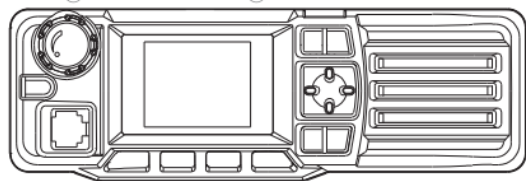


专业数字集群车载台 使用说明书
PROFESSIONAL
Digital Trunking Mobile Radio



Lisheng Communications Co., Ltd.



Important attention

Please read this manual carefully before use.

Please keep this manual, which contains important instructions on AP3500.

§ Please consult the dealer about the operation of Trunking mode, Direct mode and Repeater mode.

Warning

Do not directly connect AC power for use, which may cause fire or electric shock accidents.

Warning

Please do not use the power more than 16V DC, such as 24V battery, otherwise fire or radio may be damaged.

Warning

Please do not disconnect the fuse of on the power cable, otherwise the radio may be damaged.

Warning

Please do not place the radio in a place that affects the normal running of the vehicle, or it may cause damage or accidents.

Warning: Please place the radio out of the reach of children.

Warning: Please do not place the radio in rain, snow, water and other environments.

Please use the designated radio microphone for calling. If you use a microphone of other brands, you will not be able to use the corresponding functions and may easily cause damage to the device.

Please do not put the radio in an environment below -25°C or above 55°C to avoid direct sunlight.

Please do not operate the radio when the car battery is about to run out of power.

Please do not use the radio in dusty environment.

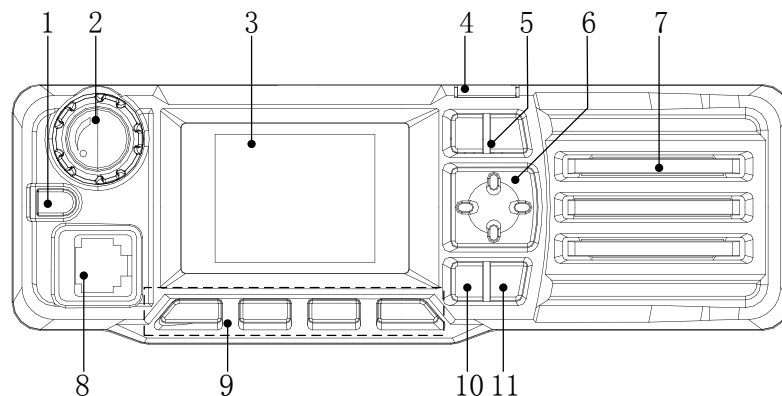
Please do not place the radio in a place that affects the heat dissipation of the device.

Please do not use corrosive liquid to wipe the instrument panel.

★ **Attention:** Long time emission will cause the radio to heat up, Avoid contact to avoid danger of burns!

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Front panel



1 Power on key

Long press to turn on or off

2 Volume knob

Turn clockwise to increase the volume.

Turn counterclockwise to decrease the volume.

3 Display screen

It can display the working status of the radio.

4 Receiving and transmitting indicator

Red light on when radio is transmitting.

Green light on when radio is receiving.

5 Channel switch keys

Channel switching can be realized through these two keys.

6 Navigation keys

You can select menu position and other operations through the navigation keys.

7 Speaker sound outlet

Send out the received sound or various prompt tones when receiving

8 Microphone connection socket

The socket is used to insert the microphone.

Note: Please do not use the microphone not produced by LS, otherwise the corresponding functions cannot be used and the radio may be damaged easily.

9 Function keys

Function keys P1-P4, different keys have different functions, which can be configured through configuration software.

10 Menu keys

Press to enter the menu or confirm the function.

11 Return key

Press to return to the previous menu.

Display function

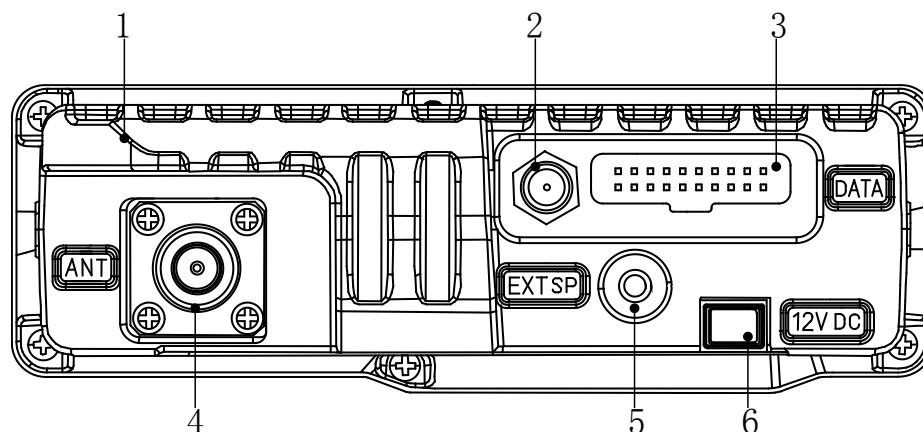


Icon description

S/N	Icon Name	Icon display	Icon represents content
1	signal intensity		signal intensity The more signal cells, the stronger the signal
2	Transmit power		high power
			low power
3	GPS indication		GPS unconnected icon
			GPS positive connection icon
			GPS positioning icon
4	Keyboard lock		Keyboard lock icon

5	Remote stun state		Remote stun indication
6	Alarm status		Radio failure or parameter not written or frequency not written
7	Mode	DM	Direct mode indication
		RM	Repeater mode indication
		TM	Trunking mode indication
8	Unread SMS		There are unread messages in the inbox
9	Voice encryption		The current voice is encrypted

Rear panel



1 Heat sink

The heat sink has radiating blades, and the temperature is high when launching to prevent scalding.

2 Positioning antenna interface

SMA type antenna interface which can be connected with positioning antenna.

Please consult the dealer for detailed types of accessories.

3 Data interface

20 cores data interface.

Please contact the dealer for detailed definitions and functions.

4 Antenna interface

N type antenna interface.

Please contact the dealer for antenna specifications.

5 External audio interface

3.5mm audio interface

The front panel speaker will mute when the connector is plugged in.

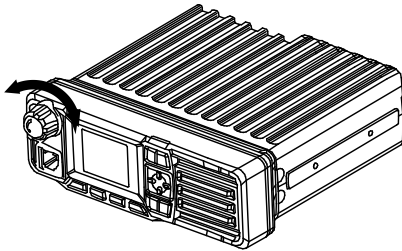
6 Power interface

Power interface, please connect 12V DC power supply.

Power on / off

1. Press and hold the [] key for more than 3s to power on the radio when the radio is powered off
2. Press and hold the [] key for more than 3s to power off when the radio is powered on

Volume adjusting



Turn the volume knob under the standby interface, and the animation figure shown in the following figure will appear on the screen. Rotate it counterclockwise, the sound will become smaller, and rotate it clockwise, the sound will become larger.

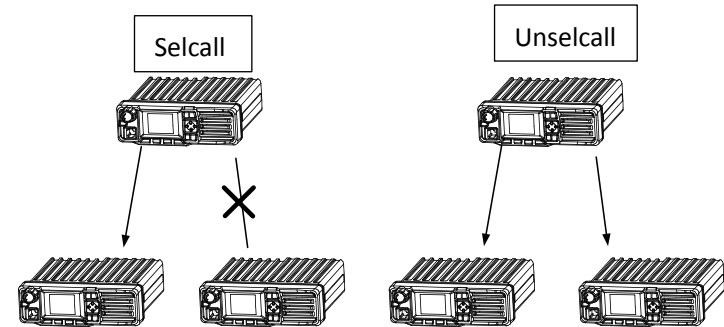


Channel selection

In the standby interface, if several channels have been configured in radio, channel switching can be achieved by pressing CH+, CH -. Press

CH+, and the channel will become a channel that is one more than the current channel number. On the contrary, press CH -, and the channel will become a channel that is one less than the current channel number.

Call operation



Receive and transmit

1 Receive

Press the power on key to power on. Adjust and select the channel to receive. After receiving the signal, the reception indicator lights up green, and adjust the volume to a proper level.

2 Transmit

Adjust and select the channel to be transmitted. Pick up the microphone, press and hold the PTT key, the red light of the emission indicator lights up, aim at the microphone 5-10cm, and then speak. Release PTT key, and the radio returns to receive mode.

Menu description

The main menu is divided into five submenus: Address book, SMS, Area, Radio setting, and Local information.

- **Address book:** Contains contact list and manual dialing.
 - **Contact list:** The user's commonly used contacts can be saved into the list. The contact can be a person or a group. When adding a contact, it needs to be written via radio programming software. When using, select a contact and press the "PTT key" to call the user.
 - **New contact:** You can add new contact information.
 - **Manual dialing:** The user can input the number of the other user, and press the "PTT key" to call this user.
- **SMS:** Including new SMS, status SMS, shortcut text, inbox and outbox.
 - **New SMS:** The user can manually input the content of the SMS, and then select the user to send it.
 - **Status message:** The user can send the status short message stored in the radio in advance to the user.
 - **Quick text:** The user can send the short message stored in the radio in advance to the user.
 - **Inbox:** Received short messages.
 - **Outbox:** Sent SMS messages.
- **Area:** Different areas correspond to different channel configurations. The channels in the area are stored in the radio through the user configuration software.
- **Working mode:** The working mode selection of the radio is divided

into "Direct mode", "Repeater mode" and "Trunking mode".

- **Bluetooth settings:** You can check Bluetooth and realize functions such as connecting, disconnecting, modifying names, and so on.
- **Radio settings:**
 - **Positioning setting:** Setting the positioning parameters of the radio, including "module switch", "report on call", "regular report" and "positioning method" settings.
 - **Arbitrary call:** Enable this function to receive any call without satisfying the receiving logic.
 - **Power selection:** Select "high power" or "low power" for the radio transmission power.
 - **Language setting:** The user can select "Simplified Chinese" or "English" as the interface display text.
 - **Display settings:** LCD backlight and display mode settings. Including "backlight mode", "backlight brightness", "backlight time" and "day/night" settings.
 - **Prompt tone setting:** Radio prompt tone include "radio mute", "key prompt tone", "SMS prompt tone", "call prompt tone". Select "on" or "off" to turn on/off this function. "Prompt tone volume" is used to adjust the prompt tone volume.
 - **Standby interface:** Select the contents displayed in the standby interface, which are divided into: "channel+frequency", "alias+frequency", "channel+number", and "alias+number".
 - **Keyboard lock:** Enable the keyboard lock switch.
 - **Date and time setting:** Modify the current clock date and time of the radio.

2 Basic operations

- **Encryption settings:** Encryption switch and secret key selection settings.
- **Vibration setting:** The vibration function is turned on and off.
- **Reverse setting:** the reverse function is turned on and off.
- **Vocoder type:** Vocoder type selection.
- **Local information:**
 - **Local information:** "Radio model", "Local number", "Belonging group number", "Boot version number", "Software version number", "Last programming time", "Data programming time", "Hardware version number", "Radio serial number", etc. are displayed.
 - **LCD information:** Display relevant information of LCD.
 - **Position Information:** Displays the specific content of the current position information.
 - **Receiving group list:** Displays the contents of the current channel receiving group list.

Introduction of working mode

This radio supports both regular mode and Truncking mode.

The working mode needs to be configured through the upper computer.

Normal mode: In this mode, the working mode is digital communication.

Digital communication: support individual call, group call, SMS, status SMS and other functions.

Truncking mode: In this mode, the radio is registered in the system.

Realize voice and data group call, individual call, cross regional call, dispatching call and other functions.

Main functions of normal mode

- **Emission:**
 - Select the desired channel and ID
 - Press the "PTT key", the emission indicator lights up (red), and speak into the microphone. Release the "PTT key" to receive.
- Note:
 - If the channel is being used, pressing the "PTT key", radio will give a channel busy tone. Please wait for the channel to be free before transmitting.
 - In order to obtain the best sound quality for the receiver, the distance between the mouth and the microphone should be 5-10cm.
- **Group call (digital)**

Open the address book, select the pre-set group number, and press the PTT key to send a group call.
- **Single call (digital)**

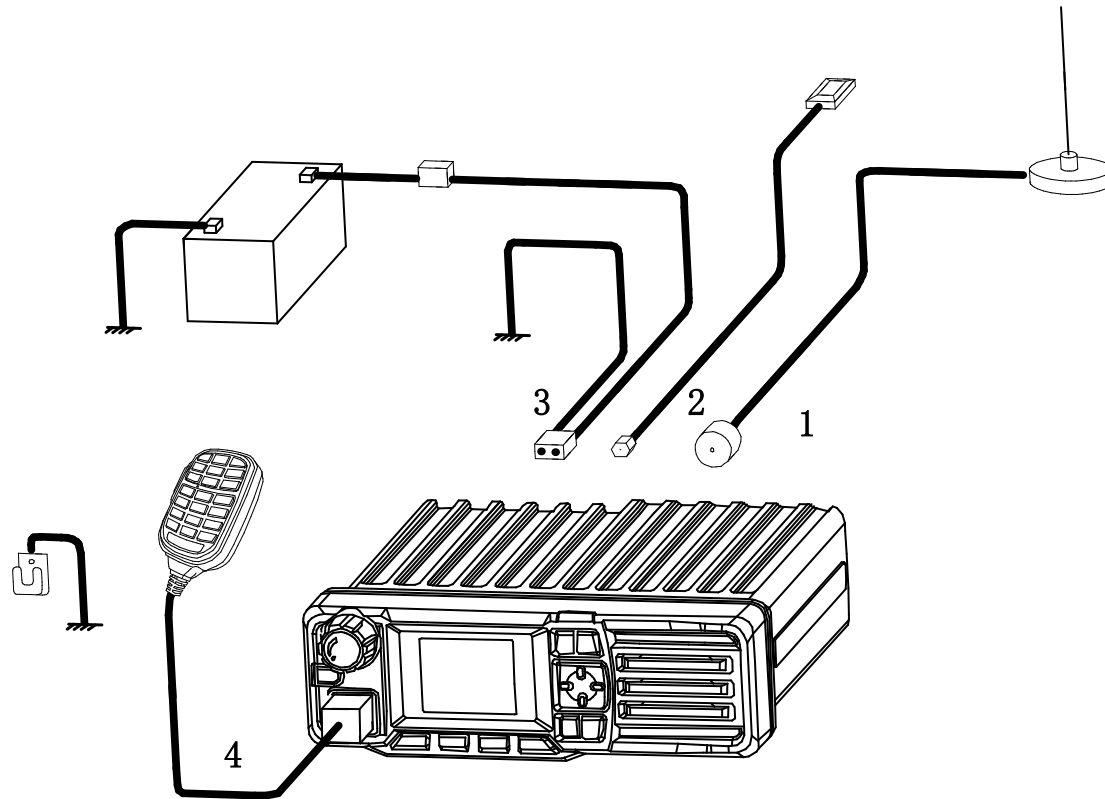
Open the address book, select the preset single call number, and press the PTT key to send a single call. When receiving a single call, the call number will be displayed on the main interface of the radio.
- **Send SMS (digital)**

Open the main menu, select New SMS in the SMS menu, and the user can edit the content of the SMS. After editing, select a contact and send it.
- **Receive SMS (digital)**

2 Basic operations

When the radio receives an SMS message, the part of received SMS message pops up on the standby menu, and you can read the SMS message in the inbox.

Mobile radio connection



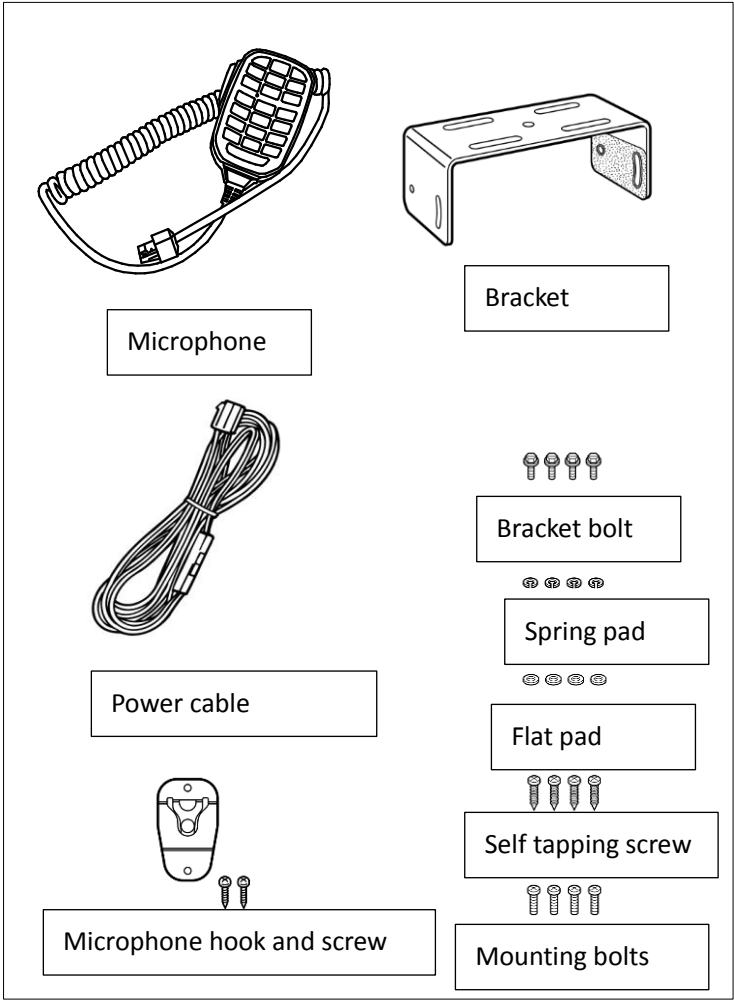
2. Connect to radio antenna interface

4. Connect to GPS antenna interface

1. Connect to DC power supplier interface

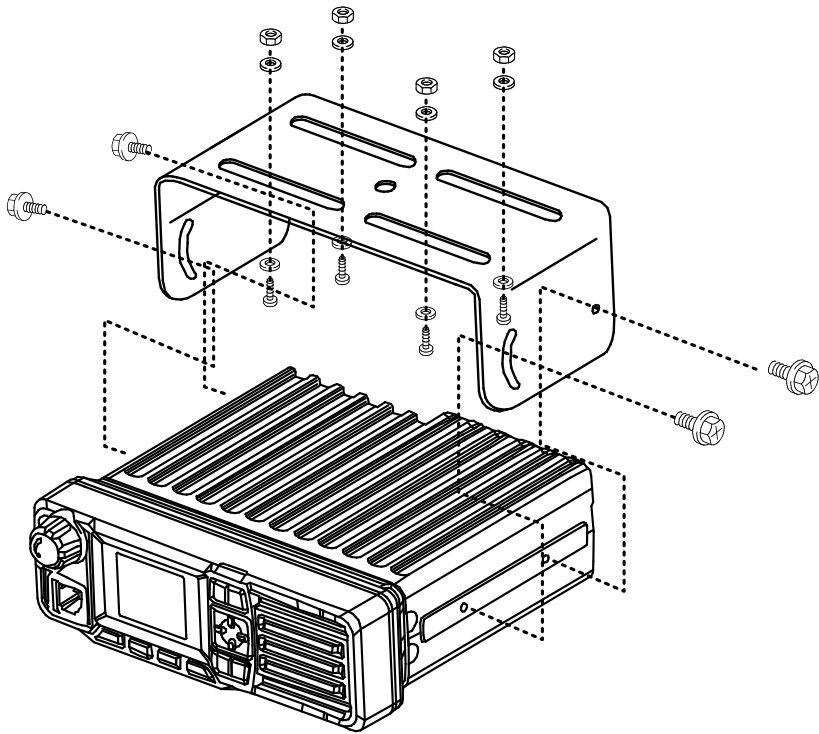
3. Connect to microphone interface of front panel

Accessories



Install mobile radio

Universal mounting bracket is provided with the radio, which can mount the transmitter on top.
Four bracket screws can bear the weight of more than 1.5kg.

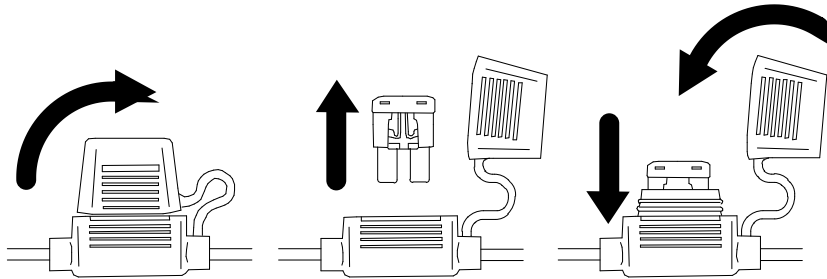


Antenna

The antenna is a key factor in the communication system, and the index and erection method of the antenna will affect the communication distance. Please consult your dealer for more information.

Replace fuse

If the fuse is burned out or the transmitter stops working, please find out the cause of the fault, then replace the fuse with a new one. Please install a fuse that meets the rated current.



Clean

If there is dust or dirt on the surface of the radio, please use a clean soft cloth to wipe it. Avoid corrosive liquid scrubbing the body

General specifications		
frequency range	400-470Mhz	
Channel spacing	12.5KHz	
channel capacity	500	
Power supply requirements	13.6V±15%	
Standby current	<0.6A	
Receiving current	<2A	
Emission current	10W	<4A
	25W	<7A
Vocoder type	AMBE+2 / NVOC	
Frequency stability	±1.0ppm	
Antenna impedance	50 Ω	
Screen pixels	160 * 128 pixels	
Dimensions (L x W x H)	45×160×160mm	
Weight	About 1.5kg	
Working temperature	-30℃ ~ +60℃	

transmitter	
output power	High power: 25W, low power: 10W
Channel spacing	12.5kHz
Emission spurious	-36dBm(≤1 GHz)
	-30dBm(>1 GHz)

FM modulation	8K0F3E @12.5kHz
Audio distortion	≤1% @ 40% deviation
Audio response	+1 ~ -3dB
FM AC sound and noise	40dB @12.5KHz
Digital FSK Error	<2%
Adjacent channel power	60dB @12.5KHz

Availability varies according to national laws and regulations.
Unless otherwise status, all specifications shown are typical
and subject to change without notice.

Receiver	
Sensitivity simulation	0.22 μV (FM @ 12dB SINAD) 0.18 μV (typ.) (FM @ 12dB SINAD) 0.3 μV (FM 20dB SINAD)
Sensitivity number	0.30 μV (typ.) (@ 5% BER)
Adjacent channel selectivity	60dB @ 12.5kHz
Intermodulation	60dB @ 12.5kHz
Block	90dB @ 12.5kHz
Spurious Response	70dB @ 12.5kHz
Audio output power at 5% distortion	3W / 8 Ω
Conducted emission spurious	<-57dBm
Rated audio output power	5W (built-in)
Maximum output power	5W (4 Ω external)

Note: The above indicators are based on ETSI standard tests.

Notice to user

RED Caution:

1. Frequency: 400-470MHz, TX Power: 25W
2. Operation temperature range: -20℃~55℃
3. RF exposure information: If the gain of the antenna is 0dBi, This device's antenna must be installed in accordance with provided instructions; and it must be operated with minimum 0.52m spacing between the antennas and all person's body (excluding extremities of hands, wrist and feet) during operation.

4. Declaration of Conformity.

Manufacturer: LISHENG COMMUNICATIONS CO., LTD.

Address: 5#, ChongXiang St., Econ & Tech. Area, Quanzhou, Fujian, China.

Hereby, LISHENG COMMUNICATIONS CO., LTD. declares that this product is in compliance with essential requirements and other relevant provisions of Directive 2014/53/EU. This product is allowed to be used in all EU member states.

Engineering personnel setting up those frequency ranges whit Customer Programming Software, the mechanism implemented in the product to avoid the end user to managing changes in the definition of operating frequency ranges in order to avoid usage

of un-allowed frequency ranges.

The authorized to set up the permitted frequency ranges for marketing in the specific EU country:

Country	Frequency Range(MHz)
Austria(AT)	444.9 - 444.900001, 450 - 456, 457.33 - 457.330001, 457.45 - 458.3,460 -470
Belgium(BE)	406.1-430 ,440-470
Bulgaria(BG)	410 -430,440-470
Croatia (HR)	406.1-430 ,440-470
Cyprus (CY)	406.1-430 ,440-470
Czech Republic (CZ)	448 - 451.3 ,457.38 - 461.3 ,467.38 - 470
Denmark(DK)	406.1-430 , 450 - 470
Estonia(EE)	406.1 - 410,412.5 - 420 , 422.5-430 ,440 - 442.5, 443 - 450,446 -446.2,450 -453 ,457.575 - 463,467.575 -470
Finland(FI)	407.525 - 408.55,410.0125 - 410.8875,417.525 - 417.9, 419.15 - 419.525,419.55625 - 419.71875,420.0125 - 420.8875,426.35 - 427.5,427.525 - 427.9, 429.15 - 429.525,429.55625- 429.71875,440.0125 - 440.5875,

	440.60625 - 440.89375,442.775 - 443, 443.025 - 444, 444.025 - 444.525,444.55 - 444.975,445 - 446, 447.00625 - 447.29375,447.30625 - 447.70625, 449.025 - 449.525,449.55 - 449.975, 450.325 - 452.475, 452.525 - 452.975,453.0125 - 453.6625,469.725 - 469.975
France (FR)	406.1-430,444.5-447, 451.5-460, 461.5-470
Germany(DE)	406.1-430 ,440-470
Greece(EL)	406.1-430 ,440-470
Hungary(HU)	417 - 420,442 - 445,456 - 460, 461.3 - 470
Ireland (IE)	410 - 430,440 - 455, 456 - 459,460 - 470
Italy(IT)	440-443,445-470
Latvia (LV)	406.1-430,440-450,456 -470
Lithuania(LT)	406.1 - 410 , 413 - 418.6 ,423- 428.6 ,440 - 450 , 450 - 452.9875 ,458.1125 - 462.9875 ,467.4875 - 467.5875
Luxembourg (LU)	410-430,440- 470
Malta(MT)	406.1-430 ,440-470
Netherlands(NL)	410 -430,440-470
Poland(PL)	448 - 449.5,457 - 460,467 - 470
Portugal (PT)	148 - 149.9,150.05 - 156.4875 , 156.8375 -

	174
Romania(RO)	408 - 410.8,415 - 420.8,425 - 429.8, 440 - 450.55, 457.5 - 458.2, 460 - 460.55,467.5 - 468.2
Slovakia(SK)	441.025 - 451.31,455.73 - 461.31,465.73-470
Slovenia(SI)	406.1-430 ,440-470
Spain(ES)	406.1-430 ,440-470
Sweden(SE)	406.1 -430, 442 - 444,444.5875 - 452.5, 457.5 - 462.5,467.5 - 470
United Kingdom (UK)	410-430 40-470

Notice to user

FCC Caution

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Verification of harmful interference by this equipment to radio or television reception can be determined by turning it off and then 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 different circuit to that of the receiver's outlet.
- Consult the dealer or an experienced radio/TV technician for help.

Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including

interference that may cause undesired operation.

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

RF Exposure Compliance and Control

Guidelines and Operating Instructions

To control your exposure and ensure compliance with the occupational/controlled environmental exposure limits, always adhere to the following procedures.

Guidelines:

- Do not remove the RF Exposure Label from the device.
- User awareness instructions should accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

Operating Instructions:

- This radio is designed for and classified as “**Occupational/Controlled Use Only**”, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards; NOT intended for use in an General population/uncontrolled environment

- DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed RF exposure limits.

- DO NOT transmit for more than 50% of total radio use time, more than 50% of the time can cause RF exposure compliance requirements to be exceeded.

- During operation, if the gain of the antenna is 0dBi, the separation distance is at least 0.42m from human body and the antenna, this separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements

- During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.