

(d) Tune in a cw station. Carefully adjust the main tuning control for the loudest signal.

(e) Adjust the BFO PITCH control to the desired pitch.

(f) If interference is present try tuning to zero beat with the interference while at the same time retaining an audible beat note with the desired signal.

(g) If the results of step f. are unsatisfactory, turn the BFO PITCH control to the other side of center and repeat step f.

(h) If steps f. and g. do not produce satisfactory reception, plate the SELECTIVITY in positions 1-2-3 or 4, as required, and carefully retune the main tuning control. When greatest audio output is reached, move the PHASING control slowly out each side from center and try to phase out the interfering signal. If adjacent signals are no problem, leave the PHASING control in center position for minimum background hiss.

(i) Further selectivity can be gained by switching in the 1 kc filter on receivers so equipped. The tuning procedures are the same except that the BFO PITCH control must not be set so far out. When searching for signals it is usually better to use the 3 kc filter and have the crystal filter out, i. e. SELECTIVITY control in the O position.

### 3.2.5. FREQUENCY MEASURING.

For AM and single-sideband reception using the 3 kc filter the 51J-4 dial reading will not necessarily correspond to the carrier frequency of the station being received. Depending upon whether the upper or lower sideband is tuned, the actual carrier frequency will be approximately 1.5 kc lower or higher than the dial reading indicates. For CW reception, if the CW station is properly tuned, the

dial reading should correspond to the carrier frequency. More accurate frequency measuring procedures are outlined below.

(a) Calibration: Frequency readings will be more accurate if the calibrator is used to calibrate the dial before frequency measurements are made. To use the calibrator, set up for CW reception (paragraph 3.2.4. (a) of this section), tune to the 100-kc point nearest the frequency to be measured, set the BFO PITCH control to center position, and turn on the calibrator. Zero beat the calibrator signal, using the main tuning control. Adjust the ZERO ADJ knob so that the dial marker lines up with zero on the KILOCYCLE dial. Turn off the calibrator.

(b) To measure the carrier frequency of an AM station, turn the SELECTIVITY control to 4, tune the station for maximum "S" meter reading, and read the frequency on the tuning dial.

### 3.3. NOTES ON MECHANICAL FILTERS.

3.3.1. GENERAL. - Certain characteristics of the mechanical filter must be considered when choosing the filter best suited for the reception conditions of each signal.

(a) Selective fading may be more noticeable when receiving AM on just one sideband. If selective fading is bad but adjacent channel interference is not, choose the 6 kc filter and tune the signal at the center of the passband.

(b) When using the 3 kc filter and one sideband for reception, there is an inherent 6 db loss in detector sensitivity due to detecting only one sideband; however, 3 db is picked up because of using a narrower bandwidth. Thus there is a net loss of 3 db in sensitivity. On weak signals it may be better to choose the 6 kc filter and tune "on the nose" except in event of adjacent channel interference, in which case the 3 kc filter may still be the best choice.