

# VINTAGE RADIO

By JOHN HILL



## The 5-valve Darelle receiver

**Restoring some old receivers takes a lot of hard work. This old 5-valve superhet is a relatively rare receiver that had been stored in my garage for many years.**

Recently, while admiring a fellow enthusiast's radio collection, I noticed an odd-looking Darelle receiver – a 1932 console model to be precise. The reason I recognised this relatively rare radio is because I had one exactly the same stored in my shed.

My Darelle had been hidden away since the day I found it with its broken cabinet (the bottom section had separated) and non-functioning receiver. Seeing a nicely restored Darelle must have triggered some sort of subconscious response because the very

next day I dragged my old wreck out for a closer inspection.

After removing the chassis from the broken cabinet, I discovered to my surprise that the Darelle is a 5-valve superhet. I had been under the impression that it was a TRF (tuned radio frequency) type receiver but, as it has two intermediate frequency (IF) transformers, it is clearly not a TRF. That just goes to show how little attention I paid to the set when I put it into storage.

Because it is a 1932 model, one

would assume that it has 2.5V valves and it has. However, where one might expect it to have a front-end line-up of a 57, 58 and 57, the old Darelle has a 24, 35 and 24, followed by a 47 output. There is also the obligatory 80 rectifier. In other words, it is an early autodyne superhet which was the industry standard for console radios in the early 1930s.

The cabinet lacks style, even though it stands on legs. They are not nice turned legs but square-sectioned ones which simply do not have the same appeal. The box-shaped cabinet has all flat surfaces with square corners and the fretwork in the speaker opening is decidedly heavy looking. The front is veneered with a simple pattern of triangular shapes across the top.

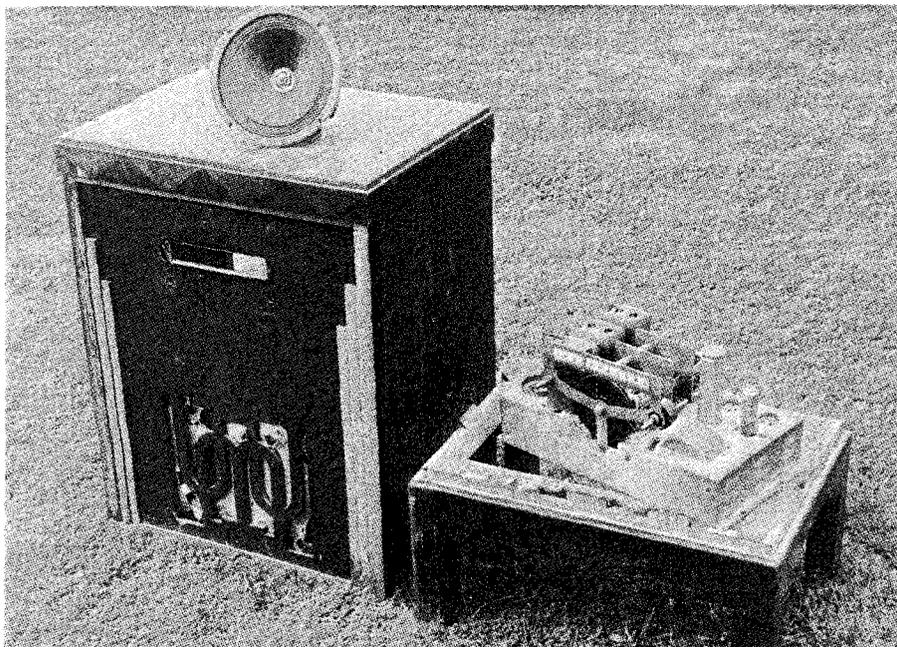
In summary, it is a fairly unimaginative design – plain but functional. Well, that's how it seems to my eyes.

Like so many receivers from the early 1930s, the Darelle appears to be made for a price. It is a straightforward basic receiver in a cheap, lightweight plywood cabinet and was basically a budget-priced radio for the depression years!

The cabinet was in poor condition, to say the least. The veneer had lifted on the top surface and broken away at the edges. There were also several small chips of veneer missing from the front and the base and legs were completely detached. Nevertheless, it was not a total write off. With a bit of perseverance (a fair bit actually), it would restore reasonably well.

### Chassis restoration

I never consider doing anything to a radio cabinet until the receiver is working again. There is little point in restoring a cabinet only to find that



**This is how the derelict Darelle, with its detached base & lifted veneer, appeared after it was hauled out of the garage. It wasn't a job for the faint-hearted.**



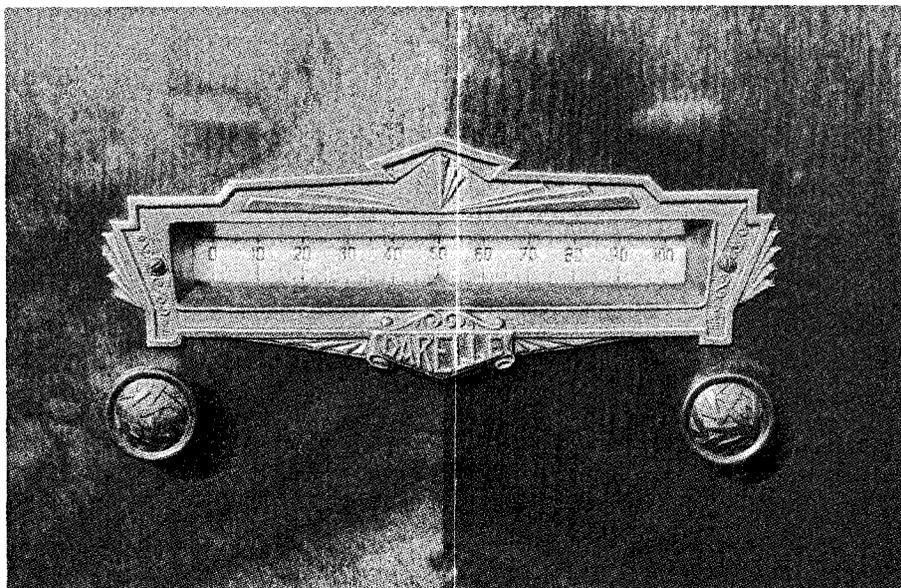
After refurbishing, the cabinet looked as good as new. It was glued back together & had a new top fitted. But regardless of the improvements, it still looks like a glorified tea-chest on legs.

the rest of the set is irreparable for some reason. And so, with this thought in mind, I set about restoring the chassis and speaker to working order.

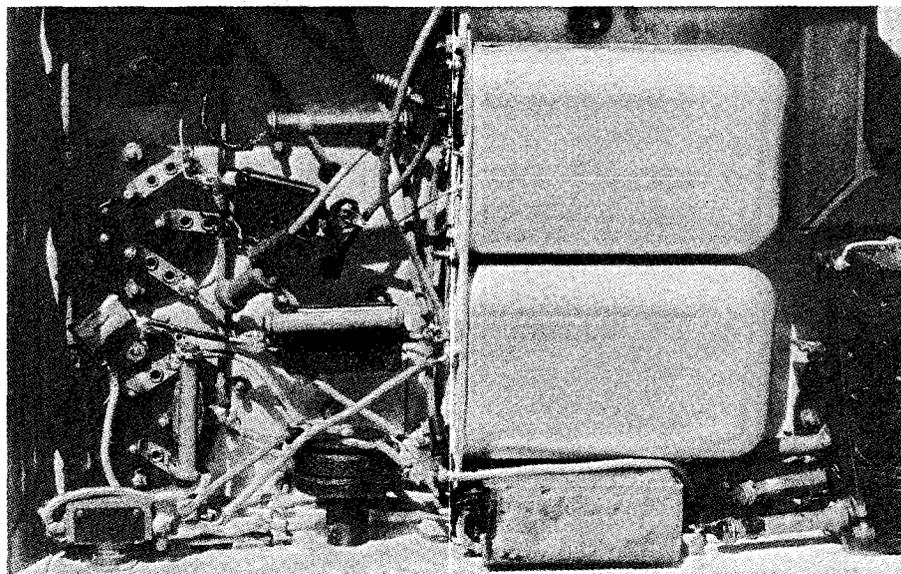
The usual routine checks cleared everything except the output transformer which had an open-circuit primary winding. This common vintage radio repair problem was easily overcome by replacing the defective component with an M-1100 audio line transformer from Dick Smith Electronics. The M-1100 is rated at 5k $\Omega$  to 2, 4, 8 or 16 $\Omega$  and, although never meant to be a valve output transformer, it does a remarkably good job and at \$7 is quite cheap.

Being much smaller than the original output transformer, the M-1100 was installed inside the mounting cover of the older unit. This helps to disguise it so that it is not too obvious (at least at first glance) that a modern unit has been used.

The paper capacitors were a mix of tubular cardboard types plus a small block capacitor with four 0.3 $\mu$ F 1000V capacitors inside it. This block was situated in a very inaccessible place and required the removal of the aerial



The Darelle's controls are for volume & tuning only. Note the straight-line dial which was unusual for 1932 when half-moon shaped dials were all the go.



The aerial & oscillator coils (in the cans) are mounted underneath the chassis. Note the small block capacitor wedged in between the chassis & the bottom can. The Darelle is not a particularly easy receiver to work on.

and oscillator coils in order to gain access to it.

As the screws that held the aerial and oscillator coils in place also secured the tuning capacitor, it too was removed. Its rubber mountings had perished to almost nothing and the plates were scrapping badly and needed attention.

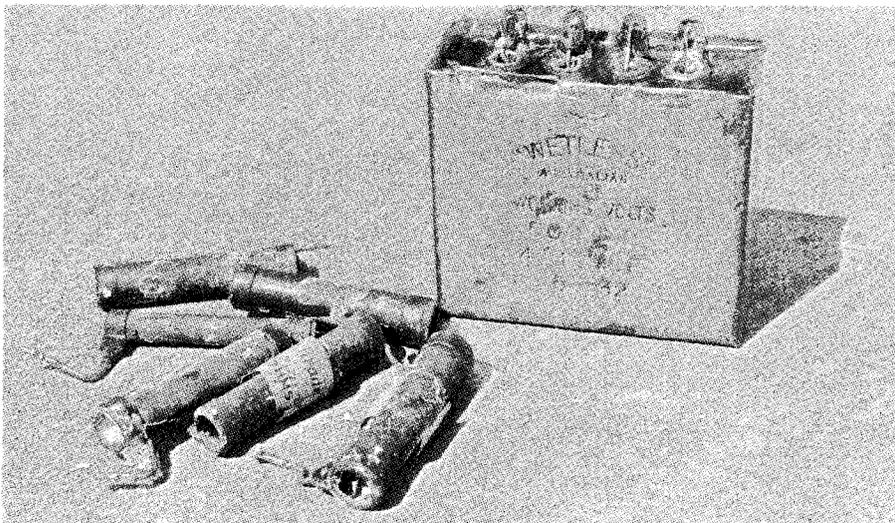
### Tuning gang repairs

I had experienced similar troubles before with this make of tuning capacitor and it seems as though it nearly always presents a problem.

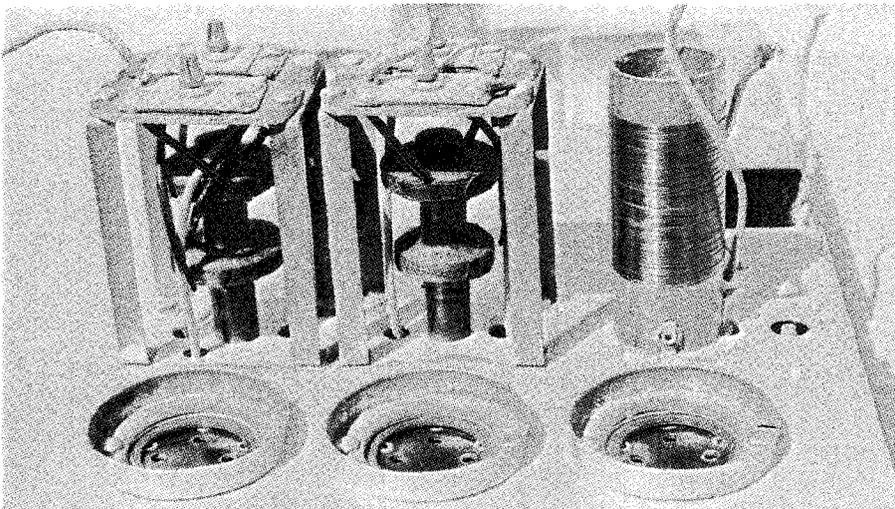
This capacitor is a plain bearing

type and is of riveted construction. It would appear that the rivet holes are much larger than the rivets and so the rivets slacken their grip over the years. This allows the rather strong thrust spring at the rear of the control spindle to spread the front and rear end plates of the body, so that all three sets of movable plates shift forward until they foul the stationary plates.

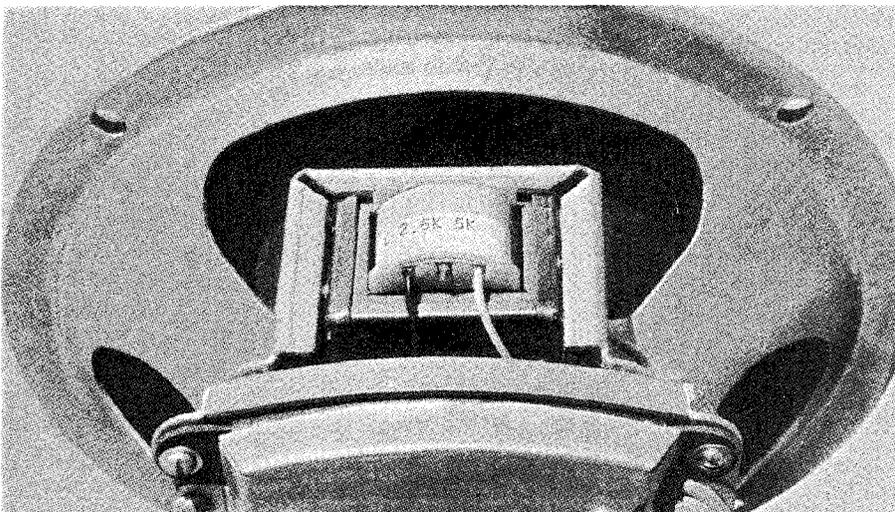
The method of construction does not allow the rivets to be tightened, as there is no room to fit anything behind the rivet head while the other end is tapped with a hammer. And because the body is made of alu-



The chassis repairs involved the usual replacement of paper capacitors & a few resistors that had gone high. The capacitor can is dated May, 1932.



An old radio chassis is much easier to paint if all the shield cans are first removed. This also allows components such as the IF transformers to be inspected & cleaned.



The replacement output transformer (see text) was installed inside the mounting cover of the original transformer. This technique helps to disguise the modern component, so that it doesn't look out of place.

minium, it cannot be soldered.

One repair technique that does work with these tuning capacitors is to first squeeze the end plates back into position using large G clamps, then glue them permanently in place with super glue.

Although a simple remedy, it seems to work OK. But first, because the tuning capacitor has plain bearings that had never been cleaned or lubricated, the main control shaft was withdrawn and the unit dismantled. Each set of movable plates was numbered so that they would go back in their respective positions.

Completely dismantling the capacitor is the only way it can be properly cleaned and the bearings lubricated with grease.

After re-assembly, the individual capacitance of each gang was checked with a capacitance meter to ensure that they were in step with each other. This was done with the trimmers slackened right off. It is important that the three gangs track each other closely, otherwise the receiver will be difficult to align. Finally, new rubber grommets were used to remount the rebuilt tuning capacitor.

All up, the tuning capacitor repairs plus the block capacitor rebuild took quite some time to complete.

Incidentally, while the tuning capacitor was removed, it was an opportune time to clear the rest of the top hardware and paint the chassis. The chassis received a coat of aluminium paint, while the other bits and pieces were painted bronze. It certainly looked better after this had been done.

## Switch on

When the big moment came to try it out, it was a bit of a disappointment because the set worked very feebly on the local station only. After some investigations, the problem was found to be a faulty type 35 valve and "donging" it sent the sound into convulsions.

After fitting another valve, the set worked much better than before but desperately needed aligning.

It is interesting to note that the faulty valve checked out OK in the valve tester, which supports statements I have made before concerning the value of such tests. A valve tester only indicates that a valve has adequate emission. One can never be sure that it does not have other faults until it has

been installed in a receiver and given a thorough workout.

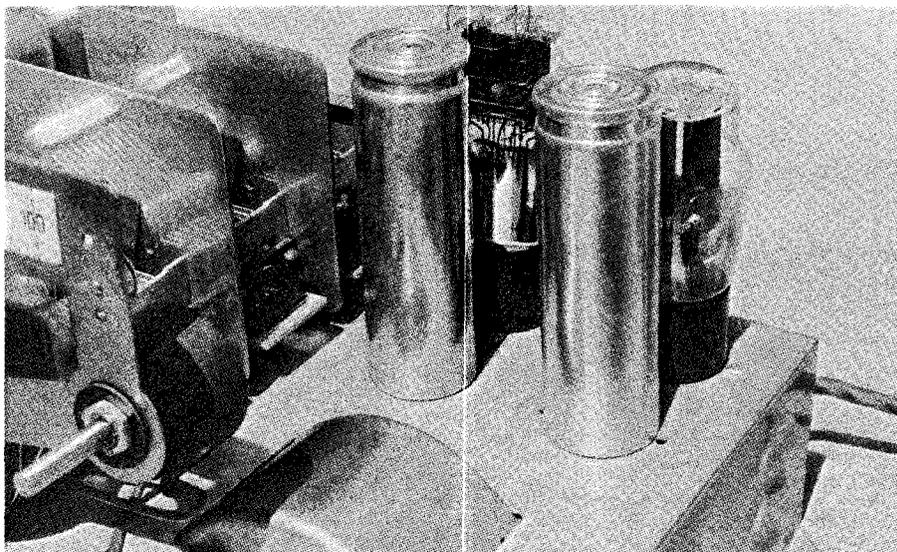
## Alignment

The first step in the alignment procedure involved setting the IF transformers to 175kHz. They were badly out of adjustment and a considerable improvement in gain was noted after they had been correctly aligned.

A problem arose when aligning the aerial and oscillator circuits because the padder circuit would not track. The padder screw tightened up solid before the output meter could be peaked while searching for maximum output at the low frequency end of the dial. This suggested that the padder lacked sufficient capacity to cover the necessary adjustment range.

In fact, the padder was relatively small in capacity and was bridged with a mica capacitor. This mica capacitor was removed and one approximately 60pF larger was installed in its place. The padder circuit could then be made to track. This is important because if the padder is out of adjustment, it can result in poor reception at various points of the dial.

The tuning capacitor trimmers also needed considerable adjustment. However, alignment when using a radio frequency generator is fairly



The repaint job greatly improved the general appearance of the chassis. The hump in the foreground is the cover for the power transformer.

straightforward, even when the adjustment screws have been disturbed.

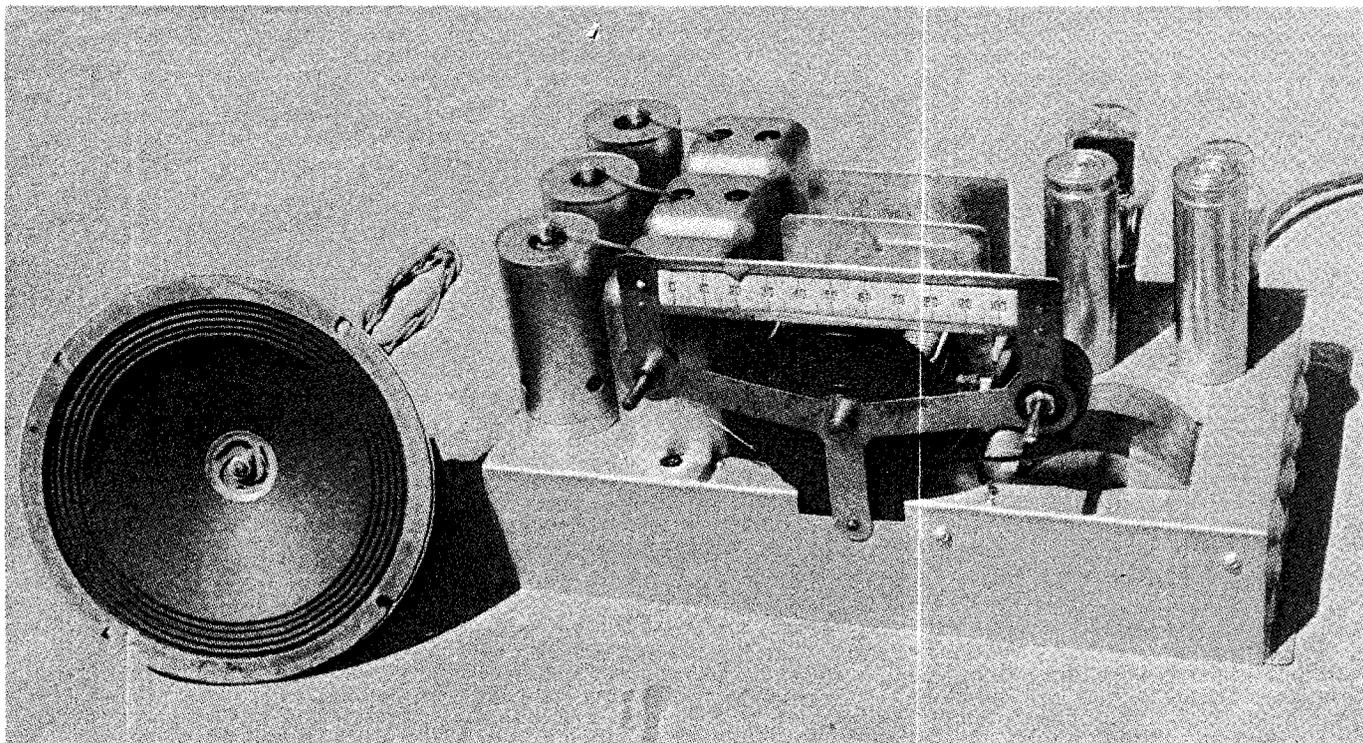
## Cabinet restoration

Well, that finished that part of the restoration. It was time to do something with that horrible cabinet; and cabinet repairs I can put off forever.

Now it just so happens that I know someone who does a fairly good job of cabinet refurbishing and I reckoned he owed me a favour or two. He likes

doing up old radio cabinets so much he couldn't say no – even to the Darelle's multi-piece pile of plywood and termite food.

As can be seen in one of the accompanying photographs, the cabinet is not only in one piece again but looks every bit as good as the day it was made. It has had a new top fitted and there is little evidence as to its prior condition. It's marvellous what a bit of time and effort can do. **SC**



This view shows the fully restored chassis & its companion loudspeaker. The chassis design is typically early 1930s – an autodyne superhet with anode bend detection. The old Magnavox loudspeaker still has a perfect cone, which is quite remarkable considering its age.