

(14) After separating the 2.0 and 3.0 mc end-points of the VFO by exactly 10 turns, replace the hex plug, put the VFO in the receiver and replace the front panel. Align the receiver dials with the VFO according to the procedure outlined in paragraph 5.4. (b). It is not necessary to readjust the r-f and i-f amplifiers for small changes in the VFO adjustment.

(c) **EXAMPLES.** - The following examples illustrate the procedure outlined in paragraph (b).

NOTE

DO NOT ATTEMPT TO FOLLOW THESE EXAMPLES AS INSTRUCTIONS. THEY ARE PURELY HYPOTHETICAL INCLUDED FOR ILLUSTRATIVE PURPOSES ONLY.

(1) Zero the pointer at the low frequency end-point (2.0 mc) of the VFO. Read zero on the shaft dial. Rotate shaft exactly 10 turns counterclockwise. Again read zero on the dial. A beat note is audible at this setting. Find zero beat by turning VFO shaft by 4 divisions clockwise. This indicates that the endpoints are 4 divisions less than 10 turns apart. Multiply the 4 error divisions by 1.5 to arrive at 6. Rotate VFO shaft counterclockwise by 6 divisions since zero beat occurs at less than 10 turns. Turn trimmer screw to zero beat. Rotate VFO shaft exactly 10 turns clockwise to check whether the endpoints are now exactly 10 turns apart. If they are not, repeat procedure in paragraph (b) until they are.

(2) Zero the pointer at the low frequency end-point (2.0 mc) of the VFO. Read zero on the shaft dial. Rotate shaft exactly 10 turns counterclockwise. Again read zero on the dial. A beat note is audible at this setting. Find zero beat by turning VFO shaft by 5 divisions counterclockwise. This indicates that the endpoints are 5 divisions more than 10 turns apart. Multiply the 5 error divisions by 1.5 to arrive at 7.5. Rotate VFO shaft clockwise by 7.5 divisions since zero beat occurs at more than 10 turns. Turn trimmer screw to zero beat. Rotate VFO shaft exactly 10 turns clockwise to check whether the endpoints are now exactly 10 turns apart. If they are not, repeat procedure in paragraph (b) until they are.

5.3.16. **ADJUSTMENT OF L124.** - Reach L124 from the bottom of the chassis. Adjust as follows:

(a) Turn BFO ON and tune in the spurious signal at 1250 kc.

(b) Adjust L124 for greatest attenuation of the spurious signal.

5.3.17. **INTERMEDIATE AMPLIFIER GAIN ADJUSTMENT.** - The current models of 51J-4 are equipped with a variable resistor for adjusting the intermediate amplifier gain. This resistor is R187, a screwdriver adjusted control that is reached from the top of the chassis. This control is set and locked at the factory for optimum results. If aging or changing tubes makes it necessary to readjust this control, use the following method:

(a) Attach a 50-ohm load to the IF OUTPUT jack, J104.

(b) Inject 3 microvolts unmodulated into the ANTENNA input jack, J101, with the receiver and generator tuned to 2.1 mc.

(c) Adjust the i-f gain control R187 until 270 millivolts are obtained at the IF OUTPUT jack.

5.4. COMPLETE VFO REMOVAL AND REPLACEMENT.

(a) **REMOVAL.** - If the vfo has to be completely removed from the receiver for servicing, proceed as follows:

(1) Remove the front panel and allow it to swing forward on the wires. (See paragraph 5.6.2. for detailed instructions on removing the front panel.)

(2) Loosen set screws on the vfo coupler. Pull coupler apart and remove the center disk.

(3) Mark the vfo connecting wires so that they may be reconnected correctly. Unsolder the wires.

(4) Remove the three screws that hold the vfo to the gear mounting plate. The upper right screw, as viewed from front of plate, is accessible through a hole in the gear by turning the KILOCYCLE shaft to align the hole over the screw.

(5) Slide the vfo back and tip the rear downward.

(6) Pull the vfo from the receiver.

(b) **REPLACEMENT.** - To replace a vfo in the receiver, reverse the above procedure. Replace the front panel and knobs; reassemble the vfo coupler. Tighten set screws on the vfo end but do not tighten the set screws on the front end of the coupler. The procedure used in aligning the vfo with the receiver tuning dials is as follows:

(1) Carefully turn the oscillator shaft in a clockwise direction until the stop in the oscillator is reached. (DO NOT FORCE THE SHAFT BEYOND THIS STOP.) Back off one turn.