

4. ADJUSTMENT

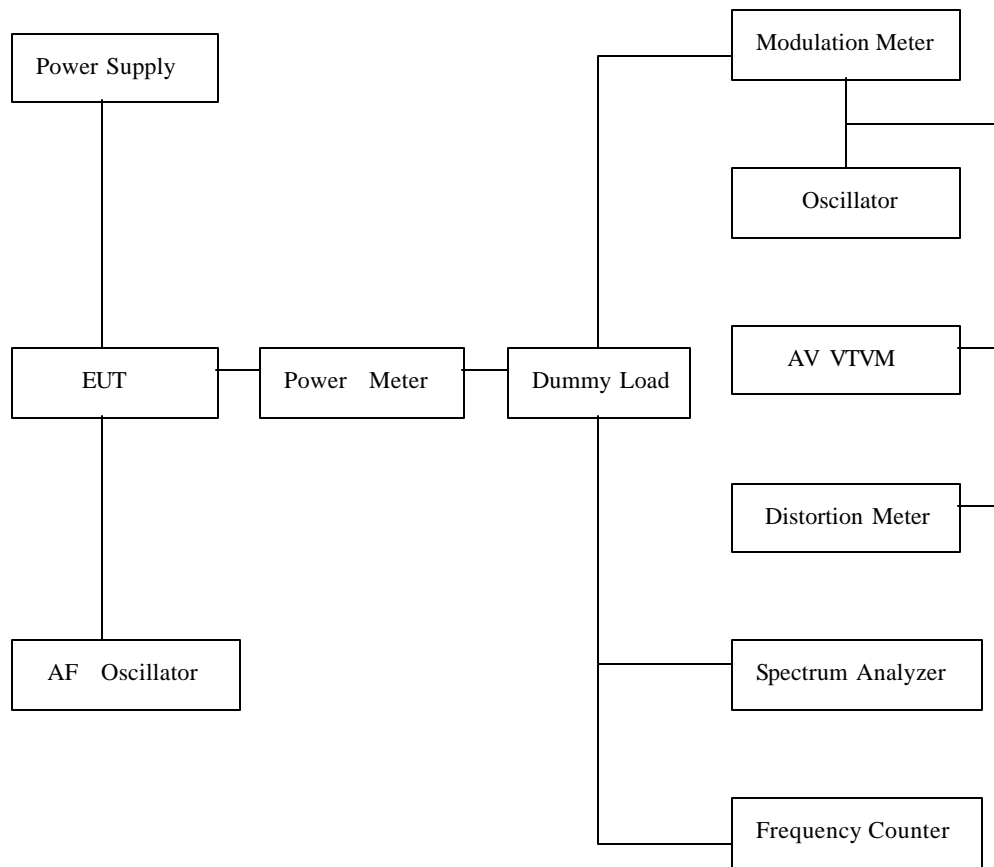
4-1. Frequency synthesizer

- a) After connecting the power meter and dummy load(50 ohm), join the antenna connector of GMRS-3000PK with above equipment.
- b) Check the voltage between RF BOARD BT POINT & GND in digital volt meter
- c) Then set the low channel of GMRS-3000PK the lowest frequency.

- d) After pressed PTT key of GMRS-3000PK, check if the lowest frequency of Tx channel to DC 1.5V in the voltage of test point(VT).
- e) After releasing the PTT key of GMRS-3000PK, check if the highest frequency of Rx channel is within DC 1.0V in the voltage of test point(VT).

4-2. Transmitter

- a) Connect EUT & measure equipment according to block diagram below.



- b) Connect DC 9.0V voltage preset to EUT.
- c) Connect 'Power Meter' and 'Dummy Load (50)
- d) Adjust Tx frequency according to trimming trimmer VC1.
- e) Connect AF Oscillator to mic terminal for conform modulation degree.
- f) Adjust the frequency of AF Oscillator to 1 kHz and adjust AF level Should be 100mV.
- g) Checking Oscilloscope and Modulation Meter.

Max deviation should be in ± 2.5 kHz.

4-3. Transmitter Test

a) Output Power Test

Power(DC 9.0V) should be Max. 1.2W ERP for GMRS channels(Channel 1~7,channel 15~22), 0.4W ERP for FRS channels(Channel 8~14)

b) Audio Response

Connect AF oscillator to Mic and then firm the audio level that doesn't distortion the wave of Oscilloscope in the frequency range, 300Hz~ 3kHz. Check the audio level for 300Hz~ 3kHz based on frequency standard,1kHz.

c) Modulation Degree Test

- 1) Connect AF oscillator to the MIC and then adjust the level to 100mV.
- 2) Measure the Oscilloscope wave and the point needle of Modulation Meter after pressing PTT key.
- 3) Sweep gradually the frequency of AF Oscilloscope from 300Hz to 3kHz.
- 4) At this time, the point needle of Modulation Meter should be in ± 2.5 kHz

d) Spectrum Test

- 1) Antenna is 50 Ω and attenuation degree should be 20 dB more.
- 2) Observe the Spectrum with pressing PTT key.

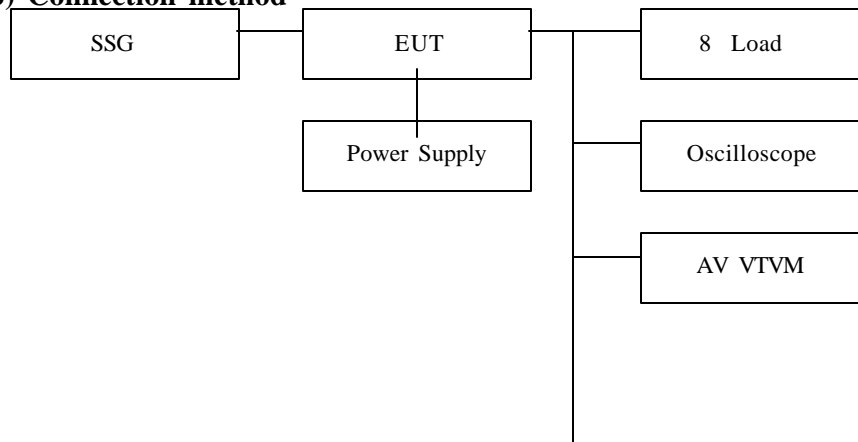
The harmonics should be less $-36 \sim -30\text{dBm}$ than carrier.

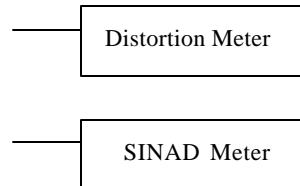
4-4. Receiver

a) Preparation

- 1) Adjust the power supply to DC 9.0V.
- 2) Adjust Voltage level to 0.7Vrms(8 Ω load) after power on.

b) Connection method





c) The Conform of Rx sensitivity

- 1) Adjust SSG to channel frequency.
- 2) Adjust modulation frequency , 1Khz to modulation degree, 3kHz.
- 3) After adjusting the frequency of SSG to channel frequency, RF level sets to -47dBm .

d) The Conform of Squelch sensitivity

- 1) Set the standard channel.
- 2) After adjusting SSG to channel frequency, the RF level of SSG is set
On SINAD 10~6 .

4-5. Receiver Test

a) Rx sensitivity test

SSG should be adjusted to 12 of SINAD point needle seeing wave of Oscilloscope as SSG sets in 1kHz frequency deviation.
At this time , normal RF level is $-110 \sim -107\text{dBm}$.

b) Audio Distortion Test

- 1) SSG should be adjusted like way of point “a)” and RF level sets to -47 dBm .
- 2) Adjust to 0.7Vrms (8 load) seeing Audio wave.
- 3) Read the needle of Distortion Meter (Normal condition would be less
Then 5% distortion)

c) Squelch Test

After RF level of SSG should be set to the least level, RF level should be Gradually increased until speaker makes audio sound.

At this point, check RF level (Check if the SINAD is 10~6).

4-6. Symptoms, Check point & Correction

a) Diagnosis method

- 1) Check each switch to work well.
- 2) Check voltage of battery.
- 3) Problem develops from transmitter or receiver?

b) Troubleshooting

1) Transmitter

- . Power key is on condition but does not work.

Battery could completely discharge.

Battery cell twist ..

Touch problem come between Battery and Radio.

- Fail to transmit.

Run out of battery or charge problem.

Fault of PTT key.

Fault of Q2,Q4,Q9,Q28,Q30

- Transmitter works but frequency is unmatched

Out of order in frequency synthesizer.

Out of order in X-tal frequency(X2)

- Audio does not sound (Tx power and Tx frequency are normal)

Problem of microphone or mic connector.

ASP(Audio Signal Processor) IC U2 problem.

- Tx is set when switch is on

Tx switch(PTT) problem.

2) Receiver

- Rx does not work

Speaker line open problem or connector problem.

Receiver power circuit problem.

Audio amplifier Base band IC U2 problem.

- Only noise sound

IF IC U2 problem.

VCO circuit problem.

- Rx sensitivity is weak

Antenna mounting problem.

Receiver front-end circuit problem.

Local oscillation frequency deviation.

FL1 SAW filter or FL2 MCF fail.

VCO circuit problem.

- . Squelch does not work

IF IC U2 problem.

Control logic circuit problem.