

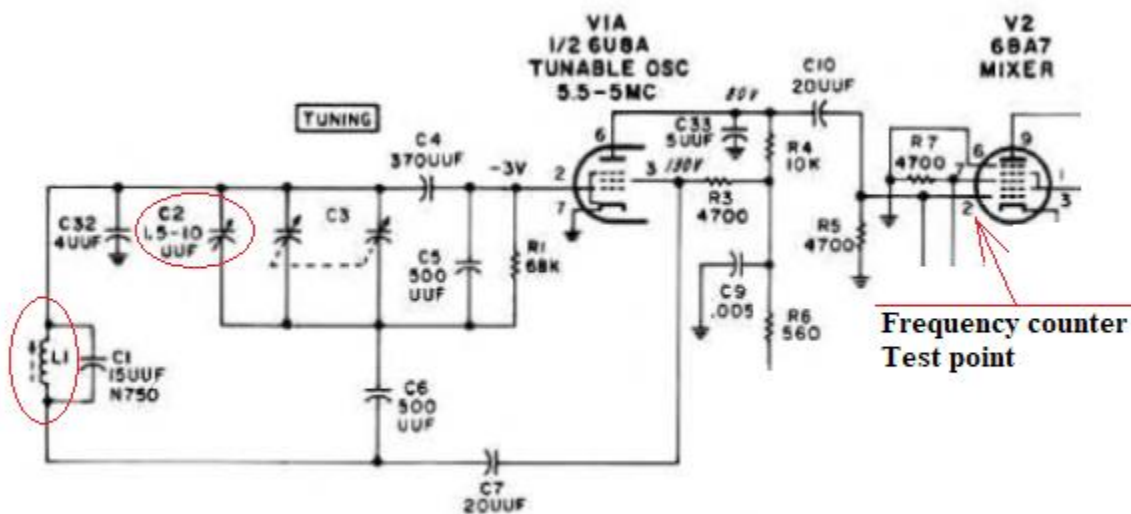
HA-5 VARIABLE OSCILLATOR PRECISION ALIGNMENT

BACKGROUND

The OPERATING AND SERVICE MANUAL for the HA-5 was written in a time when frequency counters were rare in most Ham radio shacks. Using external receivers was the best way to track VFO's. The following process is much more accurate. However, it does amplify the importance of the crystal oscillator being dead on frequency. The following chart illustrates the amount of error in the final frequency for each band. *Example:* The largest error is on 2-meters. If the crystal oscillator is off frequency by 300Hz the output frequency of the 2-meter transmitter will be off by 5.4KHz.

There is very little you can do to correct frequency errors in the crystal osc. If the error is linier from Y1 to Y4 then it is possible to alter the values of C21 and C31 to bring the error within acceptable limits. Otherwise swapping out xtals, if you can find them, is your only option. These errors will not render the equipment unusable, you will have to keep in mind there will be an offset error between the dial on the HA-5 and the operating frequency.

CRYSTAL OSC	BAND	ERROR MULTIPLIER
Y1	80M	X1
Y2	40M	X1
	20M	X2
	15M	X3
	10M	X4
Y3	6M	X5
Y4	2M	X18



VFO ALIGNMENT PROCEDURE

The following is a replacement for the procedures described in the sections 8-2 and 8-3 of the Hallicrafters OPERATING AND SERVICE MANUAL for the HA-5

Remove the unit from the case.

- 1, Set band switch to 80-meters.
- 2, Remove Y1.
- 3, Connect frequency counter to pin 2 of V2.
- 4, Set the dial to 3.5 MHz on the 80-meter dial.

Power up and allow thirty minutes warm up.

- A, Ensure the dial is still set to 3.5 MHz. Adjust C2 for 5.500 MHz on the counter.
- B, Set the dial for 4.0MHz on the 80-meter dial.
- C, Adjust L1 for 5.000Mhz on the counter.

The adjustment of C2 and L1 interact. You may have to repeat steps A, B and C several times, over correcting or under correcting on one end or the other to get it to fall into place.

The final goal is detailed in the chart below.

DIAL	VARIABLE OSC FREQUENCY
3.500 MHz	5.500 MHz
3.600 MHz	5.400 MHz
3.700 MHz	5.300 MHz
3.800 MHz	5.200 MHz
3.900 MHz	5.100 MHz
4.000 MHz	5.000 MHz

Once you are satisfied with the alignment of the VFO return to the OPERATING AND SERVICE MANUAL and complete the procedures contained in section 8-4.

IMPORTANT!: See the attached errata sheet and be sure you have made the correction to the manual described in item 12 of the errata sheet.

Errata sheet

Model ha-5

After the Instruction Manual was printed but prior to production certain minor electrical changes were made to improve equipment performance.

1. In the parts list, delete capacitors C1A, C1b, and C8 and resistors R2 and R11
2. In the parts list, change capacitor C17 from 0.005uf to 0.002uf 20%, 500v, Ceramic Disc type, part number 047-100395.
3. In the parts list, add capacitor C1, 14uuf, 500v, **N750**, ceramic tubular type, part number 491-106150-150.
4. In the parts list, add capacitor C32, 4uuf, 500v, **NPO**, Ceramic Tubular type, part number 491-101040-43.
5. In the parts list, add Capacitor C33, 5uuf, 300v plastic mica type, part number 481-162050.
6. In the parts list, add capacitors C34, C35, and C37, 100uuf, 300v, Plastic Mica type, part number 482-162101.
7. In the parts list, add capacitor C36, 1uuf, composition type, part number 047-200403-2
8. In the parts list change resistor R4 from 47K ohms to 10kohms, part number 451-252221.
9. In the parts list, Change resistor R8 from 15K ohms, 2watt to 22K ohms, 2 watt, part number 451-652223.
10. In the parts list, change resistor R12 from 560 ohms to 220 ohms, part number 452-252221.
11. In the parts list, change resistor R13 from 47K 1 watt, to 18k ohms, 1 watt, part number 451-352183.
- 12. On page -9-, figure 7 in the upper left-hand corner, change reference L4 to L2; near to the right of this, change reference L2 to L4.**