Vintage Radio

By RODNEY CHAMPNESS, VK3UG

The rare Edison R6 console receiver

Built into an ornate timber cabinet, the Edison R6 console was a high-performance TRF receiver with nine valves. It's quite a rare receiver with some interesting design features.

DESPITE HIS well-known association with the cylinder phonograph, the name "Edison" is not usually associated with radio receivers. Indeed, most people are completely unaware that Edison was ever involved in the manufacture of radio equipment.

Edison's association with radio manufacture came about when his company purchased the Splitdorf Radio Corporation of Newark in New Jersey, USA around 1928. Along with many other manufacturers in the 1920s, Splitdorf had been caught out producing too many radios for a contracting market at the beginning of the depression. As a result, the near-bankrupt company was taken over by Edison to become the Radio Division of Thomas A. Edison Inc.

The RF chassis (top) sits on a shelf, while the audio output/power supply chassis rests on the bottom of the cabinet. Note the retrofitted 240V-to-110V mains transformer at bottom right.

Edison himself was not directly involved in the Radio Division, having apparently delegated that responsibility to his son Theodore. Their venture into radio manufacturing was to be short-lived however, with production ceasing by the end of 1930. Hence, only relatively few sets were produced by Edison and they are now quite rare.

Early history

Protectionism was rife during the Edison era and the importation of radio sets was curtailed by the Australian Government around about 1930. This meant that local manufacturers had an easier time, as they had no effective overseas competition.

However, it also meant that the quality designs from overseas had little influence on the Australian market, except where some licensing arrangement could be reached. This meant that Australians were denied the chance of owning quite a few very good receivers, such as the R6 Edison described in here.

This particular receiver was one of three imported in 1930 by A. R. Harris Company of Christchurch, New Zealand. The fate of the other two is unknown but this one was used by the Harris family for many years before being put up for auction in Christchurch. There has been more horse-trading since then and the set is now part of a collection on the north coast of New South Wales, where I believe it will remain for a long time. It had been quite skilfully restored by a previous owner and the only "modification" is the installation of a 240V-to-115V transformer to the right of the power supply/audio output stages, as viewed from the rear of the set.

Main features

The R6 is built into a timber console

cabinet which is on turned wooden legs. By contrast, its R7 sister receiver is in a lowboy cabinet but shares the same electronics.

The cabinet is quite attractive and would have complemented the decor of the typical 1930s lounge room. It has two doors which are folded out when the receiver is in use. In addition, it features a fancy loudspeaker fretwork cut-out that looks rather like a large 4-leaf clover and sets the speaker section of the cabinet off very nicely.

Immediately above the speaker section is the dial scale and the five controls. These are, from bottom left to right, volume, on/off and tone; and from top left to right, local/distance and tuning. The "Light-O-Matic" is a fancy name for the dial-lamp switch. It is a mechanical switch that illuminates the dial lamp when the set is tuned to a selected station. This switching is accomplished by a contact on the dial drive system.

They certainly had some rather flash names for some of the very ordinary facilities on the radios of the time!

A rear view of the set reveals two large chassis mounted at different levels of the cabinet. The upper chassis contains the radio frequency (RF) amplifiers, the detector, automatic volume control circuit (AVC/AGC) and two stages of audio amplification. The lower and much heavier chassis houses the power supply and the audio output stages. Both chassis are in quite good condition, despite the set now being 75 years old.

This front view shows the Edison R6 console with the cabinet doors open.

R6 circuit details

At the time it was made, TRF (tuned radio frequency) receivers were the only sets being produced by manufacturers in large quantities, with superheterodyne receivers still largely in the experimental stages. Some TRF receivers were better than others and the Edison R6 with its nine valves shows its quality in terms of sensitivity, selectivity and audio performance.

The RF (radio frequency) section uses no less than three tuned circuits before the 224 (24) first RF amplifier stage. Following this stage is another tuned circuit and a second 224 RF amplifier. A third 224 RF amplifier is tuned in the grid circuit but the plate circuit has what appears to be a broadbanded circuit which feeds a 227 diode detector and AGC circuit.

A close-up view of the audio output/power supply chassis and the large electrodynamic loudspeaker. The added 240V/115V transformer looks out of place.

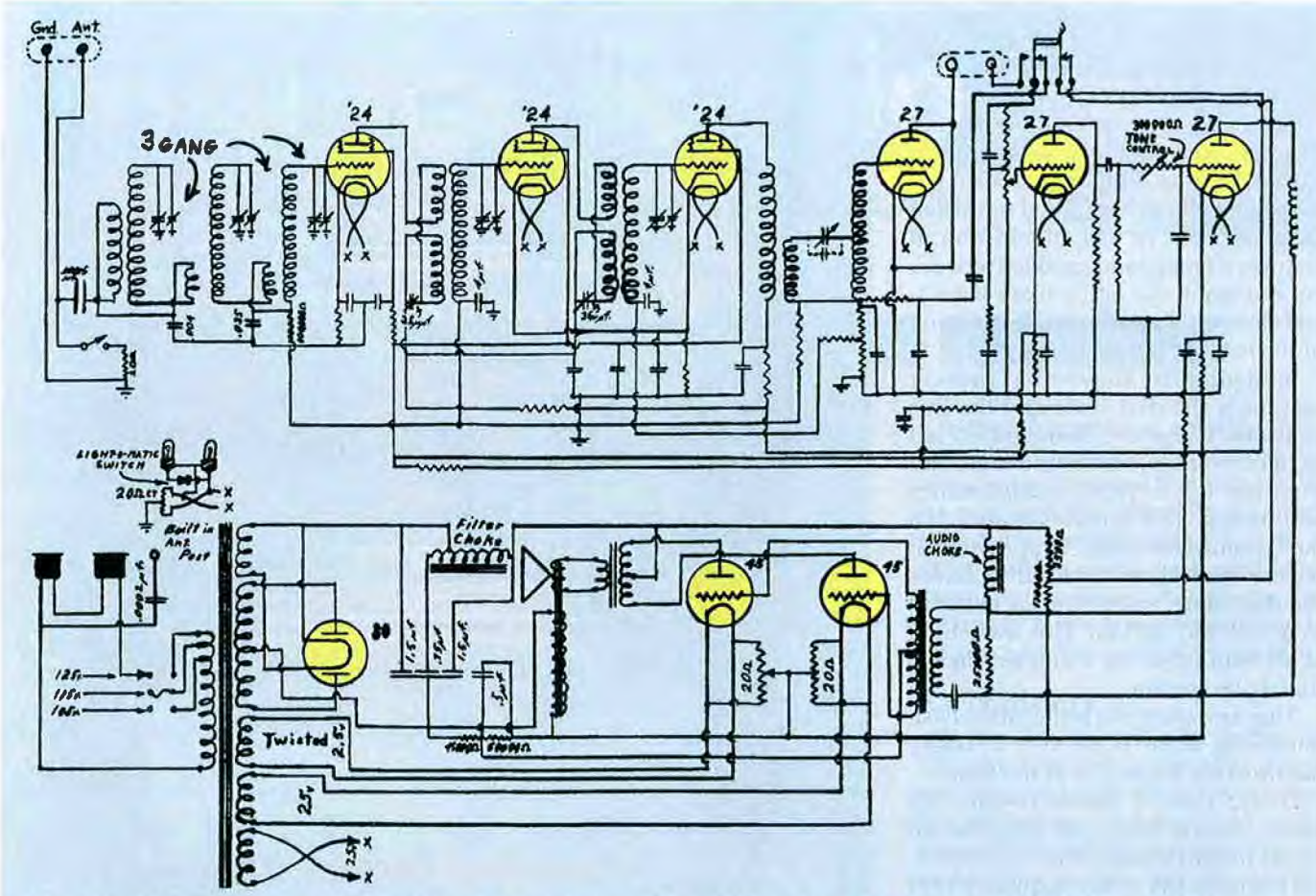


Fig.1: the Edison R6 is a 9-valve TRF receiver with three RF amplifier stages (224) and a diode detector based on a 227. Two more 227s act as audio stages, while the final audio stage consists of two 245 valves operating in push-pull. The 80 valve is the rectifier.

The 227 is actually a triode but in this circuit the plate is earthed (as a shield) and the grid acts as the diode plate. Using a diode as the detector can be considered an advanced feature in this set. Most other sets used either anode bend or grid detectors.

Another innovative feature was the use of AGC on the three RF valves. AGC was a rarity around 1930. Only partial AGC is applied to the third RF amplifier – the 224 is a relatively sharp cut-off valve and applying a lot of AGC bias to this stage could cause distortion. As it is, a local-distance switch is fitted to alleviate the problem of overloading the RF valves with strong signals.

Following the detector, two more 227 valves amplify the audio signal which is then fed to a push-pull audio transformer. This then feeds the grids of a pair of 245 valves operating in push-pull, which in turn drive an output transformer and an electrodynamic speaker.

To minimise hum in the audio, the two 245 valves each have a potentiometer across the filament transformer windings. These two pots have a ganged moving arm which goes to earth and is adjusted for minimum hum in the output.

Power supply

The power supply is conventional, with considerable attention paid to filtering. The primary of the transformer is tapped at 105V, 115V and 125V, hence the use of an additional stepdown transformer in this particular unit.

One interesting feature is the provision of a capacitor on the primary side of the transformer. The idea here was that this could be connected to the aerial (antenna) terminal, so that the mains could act as an aerial. However, this type of aerial system was usually quite noisy due to electrical interference on the mains. In addition, there was always a risk that the capacitor could break down and apply mains voltages to any external antenna, with possibly fatal results.

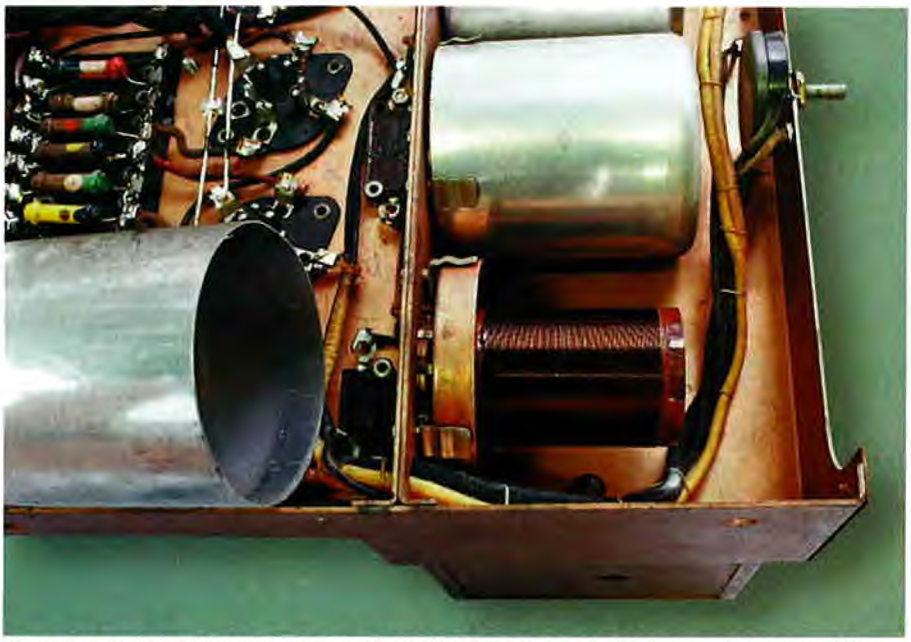
Leaving this capacitor disconnected and using a separate outside antenna was certainly a much better (and far safer) idea!

The HT secondary of the mains transformer is fed to an 80 rectifier valve (the 80 and 5Y3GT are electrically equivalent). The resulting DC is then applied to a tapped choke in the positive supply line, along with three filter capacitors. The field coil of the electrodynamic speaker acts as a filter in the negative line.

Finally, there are four filament windings on the secondary of the transformer, one five volt for the rectifier and three 2.5 volt ones for the rest of the receiver.

Alignment

The five RF circuits are tuned by two separate tuning capacitors (one 3-gang and one 2-gang), which are



Removing the coil covers shows that all the coils are still in excellent condition, despite now being more than 75 years old.

A close-up view of the Edison R6's control panel: from bottom left to right, volume, on/off and tone; and from top left to right, local/distance and tuning.

mechanically coupled together. Although I have never had to align this receiver, I suspect that it would pay to carefully follow the correct procedure, otherwise the performance could be very mediocre.

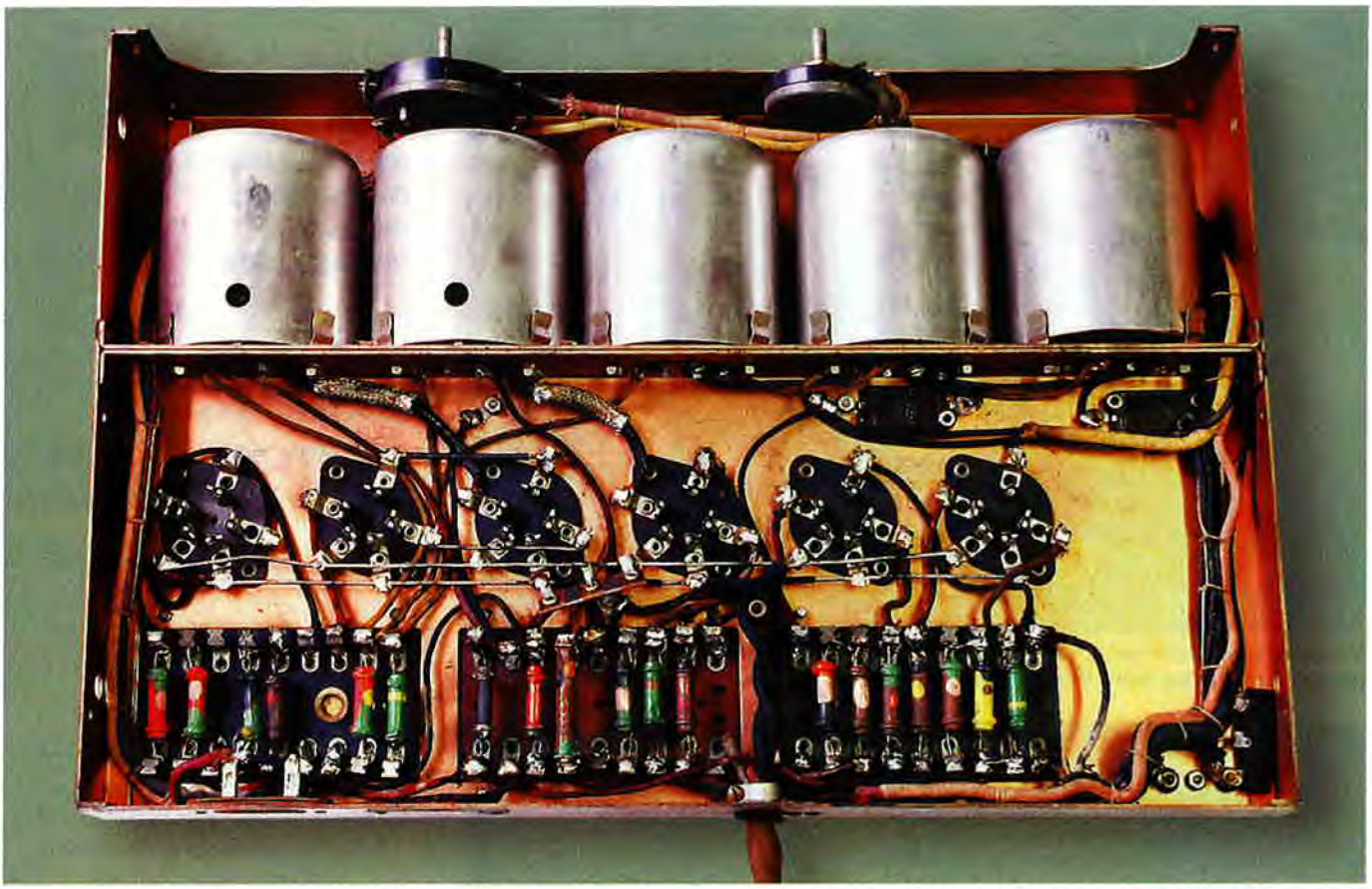
There are trimmers across the five tuning gangs and these would all be peaked at the high-frequency end of the tuning range. At first glance, there don't appear to be any adjustments at the low-frequency end of the dial. However, I wonder what the trimmer capacitors at the bottom ends of the RF primary windings on the two interstage transformers are for? It's quite possible that these alter the performance at the low-frequency end of the dial by changing the apparent inductance of the two tuned windings.

The first three tuned circuits do not have this feature. Personally, I would be tempted to note the positions of the trimmers and try adjustments at both ends of the dial to see what happened. If it all became pear-shaped, at least they could be set back to their original positions.

In this case, it was unnecessary to fiddle with the alignment, as the set is quite sensitive, has good selectivity and produces good quality audio.

Replacement parts

Most of the fixed capacitors in this set were replaced in the not too distant past. In this case, the old capacitors had been removed from their cases and the new ones substituted to keep the chassis looking original. Certainly, this job has been extremely well done, the step-down mains transformer be-



The parts on the underside of the RF chassis are very neatly laid out and easy to access. Note the row of coils at top.

Photo Gallery: Healing 527E 5-Valve Console

MANUFACTURED BY A. G. Healing, Melbourne, in 1946, the model 527E is an early post-war broadcast band console receiver. It featured a large rotating "barrel" type dial and a 30cm loudspeaker and combined good performance with attractive styling. A companion model, the 577E, was also produced and this included a shortwave band that tuned from 7.89MHz to 24MHz.

The valve line-up was as follows: 6J8-G frequency changer; 6U7-G IF amplifier; 6B6-G detector/audio amplifier/AVC rectifier; 6V6-G audio output; and 5Y3-G rectifier. Photo: Historical Radio Society of Australia, Inc.

ing the only item that's obviously a "ring-in".

Access under each of the chassis is quite good, with, all components neatly laid out and quite easy to get at. Access to the RF coils is also good, and the coil winding is still in excellent condition after all these years.

Summary

This is indeed a rare receiver and is probably the only one of its kind in Australia. It has a high-quality timber cabinet and when complete with the works, is a job for two people to lift. Both the chassis work and the wiring is also of good quality.

The set's performance is superb and is still quite useful in today's world, with stations quite close together in frequency. In summary, the Radio Division of Thomas A Edison Inc. produced a fine receiver. If their other models were of the same quality, they would have been excellent receivers – although rather expensive, I suspect.

Finally, my thanks to Brian Lackie for providing the information necessary for this article. **SC**