

SECTION III ADJUSTMENT AND OPERATION

3.1. ADJUSTMENT.

3.1.1. GENERAL. - Other than zeroing the S meter no preoperational adjustments are necessary. Should the S meter require zeroing, turn the receiver ON, BFO OFF, AVC ON, and the 100 KC CRYSTAL OFF; then turn the RF GAIN fully clockwise. Short the antenna terminals; then turn the meter zeroing control until the S meter reads zero. Refer to figure 5-1 for location of this control.

3.2. OPERATION.

3.2.1. FUNCTION OF CONTROLS. - Operation of the 51J-4 Receiver is exceedingly simple if the functioning of the controls is understood. The following paragraphs explain the functions of the controls on the receiver's front panel.

(a) OFF-STANDBY-ON. - In the OFF position, this control opens the primary power circuit to turn the equipment completely off. In the STANDBY position the power transformer is excited, thus producing filament voltage for all stages and plate voltage for all except three i-f amplifier stages. In the ON position the receiver is completely operative.

(b) RF GAIN. - The RF GAIN control is located in the grid return circuit of the avc controlled tubes and is operative at all times. It varies the amount of fixed bias placed upon the grids of these tubes.

(c) AUDIO GAIN. - The AUDIO GAIN control is located in the grid circuit of the first audio amplifier and is operative at all times. It varies the amount of a-f signal applied to the grid of this tube, and thereby controls the amount of audio power produced by the receiver.

(d) BAND CHANGE. - Any one of the 30 bands may be selected by 1/2 revolution intervals by means of this knob. A stiff detent accurately positions the controlled switches on each band.

(e) MEGACYCLE. - The MEGACYCLE scale is on the slide-rule type dial. It is calibrated in ten 100 kc divisions, each of which equals one full turn

of the circular KILOCYCLE dial. The 1.5 to 2.5 mc and 2.5 to 3.5 mc bands are printed in red, indicating that the red scale on the KILOCYCLE dial must be used when operating on these bands. The pointer on the MEGACYCLE dial is operated by the KILOCYCLE control while the scale is changed by operation of the BAND CHANGE control.

(f) KILOCYCLE. - The KILOCYCLE dial is the main tuning control on the 51J-4 receiver. Each division on its circular face represents one kilocycle. One full turn of the dial tunes the receiver through 100 kilocycles, or one division of the MEGACYCLE scale. To read the tuning dials, merely combine the figures of the MEGACYCLE dial with those of the KILOCYCLE dial, thus arriving at the frequency in kilocycles. For example, a reading of 14.1 on the MEGACYCLE dial and of 78 on the KILOCYCLE dial indicates a frequency of 14178 kc. The KILOCYCLE scale for the 1.5 to 2.5 and 2.5 to 3.5 mc bands is in reverse order to the scale for the rest of the bands, and is printed in red similar to corresponding scales on the MEGACYCLE dial.

(g) ZERO ADJ. - The ZERO ADJ moves the indicator line on the KILOCYCLE control a few divisions in either direction for calibration purposes. The receiver may be calibrated against either any receivable station whose frequency is known or the internal calibration oscillator. This oscillator emits a harmonic every 100 kc in the tuning spectrum. An example of how the receiver may be calibrated using this oscillator follows. If the desired signal is about 14100 kc, turn the 100 KC CRYSTAL ON and the BFO ON with BFO PITCH control at panel mark. Next, using the KILOCYCLE knob, tune to zero beat with the 100 kc marker at 14100 kc. Then move the ZERO ADJ control until the hair line is exactly on 14100 kc. The dial reading in this region is now very accurate, and the receiver may be set within a few hundred cycles of the desired frequency.

A ten division scale (five divisions either side of center) is engraved on the lower edge of the escutcheon opening for the KILOCYCLE dial and is