuit shows it to be the classic 5 valve superheterodyne with a tuned RF amplifier, pentagrid mixer-oscillator, 450kHz intermediate frequency amplifier, diode detector and AGC, a resistance-coupled pentode audio amplifier and a pentode speaker amplifier.

The six-inch speaker is mounted at the front of the battery compartment and there is even a small tuning slot in the front panel, to create primitive bass reflex loading! Little wonder then, that the audio quality is good, even by today's standards. The dial is the standard pattern used by STC on many of their contemporary models, and has a smooth and positive feel. A neat feature to economise on battery power is that the dial lamp only lights up when pressure is applied to the tuning knob.

When I acquired the example shown, servicing presented no problems. Without exception, the 'Chanex' paper capacitors fitted had developed low insulation resistance and were replaced, along with the 50uF electrolytic capacitor in the HT battery lead. With this done the set works well, with excellent sensitivity and volume.

Batteries still costly

Powering a radio of this type can be a problem nowadays. Although in relative terms, batteries are no more expensive now than they ever have been, the original types are no longer made.

One solution would be to make up a 135 volt high tension battery using 15 type 216 9.0 volt units, and to light the filaments with a pair of series-connected, high capacity type 'D' NiCads. The voltages of Nicad cells and the old aircells are practically identical. A resistor of 0.82 ohms should be connected in one of the filament leads to provide the correct 2.0 volts at the receiver.

As can be seen in the photograph of the internals, I have powered mine for demonstrations with a small mains unit providing 135 volts HT and using a uA317 three-terminal regulator to provide a well filtered 2.0 volt supply from a 6.3 volt transformer winding and rectifier.