

Tune-Up Procedure

The built-in Channels are 15 channels +1 scan channel

The range of frequency is 450-470MHz

1. Both channels (15 channel+1 scan channel) can be preset by the computer with programming software.
2. Install the software we supplied in the computer.
3. Connect the transceiver with the PC by programming cable.

4. Open the software, Click on "Test Channel Setting", Select a channel, Setting the data in the "Edit Channel". You can change the frequency by input the value or press "→" or "←" on the keyboard to add or deduct the value. Click "OK"/"Delete" to confirm/delete the setting.

5. The procedure of the adjusting power is similar with point 4(above).

Required Test Equipment

1. Stabilized Power supply

- ①The supply voltage can be changed between 5V and 18V, and the current is 3A or more.
- ②The standard voltage is 7.5V.

2. DC Ammeter

- ①Class 1 ammeter (17 ranger and other features).
- ②The full scale can be set to either 300mA or 3A.
- ③A cable of less internal loss must be used.

3. Frequency Counter (f. counter)

- ①Frequencies of up to 1GHz or so can be measured.
- ②The sensitivity can be changed to 500MHz or below, and measurements are highly stable and accurate (0.2ppm or so).

4. Power Meter

- ①Measurable frequency :Up to 500MHz.
- ②Impedance : 50 Ω , unbalanced
- ③Measuring range :Full scale of 10W or so
- ④A standard cable (5D2W 1m) must be used.

5. RF Voltmeter (RF V.M)

- ①Measurable frequency : Up to 500MHz or so.

6. Linear Detector

- ①Measurable frequency : Up to 500MHz or so.
- ②Characteristics are flat, and CN is 60Db or more.

7. Digital Voltmeter

- ①Voltage range : FS=18V or so
- ②Input resistance : 1M Ω or more.

8. Oscilloscope

- ①Measuring range : DC to 30MHz
- ②Provides highly accurate measurements for 5 to 25MHz.

9. AF Voltmeter (AF V.M)

- ①Measurable frequency :50Hz to 1MHz
- ②Maximum sensitivity : 1mV or more

10. Spectrum Analyzer

- ①Measuring range : DC to 1GHz or more

11. Standard Signal Generator (SSG)

- ①Maximum frequency : 500MHz or more
- ②Output :-133dBm/0.05 μ V to 7dBm/501Mv
- ③Output impedance :50 Ω

12. Tracking Generator

- ①Center frequency : 50kHz to 500MHz
- ②Frequency deviation : $\pm$ 35MHz
- ③Output voltage : 100mV or more

13. Dummy Load

- ①8 Ω , 3W or more

14. AF Generator (AG)

- ①Frequency range : 100Hz to 100kHz
- ②Output : 0.5mV to 1V

15. Distortion Meter

- ①Measurable frequency :30Hz to 100kHz
- ②Input level : 50m V to 10Vrms

ADJUSTMENT FREQUENCY LIST

Destination	M	
	TX f (MHz)	RX f (MHz)
Center	460.025	
Low	450.025	
Hi	469.975	

Remarks

- Connect the transceiver to the PC
- Send the channel data to the transceiver, then backup the data.
- Program the adjustment frequencies which are in the list, into the transceiver.

Note: Remember to reload the channel data you backed up after making the transceiver.

1. Jig(chassis)for adjustment

2. Use the jig as follows:

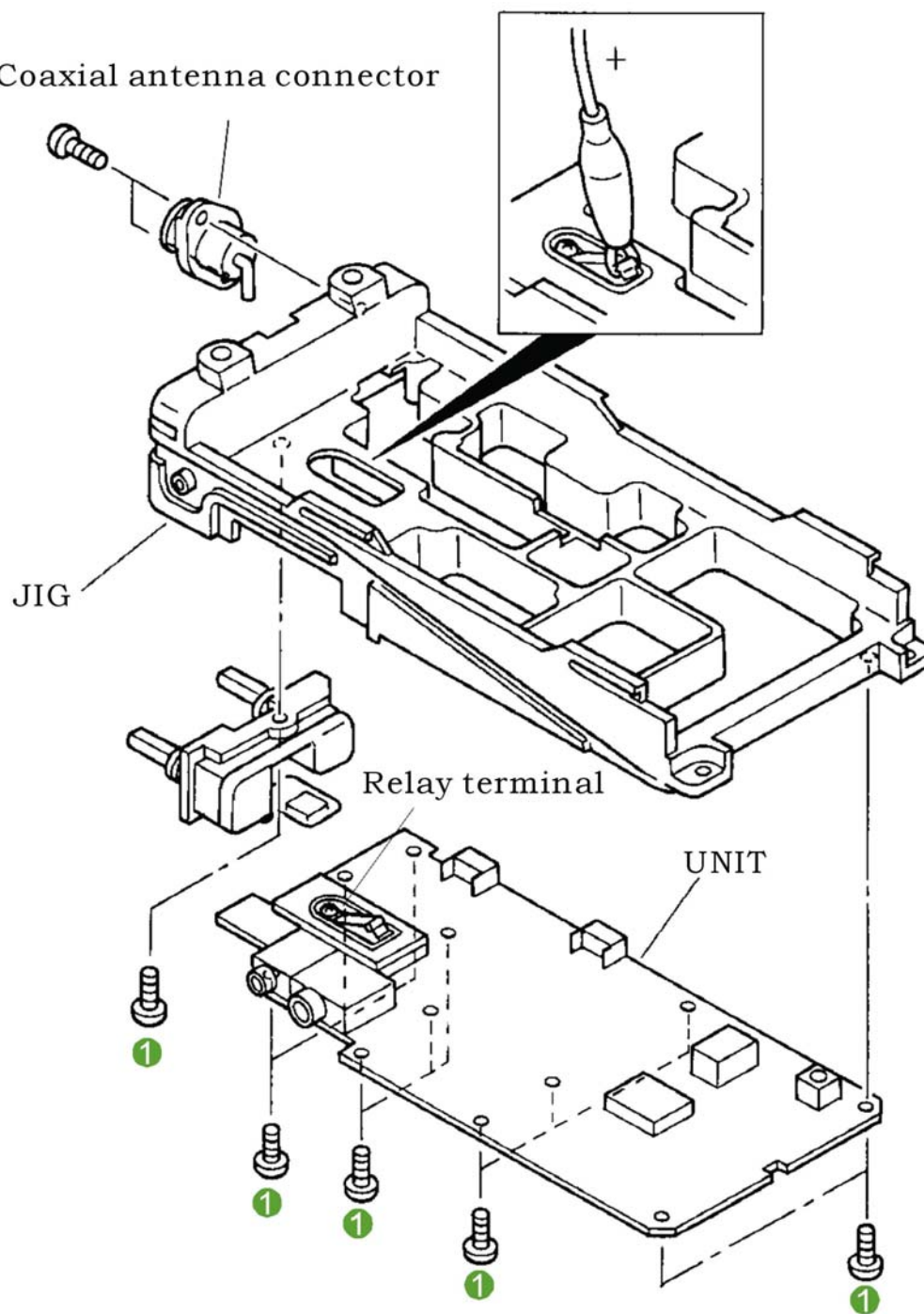
1. Insert the coaxial antenna connector into the jig.
2. Place the unit on the jig and fix it with 12 screws. ①
3. Solder the antenna terminal to the terminal of the unit.

Notes : Supply power from an external power supply.

Relay terminal: +

Jig (chassis): -

Coaxial antenna connector

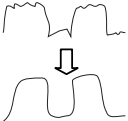


ADJUSTMENT

Squelch Level, Transmit frequency, DQT Balance, RF Power, QT Deviation, DQT Deviation, Battery Level
Section common to the transmitter and receiver(VCO)

Item	Condition	Measurement		Adjustment		Specifications/remarks
		Test equipment	Terminal	Parts	Method	
1. Setting	1)Power supply voltage Battery terminal:7.5V					
2.VCO lock voltage	1)CH:TX high	Digital voltmeter	CV	TC1	3.8V	$\pm 0.1V$
	2) CH:RX high			TC2	3.8V	$\pm 0.1V$
	3) CH:TX low				Check	More than 0.7V
	4) CH:RX low					

Item	Condition	Measurement		Adjustment		Specification s/remarks
		Test equipment	Terminal	Parts	Method	
1.Band-pass filter	1).CH:RX center 2).Tra generator output-40dBm Connect the spectrum analyzer to TP2 terminal.	Tra generator Spectrum analyzer	ANT TP2	TC201	Adjust the frequency so that it becomes the spectrum waveform shown in Fig.1.	
2.AF level	1).CH:RX center SSG output:-53dBm(501 μ V) MOD:1KHz DEV: ± 3.0 KHz (Wide) : ± 1.5 KHz (Narrow)	SSG Oscilloscope AF.V.M Distortion meter	ANT SP	L212	Adjust to the MAX AF level	
3.Sensitivity	1)CH:RX center CH:RX LO CH:RX Hi SSG ouput:-116dBm(0.35 μ V) MOD:1kHz DEV: ± 3.0 kHz (Wide) ± 1.5 kHz (narrow)				Check	SINAD:12dB or higher
4.Squelch Level (PC MODE)	1)CH:RX center MONI:ON			PC key	Level 9 Adjust to close the squelch.	The squelch must be closed.
	2)Level 9 SSG output:-117dBm(0.36 μ V)				Level 3 Adjust to close the squelch	The squelch must be closed.
	3)level 3 SSG output:-125dBm(0.126 μ V)					

Item	Condition	Measurement		Adjustment		Specifications/re marks
		Test equipment	Terminal	Parts	Method	
1. Transmit frequency (PC MODE)	1)CH:TX center PTT:ON	Frequency Counter	ANT	PC key	Adjust to center frequency	Within $\pm 100\text{Hz}$
2.DQT/QT Balance (PC MODE)	1)CH:TX center	Modulation Analyzer or linear Detector(LPF:3kHz) Oscilloscope		VR 500	Rectify the waveform to square wave	
3.Power (PC MODE)	1) CH:TX center Battery terminal:7.5V PTT:ON	Power meter Ammeter			Adjust it to 5.1W	$\pm 0.1\text{W}$
4.MAX DEV	1)CH:TX center AG:1kHz/120Mv PTT:ON	Modulation Analyzer or linear Detector(LPF:15kHz) Oscilloscope	ANT MIC	VR 501	Adjust it to $\pm 4.2\text{kHz}$ (Wide) Narrow check	$\pm 100\text{Hz}$ $\pm 1.8\text{kHz} \sim 2.2\text{kHz}$
5.MIC SENS	1)CH:TX center AG:1kHz/12Mv	AG AF.V.M			Check (+, -Peak whichever is Maximum)	$\pm 2.2\text{kHz} \sim 3.6\text{kHz}$ (Wide) $\pm 1.1\text{kHz} \sim 1.9\text{kHz}$ (Narrow)
6.QT DEV (PC MODE)	1)CH:TX high:M TX Center:M2 QT;67.0Hz	Modulation Analyzer or linear Detector(LPF:3kHz) Oscilloscope AG AF.V.M	ANT	PC key	Adjust it to $\pm 0.9\text{kHz} : \text{M}$ Adjust it to $\pm 0.75\text{kHz} : \text{M2}$ (Wide) Adjust it to $\pm 0.45\text{kHz} : \text{M}$ Adjust it to $\pm 0.35\text{kHz} : \text{M2}$ (Narrow)	$\pm 50\text{Hz}$ $\pm 50\text{Hz}$
7.DQT DEV (PC MODE)	1)CH:TX center	Modulation Analyzer or linear Detector(LPF:3kHz) Oscilloscope		PC key	Adjust it to $\pm 0.75\text{kHz}$ (Wide) Adjust it to $\pm 0.35\text{kHz}$ (Narrow)	$\pm 50\text{Hz}$ $\pm 50\text{Hz}$
8.Battery Level (PC MODE)	1)Battery terminal:5.8V	Digital voltmeter	BATT	PC key	Adjust so that the LED flashes.	The LED must Flash.

BPF-Wave

