

d. With Mic. Button pressed, adjust CAR. BAL. control for slight increase in meter reading, 50 to 60 ma. Adjust P.A. TUNE to resonance, (dip).

e. Adjust coils as indicated by alignment chart for maximum meter reading. When reading goes higher than 80 ma., or so, adjust CAR. BAL. for 60 ma. again.

f. Adjust coils carefully for maximum peak. Exercise caution with CAR. BAL. control. Do not exceed 100 ma. reading for more than a few seconds. Be sure P.A. TUNE control is resonated, (adjusted for "dip" in meter reading).

g. Switch to 3.5 mc band, and repeat steps (a) through (f), following the tuning chart carefully. Follow this procedure through for each other band.

**3. Power Amplifier Neutralization.** Perform the power amplifier neutralization adjustment on 20 meters and in the following manner.

a. After allowing approximately five minutes for warm-up, tune the transmitter to approximately 14.250 mc.

b. Position the P.A. LOAD control to the 9 o'clock position, (full counter clockwise).

c. Set meter switch to P.A. CATH.

d. Key the transmitter with the microphone switch, and without speaking into the microphone, adjust the CAR. BAL. control for a power amplifier current of approximately 100 ma. Adjust the DRIVER control for peak. Quickly adjust CAR. BAL. to 100 ma. again if it increased to a higher reading.

e. With the Mic. Button still pressed, rotate the P.A. TUNE control through its range from 9 o'clock to 3 o'clock. You will note a pronounced "dip" in meter reading at resonance. Observe any tendency for the meter to "peak" above the 100 ma. plateau on either side of resonance. If there is such a peak, adjust C402, the P.A. Neutralizing trimmer to suppress the peak. When properly neutralized, the meter reading will hold steadily at 100 ma. except for the sharp dip at resonance but there will be no peak above the 100 ma. level.

f. Key the transmitter with the microphone switch and re-adjust the CAR. BAL. control for minimum power amplifier current. Power amplifier idling current should be on the delta symbol. If not, repeat the power amplifier bias adjustment described on Page 13.

**4. Carrier Frequency Adjustment.** A dummy load wattmeter and audio generator are required for this adjustment.

a. After allowing a five-minute warm-up period, tune the transmitter to approximately 14.250 mc.

b. Key the transmitter with the microphone switch and adjust the CAR. BAL. control for minimum power amplifier current.

c. Insert 1500 cycles of audio from an audio generator into the Mic. Jack located on the front panel. Adjust the gain of the audio generator and the Mic. Gain control (R1404) until the wattmeter reads approximately 10 or 15 watts.

d. Adjust the first IF coil (L701) for maximum output. Adjust both slugs of the balanced modulator transformer (T1301) for maximum output.

e. Increase gain of audio generator until wattmeter reads 40 watts. Sweep generator down to 300 cycles and adjust the normal sideband carrier oscillator trimmer (C1502) for a reading of 10 watts.

f. Switch to the Opposite Sideband. Adjust the Opposite Sideband Carrier Oscillator trimmer (C1504) for a reading of 10 watts.

g. Re-check with audio generator set at 1500 cycles and 40 watts. Sweep down to 300 and re-adjust Carrier Oscillator capacitor, if required, for 10 watts.

**5. Carrier Balance Adjustment.** Several times during the preceding adjustments, the CAR. BAL. control has been adjusted for varying reasons. Be sure that this control is always re-set for exact null before operating.

**NOTE**

If at any time the Balanced Modulator Tube (6JH8) is replaced it may be necessary to adjust R1303, the Mini Potentiometer located on the 6JH8 tube socket, for exact Carrier Balance Null. This control is factory set and should not need adjustment except in case of tube replacement. A recommended way of adjusting the control is to locate your transmitting signal on an external receiver. Then adjust R1303 for minimum carrier while listening to the external receiver.

**VFO CALIBRATION**

**1.** After allowing approximately five minutes for warm-up, tune the receiver near 3800 KC. Using a frequency standard or a 100 KC crystal calibrator as an accurate signal source, tune the signal for zero beat and note the corresponding dial reading. If the 3800 KC signal does not zero beat at 3800 on the dial, adjust the 80 Meter trimmer until it does.

**2.** In a similar manner, check each of the other bands in the normally used portion of the band. For example: 7200 kc., 14,200 or 14,300, 21,300, or 21,400, 28,700 or whichever portion of 10 meters is normally used. Accuracy in other parts of the bands will be quite good, but remember that the Cygnet is not to be considered a frequency standard. Be cautious when operating near band edges. FCC regulations require that every amateur radio station have a means available for measuring his transmitting frequency.

If a frequency meter or frequency counter is available, the information contained in Table II can be used to perform direct VFO and Carrier Oscillator frequency measurements.