# ALIGNMENT

The following information sheets apply to all 1934-35 series Rogers, Majestic and De Forest Crosley receivers which use an I. F. of 456 KC. In general, those using 175 KC also follow the same procedure.

The method of alignment in all cases is practically identical, in that the I.F. is aligned first (see paragraph 4 "I.F.STAGES.") Please note that where the alignment point is not specified as in (C, C, C, C), the first C stands for the secondary of the I.F. transformer, next to the second detector, and the second C for the primary. The third C stands for the secondary of the next I.F. transformer and the fourth C for the primary of this transformer, and so on. In other words, work back from the second detector.

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Upon the care and exactitude with which alignment adjustments are made, depends the degree of satisfaction the receiver will provide. Proper alignment can only be arrived at by the use of proper equipment and procedure. Such being the case, it is of prime importance that the following recommendations and routines be closely followed, whenever the need for re-alignment occurs.

The tools and equipment required consist of: (1) a good signal generator (service oscillator) equipped with a good attenuator and providing modulated fundamental frequencies at 456 kc/s., 600 kc/s., 1,400 kc/s., 6.0 mc/s. and 15.0 mc/s.; (2) a reliable output meter, preferably of the rectifier type; (3) a non-inductive 400 ohm 1 watt filament type resistor and; (4) a suitable combination aligning wrench and screw-driver, such as Part No. 32702 or equivalent; (5) a .0002 Mfd. Condenser, used as a dummy Antenna on the broadcast band; and (6) a .05 or .1 Mfd. Series Condenser for use during I.F. alignment.

With the foregoing equipment on hand, re-alignment should be attempted only after a complete understanding of the following routines. The chassis should always be removed from the cabinet during alignment adjustments.

## I. F. STAGES

(1) Connect output meter across voice coil terminals of the speaker.

(2) Connect output lead of signal generator to the control grid cap of the oscillator-modulator tube (6A7S) through a .05 or .1 Mfd. Condenser, allowing grid lead to remain in position. Range selecting switch must be in broadcast position for I.F. Alignment.

(3) Turn the receiver and generator on and adjust generator to exactly 456 kc/s. Set receiver volume control at maximum. Adjust generator output for a low reading of output meter. Short circuit the oscillator section of the Gang, to avoid spurious signals.

(4) Commencing at the I.F. transformer which supplies the diode or second detector, and working progressively back to the I.F. transformer connected to the output of the oscillator modulator, carefully adjust the I.F. aligning nuts and screws (C , C , C , C , in that order) for maximum increase in reading of output meter. As the adjustment is being made, gradually reduce the generator output, so as to avoid possible overloading of any stage. Overloading may result in false alignment. Carefully check adjustments.

## R.F. AND OSC. STAGES (STANDARD BAND)

(1) Connect output lead of signal generator through a .0002 Mfd. Condenser to the antenna lead of receiver. Connect generator ground lead to ground of receiver. If the receiver under adjustment is equipped for selective antennae, arrange the terminal connections as for Conventional antenna, vis.: Short No. 1 and No. 2, Short No. 3 and No. 4, Short No. 5 and No. 6, connect ground to No. 2 and generator output lead through .0002 Mfd. Condenser to No. 3.

(2) Tune receiver and generator to 1,400 kc/s. Roughly adjust oscillator, interstage and antenna stage parallel pads (C see layout C ) in that order for maximum sensitivity.

(3) Tune generator to exactly 600 kc/s., and adjust receiver (without regard for dial calibration) to the generator frequency.

(4) Adjust 600 kc/s. series pad (without regard for dial calibration) for maximum sensitivity, rocking the tuning control in the usual manner during this adjustment.

(5) If after this adjustment the dial calibration is incorrect, loosen dial pointer screw and reset pointer to exactly 600 kc/s.

(6) Tune generator to 1,400 kc/s. and adjust receiver in tune. If calibration is incorrect, adjust oscillator parallel condenser to correct dial calibration, then carefully align antenna and interstage trimmers. Recheck oscillator, interstage and antenna parallel pads (C , C , C ) in that order for maximum sensitivity. When adjusting these condensers use as little capacity as possible.

**THIS IS IMPORTANT.**

After the foregoing adjustments have been made, the series and parallel padding condensers should not be touched again.

**R.F. AND OSC. STAGES (SHORT WAVE)**

(1) Adjust band selector switch for short-wave operation. Connect generator output lead to control grid cap of oscillator-modulator tube, through .05 or .1 Mfd. Condenser, and tune generator to exactly 15 mc/s. (15,000 kc.)

(2) Adjust receiver tuning and note at what points on the dial (near 15 mc/s.) the generator is heard. Two points, approximately 1 mc/s. apart, should be observed. The signal having the highest frequency is the desired one. The other, observed 1 mc/s. lower in frequency, is the image frequency and must be identified as such to avoid error.

(3) If the signal of highest frequency value falls at some other point on the dial than 15 mc/s., it should be moved to 15 mc/s. by adjustment of the oscillator parallel pad (C ). This adjustment should be made in small steps as a gradual adjustment, in order to avoid losing the correct signal. After the foregoing has been completed, recheck for correct adjustment by tuning receiver approximately 14 mc/s., at which point the image frequency should be observed.

(4) Connect generator output lead through 400 ohm resistor directly to antenna lead or terminal of receiver. This resistance should be located at antenna terminal panel or at the end of the receiver antenna lead. Adjust generator to exactly 15 mc/s. Adjust receiver in tune with generator (without regard for dial calibration).

Attempt alignment of interstage and antenna stage parallel pads (C , C ) (see layout) in that order. When aligning interstage coil the tuning control must be rocked in the same manner as when making a series osc. pad adjustment. If receiver has no interstage coil, the tuning control must be rocked when aligning the antenna coil. Should interstage refuse to peak, adjust interstage paralled pad (C ) for minimum capacity value and find alignment by slowly tuning receiver towards high frequency end of the dial, and at the same time increase capacity of oscillator parallel pad (C ). Continue this adjustment until a peak is obtained, which indicates that the oscillator and interstage are in alignment. This adjustment should be made without regard for dial calibration. Watch carefully for double peak, choosing one requiring most capacity, if present.

(5) Adjust antenna stage parallel pad (C ) (see layout) for maximum sensitivity.

(6) Recheck parallel pads of oscillator, interstage and antenna stage in that order (disregard dial calibration).

(7) Adjust generator to exactly 6.0 mc/s. (see layout) and tune receiver to generator. Adjust 6.0 mc/s. series oscillator pad (C ) for maximum sensitivity, rocking the tuning control slightly in the usual manner during this adjustment. (Disregard dial calibration). If calibration is incorrect, it must be left that way because readjustment of series tracker will impair the sensitivity; moving pointer will, of course, upset broadcast calibration.

(8) Adjust generator to 15 mc/s., and recheck alignment of parallel pads (C , C , C ) (see layout) at that point for maximum sensitivity. If 6.0 mc/s. series pad required more than a slight amount of correction this rechecking is very important.

After completion of short-wave alignment, in accordance with the foregoing routine, it is important that no further adjustment be made of the "Standard Band" condensers. If the Standard Band condensers are adjusted, complete re-alignment of the short-wave should follow.

The notation "without regard for dial calibration" mentioned throughout the aligning routine, has reference to the fact that at short-wave, calibration of the dial scale is approximate only. Therefore, short-wave alignment should always be made for the condition of maximum sentitivity, disregarding variation in dial calibration. At standard band frequencies, the logging of the dial scale can be held to within 10 kc/s. (1 dial division).