

Digital DMR and Analog  
UHF/VHF Two Way Radio

DR-1801UV SERIES

Operating Manual



# PREFACE

Thank you very much for choosing our Dual Band Digital DMR and Analog two-way radio. This radio adopts the latest advances in technology, providing reliable communication in today's demanding communication environment.

This radio offers both DMR digital and analog communication, introduces innovative DMR digital processing system to achieve SMS, high-audio quality and digital encryption. It offers great stability, and reliability, together with long distance communication as well as fashionable design and compact exterior lines. The radios has Text Messaging, Voice Message, Digital Encryption, Emergency Alarm, Work Alone, Analog DTMF, CTCSS/DCS encode/decode functions.

## ATTENTION!

- >> When programming the radio, start by reading the factory software data, and then rewrite this data with your frequency etc., to a new saved code plug, otherwise errors may occur.
- >> You can use the programming cable with a PC to program the frequency, power etc. your programming must comply with your FCC (or other country) license certification.

## RF ENERGY EXPOSURE AND PRODUCT SAFETY GUIDE FOR PORTABLE TWO-WAY RADIOS

## ATTENTION!

Before using this product, read the RF Energy Exposure and Product Safety Guide that ship with the radio which contains instructions for safe usage and RF energy awareness and control for compliance with applicable standards and regulation.

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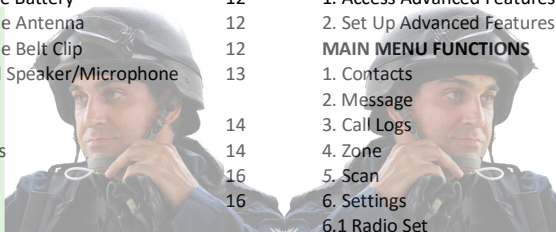
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# GETTING STARTED

## 1. Regulations and Safety Warnings

### FCC Licensing Information

This device complies with Part 90 and 15 of the federal Communications Commission (FCC) Rules.

Operation is subject to the condition that that this device does not cause harmful interference. The radio operates on radio frequencies that are regulated by the Federal Communications Commission (FCC). To transmit on these frequencies, you are required to have a license issued by the FCC. To obtain forms, call the FCC forms hotline at: 1-800-418-3676 or go to <http://www.fcc.gov> For questions concerning commercial licensing, contact the FCC at 1-888- CALL-FCC (1-888-225-5322). Before filling out you application, you must decide which frequency you can operate on.

**NOTICE:** Use of this radio outside the country where it was intended to be distributed is subject to government regulations and may be prohibited.

### FCC Regulatory Conformance

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 circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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 condition that this device does not cause harmful interference.

**WARNING!** **WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER IC RULES AND FEDERAL LAW.**

## EU Regulatory Conformance

As certified by the qualified laboratory, the product is in compliance with the essential requirements and other relevant provisions of the Directive 2014/53/EU. All applicable EU regulations are regarded (2006/66/EC, 2011/65/EU, (EU)2015/863, 2012/19/EU). **NOTE: It can be operating under 2000m.**

**WARNING!** European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution. At this subject, refer to the "EU" specification guide 2014/53/EU.

**Please note that the above information is applicable to EU countries only.**

## Compliance with RF Exposure Standards

The radio complies with the following RF energy exposure standards and guidelines:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR § 1.1307, 1.1310 and 2.1093
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95.1:2005; Canada

- Institute of Electrical and Electronic Engineers (IEEE) C95.1:2005 Edition

## 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:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), press the Push-to-Talk (PTT) key. To receive calls, release the [PTT] key. Transmitting 50% of the time, or less, is important because the radio generates measurable RF energy only when transmitting (in terms of measuring for standards compliance).
- Keep the radio unit at least 2.5cm away from the face. Keeping the radio at the proper distance is important as RF exposure decreases with distance from the antenna. The antenna should be kept away from the face and eyes.
- When worn on the body, always place the radio in an approved holder, holster, case, or body harness or by use of the correct clip for this product. Use of non-approved accessories may result in exposure levels which exceed the FCC's occupational/ controlled environmental RF exposure limits.
- Use of non-approved antennas, batteries, and accessories causes the radio to exceed the FCC RF exposure guidelines.
- Contact your local dealer for the product's optional accessories.

## ■ Precautions for Portable Terminals

### Operating Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not operate the product in a location containing fuels, chemicals, explosive atmospheres and other flammable or explosive materials. In such location, only an approved Ex-protection model is allowed for use, but any attempt to assemble or disassemble it is strictly prohibited.
2. Do not operate the product near or in any blasting area.
3. Do not operate the product near any medical or electronic equipment that is vulnerable to RF signals.
4. Do not hold the product while driving.
5. Do not operate the product in any area where use of wireless communication equipment is completely prohibited.

### Important Tips

To help you make better use of the product, be sure to observe the following instructions:

1. Do not use any unauthorized or damaged accessory.
2. Keep the product at least 2.5 centimeters away from your body during transmission.
3. Do not keep the product receiving at high volume for a long time.
4. For vehicles with an air bag, do not place the product in the area over the air bag or in the air bag deployment area.
5. Keep the product and its accessories out of reach of children and pets.
6. Please operate the product within the specified temperature range.
7. Continuous transmission for a long time may lead to heat accumulation within the product. In this case, please keep it at a proper location for cooling.
8. Handle the product with care.
9. Do not disassemble, modify or repair the product and its accessories without authorization.

## ■ Precautions for Batteries

### Charging Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not charge or replace your battery in a location containing fuels, chemicals, explosive atmospheres and other

flammable or explosive materials.

2. Do not charge your battery that is wet. Please dry it with a soft and clean cloth prior to charge.
3. Do not charge your battery suffering deformation, leakage and overheat.
4. Do not charge your battery with an unauthorized charger.
5. Do not charge your battery in a location where strong radiation is present.
6. Overcharge shall always be prohibited for it may shorten the life of your battery.

## Maintenance Instructions

To help your battery work normally or prolong its life, be sure to observe the following instructions:

1. Accumulated dust on charging connector may affect normal charging. Please use a clean and dry cloth to wipe it on a regular basis.
2. It is recommended to charge the battery under 5°C~40°C. Violation of the said limit may cause battery life reduction or even battery leakage.
3. To charge a battery attached to the product, turn it off to ensure a full charge.
4. Do not remove the battery or unplug the power cord during charging to ensure a smooth charging process.
5. Do not dispose of the battery in fire.
6. Do not expose the battery to direct sunlight for a long time nor place it close to other heating sources.
7. Do not squeeze and penetrate the battery, nor remove its housing.

## Transportation Instructions

1. Damaged batteries must not be transported.
2. To avoid short circuit, separate the battery from metal parts or from each other if two or more batteries are transported in one packaging.
3. The radio must be switched off and secured against switch-on, if the battery is attached.

The content of the shipment must be declared in the shipping documents and by a Battery Shipping Label on the packaging. Contact your hauler for the local regulations and further information.



## 2. Feature Overview

- **Large-capacity storage to meet complex application needs**

*1024 channel storage, 1024 digital contacts can be manually programmed*

- **DMO True 2-Slot Two time slots**

*Direct-mode Dual-Slot communication, enabling two groups of calls to be simultaneously performed at one frequency, to make double communication efficiency; while saving frequency resources*

- **Rich digital signaling**

*It not only supports Private Call, Group Call, All Call and alarm call of DMR protocol; also supports radio detection, Call Alert, Remote Monitor, Remote Active and Remote Kill and short message data transmission.*

- **Digital and analog compatible, smooth transition**

*Support DMR digital and analog two communication modes, ensure that the original analog products smooth transition to digital products to meet different communication needs.*

- **SMS function**

*Support Chinese and English language, support for 64-character text messaging, text editing, and draft box functions. When it is not convenient to make a voice call, you can send a message by sending a message to the other party.*

- **Excellent sound quality compatible with Motorola**

*This digital radio uses advanced AMBE+2™ voice processing technology to achieve excellent call quality.*

- **Digital encryption function**

*Digital signal encoding and decoding, improves voice call quality; digital encryption provides security for your voice calls*

- **Digital alarm function, protect the safety of the team**

*Supports regular alarms .silent alarms and working alone in emergencies*

- **Support DMR system, easy to interconnect**

*Support DMR digital repeater function, easy network scheduling and control globally through IP interconnection*

### 3. Unpacking and checking the equipment

Unpack the radio carefully. We recommend that you identify the items listed in the following table before discarding the packing materials.

*NOTE: If any of these items are missing from the box, contact your place of purchase immediately.*

#### Supplied Accessories

Antenna	1	Li-ion Battery Pack	1
Battery Charger	1	AC Adaptor	1
Belt Clip	1	Hand Strap	1
Instruction Manual	1		

### 4. Battery Information

#### Charging the Battery Pack

The Li-ion battery pack is not charged at the factory; please charge it before use. Charging the battery pack for the first time after purchase or extended storage (more than 2 months) may not bring the battery pack to its normal maximum operating capacity. Best operation will require fully charging/ discharging the battery two or three times before the operating capacity will reach its best performance. The battery pack life may be depleted when its operating time decreases even though it has been fully and correctly charged. If this is the case, replace the battery pack.

#### Charger Supplied

Please use the designated charger provided by our company. Other models may cause explosion and personal injury. After installing the battery pack, and if the radio displays low battery with a red flashing lamp or voice prompt, please charge the battery.

## Use Caution with the Li-ion Battery

- (1) Do not short the battery terminals or throw the battery into a fire. Never try to remove the case from the battery pack, as our company is not responsible for any accidents caused by modified batteries.
- (2) The ambient temperature should be between 5°C-40°C (40°F - 105°F) while charging the battery. Charging outside this range may not fully charge the battery.
- (3) Please turn off the radio before inserting it into the charger. It may otherwise interfere with correct charging.
- (4) To avoid interfering with the charging cycle, please do not cut off the power or remove the battery during charging until the green light is on.
- (5) Do not recharge the battery pack if it is fully charged. This may shorten the life of the battery pack or damage the battery pack.
- (6) Do not charge the battery or the radio if it is damp. Dry it before charging to avoid damage.

### WARNING:

» When keys, ornamental chain or other electric metals contact the battery terminal, the battery may become damage or injure a human. If the battery terminals are short circuited it will generate a lot of heat. Take care when carrying and using the battery. Remember to put the battery or radio into an insulated container. Do not put it into a metal container.

## How to Charge

Follow these steps to hook up and use the charger:

- (1) Plug the DC connector of the power adaptor into the charger base.
- (2) Plug the AC connector of the power adaptor into a main AC wall outlet.
- (3) Place the radio in the charging slot on the charger.
- (4) Make sure the radio is making contact with the charger. When the red LED comes on steady, your radio is charging.

(5) The radio is fully charged once the charger's green status LED goes steady. Please remove the radio at that time to avoid over-charging your battery.

### Charger LED codes

Red LED Green LED	Green LED	Status
Flashing	Steady	<b>Standby</b> (charger empty) <b>Error</b> (charger with radio)
Steady	Off	Charging
Off	Steady	Charge complete.

The charger and battery are fitted with matching notches so that you can charge your battery on its own! Practical if you have two batteries. That way you can charge one battery while still using your radio.

**Radio should be turned OFF during charge cycle.**

### How to Store the Battery

- (1) If the battery needs to be stored, keep it in status of 80% discharged.
- (2) It should be kept in low temperature and dry environment.
- (3) Keep it away from hot places and direct sunlight.
- (4) To avoid severe capacity degradation of your battery while in long-term storage, please cycle the battery at least every six (6) months.

#### **NOTE:**

- » *Do not short circuit the battery terminals.*
- » *Never attempt to remove the casing from the battery pack.*
- » *Never store the battery in unsafe surroundings, as a short may cause an explosion.*
- » *Do not put the battery in a hot environment or throw it into a fire, as it may cause an explosion.*

## PREPARATION

### Assembly

Before the radio is ready for use we need to attach the antenna and battery pack, as well as charge the battery.

#### 1. Installing / Removing the Battery

Before attaching or removing the battery make sure your radio is turn off by turning the power/volume knob all the way counter-clockwise.

##### (1) Installation

Make sure the battery is aligned in parallel with the radio body with the lower edge of the battery about 1-2cm below the edge of the radio.

Once aligned with the guide-rails, slide the battery upward until you hear a click as the battery locks in place.

##### (2) Removal

To remove the battery, press the battery release above the battery pack, as you slide the battery downward.

#### 2. Installing / Removing the Antenna

(1) Installing the Antenna: Screw the antenna into the connector on the top of the transceiver by holding the antenna at its base and turning it clockwise until secure.

(2) Removing the Antenna: Turn the antenna counter-clockwise to remove it.

#### 3. Installing / Removing the Belt Clip

(1) Installing the Belt Clip: Place the belt clip above the corresponding holes on the back of the radio, and screw it into place clockwise with the two supplied screws.

(2) Removing the Belt Clip: Unscrew counter-clockwise to remove the belt clip.

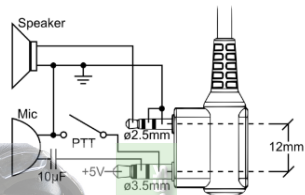
#### 4. Installing the Additional Speaker/Microphone (Optional)

Pry open the rubber MIC-Headset jack cover and then insert the Speaker / Microphone plug into the double jack.

#### Accessory jack

The accessory jack on the radios is a Kenwood compatible two (2)-pin design. Typical 2 pin Kenwood headset configuration.

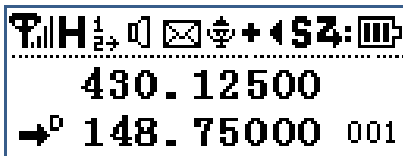
- *To attach accessories such as headsets, speaker-mics or programming cables, align the connectors and push in fully.*
- *The fit isn't always perfect on cheap or clone cables and connectors and may require a bit of force to wiggle them in completely.*
- *Make sure the radio is off before attaching any accessories.*



#### RADIO OVERVIEW














## 1. The main display




## 2. Description of LCD Icons

Icon name	Icon	Description of product status
Signal strength		The more signal bars, the stronger the signal is
Transmission power		The current channel transmits at high power
		The current channel transmits at low power
Digital icon		Digital mode
Analog icon		Analog mode
Direct mode slot icon		The current channel is in double slot direct mode and slot 1 is active
		The current channel is in double slot direct mode and slot 2 is active
Sub-codes	<b>CT</b>	The current sub-codes is CTCSS
	<b>DCS</b>	The current sub-codes is CDCSS
Speaker icon		Speaker is enabled, and reception is effective

Narrowband mode	<b>N</b>	Work in narrowband mode
Message icon		Receive a text message, or have an unread message
VOX icon		VOX has been turned on
Relay mode icon	<b>+</b>	The current transmission frequency is the reception frequency plus a frequency bias (positive bias)
	<b>-</b>	The current transmission frequency is the reception frequency minus a frequency bias (negative bias)
		Currently in offline state
Keyboard Lock icon		The keyboard lock is locked; Lock status. Press the combo keys [MENU] and [*] to unlock
Scrambling icon	<b>R</b>	The current reception frequency and the transmission frequency are inverted (if the reception sub-code and transmission sub-code are different, the sub-code will also be inverted)
Double-waiting icon	<b>S</b>	Has been set to dual-band Double-Wait function, and allows waiting on two frequency bands displayed on the screen at the same time
Scan icon		The scan is on and is in normal mode
		The scan stays on priority channel 1
		The scan stays on priority channel 2
Battery power icon		The more bars, the more battery power
Pointer icon		Currently pointing to the main digital mode; press A/B key to switch the main channel up and down. When double-waiting is turned on and works in digital sub-channel, the icon is 
		Currently pointing to the main analog mode; press A/B key to switch the main



		channel up and down. When double-waiting is turned on and works in analog sub-channel, the icon is 
Channel number icon	<b>001</b>	In channel mode, the current channel number is 001 (range 1~32)

### 3. Status Indications

The top LED will help you to identify the current radio status.

LED Indication	Status
Flashes Red	Low battery voltage
Constant Red	Transmitting
Constant Green	Analog and Digital Receiving
Flashes orange slowly	Scanning

### 4. Programmed Key

It is possible to set different functions for [SK1], [SK2], [TK] keys.

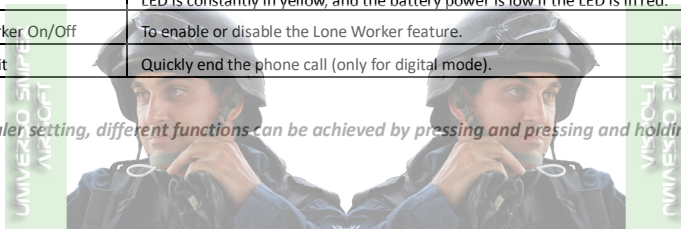
In PC software – Operation – Key Settings.

No.	Shortcut name	Purpose
1	None	No function is assigned to the preset key.
2	Emergency on	To initiate an emergency alarm. This is a recommended option for "TK Short".
3	Emergency off	To end an emergency alarm. This is a recommended option for "TK Short".
4	High/Low power	To switch the power level between High and Low.
5	Monitor	Monitor the weak signal or the signal with unmatched ID.
6	One Touch Access1-5	To make a call or send a message to the preset contact or implement an auxiliary feature.
7	Repeater/Talk Around	To switch between Direct mode and Repeater mode.

8	VOX On/Off	To enable or disable the VOX feature.
9	Scan on / off	Quickly turn the scan function on or off. <i>Note: double-segment double-waiting scan does not work.</i>
10	Encryption on/off	Quickly turn on/off encryption for channel (only for digital mode).
11	VOX On/Off	To enable or disable the VOX feature.
12	Zone select	Quickly select the zone, allowing the user to switch between two zones.
13	Battery Indication	Quickly access to battery power. The user can check the battery status by LED. The battery power is sufficient if the LED is constantly in green, the battery power is still available if the LED is constantly in yellow, and the battery power is low if the LED is in red.
14	Lone Worker On/Off	To enable or disable the Lone Worker feature.
15	Phone Exit	Quickly end the phone call (only for digital mode).

**Note:**

- Depending on dealer setting, different functions can be achieved by pressing and pressing and holding the same key.



## BASIC OPERATIONS

### 1. Power on the Radio

Turn on the radio by turning the **[Power/Volume]** switch clockwise till a click is heard, and the LCD displays will show a start-up message, and you will hear a beep after 7 seconds.

### 2. Adjust Volume

Rotate the **[Power/Volume]** knob to adjust the volume. Turn clockwise to increase the volume and counterclockwise to decrease the volume.

### 3. Main Band/Sub Band Switch

Press the **[A/B]** key to switch the main channel to the other channel if there is 2 channels shown on the display. The channel indicated by the arrow is the main channel.

### 4. VFO/Channel Switch

Press the **[VFO/MR]** key to switch between VFO and channel display.

### 5. Set Up VFO Frequency

Press the **[VFO/MR]** key to tune the radio to VFO mode, then press the **[A/B]** key to switch to the main band, the VFO frequency can only be set on the main **"arrow"** channel.

Operation 1: Input the VFO frequency directly by the keyboard.

Operation 2: Press the **▲** or **▼** navigation keys to adjust the VFO frequency in preset steps.

### 6. Selecting a Zone

A zone is a group of channels with the same property. The radio supports up to 150 zones, with a maximum of 32 channels per zone. To select a zone, do one of the following:

Operation 1: Go to Menu > Zone, press ▲ or ▼ navigation key to select a zone, and then press [MENU] key to switch to the selected zone.

Operation 2: Press the preprogrammed [Zone Select] key to switch to the selected zone.

## 7. Select a Channel

Press [VFO/MR] key to switch the radio between VFO and Channel mode, select Channel mode.

Operation 1: Press the ▲ or ▼ navigation key to select the channel.

Operation 2: Input the channel numbers by the keyboard. For example, if you want switch to channel 12, input 1+2 a total of 2 digits, and it will switch to channel 12.

A channel can either be Analog or Digital.

For the analog channels the PTT (Push-To-Talk) key is always available, and on the Digital Channels the parameters can be set up by the users / system operators by individual channel to allow talk permit.

There are four possible settings that can be selected in the CPS channel:

- (1) Always Allow: The user can transmit all the time.
- (2) Channel Free: The radio can transmit only if the channel is free.
- (3) Same CC/QT: The radio can transmit only if the channel is free and the color code matches.

## 8. Call Services

When you are speaking during a call, keep the microphone about 2.5 to 5 cm away from your mouth. This ensures optimal voice quality on the receiving radio. Press the [PTT] key to start the call, the red LED lights up. Release [PTT] key to receive the reply.

### *Call on Digital Channel*

You can initiate or receive the following types of calls on a digital channel:

- **Private Call:** a call from an individual user to another individual user.



- **Group Call:** a call from an individual user in a group to all the other members in the group.
- **All Call:** a call from an individual user to all the other users on the current channel.

You can request your dealer to enable all call feature.

## 8.1 Making a Call

You can make a call in any of the following ways:

### • Preset Contact

- (1) Press the **▲** or **▼** navigation keys to select the desired channel.
- (2) Press and hold the **[PTT]** key to call the private contact, group contact, or all call contact preset for the selected channel.

### • Contact List or Call Logs


- (1) Press the **[MENU]** key.
- (2) Go to Contact > Contact List or Call Logs > Outgoing/ Answered/ Missed > Outgoing List/ Answered List/ Missed List.
- (3) Press the **▲** or **▼** navigation key to select the required contact.
- (4) Press and hold the **[PTT]** key to call the selected contact.

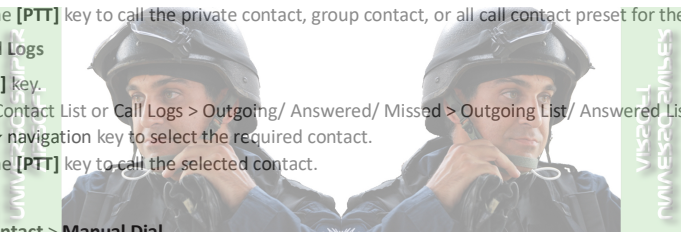
### • Manual Dial

- (1) Go to **Menu > Contact > Manual Dial.**  
Or press the **# 1** key to quickly enter the manual dial operation.
- (2) Input a contact number and press and hold the **[PTT]** key to make a call.

### • One Touch Call


- (1) Press the preprogrammed **One Touch Call** Key.
- (2) Press and hold the **[PTT]** key to call the contact.

The radio displays  for an outgoing private call, group call, and all call respectively.



## 8.2 Receiving and Responding to a Call

When receiving a call, you can listen to it without any operation.

The radio displays  for an incoming private call, group call, and all call respectively. You can press and hold the **[PTT]** key and speak within call hang time.

### Ending a Call

The radio will end a call when the call hang time expires.

## 8.3 Call on Analog Channel

You can initiate or receive a call on an analog channel with or without signaling.

### Call Without Signaling

A call without signaling is a call made to all the other users on an analog channel without signaling.

To initiate a call without signaling, do as follows:

- (1) Press the **▲** or **▼** navigation keys to select the desired analog channel.
- (2) Press and hold the **[PTT]** key, and speak into the microphone.

## 9. Monitor

In standby, press the pre-programmed **[MONITOR]** key to monitor. When receiving matched carrier but the signaling / ID is unmatched or the signal is too weak, this function allows monitor the weak signal and signal with unmatched ID. Press the pre-programmed **[MONITOR]** key again to turn off the speaker and return to standby.

» *When in analog mode, if no signal, it will emit noise when press the Monitor Key.*

**NOTE:** The Rx  icon is seen when monitor is activated.

## 10. Emergency Alarm

The top orange function key (**Top-Key**) is pre-programmed as a panic key. Press the emergency alarm key **[TK]** to turn on the alarm function, and press this key again to exit the emergency alarm.

## 11. Locking or Unlocking Keypad

When the keypad is not in use, it is recommended that you lock it to avoid accidental operations.

To lock or unlock the keypad manually, do one of the following from the home screen:

Press and hold the **\* #** key to lock the keyboard.

- Press the **[MENU]** key and then press **\* #**.
- To allow the keypad to be locked automatically, enable the Keypad Lock feature as follows:

(1) Go to **Menu > Settings > Radio Set > Keypad Lock**.

(2) And set **Delay Time** by pressing the **▲** or **▼** navigation key.

To disable this feature, select **Manual** under the **Keypad Lock** menu.

## 12. Inputting via Keypad

You can input alias, contact numbers or messages via the keypad of the radio. Here are some useful tips:

(1) To switch the input method between alphabetic mode and numeric mode, press **# 1**.

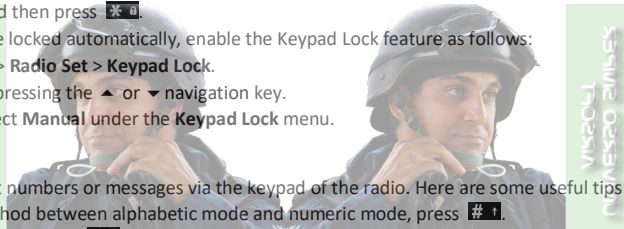
(2) To enter special characters, press **1 .? \*** in alphabetic mode.

(3) To enter a space, press **0 \_** in alphabetic mode.

(4) To delete the entry, press **\* #**.

## 13. Battery voltage test

Press the programmed as '**Battery level display**' key to check the current battery voltage.



## ADVANCED FEATURES

### 1. Access Advanced Features for Private Call

**Method 1:** To Access a Private Call from Contact list

- (1) Press the **[MENU]** key.
- (2) Go to Contact > Contact List.
- (3) Press the **▲** or **▼** navigation key to select the required contact (Private Call).
- (4) Press MENU key to access the advanced features.

**Method 2:** Access from Manual Dial

- (1) Press the **#†** key to enter Manual Dial.
- (2) Input the Private ID, press **[MENU]** key to access the advanced features.

### 2. Set Up Advanced Features for Private Call

#### (1) Call Alert

Select Call Alert, it will send out a call alert, the target radio will sound a beep or vibrate when receiving the call alert, and it will return a success call or failed call message to the transmit radio.

#### (2) Check Radio

Select Check Radio, and it will send out a radio check to the target radio which will send back a message if it is available or not available to the transmit radio. With this feature, you can determine if another radio is active and powered on in the system.

#### (3) Remote Monitor

Select Remote Monitor and it will send out a signal for the target radio will turn on its microphone and transmit when receiving the signaling, it will send back the voice to the transmit radio. With this feature you can monitor the sound activity near the target radio remotely.



#### (4) Radio Active

Select Radio Active, and it will send out a active signaling to the killed radio and the target radio will return to standby when it receives this signaling and send back a Active successful message to the transmit radio.

#### (5) Radio Kill

Select Radio Kill, and it will send out a kill signaling to the target radio which will be killed (no operation) when receiving the signaling and it will send back a kill successful message to the transmit radio.

## MAIN MENU FUNCTIONS

### 1. Contacts

- Contact List: Will display the talk group list which had been programmed in the PC software. This list is used as a look-up table to display the contact information when receiving a call.
- New Contact: Allows to create a new contact.
- Manual Dial: Input the group ID or private ID to access a contact quickly.

### 2. Message

- InBox: Shows all the received messages, and allows forward or delete the message.
- New Message: Create a new message and send to a contact.
- OutBox: Shows all the sent messages, and allows resend, forward or delete of the message.
- Draft: Draft messages, and allows send, edit or deleting of the message.
- Quick Text: Pre-saved messages, and allows to send, edit or delete the message.

### 3. Call Logs

- Outgoing: The Sent List shows sent messages until selected and deleted.
- Answered: Shows all the answered calls, and allows deleting the call record or saving the ID as a new contact.
- Missed: Shows all the missed calls, and allows deleting the call record or saving the ID as a new contact.

*Note: The call Logs only Logs the outgoing, answered and missed calls of the Private Call attributes.*

## 4. Zone

### Select a Zone

A Zone is a group of channels grouped together. The DMR radio has 150 Zones. A Zone can have the maximum of 32 analog and/or digital channels.

Operation 1: Press the preprogrammed **[Zone select]** key to switch to the selected zone.

Operation 2: Go to Menu > Zone, press ▲ or ▼ navigation key to select a zone, and then press **[MENU]** key to switch to the selected zone.

## 5. Scan

In the PC software – Functions – Scan list, it allows to save 10 scan lists, and to program the required scan lists and write it into radio.

Switch the radio to channel mode, as the scan list is only valid in the channel mode.

**NOTE: In Double Wait mode, the scan function is disabled.**

### 5.1 Start On

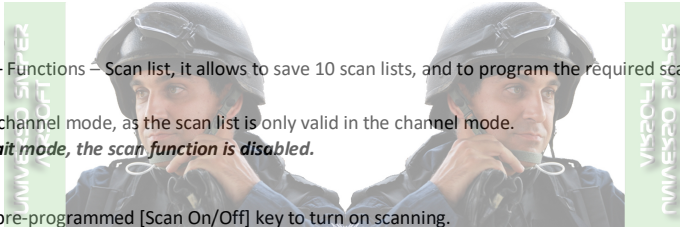
Action 1: Press the pre-programmed **[Scan On/Off]** key to turn on scanning.

Operation 2: Go to Menu > Scan > Enable to enable the scan function.

- During the scanning process, press the ▲ or ▼ navigation key to change the scanning direction.
- Press **[BACK]** to exit scanning.

### 5.2 Scan List Operation

1. Go to Menu > Scan > Scan List.
2. Press the MENU key to view the channel composition and priority settings in this list.



## 6. Settings

### 6.1 Radio Set

#### (1) Analog Squelch Level

Adjusts the squelch level to receive signal with different signal strength, with normal and strict options available.

*NOTE: This function is only valid for analog channel.*

#### (2) TX Power

Set up the TX power for current channel.

*NOTE: When set to high power, display 'H'; When set to low power, display 'L'.*

#### (3) Talk Around

When the TX radio and RX radio both are set up with Talk Around on, they can communicate directly without a repeater. The analog channel will use the RX frequency as TX/RX frequency, the RX CTCSS/DCS decode as TX CTCSS/DCS encode.

#### (4) Busy Lock

- Off: Always allows transmissions.
- QT/CC: Will not allow transmit when receiving matched carrier but unmatched CTCSS/DCS.
- Carry: Will not allow transmit when receiving matched carrier.

#### (5) TX Timer

- OFF: Turn off the TX time limit, and there is no limit for the transmission time.
- 15S-495S: The TX will be limited in the set time. When this time is reached, the radio will auto stop transmission.

## (6) VOX

Enable the VOX, you can speak into the microphone to start transmitting instead of pressing the **[PTT]** key. A total of 3 levels are provided.

## (7) Double wait

- Off: Single channels mode.
- Double Wait: Scan main channel and sub-channel in turn; call is locked when the reception is effective; you can press **[PTT]** to talk with the other party.
- Single Wait: Switch upper and lower channels through the keypad; when the machine works in the main channel, the sub-channel can't transmit or receive.

*NOTE: When Double Wait mode is on, the 'S' icon is displayed on the top of the screen. In Double Wait mode, the scan function is disabled.*

## (8) Digi Encrypt

With the digital encryption, the communication will be confidential. A total of 10 digital encryptions is offered, and it can be programmed in the PC software or defined in the Menu.

## (9) Power Save

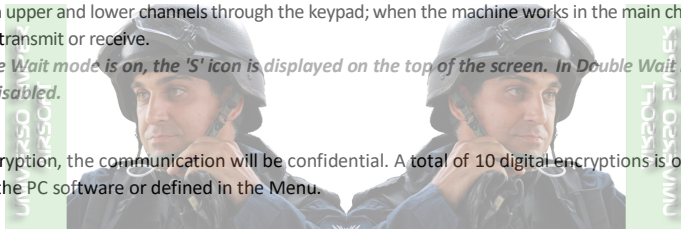
Turn on the function to extend the battery life.

- 1 Level: Save 1:1, work 30ms, dormant 30ms.
- 2 Level: Save 2:1, work 60ms, dormant 30ms.
- 3 Level: Save 4:1, work 120ms, dormant 30ms.

*NOTE: When turn on the power save, it may not receive the message in time.*

## (10) Beep

a. All Tone: Options: Off/On. Turn off all tones when Off is selected, but do not include emergency alarm tone.



b. Call Permit: Options: Off / Digital / Analog. Pressing the [PTT] key will transmit the signal through the channel and will sound a tone that prompts the user to start speaking.

- OFF: Turn off this function;
- Digital: Enable this tone only for digital channels;
- Analog: Enable this tone only for analog channels;
- Both: Enable this tone for analog channels and digital channels.

c. Key Beep: Options: Off/On. There is no prompt tone when Off is selected.




- Off: None beep when you press the keypad.
- On: The radio will beep when you press the keypad.

#### (11) Backlight

- Always Off: The backlight is always off.
- 5S-10S adjustable.
- Always On: The backlight is always on.

**Note:** This function is valid when turn off the power save.

#### (12) KeyPad Lock

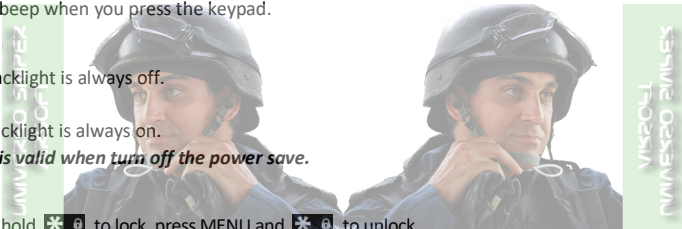
- Manual: Press and hold \* to lock, press MENU and \* to unlock
- 5S-10S-15S Auto Lock: Auto lock; lock automatically at set time; press MENU and \* to unlock.

#### (13) LED Indicator

- Off: The indicator (transmission, receiving, boot, etc.) does not work when it is off.
- On: Default option is on.

#### (14) Password Lock

Input correct password to enter the setup menu; the password can be configured by default on host computer.



Options: On or Off / Changes boot password.

On or Off: Turn on if it is turned off, and turn off if it is turned on; when On is selected, you need to enter the correct password and press the **[MENU]** key to start the unit.

Change boot password: You can enter a new password not more than 6 digits; please remember after changing.

### **(15) Mode**

- CH NO.: The channel mode is displayed by channel number.
- CH NAME: The channel mode is displayed by channel name.
- CH Freq: The channel mode is displayed by frequency mode.

### **(16) Screen:**

- Picture: Display according to the picture provided by the customer.
- Character: Two lines, can be edited by Software.

### **(17) Language**

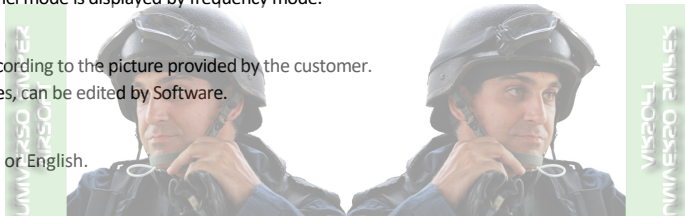
Choose the Chinese or English.

### **(18) P2P Match**

- Off: Ignore the matching of the DMR ID of the Private call, and directly receive and respond to the Private call with the same frequency/color code.
- On: The DMR ID of the Private call needs to be matched when making a Private call.

### **(19) Group Match**

- Off: Ignore Group Call ID matching during Group Call, directly receive and respond to Group Calls with the same frequency/color code.
- On: The Receive Group ID needs to be matched during Group Call.



## 6.2 Radio Info

Show the Radio ID, Radio name, serial number, model name, CPS-Version, H-Version, Soft-Version, DSP-Version and Program Time etc.

## 6.3 Radio Cfg

Radio Cfg menu Route: Main Menu > Settings > Radio Cfg. The radio Cfg menu will change accordingly to the channel type. When the channel type is digital, it will automatically hide the analog menus.

### (1) RX\_Freq

Input the RX frequency by keypad, click the Menu key to save, press **[BACK]** key to return.

### (2) TX\_Freq

Input the TX frequency by keypad, click the Menu key to save, press **[BACK]** key to return.

### (3) Ch\_Name

Allow reset the channel name.

### (4) Color Code

The digital channel should have the same color code for communication as defined by the repeater to be used; which can be programmed in the PC software or defined in the Menu.

### (5) Time Slot

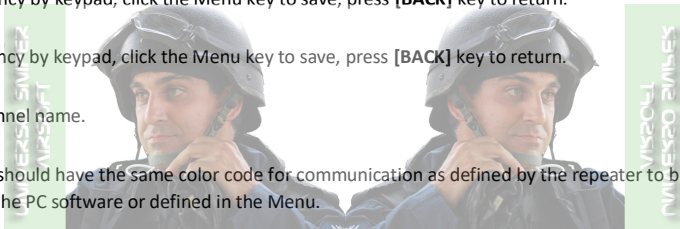
Set up Slot 1 or Slot 2 for the current channel.

### (6) Shift Frequency

Specifies the difference between the TX and RX frequencies.

### (7) Frequency Shift Direction

- OFF: TX = RX (simplex)
- +: TX will be shifted higher in frequency than RX.
- -: TX will be shifted lower in frequency than RX.



**Enables access of repeaters in VFO/Frequency Mode.**

**(8) Freq Step**

2.5K, 5K, 6.25K, 10K, 12.5K, 25K, 30K, 50K, total of 8 frequency steps.

**(9) Channel Type**

- Analog: Set up to analog channel.
- Digital: Set up to digital channel.

**※Chan Set (Available in Analog Channel only)**

When the channel type is analog, it will automatically hide the digital menu, the below listed menus are for analog channel only, unlisted menus are the same as the digital channel, please refer to Chan Set (Digital Channel).

**(1) C CTC/DCS**

Set up the CTCSS/DCS code for both TX and RX

**(2) R CTC/DCS**

Set up the CTCSS/DCS code for the RX.

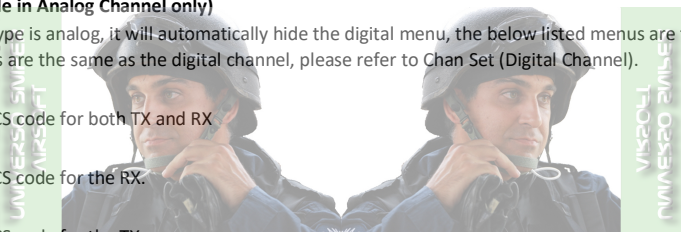
**(3) T CTC/DCS**

Set up the CTCSS/DCS code for the TX.

- CTCSS code: 62.5Hz~254.1Hz, a total of 51 groups.
- DCS code: 023N~754I, a total of 208 groups.

**(4) Band Width**

Choose wide band (25.0kHz) or narrow band (12.5kHz) for the analog channel.

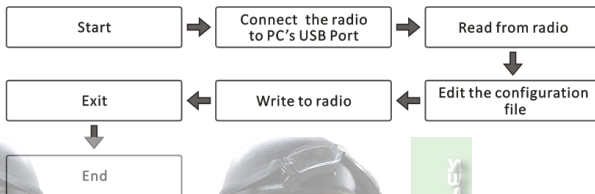




# PROGRAMMING GUIDE

## (1) Programming Flow

The programming flow of the CPS is as follows:



If you have the configuration file of the radio locally, you can also open the local configuration file in the CPS for configuration, and then write it into the radio.

- During the process of reading data from the radio, the 'Memory Prog' is displayed, and the red indicator light is flashing.
- During the process of writing data to the radio, the 'Memory Prog' is displayed, and the green indicator flashes.

Configuration order:

Read from Radio (read frequency) >> Functions >> Contacts >> Receive Group >> Encrypt >> Alarm System >> Channels >> VFO >> Scan List >> Zone >> One Touch Access >> Key Settings >> Fast Message >> Write to Radio (write frequency).

## (2) Communication Port

Users are required to choose a port for the operation.

### NOTE:

- The CPS displays None if PC cannot detect the port.
- The computer will detect the usb port's dynamic access. So CPS marks the ports as USB1, USB2...according to access time.

### (3) Read From Radio

This option instructs the PC to read data from radio.

Power on the radio and connect it to the PC, select the menu Operation-> Read From Radio, and then a "Read From Radio" window displays. Click "OK" to begin reading.

During reading, a progress bar shows the reading process. When this process is finished, a "Read Successfully" window appears.

- *The PC displays a message "Found New Hardware Wizard " when the radio is connected to PC for the first time, and you will be required to install the DMR usb\_Driver.*
- *If the message: "Cannot open USB device. Please check all connections! " appears, please wait for seconds and then retry. If operation still fails, check whether the radio is powered on and connected to PC successfully.*
- *If the message: "Data error detected, please restart the radio. " appears, please restart the radio and try again.*
- *If the message: "Please update GPS software! " appears, please contact your dealer to update the GPS software.*
- *If an incorrect password was given, please enter the correct one. Contact the dealer if you forget the password.*
- *Read operation can only be performed on one radio at a time.*

### (4) Write To Radio

This option instructs the PC to write data to the radio.

Power on the radio and connect it to the PC, go to the menu bar ->Program-> Write To Radio, and then a "Write" window displays. Click "OK" to begin writing. During writing, a progress bar works to indicate the writing process. When this process is finished, a "Write Successfully" window appears.

#### **NOTE:**

- *The PC displays a message "Found New Hardware Wizard " when the radio is connected to PC for the first time, and the user is required to install the DMR usb driver*
- *If the message: "Cannot open USB device. Please check all connections! " appears, please wait for seconds and then retry. If operation still fails, you will have to check whether the radio is powered on and connected to PC successfully.*

- If the message: "Data error detected, please restart the radio. " appears, please restart the radio and try again.
- If the message: "Please update CPS software! " appears, please contact your dealer to update the CPS software.
- If an incorrect password was given, please give the correct one. Contact the dealer if you forget the password.
- The correct frequency band is required for the radio before programming. To check the frequency band, go to "Device Information -> frequency Range".
- Write operation can only be performed on one radio at a time.

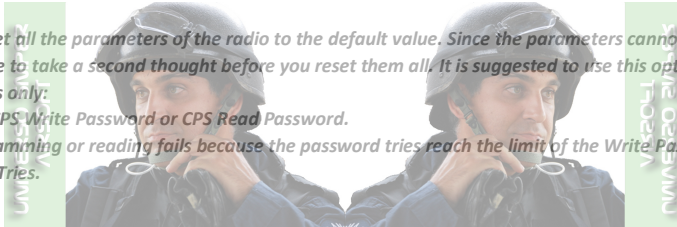
### **(5) Reset default data**

Press and hold number keys 2 and 3 to turn on the radio until the radio turns off and restarts.

#### **NOTE:**

*This option will reset all the parameters of the radio to the default value. Since the parameters cannot restore after this operation, you have to take a second thought before you reset them all, It is suggested to use this option in the following situations only:*

- *You forgot the CPS Write Password or CPS Read Password.*
- *The radio programming or reading fails because the password tries reach the limit of the Write Password Tries or Read Password Tries.*



# Appendix A. - Technical Specifications

## 1. General

Channel Capacity	1024 channels
Channel Spacing	25KHz(Wide Band), 12.5KHz(Narrow Band)
Phase-locked Step	5KHz, 6.25KHz
Frequency Stability	±2.5ppm
Operating Temperature	+10°C~+50°C
Operating Voltage	7.4V DC±20%/(2200mAh)
Demission (H×W×D)	133×62×36mm (with battery pack)
Weight	260g (with battery pack, antenna)

## 2. Transmission

Output power	High:5W    Low:1W
Output Consumption	Analog≤1.6A    Digital≤0.9A
Consumption	≤0.18A
FM modulation (wide/narrow)	16KCF3E@25KHz    141KCF3E@20KHz    11KCF3E@12.5KHz
4FSK digital modulation	12.5KHz for data:7K60FXD    12.5KHz for data and voice :7K60FXE
Modulation Distortion	<5%
Signal-to-noise(wide/narrow)	≥45dB@25KHz    ≥40dB@12.5KHz
Adjacent Channel power	≤-65dB    ≤-60dB
Audio Response	+1~-3dB
Antenna Port Spurious	9KHz-1GHz: ≤-36dBm    1GHz-12.75GHz: ≤-30dBm
Digital Protocol	ETSI-TS102 361-1,-2,-3
Vocoder Type	AMBE+2™

## 3. Reception

Analog receive sensitivity	-122dBm (12dB SINAD)
Digital receive sensitivity	-120dBm (BER≤5%)
Audio power	1W
Audio distortion	<10%
Audio response	+1~-3dB

Signal imitation	≥70dB
Intermediation (Wide/ narrow)	≥62dB/≥58dB
Adjacent channel selectivity(Wide/ narrow)	≥65dB/≥60dB
Receive Current	≤380mA
FM noise	≥45dB@25KHz /≥40dB @12.5KHz

## Appendix B. – Trouble shooting guide

Phenomena	Analysis	Solution
The radio doesn't start.	The battery doesn't be installed correctly.	Remove and re-install the battery.
	The battery runs out.	Charging or change a new battery.
	The battery is poor contact causing by damaged or dirty.	Clearing the contact. Please get contact with our distributor to repair, if you cannot solve it.
The sound is small/ intermittent, or on sound when receiving the signal.	Battery voltage is low.	Charging or change a new battery.
	The voice is too small.	Turn up the sound.
	The antenna is loose.	Turn off the radio and re-install the antenna.
	The speaker is damaged or dirty.	Clear the speaker. Please get contact with our distributor to repair, if you cannot solve it.
Cannot talk with the members in the same group	The frequency is different with other members.	Resetting the same frequency with them.
	In the different digital or analog channels	Correct to the same channel.
	Too far away from each other	Get close with each other
Private Call or group call does not work in the digital channel	Be different in the frequency/channel/color code/ time slot	Setting the same frequency/channel/color code/ time slot
Other sound in the channel, which is not from the members	Interference from the same frequency	Change to new frequency, or correct the squelch
	The signal is not set yet.	Set the signal for all radio in the group
The loud noise	Be too away from other members.	Get close with other members.
	Poor location, such as blocked by tall buildings, or located in the basement	Move to open environment, restart the radio.
	Interfere by the environment or electromagnetic	Avoid the device interfering the radio

**NOTE: If the above solutions cannot fix your problems, or you may have some other queries, please contact your dealer for more technical support.**

## Appendix C. - CTCSS Table

CTCSS CHART (Hz)

Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency
1	67.0	2	69.3	3	71.9	4	74.4	5	77.0
6	79.7	7	82.5	8	85.4	9	88.5	10	91.5
11	94.8	12	97.4	13	100	14	103.5	15	107.2
16	110.9	17	114.8	18	118.8	19	123.0	20	127.3
21	131.8	22	136.5	23	141.3	24	146.2	25	151.4
26	156.7	27	159.8	28	162.2	29	165.5	30	167.9
31	171.3	32	173.8	33	177.3	34	179.9	35	183.5
36	186.2	37	189.9	38	192.8	39	196.6	40	199.5
41	203.5	42	206.5	43	210.7	44	218.1	45	225.7
46	229.1	47	233.6	48	241.8	49	250.3	50	254.1

## Appendix D. - DCS Table

### DCS CODE LIST

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

101	D731N	102	D732N	103	D734N	104	D743N	105	D754N
106	D023I	107	D025I	108	D026I	109	D031I	110	D032I
111	D036I	112	D043I	113	D047I	114	D051I	115	D053I
116	D054I	117	D065I	118	D071I	119	D072I	120	D073I
121	D074I	122	D114I	123	D115I	124	D116I	125	D122I
126	D125I	127	D131I	128	D132I	129	D134I	130	D143I
131	D145I	132	D152I	133	D155I	134	D156I	135	D162I
136	D165I	137	D172I	138	D174I	139	D205I	140	D212I
141	D223I	142	D225I	143	D226I	144	D243I	145	D244I
146	D245I	147	D246I	148	D251I	149	D252I	150	D255I
151	D261I	152	D263I	153	D265I	154	D266I	155	D271I
156	D274I	157	D306I	158	D311I	159	D315I	160	D325I
161	D331I	162	D332I	163	D343I	164	D346I	165	D351I
166	D356I	167	D364I	168	D365I	169	D371I	170	D411I
171	D412I	172	D413I	173	D423I	174	D431I	175	D432I
176	D445I	177	D446I	178	D452I	179	D454I	180	D455I
181	D462I	182	D464I	183	D465I	184	D466I	185	D503I
186	D506I	187	D516I	188	D523I	189	D526I	190	D532I
191	D546I	192	D565I	193	D606I	194	D612I	195	D624I
196	D627I	197	D631I	198	D632I	199	D645I	200	D654I
201	D662I	202	D664I	203	D703I	204	D712I	205	D723I
206	D731I	207	D732I	208	D734I	209	D743I	210	D754I



## Note to EU users

European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution. At this subject, refer to the “EU” specification guide 2014/53/EU.

## Disposal of your Electronic and Electric Equipment

Products with the symbol (crossed-out wheeled bin) cannot be disposed as household waste. Electronic and Electric Equipment should be recycled at a facility capable of handling these items and their waste by products.

In EU countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.



## Attention in case of use

This product can be used in EU countries and regions, including: Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Croatia (HR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI) and Sweden (SE).

**For the warning information of the frequency restriction, please refer to the package or manual section.**

## Disclaimer

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