User's Manual
Dual Band Digital Two Way Radio **DM-R89**

FOREWORD
Thank you for choosing the dual band digital radio DM-R89. This product is designed to meet the requirements of a radio that is easy to operate and give excellent performance.

MAIN FUNCTIONS & FEATURES

General
- Support channel mode & frequency mode
- 250 Zones, max 64 channels can be added in each Zone
- Scan / Priority Channel Scanning
- Talk around
- Hi/Low power selection
- Squelch levels
- Chinese/English Surface Selection
- VOX
- Power saving
- Time-out Timer (TOT)
- Programmable Side Key
- Software password
- Battery Capacity Indicator
- Power On Password
- Date and time display

Digital
- Single Call / Group Call / All Calls
- Emergency Alert
- Radio checking
- Remote monitoring
- Contact list
- Calls record
- Messages (SMS)
- Encryption (16 keys)
- Calling prompt
- DTMF
- Remote killed / activating
- Work alone
- 2-Slots

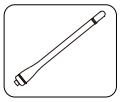
Analog
- Narrow band /width band
- CTCSS/DCS
- Tail tone elimination

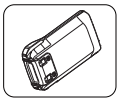
UNPACKING

Carefully unpack the radio and its accessories to identify them as illustrated below. If you find any missing or damaged parts, please contact your dealer immediately.

Note: Pictures are for illustration purposes only. The actual accessories supplied may vary.


Radio Body

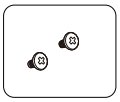

Antenna


Battery Pack

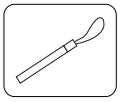

Power Adaptor


Charger Pod


Belt Clip


Belt Clip Screws


User Manual


Hand Strap

Items	QTY
Radio Body	1
Antenna	1
Battery Pack	1
Charger Pod	1
Power Adaptor	1
Belt Clip	1
Belt Clip Screws	2
User Manual	1
Hand Strap	1

BASIC OPERATION INSTRUCTION

Power On/Off / Volume

Turn the Power / Volume Knob (Fig.1) clockwise to switch ON the radio, a beep will be heard. Turn the knob clockwise / anti-clockwise to adjust the volume. Turning the knob fully anti-clockwise will switch off the radio.

VFO Mode

In the main interface, the radio can switch to VFO mode by pressing [back] key in the frequency display mode. Users can setup the frequency by rotating the channel knob or numeric keypad.

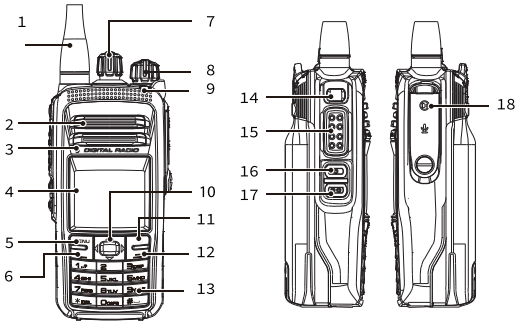
Select A Channel

Turn the channel knob to select the channel number. The radio has 250 zones and each zone has 64 channels. Each channel can set Analog mode or digital mode. You can select the zones from LCD menu. When you switch to Analog mode, some functions can't be used; the icon of referring to digital function will be grey.

Transmit/Receive

Hold the radio about 2.5cm to 5cm from your mouth. It is important that the antenna is 2.5 cm away from your face. Press the PTT button, the red LED will be illuminated and whilst keeping it pressed, speak into the microphone in your normal voice. And release the PTT key to receive, the green LED will illuminate.

OVERVIEW



No.	Items		
1	Antenna		
2	Speaker		
3	MIC		
4	LCD Display		
5	MENU Key		
6	Programming Key 1 (P1)		
7	Channel Knob		
8	Power / Volume Knob		
9	LED Indicator		

Notes: Users need to understand well the functions which definite in Keypad / Side Buttons / LCD Display Icon / LED Indicator, then can maximize the capabilities of this DMR radio .

KEYPAD

◆ Users can check the menu function by pressing [Navigation key], after choose the function, press [MENU] key to confirm or press [Return] key back to last menu.

◆ Users can use the 3 X 4 alphabet and digital keypad to view the function, also can input the alias, ID and message. Some character needs to press more times.

PROGRAMMABLE BUTTONS P1 / P2 / SK1 / SK2 / SK3

These side buttons PF1/PF2 can be allocated for certain functionalities by software. The functions and features that can be programmed are listed below, you can active / deactivate the function by short press or long press once your definite the key in advanced.

Short Press – Pressing and releasing rapidly.

Long Press – Pressing and holding for the programmed duration.

No.	Feature	No.	Feature
1	None	10	Squelch
2	All Alert Tones On/Off	11	Private On/Off
3	Emergency On	12	VOX On/Off
4	Emergency Off	13	Zones Selective
5	High/Low Power	14	Battery Checking
6	Monitor	15	Lone Work On/Off
7	One key Connected "1-6"	16	1750 Tone
8	Repeater/Talk Around	17	Right Key
9	Scan On/Off	18	Left Key

FUNCTIONS OPERATION INSTRUCTION

Making and Receiving Calls

1. PTT Button

Each channel can be set as Analog or Digital mode. Press PTT to transmit, release PTT to receive.

2. Select a Zone

Zone is a channels group, the radio supports max.250 zones and each zone support 64 channels.

Press [MENU] key enter menu page, then press [Up]/[Down] key to access menu and select the 'Zone', then press MENU] key to confirm. Turn the channel knob to select a channel under this zone.

3. Receive and Reply a Group Call

To receive a call made to a group of users, your radio must be configured as part of that group.

4. Receive and Respond to a Private Call

A Private Call is a call from an individual radio to another individual radio.

5. Receive an All Call

An All Call is a call from an individual radio to every radio on the channel. It is used to make important announcements requiring the user's full attention.

Making a Radio Call

After selecting your channel, you can select a subscriber alias or ID, or group alias or ID by using:

• The Channel Knob
• A programmed One Touch Access button
• The Contacts list
• Manually dial (by contact lists)

1. Making a Group Call

To make a call to a group of users, your radio must be configured as part of that group.

2. Making an All Call

This function allows you to transmit to all users on the channel. Your radio must be programmed to allow you to use it.

3. Making a Group or Private Call with the One Touch Access Button

The One Touch Access feature allows you to make a Group or Private Call to a predefined alias or ID easily. This feature can be assigned to a short or long programmable button press, or to a long numeric button press. You can ONLY have one alias or ID assigned to a One Touch Access button. Your radio can have multiple One Touch Access buttons programmed.

Emergency Alert

An emergency alert is used to indicate an emergency situation, and you can initiate an emergency call at any time or on any page when users operate radio, even if there is activity on the current channel. Your radio must be programmed for the button before use.

There are three emergency alert modes as below.

- Emergency Alert
- Emergency Alert & Calling
- Emergency Alert & Voice

Security

You can enable or disable any radio in the system. Users can choose the function by MENU operation, to active "Radio Disable" or "Radio Enable".

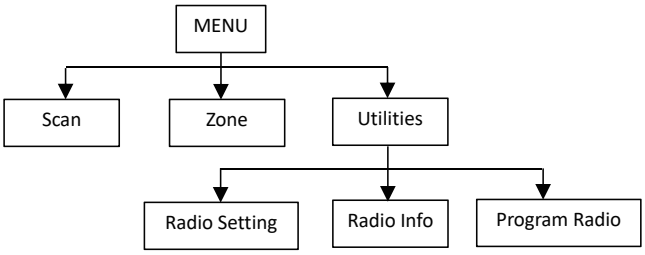
OPERATION OF MENU

Most functions of the radio can be realized through the menu. The steps of Menu operation as below.

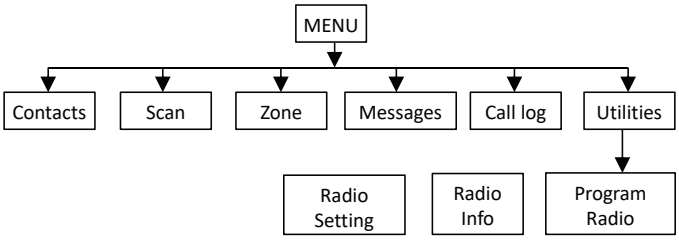
- Press [MENU] key enter menu page, press [Up]/[Down] key to check items in Menu.
- Press [MENU] key to confirm a selection or entry next page.
- Press [Back] key return to last page.

Note: After a period of inactivity, the radio will automatically exit the menu and return to main screen (the hang time is set by the programming software).

Menu of Analog Mode



Menu of Digital Mode



Under this menu, users can setup the functions include "Password Lock Features", "Turning the Radio Tones/Alerts On or Off", "Set Squelch Level", "Set Power Level", "Turn On/Off Display Backlight", "Turn the Introduction Screen On or Off", "Turn On/Off the VOX", "Language", "Turn On/Off VOX", "Turning the Password", Lock On or Off", "Changing the Password", "Accessing General Radio Information", "Checking the Radio Alias and ID", "Checking the Firmware Version"…… and so on.

But there are some functions that can only be used on radio after they are set in the software.

TECHNICAL SPECIFICATION

General	
Frequency Range	136-174MHz and 400-470MHz
Channels	3000
Working Voltage	7.4V Rated
Battery Capacity	2200mAh
Dimension (H*W*D)	120 x 55 x 37mm
Weight	About 319g (with battery and antenna)
Display Screen	1.77 inch
Working Temperature	-25°C~+60°C
Storage Temperature	-40°C~+85°C
Frequency Spacing	12.5kHz
Frequency Stability	±1.0 ppm

TECHNICAL SPECIFICATION

Receiver	
Sensitivity (Analog)	0.35uV/-116dBm (20 dB SINAD), 0.22uV/-120dBm (typical)
Sensitivity (Digital)	0.3uV/-117.4dBm (BER 5%), 0.7uV/-110dBm (BER 1%)
Intermodulation	TIA603C: 55dB ETSI: 55dB
Adjacent Channel Selectivity	TIA603C: 55dB@12.5KHz ETSI: 55dB@12.5KHz
Common Channel Suppression	-12dB@12.5KHz
Spurious Response Rejection	TIA603C: 60dB ETSI: 60dB
Spurious Radiation	- 57dBm@<1GHz，- 47dBm @>1GHz
Block	80dB
Rated Audio Power	1W
Audio Response	+1~-3dB
Rated Audio Distortion	≤3%
Transmitter	
Power Output	5W/1W
FM Hum & Noise	40dB @ 12.5 kHz
Spurious Emission	-36dBm<1GHz; -30dBm>1GHz
Adjacent Channel Power	60dB @ 12.5 kHz
FM Modulation	11KΦF3E @ 12.5 kHz;
4FSK Digital Modulation	12.5kHz (Data only): 7K60FXD 12.5kHz Data & Voice: 7K60FXE
Modulation Limiting	±2.5kHz @ 12.5 kHz
Idle Slot Power	-57dBm
Audio Response	+1~-3dB
Rated Audio Distortion	≤3%
Digital Protocol	ETSI TS 102 361-1,-2,-3
Digital Vocoder	AMBE+2™

Note: The above specifications are tested in accordance with applicable standards and subject to change without prior notice due to the continuous development of technology.

FCC compliance statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference including received interference that may cause undesired operation.

The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment. Replacement of any transmitter component (crystal, semiconductor, etc.) not authorized by the FCC equipment authorization for this radio could violate FCC rules.

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

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

This device complies with RF radiation exposure limits set forth for an uncontrolled environment. Do not use this device when the antenna shows obvious damages.Hold this transmitter approximately 25 mm away from your face and speak normal with the antenna pointed up and away. Use the supplied belt clip for body-worn configuration as other accessories may not comply to the limits.

RF Exposure Statement

The radio generators RF electromagnetic energy during transmit mode. The radio is designed for and classified as "Occupational 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.

The radio is NOT intended for use by the "General Population" in an uncontrolled environment. The radio has been tested and complies with the FCC RF exposure limits for "Occupational Use Only".In addition, the radio complies with the following Standards and Guidelines with regard to RF energy and electromagnetic energy levels and evaluation of such levels for exposure to humans:

---IEEE Std. 1528:2013 and KDB447498, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

---American National Standards Institute (C95.1-1992), IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields 3 kHz to 300 GHz.

---American National Standards Institute (C95.3-1992), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields-RF and Microwave.

The information listed above provides the user with the information needed to make him or her aware of RF exposure and what to do to as-sure that this radio operates with the FCC RF exposure limits of this radio.

Electromagnetic Interference/Compatibility

During transmissions, the 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.

Occupational/Controlled Use

The radio transmitter is used in situations in which persons are exposed as consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

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