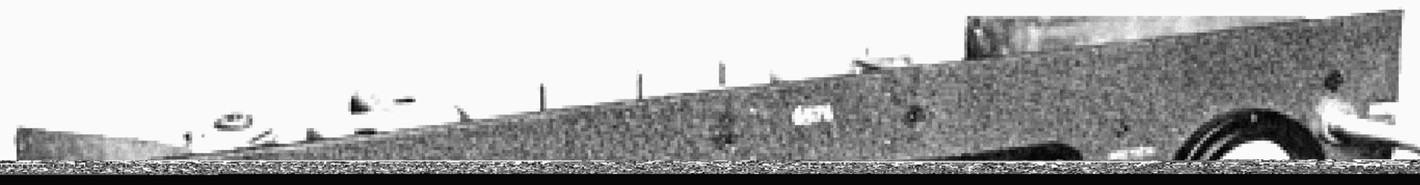
PHOTOFACT* Folder

* TRADE MARK

COLLINS
MODEL 51J-3



ALIGNMENT INSTRUCTIONS

ADJUSTMENT INSTRUCTIONS - READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Alignment of this equipment should be attempted only by authorized and competent service personnel with proper test facilities.
Allow a 15 minutes warm-up period for receiver and test equipment.
The following test equipment and alignment tools should be used:

a. 500KC to 30.5MC signal generator
b. DC vacuum tube voltmeter and oscilloscope
c. Two fiber or bakelite aligning tools having diameters of 1/8" and 5/16" and using screwdrivers type bits.

(Preset CAL coarse frequency trimmer at mid-capacity front panel screwdriver adjustment location to left of zero ADJ knob.)
Use a secondary frequency standard and adjust A1 to calibrate the 100KC crystal oscillator.

Set AVC to "on" position and calibrate to "off" position.
Note: The calibration oscillator may be used if a signal generator is not available. Set calibrate to "on" position and follow procedure outlined below. Using the "Kilocycle Knob" tune receiver to each alignment frequency until a peak reading is obtained on the input meter. Make the indicate adjustments but use the "input meter" on panel to indicate maximum readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	2MMF	High side to pin 1 (grid) of 6AK5 (v1). Low side to chassis.	29.5MC (Unmod)	30	29.5MC	DC probe thru 470K to pin 7 (grid 3) of 6BE6 (V2). Common to chassis.	A3	Preset A2 to MINIMUM capacitance. Adjust for maximum deflection if less than 2 volts is obtained at VTVM. If more than 2 volts deflection is obtained re-adjust (detune toward MINIMUM capacitance) until 2 volts deflection is obtained.
2.	•	• •	27.5MC	• •	27.5MC	• •	A4	• •
3.	• •	• •	25.5MC	• •	25.5MC	• •	A5	• •
4.	• •	• •	23.5MC	• •	23.5MC	• •	A6	• •
5.	• •	• •	21.5MC	• •	21.5MC	• •	A7	• •
6.	• •	• •	19.5MC	• •	19.5MC	• •	A8	• •
7.	• •	• •	17.5MC	• •	17.5MC	• •	A9	• •
8.	• •	• •	15.5MC	• •	15.5MC	• •	A10	• •
9.	• •	• •	13.5MC	• •	13.5MC	• •	A11	• •
10.	• •	• •	1.5MC	•	1.5MC	• •	A12	• •
11.	•	•	•	•	• •	DC probe thru 470K to pin 1 (grid 1) of 6BE6 (V2). Common to chassis.	A13	

FIXED 500KC IF AMPLIFIER ALIGNMENT

Connect the generator to pin 7 (grid 3) of V5. Connect a clip lead to the cold side of C92 (output of crystal oscillator). Hold other end of clip lead near grid of V5. Set calibrate to "On" position and zero beat signal generator at 500KC. Set calibrate to "Off" position. Set selectivity to "0" position. Attenuate generator output to maintain not more than 3 volts of VTVM.
In step 19 the VFO pitch oscillator is aligned using a signal generator. An alternate method of alignment without a signal generator is as follows:

a. Disconnect antenna. Turn calibrate and BFO to "On" positions.
b. Tune to a 100KC check point on hands 2 or 3. For example: Tune receiver to 2.0MC.
c. If the "BFO Pitch" knob has never been removed from the shaft, rotate the knob until the line on the knob lines up with the line on the panel. If the knob has ever removed from the shaft adjust A21 to produce a beat note. Turn BFO pitch knob to right or left of the panel mark until the beat note reaches maximum pitch. The BFO pitch capacitor plates are now either fully closed ot open. Loosen set screws on BFO pitch knob and turn knob until white line on knob is 90 degrees from panel mark. Tighten set screws and align mark on knob with mark on panel. The BFO pitch is now at mid-range.
d. Tune receiver 10KC off of any 0.1KC point on bands 2 or 3 and advance AUDIO GAIN until a constant pitch beat note is heard. If the constant pitch beat note is not available, adjust A21 until it is. To make sure that this is the correct note turn the kilocycle dial ±10KC and note whether the pitch of the note remains constant. This constant pitch beat note (on bands 2 and 3 only) is the result of fifth harmonic

21.	.01MFD	High side to pin 7 (grid 3) of 6BE6 (V5). Low side to chassis	2.5MC (20KC Swp)	2	See Remarks	Vert. Amp. To point <B>. Low side to chassis	A22	Turn RF gain to mid-range and synchronies scope. If two symmetrical peaks (each peak is an IF response curve) do not appear on scope, adjust receiver tuning, RF gain and scope controls until they do. Turning phasing control to should left cause rejection notch to appear at one side of each peak. If notch dose not appear set phasing control approximately 1/8 turn to left of center and adjust A22 until a well defined notch appears on scope pattern. Adjust until no evidence of damped oscillation remaines. Turn phasing control approximately 1/8 turn to the right of center. The rejection notch should be appear on opposite side of each peak. If the notch is not well defined with no evidence of damped oscillation SLIGHTLY retouch A22. Repeat step 21 until a symmetrical notch with no evidence of damped oscillation appears on both sides of the response curve as outlined above.

500KC IF PERFORMANCE MEASUREMENTS

SENSITIVITY - An input signal of 25 to 40 microvolts at pin 7 (grid) of V5 should produce 4 volts on VTVM at point <B>

SELECTIVITY -

1. Alternate signal generator for 4 volts at point <B>. Use voltage at point <B> and output level of signal generator as reference voltage.
2. Increase signal generator output 6DB (double the voltage). The band width may be determined by noting how far on either side of resonance the generator signal must be detune to lower the voltage at point <B> to 4 volts.
3. Repeat procedure in step 2 for 60DB increase (1000 times the signal input voltage level).
4. The overall selectivity specifications are:
   a. Minimum selectivity

6DB	5.5KC Min.	6.5KC Max.
60DB	17.0KC Min.	20.0KC Max.

   b. Maximum selectivity (crystal filter in)

6DB	0.2KC Min.	0.3KC Max.
60DB	0.2KC Min.	12.0KC Max.

ALIGNMENT OF DIALS WITH VFO

A. MEGACYCLE DIAL POINTER - If the dial pointer has been accidentally slipping along the dial cord then rest pointer as follows: Remove the escutcheon plate; turn the kilocycle knob counter clockwise until it reaches the mechanical stop. Then turn it clockwise until the zero-zero mark lines up with the fiducal mark. Turn the kilocycle knob exactly 5 turns clockwise. Slide the megacycle pointer along the dial cord to the center frequency of the band. For example: 2.0MC is the exact center of band 2.

B. KILOCYCLE DIAL - If the kilocycle dial reading is incorrect it will be necessary to determine the magnitude and direction of the errors first. To do this, set receiver band 2. Set kilocycle fiducal line to the center mark on the escutcheon opening by rotating zero adjustment knob. Set mark on BFO pitch knob to coincide with mark on panel (this sets BFO at 500KC as outlined in step 19). Set calibrate to "On" position. Rotate kilocycle knob to zero beat. Note magnitude and direction of error in kilocycle dial reading. Tune receiver to 2.5mc. Leave BFO pitch knob set at 500KC and rotate kilocycle knob to point of zero beat. Again, note magnitude and the direction of error in the kilocycle dial reading.

1. If kilocycle dial reading is incorrect by less than 3KC in the same direction by equal amount at both ends of the megacycle dial correct as follows:
   a. Make certain BFO pitch knob is set at 500KC.
   b. Tune the receiver for zero beat at the 100KC check point nearest the dial setting for which maximum accuracy is desired. For example: If maximum accuracy is desired at 1.83MC, tune for zero beat at 1.8MC by rotating the kilocycle knob.
   c. Set kilocycle fiducal line to zero-zero on kilocycle dial by rotating zero adjustment knob.
2. If the kilocycle dial reading is incorrect by more than 3KC in the same direction by an equal amount at both ends of the megacycle dial, correct as follows:
   a. Check to see that BFO pitch knob is set at 500KC.
   b. Tune to zero beat at 1.5MC.
   c. Set kilocycle fiducal line to middle index mark on escutcheon opening by rotating zero adjustment knob.

ALIGNMENT INSTRUCTIONS • cont• •

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	• Alternate signal generator output to maintain less than 5 volt on VTVM at point <A>							
	DUMMY ANTENNA	**SIGNAL GENERATOR COUPLING**	**SIGNAL GENERATOR FREQUENCY**	**BAND SWITCH POS.**	**RADIO DIAL SETTING**	**CONNECT VTVM**	**ADJUST**	**REMARKS**
24.	47Ù Resister in series with 100MMF capacitor	High side thru dummy to antenna receptacle. Low side to chassis.	2.6MC	3	2.6MC	DC probe to point <A>. Common to chassis.	A30 A31 A32	Turn BFO to "On" position and adjust generator to zero beat at 2.6MC. Turn BFO to "Off" position. Adjust for maximum deflection.
25.	• •	• •	2.4MC	• •	2.4MC	• •	A33 A34 A35	Turn BFO to "On" position and adjust generator to zero beat at 3.4MC. Turn BFO to "Off" position. Adjust for maximum deflection. Repeat steps 24 and 25 until maximum deflection is obtained on VTVM.

ALIGNMENT INSTRUCTIONS • Sept. •