4. Alignment Procedure

Measurement Condition

The following sections describes the alignment procedure for HJC-FRS X2 transceiver under the following reference environment conditions;

Temperature	:	25℃ (77°F)
Relative Humidity	:	65%
Power Supply Voltage	:	4.8VDC +/- 5%

Test / Equipment / Tools required

The following list of equipment is recommended for use in setting up the radio property. Please ensure the test equipment are calibrated according to the manufacturer's instructions:

- Frequency counter more than 1000MHz +/- 100Hz tolerance, high input impedance and high sensitivity
- VHF FM Signal generator, 1000MHz with adjustable frequency, FM deviation, and RF output attenuators. 50Ω Output impedance.
- Oscilloscope, high input impedance.
- 16 Ω 1 Watt resistor as loudspeaker load
- Audio Signal Generator, 10Hz to 20KHz, 600Ω impedance with attenuators.
- RF Watt meter, with 50Ω 1 Watt termination resistor (Or RF Voltmeter with 50Ω termination and external 50Ω attenuators)
- Regulated Power Supply 4.6VDC 1A output
- Digital A-V-O Multi-meter
- SINAD meter
- External Speaker Mic plug (or special audio test jig)
- Interconnection test cable for RF and Control PCB
- Circuit Diagram for HJC-FRS X2
- PCB Layout Diagram for HJC-FRS X2
- Tuning tools for RF/IF transformer and the VR potentiometers

Transmitter Adjustment

- X-TAL frequency

On receiving mode, check X-TAL(X301) output(pin2) is at 21.25MHz

-VCO Control Voltage

Set radio to receive on CH1(462.5625MHz), adjust L402 for 2.3V on test point VT.

- Transmitter Frequency

Connect RF Power meter to ANT1, Activate PTT to transmit on CH1(462.5625MHz) check transmitting frequency error is within +/- 250Hz.(adjust with VC301)

- Transmitter Output Power

Activate PTT to transmit on CH1, Set L208 for 500mW power output at ANT1. Repeat test on CH14.

- Transmitter Deviation Limit

Set radio to transmit on CH1, with CTCSS code 38(250.3Hz) and no audio modulation. At the external microphone input, inject 1KHz tone at -20dBm. Adjust VR501 for 2.0KHz deviation. Reduce 1KHz tone input to -40dBm, check deviation dropped to 1.2 to1.5KHz. Repeat test on CH14.