Hallicrafters SR-2000 and SR-400 6.5Mc I.F. alignment procedure.

Since I keyed this up in a conversation on another site, I thought it prudent to share it here as well. It describes a simplified procedure to align the 6.5Mc 1st IF system in the SR-2000 and SR-400 transceivers; one of the most difficult adjustments to get right.

The Hallicrafters factory alignment process used sweep analysis to adjust broadband amplifiers and has historically been very difficult and tricky.

There are three methods to align broadband I.F systems. Sweep alignment, sweep alignment using swamping, and the following method which is far simpler, and just as precise as either sweep technique.

There are two links, this one and the second, a photo that says more than the words.

There are two retired sweep techniques following this link that have been retained for educational purposes.

If you haven't tried sweep analysis for broadband filters try it. It is an interesting and educational experience. However, you can get it right with very little effort using the following method.

NOTE: The following simplified procedure can be used on any broadband filter that uses tight coupling to broaden the band width.

Please read the entire note before proceeding.

FOR THE SR-2000, DO NOT APPLY THE HIGH VOLTAGE AND FOR THE SR-400, DISCONNECT THE SCREEN!

1. Remove V12 the Heterodyne oscillator tube.
2. Band switch 14Mc.
3. Frequency dial 14.050Mc.
4. Scope probe 10X on V11AP2 for the SR-2000 and V11AP7 for the SR-400 and SR-400A. We will be looking for 6.0Mc to 6.5Mc at 3V PEV.
5. Set Tune mode.
6. Go to transmit. Don't worry about Xmit RF settings. Also, don't worry about plate current in the SR-400's. With the screen disconnected, there will be none.
7. Adjust T1 and T2 top and bottom slugs for peak.
8. Set frequency dial to 14.450Mc

9. Repeat step 7 noting which slugs need adjustment.

10. Set frequency dial back to 14.050.

11. Repeat step 7 at 14.050 and 14.450 until the peaks occur at both ends without the need for further adjustment.

12. If you have been successful you will measure approximately 3 volts PEV on V11P2 for the SR-2000 and V11AP7 for the SR-400 and SR-400A. Tune from 0 to 500Kc, end to end. The signal should not exceed 3db of ripple in or at the band edges.

NOTE: Walt Cates had a difficult time with the procedure and offered the following suggestion.

Back all of the slugs from both T1 and T2 out to the coil edge. Then begin by turning all of the slugs in one turn at a time until there is a measureable response.

Then peak both slugs in T1 simultaneously, then T2 until they are all peaked. Then repeat step 7 at both ends of the band to verify they peak equally at 14.050MC and 14.450Mc. Take care not to go beyond the peak. This will result in the slug moving into the space between coils. If it does, alignment will be impossible.

The reason for this behavior is the transformer has two windings each with a slug. You can turn a slug in so far that it moves beyond its coil into the area of the second coil. It will peak at one end of the band and fail at the other if this happens. Both slugs must be on the outside of their respective coils, not between, or alignment will be Impossible because the coupling will be totally distorted.

You may wonder what we just did. That broad band system is designed to be 500Kc wide with 3db skirts using tight coupling**,** and a 2200 ohm resistor across each coil winding. Tight coupling causes the output to look like a Bats wing and the resistor further flattens the shape. The resultant wave shape rises at the beginning droops in the center and rises again at the other end. See the photo.

What you just accomplished is to peak the wave shape at the ends of the bats wings, 14.050Mc and 14.450Mc which are the locations of the high points of the peak – droop - peak shape. The link to the photo clearly points this out.

NOTE: You can do a complete transmit alignment on the SR-2000 including neutralization without applying the high voltage and on the SR-400 after detaching the screen.

With the screen detached in the SR-400, there will be no plate current. This will enable you to do protracted alignment while not harming the finals.

Simply make a copper shield about one inch long that fits snugly around the 12BY7A and do not allow it to touch ground. Silver solder a one inch length of wire to the shield so that you can connect a scope probe without it melting from the heat.

Attach a 10X scope probe to the ungrounded copper shield and set the scope to 1 volt/division. Use this setup to measure the results rather than the transmit output.

The SR-2000 in tune mode will measure approximately 20 to 25 volts PEP with the transmit RF drive set fully clock wise. The SR-400 will measure approximately 45 volts same conditions. In both cases these measurements represent adequate drive to saturate the finals.

Hope you have found this of interest and if it lacks clarity please send a note so I might correct it.