

**ACKNOWLEDGEMENTS!**

Thank you for purchasing this dual band vehicle transceiver. We are dedicated to provide amateur radio products which always surprise and excite serious HAMS. This transceiver is no exception. As you learn how to use this transceiver, you will find that we lay great emphasis on "user friendliness." For example, each time you change the menu No. in menu mode, you will see a text message on the display, notifying you what you are configuring. Though user friendly, this transceiver is technically sophisticated and some features may be new to you. Consider this manual to be a personal tutorial from the designers. Allow the manual to guide you through the learning process now, and act as a reference in the future.

data communication.

**FCC Radiated Exposure Statement:**

This equipment complies with FCC radiated exposure limits set forth for a controlled environment. This equipment should be installed and operated with minimum distance 1 m between the antenna and your body.

**FCC Caution**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**PRECAUTIONS**

Please observe the following precautions to prevent fire, personal injury, and/or transceiver damage:

- Do not attempt to configure your transceiver while driving; it is simply too dangerous.
- Be aware of local laws pertaining to the use of headphones/headsets while driving on public roads. If not sure, do not wear headphones while driving.
- Do not transmit with high output power for extended periods; the transceiver may overheat.
- Do not attempt to modify the transceiver unless instructed by this manual or other our documentation.
- Do not expose the transceiver to long periods of direct sunlight nor place it close to heating appliances.
- Do not place the transceiver in excessively dusty, humid or wet areas, nor on unstable surfaces.
- If an abnormal odor or smoke is detected coming from the transceiver, turn OFF the power immediately. And contact our service station or your dealer.
- This transceiver is designed for a 13.8 V power source. Never use a 24 V battery to power the transceiver.

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## Unpacking and checking equipments

### Supplied accessories

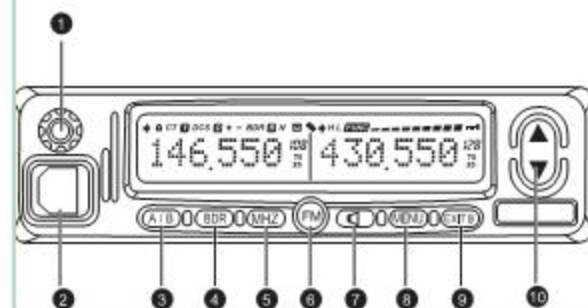
After carefully unpacking the transceiver, check the items listed in the table below. We recommend you keep the box and packaging for shipping.

Accessory	Quantity
Microphone	1
DC power cable	1
Mounting bracket	1
Microphone hanger	1
Screw set	1
Instruction manual	1

### Getting acquainted

#### Description of transceiver

##### 1. Front panel



##### ① (Power) switch/ Volume control

Press to switch the transceiver power ON or OFF.

Turn it to adjust the level of the receive audio from the speaker.

##### ② Microphone/Programming cable port

For voice communications, connect a 600  $\Omega$  Microphone equipped with an 8-pin modular plug into the modular socket on the front of the main unit. Press firmly on the plug until the locking tab clicks; you can be programmed by programming cable connect to computer through the port.

③ **A/B** : Press this key to switch A/B band display and working band.

④ **BDR** : Short press this key, it can be choose bands (VHF/UHF0); Long press this key, the receiving and transmitting frequency will be reverse; press and hold on Mic (PTT) key, then press key **BDR** it can be transmit 1750Hz burst tone, release **BDR** key to end transmitting 1750Hz burst tone.

⑤ **MHz** : In frequency mode, press **MHz** key it can be adjusted each MHz value on the screen, press  $\Delta$  /  $\nabla$  Key for fast choose your need frequency. E.g: if you want to set 144.550MHz in A band, first please confirm  $\rightarrow$  in A band, press **MHz** key, the screen display  $\boxed{14.550}$  430.550; press **MHz** key again, it can be selected 3-7, press  $\Delta$  /  $\nabla$  key for choose "4", the screen display  $\boxed{14.550}$  430.550, as the same with the step, it can be selected numerical on next position; press **EXIT** key that can be returned last number when you set frequency.

⑥ **FM** : startup and turn of FM radio, please short press **FM** key; startup alarm, please long press **FM** key.

⑦ **EXIT** : startup squelch, press short press **EXIT** key; startup scan for

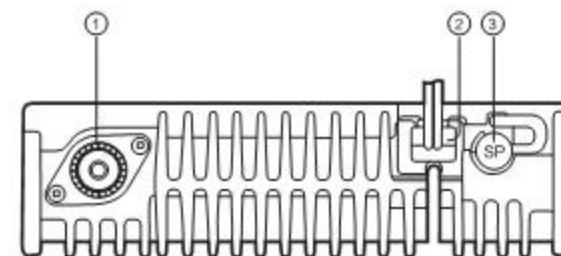
frequency and channel, please long press **EXIT** key for 2 seconds; it can be stop scan when you press any key.

⑧ **MENU** : This is start key to enter the menu setting mode, press this key means to confirm the current menu items if had been in menu setting mode.

⑨ **EXIT** : This is Return/ Clear key, press this key to exit the menu setting when in menu setting state; to cancel the last input number when in frequency, channel and FM radio frequency input state.

⑩  $\Delta$  /  $\nabla$  : In frequency mode, to change the current receiving frequency by  $\Delta$  /  $\nabla$  key according to the frequency step which had been set when in standby; in channel mode, to change the channel by  $\Delta$  /  $\nabla$  key when in standby; press more than 2 seconds will fast go forward or backward if you want to change the setting of menu items and value. To change the scan direction in scan mode.

##### 2. Rear panel



##### ① Antenna connector

Connect an external antenna here. When making test transmissions, connect a dummy load to replace the antenna. The antenna system or load should have an impedance of 50  $\Omega$ .

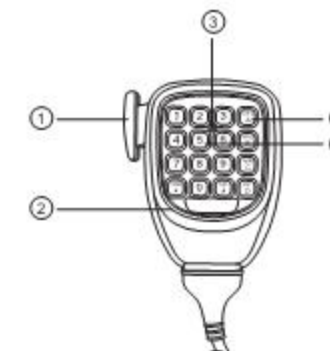
##### ② Power input 13.8 V DC cable

Connect a 13.8 V DC power source here. Use the supplied DC power cable.

##### ③ SP (speaker) jack

If desired, connect an optional external speaker for clearer audio. This jack accepts a 3.5mm mono (2-conductor) plug.

##### 3. Microphone



##### ① PTT (Push-to-Talk) switch

Press and hold to transmit. Release to receive.

##### ② Speaker

It can be output voice when receive signal.

##### ③ Microphone

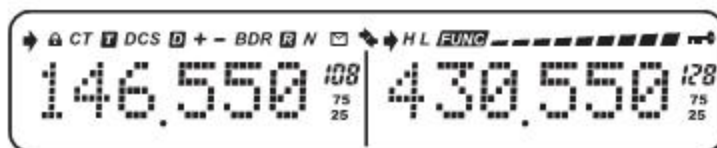
To transmit, hold the Microphone approximately 5cm (2 inches) from your mouth, then press and hold MIC [PTT] and speak into the Microphone in your normal tone of voice.

④ **Recall** key: Press PTT and recall key, it can be recall DTMF code of last time.

⑤ **Number** key: Hold PTT key, it is enter an operating DTMF function by press number key.

## LCD display

You can see various icons show on the screen when power on. The following table can help you identification the icon's meaning which display on LCD.



➡ It indicates the current transmitting, receiving and standby working band; the left of A band on the screen, the right of B band.

🔒 No definition

**CT** Appears when the CTCSS function is activate

**T** Appears when the Tone function is activated

**DCS** Appears when the DCS function is activated

**D** No definition

**+** Appears when the repeater shift function (positive) is activated

**-** Appears when the repeater shift function (negative) is activated.

**BDR** If it static displays on screen, it means only startup dual standby mode and not been activated; it is working standby the two bands' frequency range at the same time when it flickers.

**R** The receiving and transmitting frequency interchanged in frequency/channel mode.

**N** Appears when narrow Mode is selected

☑ No definition

🔑 Appears when the Key Lock function is ON, unlock the keyboard by long press **EXTB** key.

**H** The high power transmission is selected

**L** The low power transmission is selected

**FUNC** No definition

----- It indicates the transmitting signal strength when transmitting, and it indicates the receiving signal strength when receiving.

**188** In channel mode, it indicates the channel order when in frequency and channel name display mode.

It indicates the current menu order when in menu setting mode.



It displays the receiving and transmitting frequency, FM radio frequency, menu items, menu value and other working mode.

## Brief introduction of functions

## 1. Working mode

FM 87-108MHz(Receiving)

VHF 136-174MHz(Receiving & transmitting)

UHF0 400-470 MHz(Receiving & transmitting)

## 2. Working mode: Frequency mode, channel mode

## 3. Digital FM radio

## 4. Dual frequency display

## 5. U&amp;V, U&amp;U, V&amp;V, V&amp;U dual band working mode can be selected arbitrarily

## 6. Dual frequency standby in any band

## 7. DTMF signaling system

## 8. Alarm(Distant and spot alert)

## 9. Inspection, Monitor, Stun and Kill

## 10. 50 Groups CTCSS and 105 Groups DCS

## 11. Non-standard CTCSS(From 60Hz to 259.9 Hz)

## 12. High/Low output power can be changed

## 13. Transmit Over Timer

## 14. 5 kinds of frequency step (5K, 6.25K, 10K, 12.5K, 25K)

## 15. Channel bandwidth selectable(Wide/Narrow)

## 16. Busy channel lockout

## 17. Auto backlight

## 18. Auto/Manual keyboard lock

## 19. Three display colors selectable both in transmitting, receiving and standby

## 20. Frequency, channel order and channel name multi-display modes

## 21. ANI code display(caller ID)

## 22. Ring alert function

## 23. DTMF sidetone switch

## 24. 1750Hz burst tone

## 25. 3 kinds of scan mode(TO/CO/SE)

## 26. PTT-ID Function(BOT/EOT/BOTH)

## 27. Multi-kind mute modes (QT/AND/OR)

## 28. Frequency shift direction selectable in frequency mode

## 29. Offset frequency( can be set between 0 -69.950 MHz in frequency mode)

## 30. Frequency, channel and menu fast search function

## 31. Channel parameter can be saved in frequency mode

## 32. 128 memory channels

## 33. Reverse frequency function

## 34. U/V receiving and transmitting inter-band can be connected with repeater

## 35. Computer programmable

## Menu function list

Menu order	Function name	Function Description	Optional settings	Page
0	SQL	Squelch level	0,....,9	09
1	BAND	Band selection	VHF(136-174MHz ) UHF0(400-470MH z)	09
2	TX-AB	Transmitting selection in dual standby	OFF A B	09
3	BDR	Dual frequency standby	OFF ON	10
4	TXP	Transmitting power	HIGH LOW	10
5	TOT	Transmit over timer	15,30,...600	10
6	STEP	Frequency step	5.00K 6.25K 10.00K 12.50K 25.00K	10
7	WN	Bandwidth	WIDE(N/A .) NARR(12.5K)	10
8	R-DCS	Receiving DCS	OFF D023N,...,D754I	10
9	R-CTCS	Receiving CTCSS	OFF 67.0HZ,...,254.1HZ	11
10	T-DCS	Transmitting DCS	OFF D023N,...,D754I	11
11	T-CTCS	Transmitting CTCSS	OFF CTCSS 67.0HZ,...,254.1HZ	11

Menu order	Function name	Function Description	Optional settings	Page
12	ABR	Auto backlight	OFF ON	12
13	BEEP	Beep prompt switch	OFF ON	12
14	ANI-SW	ANI code switch	OFF ON	12
15	OPTSIG	Optional signal	OFF DTMF	12
16	SPMUTE	Mute mode	QT AND OR	12
17	ANI-ID	Transceiver's ANI ID code	By programming software	12
18	RING-T	Ring time	OFF 1,...,10 second	13
19	DTMFST	DTMF sidetone switch	OFF DT-ST ANI-ST DT+ANI	13
20	S-CODE	Signal information code	1,...,15 for selected	13
21	SC-REV	Scan mode	TO CO SE	13

Menu order	Function name	Function Description	Optional settings	Page
22	PTT-ID	Transmit PTT ID code	OFF	14
			BOT	
			EOT	
			BOTH	
23	PTT-LT	Transmit ANI code delay	0,1,...,30 second	14
24	MDF-A	A channel display mode	FREQ	14
			CH	
			NAME	
25	MDF-B	B channel display mode	FREQ	14
			CH	
			NAME	
26	BCL	Busy channel lockout	OFF	15
			ON	
27	AUTOLK	Auto keyboard lock	OFF	15
			ON	
28	SFT-D	Frequency shift direction	OFF	15
			+	
			-	
29	OFFSET	Offset frequency	00.000,...,69.950	15
30	MEMCH	Memory channel	000,...,127	15
31	DELCH	Delete channel	000,...,127	16

Menu order	Function name	Function Description	Optional settings	Page
32	WT-LED	Standby display color	OFF	16
			BLUE	
			RED	
			PINK	
33	RX-LED	Receiving display color	OFF	16
			BLUE	
			RED	
			PINK	
34	TX-LED	Transmitting display color	OFF	17
			BLUE	
			RED	
			PINK	
35	RESET	Reset	VFO	17
			ALL	

## Basic operations

## NOTE

» In dual standby mode, the screen shows "BDR". The ➡ mark is the master frequency while the other without ➡ mark is the sub frequency, the transceiver only transmits in the master frequency and receives in the sub frequency.

» Master frequency setting

In dual standby, press **A/B** to choose the master frequency.

» This is dual band vehicle transceiver, with dual frequency and dual display functions. In frequency mode, it can display two different receiving/transmitting frequencies at the same time; in channel mode, it can also display the channel frequency and related parameter in both channels at the same time.

» In frequency/channel mode: it is switchable between band A and band B by **A/B** key, when the A/B indicator shows in band A, all the operations are based on band A, while the indicator shows in band B, all the operations are based on band B.

» In frequency mode: it can be set the following function; the frequency step, output power, squelch level, bandwidth, CTCSS, DCS, offset frequency, frequency shift direction and channel display modes in band A or band B.

» In channel mode: it can be set the following function; output power, bandwidth, CTCSS, DCS, offset frequency, frequency shift direction and channel display modes in band A or band B.

## 1. Squelch level(SQL)-----Menu 0

Setting squelch level, it is available from 0-9, 0 is always open squelch, 1 opens when the signal is weak, 9 opens when the signal is strong. Whether to open the speaker depends on if it had set the CTCSS/DCS or other optional signal.

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 0, the screen display **SQL** **2**, press **MENU** again, it shows "2", then press **▲ / ▼** key to select the desired squelch level, press **MENU** to confirm, press **EXIT** to return to standby.

## 2. Band selection(BAND)-----Menu 1

This menu is used for setting the current ➡ working band. There are VHF, UHF0 can be selectable, A/B band (The band display on the left and right on the screen.) can be set as working band respectively.

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 1, the screen display **BAND** **UHF**, press **MENU** again, it shows "VHF", then press **▲ / ▼** key to select the desired band VHF or UHF0, press **MENU** to confirm, press **EXIT** to return to standby.

» This vehicle transceiver have VHF and UHF0 for selectable. VHF: 136-174MHz, UHF0: 400-470MHz.

## 3. Transmitting selection in dual standby(TX-AB)-----Menu 2

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 2, the screen display **TX-AB** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select the desired band A, B or OFF, press **MENU** to confirm, press **EXIT** to return to standby.

» When open dual frequency standby, press PTT key, it will be transmit in A band when you set A band, the same it will be transmit in B band when you set B band, if it have't open or startup "BDR", this menu 2 can not control to open or startup "BDR".

## 4. Dual frequency standby(BDR)-----Menu 3

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 3, the screen display **BDR** **ON**, press **MENU** again, it shows "ON", then press **▲ / ▼** key to select ON or OFF, press **MENU** to confirm, press **EXIT** to return to standby.

» If it static displays on screen, it means only startup dual standby mode and not been acticated; it is working standby the two band's frequency range at the same time when it flickers.

## 5. Transmitting power(TXP)-----Menu 4

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 4, the screen display **TXP** **HIGH**, press **MENU** again, it shows "HIGH", then press **▲ / ▼** key to select HIGH or LOW, press **MENU** to confirm, press **EXIT** to return to standby.

## 6. Transmit over timer(TOT)-----Menu 5

This function is to prevent the transceiver from transmitting for too long time, when the transceiver is exceeding the preset time limit, it will stop transmitting with an overtime alarm.

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 5, the screen display **TOT** **60**, press **MENU** again, it shows "60", then press **▲ / ▼** key to select setting value, press **MENU** to confirm, press **EXIT** to return to standby.

» This transceiver can be set in 40 levels with 15 seconds each, between 15-600 seconds.

## 7. Frequency step(STEP)-----Menu 6

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 6, the screen display **STEP** **25.00K**, press **MENU** again, it shows "25.00K", then press **▲ / ▼** key to select desired value, press **MENU** to confirm, press **EXIT** to return to standby.

» The frequency steps selectable for this transceiver are as below: 5.00K, 6.25K, 10.00K, 12.50K, 25.00K.

## 8. Bandwidth(W/N)-----Menu 7

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 7, the screen display **W/N** **WIDE**, press **MENU** again, it shows "WIDE", then press **▲ / ▼** key to select WIDE or NARR, then press **MENU** to confirm, press **EXIT** to return to standby.

## 9. Receiving DCS(R-DCS)-----Menu 8

Using the CTCSS/DCS can be used for you to receive the specified call in individual or group calls, and avoid the needless callings from others with

the same frequency. Only receiving the same CTCSS/DCS signals, the transceiver can release the squelch.

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 8, the screen display **R-DCS** **↑** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select desired value, press **MENU** to confirm, press **EXIT** to return to standby.

- » This vehicle transceiver has 105 groups DCS, see appendix (2) DCS frequency sheet.
- » In DCS selections, from D023N-D754N means POSITIVE code, while from D023I to D754I means NEGATIVE code.

## 11 10. Receiving CTCSS(R-CTCS)----- Menu 9

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 9, the screen display **R-CTCS** **↑** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select desired value (67.0-254.1Hz), if you want to set non-standard (from 60-259.9Hz), press **MENU** key, and press **▲** key to choose desired value, press **MHz** key to select the desired MHz value, press **MENU** to confirm, press **EXIT** to return to standby.

- » This vehicle transceiver has 50 groups CTCSS, see appendix (1) CTCSS frequency sheet
- » While in non-standard CTCSS, please press **▼** key to change standard CTCSS.

## 11. Transmitting DCS(T-DCS)----- Menu 10

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 10, the screen display **T-DCS** **↑** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select desired value, press **MENU** to confirm, press **EXIT** to return to standby.

- » This vehicle transceiver has 105 groups DCS, see appendix (2) DCS frequency sheet.
- » In DCS selections, from D023N-D754N means POSITIVE code, while from D023I to D754I means NEGATIVE code.

## 12. Transmitting CTCSS(T-CTCS)----- Menu 11

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 11, the screen display **T-CTCS** **↑** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select desired value (67.0-254.1Hz), if you want to set non-standard (from 60-259.9Hz), press **MHz** key, and press **▲** key to select desired value, press **MHz** key to select the desired MHz value, press **MENU** to confirm, press **EXIT** to return to standby.

- » This vehicle transceiver has 50 groups CTCSS, see appendix (1) CTCSS frequency sheet
- » While in non-standard CTCSS, please press **▼** key to change standard CTCSS.

## 13. Auto backlight(ABR)- ----- Menu 12

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select menu 12, the screen displays **ABR** **↑** **ON**, press **MENU** again, it shows "ON", then press **▲ / ▼** key to select "ON" or "OFF", press **MENU** to confirm, press **EXIT** to return to standby.

## 14. Beep switch (BEEP) -----Menu 13

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 13, the screen display **BEEP** **↑** **ON**, press **MENU** again, it shows "ON", then press **▲ / ▼** key to select ON or OFF, press **MENU** to confirm, press **EXIT** to return to standby.

## 15. ANI code switch (ANI-SW) -----Menu 14

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 14, the screen display **ANI-SW** **↑** **ON**, press **MENU** again, it shows "ON", then press **▲ / ▼** key to select ON or OFF, press **MENU** to confirm, press **EXIT** to return to standby.

- » Whether to display the caller ID when the caller transmit the ANI code.

## 16. Optional signal (OPTSIG) -----Menu 15

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 15, the screen display **OPTSIG** **↑** **OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** key to select OFF or DTMF, press **MENU** to confirm, press **EXIT** to return to standby.

- » You can accomplish all calls, group calls and selective calls etc functions through DTMF optional signal; if you want to use the function of all calls, group calls and selective calls, please make sure you had turn on the optional signal function (To select DTMF).

## 17. Mute mode (SPMUTE) -----Menu 16

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 16, the screen display **SPMUTE** **↑** **QT**, press **MENU** again, it shows "QT", then press **▲ / ▼** key to select setting, press **MENU** to confirm, press **EXIT** to return to standby.

- » This menu is used to set the conditions of the open speaker, you can use all calls, group calls and selective calls if this menu be set reasonable when optional signal works.  
 QT: Open speaker by right QT;  
 AND: Open speaker by right QT and DTMF.  
 OR: Open speaker by right QT or DTMF.

## 18. ANI ID code (ANI-ID) -----Menu 17

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 17, the screen display **ANI-ID** **↑** **99999**, to display the transceiver's ANI ID code

- » Transceiver's ANI ID code must be programmed by computer.

**19. Ring time (RING-T) -----Menu 18**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 18, the screen display **RING-T 5**, press **MENU** again, it shows "5", then press **▲ / ▼** key to select OFF or 1.....10, press **MENU** confirm, press **EXIT** to return to standby.

» The transceiver will ring when receiving the calling of the signal information code in the case of having set the optional signal function; this menu is used to set how long(1-10seconds) to open the speaker after ring time.

**20. DTMF sidetone switch (DTMFST) -----Menu 19**

In frequency mode, press **MENU** to enter, then press **▲ / ▼** key to select Menu 19, the screen display **DTMFST DT+ANI**, press **MENU** again, it shows "DT+ANI", press **▲ / ▼** key to select setting, press **MENU** to confirm, press **EXIT** to return to standby.

» This menu is used to control if the transceiver transmit the same DTMF signal when transmit DTMF.

OFF Turn off DTMF sidetone

DT-ST To transmit DTMF sidetone by keyboard when transmitting, do not transmit DTMF sidetone when auto transmitting.

ANI-ST To transmit DTMF sidetone when auto transmitting, do not transmit DTMF sidetone by keyboard.

DT+ANI Transmit DTMF sidetone both auto transmitting and transmit by keyboard.

**21. Signal information code (S-CODE) -----Menu 20**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 20, the screen display **S-CODE 1**, press **MENU** again, it shows "1", then press **▲ / ▼** key to select 1.....15, press **MENU** to confirm, press **EXIT** to return to standby.

» When PTT-ID had set as BOT, EOT or BOTH, press or release the PTT key to transmit the DTMF information code(DTMF information code must be programmed by computer.)

**22. Scan mode (SC-REV) -----Menu 21**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 21, the screen display **SC-REV TO**, press **MENU** again, it shows "TO", press **▲ / ▼** key to select TO, CO or SE, press **MENU** to confirm, press **EXIT** to return to standby.

» This menu is used to set how to deal with after scanned the signal when scanning.

TO: Continue scanning after 5 seconds when received a signal.

CO: Scanning stop when received a signal, it will continue scanning after signal disappeared 3 seconds.

SE: Scanning will stop when received a signal.

**23. Transmit PTT-ID (PTT-ID) -----Menu 22**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 22, the screen display **PTT-ID OFF**, press **MENU** again, it shows "OFF", then press **▲ / ▼** to select OFF, BOT, EOT or BOTH, press **MENU** to confirm, press **EXIT** to return to standby.

» This menu is used to set if to transmit all kinds of ID code when press or release PTT key.

OFF Do not transmit ID code either press or release PTT key

BOT Transmit ID code when press PTT key, release PTT key do not transmit ID code

EOT Transmit ID code when release PTT key, press PTT key do not transmit ID code

BOTH Transmit ID code either press or release PTT key.

It is depending on the programming software whether to transmit the signal information code or transceiver's ANI code.

**24. Transmit ANI code delay (PTT-LT) -----Menu 23**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 23, the screen display **MDF-A 25**, press **MENU** again, it shows "25", then press **▲ / ▼** key to select 0.....30, press **MENU** to confirm, press **EXIT** to return to standby.

» This menu is used to set the interval from pressing PTT key to start transmit ANI code.

**25. A channel display mode (MDF-A) -----Menu 24**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 24, the screen display **MDF-A FREQ**, press **MENU** again, it shows "FREQ", press **▲ / ▼** key to select FREQ, CH or NAME, press **MENU** to confirm, press **EXIT** to return to standby.

» In channel mode, it decide the display mode of the left channel. The channel name is programmed by computer, if the channel do not set channel name in the channel name display mode, the system will auto display according to the CH mode.

FREQ: display frequency+ channel

CH: display channel order

NAME: display channel name

**26. B channel display mode (MDF-B) -----Menu 25**

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 25, the screen display **MDF-B FREQ**, press **MENU** again, it shows "FREQ", then press **▲ / ▼** key to select FREQ, CH or NAME, press **MENU** to confirm, press **EXIT** to return to standby.

» In channel mode, it decide the display mode of the right channel. The channel name is programmed by computer, if the channel do not set channel name in the channel name display mode, the system will auto display according to the CH mode.

FREQ: display frequency+ channel

CH: display channel order NAME: display channel name

**27. Busy channel lockout (BCL) -----Menu 26**

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu 26,the screen display **BCL** **OFF** ,press **MENU** again,it shows "OFF", press **▲ / ▼** key to select OFF or ON, press **MENU** to confirm, press **EXIT** to return to standby.

» When this menu is set to ON, it can not transmit after received a signal.

**28. Auto keyboard lock (AUTOLK) -----Menu 27**

In frequency mode,press **MENU** to enter,press **▲ / ▼** to select Menu 27, the screen display **AUTOLK** **OFF** ,press **MENU** again,it shows "OFF", press **▲ / ▼** key to select OFF or ON, press **MENU** to confirm,press **EXIT** to return to standby.

» When this menu is set to ON, it will auto lock keyboard when you do not any operation within 10 seconds, press more than 2 seconds to unlock the keyboard.

**29. Frequency shift direction (SFT-D) -----Menu 28**

The offset frequency,to set positive or negative offset according to the transmitting frequency is higher or lower receiving frequency.

- 1、Transmitting frequency is higher than receiving frequency means positive offset(+).
- 2、Transmitting frequency is lower than receiving frequency means negative offset(-).
- 3、Turn off frequency shift direction(OFF).

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu 28,the screen display **SFT-D** **OFF** ,press **MENU** again,it shows "OFF", then press **▲ / ▼** key to select one of OFF/+/-, press **MENU** to confirm, press **EXIT** to return to standby.

**30. Offset frequency(OFFSET)-----Menu 29**

Offset frequency means the offset of transmitting and receiving frequency. The range of offset frequency: 0~99.95MHz

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu 29,the screen display **OFFSET** **10.000** ,press **MENU** again,it shows "10.000",press **▲** key to modulate offset frequency (press **MHZ** key to adjust the position),press **MENU** to confirm,press **EXIT** to return to standby.

» Offset of TX & RX frequency is set by this menu when transceiver works under the frequency mode.

**31. Memory channel (MEMCH) -----Menu 30**

In frequency mode,setting all parameters for receiving,press **MENU** to enter, press **▲ / ▼** key to select Menu 30, the screen display **MEMCH** **CH-127** , press **MENU** again,it shows "CH-127",then press **▲ / ▼** key to select the desired memory channel.

press **MENU** to confirm,press **EXIT** to return, then the channel is co-channel. To repeat the above operation if you need memory dis-channel, setting all parameters for transmitting, press **MENU** to enter, then press **▲ / ▼** key to select Menu30,press **MENU** again,press **▲ / ▼** key to select the channel of receiving parameter that you just memoried, press **MENU** to confirm,press

**EXIT** to return to standby.

E.g:To memory the RX frequency 440.025MHz,TX frequency 450.025MHz in the CH-018, the operation as follow:

- a. In frequency mode,press **BOR** key to select UHF band;
- b. press **▲ / ▼** key and together with **MHZ** key to adjust frequency to "440.025",
- c. press **MENU** to enter,press **▲ / ▼** key to select Menu 30;
- d. press **MENU** again,press **▲ / ▼** key to select the desired memory channel "018" ;
- e. press **MENU** to confirm,press **EXIT** to return;
- f. Then repeat the step b,c,d,to adjust the frequency to "450.025" and memory in channel "018";
- g. press **MENU** to confirm,press **EXIT** to return;

» If you want to have CTCSS/DCS tone with the frequency should be set before the memory channel; So that it can be stored into desired channel with the frequency.

» If frequency mode, if you want to memory channel by manual, it can both the receiving and transmitting memory be done when the desired channel is empty. Otherwise only the transmitting memory can be programmed.

» If the desired channel had already been stored, please delete the channel before receiving and transmitting memory.

» Besides the manual memory, it is also available to do the memory channel via the programming software.

**32. Delete channel (DELCH) -----Menu 31**

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu31, the screen display **DELCH** **CH-127** ,press **MENU** again,it shows "CH-127", then press **▲ / ▼** key to select the channel to be deleted,press **MENU** to confirm,press **EXIT** to return to standby.

» CH character will disappear when the channel order had been deleted, which means this channel is empty and can store new parameter.

**33. Standby display color (WT-LED) -----Menu 32**

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu 32,the screen display **WT-LED** **PINK** ,press **MENU** again,it shows "PINK", then press **▲ / ▼** key to select OFF/BLUE/RED/PINK, press **MENU** to confirm, press **EXIT** to return to standby.

» This transceiver has four options: OFF / BLUE/ RED / PINK

**34. Receiving display color (RX-LED) -----Menu 33**

In frequency mode,press **MENU** to enter,press **▲ / ▼** key to select Menu 33,the screen display **RX-LED** **BLUE** ,press **MENU** again, it shows "BLUE", then press **▲ / ▼** key to select OFF/BLUE/RED/PINK, press **MENU** to confirm, press **EXIT** to to return to standby.

**35. Transmitting display color -----Menu 34**

In frequency mode, press **MENU** enter, press **▲ / ▼** key to select Menu 34, the screen display **TX-LED** **RED**, press **MENU** again, it shows "RED", then press **▲ / ▼** key to select OFF/BLUE/RED/PINK, press **MENU** to confirm, press **EXIT** return to standby.

**36. Reset -----Menu 35**

This transceiver has two kinds for the reset operation-VFO reset and ALL reset.

VFO reset, all the menu setting will return to the factory default.

ALL reset, it will delete all the channel setting when it finished menu reset at the same time, then channel 0 and channel 127 will display two frequencies respectively which predetermined by factory.

In frequency mode, press **MENU** to enter, press **▲ / ▼** key to select Menu 35, the screen display **RESET** **ALL**, press **MENU** again, it shows "ALL", then press **▲ / ▼** key to select VFO/ALL, press **MENU** to confirm, press **EXIT** to return to standby.

**37. Setting FM radio**

press **FM** startup, the screen display **FM** **37.000**, Then you can adjust the FM frequency by **▲ / ▼** key, also you can press **MENU** to auto scan FM frequency. Press **FM** key again to turn off radio and return to standby.

Note:

- » Auto scan function can not startup when receiving signal weak.
- » Dual standby function will auto cancel after FM startup, it only standby

in the **➡** frequency. The system will cancel the FM radio mode temporarily when there is signal in this frequency and turn into the receiving mode. It will auto return to the FM radio mode a few seconds later after receiving completed and continue to radio.

**38. Distant urgency alarm**

Startup alarm function by long press **FM** key more than 2 seconds. The transceiver will transmit the alarm signal in the frequency which it shows in a certain time interval, and the transceiver will sound alarm at the same time, the band which it shows will flicker display alarm.

the screen display **ALARM** **430.550**, "ALARM" character will flicker display. You can close this function by programming software if you do not need to sound alarm during transmitting alarm signal.

From other factories transceivers with alarm function will sound alarm too when received the alarm signal, and will flicker display the ANI code from the alarm side; It will cancel the alarm when received a signal by press PTT key or **FM** key again during alarm.

**39. A/B switch**

Switch between the left and right band by pressing **A/B** key.

- » If startup the dual standby, and had set the transmitting frequency in Menu 2 "TX-AB", will always transmitting that frequency when press PTT key. Then press **A/B** key is invalid.

**40. Working band switch**

Press **BDR** key can switch the working band that the **➡** band, the left and right of frequency band can be set VHF and UHF0 etc different bands arbitrarily in this transceiver. So it can work arbitrarily in UU, UV, VV, VU etc dual frequency mode.

- » In channel mode, which is the working band in left and right band depends on the channel which you called, then the setting of menu is invalid at this time.

**41. Working mode switch**

Press **MENU** key can switch between the frequency mode and channel mode when turn on radio.

**42. All calls、group calls、selective calls**

This transceiver can achieve the function of all calls, group calls and selective calls by DTMF signaling system. The transceiver in the group must had wrote everyone's ANI code and wrote all calls ID, group calls ID and selective calls ID in advance by programming software if you want to achieve the function of all calls, group calls and selective calls, For example, there are 30 pcs of transceivers in the group, the ANI code is 600-609, 700-709, and 800-809 in sequence, all the transceiver must to do the setting as below except writing ANI code for each transceiver.

**a. Turn on the ANI display code**

**ANI-SW** **ON**

**b. Startup DTMF optional signal**

**OPT SIG** **DTMF**

**c. Setting mute mode to "AND"**

**SPMUTE** **AND**

**d. Setting ring time arbitrarily**

**RING-T** **5**

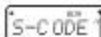
**e. Setting PTT-ID to "BOTH"**

**PTT-ID** **BOTH**

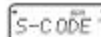
**E.g:** 600 mobile transceiver had wrote 1、all calls ID; 2、group calls ID selective calls ID in advance in transmitting encode group through programming software.

- » This transceiver can wrote 15 groups transmitting encode in total through programming software, any group can write all calls ID、group calls ID or one of the selective calls ID.


**All calls:**

To set signaling information code as "1" if you want to call all the transceiver at this moment  1, then all the transceiver in the group will sound ringing signal after press PTT key, and open each speaker to achieve the function of all calls.

**Group calls:**

E.g: The transceiver of 600 want to call 10 pcs transceivers from 700 ~ 709, set signaling information code(S-CODE) as "2"  2, press PTT key, then the transceiver from 700 ~ 709 sound ringing signal, and open each speaker to achieve the function of group calls.

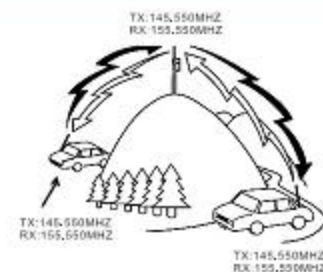
**Selective calls:**

To set signaling information code as "3" if you want to call all 802 transceiver  3, after press PTT key, then only 802 transceiver sound ringing signal to achieve the function of selective calls.

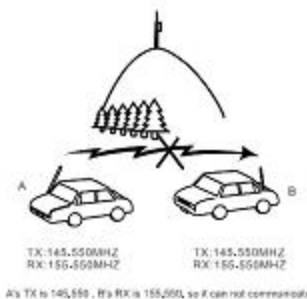
**43. Communication through repeater**

The communication will be long-distance by using the repeater. The transmitting and receiving frequency is different when using repeater to communicate. there are offset frequency between them, may be have a standard and Non-standard CTCSS tone match with repeater. In frequency mode, to set the different frequency for receiving and transmitting through the menu of frequency shift direction and offset frequency; in channel mode, receiving and transmitting frequency can be edited respectively.

The transmitting frequency of all the transceiver is the same by using the repeater, and all the receiving frequency of the transceiver is the same too.

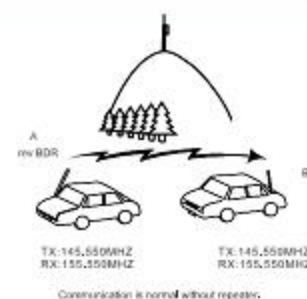


The communication between the transceiver will break off if the repeater is unable to work or the transceiver is far away the repeater which made the repeater can not transfer the signal effectively.



This transceiver had set a **BDR** key to avoid this phenomenon happens. Transmitter just need to press **BDR** key more than 2 seconds if you found you can not calling which caused by repeater can not provide service to reach the purpose of communication between the transceiver without repeater.

» Transmitter can not use this function when it is in dual standby.

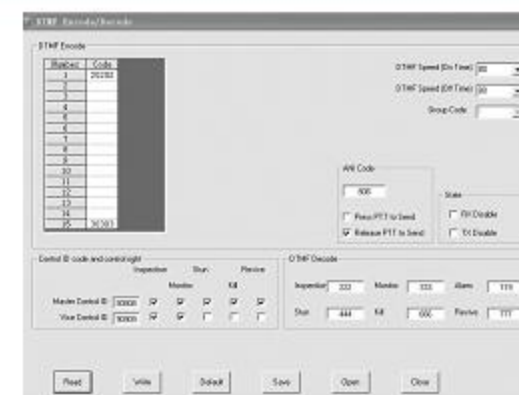
**44. U/V inter-band communication**

The receiving and transmitting frequency is in a different band under certain special occasions of repeater, then the most transceiver unable to use repeater to receive and transmit. This transceiver can join the repeater by the relative menu setting.

- To select the left and right working band respectively by Menu1"BAND".
- To well adjust the left and right working band.
- Startup the dual standby when the Menu 3 **BDR** is set to "ON".
- To appoint the left transmitting band by Menu 2 TX-AB, set to A if the left band is A, set to B if the left band is B.

**45. Inspection, Monitor, Stun and Kill**

- The setting of this transceiver ID code can set 5 numeral arbitrary, e.g:13148
- The setting of the master control ID code can input 5 numeral arbitrary, e.g: 80808.
- other setting as follow:



The operation of Inspection:

- Setting master control transceiver,
  - Input master ID code (e.g: 98765 etc 5 numeral arbitrary)
  - Mark "✓" "release PTT TX"
  - Setting master control ID code(e.g: 80808 etc 5 numeral arbitrary)
  - Transmitting encode ID setting relative 3 numeral too.
- Setting vice control transceiver,
  - Input vice control transceiver ID code(e.g: 55555 etc 5 numeral arbitrary)  
(The transceiver ID code for each vehicle transceiver must be different.)
  - The master control ID of sub-control transceiver need to set as master control transceiver's ID. (e.g:98765 etc 5 numeral arbitrary)
  - Mark "✓" "Inspection"
- Setting Monitor, Revive code is the same with Inspection code.

## Trouble shooting

Problem	Solutions
Transceiver can not power on.	<ol style="list-style-type: none"> <li>1. The power cable was connected backwards.</li> <li>2. The Power cable fuses are open.</li> </ol>
Transceiver can not receive the signal	<ol style="list-style-type: none"> <li>1. To check if the receiving frequency is the same with the transmitting frequency; if the distance between the transmitting and receiving exceed the transceiver's communication distant.</li> <li>2. If there is a big obstacle between the transmitting and receiving.</li> <li>3. If the squelch level be set in a high level.</li> <li>4. If the transmitting power of the transmitter be set to LOW, this will cause the transmitting power become lower.</li> </ol>
The signal had been received, but there is no sound from the speaker.	<ol style="list-style-type: none"> <li>1. To check if the setting of CTCSS/DCS the same with transmitter.</li> <li>2. If the optional signal had been set, the transmitter must transmit the signal information code which transceiver can identify in case of having set this function, then speaker can be opened.</li> </ol>
Transceiver can not transmit.	If the MIC is ok, or if connect well between MIC and mobile transceiver.
You can not communicate with other member in the group.	<ol style="list-style-type: none"> <li>1. Please confirm that you used frequency and CTCSS/DCS is the same with the member in the group.</li> <li>2. The other member in the group may far away from you, please confirm if the transceiver is in the effective communication range.</li> </ol>
You receive other groups' signal in channel.	Please change the channel order of the CTCSS/DCS. The others transceiver will be change also in the group.
The receiving voice is too lower.	Please check if the MIC of transceiver was blocking up and if the volume potentiometer is open larger enough.

## Technology parameter

Appendix 1 CTCSS standard frequency list

1	67.0	23	141.3	45	225.7
2	69.3	24	146.2	46	229.1
3	71.9	25	151.4	47	233.6
4	74.4	26	156.7	48	241.8
5	77.0	27	159.8	49	250.3
6	79.7	28	162.2	50	254.1
7	82.5	29	165.5		
8	85.4	30	167.9		
9	88.5	31	171.3		
10	91.5	32	173.8		
11	94.8	33	177.3		
12	97.4	34	179.9		
13	100.0	35	183.5		
14	103.5	36	186.2		
15	107.2	37	189.9		
16	110.9	38	192.8		
17	114.8	39	196.6		
18	118.8	40	199.5		
19	123.0	41	203.5		
20	127.3	42	206.5		
21	131.8	43	210.7		
22	136.5	44	218.1		

Appendix 2 DCS standard frequency list

1	D023N	26	D145N	51	D274N	76	D462N	101	D731N
2	D025N	27	D152N	52	D306N	77	D464N	102	D732N
3	D026N	28	D155N	53	D311N	78	D465N	103	D734N
4	D031N	29	D156N	54	D315N	79	D466N	104	D743N
5	D032N	30	D162N	55	D325N	80	D503N	105	D754N
6	D036N	31	D165N	56	D331N	81	D506N		
7	D043N	32	D172N	57	D332N	82	D516N		
8	D047N	33	D174N	58	D343N	83	D523N		
9	D051N	34	D205N	59	D346N	84	D526N		
10	D053N	35	D212N	60	D351N	85	D532N		
11	D054N	36	D223N	61	D356N	86	D546N		
12	D065N	37	D225N	62	D364N	87	D565N		
13	D071N	38	D226N	63	D365N	88	D606N		
14	D072N	39	D243N	64	D371N	89	D612N		
15	D073N	40	D244N	65	D411N	90	D624N		
16	D074N	41	D245N	66	D412N	91	D627N		
17	D114N	42	D246N	67	D413N	92	D631N		
18	D115N	43	D251N	68	D423N	93	D632N		
19	D116N	44	D252N	69	D431N	94	D645N		
20	D122N	45	D255N	70	D432N	95	D654N		
21	D125N	46	D261N	71	D445N	96	D662N		
22	D131N	47	D263N	72	D446N	97	D664N		
23	D132N	48	D265N	73	D452N	98	D703N		
24	D134N	49	D266N	74	D454N	99	D712N		
25	D143N	50	D271N	75	D455N	100	D723N		

## Technology Specification

Frequency range	FM: 87 ~ 108 MHz (RX)
	VHF: 136 ~ 174MHz(RX/TX)
	UHF0: 400 ~ 470MHz( RX/TX)
Memory channels	128 channels
Working mode	Co-channel or Dis-channel simplex
Working temperature	-30℃+60℃
Operating voltage	13.8V DC ±15%
Modulation	FM (F3E)
output Power	High: UHF:10~50W/VHF:10~40W Low: UHF: 8~20W / VHF: 8~20W
Maximum frequency deviation	≤±5KHz
Spurious radiation	<-60dB
Frequency stability	±2.5ppm
Receiving sensitivity	<0.18μV
Audio output power	≥400mW
Transmitting current	6A or lower
Standby current	220mA or lower
Weight About	1.2kg
Dimension	160x43x160mm(projection not include)

Note: The above specifications subject to change without notice.

## Declaration

## Declaration

We strive to achieve the accuracy and completeness of this manual, but take no responsibility for any possible errors or omissions. All the above specifications subject to be change by without our notice.

This manual can not be copied, adapter or translated without our prior written permission by except the copyright law allowed.

## Installation of Transceiver

Select a safe and convenient site in your vehicle so as to reduce possible damage to your passenger or yourself during vehicle movement. You may install the transceiver below the dashboard in front of the front passenger seats so that your knees and legs will not collide the transceiver in case of emergency brake. It's best to select a well ventilated location which is shielded from direct sunlight.

1. Use the supplied self-tapping screws (4X) and flat washers (4X) to install the mounting bracket in the vehicle as shown in Fig. 1 and Fig. 2.

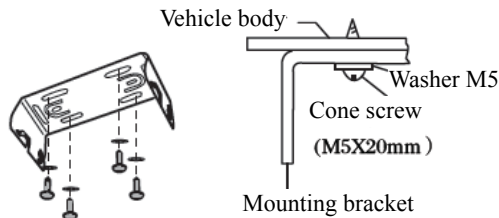


Fig. 1

Fig. 2

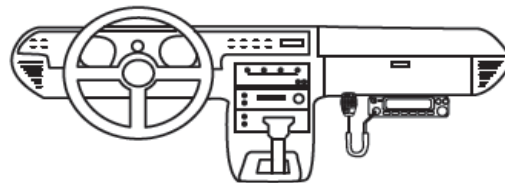


Fig. 3

2. Fix the transceiver, and then insert and tighten the supplied hexagonal screws (4X) as shown in Fig. 3.

- Make sure all screws are tightened to avoid loosening of the bracket or the transceiver in vibration of vehicle.
- Use the 3 screw grooves at the side rear side of each bracket to install the main body at a proper inclined angle as shown in Fig., 4, 5 and 6.

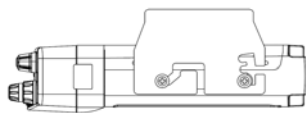


Fig. 4



Fig. 5



Fig. 6

## Power Cable Connection

### ■ Operation of transceiver

Be sure to use 12V vehicle batteries with sufficient electricity. If the electricity is insufficient, the display screen may darken or the transmission output power may greatly drop during the transmission. Do not connect the transceiver to 24V batteries.

---

Note: If you use the transceiver when the vehicle-use batteries are not sufficiently charged or the engine is off, battery discharge may lead to insufficient electricity quantity, making it difficult to start the vehicle. Therefore, try to avoid using the transceiver in such situation.

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1. Use the DC power cable supplied with the transceiver to connect the transceiver with the vehicle battery terminal in a shortest route.

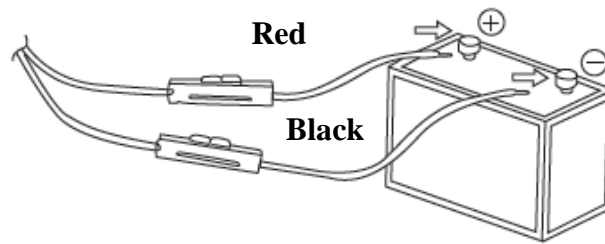
- It is suggested not to use a cigar lighter outlet as much as possible as some of them may lead to great voltage drop.
- The whole power cable must be wrapped up to isolate it from heat and moisture and from the engine ignition system/connection wiring.

2. When the power cable is installed in place, wind the fuse holder with heat-resistant adhesive tape to protect it against moisture. It's better to use heat-resistant adhesive tape to wrap the whole power cable.

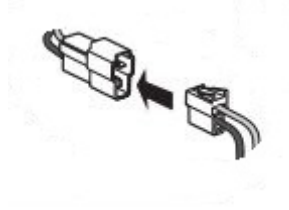
3. To prevent short-circuit, disconnect the other connection wirings at the negative (-) battery terminal before connecting the transceiver.

4. Please confirm the correct polarity of connections before attaching the power cable to the battery terminal. Connect the red wire to the positive (+) terminal of battery and the black to the negative (-).

- Use the full length of power cable without cutting off the excess even if it is longer than needed. Remember not to remove the fuse holder from the cable.



5. Reconnect all connection wirings removed from the negative terminal previously.
6. Connect the DC power cable to the transceiver.
  - Plug in the outlet and keep pushing firmly until the locking tab clicks.



#### ■ Operation of fixed radio station

If you intend to use the transceiver as a fixed radio station, you need to buy an independent 13.8 DC power supply separately with a suggested continuous current capacity of above 12A.

##### Note:

- Do not connect this DC power supply to the AC power outlet before all connections are completed. (Do not connect the transceiver when it's powered on.)
- Please connect all cables before inserting the DC power supply device into the AC outlet.

1. Be sure the transceiver and the DC power supply are off.
2. Connect the DC power supply cable to the DC stabilized power supply and make sure the polarities are correct (red: positive, black: negative).
  - Do not directly connect the transceiver to the AC outlet.
  - Use the supplied DC power cable to connect the transceiver to a DC stabilized power supply.
  - Do not use a power cable with the specification and parameters lower than the original power cable.
3. Connect the DC power cable to the transceiver.
  - ◆ Plug in the outlet and keep pushing firmly until the locking tab clicks.

##### Attention

Only use fuses of specified type and rated value. Otherwise, the transceiver may be damaged at your own risk.

## Connecting Antennas

Before operation, install a highly efficient and well-tuned antenna. Successful installation depends largely on the correct antenna type and installation. If a proper antenna system is selected and installed correctly, the transceiver will achieve best performance.

Use an antenna with a characteristic impedance of  $50\Omega$  and a low loss coaxial feeder with  $50\Omega$  characteristic impedance to match the input impedance of the transceiver. Using a

feeder whose impedance is not  $50\Omega$  to connect the antenna with the transceiver will reduce the performance of the antenna system, and may cause interference to the nearby radio and TV receivers, radio receivers and other electronic devices and even damage the transceiver.

#### Attention

- ◆ Transmitting without connecting antenna or other matched load is prohibited. Otherwise, the transceiver will be damaged. Be sure to connect the antenna to the transceiver before transmitting, and only when the connection is confirmed can the transmission be made.
- ◆ All fixed radio stations must be equipped with a lightning arrester to reduce the risk of damaging the transceiver by fire or electric shock.

The location and mounting mode of the antenna on the vehicle are shown as follows:

