

GMRS500

ALIGNMENT PROCEDURE

1. REFERENCE TEST EQUIPMENT

- A. HP8921A Cell site test set or HP8920A, B Communication Test Set with Spectrum Analyzer option.
- B. Fluke 187 Digital Voltmeter
- C. HP E3615A Power supply

2. TEST POINT

- A. ANTENNA : Test point ANT1 is prepared with ANTGND1(antenna ground).
- B. GMRS VCO reference voltage: Test point 1 is prepared.
- C. FM VCO reference voltage : Test point 2 is prepared.
- C. RX audio output : Speaker terminals & ear jack are prepared.
- D. TX Mic. Input : Test point MICIN is prepared.
- E. Battery Vcc : Test point BAT+ is prepared.
- F. Up Key : Test point UP is prepared.
- G. Down Key : Test point DOWN is prepared.
- H. Function Key : Test point MENU is prepared.
- I. Monitor Key : Test point MONITOR is prepared.
- J. PTT Key : Test point PTT is prepared.
- K. Power Key : Test point PWR is prepared.
- L. Scan key : Test point SCAN is prepared.

Note. : All key can be activated when connect with ground.

3. VCO ALIGNMENT

- A. Set unit to Channel 1 and connect a voltmeter to TP1 (VCO PD).
- B. Press & hold PTT.
- C. Extend L303 until the voltmeter reads 1.5V.
- D. Release PTT button so units is in receiving mode and monitor the voltage on TP1. The voltage should be in the range 1.5Vdc +/-0.5V
- E. Set unit to channel 14.
- F. Press & hold the PTT switch and observe the voltage on TP1. The voltage should be 2 – 2.5 Vdc.
- G. Release PTT and observe the voltage on TP1. The voltage should read between 2.0 – 2.5 Vdc.

Note : VCO shield-can should be soldered after VCO alignment is finished.

4. TRANSMITTER FREQUENCY ALIGNMENT

- A. Press & hold the PTT button.
- B. Align CT201 trimmer capacitor such that the output frequency is equal to the channel frequency with a maximum error of +/- 200 Hz. CT201 is located on the right side of 20.95MHz X-tal.

5. TRANSMITTER OUTPUT POWER CONFIRMATION

- A. Set unit to channel 1.
- B. Press & hold the PTT button.

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- C. Transmit power should not exceed 2.0W.
- D. Set unit to channel 14.
- E. Press & hold the PTT button. Ensure that Tx Power should not exceed 0.5W.

6. TRANSMITTER DEVIATION ALIGNMENT

- A. Connect an audio generator (600 ohms) to MICIN or the ear jack. The audio frequency should be set at 1KHz with a level of 200mV RMS.
- B. Connect an FM deviation meter (communications test set) to Antenna contact. Set the monitor to read peak to peak divided by two $[(pk-pk)/2]$ deviation. Set filter of equipment from 25Hz to 15KHz.
- C. Press & hold the PTT button.
- D. Align RV2 for +/- 2.1 kHz deviation (+/-0.1KHz). RV2 is located on the below of CT201.
- E. Decrease audio generator level until deviation reads +/- 1.5 kHz (approximately 12mV) and record generator level. Level should be between 6 mV and 10 mV.
- F. Confirm that transmit audio distortion is less than 5%.

7. RECEIVER ALIGNMENT

- A. Set the output level of the RF signal generator for -47dBm. The generator should be set for 1.5 kHz deviation at 1 kHz audio.
- B. Set volume level 4 (It is initial.).
- C. Connect Audio analyzer to SPK+.
- D. Set equipment filter 25Hz to 15KHz.
- E. Confirm that Rx audio distortion is less than 5%.
- F. Confirm that Rx Sensitivity is less than -120dBm (nominally -123dBm) by reducing the output level of the RF signal generator until a 12 dB SINAD reading is achieved.
- H. Set SSG output level until 9dB sinad sensitivity and confirm unit is un-squelched.
- I. Set signal generator level to -47dBm.
- J. With 1.5KHz deviation at 1KHz modulation, set volume for maximum audio. Audio level should be on over than 1.3Vrms.

8. LOW BATTERY INDICATOR CONFIRMATION

- A. Set unit to receiving mode. Don't set transmitter mode..
- B. Set power supply voltage to 3.7V.
- C. Decrease power supply voltage until low battery icon blinks.

9. POWER OFF CURRENT CONSUMPTION

- A. Set power supply voltage to 3.7 and connect to unit.
- B. Confirm current. It must be less than 100uA.

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10. FREQUENCIES TABLE

Channel	Freq. MHz	Channel	Freq. MHz
1	462.5625	12	467.6625
2	462.5875	13	467.6875
3	462.6125	14	467.7125
4	462.6375	15	462.5500
5	462.6625	16	462.5750
6	462.6875	17	462.6000
7	462.7125	18	462.6250
8	467.5625	19	462.6500
9	467.5875	20	462.6750
10	467.6125	21	462.7000
11	467.6375	22	462.7250