

Section 3  
ADJUSTMENT AND OPERATION

will not give an over-all gain in results because of the loss in audio frequencies.

3.2.3. TUNING SINGLE-SIDEBAND SIGNALS.

The 51J-4 is used for single sideband reception in much the same manner as is any other communications receiver. The transmitted signals carrier must be reinserted at the receiver, of course, and in the 51J-4, this is done by turning on the BFO. Before attempting to receive single sideband signals, calibrate the BFO following the procedure in paragraph (a) below. After the BFO has once been calibrated it will only be necessary to recalibrate as component aging or extreme temperature variations cause the BFO frequency to shift.

(a) Calibrating the BFO. Calibrating the BFO makes it possible to set the receiver up for single sideband reception with minimum delay thereafter. It, in effect, establishes the correct point in the receivers passband at which the carrier is being reinserted. See figure 3-2(B). We calibrate for both upper and lower sideband operation.

(1) Set up for AM reception but do not turn on the crystal filter. (POWER ON; operate BAND CHANGE to desired band; BFO to OFF; AVC to ON; AUDIO GAIN maximum - use RF GAIN for volume control; use 3 kc filter).

(2) Turn the CALIBRATE switch to ON and tune to the exact center of the signal (the "S" meter is helpful here). Turn on the BFO. If the BFO is correctly adjusted the zero beat should occur at or very near the center position of the BFO PITCH knob. Turn the BFO off.

(3) It has been determined that for best results, the reinserted carrier (BFO signal) should be placed 18 to 20 db down on the filter skirt. The point to set the BFO can be found by the following method: Tune in a signal of approximately S-9 either from the calibrator at one of the calibrator check points or from a signal generator. Tune the receiver dial below the signal until the S-meter has dropped 3-S units (18 db). Turn the BFO switch to ON. Increase the audio gain and decrease the RF gain to prevent overloading. Zero beat the bfo with the front panel BFO PITCH control. Note the position of the BFO PITCH knob.

(4) Return the receiver controls for AM reception, tune the receiver dial above the input signal until the S-meter shows a decrease of 3-S units on this side of the filter curve. Again return to CW reception, zero beat the BFO PITCH and note the knob position.

(b) Set up for single-sideband reception: Power ON; operate BAND CHANGE to desired band; BFO to ON; LIMITER to OUT; SELECTIVITY to O; AVC to OFF; use 3 kc filter maximum - use RF GAIN for volume control.

(c) Adjust ANT. TRIM for maximum back-ground noise.

(d) Tune to S.S.S.C. station with RF GAIN at low setting to prevent overload. (There is no avc now.)

(e) Turn the BFO PITCH control counterclockwise to the left hand position mark as determined in step (a).

(f) Very carefully adjust the main tuning dial until the S.S.S.C. signal becomes readable. This may take considerable patience the first few times because tuning to an S.S.S.C. station is more critical than tuning for AM signals. Do not adjust the BFO PITCH after it is once set - rather, make all tuning adjustments with the main tuning dial. If the signals cannot be made readable, set the BFO PITCH to the clockwise mark and again carefully adjust the main tuning dial.

(g) Advance the RF GAIN to suit.

(h) If heterodyne interference is severe, turn the SELECTIVITY control position 1 and adjust the crystal filter PHASING control to "notch out" the interfering signal, as described in paragraph 3.2.1. (n), of this section.

3.2.4. TUNING CW SIGNALS.

The extreme selectivity of the 51J-4 Receiver makes single-signal reception an inherent feature of the set. However, because of the selectivity, careful tuning and special techniques are in order. Best single-signal reception is with the BFO PITCH set to produce a 1000 cps peak note when using the 3 kc filter.

(a) Set up for CW reception: Power ON; operate BAND CHANGE to desired band; BFO to ON; SELECTIVITY to O; LIMITER to OUT; AVC to OUT; AUDIO GAIN maximum - use RF GAIN for volume control.

(b) Adjust BFO PITCH to approximately 1/4" off the index mark.

(c) Adjust ANT. TRIM for maximum back-ground noise.