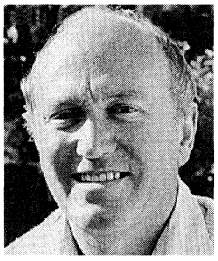
VINTAGE RADIO

By JOHN HILL



New life for an old Kriesler

A vintage radio receiver must be correctly aligned if it is to function correctly. However, many vintage radio enthusiasts neglect this important procedure.

There are two types of vintage radio collectors - those who do not do their own repairs and those who do. Alf started out being one of the former but over a period of time has become one of the latter. He has read up on the subject, asked lots of questions and is now doing reasonable repairs.

But Alf had a problem. He had restored a 5-valve Kriesler mantel receiver but it didn't work very well at the high frequency end of the dial, although it functioned reasonably well at the low frequency end.

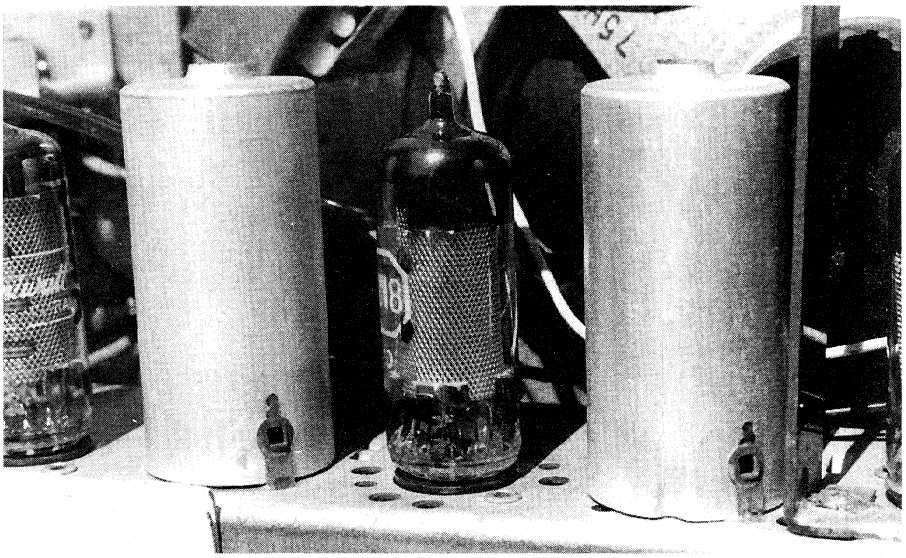
Receiver alignment was a particular problem for Alf. Despite the fact that he had a very good signal generator and various alignment instructions to follow, he was unable to get on with the job because he didn't really understand the instructions he had. I can sympathise with anyone in this situation because I have been there myself.

My first receiver alignments were total disasters due to not having the right equipment on one hand and not knowing what to do on the other.

The vague instructions I had at the time summed up alignment by saying: "adjust the iron cores or slugs at the low frequency end of the dial and the trimmers at the high frequency end." As the set being aligned didn't have iron cores in the aerial or oscillator coils, that presented a problem. But there were slugs in the intermediate frequency (IF) transformers – and one slug is as good as another when an overconfident mug like me has absolutely no idea of what he is doing.

So the IF transformer slugs were twiddled at one end of the dial and the trimmers twiddled the other. To make matters worse, these adjustments were made at the wrong ends of the dial.

This dial error was possibly caused by my father who dabbled in radio in his younger days. Dad always referred to the low frequency end as the "top" end of the dial – which it is if you happen to be thinking wavelengths in metres and not frequency in kHz. Whatever the cause, my early attempts at receiver alignment were not what could be described as good and I was guilty of totally misaligning a number of receivers; that is, until I learned how to do it correctly.



The Kriesler's IF transformers were out of adjustment, to the extent that they were double peaking. IF alignment is an important aspect of any receiver tune up to ensure that the set performs correctly.

My turn to instruct

It's all very well for those who have been properly trained to be critical but when it comes to alignment, it is difficult for novices to find understandable instructions for receivers that became obsolete half a century ago. I blindly blundered on until a kindly old bloke took pity on me and showed me how it was done. Being shown and being told are two different things and the former is much easier to comprehend.

So it looked as though it was my turn to pass on the favour and show Alf how to align his Kriesler mantel set.

One problem with receiver align-

This Kriesler mantel model from the mid-1960s is a commonly encountered valve radio. Although this unit was fully restored, it lacked performance until it was correctly aligned. It also required a valve replacement.

ment is that it varies from set to set because the components themselves changed as radio developed over the years. Early superhets have air-cored aerial and oscillator coils and may also have a bandpass filter or a radio frequency stage. In addition, the IF transformers are tuned by adjusting the variable capacitors that are placed across each of the two transformer windings.

If we go forward a little in time we find that receivers no longer have bandpass filters, while the IF transformers are adjusted with iron cores and tuned to higher frequencies. However, the aerial and oscillator coils may still be air-cored.

Other varieties have iron cores in the aerial and oscillator coils or, in some instances, the oscillator coil only. There are also dual-wave receivers of various types to worry about.

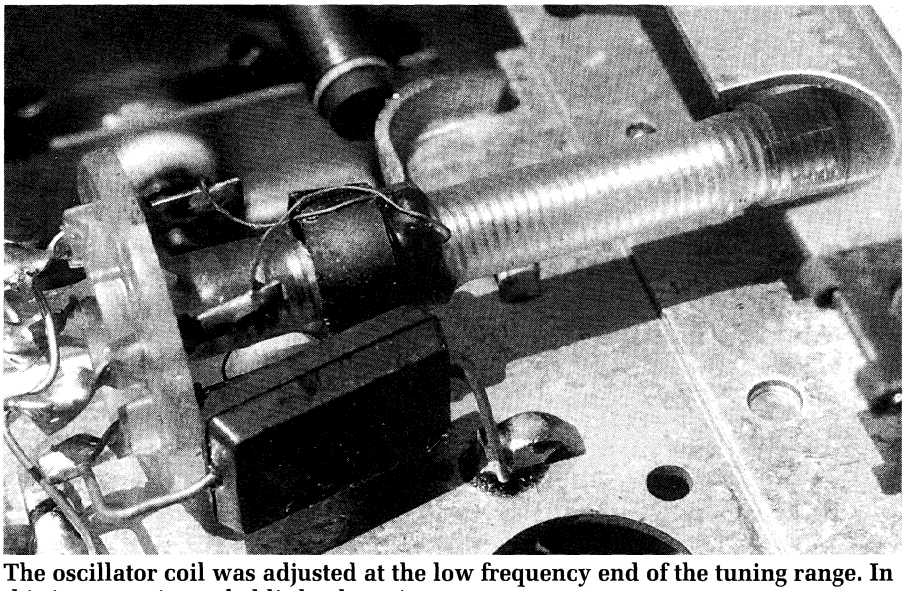
Confused? I know I was! Learning vintage radio repairs from scratch isn't easy.

Alf's Kriesler

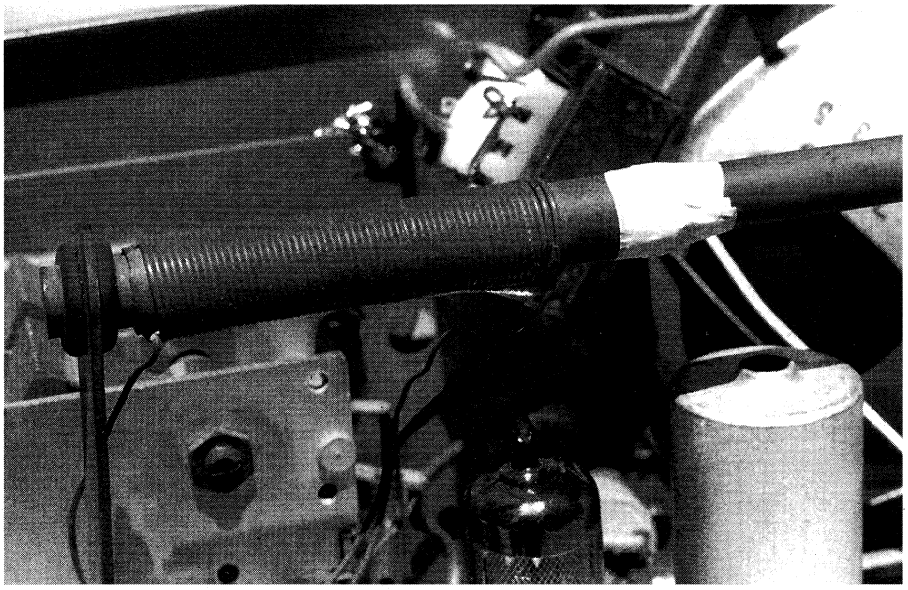
Alf's Kriesler was from the mid-1960s and it had a built-in ferrite rod aerial. The coil consists of the usual primary and secondary windings and, instead of using a slug, the coil is tuned by sliding the winding along the rod. The oscillator coil is slug-tuned with an iron core, as are the two IF transformers.

With the 5-valve Kriesler on the workbench, an aerial was connected to the set so that the problem could be assessed. It was as Alf claimed and performed poorly at the high frequency end of the tuning range.

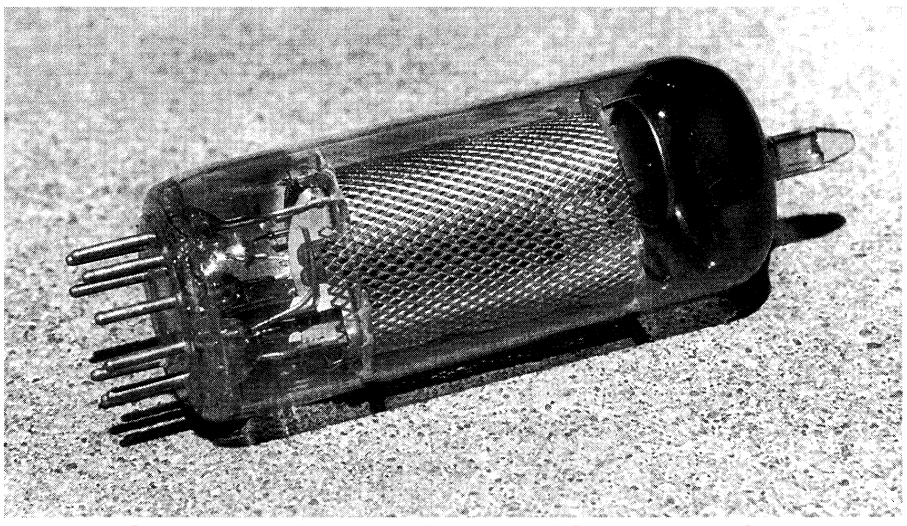
A few preliminaries had to be taken care of before commencing the alignment. First, some frequency checks were made on Alf's signal generator using a modern receiver with a digital readout. These checks indicated that the little "Palace" transistorised signal generator was quite accurate and that it was well within the usual 2-3%



The oscillator coil was adjusted at the low frequency end of the tuning range. In this instance, it needed little alteration.



This photo shows the ferrite rod antenna fitted to the old Kriesler. Moving the coil position can sometimes improve the reception but, in this case, it worked best in its original location.



The 6N8 valve was extremely sick and was one of the reasons for the set's poor performance.

tolerance these instruments have.

Next, an output meter was improvised by connecting a .047µF 630V capacitor in series with a multimeter lead. The meter was then set to AC volts and connected between chassis and the output valve plate. The capacitor blocks the DC plate voltage and passes only the audio signal, which is shown on the meter. An output meter has much greater sensitivity to level changes than the human ear.

While reasonable alignments can be done without instruments (a signal generator and output meter), these accessories make the job so much easier. So if you are thinking of taking the plunge and doing your own alignments, now may be a good time to consider buying the necessary equipment.

With everything in place, a modulated signal of 455kHz (the receiver's IF) was fed into the control grid of the converter valve. If the IF transformers are correctly aligned, there will be a single peak which will be heard through the receiver's loudspeaker and seen on the output meter when the signal generator is swept slowly through 455kHz. In this case, there were two peaks which were quite some distance apart – not the ideal situation!

When adjusting the first IF transformer, it was noted that the iron slugs had been screwed well in and were touching each other. IF slugs will usually peak in two places: either screwed in or screwed out. The outer position is correct. The second IF transformer also had its slugs badly adjusted.

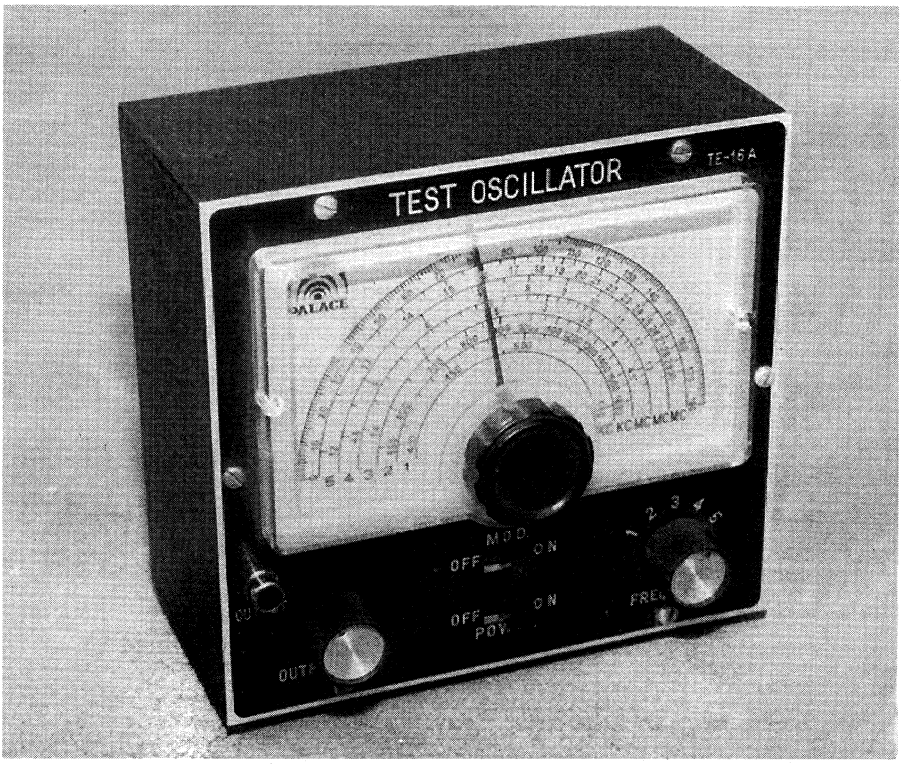
(Editorial comment: many IF transformers, fitted with iron cores, could produce a false peak. When the cores were screwed in too far, the false peak resulted from unwanted coupling between the windings, rather than peaks in the winding inductance. It was a well known trap in the early days of iron-cored IFs.)

After the transformers were correctly tuned, there was only a single peak when the generator was swept across the IF. So far so good! It was now time to align the aerial and oscillator circuits and so the signal generator leads were moved to the receiver's aerial and earth connections.

Most Melbourne radio stations line up very well on old dials, as their frequencies have changed little over the years. As the worst one is only 4kHz out, it is possible to do a reasonable alignment to station callsigns rather than to the frequency scale on the dial, if it has one. The Kriesler has no frequency scale to align to but the stations lined up quite well with their dial markings, even before the alignment was commenced. Apparently, that part of the receiver had not been tampered with as had the IF transformers.

There was a line on the dial marked PS (pointer start). With the tuning gang closed, the pointer came to rest on the mark. With the signal generator set to 621kHz (3AR) and the receiver tuned to that frequency, the oscillator coil slug was adjusted until the output meter indicated maximum deflection.

Strictly speaking, both the oscillator and aerial coils should be peaked at this stage but the coil assembly on the ferrite rod was securely taped in place, indicating that it had never been moved. As a result, it seemed logical to leave it where it was and to simply adjust the oscillator circuit. This was done by rocking the dial setting across the generator signal and simultaneously adjusting the oscillator coil until maximum signal (on the output meter) was achieved. Actually, the original setting was not far out and these adjustments put the pointer right on 3AR.



This "Palace" brand signal generator is a compact transistorised unit and is powered by a standard 9V battery. Frequency checks proved the generator to be quite accurate.

A frequency of 1422kHz (3XY) was then selected for the high frequency adjustments. Once again the dial pointer was spot on. If the pointer had not been accurately positioned it could have been corrected by adjusting the oscillator trimmer (this trimmer controls the dial pointer position at the high frequency end of the dial).

All that remained to do at this stage was to adjust the aerial trimmer for maximum output meter deflection while tuned to 1422kHz. We found that the aerial coil trimmer was out of adjustment but not badly so.

It's still crook

After disconnecting the generator leads and attaching an aerial, we found that the receiver still performed poorly at the high frequency end. There had been an improvement but not as much as had been hoped for.

So in spite of all the previous adjustments and the observation that the aerial coil had never been adjusted, it was felt that this was now worth checking, just to make sure. Unfortunately, removing the tape and sliding the former back and forth around did nothing to boost the performance and so it was eventually returned to its original position.

It was time to check a few valves. Alf's valve tester cannot test 9-pin valves because of a broken socket. On my tester, all the valves except one checked out OK, the exception being the 6N8 IF amplifier. This valve was very weak and the meter needle struggled to rise to the halfway position on the "bad" scale.

Replacing the 6N8 made a noticeable difference to the set's performance at the high frequency end of the dial. However, it still seemed to be lacking somewhat and the final solution was to connect an earth lead to the receiver. This increased the volume noticeably and considerably reduced interference hash from a 22,000V power line in the street outside.

It should be noted that most valve receivers work better with an earth. It not only helps regarding reception but also eliminates or reduces a lot of interference. Most valve radios have an earth connection for good reason – they work better with one!

Receiver alignment is an important aspect of restoring an old radio. There is not much point in replacing all those age-damaged components if the alignment is not restored as well. Only then will it perform as it should. **SC**