





## ALIGNMENT SEQUENCE

### I. F. AND BROADCAST BAND

Operation	Connect Generator	Set Generator Tuning	Set Receiver Tuning	Dummy Antenna	Volume Control	Adjust	Remarks
1	To Grid Cap of 20J8M	456 kc/s.	700-800 kc/s.	.01 mfd.	Max.	C15, C14, C13, C11, C10	To Peak I.F.
2	Drape Generator	1500 kc/s.	1500 kc/s.		Max.	C8	To Peak Osc.
3	Lead-in	1500 kc/s.	1500 kc/s.		Max.	C6	To Peak I.S.
4	Proximity	1500 kc/s.	1500 kc/s.		Max.	C4	To Peak Ant.
5	of Loop	600 kc/s.	600 kc/s.		Max.	T6	To Track Osc.
6	in Cabinet	1500 kc/s.	1500 kc/s.		Max.	C8, C6, C4	Recheck Adj.

### SHORT-WAVE SPREAD-BAND

The process of aligning the short-wave channels of a spread-band model differs materially from that encountered in conventional short-wave receivers. Before attempting such adjustment, the following detail must be fully read over and understood, so as to avoid the possibility of error which would result in complete mis-alignment of one or more of the short-wave channels.

The signal generator used for adjustment of short-wave band-spread channels shall be of such type that very close stability as regards frequency prevails. The signal generator is to be used primarily for the purpose of providing a steady signal, with suitable attenuation, at those frequencies selected for band-spread alignment. For positive identification of the frequencies used, it is essential that accurate calibration prevail. If necessary, use short-wave stations of known frequencies for final frequency calibration. If a crystal controlled oscillator is available, it is recommended that it be used to provide marker frequencies throughout the short-wave channels.

Throughout the short-wave channels the oscillator operates 456 kc. LOWER in frequency than the station carrier frequency. This point is important and must be kept well in mind to prevent aligning the short-wave channels on the image. After adjusting the oscillator circuit, it is wise to check against having aligned the oscillator on the image frequency instead of on the correct signal frequency. To do this, without adjusting the receiver tuning control, locate the image response by tuning the signal generator 912 kc. LOWER in frequency than the aligning signal. If the image is located as described, the oscillator is correctly set. If, however, the image cannot be located as outlined above, but must be found by tuning the signal generator 912 kc. higher in frequency than the aligning signal, the oscillator has been aligned on the image and the alignment must be corrected. In locating the image response, it is necessary to increase the output of the signal generator considerably or it will not be heard.

Of the eight adjustments provided for the short-wave channels, three (identified by the symbols C5, C7 and C9 of the chassis illustration) affect simultaneously all the short-wave bands.

Adjustment of C9 is for the purpose of correcting logging, and in practice it will be found that this is best done by setting the dial pointer to the mid-point of the 18 mc. scale, adjusting C9 to some arbitrary value (about half capacity) then adjusting the logging of each of the short-wave bands by means of the movable cores T7, T8, T9, etc. Return the set to the 18 mc. band and adjust the antenna (C5) and interstage (C7) for maximum sensitivity.

Re-adjustment of C9 (and C5, C7) will be necessary whenever circuit characteristics are altered, such as by the replacement of a tube.

Re-adjustment of the movable cores of the oscillator coils T7, T8, T9, T10 and T11 will be required whenever servicing of the receiver necessitates replacement of an oscillator coil, band switch section or wiring associated with the oscillator circuit.

The most satisfactory method of aligning and checking the spread-band ranges is through the use of actual short-wave stations of known frequencies, which are tuned to in a specific receiver band and deviations from calibrations noted.

Aligning points for the oscillator stages at short-waves are approximately 6.1, 9.6, 11.8, 15.2 and 17.8 megacycles. Minor deviations from these points will not materially affect the accuracy of adjustment.

The alignment of the antenna and interstages (R. F.) is made for all bands at one point only. By choice, this may be either at some particular band in which the user is especially interested (to ensure maximum sensitivity), but preferably on the 18 mc. band. This automatically provides maximum sensitivity in the middle of all other short-wave bands.

Before attempting complete re-alignment, always consider whether this adjustment is necessary. Possibly the desired improvement can be achieved by a minor adjustment of C9, C7 and C5. This latter usually suffices other than when coils, condenser, wiring or switches, in the R. F. unit have been changed.

In the foregoing have been described the functions of the various spread-band adjustments. Permissible deviation (in fractional inches) from scale calibration at aligning points is shown. To provide direction on the actual adjustment, the following procedure is given:

Operation	†Connect Generator	Generator Tuning *	Receiver Tuning	Dummy Antenna	Adjust	Lineal Deviation
1	Antenna	17.8 mc/s.	17.8 mc/s.	400 ohms	C9	+ 1/8 "
2	Antenna	6.1 mc/s.	6.1 mc/s.	400 ohms	T7	+ 1/8 "
3	Antenna	9.6 mc/s.	9.6 mc/s.	400 ohms	T8	+ 1/8 "
4	Antenna	11.8 mc/s.	11.8 mc/s.	400 ohms	T9	+ 1/8 "
5	Antenna	15.2 mc/s.	15.2 mc/s.	400 ohms	T10	+ 1/8 "
6	Antenna	17.8 mc/s.	17.8 mc/s.	400 ohms	T11	+ 1/8 "
7	Antenna	For maximum sensitivity in the middle of the 18 mc. band.		400 ohms	C7	
8	Antenna			400 ohms	C5	

NOTE:—Use only a visual output indicator during alignment. Keep the generator output low — only sufficient to give a readable indication. The dummy antenna must be non-inductive, preferably that using an isolantite sleeve, and located right at the antenna terminal of the receiver.

\*Stabilize the generator before using by allowing it to operate until it stops drifting. Check its calibration against known stations at or near the aligning frequencies shown.

†Connect dummy antenna to terminal No. 4.

**Rogers 15-78 Majestic 4178 De Forest "Calcutta"**