

and measuring across socket terminals. The MEGACYCLE control must be set to a band which employs the crystal removed. See table in paragraph 4.2.4. Should this capacitor, C167, be badly mistuned, the crystals will be off frequency and low in output.

(b) Connect a 470K-ohm resistor to pin 7 of tube V102. Connect VTVM between free end of 470-ohm resistor and chassis. This resistor reduces the effect of the capacitance of the meter lead.

(c) In all of the following adjustments, peak the trimmers if the indicated voltage is not more than 2 volts. If it is more than 2 volts, detune trimmer toward minimum capacitance, until the voltage reads 2. See figure 5-1.

(1) Turn receiver on. Set bandswitch on band 30; then tune trimmer marked 30 according to the procedure in paragraph (c), above.

(2) Repeat, tuning trimmer marked 28, with bandswitch on band 28.

(3) Repeat on even bands from 26 through 14, tuning correspondingly marked trimmers.

(4) Repeat with bandswitch on band 1. Adjust trimmer labeled B. C. That is nearer V105.

(d) Remove 470K-ohm resistor from V102. Connect the resistor to pin 1 of V103. Connect VTVM between free end of resistor and chassis.

(e) Place bandswitch on band 1. Tune for maximum indication on VTVM the trimmer marked B. C. that was not previously tuned.

5.3.4. 100 KC CALIBRATION OSCILLATOR ALIGNMENT. - Calibrate the 100-kc calibration oscillator by means of the CAL trimmer, C224, located on the front panel, using a primary frequency standard. D-c grid voltage on V104, as indicated on a d-c VTVM should be a negative 15-30 volts minimum.

5.3.5. FIXED 500 KC I-F AMPLIFIER ALIGNMENT. - Connect signal generator between pin 7 of V106 and chassis. Connect one end of a clip lead to output of 100-kc calibration oscillator at C173. Hold the other end near grid of V106. Be sure BFO is in OFF position. Set signal generator to zero beat at 500 kc. Turn off 100-kc calibration oscillator and remove clip lead. Connect a d-c VTVM from the diode load resistor R151 to chassis.

Place SELECTIVITY switch in "O" position. Select the 3 kc mechanical filter.

(a) Tune L301 by adjusting the slug for maximum indication on VTVM. Keep diode load voltage below 3 volts by adjusting signal generator output.

(b) Connect detuning network from plate of V108 to chassis. Tune secondary of T104 for maximum indication on VTVM.

(c) Connect detuning network to terminal 4 of T104. Tune primary of T104 for maximum indication on VTVM.

(d) Connect detuning network to plate of V109. Tune secondary of T105 for maximum indication on VTVM.

(e) Connect detuning network to terminal 4 of T105. Tune primary of T105 for maximum indication on VTVM.

(f) Remove detuning network from terminal 4 of T105. Tune T101 for maximum VTVM indication.

(g) If the BFO PITCH knob has never been off the shaft during the life of the receiver, align the BFO as follows: Turn BFO on. Set the line on the BFO PITCH knob at the fiducial mark on the panel. Adjust core in T106 (figure 5-1) to zero beat.

If the BFO PITCH knob has ever been off the shaft, align the BFO as follows: Turn BFO on. Adjust core in T106 to produce a beat note. Line up the knob with the panel mark and with the mid-range point of the BFO pitch capacitor by turning the knob to either the right or the left of the fiducial panel mark until pitch of beat note rises to a maximum. Leave knob exactly at point of maximum pitch. BFO PITCH capacitor plates are now either all in or all out. Loosen set screws in BFO PITCH knob. Rotate knob on shaft until knob mark is 90° from panel mark. Tighten set screws. Set knob mark at fiducial mark on panel. BFO PITCH capacitor is now at mid-range. Adjust core of T106 to zero beat. (A method of aligning the BFO without a signal generator is given in paragraph 5.3.6. below).

(h) Align T102 as follows:

(1) Use an oscilloscope and a frequency-modulated signal generator having a sweep rate of four cycles per second, a frequency excursion of about 20 kc and a carrier frequency between 1.5 and 3.5 mc.