

# R-390A/URR ALIGNMENT & OPTIMIZATION

(excluding 455-kHz, fixed-frequency IF)

## 1. Initial setup Set all front-panel controls as follows:

- |                         |                           |
|-------------------------|---------------------------|
| A. FUNCTION switch: CAL | I. BANDWIDTH KC: 8        |
| B. BREAK IN switch: X   | J. BFO ON/OFF switch: OFF |
| C. LIMITER control: OFF | K. LOCAL GAIN: CCW        |
| D. AGC switch: FAST     | L. DIAL LOCK: CCW         |
| E. ANT TRIM: "0"        | M. ZERO ADJ: CCW          |
| F. LINE GAIN: CCW       | N. RF GAIN: CW            |
| G. AUDIO RESPONSE: WIDE | O. MEGACYCLE CHANGE: X    |
| H. BFO PITCH: "0"       | P. KILOCYCLE CHANGE: X    |

X= irrelevant

## 2. Allow about 30 minutes warmup before proceeding.

## 3. Set receiver in turn to each frequency specified below, in column A. of TABLE 1. Adjust the corresponding inductors (L-) specified in column B. of TABLE 1, and then the corresponding trimmer capacitors (C-) specified in column C. of TABLE 1. Rock the KILOCYCLE CHANGE back and forth for a maximum indication on each frequency on the CARRIER LEVEL meter. Refer to CHART 1 for the location of adjustments.

TABLE 1

A.	B.	C.	A.	B.	C.
600 kHz	L224-1 L224-2		4400 kHz	L227-1 L227-2	
900 kHz		C230-1 C230-2	7600 kHz		C239-1 C239-2
1100 kHz	L225-1 L225-2		8800 kHz	L228-1 L228-2	
1900 kHz		C233-1 C233-2	15200 kHz		C242-1 C242-2
2200 kHz	L226-1 L226-2		17600 kHz	L229-1 L229-2	
3800 kHz		C236-1 C236-2	30400 kHz		C245-1 C245-2

## 4. Set the receiver FUNCTION switch to AGC. Assure that the regularly used antenna is connected to the receiver input.

## 5. Received signals are used to make the following alignment. Reception of a relatively stable-intensity signal is indicated for alignment, so it may be necessary to seek such a signal at a frequency slightly at variance with those specified in the following TABLE 2; however, the alternate chosen frequency should not differ from the specified frequency by more than 10%. When aligning on alternate frequencies, chose a HIGHER alternate frequency when aligning inductors (L-); and chose a LOWER frequency when aligning capacitors (C-).

### NOTE

A signal generator may be used to good effect in the following alignment. Do not make a direct connection from the signal generator to the antenna or receiver. Instead, using a short antenna wire of a few feet connected to the generator's output, radiate a signal at the frequencies specified in the following TABLE 2 to the receiving antenna. Use the least output from the generator that just produces a usable indication on the CARRIER LEVEL meter. Note that TABLE 1 adjustments may be "touched up" (as may all following adjustments in all tables) using the radiated signal from the generator.

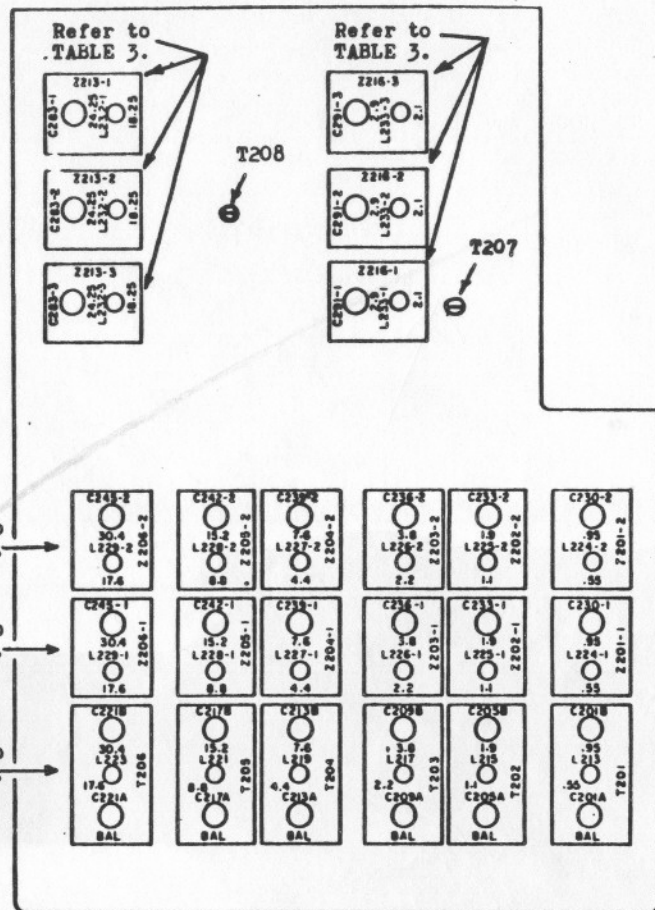


Chart 1. Adjustment points on R-F subchassis.

TABLE 2

A.	B.	C.	A.	B.	C.
600 kHz	L213		4400 kHz	L219	
900 kHz		C201B	7600 kHz		C213B
1100 kHz	L215		8800 kHz	L221	
1900 kHz		C205B	15200 kHz		C217B
2200 kHz	L217		17600 kHz	L223	
3800 kHz		C209B	30400 kHz		C221B

## 6. Set the receiver FUNCTION switch to CAL, then align the inductors and capacitors specified in TABLE 3.

TABLE 3

A.	B.	C.	A.	B.	C.
1300 kHz	L232-1 L232-2 L232-3		1900 kHz	L233-1 L233-2 L233-3	
7300 kHz		C283-1 C283-2 C283-3	1100 kHz		C291-1 C291-2 C291-3

7. Set the receiver KILOCYCLE CHANGE to any 100 kHz calibration point between 500 kHz and 7900 kHz, and align the following adjustments:

T207  
T208

8. Referring to CHART 2, set the receiver KILOCYCLE CHANGE and MEGACYCLE CHANGE controls for a dial reading of 8100 kHz, and adjust the trimmer labelled "8" on the Crystal Oscillator subchassis for a peak indication on the CARRIER LEVEL meter. Next, tune the receiver to 9100 kHz, and likewise adjust the trimmer labelled "9". Then, tune the receiver to 10,100 kHz, and adjust the trimmer labelled "10". Continue this to 31,100 kHz for the trimmer labelled "30". Note that the trimmer labelled "17" also aligns the 00 MHz band, the trimmer labelled "16" also aligns the 01 MHz band, and so on. Therefore, those bands are aligned in the above procedure.

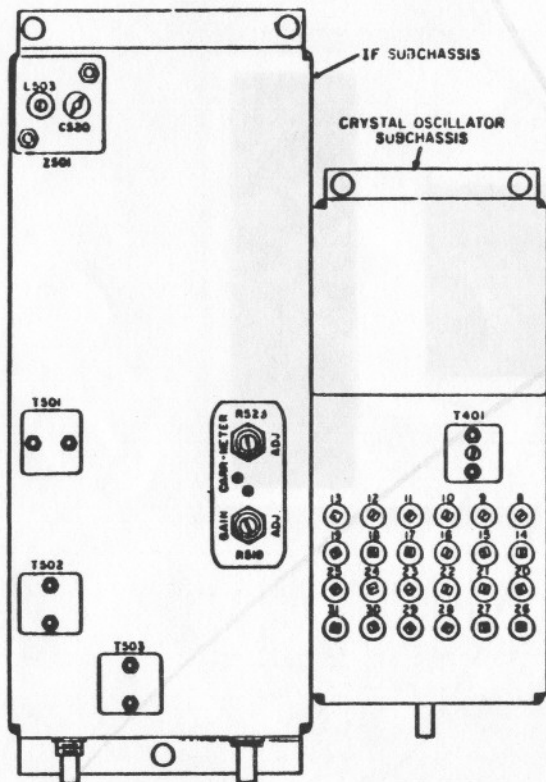


Chart 2. Adjustment points on I-F subchassis and Crystal Oscillator.

9. Rotate the RF GAIN control fully CCW. Loosen the locking nut on the CARR-METER adjustment potentiometer, R523, on the I-F subchassis. Using a flat-blade screwdriver, rock R523 back and forth across its present setting about ten times. This is to clear the pot of noise and dirt. Then, carefully reset this pot such that the CARRIER METER comes to rest on zero. This will probably require several tries.

Notes R519 (GAIN ADJ) on I-F subchassis is not critical to adjust, and generally only needs to be readjusted when the set is retuned. An approximately correct setting can be made thusly: (set up)

- |                         |                           |
|-------------------------|---------------------------|
| A. FUNCTION switch: AGC | I. BANDWIDTH KC: 8        |
| B. BREAK IN switch: X   | J. BFO ON/CFF switch: OFF |
| C. LIMITER control: OFF | K. LOCAL GAIN: CCW        |
| D. AGC switch: X        | L. DIAL LOCK: CCW         |
| E. ANT TRIM: X          | M. ZERO ADJ: CCW          |
| F. LINE GAIN: fully CW  | N. RF GAIN: CW            |
| G. AUDIO RESPONSE: WIDE | O. MEGACYCLE CHANGE: 05   |
| H. BFO PITCH: X         | P. KILOCYCLE CHANGE: 500  |

- Q. LINE METER switch: -10  
R. DISCONNECT ALL ANTENNAS  
X= irrelevant

With all controls thusly set, adjust the ANT TRIM control for a peak reading on the LINE LEVEL meter. What is being registered at this stage is "front end" noise of the set. The reading should be no less than "VU" on the -10 to VU scale of the LINE LEVEL meter (note that "VU" is to the right—upscale—of the physical center of the meter scale). It should also be no more than "VU" on the LINE LEVEL meter, with the LINE METER set to "0". R519 (GAIN ADJ) may be varied to bring the indication within this range. BEFORE varying the setting of R519, however, carefully SCRIBE A MARK ON THE POT TO INDICATE PRESENT POT SETTING. The pot can then be returned to its former position.

If you are unable to attain a "VU" reading on the LINE LEVEL meter with the LINE METER set to -10, and after adjusting R519, this probably indicates a need to retube the receiver. Note, however, that if the set has been functioning normally otherwise, don't be quick to test tubes. Refer the set to a qualified serviceman, if in serious doubt.

Depending on the characteristics of your longwire antenna, once your R-390A is optimized for that antenna, you may find that the set "front end" does not resonate exactly for such as an amplified loop. This is evidenced by the lack of a sharp, well-defined peak in signal and noise level when the ANT TRIM control is rotated. Since most amplified loops are tuned, and possess considerable "Q", this shouldn't be a problem (as far as cross-modulation is concerned). It is therefore advantageous to optimize your R-390A for the antenna that will be most likely to induce cross-modulation in your set.

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