DYNASCAN

VHF/UHF DUAL BAND FM RADIOAMATEUR MOBILE TRANSCEIVER

USER´S MANUAL

DYNASCAN P-72

English

DYNASCAN

INDEX 1 of 2

INDEX 2 of 2

1.- DEFINITIONS:

Restrictions can exist for the use this equipment in any European Union member states, for more information it consults with their salesperson or Telecommunication Authorities.
Member states of the European Union where this equipment may be used:

BE	BG	CZ	DK	DE	EE	IE
EL	ES	FR	HR	IT	CY	LV
LT	LU	HU	MT	NL	AT	PL
PT	RO	SI	SK	FI	SE	UK

This equipment complied whit Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). This means that this product must be disposed of at a designated collection point for the recycling of waste electrical and electronic equipment, with the intention of being either recycled or dismantled in order to reduce any impact on the environment. For more information, please contact your distributor, salesperson or regional administration.

Electronic products that have not been disposed of in this way are potentially dangerous for the environment and public health due to the possible presence of dangerous substances.

This equipment complied with Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS). The restricted substances are: Lead (<0.1%); Mercury (<0.1%); Hexavalent chromium (<0.1%); PBB (<0.1%); PBDE (<0.1%); Cadmium (<0.01%).

2.- INTRODUCTION:

● PIHERNZ COMUNICACIONES, S.A. he thanks for purchasing this transceiver. We appreciate your trust in our products and believe that its easy operation function would well serve your diverse communication needs.
● This User´s Manual has been created with the intention of supplying as much information as possible. PHERNZ COMMUNICACIONES, S.A. is not responsible for any omissions or any errors in printing or translation.
● It´s prohibited totally or partially reproduces this User´s Manual without prior written authorization from PHERNZ COMUNICACIONES, S.A.

3.- SAFETY CAUTIONS:

● Turn OFF the transceiver in explosive environments (gas, dust and smoke, etc.). Turn OFF the radio while refueling or parking in the gas station. If you transceiver is installed in the car´s rear luggage compartment, don´t put the spare fuels in the trunk.
● Don´t operate the transceiver when you are located near to the antenna in order to avoid electromagnetic fields.
● In blasting areas, detonators, explosives, for 150 meter (500 feet) of the detonators can lead to explosion. Turn OFF the transceiver before access a blasting area.
● Don´t try to set the transceiver while driving a vehicle, otherwise it will lead to dangerous consequences.
● Do not transmit with the radio at high transmission power for a long time to prevent overheat in to transceiver.
● Don´t attempt to disassemble or repair the transceiver yourself.
● Don´t put the transceiver directly to the sunlight for a long time and do not put it near the heating devices.
● Don´t put the transceiver on the high humidity, splashing water and not place it to unstable surfaces.
● If you find unusual smell or smoke from the transceiver, you should immediately turn OFF the radio and contact with the Technical Service for their reparation.
● Please follow the local traffic regulations before using this transceiver.
● Don´t use accessories not originals or not recommended by manufacturer of the transceiver.
● Use DC 13.8 V ±15 % power supply. Do not use 24 VDC battery or power supply to operate the radio. Check the battery polarity and voltage before installing the transceiver on the vehicle.
● Always use the supplied DC power cable for the transceiver installation.
● Don´t introduce any metal objects by connectors or holes of the transceiver.
● Don´t remove the fuse holder on the DC line. Error or wrong connection may cause fire.
● For your safety, use the mounting bracket and screws supplied to install the transceiver in a vehicle.
● Consult with the manufacturer or salesperson of the car before installing the transceiver because the transceiver transmission can interfere in to operation of the control and navigations systems if these devices not have the adequate protection when the transceiver is in transmission mode.

4.- MAINTENANCE:

● This radio has been well tested and tuned by manufacturer. The reparations or internal adjust without authorization from manufacturer will invalidate the warranty.
● Contact with your Technical Service if the transceiver no operates correctly.
● Use a soft cloth slightly moistened with a neutral detergent for cleaning the transceiver, do not use concentrated chemicals, alcohol or solvents.

5.- INSTALLATION:

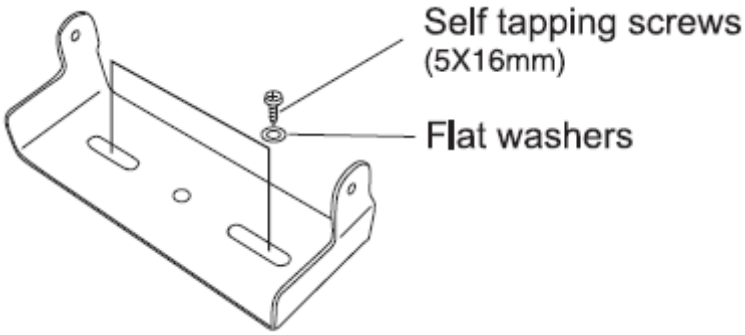
5.1.- MOBILE INSTALLATION:

For your safety and that of the passengers of the vehicle, install the transceiver in a safe place of the vehicle. We recommend that you install the transceiver under the dashboard, in order to prevent the transceiver from hitting the legs or knees of passengers in the event of sudden braking of the vehicle. Install the transceiver in a place with good ventilation and avoiding direct sunlight.

1. Install the mounting bracket to the car with using the self-taping screws and flat washers (2 pcs screws and 2 pcs washers).

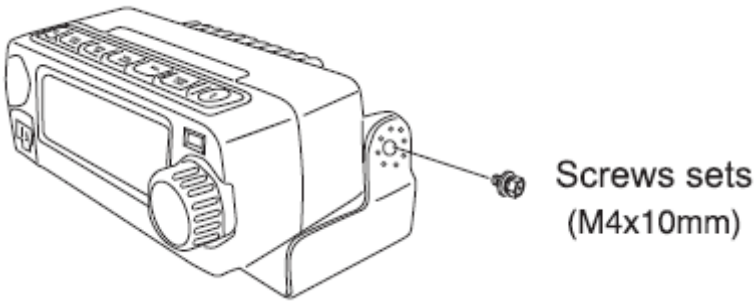
● You can install the mounting bracket upside or downside on the dashboard of the vehicle.

● When installing the mounting bracket, make sure that the screw side edge with slots on the bracket are backwards.

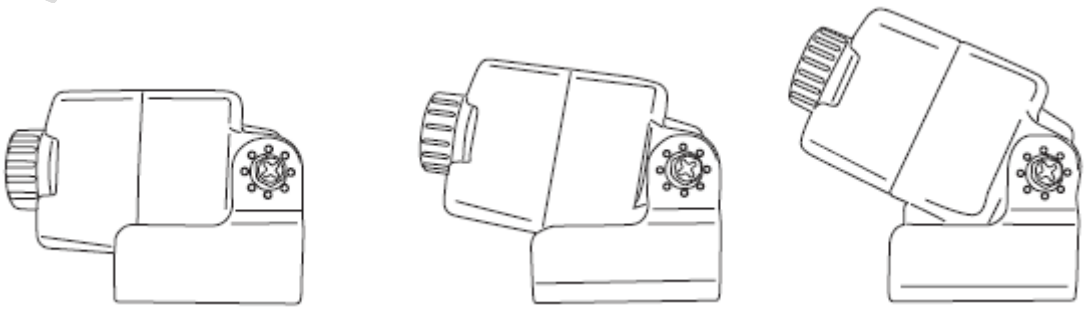


2. Place the transceiver on the mounting bracket by fixing it at the proper angle using the hexagonal screws and tighten them firmly.

● Make sure that the all screws are properly tightened to prevent them from loosening by the vehicle vibrations.



● The angles positions of the mounting bracket allow you to adjust the desired angle of the transceiver.



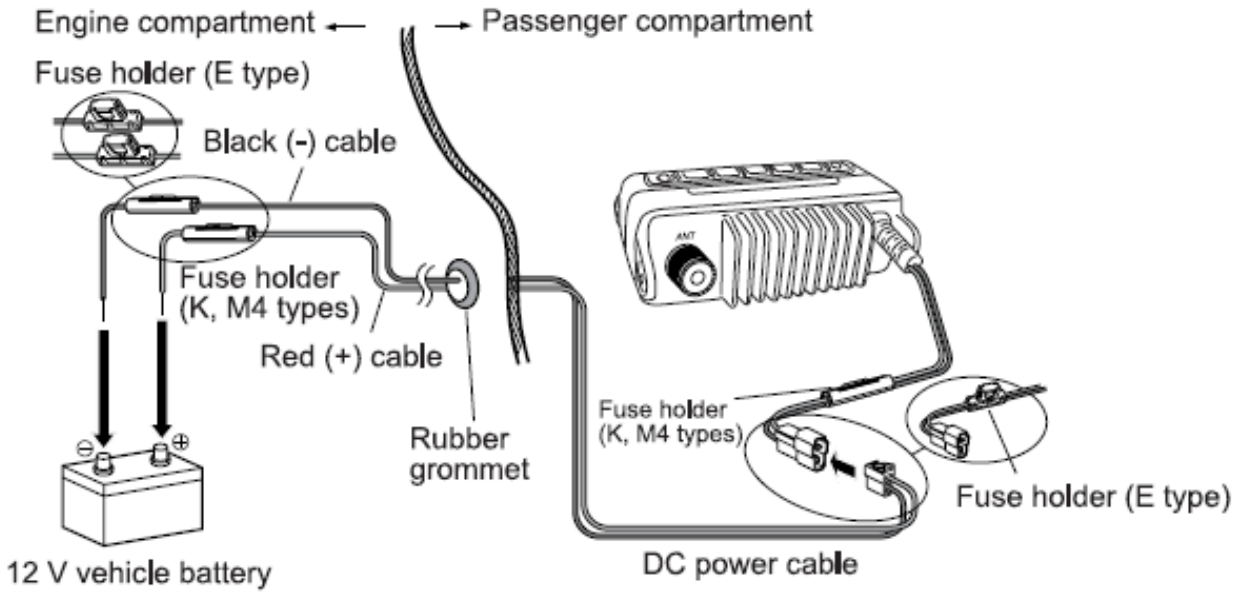
5.2.- CONNECTING THE DC POWER CABLE:

5.2.1.- Mobile installation:

Make sure to use 12 V car batteries. If the radio´s power is low, during transmitting the screen will grow dark and the output power may be significantly decreased.
Do not connect the transceiver to the 24 V power supply.

Note:
- If the battery is not fully charged or when the engine is switched off but the battery is still not fully charged, the battery may discharge and there will not be enough power to start the car. In this case, avoid using the transceiver in these conditions.

1. Install the transceiver as close as possible to the battery by connecting the power cable directly to the vehicle's battery.
● If installing a noise eliminator filter, install an insulator to prevent the metal filter case from contacting the car body.
● We do not recommend that you use the cigarette lighter socket of the car to power the transceiver since some lighters may have voltage drops.
● Use rubber bushings when the cables have to be routed through the car chassis.
● The power cable must be protected from the heat produced by the car engine.
2. Once the power cord is installed, protect it from moisture including the fuse holder.
3. Disconnect the negative terminal of the car battery during the installation of the transceiver to avoid short circuits.
4. Check the correct connection of the DC power cable, red to (+) terminal and black to (-) terminal of the battery.
● Don´t remove the DC power cable fuses under any circumstances.
5. Once the transceiver is installed, connect the negative terminal of the battery again.
6. Connect the DC power cable to the transceiver.
● Press firmly on the DC power cord connector until you hear a “click” sound.

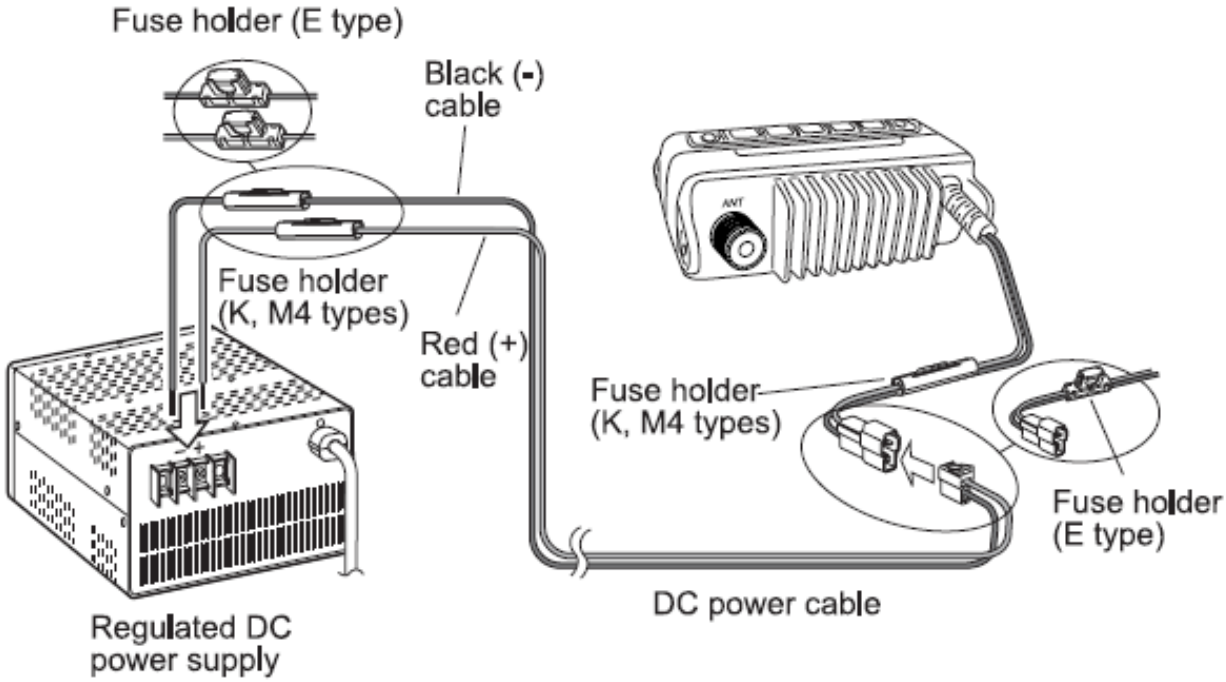


5.2.2.- Fixed station installation:

For use as a fixed station, an external 13.8 VDC power supply is required. We recommend a power supply that provides a current of at least 12 A.

Note:
- Do not connect the external power supply to the 230 VAC socket until all the transceiver connections are complete.

1. Make sure the transceiver and the power supply are OFF mode.
2. Connect the transceiver DC power cable to the external power supply connectors (Red wire: positive, black wire: negative).
● Use the supplied DC power cable to connect the transceiver to the external power supply. Never connect the transceiver to a 230 VAC wall outlet.
● Don´t use a power cable with a smaller section than the one supplied.
3. Connect the DC power cable to the transceiver.
● Press firmly on the DC power cable connector until you hear a "click" sound.



5.2.3.- Replacing the fuse:

If the fuse blows, check the cause and solve the problem. Once the problem is solved, replace the fuse by other of the same characteristics as the one supplied with the transceiver. If the new fuse blows again, disconnect the DC power supply and contact with the Authorized Technical Service.

Fuse position	Fuse rated current
Transceiver (in DC connector)	10 A
DC power cable	10 A

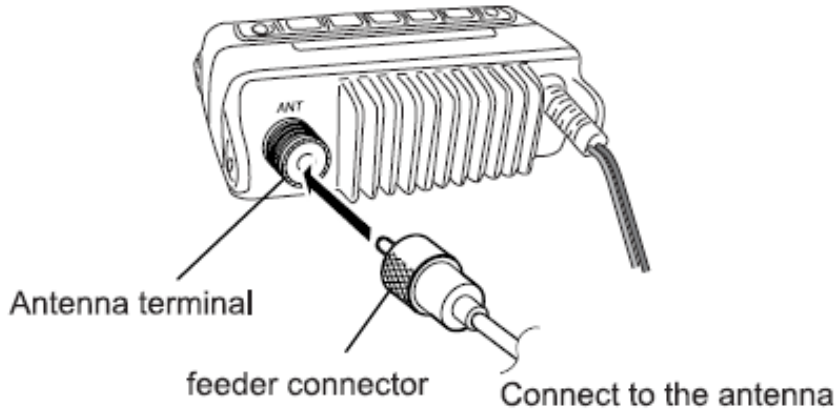
Note:
- Use only the specified type and the rated value of the fuse; otherwise the transceiver could be damaged.

5.3.- ANTENNA INSTALLATION:

Before operate the transceiver, it is necessary to connect and adjust a suitable antenna. The success of the installation depends mainly on the type of antenna and its correct installation. The transceiver has its best performance when the proper antenna is installed correctly.
Use a 50 Ω low loss coaxial cable for the connection of the antenna to the transceiver. If you use a cable with impedance other than 50 Ω, the effectiveness of the antenna system will be reduced, and will cause interferences to radio and television receivers and other nearby electronic devices, and even the transceiver could be damaged.

Note:
- Transmit without an antenna or a 50 Ω artificial load can damage the transceiver. Connect a suitable antenna before operate the transceiver.

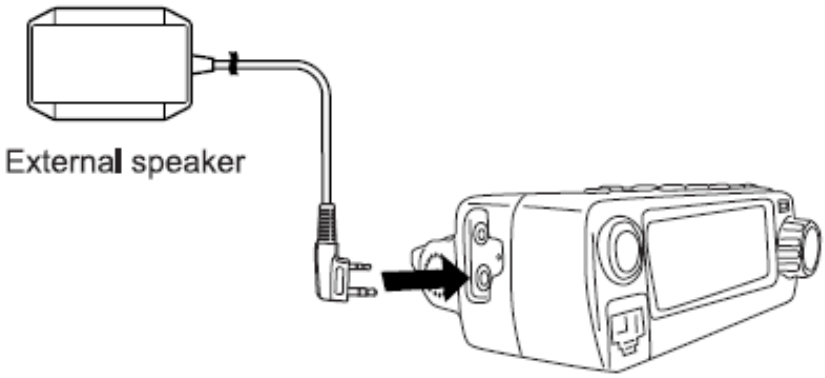
● In a fixed installation, protections against electrical storms should be installed to reduce the risk of fire, electric shock and damage to the transceiver.



5.4.- ACCESSORIES INSTALLATION:

5.4.1.- Speaker-microphone or headset + MIC:

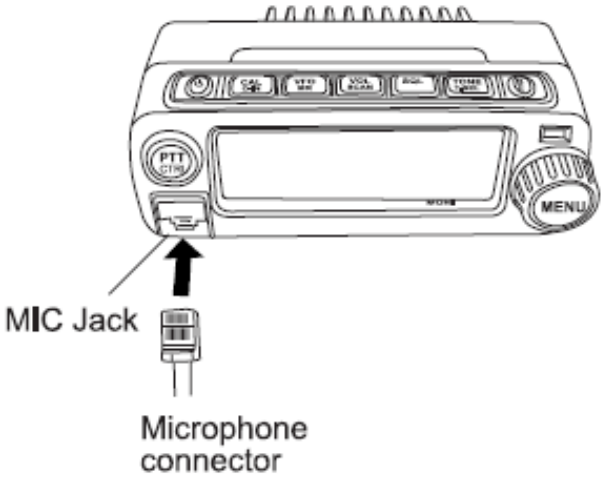
1. Install an external 8 Ω impedance speaker or a suitable headset. The headset or the speaker-microphone must incorporate a 2.5 mm and 3.5 mm mono plug jacks.



The left side of the transceiver incorporates two jacks for speaker and microphone. Consult the instructions of the accessories for installation.

5.4.2.- Microphone:

Connect the supplied microphone (with built-in speaker) to the RJ45 jack on the left side of the front panel of the transceiver. Press the connector until you hear a “click” sound.



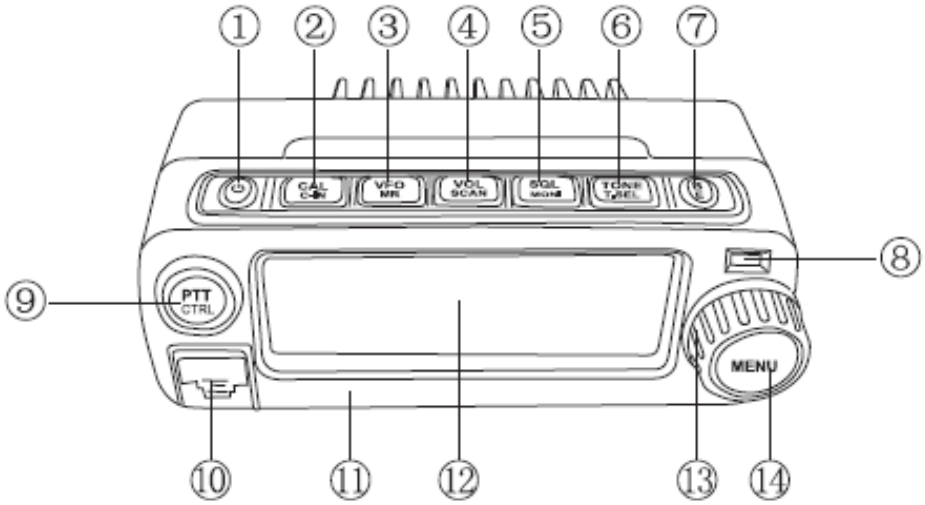
5.4.3.- Keypad operations:

Follow the operation of the keys described below to simplify the instructions and avoid unnecessary duplication.

Instruction	Operation
Press the [XXX] key.	Means briefly press the key.
Press and hold the [XXX] key.	Means press and hold the key for 3 seconds or more.
Press the [MENU] tuning knob + the [XXX] key.	Means briefly press the [MENU] knob, then press and release the proper key to enter into settings menu.
[MENU] tuning knob.	Select the set options.
Press and hold the [POWER] key.	Press and hold the [POWER] key for 3 seconds or more to turn ON/OFF the transceiver.

6.- GETTING ACQUAINTED:

6.1.- FRONTAL PANEL:



(1) [ON/OFF] key:

● Press and hold for 3 seconds to turn [ON/OFF] the transceiver.

(2) [CALL/C.IN] key:

● Press this key to call up the call channel of the currently operation (CTRL) band.
● In VFO mode, press and hold this key for more than 3 seconds to store the frequency of the currently operation band (CTRL) as the calling cannel.
● In VFO mode, press the [MENU] knob, then [CALL/C.IN] key to turn ON/OFF the reverse function of currently operation band (CTRL).
>> The reverse function is valid only when the offset frequency is set and offset direction (+,-) is on.
● In channel operation mode (CH), press the [MENU] knob, then the [CALL/C.IN] key, the current channel is locked. Repeat the procedure again to unlock the current channel.

(3) [VFO/MR] key:

● Press the [VFO/MR] key to select the working operation mode for the currently operation band (CTRL).
>> Every time when [VFO/MR] key is pressed, the display and working mode is switched in: Channel → Channel + Frequency → Channel + Name → VFO.
● In VFO operation mode, press and hold this key for more than 3 seconds to store the frequency of the currently operation band (CTRL) as the calling channel.
● In Channel / Channel + Frequency / Channel + Name, press and hold this key for more than 3 seconds to edit the channel name of the currently operation band (CTRL).

(4) [VOL/SCAN] key:

● Press this key to set the volume level of the currently operation band (CTRL).
● Press the [VOL/SCAN] key twice to mute the transceiver. Press this key again to turn off the mute mode.

● Press and hold the key for 3 seconds to turn on the scan mode of the currently operation band (CTRL). Repeat above procedure to turn off the scan mode.
● In standby mode, press the [MENU] knob and this key to select the scan mode for the current operation band (CTRL).
>> Search (SE).
>> Carrier (CO).
>> Time (TO).

(5) [SQL/MONI] key:

● Press this key to set the squelch (SQ) level of the currently operation band (CTRL).
● Press and hold the key for 3 seconds to turn off the SQ circuit of the currently operation band (CTRL) and be in monitor mode.
● Press the [MENU] knob, then this key to disable or enable RX/TX of the currently operation band (CTRL).

(6) [TONE/T.SEL] key:

● In VFO mode, press this key to turn ON/OFF the CTCSS/DCS code of the current operation band (CTRL).
>> Options: QT → DQT → OFF.
● If CTCSS/DCS is on, press and hold the key for more than 3 seconds to set the CTCSS/DCS code of the current operation band (CTRL). RX, TX and RX + TX CTCSS/DCS code can be set separately.
● In VFO mode, press the [MENU] knob, then this key, the currently operable band (CTRL) is switched between VHF and UHF.

(7) [B/E] key:

● In menu operation, press this key to return to the previous operation.
● In any submenu operation, press and hold this key for more than 3 seconds to exit the operation mode and return to standby mode.
● In standby mode, press and hold this key for more than 3 seconds to turn ON/OFF the key lock function.

(8) [LED] indicator:

● Lights green when receiving and lights red when transmitting.
● When the speaker microphone is operated, the led flashed red.

(9) [PTT/CRL] key:

● Press this key to transmit in the selected band where you want to transmit, the selected band is indicated by the “PTT” icon.
● Press and hold this key for more than 3 seconds to select the currently operation band (CTRL) for any operation, including SQ level, volume, signaling, menu, etc. The selected band is displayed with the “CTRL” icon.
● Press the [MENU] knob, and then this key to turn ON/OFF the display and working mode of the non-operation band. The display switches between single band and dual band.

(10) MIC and PC jack (RJ45):

● It is used for connecting the microphone + speaker.
● Connect the PC cable to this Jack to program on the computer.

(11) Front panel:

● It is made of ABS material.

(12) LCD display:

● For displaying the working channel or frequency, instructions status, menus and other related visual information with the transceiver.

(13) Rotate knob (ENC):

● Rotate this knob to select the operating frequency or memory channel, change the scanning direction mode, select the audio level, etc. When in menu mode operation, it can be used for selecting the settings options.

(14) [MENU] knob:

● Press this knob to enter menu mode.
● Press the knob, and then press any other key to set function options quickly.
● After set, press the [MENU] knob to confirm.

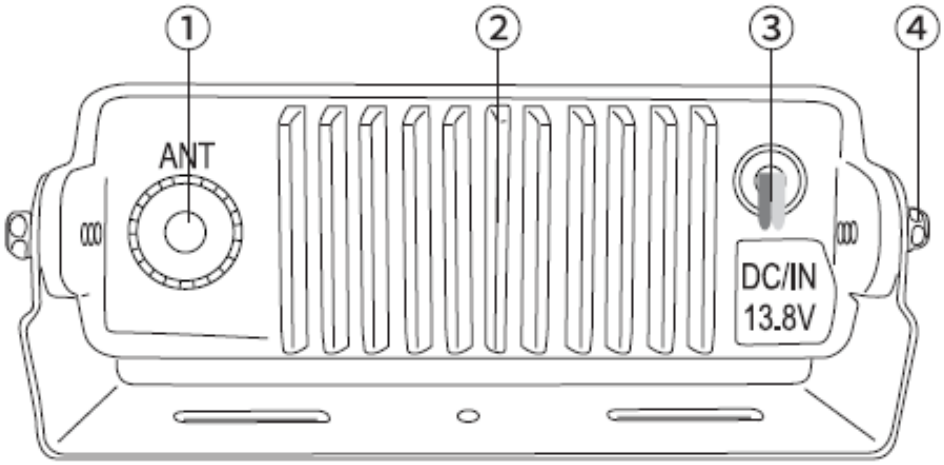
6.2.- LCD DISPLAY:

Icons descriptions displayed on the screen.

Icon	Description
PTT	Indicating the band can be transmitting.
CTRL	Indicating the band can be operated and set.
QT	CTCSS tones enabled.
DQT	DCS codes enabled.
+	Transmission frequency upper that receiving frequency (Positive "Offset").
–	Transmission frequency lower that the receiving frequency (Negative "Offset").
R	Reverse function activated.
N	Narrow band operation.
W	Wide band operation.
▲	Displayed when the selected channel number is saved as memory channel.
🔒	Displayed when the lock function for the memory channel is on.
CH 888	Shows the channel memory number.
H	High transmission power.
L	Low transmission power.

	Signal strength at RX and power level at TX.
SQL 0-9	Squelch level.
VOL 00-20	Volume level.
VFO	VFO mode operation.
	Keypad locked.
	The current band is prohibit to TX & RX.

6.3.- REAR PANEL:



(1) ANT:

External antenna connected to this terminal. During the transmitting test, connect the load to replace the antenna. Antenna system or the load should be with 50 Ω impedances.

(2) Heat sink:

Allows cooling avoiding overheating that can cause damage to the internal components of the transceiver.

(3) External power plug:

When you connect to the external power, you should carefully check the polarity of the power supply (Red cable: + and black cable: -) and the power ratings (13.8 VDC ±15 %).

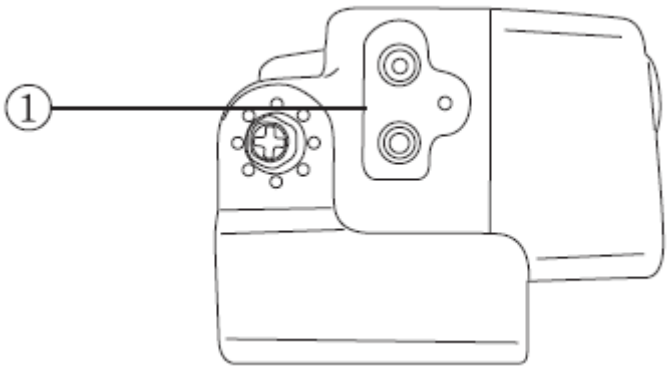
(4) Rack mounting screws:

Release the left and right screws to adjust a proper position angle, and re-fasten.

[SP/MIC] jack on side panel:

If necessary, connect a suitable headset or an external speaker for better sound. In these jacks can only be connected monaural jacks with 2.5 mm and 3.5 mm diameter socket.

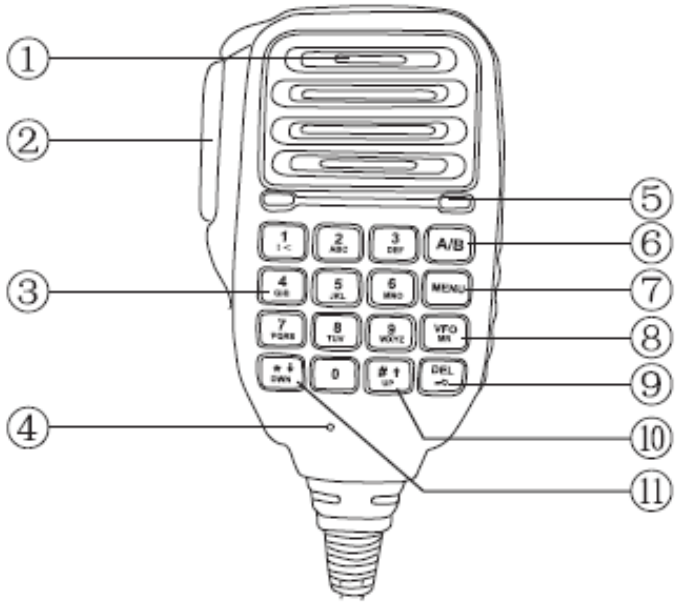
(1) Accessories installation jack:



● Insert the headset with standard K type connector to this jacks.

Note:
- There is no speaker assembled in the transceiver body, the accessories used must be equipped with speaker and microphone.

6.4.- SPEAKER-MICROPHONE:



(1) Speaker:

● An audio is issued when a signal is received.

(2) PTT:

● Press and hold and speak into the microphone to transmit. Release it to receive.

(3) Keypad:

● Press these keys to input the frequency or characters.

(4) Microphone (MIC):

● Speak towards the microphone in a normal, clear tone of voice.

(5) Led indicator:

● When transmit, the led indicator lights red.
● If operating on speaker microphone keypad, the led indicator lights red, once release, the led turn OFF.

(6) PF1 [A/B] key:

● The function is the sane that the [PTT/CLR] of the front panel of the transceiver. It is also definable MIC PF1 key by programing software.

(7) PF2 [MENU] key:

● For selecting the menu mode. It is also definable MIC PF2 key by programing software.

(8) PF3 [VFO] key:

● For selecting the VFO mode. It is also definable MIC PF3 key by programing software.

(9) PF4 [DEL] key:

● Same function as [B/E] key on front panel of the transceiver. It is also definable MIC PF4 key by programing software.

(10) [UP] key:

● Increase the parameter value.

(11) [DWN] key:

● Decrease the parameter value.

6.5.- DEFINABLE KEYS ON SPEAKER-MICROPHONE:

There are 4 PF definable functions keys: [MICPF1], [MICPF2], [MICPF3] and [MICPF4], whose functions can be programmed by following procedure:

1. Press the [MENU] knob to enter the settings menu.
2. Rotate the [MENU] knob to select the “SET” option. Then press the [MENU] knob to confirm.
3. Rotate the [MENU] knob to select “Definable set” option. Then press the [MENU] knob to confirm.
4. Turn the [MENU] knob to select the desired definable keys. Then press the [MENU] knob to confirm.
5. Turn the [MENU] knob to assign the function for the selected definable key. Then press the [MENU] knob to confirm.

● The “Set Completed” is displayed on the screen.

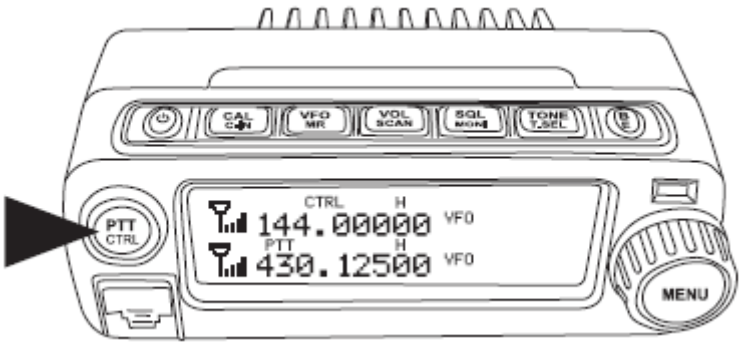
6. The screen returns to the previous interface.

Available functions for definable keys are as follows:
● PTT/CLR.
● CAL/C-IN.
● VFO/MR.
● VOL/SCAN.
● SQL/MONI.
● TONE/T.SEL.
● BACK/DEL/LOCK.
● MENU.

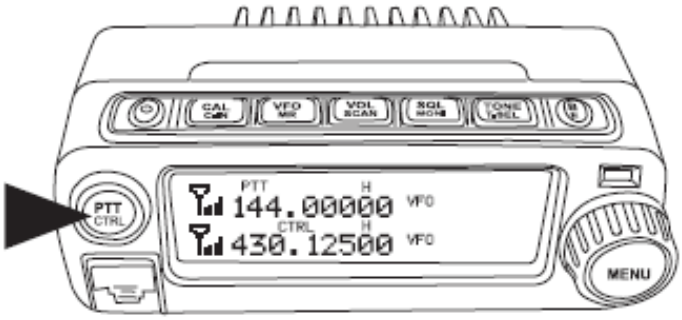
6.6.- SELECT THE OPERATING BAND:

The band with “CTRL” icon displaying above is the operable band.
1. In standby mode, press and hold the [PTT/CTRL] for more 3 seconds, “CTRL” icon switches between the upper and lower band. The band with “CTRL” icon displaying above is the currently operation band.

The upper operable band:



The lower operable band:



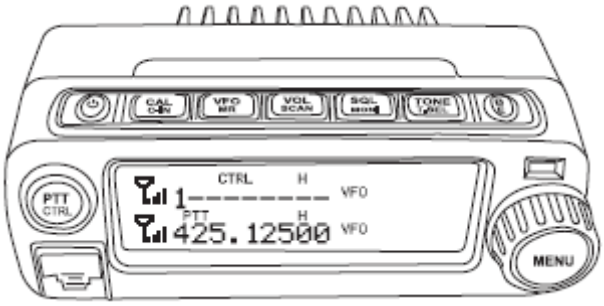
6.7.- FREQUENCY INPUT METHOD:

If the desired operating frequency is far away from the current frequency, it is quicker to input the desired frequency with speaker-microphone keypad.

♦ Speaker-microphone input mode:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to switch to VFO mode.
3. Enter the desired frequency by using the numbers (0~9) on speaker-microphone keypad.

LCD display for direct frequency entry showing:



Note:
- If the [PTT] or [MENU] knob is pressed before all the digits are entered, the remaining digits are set to "0".

♦ Shift input mode:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to switch to VFO mode.
3. Press the [MENU] knob, then press the [VFO/MR] key.

● The "Hundred digit MHz" of the currently selected operational band (CTRL) we flashes.

4. Rotate the [MENU] knob to select the input digit, or input the number through the speaker-microphone keypad.

● Press the [SQL/MONI] key to move the cursor to the left by one digit, or the [TONE/T.SEL] key to the right by one digit. When the shift is selected, the previous digit is automatically confirmed.

5. After selecting, press the [MENU] knob to confirm.

● The setting will be confirmed automatically if 5 seconds without performed any operation or you can press the [B/E] key to confirm the setting and exit.

7.- BASIC OPERATION:

7.1.- SWITCHING THE POWER ON/OFF:

1. Press and hold the [ON/OFF] key for more than 3 seconds to turn ON the transceiver.

● Power on message displays briefly on the screen.

2. Press and hold the [ON/OFF] key for more than 3 seconds to turn OFF the transceiver.

7.2.- VOLUME SETTING:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VOL/SCAN] key.

● The "VOL" icon displays on the right side of the band.

3. Turn the [MENU] knob to select the volume output level from 00 to 20.

● If set to "00", the current band volume output is the minimum.
● If set to "20", the current band volume output is the maximum.

4. After selecting, press the [MENU] knob to confirm or press the [B/E] key to cancel the setting.

5. The screen returns to standby mode.

7.3.- MUTE MODE:

1. Press the [VOL/SCAN] key twice to tur ON the mute mode, and press it once again to turn OFF the mute function.
● If the mute mode is ON, the speaker icon display on the right side of the band.
● If the mute mode is OFF, the speaker icon disappears from the screen.

7.4.- SQUELCH LEVEL SETTING:

The squelch is used to turn OFF the speaker volume when there is no received any signal. With the squelch level is setting correctly, the audio can be heard only when a matching signal is received. The higher the squelch level is, must be the stronger of receive signal level to listen the audio.

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [SQL/MONI] key.
● The “SQL” icon blinks on the right side of the operation band.
3. Turn the [MENU] knob to select the squelch level from 0 to 9.
● If set to “00”, the squelch of current band is OFF.
● If set to “9”, the squelch level of current band is maximum, the signal level must be stronger for the communication can be heard.

Note:
- Set the squelch level depending on actual communication distance, the higher level is for short distance communications.

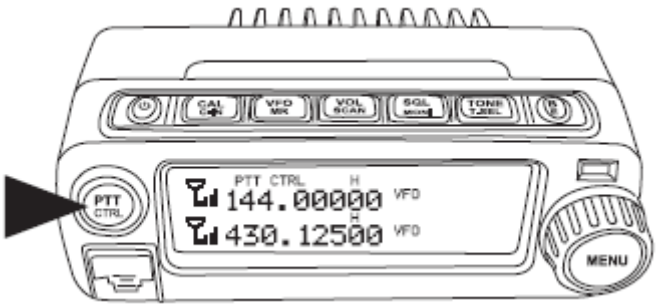
4. After selecting, press the [MENU] knob to confirm or press the [B/E] key to cancel the setting.
5. The screen returns to standby mode.

7.5.- SELECT THE TRANSMISSION BAND:

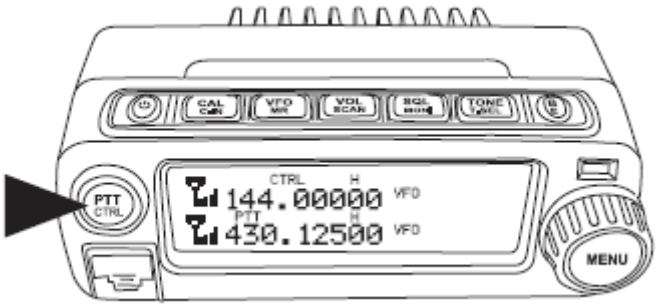
The band with the “PTT” icon displaying above is the transmitting band.

1. In standby mode, press the [PTT/CLR] key.
● The “PTT” icon switches between the upper and lower band.

Upper band to transmit:



Lower band to transmit:

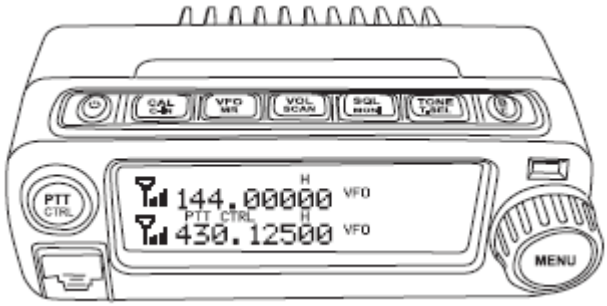


7.6.- SINGLE BAND / DUAL BAND OPERATION:

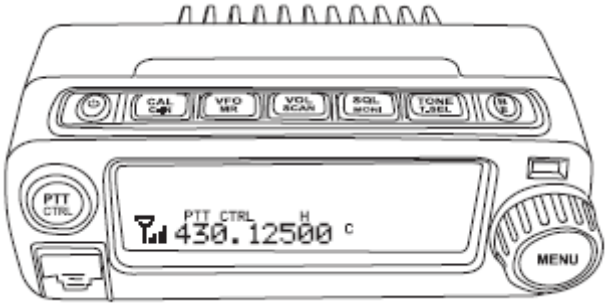
You can turn OFF the desired band; the transceiver can operate between dual band and single band.

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the "CTRL" icon to the desired band (CTRL).
2. Press the [MENU] knob, and then press the [PTT/CTRL] again, the non-operating band switched between OFF or ON.

Dual band mode:



Single band mode:



Note:
- Only when the "CTRL" icon displays on the desired band, then can the un-desired band be turned OFF by pressing the [MENU] + [PTT/CTRL] keys.

7.7.- SELECT THE OPERATING BAND / DISPLAY MODE:

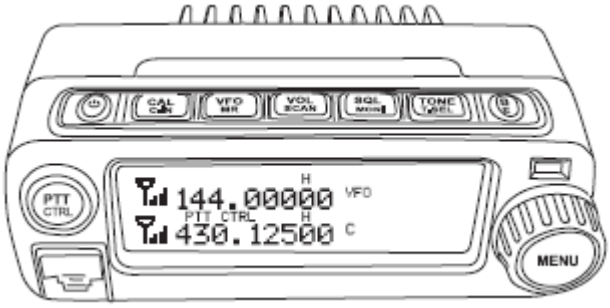
After saving the memory channel, the transceiver can switch between the memory channel and the stored frequency. This is useful for confirming the frequency stored in the memory channel.

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the displaying mode from the following four modes:
● VFO (Frequency display) mode.
● Channel & Frequency mode.
● Channel mode.
● Channel & Name mode.

7.8.- CALLING CHANNEL MODE:

Calling cannel mode allows selecting a preset channel to call immediately. It can be easily used as an emergency channel.

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [CALL/C.IN] key to call out the saved calling channel.
● The “C” icon appears on the screen of the current band.



● Press the [PTT] and then speak into the microphone to transmit.
3. Press the [CALL/C.IN] key again to exit the calling channel mode and return to the previous operating mode.

7.9.- TRANSMITTING:

1. Press the [PTT/CLR] key to select the desired transmitting band.
● The band with the “PTT” icon appearing above can be transmitted.
2. Press the [PTT] and then speak into the microphone to transmit.
● The icon displaying on the transmitting band, indicates the relative transmitting power.
● The “L” or “H” icon will display in the upper of the band depending on the selected output transmission power.
● Speak into the microphone with normal voice, and keep the microphone about 5 cm far away from your mouth. Speak too loud or keep too close to the Mic will increase the signal distortion and decrease the intelligibility.
3. After speaking, release the [PTT] to receive.

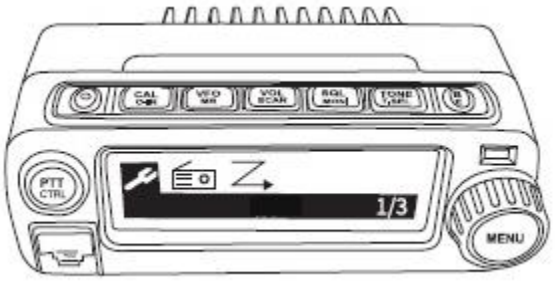
8.- SETTINGS MENU:

Many functions of the transceiver are selected or setting via menu, rather than thru keypad.

8.1.- MENU ACCESS:

1. The transceiver must be in standby mode.
2. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
3. Press the [MENU] knob to enter into menu options.

As shown below:



4. Rotate the [MENU] knob to select the desired function.
- Set.
- Radio.
- Scan.

5. After selecting, press the [MENU] knob to enter the current menu options.
- For information of the settings menu, refer to the following table.

6. Rotate the [MENU] knob to select the desired parameter or configuration.
7. After selecting, press the [MENU] knob to confirm the desired parameter or press the [B/E] key to cancel and return to the previous option.
- Press and hold the [B/E] key for 3 seconds to exit the settings menu and return to the standby mode.

8. Repeat the above 4 to 6 operation procedure to continue to set the other desired functions.
- In any menu operation, press and hold the [B/E] key for 3 seconds to exit the menu operation mode.
- In settings menu options, press the [B/E] key to cancel the current setting and return to the previous menu option.

8.2.- SETTINGS MENU TABLE:

Main menu	Menu no.	First menu	Second menu	Third menu	Selections	Default
Set	1	Parameter	TOT	Time set	30 ~ 500 seconds	60 seconds
				ON/OFF	ON/OFF	ON
			Power	---	High power	H
				---	Low power	---
	2	Audio mode	Speaker MIC	---	---	---
			Headset	---	---	---
			MIC & headset	---	---	MIC & headset
	3	Prompt tone	Profiles	---	Standard	Standard
				---	Silent	---
			Key tone	ON/OFF	ON/OFF	ON
				Volume	01 ~ 13	10
			Call Tone	ON/OFF	TX Begin Tone	OFF
					TX End Tone	OFF
	4	Others	Language	Others	---	---
				Chinese	---	---
				English	---	English
			Keylock	Auto	---	
				Manual	---	Manual
			Backlight	ON/OFF	ON	---
					OFF	---
					Auto	Auto
			Version	Version No.	---	---
				Version Freq.	---	---
				Version Date	---	---
				Version Time	---	---
			Disp Mode	CH No & Name	---	---
				CH No. & Freq.	---	---
				CH No.	---	---
				VFO	---	VFO
				S/D Mode	Single Mode	---
					Dual Mode	Dual Mode
			ENC	---	ON	ON
				---	OFF	---
			VOX	ON/OFF	ON/OFF	OFF
				Level	1 ~ 12	10
	5	Smart Boot	Factory Reset?	---	---	---

Main menu	Menu no.	First menu	Second menu	Third menu	Selections	Default
Set	6	Function	SQ level	---	0 ~10	5
			Freq. Step	---	5/6.25/10/12.5/ 25/50/100 kHz	5 kHz
			BCL	ON/OFF	---	OFF
			Band	Narrow/Wide	---	Wide
			SFT Direction	+	---	---
				-	---	---
				OFF	---	OFF
			SFT Range	---	0.00 ~70.00	0.00
	7	Signalling	CTCSS	R&T CTCSS	62.5 – 254.1	---
				RX CTCSS	62.5 – 254.1	---
				TX CTCSS	62.5 – 254.1	---
			DCS	R&T DCS	017 – 754N/I	---
				RX DCS	017 – 754N/I	---
				TX DCS	017 – 754N/I	---
			OFF	---	---	---
	8	PF Keys	PF1	A/B Band	---	A/B Band
				Call Channel	---	---
				VFO/MR	---	---
				VOL/SCAN	---	---
				SQL/MONI	---	---
				TONE/T.SEL	---	---
				B/E	---	---
				MENU/OK	---	---
			PF2	A/B Band	---	---
				Call Channel	---	---
				VFO/MR	---	---
				VOL/SCAN	---	---
				SQL/MONI	---	---
				TONE/T.SEL	---	---
				B/E	---	---
				MENU/OK	---	MENU/OK
			PF3	A/B Band	---	---
				Call Channel	---	---
				VFO/MR	---	VFO/MR
				VOL/SCAN	---	---
				SQL/MONI	---	---
				TONE/T.SEL	---	---
				B/E	---	---
				MENU/OK	---	---
		PF Keys	PF4	A/B Band	---	---
				Call Channel	---	---
				VFO/MR	---	---
				VOL/SCAN	---	---
				SQL/MONI	---	---
				TONE/T.SEL	---	---
				B/E	---	B/E
				MENU/OK	---	---

Main menu	Menu no.	First menu	Second menu	Third menu	Selections	Default
FM Radio	1	FM radio frequency	---	---	---	---
Scan	1	List Check	Scan List	Set PrioCH	---	---
				Disable PrioCH	---	---
				Delete CH	---	---
				Add CH	---	---
	2	Scan Mode	CO	---	---	---
			TO	---	5/10/15/20 seconds	---
			SE	---	---	---
	3	List Scan	Start scan	---	---	---
	4	Freq Scan	Start scan	---	---	---
	5	Scan Off	Disable scan	---	---	---

8.3.- CHANNEL NAMING:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the current band to channel mode.
3. Press and hold the [VFO/MR] key for 3 seconds to access to channel naming mode.
● Press the [#] key on microphone to switch the character input type.
● Character input type icon will displayed on the right of the current editable band.
● AB (for capital letter) / ab (for lowercase letter) / 12 (for numeric 0 ~ 9).
4. Rotate the [MENU] knob to select the desired character input type.
● You can enter the following characters for the channel name: 0 ~ 9, A ~ Z, a ~ z ...
● Press the [SQL/MONI] key to move left the cursor; and move right by press the [TONE/T.SET] key.
● To delete a prior character, press the [B/E] key.
5. Once program completed, press the [MENU] knob to confirm and exit the current editing mode.
6. Or press the [B/E] key to cancel the program and exit the editing mode.

8.4.- CHARACTER INPUT FROM MICROPHONE KEYPAD:

You can enter the characters using the microphone keypad as shown in the following table.

Key	Character display (for every press of the key)				
1	0	,	´	…	1
2	A	B	C		2
3	D	E	F		3
4	G	H	I		4
5	J	K	L		5
6	M	N	O		6
7	P	Q	R	S	7
8	T	U	V		8
9	W	X	Y	Z	9
0	Blank space				0

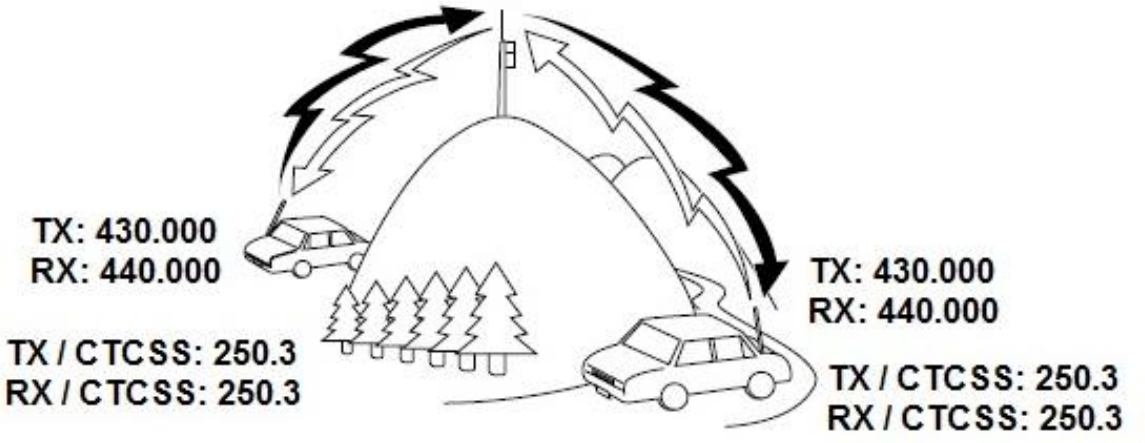
*	Blank space	Down			*
#	Up	To switch character input type			#

Note:
- The [A/B] to [DEL] keys on microphone are with default pre-set features as below:
[A/B]: A/B-PF1.
[MENU]: MENU-PF2.
[VFO]: VFO/MR-PF3.
[DEL]: DEL/PF4.

8.5.- OPERATION VIA REPEATER:

The repeaters are typically used to long-distance communications and are mostly installed on top of a mountain or other high locations.

Example of installation of a repeater:



Note:
- The most repeaters use receive and transmit frequency with a standard or non-standard offset.

8.5.1.- Offset programming:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [MENU] knob to access the current band menu.
3. Rotate the [MENU] knob to select the settings, and then press the [MENU] knob to confirm.
4. Rotate the [MENU] knob to select function, and then press the [MENU] knob to confirm.
5. Rotate the [MENU] knob to select the offset direction or offset step options, then press the [MENU] knob to confirm.

8.5.2.- Offset direction:

● To select the offset direction, could make your TX frequency higher (+) or less (-) tan your RX frequency.
● Once selection done, press the [MENU] knob for confirmation.
>> Screen will show up “Saved”.

8.5.3.- Offset step range:

● Offset step refers to the offset value for TX frequency to RX frequency.
● Rotate the [MENU] knob to select the offset step or input the offset value from microphone keypad.
● Once selection done, press the [MENU] knob for confirmation.
>> Screen will display "Saved".
6. Press the [B/E] key to back to previous menu.

Notes:
- If the offset step frequency beyond the allowable frequency band range, the transmission will be prohibited.
To solve it, you could try the following methods:
● Increase the RX frequency under frequency band.
● Change the offset direction.
- Users fail to change the offset direction if to use the memory RX or TX frequency.

9.- ADVANCED OPERATION:

9.1.- KEYPAD OPERATION AND DESCRIPTION:

Key	Operation	Function
[⏻]	Press and hold for 3 seconds	Turn ON/OFF the transceiver.
[PTT/CTRL]	Press	To select the current available transmitting (PTT) band.
	Press and hold for 3 seconds	To select the currently operation band (CTRL) and transmissible (PTT) band.
[CALL/C.IN]	Press	To retrieve the call channel from the currently operation band (CTRL).
	Press	To exit the call channel mode from currently operation band (CTRL).
	Press and hold for 3 seconds	Under VFO mode, it can save the currently operation band (CTRL) frequency as call channel frequency.
[VFO/MR]	Press	To the working display mode for currently operation band (VFO / Channel number + frequency / Channel number + channel name).
	Press and hold for 3 seconds	Be able to save the channel number under VFO mode.
	Press and hold for 3 seconds	Be able to channel name under VFO mode.
[VOL/SCAN]	Press	To adjust the volume output for currently operation band (CTRL).
	Press 2 times	Activate the mute mode, to unmute it by press it again.
	Press and hold for 3 seconds	Turn ON/OFF the scan for currently operation band (CTRL).
[SQL/MONI]	Press	To adjust the squelch (SQ) level for currently operation band (CTRL).
	Press	Could be used as left cursor under channel naming or quick setting the frequency mode.
	Press and hold for 3 seconds	Turn ON/OFF the squelch of currently operation band (Monitoring).

[TONE/T.SET]	Press	Under VFO mode, turn ON the CTCSS/DCS select signaling type and turn OFF the signaling for currently operation band (CTRL).
	Press	Could be used as right cursor under cannel naming or quick setting the frequency.
	Press and hold for 3 seconds	Under VFO mode, and CTCSS/DCS signaling activated, it could enter to tone or encode setting.
[B/E]	Press	To select menu item or parameter settings, etc., used as [Cancel] and [Back].
	Press and hold for 3 seconds	Quick exit from current operation and back to standby mode, under function mode.
	Press and hold for 3 seconds	To lock and unlock the keypad under standby mode.
[MENU] knob	Press	Enter to menu list when on standby mode.
	Press	To select the item and confirm the parameter or other values, used as confirm key.
	Rotate	To select the items, frequency, parameter and other related options and operations.

9.2.- KEYPADS COMBINED OPERATION AND DESCRIPTION:

Main keypad		Function key	Function
[MENU] knob	+	[PTT/CTRL]	Turn ON/OFF the inoperable band (Single band/dual band operation).
		[CALL/C.IN]	Under VFO mode, turn ON/OFF the reverse function of the currently operation band (CTRL). Note: Only it is in effect when offset direction (+/-) is activated.
		[VFO/MR]	Under VFO mode, it can quick change the currently operation band (CTRL).
			Under channel mode, it is to lock or unlock the currently operation band (CTRL). Once the channel is locked, the 🔒 icon will display next to channel number.
		[VOL/SCAN]	To select the scan mode (SE/TO/CO) for the currently operation band (CTRL).
		[SQL/MONI]	To allow or forbid the RX and TX of the currently operation band (CTRL).
		[TONE/T.SET]	To quick setting the working frequency (VHF/UHF) of the currently operation band (CTRL).

9.3.- TO DELETE THE MEMORY CHANNEL:

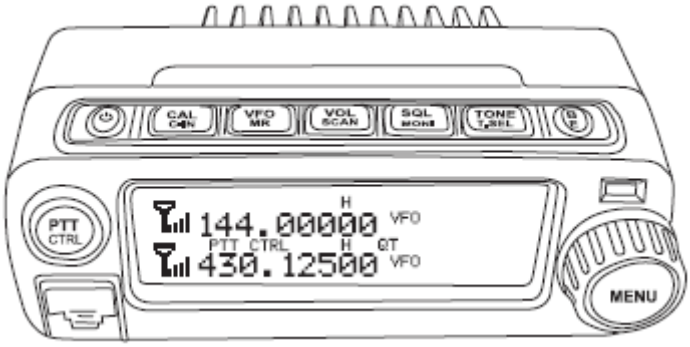
1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the channel mode.
3. Rotate the [MENU] knob to select your desired channel for delete.
4. Press and hold the [ON/OFF] key for 3 seconds at least to power OFF the transceiver.
5. Press and hold the [VFO/MR] and [ON/OFF] keys to power ON the transceiver.
6. Press the [MENU] knob to confirm the deletion or press the [B/E] key to cancel and back to standby mode.

9.4.- TURN ON/OFF THE CTCSS/DCS:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the VFO mode.
3. Press the [TONE/T.SET] key to cycle select the tone type or turn OFF the tone.

● Every press the [TONE/T.SET] key the options will be changed as below: → QT → DOT → OFF → ON.

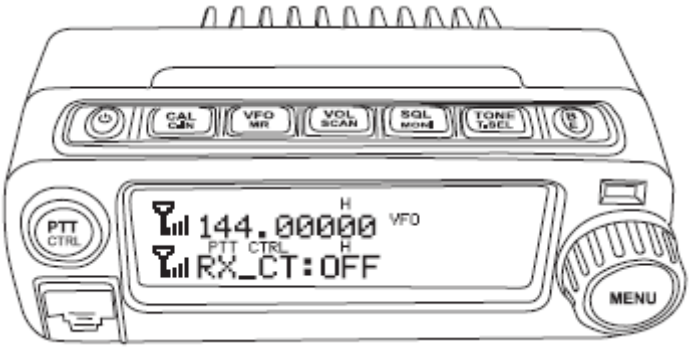
● When the CTCSS/DCS signaling is activated; "QT" will be displayed on the screen.



9.5.- TO CHOOSE CTCSS TONE OR DCS CODE:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the VFO mode.
3. Press the [TONE/T.SET] key to select the tone type (CTCSS/DCS).
4. Press and hold the [TONE/T.SET] key for 3 seconds to access CTCSS tones or DCS codes.

● Once the CTCSS/DCS is activated, settings can be operable.



5. Rotate the [MENU] knob to select the CTCSS tone/DCS code, or press the [TONE/T.SET] key to choose the CTCSS tone/DCS code for RX or TX or RX+TX.

● Every press the [TONE/T.SET] key the options will be changed as below:

>> CTCSS: RX&TX_CT (RX+TX) → RX_CT → TX_CT.

>> DCS: RX&TX_DCS (RX+TX) → RX_DCS → TX_DCS.

6. Press the [MENU] knob to confirm the current operation, or press the [B/E] key to cancel and back to standby mode.

Note:

- If the memory channel to be programmed with CTCSS/DCS, then just need to call the memory channel rather than to program the CTCSS/DCS every time.

CTCSS table:

Freq. (Hz)	Freq. (Hz)	Freq. (Hz)	Freq. (Hz)	Freq. (Hz)	Freq. (Hz)
OFF	88.5	123.0	165.5	196.6	250.3
62.5	91.5	127.3	167.9	199.5	254.1
67.0	94.8	131.8	171.3	203.5	61
69.3	97.4	136.5	173.8	206.5	63
71.9	100.0	141.3	177.3	210.7	
74.4	103.5	146.2	179.9	218.1	
77.0	107.2	151.4	183.5	225.7	
79.7	110.9	156.7	186.2	229.1	
82.5	114.8	159.8	189.9	233.6	
85.4	118.8	162.2	192.8	241.8	

DCS table:

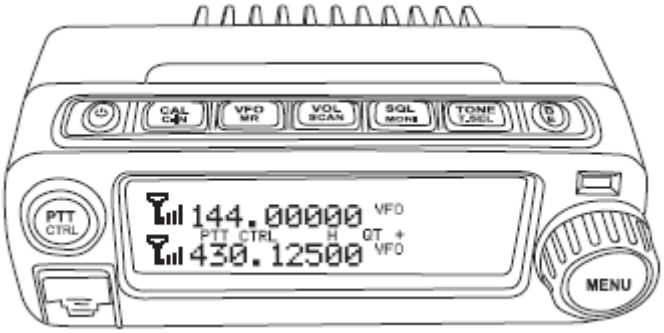
DCS codes								
OFF	054N/I	134N/I	225N/I	271N/I	365N/I	462N/I	612N/I	731N/I
017N/I	065N/I	143N/I	226N/I	274N/I	371N/I	464N/I	624N/I	732N/I
023N/I	071N/I	145N/I	243N/I	306N/I	411N/I	465N/I	627N/I	734N/I
025N/I	072N/I	152N/I	244N/I	311N/I	412N/I	466N/I	631N/I	743N/I
026N/I	073N/I	155N/I	245N/I	315N/I	413N/I	503N/I	632N/I	754N/I
031N/I	074N/I	156N/I	246N/I	325N/I	423N/I	506N/I	645N/I	
032N/I	114N/I	162N/I	251N/I	331N/I	431N/I	516N/I	646N/I	
036N/I	115N/I	165N/I	252N/I	332N/I	432N/I	523N/I	654N/I	
043N/I	116N/I	172N/I	255N/I	343N/I	455N/I	526N/I	662N/I	
047N/I	122N/I	174N/I	261N/I	346N/I	446N/I	532N/I	664N/I	
050N/I	125N/I	205N/I	263N/I	351N/I	452N/I	546N/I	703N/I	
051N/I	131N/I	212N/I	265N/I	356N/I	454N/I	565N/I	712N/I	
053N/I	132N/I	223N/I	266N/I	364N/I	455N/I	606N/I	723N/I	

9.6.- REVERSE FUNCTION:

If the transceiver was performed under offset working mode, you could swap the TX and RX frequency by activate the reverse frequency function. Thus you could manually check the receiving signal strength from other stations, while using a repeater.

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the VFO mode.
3. Press the [MENU] knob, and then press the [CALL/C.IN].

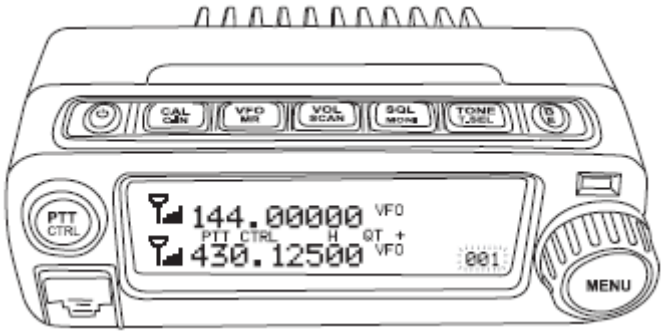
● Every press the [MENU] knob and then [CALL/C.IN] key, the reverse function will be switch between ON and OFF.
● If the reverse function is activated, “+” or “-” will show up on screen.
● If the reverse function is activated, “R” icon will show up at the right of the band.



Notes:
- While using the reverse function, if the TX frequency exceeds the allowable transmitting frequency range, press the [PTT] will result in transmitting prohibited.
- While using the reverse function, if the RX frequency exceeds the allowable receiving frequency range, the reverse function will fail to use.
- While using the reverse function, if there is no offset frequency, the reverse function will fail to use.
- While using reverse function, if there is no offset direction, the reverse function will fail to use.
- While on transmitting, the reverse function will fail to turn ON or OFF.

9.7.- TO STORE FREQUENCY ON MEMORY CHANNEL:

1. Press and hold the [PTT/CLR] key for more than 3 seconds to select the operation band (CTRL).
2. Press the [VFO/MR] key to select the VFO mode.
3. Rotate the [MENU] knob, or input the desired frequency through the microphone keypad.
● Besides, the user could change the frequency with preset step frequency by press the [UP] / [DOWN] keys on microphone.
● If necessary, you can preset the parameters mentioned below for the channel you want to stored. Offset direction (+/-), enable or disable the CTCSS/DCS, setting the CTCSS tone or DCS code.
4. Once the setting is finished, press and hold the [VFO/MR] key for 3 seconds.
● The memory channel number will show up and flashed at the right of the currently operation band (CTRL).

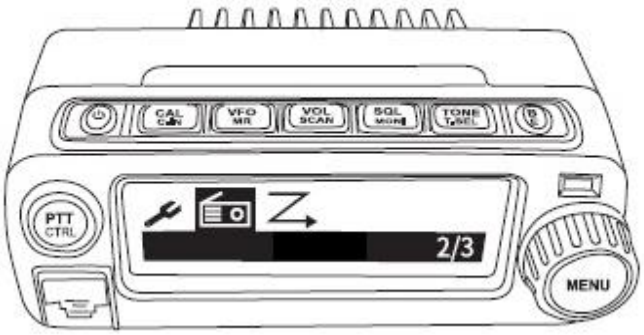


5. Rotate the [MENU] knob to choose the desired channel number for storage.
6. After selection, press the [MENU] knob to confirm the selected frequency and parameters saved on the memory channel.
● "Saved" will display on the screen once the program is completed, or press the [B/E] key to cancel the storage and return to standby mode.

Notes:
- If the selected channel number has been stored with other parameters, the ▲ icon will display next to the channel number.
- If the stored channel to be stored again, the previous parameters will be replaced by the new parameters.
- If the selected channel already is memory channel, the 🔒 icon will display next to the channel number until the user to unlock it first or fail to store.

9.8.- FM RADIO OPERATION:

1. Press the [MENU] knob to access into menu list.
2. Rotate the [MENU] knob to select the FM option.
● The screen will display the FM radio.



3. Press the [MENU] knob to access into FM radio options.
4. Rotate the [MENU] knob to select what your need the FM frequency (Auto/Manual).
Or:
● Press the [MENU] knob to Access to FM list options.
● Rotate the [MENU] knob to select an option from the ones described in the following chapters.

9.8.1.- Storing FM radio frequency:

● Select the desired FM radio frequency.
● Press the [MENU] knob to confirm.
● "Saved" will display on the screen.
Or:
Press the [B/E] key to cancel and return to the previous mode.

9.8.2.- Stored FM radio frequencies:

● Press the [MENU] knob to access to stored FM radio frequencies options.
● Rotate the [MENU] knob to check the stored FM frequencies.
Or:
● Press the [MENU] knob to access to stored FM radio frequencies list.
● Rotate the [MENU] knob to select "Delete" or "Play" option.
● Press the [MENU] knob to confirm option.
Or:
Press the [B/E] key to cancel and return to previous mode.

9.8.3.- FM mode manual/auto:

● Press the [MENU] knob to access to options list.
● Rotate the [MENU] knob to select “Manual” or “Auto” option.
● Press the [MENU] knob to confirm the selected option.
● “Saved” will display on the screen.
Or:
Press the [B/E] key to cancel and return to previous mode.

9.8.4.- Audio output mode:

● Press the [MENU] knob to access to options list.
● Rotate the [MENU] knob to select below desired audio output options.
>> PRE: Output from the microphone speaker.
>> SIDE: Output from the external speaker/microheadset.
>> PRE & SIDE: Output from the speaker microphone and external speaker/microheadset.
● Press the [MENU] knob to confirm the selected option.
● “Saved” will display on the screen.
Or:
Press the [B/E] key to cancel and return to previous mode.
5. Press the [B/E] key to exit FM mode and return to main screen.

9.8.5.- FM volume setting:

1. Press the [MENU] knob to access to menu list.
2. Rotate the [MENU] knob to select FM list and then press the [MENU] knob to confirm.
3. Press the [VOL/SCAN] key to access to volume setting mode.
● “VOLxx” will display on the screen.
Rotate the [MENU] knob to select the desired volume level.
Or:

Double press the [VOL/SCAN] key to enable the silent mode. The  icon will show on the screen.
Press the [VOL/SCAN] key to cancel the silent mode.
4. Press the [B/E] key to exit the FM mode, and return to main screen.

Notes:
- Select “Manual” to manually select the FM frequencies (Step: 100 kHz.).
- Select “Auto” to scan the FM frequencies. Once the FM station is tuned, scanning will stop in the frequency.
- When you are listen the FM radio, if press the [PTT] to transmit or if receiving a signal, the FM radio will be disabled temporarily. After the signal disappear or not press the [PTT] in a preset time, the transceiver will return to FM radio mode automatically.

9.9.- SCAN:

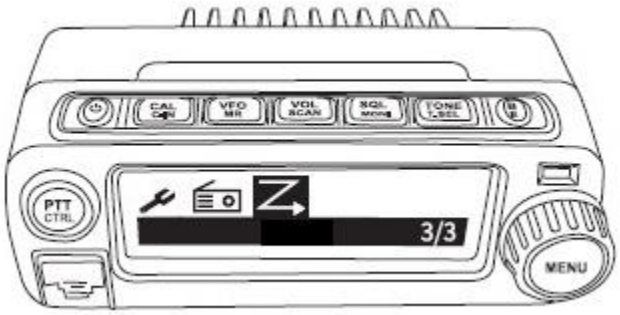
The scan function is used for monitor channels/frequencies. To familiar with all scan types will improve your operation.
● VFO scan: To scan all frequencies of the currently operation band (CTRL).
● Memory channel scan: To scan all stored frequencies on memory channels.
● Channel list scan: To scan all channels of memory channel list.

Notes:
- If setting the squelch level or press other keys except the [TONE/T.SET] and [B/E] during scanning, it will stop scanning.
- When operate with CTCSS/DCS, the transceiver will stop scanning when receive any matching signal
- When operate with CTCSS/DCS, the transceiver will stop scanning when it receives any frequency that incorporates CTCSS/DCS matched signaling with the one programmed on your transceiver.
- If you select the scan mode during scanning, the transceiver will stop scanning.

9.9.1.- Scan ON/OFF:

When the scan is enabled, the transceiver will start scan cyclically to check if there is any activities on the channel of preset scan list. Once the scan is ON, the led will flash, and scan icon will be displayed at the right on scanning band.
● Press and hold the [PTT/CTRL] key for 3 seconds to select the currently operation band (CTRL).
● Press and hold the [VOL/SCAN] key for 3 seconds to turn ON/OFF the scan function.

To program the scan function:
1. Press and hold the [PTT/CTRL] key for 3 seconds to select the currently operable band (CTRL).
2. Press the [MENU] knob to access menu list.
3. Rotate the [MENU] knob to select the scan options, and press the [MENU] knob to confirm.
● The scan will be display on the screen.



4. Turn the [MENU] knob to select the below described scan options.

9.9.2.- VFO scan:

● Press the [MENU] knob to confirm the option.
● "Start scanning" will display on the screen, and return to main screen.
● Scan icon will display at the right of scanning band.

9.9.3.- Channel scan list:

● Press the [MENU] knob to confirm the option.
● "Start scanning" will display on the screen, and return to main screen.
● Scan icon will display at the right of scanning band.

9.9.4.- Scan OFF:

● Press the [MENU] knob to confirm the option.
● The screen will return to main interface.
● Scan icon will be disappeared.

5. Press the [B/E] key to return to previous menu or press and hold the [B/E] key for 3 seconds to exit the menu mode, and return to main screen.

9.9.5.- Scan mode:

Once receives a scanned signal, the transceiver will stop scanning and resume scanning according the preset scan mode.
You select one of the below options:
● TO (Time): Once the transceiver receives a signal while scanning, it will stay into signal for a preset time. When the time is finished, it will continue to scanning.
● CO (Carrier): Once the transceiver receives a signal while scanning, the scan will stop until the signal disappears, after 3 seconds will resume the scan.
● SE (Search): Once the transceiver receives a signal while scanning, the scan turns OFF until you manually re-activate again.

Procedure:
● Press and hold the [PTT/CTRL] key for 3 seconds to select the currently operation band (CTRL).
● Press the [MENU] knob, and then press the [VOL/SCAN] key.

Also you can program it by means settings menu as below:
1. Press and hold the [PTT/CTRL] key for 3 seconds to select the currently operation band (CTRL).
2. Press the [MENU] knob to access menu list.
3. Rotate the [MENU] knob to select the scan option, and then press it to confirm.
4. Rotate the [MENU] knob to select the scan mode and then press it to confirm.
5. Rotate the [MENU] knob to select TO/SE/CO, and then press it to confirm.
6. “Saved” will display on the screen, and back to previous menu.
7. Press the [B/E] key to back to previous menu or press and hold this key for 3 seconds to exit the menu mode and return to main screen.

9.9.6.- Scan list:

Users can preset scan list. The transceiver will scan cyclically to check if there is a valid signal on the scan list channel.
This transceiver can store a maximum of 255 channels.
If it is configured by your salesperson, the users can edit, add, delete channel or choose thr priority channels through the screen menu.

9.9.7.- Scan list operation:

1. Press and hold the [PTT/CTRL] key for 3 seconds to select the currently operation band (CTRL).
2. Press the [MENU] knob to access into menu list.
3. Rotate the [MENU] knob to select the scan option, and then press it to confirm.
4. Rotate the [MENU] knob to select “Check scan list”, and then press it to confirm.
The screen will display the total channel number for current scan list.
5. Rotate the [MENU] knob to check the current list.

Or:
Press the [MENU] knob to access into channel list, and then rotate it to select the desired channel options.
● Priority channel: Press the [MENU] knob to confirm the current cannel as priority cannel.
● Disable channel: Press the [MENU] knob to disable the current priority channel.
● Delete channel: Press the [MENU] knob to delete a channel from current channel list.
● Add channel: Press the [MENU] knob to select the memory channel number, and then press the [MENU] knob again to add the channel to the scan list.
6. "Saved" will display on the screen, and back to previous menu.
7. Press the [B/E] key to back to previous menu or press and hold this key for 3 seconds to exit the menu mode and return to main screen.

10.- TECHNICAL SPECIFICATIONS:

10.1.- GENERAL:

Frequency range	144 – 146 MHz (VHF) / 430-440 MHz (UHF). 88 – 108 MHz (FM broadcast receivers).
Channel steps	5/6.25/10/12.5/25/50/100.
Operating voltage	13.8 VDC ±10 %.
Antenna impedance	50 Ω.
Operating temperature	-20 ºC to +55 ºC.
Frequency stability	±2.5 ppm.
Duty cycle	100 %.
Dimensions	121.5 x 66.5 x 42.5 (mm).

10.2.- TRANSMITTER:

RF output power	20 W.
Modulation type	F3E.
Maximum deviation	≤±5 kHz (Wide band) / ≤±2.5 kHz (Narrow band).
Spurious emissions	≤65 dB below carrier.
Distortion	≤5 % (300 – 3000 Hz).
FM noise	≤-42 dB (Wide band) / ≤-38 dB (Narrow band).

10.3.- RECEIVER:

Intermediate frequencies	49.950 MHz & 450 kHz.
Sensibility (12 dB SINAD)	0.2 µV (Wide band) / 0.25 µV (Narrow band).
Squelch selectivity	0.15 µV (Wide band) / 0.2 µV (Narrow band).
Adjacent channel selectivity	≥70 dB (Wide band) / ≥65 dB (Narrow band).
Intermodulation	≥70 dB.
Spurious rejection	≥65 dB.
Image frequency rejection	≥70 dB.
Hum & noise	≤ -45 dB (Wide band) / ≤-40 dB (Narrow band).
Modulation type	16K0F3E / 11K0F3E.
Audio output	2 W (8 Ω, 5 % distortion).
Distortion	≤5 %.

11.- TROUBLESHOOTING:

Problem	Possible cause	Possible solution
After connect to 13.8 VDC power supply and press the [ON/OFF] key, the transceiver no turn ON.	1. The polarity (+) and (-) of the DC power cable is inverted. 2. One or more fuse is blow.	1. Connect the DC power cable correctly (Red cable to positive terminal and black cable negro to negative terminal). 2. Solve the problem that the fuse blows. Once checked and fixed out, install a new fuse of the same characteristics.
Cannot change the frequency by rotating the [MENU] knob or pressing the microphone [UP] / [DWN] keys.	The transceiver is under call channel mode.	Press the [VFO] key.
Most keys and the [MENU] knob no operate.	1. The lock function is activated. 2. The transceiver is in channel display mode.	1. Disable de lock function. 2. Under channel mode, can input the channel number. The frequency can input only under VFO mode.
Cannot select a memory channel by rotating the [MENU] knob or pressing the microphone [UP] / [DWN] keys.	Without parameters stored into memory channel.	Store some channel into memory channel.
No transmit when pressing the [PTT].	1. The microphone don´t install correctly into transceiver. 2. The Offset is out of transmission operation range band. 3. The busy channel lockout function is enabled.	1. Power OFF the transceiver and plug the microphone jack until a “click” hear. 2. Disable the frequency Offset function. 3. Disable the busy channel lockout.
If it continues the transceiver problems, consult with their salesperson or Technical Service.		