

# R4B Receiver Alignment Using “Alignment Loads” Does Make A Difference

By: Garey Barrell, K4OAH

There has been discussion over the years questioning whether the various 'Alignment Loads' specified in the Drake service procedures were really necessary. Many seem to think that they are not really necessary, and that the radios work fine just by alternately peaking the inductors or caps involved. The type of load varies from model to model, but whether it's just resistors, resistor and cap, or as simple as touching a screwdriver to a switch point, it DOES change things. By the way, a short insulated clip lead is a little easier to handle than a screwdriver.

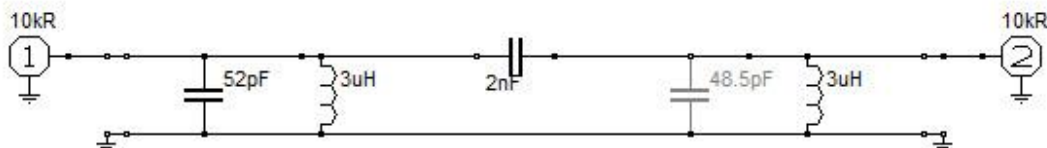
Guess what?? If DOES matter, and once again Drake engineers really DID know what they were doing.!!

I took the PreMixer bandpass filter in the R-4B as a test case. The circuit is similar in the T-4XB.

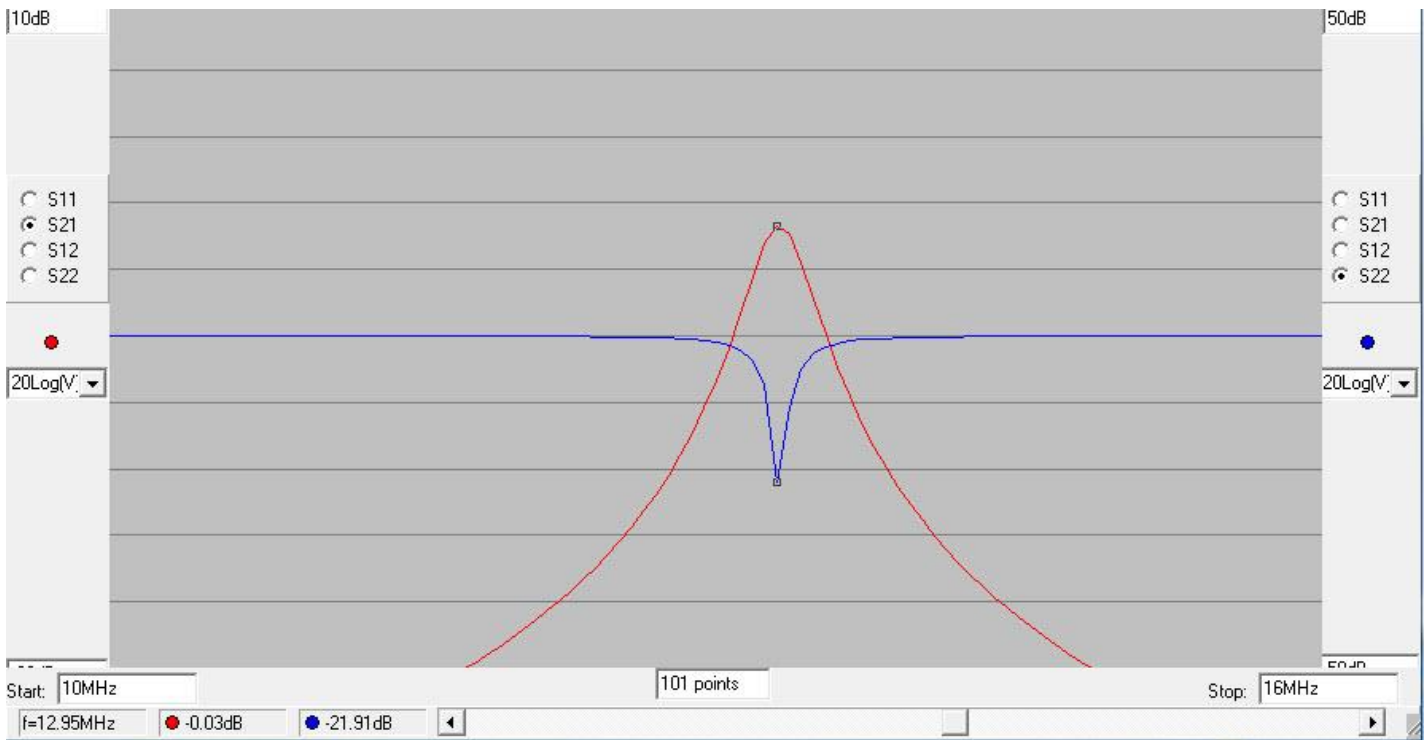
The receiver circuit involved consists of transformers T3 and T4 and associated resonating capacitors. These components are connected as a 'Critically Coupled' bandpass filter as shown below.

## Drake R-4B PreMixer Bandpass Filter

40M Band - 12.945 MHz PreMix Signal



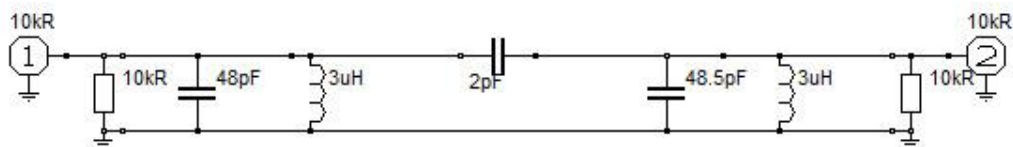
If this circuit is tuned to the frequency specified in the manual by alternately adjusting the two resonating capacitors, the passband looks like the RED trace. The marker is at 12.945 MHz, the PreMixer frequency when the receiver is tuned to 7.3 MHz:



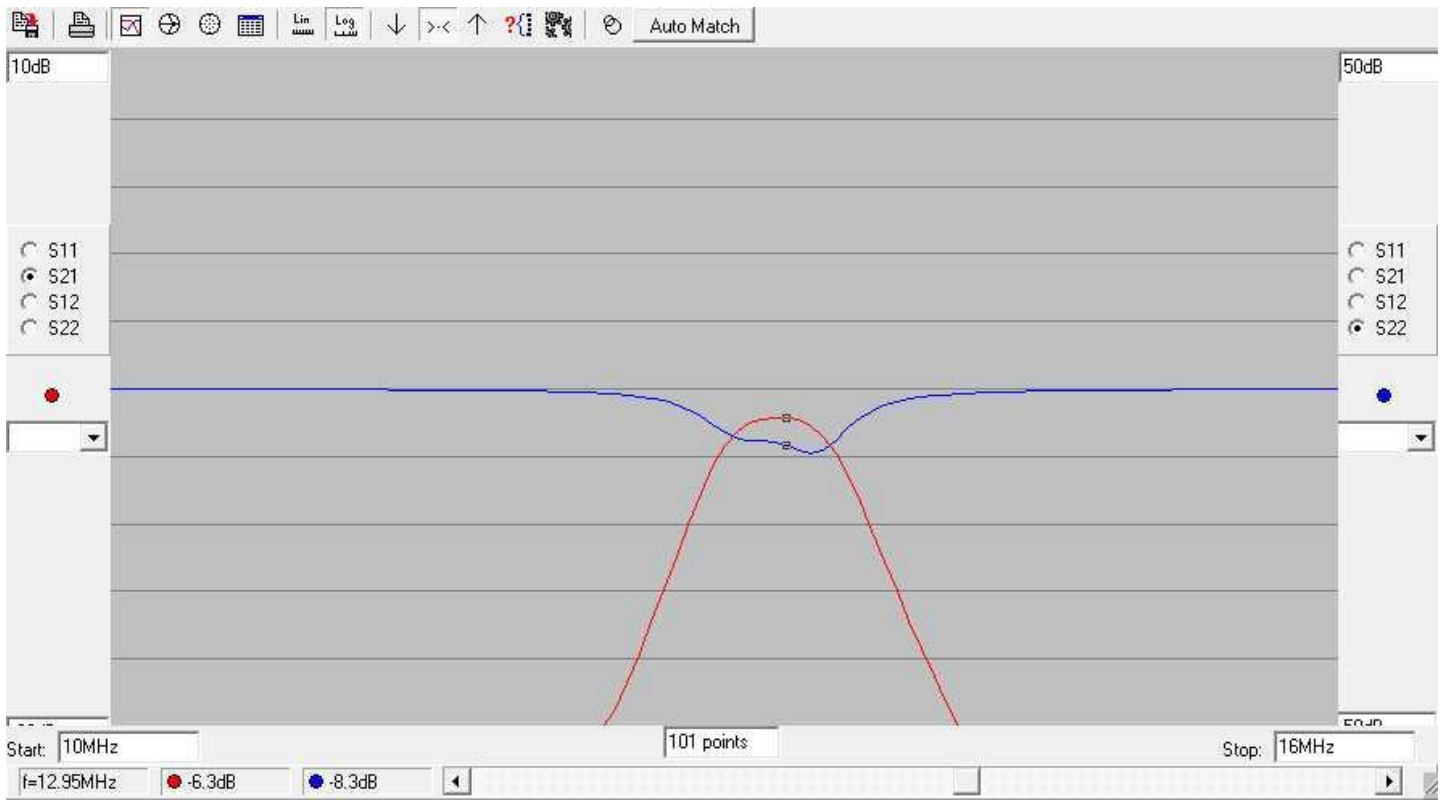
Next we add the two 10k loading resistors specified in the procedure. In the actual receiver, one resistor goes to B+ and the other goes to chassis ground, but since the B+ is 'RF Grounded' we can cheat a little in the schematic.

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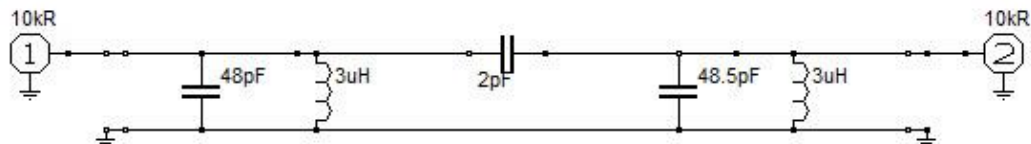
When the two 10k resistors are connected as described in the procedure and the trimmers peaked at the same frequency, the trace looks like this:

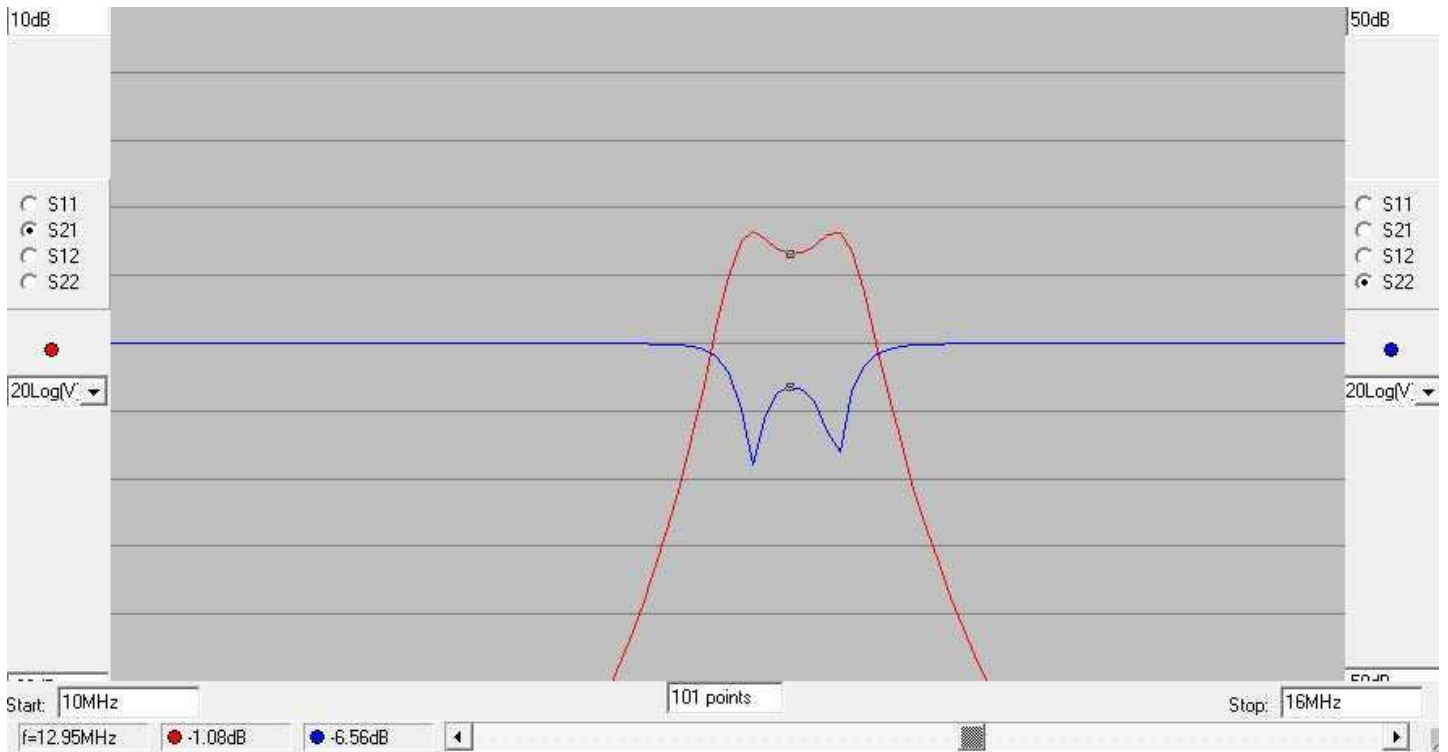


Finally, when we remove the 10k loading resistors, this is the result!

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A fine adjustment of the 2 pF coupling capacitor could bring up that dip in the center, but it's only about half a dB. Not only is the top of the filter wider, the skirts are also steeper providing broader PreMixer tuning along with better spurious reduction.

So as usual, once WE understand, it makes sense!

Garey Barrell, K4OAH