VINTAGE RADIO

By JOHN HILL

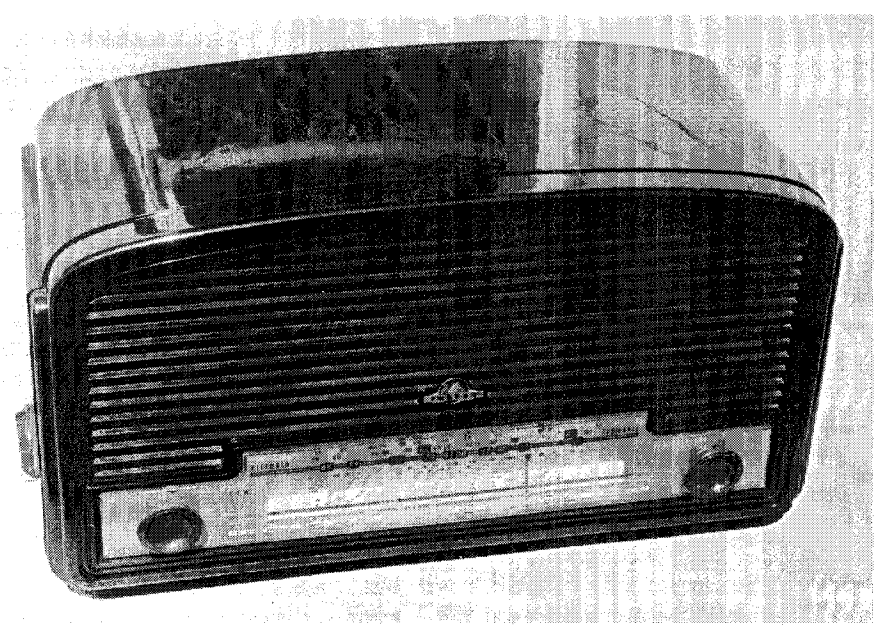
Bandspread tune-up for an old Astor multiband receiver

As readers could well imagine, I have met a lot of fellow radio collectors over the years, particularly since I began writing Vintage Radio. My monthly column has brought about many meetings and, in some instances, long and lasting friendships.

However, being a so-called "authority" on vintage radio does have its disadvantages, including the occasional knock on my door by complete strangers seeking advice on a particular receiver.

In fact, it was a knock on the door that started this month's story although, in this case, the owner of the receiver is well known to me. Generally, he is quite capable of servicing his own radios and can usually track down an elusive fault and fix it.

In this particular case, the receiver – a 1950 5-valve dual-wave Astor table model – had been repaired but the remaining problem was alignment. Not only was there an annoying double peak response when tuning but there was also the matter of three bandspread shortwave bands that were badly out of alignment. It seemed as though someone had tightened up all the adjustment slugs so that they wouldn't fall out.



This particular style of Astor receiver was popular in the early 1950s. It was available in four, five & 6-valve versions, some of which had three bandspread shortwave bands.

In a past series of three articles, I covered receiver alignment fairly thoroughly but shied away from multiband shortwave tune-ups. After three consecutive months devoted to alignment, it seemed about time to change the subject.

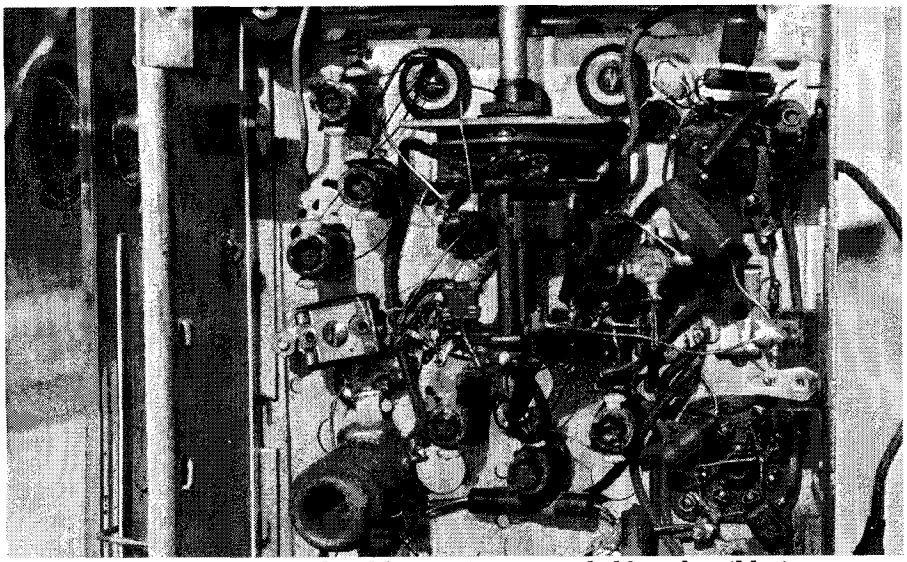
However, a multiband receiver such as this Astor offers different tune-up problems which should be discussed. Both the five and 6-valve versions of these Astors were popular radios back in the early 1950s and there are still a lot of them around. No doubt, a good many of them could do with a tune-up.

In my opinion, a realignment of this type cannot be satisfactorily carried out without a radio frequency generator and an output meter. It was the owner's lack of these items that led him to seek my assistance.

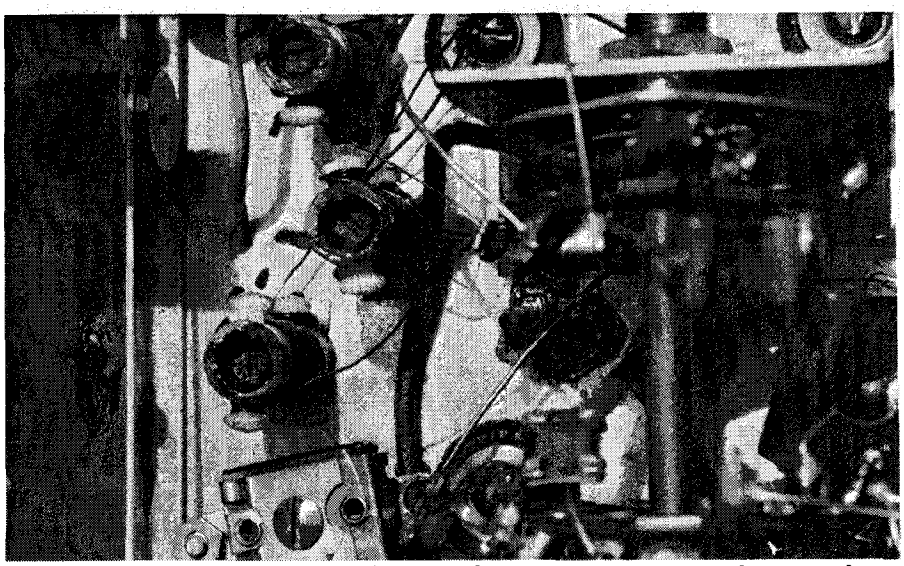
IF transformers

The first step was to align the intermediate frequency (IF) transformers, particularly as a double-peak problem is usually the result of these devices being out of alignment. Unfortunately, the IF alignment was not a straightforward job, as one of the adjustment slugs was stuck solid. To make matters worse, the adjustment slot in the soft iron core had been gouged out by a screwdriver blade. Nothing is ever as simple as first thought!

Tuning the RF generator slowly across the IF showed up the double peak, with one peak being stronger



The wave change switch in the old Astor is surrounded by a bewildering array of components & wiring. However, a close examination of the switch will reveal which coil is in circuit for each switch position. There are eight coils to adjust plus a trimmer.



The shortwave coils are arranged in two clusters of three. Shown here are the coils that are switched (one at a time) into the oscillator circuit. The wave change switch controls a large number of components.

than the other. The strong peak was at 455kHz while the lesser one was at 463kHz.

When correcting a problem of this nature there are a number of options available: (1) replace the faulty IF transformer if a replacement is available; (2) add correcting trimmer capacitors to the base connections; or (3) compensate for the immovable slug by shifting the ones that will move to the frequency of the one that has stuck. I tried the latter option, as it seemed the easiest solution.

After setting the RF generator to 455kHz, the IF transformers were readjusted to that frequency but there was no noticeable improvement. Readjusting the transformers to 463kHz produced a much sharper peak and, what's more, without any hint of the previous double peak. Try doing that without an RF generator and an output meter!

Not having a circuit diagram for the old Astor, I could only guess at what the IF was supposed to be but it would be unlikely to be anything other than 455kHz. While pulling the transformers off frequency a little is perhaps undesirable in theory, in practice it makes little or no difference to performance. It is definitely a better alternative to a double peak.

Broadcast band alignment

The next step was the alignment of the broadcast band. The Astor is fitted with a nonadjustable aerial coil, an iron-dust cored oscillator coil and a trimmer on each of the tuning capacitor's two sections. As there were pointer marks at each end of the dial, the pointer was adjusted to coincide with these marks. There were also marks at 600kHz and 1400kHz for alignment purposes.

Starting at the low-frequency end of the band, a 600kHz generator signal was fed into the aerial and earth terminals and the oscillator coil adjusted for maximum output as shown on the output meter. As there was no adjustment provided in the aerial coil, it was necessary to rock the tuning capacitor while adjusting the oscillator coil slug so as to locate the aerial coil peak. This adjustment did not quite bring the dial pointer to the 600kHz mark and so the pointer was slid along the dial cord a couple of millimetres until it coincided.

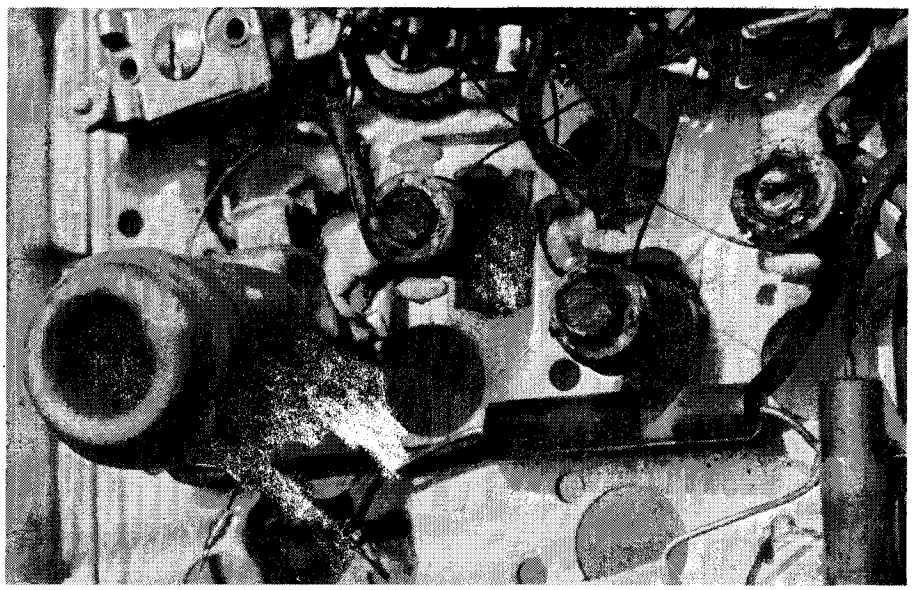
After injecting a signal of 1400kHz and transferring operations to the other end of the dial, the pointer was found to be spot on its designated mark. If it had not been, the pointer position could have been moved by adjusting the oscillator trimmer.

All that remained was to adjust the aerial trimmer for maximum output at the 1400kHz position. It too was almost spot on and the screw required only a few degrees of rotation to peak the output meter. This completed the broadcast band alignment.

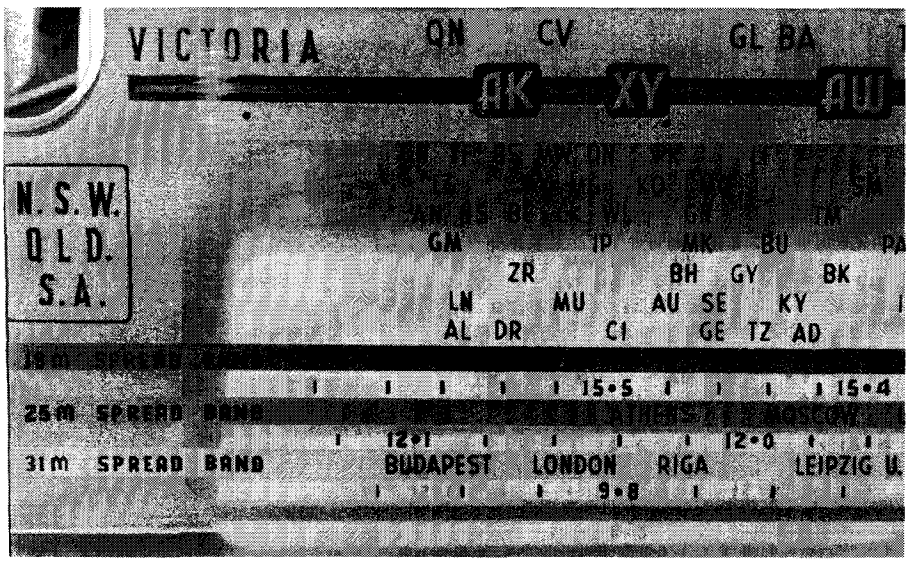
Shortwave bands

To the uninitiated, the 3-band, bandspread shortwave section with its array of six coils and adjustment slugs can be rather intimidating. However, taking one band at a time removes a lot of the mystery and two thirds of the coils.

If one looks closely at the wavechange switch, it is not difficult to work out which pair of coils (three pairs altogether) are brought into circuit at each of the three shortwave positions. It helps if the coils are then marked: a simple 1, 2 and 3 to correspond to the switch positions is all that is needed. This is fairly important for there is nothing more annoy-



This photo shows the broadcast band coil (the large coil at bottom left) plus the three smaller shortwave coils that are switched into the aerial circuit.



The three shortwave bands (19, 25 and 31 metres) are marked at the bottom of the dial. Note the clear frequency markings in MHz for each of these three shortwave bands.

ing than to move a previously aligned coil slug by mistake.

These pairs of shortwave coils are adjusted in much the same way as those for the broadcast band. During the alignment procedure, one coil from a group of three is switched alternately into the oscillator circuit and its slug adjusted to give the correct frequency on the dial. The other three coils are switched into the aerial circuit and are adjusted for maximum output. There are no trimmers with this type of set up.

In a bandspread receiver, such as the Astor, three of the more common shortwave bands were usually chosen. They are the 19, 25 and 31-metre bands. (Note: in a bandspread receiver of this type, a large fixed capacitor is connected in series with the tuning capacitor to restrict its tuning range. This is designed to make it easier to select stations without requiring a large step-down ratio in the tuning capacitor drive).

19-metre band

Alignment of the 19-metre band was first. As the dial is also marked in MHz, a frequency of 15.4MHz was chosen because it is towards the high frequency end of the dial. The RF generator was set to this frequency and its output injected into the aerial and earth terminals.

Selecting a frequency of exactly 15.4MHz on an RF generator is a difficult task without some assistance. The assistance in this instance was provided by a modern multiband receiver with digital tuning. All one has to do is tune to the required frequency on the synthesised receiver and place it near the RF generator. The RF generator is then adjusted until a squeal is heard in the receiver.

By using this technique, almost any obscure frequency can be dialled up on the synthesised receiver and the RF generator adjusted to suit. Receiver alignment on the shortwave bands can be a hit and miss (mostly miss) affair unless the generator frequency is accurately set.

All three shortwave bands required similar treatment; ie, adjustment of the oscillator coil slug to bring the frequency in line with the dial graduation, followed by aerial coil adjustment for maximum output.

Everything went fairly smoothly in the shortwave department, with no tight slugs to give trouble. The slug positions were held in place by re-melting the wax that was originally applied to them for that purpose. Just re-melting the wax with a warm soldering iron was enough to shift the frequency a little and some readjustment was required on one band. It doesn't take much to alter the settings on shortwave adjustments!

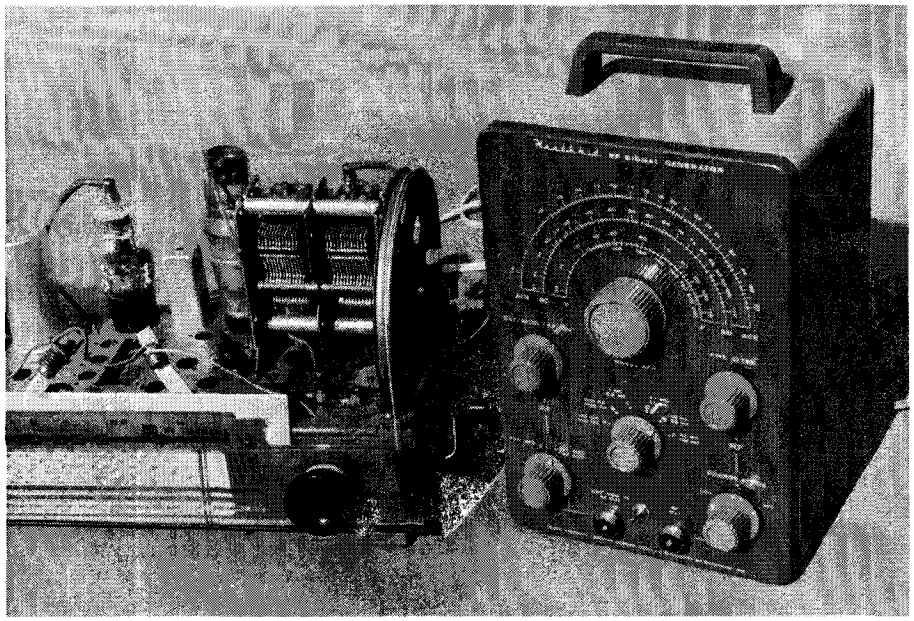
If the receiver had been a 6-valve model with a stage of RF amplification, then there would have been additional coils requiring adjustment in the RF section. These would need to be adjusted for maximum output after the oscillator and aerial coils had been reset.

Testing

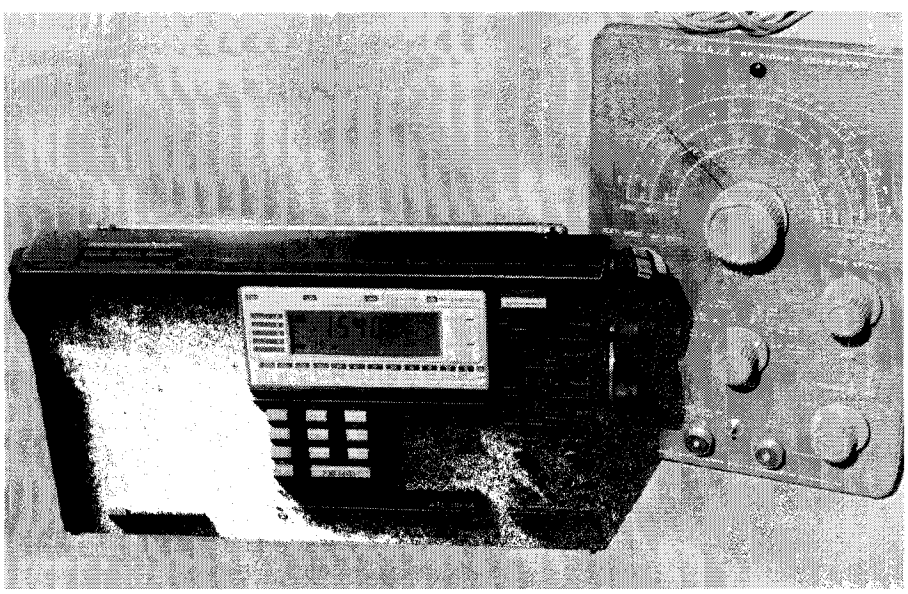
Testing the receiver was a bit of an anticlimax. It was midday in January and there was almost nothing to be heard on any of the three shortwave bands. It gave the impression that the shortwave bands had been completely detuned.

Fortunately, after-dark reception was a completely different story and all three bands responded well to all corners of the globe. The Astor's owner was very pleased.

All things considered, the realignment of the old Astor was a relatively



An RF generator is indispensable when aligning a shortwave receiver like the old Astor. The other essential item (not shown here) is an output meter.



Almost any desired frequency can be set accurately on the RF generator with the aid of this Sangean ATS-803A synthesised receiver. The receiver dial reads 15.4MHz – a convenient alignment point on the 19-metre band. It would be impossible to accurately set the RF generator to this frequency without the assistance of the digital receiver.

straightforward process. On the other hand, to attempt such a task without the aid of the RF generator and output meter would result in far from optimum results.

Alignment fiddles

Many of the valve receivers that we collect today are getting quite long in the tooth, this particular Astor being well over 40 years old. It is unreasonable to expect that someone at some time in the past hasn't had a fiddle with the alignment adjustments. If they used the right equipment and knew what they were doing, OK. But that may not have been the case.

I know from my own early alignment attempts that I'm guilty of misaligning many a good receiver. I'm sure I'm not the only one to do so.

Correct receiver alignment is an absolute necessity if the full potential of any radio is to be attained. A restoration is incomplete without a comprehensive tune-up to finish it off. **SC**