Tune-up procedure

Required Test Instrument

Radio communication test set	1 set
Scanner	1 set
3A/10V power supply	1 set
Digital voltmeter	1 set
3A Ammeter	1 set

Preparation

Open the programming software in PC and operate as the following instructions.

1. Programme Download:

Connect the radio with the computer via programming cable. And then turn the power on. LED glows orange. Click “Programme” → “Download” on the interface to choose programme. Click “Open” to begin download and LED flashes red. When download is complete, click “End” and turn the power off. And then disconnect the programming cable.

2. Initialization:

Turn the power on while holding down [PTT] and [A] key simultaneously. LED glows orange and a BEEP sounds. Radio channel frequency and setting data are initialized.

3. Destination Set:

Turn the power on. And then connect the radio with the computer via programming cable. Set “frequency range” on the programming software interface. And then click “Programme” → “ Writing”.

4. Factory Setting

The compander is enabled. Squelch level 2. Adjustment mode is disabled.

Adjustment Procedure & Method

1) Turn the power on while holding down PTT and programmable key C, after two seconds, the radio enters adjustment mode.

2) CH1-CH16 are defined as following:

CH1: Keyboard and Display Detect;

CH2: Transmitting VCO;

CH3: Receiving VCO;

CH4: Frequency Accuracy;

CH5: High power;

CH6: Low power;

CH7: CDCSS balance;

CH8: MIC sensitivity;

CH9: Maximum frequency deviation;

CH10: CTCSS/CDCSS deviation;

CH11: FFSK deviation;

CH12: TONE deviation;

CH13: Receiving sensitivity;

CH14: Squelch level;

CH15: Low battery alert level;

CH16: VOX sensitivity.

3) Keyboard and display detect: Enter adjustment mode. Turn to CH1. Press PTT. A black screen is displayed. And then press keys on the keyboard to check the display.

VCO

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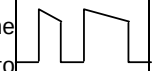
<tr><td>1. Setting</td><td>Power supply 7.5V</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">2.Transmit VCO lock voltage</td><td>1.Turn to CH2. Press PTT. TX High</td><td rowspan="4">Digital Voltmeter</td><td rowspan="4">CV</td><td rowspan="4">TC350
TC351</td><td>Check</td><td>3.1V±0.2V</td></tr>
<tr><td>2. Press PTT again. TX Low</td><td>Check</td><td>1.0V±0.2V</td></tr>
<tr><td rowspan="2">3. Receiving VCO lock voltage</td><td>1. Turn to CH3. Press PTT. TX High</td><td>Check</td><td>3.1V±0.2V</td></tr>
<tr><td>2. Press PTT again. TX Low</td><td>Check</td><td>1.0V±0.2V</td></tr>
</table>

Transmitter

Item		Condition	Measurement		Adjustment		Specification /Remarks
			Test Instrument	Terminal	Part	Method	
1. Transmit frequency		Turn to CH4. Press PTT.	Radio Communication Test Set	ANT	[B] (up) [C] (down)	Adjust to center frequency. Press [A] to save.	Error≤ 150Hz
2. Power	High	1. Turn to CH5. Press PTT. Center frequency	Radio Communication Test Set Ammeter	ANT	[B] (up) [C] (down)	Adjust to 4.0 W, I≤1.6A. Press [A] to save.	4.0W±0.3W
		2. Press PTT. Frequency changes to low frequency.				Adjust to 4.0 W, I≤1.6A. Press [A] to save.	
		3. Press PTT again. Frequency changes to high frequency.				Adjust to 4.0 W, I≤1.6A. Press [A] to save.	
	Low	1. Turn to CH6. Press PTT. Center frequency.				Adjust to 1.0 W, I≤0.7A. Press [A] to save.	1W±0.3W
		2. Press PTT. Frequency changes to low frequency.				Adjust to 1.0 W, I≤0.7A. Press [A] to save.	
		3. Press PTT again. Frequency changes to high frequency.				Adjust to 1.0 W, I≤0.7A. Press [A] to save.	
3. CDCSS balance	Wideband	1. Turn to CH7. Press PTT. Wideband. Center frequency.	Radio Communication Test Set LPF: 15KHz	ANT	[B] (up) [C] (down)	Rectify the waveform to square wave. Press [A] to save.	
		2. Press PTT. Frequency changes to low frequency.					
		3. Press PTT again. Frequency changes to high frequency.					
	Narrowband	4. Press PTT for two seconds. LED flashes indicating that the radio operates with narrowband. Center frequency. Adjust narrowband following the above steps.					

4. MIC Sensitivity (Wideband)		1. Turn to CH8. Press PTT. Wideband. Center frequency. 2. Press PTT. Frequency changes to low frequency. 3. Press PTT again. Frequency changes to high frequency.	Radio Communication Test Set LPF: 15KHz AF: 1KHz 24mV	ANT MIC Jack	[B] (up) [C] (down)	Check Frequency deviation 2.9±0.1KHz. Press [A] to save.	Adjust as wideband.
5. Maximu-m frequenc-y deviation	Wideba-nd	1. Turn to CH9. Press PTT. Wideband. Center frequency. 2. Press PTT. Frequency changes to low frequency. 3. Press PTT again. Frequency changes to high frequency.	Radio Communication Test Set LPF: 15KHz AF: 1KHz 500mV	ANT MIC Jack	[B] (up) [C] (down)	Adjust it to 4.0KHz±100Hz. Press [A] to save.	
	Narrow-band	4. Press PTT for two seconds. LED flashes indicating that the radio operates with narrowband. Center frequency. Adjust narrowband following the above steps.				Adjust it to 2.0KHz±100Hz. Press [A] to save.	
6. CTCSS / CDCSS deviation	Wideba-nd	1. Turn to CH10. Press PTT to adjust CTCSS deviation. Wideband. Center frequency. 2. Press PTT. Frequency changes to low frequency. 3. Press PTT again, frequency changes to high frequency.	Radio Communication Test Set LPF: 3KHz	ANT	[B] (up) [C] (down)	Adjust deviation to 0.70KHz ± 50Hz. Press [A] to save.	

		4. Press PTT to adjust CDCSS deviation. Wideband. Center frequency.					
		5. Press PTT. Frequency changes to low frequency.					
		6. Press PTT again, frequency changes to high frequency.					
	Narrow-band	7. Press A key for two seconds. LED flashes indicating that the radio operates with narrowband. Adjust CDCSS deviation. High frequency.				Adjust deviation to 0.35KHz± 50Hz. Press [A] to save.	
		8. Press PTT. Frequency changes to center frequency.					
		9. Press PTT. Frequency changes to low frequency.					
		10. Press PTT to adjust CTCSS deviation. Narrowband. Center frequency.					
		11. Press PTT. Frequency changes to low frequency.					
		12. Press PTT again, frequency changes to high frequency.					
7. FFSK deviation	Wideba-nd	1. Turn to CH11. Press PTT. Center frequency.	Radio Communication Test Set LPF: 3KHz	ANT	[B] (up) [C] (down)	Adjust deviation to 3KHz± 0.1KHz. Press [A] to save.	
		2. Press PTT. Frequency changes to low frequency.					
		3. Press PTT again, frequency changes to high frequency.					

	Narrowb-and	4. Press A key for two seconds. LED flashes indicating that the radio operates with narrowband. Center frequency. Adjust narrowband following the above steps.				Adjust deviation to 1.45KHz± 0.05Hz. Press [A] to save.	
8.TONE deviation	Wideba-nd	Turn to CH12. See FFSK deviation adjustment.	Radio Communication Test Set LPF: 3KHz	ANT	[B] (up) [C] (down)	Adjust it to 3KHz±0.1KHz. Press [A] to save.	
	Narrow-band	See FFSK deviation adjustment.				Adjust it to 1.45KHz± 0.05KHz Press [A] to save.	
9. Low battery alert level		Turn to CH15. Adjust voltage to 6.1V.	Digital Voltmeter			Press [A] to save.	
10.VOX Sensitivity		Turn to CH16.	Radio Communication Test Set LPF: 15KHz AF: 1KHz 3mV	ANT MIC Jack		Press [A] to save.	

Receiver

Item		Condition	Measurement		Adjustment		Specification/ Remarks
			Test Instrument	Terminal	Part	Method	
Sensitivity		1. Turn to CH13. Press PTT. Center frequency. 2. Press PTT. Frequency changes to low frequency. 3. Press PTT. Frequency changes to high frequency.	Scanner	ANT T1	[B] (up) [C] (down)	Adjust the waveform. Press [A] to save.	
Squelch	Wideband	1. Turn to CH14. Press PTT. Wideband. Center frequency. 2. Press PTT. Frequency changes to low frequency. 3. Press PTT. Frequency changes to high frequency.	Radio Communication Test Set SSG output: -118dBm MOD: 1KHz DEV: ±3KHz FILTER: 0.3-3.4KHz	ANT Speaker Jack		Adjust radio communication test set. SSG output: SINAD: 15dB Press [A] to save.	
	Narrow-band	4. Press A for two seconds. LED flashes indicating that the radio operates with narrowband. High frequency. 5. Press PTT. Frequency changes to center frequency. 6. Press PTT. Frequency changes to low frequency.	Radio Communication Test Set SSG output: -118dBm MOD:1KHz DEV:±1.5KHz FILTER: 0.3-3.4KHz			Adjust radio communication test set. SSG output: SINAD: 15dB Press [A] to save.	