VINTAGE RADIO

By JOHN HILL

How to solve unusual problems

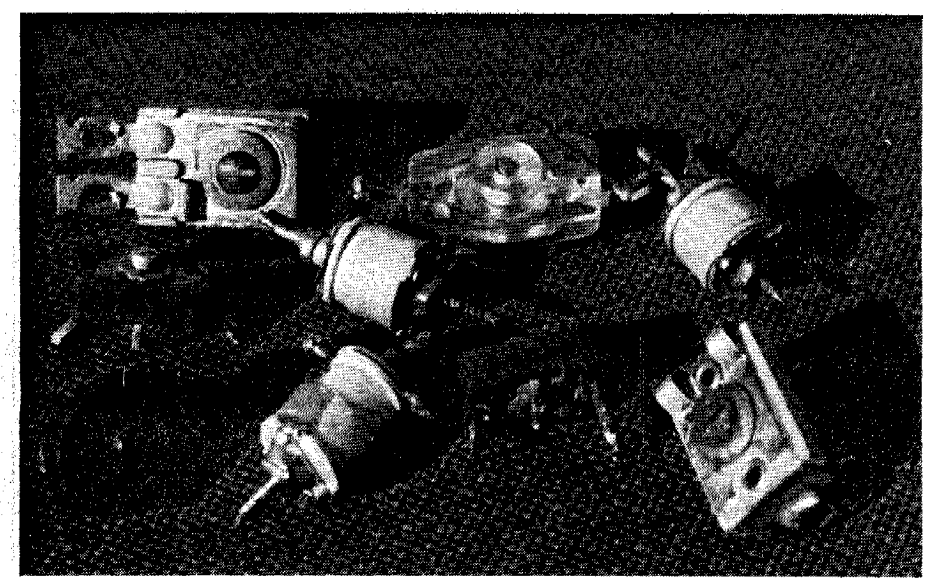
When one's hobby is restoring old radio receivers, it is inevitable that every now and then a set comes along with an unusual problem. Solving some of these odd problems is often easier said than done and the new chum to the vintage radio scene may find some repairs quite difficult.

Some time ago, I reworked a few of the sets in my collection. These receivers were ones that I had restored several years ago but, in some instances, the restoration work was not as good as I would do today.

The reasons are many. First, I did not know then what I know now. Second, some recently acquired test equipment (such as a valve tester, a radio frequency generator and an output meter) now makes it possible to perform much more precise tune-ups than in the past.

These reworked sets included a number of 4-valve receivers, several of which responded extremely well to the fine tuning they received. A 4-valve radio, in particular, requires spot on alignment if it is to perform well.

There was still another set that needed attention and I had been well aware of its shortcomings for quite some time. While it looked a nice enough receiver, it was a terrible performer due to poor alignment. This mid-1950s 5-valve Mullard was so far out of tune it was "double spotting". As the dial pointer was moved across a station, the station would tune in, tune out, then tune in again, thus occupying two side-by-side positions on the dial.



Small 30pF trimmer capacitors can be used to tune an IF transformer when the normal tuning slugs are immovable. The alternative is to replace the IF transformer but suitable replacements are not always available.

It was a problem I could not handle at the time because the iron cores in the IF transformers had been butchered. The screwdriver slots had been gouged out by someone trying to get the rather stiff slugs to move.

When I last worked on the Mullard, I did manage to move the slugs a little but it appears that they were moved in the wrong direction because the alignment got worse. In desperation, the chassis was put back into the cabinet and the set placed in the "too hard basket".

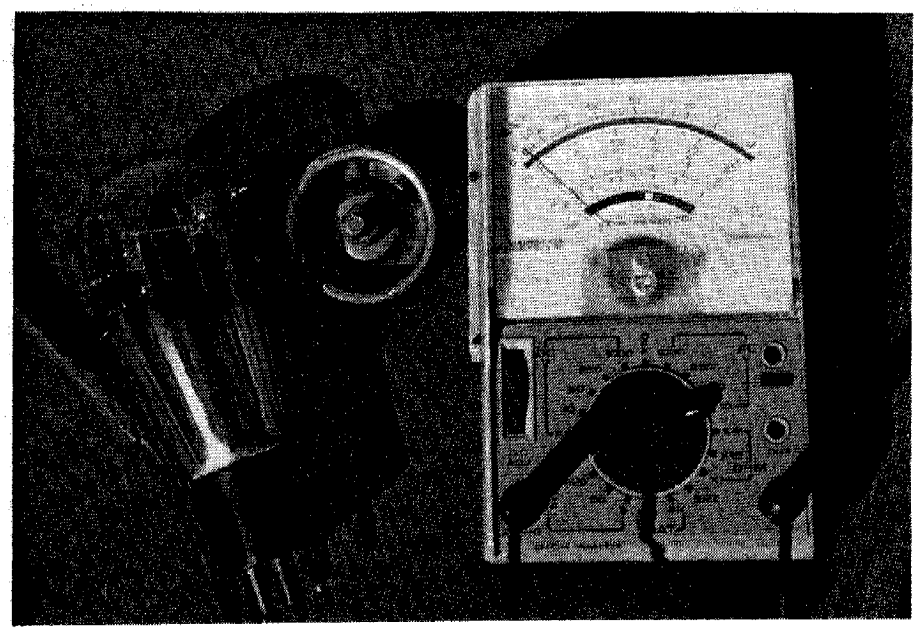
Alignment techniques

Anyone familiar with old radios will know that IF transformers can be tuned by two methods. The method used in the Mullard and most other more recent receivers is by means of adjustable iron cores. However, back in the early days of superhets, the IF transformers were tuned with small trimmer capacitors.

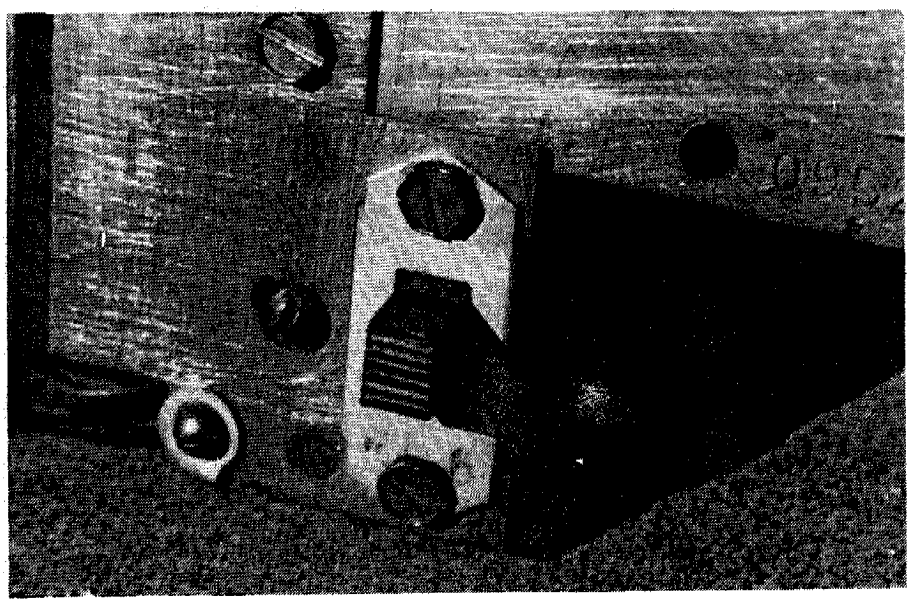
It therefore seemed reasonable to assume that the Mullard could be pulled back into alignment by adding some 30pF trimmer capacitors to the base connections of the transformers. Four trimmers were soldered into the circuit to see if the theory would work — and work it did!

As it happened, four trimmers were unnecessary and two were removed from the circuit for the better. Such a modification is a bit of a trial and error affair.

To cut a long story short, the set tuned up really well and the double



If you want to use a 2.5V valve in a 4V socket, the required resistance can be determined using a rheostat and a multimeter. You simply connect the rheostat (set to maximum) in series with the valve heater, and connect the multimeter (set to AC volts) across the valve heater. The rheostat is then wound back until the meter indicates 2.5V and its value measured to obtain the resistance.



Some radios, such as this 5-valve Philips mantle set, have a tone switch at the back which cuts in a capacitor that is used as a fixed tone control. Altering the size of the capacitor affects the degree of tonal response.

ance. This done, the multimeter (set to AC volts) is connected across the filament of the valve.

The rest is straightforward: you simply adjust the rheostat until the meter reads 2.5V. The rheostat resistance is then measured with the multimeter to get the required value for the filament resistor.

In the case of my valve substitution in the Seyon, there is a 4V supply with 1.5 amps flowing through the filament resistor and the 2.5V valve. Therefore, the potential across the resistor is 1.5 volts. Since Watts = Volts x Amps, the wattage of the resistor required must be 2.25 watts.

A 5W wirewound resistor would do nicely, even if the valve drew two amps. The 10W one I used was more than adequate.

Most of the old 2.5V output triodes had directly heated cathodes in the form of a fairly heavy filament. Because these valves used an AC supply, a special centre-tapped cathode resistor was used across the filament to reduce mains hum. The amount of resistance used on a 4V valve would be different to that used on a 2.5V or 6.3V valve and the resistor should be replaced if the filament voltage is changed.

Substituting a 4V valve with a 2.5V valve, as was done in the Seyon, would require a centre-tapped resistor of a slightly lower value. Not having the appropriate resistor meant that it wasn't changed at all and that didn't seem to make the slightest difference. It also meant that no alteration was necessary when the set was converted back to 4V operation.

There are numerous situations whereby one can get out of trouble by using a resistor and a valve with a lower filament or heater voltage. Such a method is quick and easy and does not involve separate transformers or other inconveniences. It is also applicable to both AC and DC-powered receivers.

Warning signs

Although this story is about getting out of trouble, ignoring certain warning signs can also get one into trouble.

For example, my old Seyon has a potential problem that I have ignored for years — one that could give rise to a serious short circuit.

The 240 volt supply to the power transformer is platted rubber covered wire and over the years the insulation has decomposed, merged into a single mass and gone quite brittle. Just how close those wires are to each other is anyone's guess and if there is a big zap one day and a fuse blows then I will know that they were a little closer than I thought.

In my defence, there are two reasons why I have not replaced this old wiring. First, it has not been disturbed and is in working order. Second, the wires are not just rubber covered but also cotton covered. That layer of cotton seems to make all the difference and I doubt if it will ever give trouble. Only time will tell.