

APPENDIX 6
TRANSMITTER ALIGNMENT

THREE (3) PAGE ALIGNMENT INSTRUCTIONS FOLLOW THIS SHEET

TRANSMITTER TUNE-UP PROCEDURE
FCC ID: F3JGMRS50

APPENDIX 6

ALIGNMENT PROCEDURE

GMRS-50

The ~~SP-120~~ UV Receiver is by design, broad band covering UHF(440 to 470 MHz) and ~~VHF(148-174MHz)~~ and should require no special alignment, unless repairs are performed on the receiver portion. Refer to page 17 for Alignment Points Diagram.

The only alignment normally required is to the squelch circuit, Apply a signal that produces 10dB SINAD, reduce the input to -130 dBm, close the squelch control (RV2) until the receiver mutes.

Increase the signal to the 10dB SINAD reading reference level and adjust RV2 until the squelch opens. In high noise environment, some users may prefer to have the squelch opening set somewhat tighter, e.g.: 12 to 14 dB SINAD.

Should repairs be required, the following procedures should be applied:

RX VCO

1. Set the unit to the highest receive frequency, 470 MHz(UHF), ~~174MHz(VHF)~~ and adjust the VCO L303 to 10 volts.
2. Set the unit to the lowest receive frequency 450 MHz(UHF), ~~148(VHF)~~ and check that the VCO voltage is above 2.0 volts. Adjust L303 for 2.0 volts.

- **Note: Use TPI to measure the voltage.**

Receiver

1. Apply a standard test signal to the receiver antenna terminals.
2. Adjust T1 for maximum sensitivity and audio output with minimum audio distortion.

This completes the receiver alignment procedures.

Transmitter

Connect the unit to a Service Monitor with the power meter setting to the 10 W scale (or autorange).

TCXO

Set the channel selector to the mid-range frequency 460 MHz, adjust TC701, on the TCXO board, for a reading of 460 MHz +/-200 Hz (155 MHz VHF models).

TX VCO

1. Set the unit to the highest transmit frequency, 470 MHz(UHF), ~~174MHz(VHF)~~ and adjust the VCO L203 to 10 volts.
2. Set the unit to the lowest transmit frequency 450 MHz(UHF), 148(VHF) and check that the VCO voltage is above 2.0 volts. If voltage is below 2.0 volts, adjust L203 for 2.0 volts or more.

CTCSS, DCS & Deviation Alignment

- 1a. Set the unit to a mid-frequency range and a CTCSS of 67Hz. Push PTT and adjust RV403 for desired CTCSS tone deviation.
- 1b. Switch to a channel with the same frequency and CTCSS of 250.1Hz. Push PTT and adjust RV401 to desired CTCSS tone deviation, same as above step.
- 1c. Switch between the 67Hz channel and the 250.3Hz channel and adjust RV401 until the deviation is the same on both channels. It may be necessary to readjust RV403 to get the desired deviation.
2. Inject a 6mV signal of 1000Hz to the microphone input. This should produce a 3kHz deviation measure transmit distortion, that should be less than 5%. Increase the audio input level to 20mV.
3. Set the deviation by adjusting RV402 to 4.5kHz on a non-CTCSS or CDCSS channel for the initial setting. Select a CTCSS or CDCSS frequency and verify that the deviation is less than or equal to 5kHz.
4. Vary the audio frequency from 300 to 3000Hz and verify that the deviation does not exceed 5kHz.

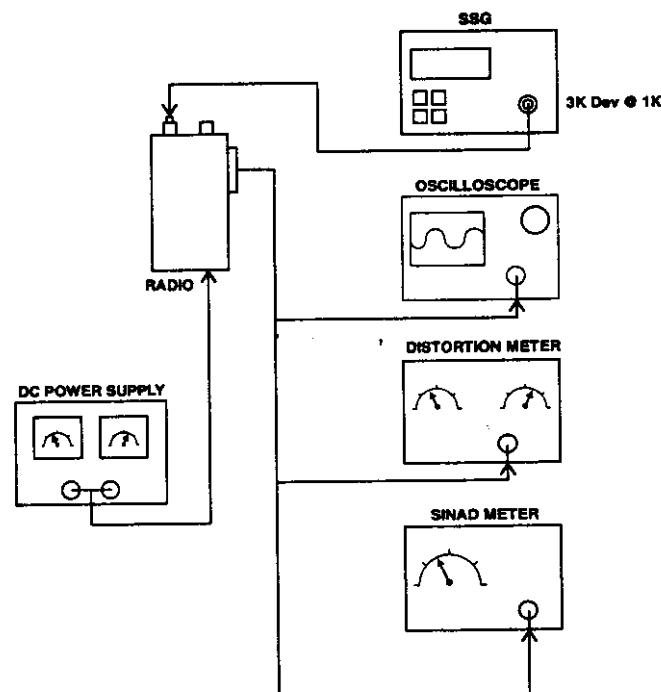
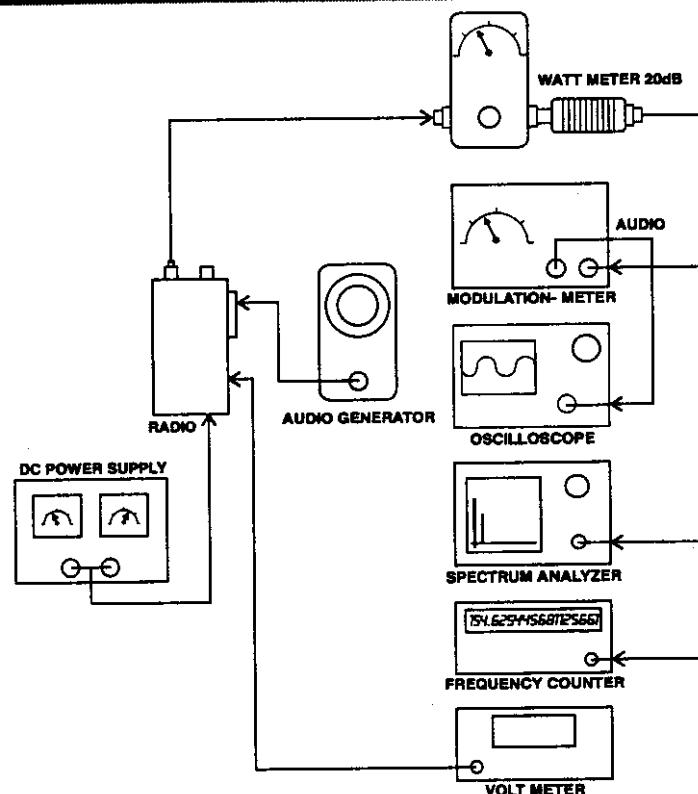
APC

While transmitting adjust RV1, in the APC circuit, for ~~5~~ watts +/- 0.1 watt. (~~VHF and~~ UHF models).

This completes the transmitter alignment procedures.

MAXON
SP-120 HAND HELD
GMRS-50

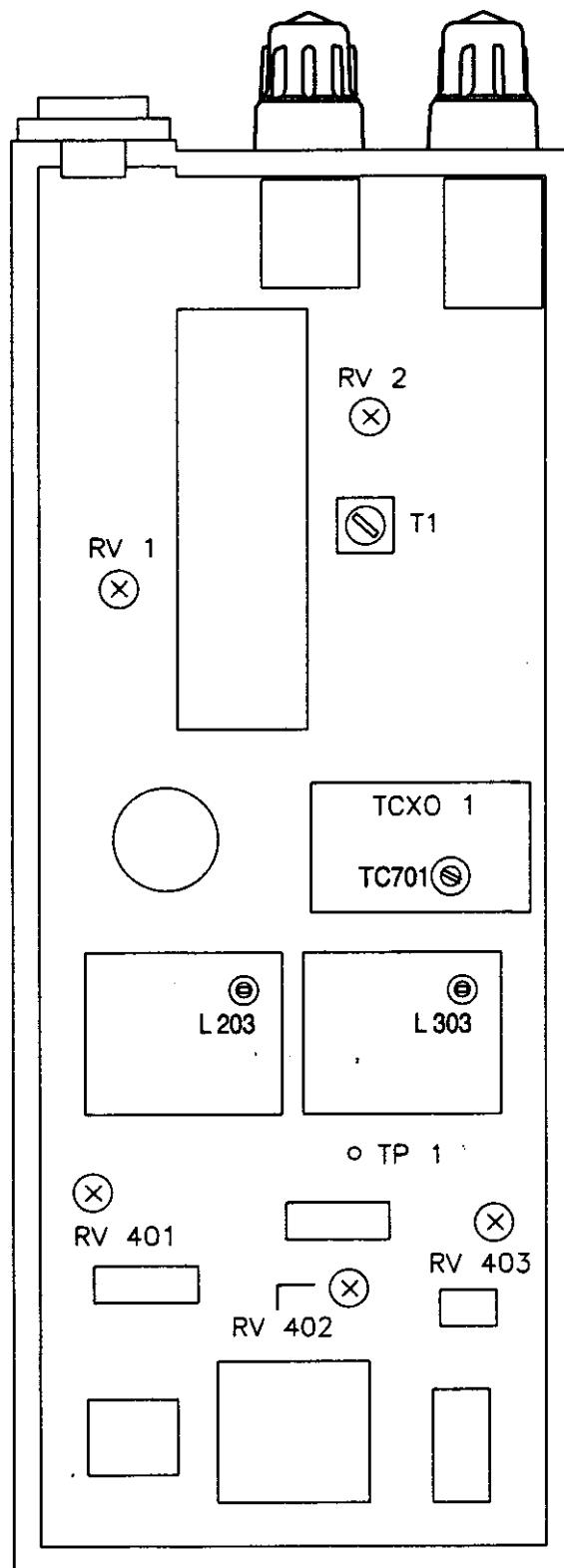
TEST EQUIPMENT SETUP



1. S.S.G. : @ 1KHz Audio, 3KHz Deviation (25KHz Channel Spacing)

2. AF Generator : 10mV & 20dB Up.

ALIGNMENT POINTS DIAGRAM



APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

A 12.8 MHz TXCO is a reference oscillator for a PLL circuit which establishes and stabilizes frequency.

CIRCUITS AND DEVICES TO
STABILIZE FREQUENCY
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APPENDIX 7

APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION
AND LIMIT MODULATIONCIRCUITS TO SUPPRESS SPURIOUS RADIATION AND HARMONICS

L7, L8, L11, C72, C73, C74 and C75 are the 7th order Cheby-shev low pass filter. Unwanted harmonic are reduced by >70 dBc.

CIRCUITS TO LIMIT MODULATION

The TX audio from the internal mic or external mic is fed into IC411 (Pin 3). The TX audio is output on Pin 4 (IC411) and into the high pass filter (IC410), where sub-audible voice products are removed. The TX audio output from IC410 is fed into IC404D & C, with associated parts form a mic amplifier and limiter. The output from Pin 8 IC404C is fed to RV402 (TX Modulation Level Adjust) and fed into IC404A & B to form a 3k low pass filter. The output of IC404A (Pin 1) is then fed into the Audio Mixer Circuit.VCO.

CIRCUITS TO SUPPRESS SPURIOUS
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APPENDIX 8