Tuning Method and Procedures:

1. Download

- Connect the radio with PC by programming cable; turn the radio on.
- Click “Download” on software interface.
- Select the desired program and click “Open”, download starts.
- Click “End” when download is completed.
- Turn the radio off and remove the programming cable.

2. Initialization

It is necessary to set the frequency and initialize the radio before tuning because there is no needed information in EEPROM when the radio is manufactured.

- Turn on the power while holding down [P2], and press [P4] after LCD displays “DESTINA+initial value” (Refer to “Initial value/model” in the following table)
- The LED on the front panel finishes flashing, indicating that the initialization is over.

3. Tuning

Some items can be Tuninged in conventional mode and the others in manual tuning mode.

- Turn on the power to enter conventional mode.
- Switch off the power. And then turn on the power while holding down [P1]. The radio enter manual tuning mode. The tuning item is displayed on LCD.
- Frequency Table

Model	RX/TX	1 (C)	2 (L)	3 (H)	4	5	6	7	8
0	RX(MHz)	155.15	136.15	173.85	145.55	164.50	155.00	155.20	155.40
(V)	TX(MHz)	155.00	136.00	174.00	145.50	164.50	155.00	155.20	155.40
1	RX(MHz)	435.15	400.15	469.85	417.55	452.50	435.00	435.20	435.40
(U1)	TX(MHz)	435.00	400.00	470.00	417.50	452.50	435.00	435.20	435.40
2	RX(MHz)	475.15	450.15	499.85	462.55	487.50	475.00	475.20	475.40
(U2)	TX(MHz)	475.00	450.00	500.00	462.50	487.50	475.00	475.20	475.40
3	RX(MHz)	505.15	480.15	529.85	492.55	517.50	505.00	505.20	505.40
(U3)	TX(MHz)	505.00	480.00	530.00	492.50	517.50	505.00	505.20	505.40
4	RX(MHz)	375.15	350.15	399.85	362.55	387.50	375.00	375.20	375.40
(U4)	TX(MHz)	375.00	350.00	400.00	362.50	387.50	375.00	375.20	375.40

TM-610V：136-174；

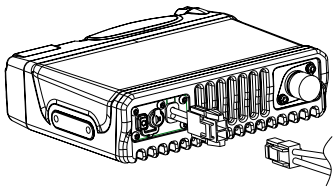
TM-610U1：400-470；

TM-610U2：450-500；

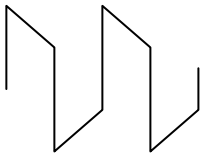
TM-610U3：480-530；

TM-610U4：350-400；

VCO

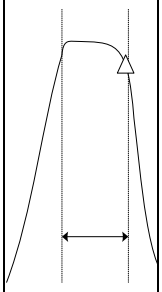
<table>
<tr><th rowspan="2">Item</th><th rowspan="2">Condition</th><th colspan="2">Measurement</th><th colspan="2">Tuning</th><th rowspan="2">Specification/Remarks</th></tr>
<tr><th>Test Instrument</th><th>Terminal</th><th>Part</th><th>Method</th></tr>
<tr><td>1. Power Supply</td><td>1. Power supply voltage DC 13.6V</td><td colspan="5"> 
Note: 1. This radio can only be installed in negative grounding electrical system. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before the installation to avoid wasted time and effort.
2. If DC power is to be controlled by the vehicle ignition switch, a switch relay should be used to switch the positive power lead. The vehicle ignition switch then controls DC to the relay coil.</td></tr>
<tr><td rowspan="2">2. VCO Lock Voltage (Tx)</td><td>1.CH: TX HI</td><td rowspan="4">Digital Voltmeter</td><td rowspan="4">CV</td><td rowspan="2">TC1</td><td colspan="2">VHF:6.0V±0.1V
UHF:5.0±0.1V</td></tr>
<tr><td>2.CH: TX LO</td><td>Check</td><td>＞1.0V</td></tr>
<tr><td rowspan="2">3. VCO Lock Voltage (Rx)</td><td>1.CH: RX HI</td><td rowspan="2">TC2</td><td colspan="2">VHF:6.0V±0.1V
UHF:6.5±0.1V</td></tr>
<tr><td>2.CH: RX LO</td><td rowspan="2">Check</td><td>VHF＞1.2V
UHF＞1.0V</td></tr>
</table>

Transmitter

Item	Condition	Measurement		Tuning		Specification /Remarks
		Test Instrument	Terminal	Part	Method	
4. Tx Frequency	Not enter tuning item, but switch to CH_2	Radio Communication Test Set	ANT	Tuning VR801	Tuning channel frequency	Error<50Hz
5. Tx Power	Each CH corresponds to a specific TX freq; enter the item “TXHIGH”、 “TX LOW” in turn, to tuning High/Low power.	Radio Communication Test Set Ammeter	ANT	Tuning software setting & VR101; press [P4] to save the setting and move to the next item.	High Power: PO=23~25W I≤8.0A	Check High Power
					Low Power: PO=5±0.5W I≤5.0A	Check Low Power
6. Max. Deviation	1. Each CH corresponds to a specific TX freq; enter the item “MAX.DEV” and tuning “_C” “_L”、“_H” 、 “M_C” 、“N_C”、”N_M”、”N_H”	Radio Communication Test Set Filter: 0.05-15KHz AF：1KHz 75mV	ANT MIC Jack	Tuning software setting; press [P4] to save the setting and move to the next item.	Check the deviation of Hi/Mid/Low channel: 4.0±0.1KHz(W)	
					Check the deviation of Hi/Mid/Low channel: 3.2±0.1KHz(M)	
					Check the deviation of Hi/Mid/Low channel: 1. 9±0.1KHz (N)	
7. Modulation Sensitivity	1. Each CH corresponds to a specific TX freq.	Radio Communication Test Set Filter: 0.05-15KHz AF：1KHz 7.5mV	ANT MIC Jack		Check deviation: 2.6KHz-3.4KHz (W) 2.2KHz-2.7KHz (M) 1.3KHz-1.7KHz (N)	Check
8. Modulation Distortion					≤5%	
9. CDCSS Balance	Each CH corresponds to a specific TX freq; enter item “CDCSS.BAL”	Radio Communication Test Set Filter LPF: 300Hz	ANT	Use “UP”, “DN” key to set CDCSS		Check waveform

10. CTCSS Deviation	Each CH corresponds to a specific TX freq; enter item “CTC.L_DEV”、“CTC.C_DEV”、“CTC.H_DEV” tuning 67Hz/151.4Hz/254.1Hz CTCSS	Radio Communication Test Set Filter LPF: 300Hz	ANT	Use “UP”, “DN” key to set CDCSS	Tuning deviation to 0.75KHz±0.10KHz (W) 0.60KHz±0.10KHz (M) 0.37KHz±0.05KHz (N)	
11. CDCSS Deviation	Each CH corresponds to a specific TX freq; enter item “CDCSS.DEV”	Radio Communication Test Set Filter LPF: 300Hz	ANT	Use “UP”, “DN” key to set CDCSS	Tuning deviation to 0.75KHz±0.10KHz (W) 0.60KHz±0.10KHz (M) 0.37KHz±0.05KHz (N)	
12.DTMF Deviation	Each CH corresponds to a specific TX freq; enter item “DTMF.DEV”	Radio Communication Test Set Filter LPF: 3KHz	ANT	Use “UP”, “DN” key to set CDCSS	3.0KHz±0.1KHz (W) 2.4KHz±0.1KHz (M) 1.5KHz±0.1KHz (N)	
13. MSK	Each CH corresponds to a specific TX freq; enter item “MSK.DEV”	Radio Communication Test Set Filter LPF: 3KHz	ANT	Use “UP”, “DN” key to set CDCSS	3.0KHz±0.1KHz (W) 2.4KHz±0.1KHz (M) 1.5KHz±0.1KHz (N)	
14. Single tone (2-/5-Tone)	Each CH corresponds to a specific TX freq; enter item “TONE DEV”	Radio Communication Test Set Filter LPF: 3KHz	ANT	Use “UP”, “DN” key to set CDCSS	Tuning deviation to 3.0KHz±0.10KHz (W) 2.4KHz±0.10KHz (M) 1.5KHz±0.1KHz (N)	

Receiver

Item	Condition	Measurement		Tuning		Specification /Remarks
		Test Instrument	Terminal	Part	Method	
15. RF bandpass filter	Enter item“SENSITVITY”; Each CH corresponds to a specific Tx freq.	Scanner	ANT . TP1	First manually tuning TC101, then the software setting	Set the gain value to the max; the corresponding frequency of VHF and UHF is on the rightmost and leftmost of the bandpass wave. Press [P4] key to save.	
16. Max. SINAD	Frequency: Rx Center; tuning to CH_1(C); corresponds to a specific freq.	Radio Communication Test Set SSG Output: -47dBm MOD: 1KHz DEV: ±3KHz(W) ±1.5KHz(N) Filter: 0.3-3.0KHz	ANT SP Jack	K301	First Tuning K301. Tuning the volume to rated output. Take the record of max SINAD and Tuning K301 to the max volume output.	Check Max. volume: 4.2V or above
17. Sensitivity	1. Test Mode, CH: RX Center, manually tuning to CH_1(C).	Radio Communication Test Set SSG Output: -116dBm MOD: 1KHz DEV: ±3KHz(W) ±2.4KHz(M) ±1.5KHz(N) Filter:0.3-3.0KHz	ANT SP Jack	Press [UP] & [DN] key to toggle among channels.	Tuning K301. Tuning the volume to rated output.	SINAD: 12dB or above
	2. Test Mode, CH: RX LO, manually tuning to CH_2(L).					
	3. CH: RX HI, manually tuning to CH_3(H).					

18. SQLOpen	Enter in turn the item“OPENSQL9”(Level 9 on), “OPENSQL3” (Level 3 on); tuning CH to “_C”、“_L”、“_H ”、“ M_C ”、“ N_C ”	Radio Communication Test Set SSG Output: -119dBm (Level 3) SSG Output: -113dBm (Level 9)	ANT SP Jack	Tuning software setting	No need to tuning software setting at SQ Level 3/9; press [P4] twice to save.	Continuously press[P2] key twice for CPU reading and SQL level writing
19. SQLClose	Enter in turn the item“CLOS.SQL9”(Level 9 off), “CLOS.SQL3” (Level 3 off); Tuning CH to“_C”、“_L”、“_H”、“M_C”、“N_C”	Radio Communication Test Set SSG Output: -123dBm (Level 3) SSG Output: -115dBm (Level 9)			No need to tune software setting at SQ Level 3/9; press [P4] twice to save.	Continuously press[P4] key twice for CPU reading and SQL level writing
20. Distortion	1. Channel: RX Center	Radio Communication Test Set SSG Output: -60dBm	ANT SP Jack	Filter: 0.3-3.0KHz	Check	DIS≤5%
21. S/N						S/N≥**45** (W) S/N≥**40** (N)

Note: The radio must be covered with aluminum chassis during the tuning of sensitivity, Tx power, signalling waveform, frequency deviation, Rx Squelch. Connect an RF power meter to the antenna connector during transmission. Connect the SINAD meter with 16ohm load to the external [SP] Jack.