# VINTAGE RADIO

By JOHN HILL

# Unusual problems lead to interesting repairs

**The more time one spends repairing old radios, the more unusual some of the problems become. This month, we will take a look at a couple of odd repairs that took a while to work out.**

My first story is about an early post-war 4-valve Astor. It was a common radio in its day and is characterised by its unusual control knobs which, in my opinion, are neither attractive nor functional. The Astor was a repair for a collector friend.

It was a fairly easy job really. The set was still working and only needed a few replacement capacitors, a length of dial cord and a tune-up. However, the rot started when the time came to align the receiver.

The alignment procedure was carried out with the chassis propped up on one end and seemed to be a straightforward job. But when the set was placed right way up on the bench, the volume slowly diminished over a period of about five seconds to quite a low level and stayed there.

Tipping the chassis upside down on the workbench to check underneath revealed nothing other than the fact that the set was now working normally again. Restoring the set to the upright position then produced exactly the same effect as before, with the volume again dropping to the previous low level.

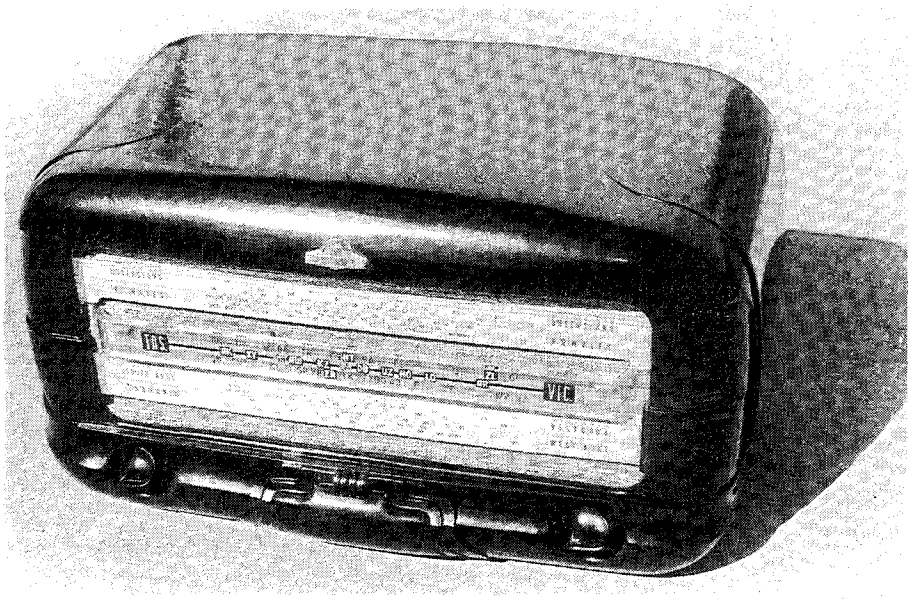
Rather than tell the owner to operate the set upside down, I thought I had better investigate further. The procedure was repeated but this time the volume remained steady. Reaching for my trusty donger (a pencil with two rubber grommets attached to one end), I proceeded to tap various components and a single dong on one of the IF transformers reduced the volume almost instantly.

It appeared as though there was something wrong with that particular component.

Removing the transformer from the chassis not only revealed the problem but showed that it would also be easy to repair. One of the iron slugs that adjust the transformer had detached itself from the brass screw that controls its position. Instead of being firmly attached, it was adrift and was sliding (slowly because of a smear of grease) around inside the former carrying the transformer windings.

The repair was simple – attach the slug back onto the brass adjustment screw with a drop of "superglue", then reassemble and reinstall the transformer in the receiver. After retuning the IF transformers, the set behaved quite normally.

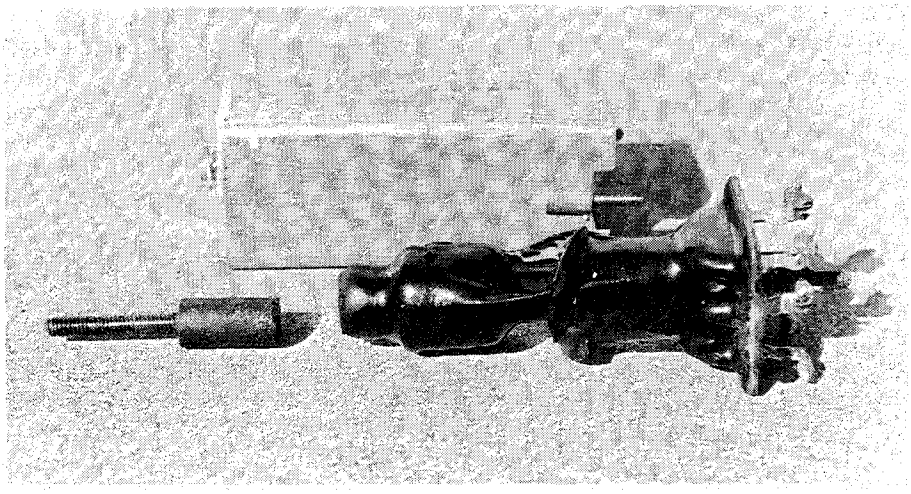
It is always satisfying to solve these odd problems because they seem so obscure at the time.



**This post war Astor of about 1949 vintage had a most unusual problem – variable volume, depending on the orientation of the set.**

## The old Radiola

Another unusual problem was encountered with an old mid-1930s Radiola which was acquired in pieces and incomplete. Missing were the knobs and the dial escutcheon – exactly the same escutcheon that I had

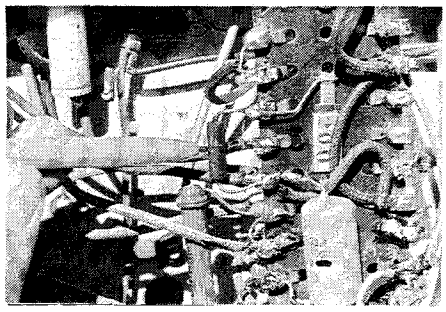


**The variable volume characteristic in the old Astor was caused by a detached tuning slug. The problem was solved by gluing the iron slug back onto its adjustment screw.**

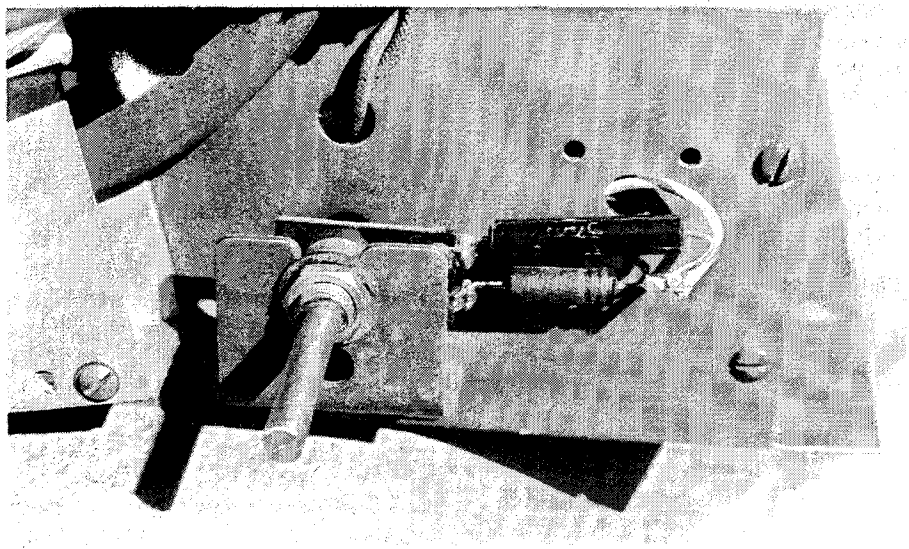
previously sought for a similar model Radiola (see Vintage Radio, January 1990). Fortunately, I knew where there was a battery version of this model and it was bought solely for its knobs and escutcheon.

The real problems with this set were in the receiver itself. It had been tinkered with and it was a bit different from the one I had worked on previously. The two obvious problems were an open circuit radio frequency (RF) coil and the wiring to the local station switch had been removed.

The RF coil was replaced with a similar unit – with considerable difficulty – but the set still failed to work. It was quite some time before the fault was found to be the disconnected local station switch. This switch connects a resistor into the cathode circuits of the first two valves and if it is not connected properly, the set does not work. It is a different system from the resistor to chassis type of local station control that can be found in the aerial circuit of some receivers.



**Fitting this 1MΩ resistor solved an annoying automatic gain control problem in a mid 1930s Radiola. Before the resistor was added, it took 8-10 seconds for the volume to settle down each time the set was tuned to a different station. Tracing out a circuit is quite difficult with this type of tagboard construction.**



**This close-up view shows the Radiola's local station switch. This had been disconnected from the circuit, rendering the set inoperative. The two resistors connected to the switch are in the cathode circuits of the first two valves.**

I must confess that I had to have this pointed out to me, which just goes to show that working without a circuit diagram does leave one in the dark unless one is very familiar with a particular make and model. However, although the set was now working, it still had a peculiar fault.

Under certain conditions, the volume control seemed sluggish and unresponsive. Likewise with the automatic gain control; it took up to 10 seconds before it responded. I don't think the term "delayed AGC" was meant to describe the problem I was having with the old Radiola.

To explain this fault a little further, if the set was tuned to a strong local station and then retuned to a weaker station, approximately 8-10 seconds would elapse before that station could be heard at normal volume.

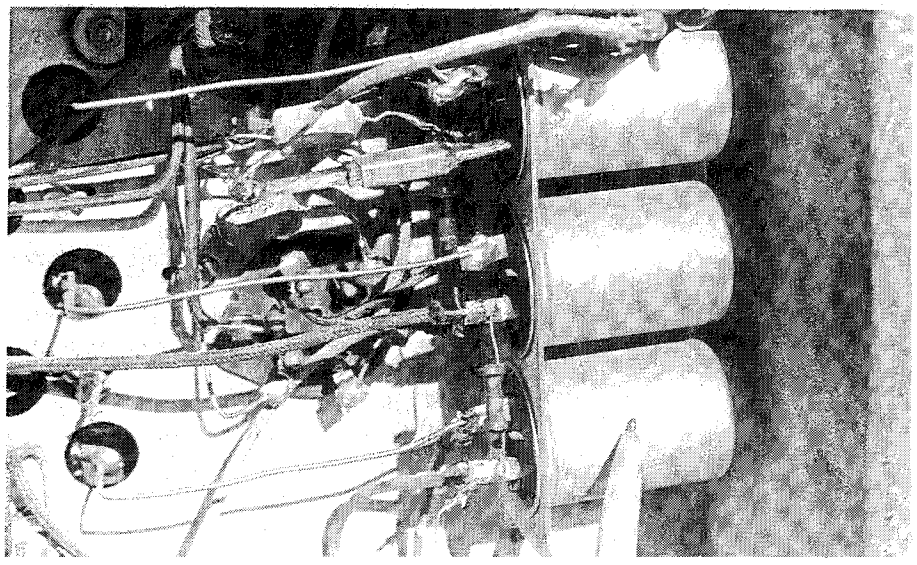
Now the circuits of some of those mid-1930s Radiolas are hard to trace because they were made with little component boards containing numerous resistors and capacitors. Besides, I had no circuit diagram so I could not tell whether the wiring was original or not.

The problem appeared to be in the AGC circuit so I probed the various small capacitors with a multimeter, looking for one that showed a negative voltage. The first one to indicate a negative reading seemed to be the one I was searching for because the meter probe had two immediate effects.

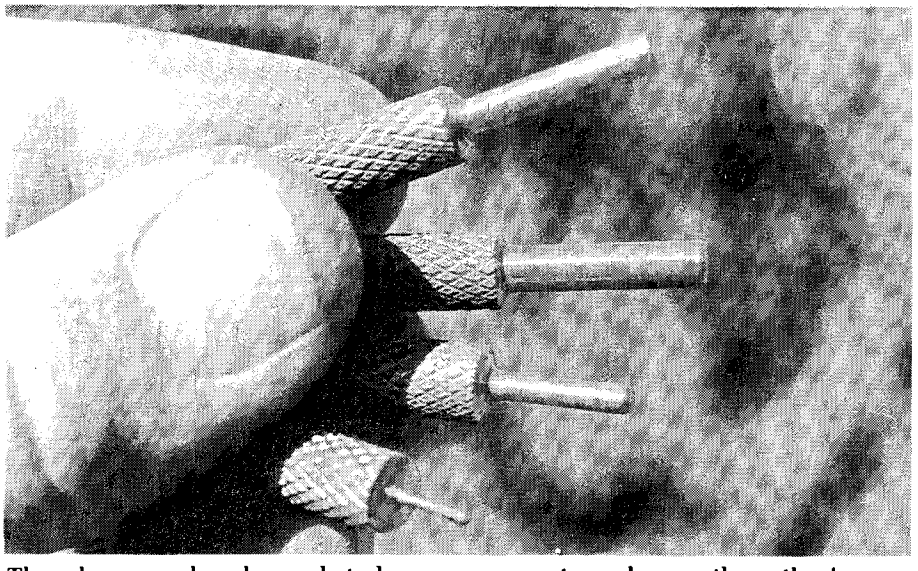
First, there was a small increase in volume when the probe was connected. Second, the AGC behaved normally while the probe was in place. Because the meter was acting as a resistor in this position, it was apparently bleeding off the excess charge from the capacitor, thus allowing the AGC to respond faster and work as intended.

When the meter was replaced with a 1MΩ resistor, everything worked just fine. So that, for the present, is how it has been left.

Granted this may not satisfy the purest, who would no doubt regard it as a bodgie approach. But with no



**Another problem with the old Radiola was a defective RF coil. Replacing the coil was no easy job as the whole coil assembly had to be removed from the chassis – and it's riveted in.**



**These home-made valve socket plug gauges were turned up on the author's lathe. They have been made to standard base pin sizes and are used to check valve sockets for contact tension. If you don't have a lathe, you can use standard size drill bits.**

circuit and someone's butchery to contend with, it was at least a short-term solution.

If the set had been bought in original condition, the problem may never have occurred. But when someone else has been tinkering around, anything is possible.

In theory, the most likely explanation would involve the AGC diode load resistor, which may have gone high in value. Alternatively, an AGC line decoupling resistor could have gone high. The resistors of those days, particularly the 1MΩ values and higher, were notorious for this habit. But tracing the circuit and finding them is something which will have to wait.

## The 5-valve Astor

Although my third story is a fairly straightforward one, it taught me a lesson that is worth passing on.

It all started with an embarrassing situation. I had repaired a 5-valve Astor for a lady and when she came to pick it up, it didn't work. Waggling a couple of valves in their sockets solved the problem and the receiver burst into life. In view of what had happened, I suggested that the set be left with me for a while longer so that I could check out the new and unexpected fault.

Dirty and ill-fitting base pin connections are a common source of trouble in valve radios, particularly old valve radios. The Astor was no exception.

After checking each individual valve socket connection with the shank of a 3/32-inch drill, it became fairly obvious that not many of them were making good contact. Some were firm, some only just touching, and others were not touching at all.

The solution seemed simple: upend the chassis and, using a pair of long-nosed pliers, gently squeeze each socket connection until it had the desired drag on the drill shank. But although that sounds a simple enough procedure, things did not go exactly as planned.

The socket connections had been formed from rather brittle sheet brass and some of them broke instead of squeezing in. What seemed to be a simple task originally had now developed into one that required two replacement valve sockets.

In the end, all the problems were solved, the lady was very pleased with the repair and I have heard nothing but good reports ever since.

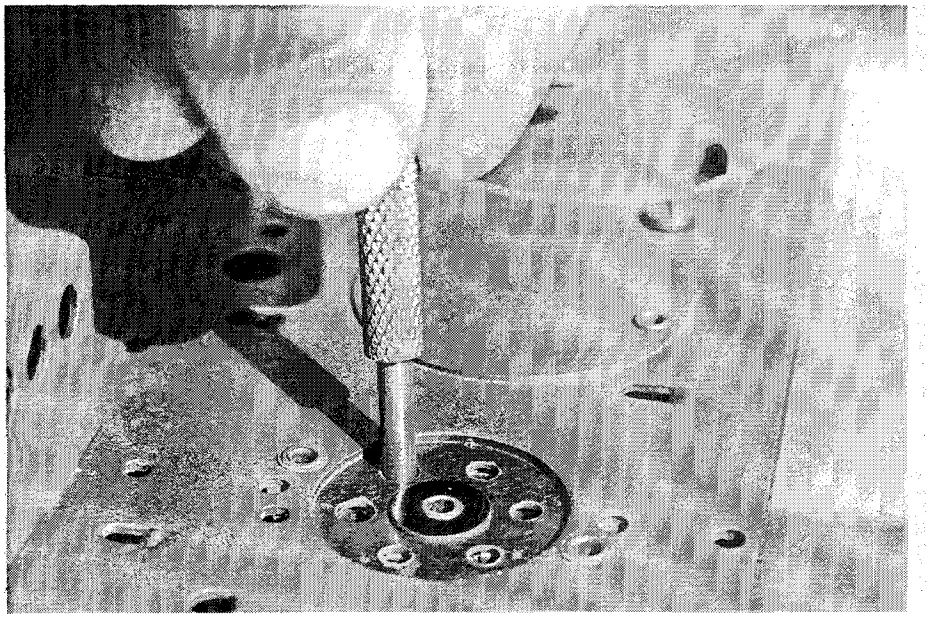
That experience with the ill-fitting valve socket connections prompted me to make up a set of special gauges for the purpose of checking each and every socket connection. All future repairs will have this check as a matter of course.

If one looks at valve base pin sizes from the 1920s to the end of the valve era, only four different size pins were used (generally speaking). This excludes the split pins of some of the early British and European valves and the Loctal types.

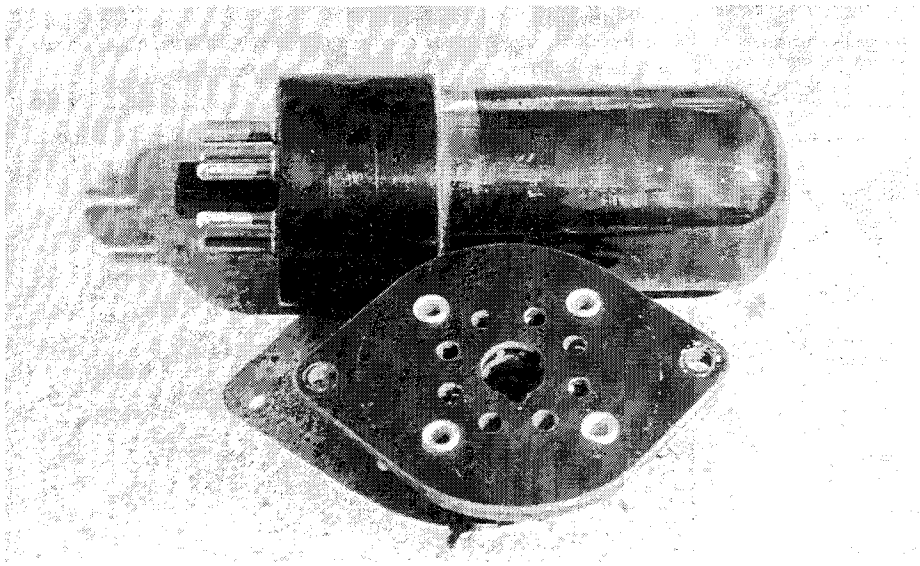
These pin diameters are a mixture of metric and imperial sizes and are as follows: 1mm (7 & 9-pin miniatures), 3/32-inch (octal), 1/8-inch and 5/32-inch (4, 5, 6 & 7-pin pre-octal).

A good selection of drills allows one to check just about any valve socket that is likely to be encountered in a domestic radio receiver. This simple check can quickly reveal possible socket problems due to poor contact tension.

As I have a lathe in my workshop, I decided to make up a set of valve socket gauges instead of using drill



**Loose and potentially troublesome valve socket connections are easily detected with the gauges. Pushing the gauge in & out of the pins five or six times also helps to clean the socket contacts.**



**There are approximately 30 valve socket connections in an average valve radio. It requires only one bad contact to cause problems. Firm pin contact is extremely important & all valve sockets should be carefully checked.**

shanks. As can be seen from one of the accompanying photographs, these gauges have knurled handles which are less likely to cut fingers as can be the case when using drills.

Checking the valve socket connections in this manner not only determines whether or not they are functioning properly but also cleans them at the same time. The best approach is to push the gauge in and out five or six times and then use a pipe cleaner to remove any dust and other undesirable rubbish. Deposits of green corrosion may require a more determined effort, however.

There are approximately 30 "dry" connections in an average 5-valve receiver in the valve sockets alone. Tone control switches and wave-change switches also add to the number of dry connections – all of which are a potential source of trouble if not carefully checked.

Therefore, anything that can be done to reduce the incidence of bad connections must contribute to more reliable valve radio restorations. **SC**