



Dual Band Handheld Radio

User Manual

Foreword

Thank you for purchasing a Rugged Two-Way Radio. This radio was optimized before shipping to you. Please use caution before attempting to change the settings on this radio. If you have any questions about the functions of this radio, please consult this manual, or call our Tech Department at (888) 541-7223.

Read Before Using Your Radio

WARNING: Not complying with the following rules may violate the law or create hazardous situations.

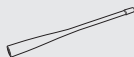
- Obey all government regulations. Improper use may be punishable by law.
- Do not use the radio in hazardous areas, near flame, explosives, or blasting zones.
- Do not use this radio if the antenna is damaged. Damaged antennas may cause injury.
- Do not attempt to open or repair the radio. Repairs should be handled by professionals.
- Do not use the radio where it is possible to cause interference, such as in hospitals.
- In a car with an airbag, do not put the radio within the scope of the airbag deployment.
- Do not store the radio in sunlight or direct heat.
- When transmitting, keep the radio at least 2 inches from your face.
- If the radio smells of smoke, power it down and report it to your dealer.
- Do not transmit for an extended period of time. This may cause the radio to overheat.

Unpacking

The items below are included with your handheld radio. Please check to see if there are any damaged items, and if so, please contact your dealer immediately.



V3 Radio



Antenna



Li-ion Battery



Power Adapter



Handstrap



Belt Clip



User Manual



Scan this QR code to view optional V3 accessories

- Battery Eliminator
- Go Further® Antenna



Charging Battery

This radio includes a high performance Li-ion battery with 7.4V standard voltage and 1600Ah capacity. Under normal use, this battery can be used for approximately 500 charge cycles before capacity will start to diminish. Old batteries should be replaced with a Rugged Radio designated battery, as off brand batteries have the potential to harm the radio or consumer.

- Do not short-circuit battery terminals or expose them to flame.
- Do not charge the battery in climates with a temperature above 113°F or below 32°F.
- Turn off your radio before charging the battery.
- Do not unplug the power adapter while charging.
- Do not charge if either the battery or radios is wet.
- Conductive metals, such as jewelry, can short circuit the battery and cause injury.

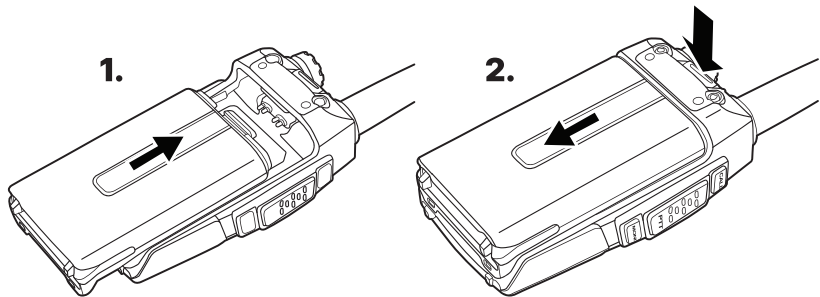
Batteries are not charged in the factory. Please charge the battery before first use. For optimal performance, the battery should be completely charged and completely discharged 2-3 times.

Use the provided power adapter to charge your Li-ion battery. The indicator light on the adapter will display red while charging and green when charging is complete.

Your battery charge is indicated by the  icon. When the battery is empty (), please recharge your battery.

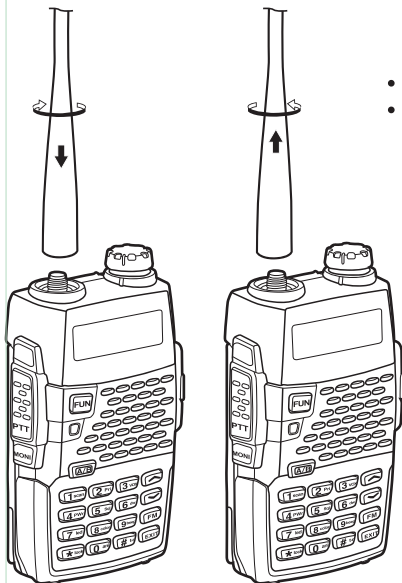
Battery Pack Installation

1. Fit the battery pack into the trough and slide it toward the head to insert completely.
2. To release, press the battery lock button to release the battery, then slide it out of the trough.



Antenna Installation

To install the provided VHF/UHF antenna, screw the bottom of the antenna onto the radio connector in a clockwise motion. Do not overtighten. To uninstall the antenna, turn it counter clockwise until it detaches from the connector.

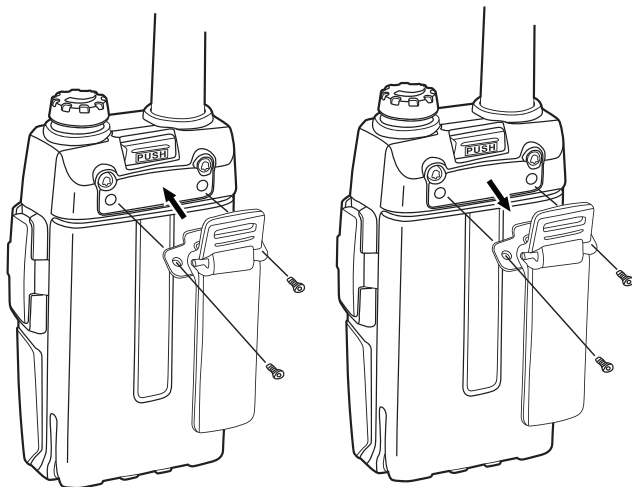


CAUTION

- Never transmit without an antenna.
- When installing the antenna, do not hold the antenna from its far end. Doing so may result in radio or antenna damage.

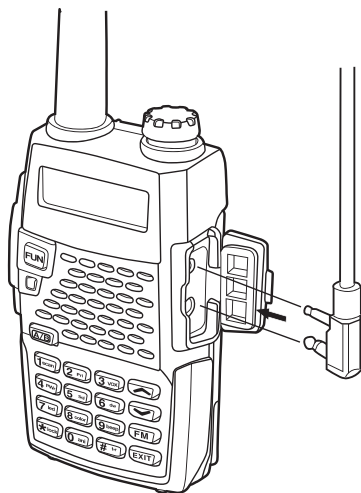
Belt Clip Installation

Align the two holes of the belt clip with the two holes on the radio. Fix them with the supplied screws. To uninstall, loosen the screws and detach the belt clip.



Connecting Intercoms, Headsets & External Speakers

Open the speaker/mic jack cover and insert the accessory plug. Please note, attaching accessories will make the radio susceptible to water damage.



Overview

Antenna

Connect antenna here

Busy/TX

Turns green while receiving and red during transmission

Mic

Internal microphone located here

Power/Volume

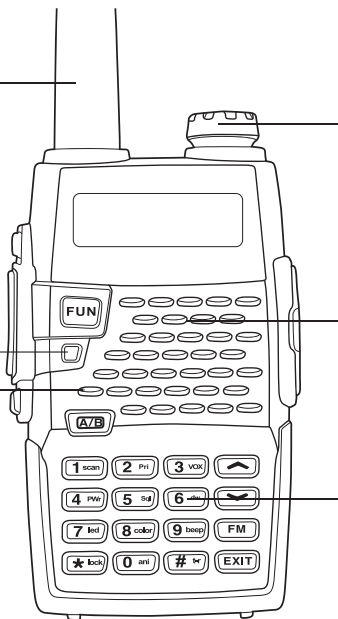
Toggle on/off and adjust volume

Speaker

Internal speaker located here

Keypad

These keys control the operating features of this radio, as described in the following pages



Call

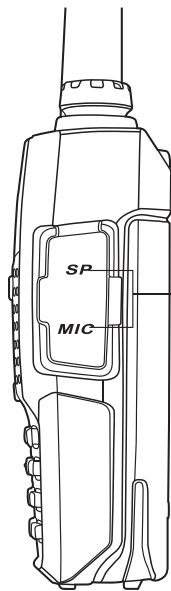
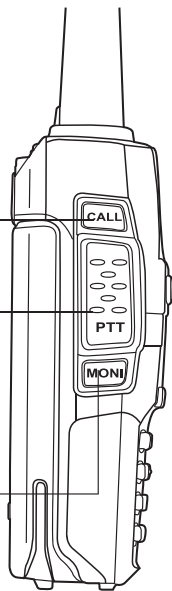
Transmits an audible tone on the active channel

PTT

Press to transmit and release to receive transmission

MONI

Long press disables squelch, allowing you to hear weaker signals

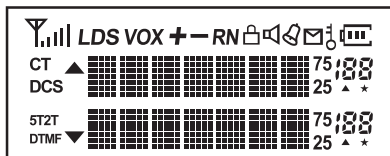


SP/MIC

This jack allows you to connect accessories







LCD Display

The following table defines the icons that display on the radio LCD.



Icon	Function
	Operating Band Signal & Power Meter
L	Low TX Power Active
D	Dual Watch/Standby Active
S	RX Power Save Active
VOX	VOX Active
+ -	Repeater Shift Direction
R	Reverse active transmit/receive frequency
N	Narrow Band Mode Active
	Keypad Lock Active
	Squelch Active
	Beep Tone Active
	Receive Caller ID or MSG

LCD Display (Continued)

Icon	Function
	Scrambler Active
	Battery Power Indicator
CT	Set CTCSS Tone
DCS	Set DCS Tone
5T	5 Tone Signaling Active
2T	2 Tone Signaling Active
DTMF	DTMF Tone Signaling Active
	Operating Band Indicator A
	Operating Band Indicator B
⁷⁵ ₂₅	Frequency Mantissa Indicator
	Channel/Menu Number Indicator
	Busy Channel Indicator
★	Scanned Channel Available in CH Mode

Keypad Functions

	FUN	A/B	^	v	EXIT
Press	Menu/Enter	Switch operating freq	Menu/Chan. Up	Menu/Chan. Down	Back/Exit

	* LOCK	# T-R	FM RADIO		
Press	Cursor left (editing chan name)	Cursor right (editing chan name)	FM Radio		
Hold	Lock/Unlock Keypad	Scan Reverse	Menu/Chan. Up		



	1 SCAN	2 PRI	3 VOX	4 PWR	5 SQL
Press FUN with Key	Scan Mode	SQL	MONI	Backlight	Bright

	6 DTV	7 LED	8 COLOR	9 BEEP	0 ANI
Press FUN with Key	Beep	TX Beep	Auto Lock	Voice	On MSG


NOTE: To send out an emergency alert, press **FUN** then press **FM RADIO**.

Operation Modes


Channel Mode

When turning on your radio, you are by default in Channel Mode. Use   to scroll through channels, or use the 0-9 number keys to change the channel manually. Channel numbers for channels 01-19 must be entered in 3 digits, for example for channel 05 enter 0-0-5, or 15 enter 0-1-5. Channels 20-77 can be entered as 2 digits.

FM Radio Mode

The V3 provides 76.00-108.00MHz FM radio. In FM mode, you can choose the frequency you need directly, scan frequency range, and store your favorite channels. Press  to enter and exit FM radio mode.

Menu Mode

Press  to enter Menu mode. See the following pages for a list of functions and descriptions.

Menu

#	Display	Available Values	Function
01	SCAN		Frequency/Channel Scan
02	SQL	SQUELCH	0-9
03	MONI	MONITOR	1 Channel or 2 Channels
04	BACKLIT	AUTO/ON/OFF	Backlight Display Mode
05	BRIGHT	1-3	Brightness Level Setting
06	BEEP	ON/OFF	Keypad Beep Setting
07	TX BEEP	ON/OFF	Transmit Over Beep Setting
08	AUTOLOK	ON/OFF	Auto Keypad Lock
09	VOICE	ON/OFF	Voice Prompt
10	ON.MSG	CUSTOM/OFF/VOLTS	Power On Display
11	BATTERY		Battery Power Voltage
12	ON.MSG		Power On Message
13	CH.NAME		Edit Channel Name
14			
15			
16			
17			
18			

Menu Operation

- Press **FUN** to enter menu mode.
- Press **▲ ▼** to select the desired menu item.
- Press **FUN** again to make a selection.
- Press **EXIT** twice to return to home screen.

Detailed Function Descriptions

01. SCAN - Frequency/Channel Scan

Selecting this option will start the scanning operation. Press **▲ ▼** to change scan direction. Scanning will stop when a signal is encountered. Press the PTT button to stop scanning. Press MONI to stop scanning temporarily. Press **FUN** again to exit Scan Mode.

02. SQL - Squelch Adjustment (DEFAULT: 5)

This function allows you to mute background noise when no signal is being received. Squelch can greatly reduce battery consumption.

03. MONITOR - Dual Channel Monitor (DEFAULT: ON)

Receive a sub band signal, even while working on the operating band. The **▲ ▼** icons indicate which band you are transmitting on. Press the A/B key to switch between bands. The radio will monitor both channels concurrently.

04. BACKLIT - Backlight Display Mode (DEFAULT: AUTO)

Turn the LED backlight on or off, or choose AUTO to automate the backlight based on key press. On AUTO mode, the backlight will turn off after 3 seconds.

05. BRIGHTNESS

Adjust the brightness of the display.

06. BEEP - Keypad Beeper Setting (DEFAULT: ON)

Enable or disable the keypad beep indicator sound.

07. TX BEEP - Receive End Indicator (DEFAULT: OFF)

Beep indicator activates at the end of a transmission.

08. AUTOLOK - Auto Lock Keypad (DEFAULT: OFF)

Automatically lock your keypad after 5 seconds when keypad is not in use.

09. VOICE - Enable Voice Prompts (DEFAULT: OFF)

Voice prompts will sound in context with buttons pressed on the keypad.



10. ON.MSG - Power On Display (DEFAULT: MESSAGE)

Choose what displays when the radio powers on. Options are: OFF (nothing displays), VOLTS (remaining battery voltage), MESSAGE (customizable message).



11. BATTERY - Remaining Battery Voltage (NO OPTIONS)

Displays remaining battery voltage. This function is not editable.

12. ON.MSG - Power On Message

Customize the power on message. There is a 7 character limit. Use   to change character, press * to move cursor left and # to move cursor right.

13. CH.NAME - Edit Channel Name (DEFAULT: NAME)

Customize the name of the current channel. There is a 7 character limit. Use   to change character, press * to move cursor left and # to move cursor right.



To program your radio and to access advanced features, visit rtsystemsinc.com, or contact them at 800-921-4834

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Technical Parameters

Specifications may be revised without notice due to technical improvement.

General

Frequency Range	136-174MHz	400-470MHz
	136-174MHz	245-246MHz
	245-246MHz	400-470MHz
Frequency Stability	±2.5PPm	
Channel No.	182×2	
Antenna	High Gain Antenna	
Antenna Impedance	50Ω	
Mode of Operation	Simple or Semi-Duplex	
Dimensions (WxHxD)	128×63×33mm	

Transmitter

Output Power	≥4W(H)	≥0.5W(L)
Modulation Mode	16kΦF3E / 11kVF3E	
Maximum Deviation	<5KHz / <2.5KHz	
Adjacent Channel Power	≥65dB	≥60dB
Spurious Radiation	<7μW	
Pre-emphasis Characteristics	6dB	
Current	≤1.6A(5W)	
CTCSS/DCS Deviation	0.5kHz±0.1kHz / 0.3kHz±0.1kHz	
Intermediation Sensitivity	8-12mV	
Intermediation Distortion	<5%	

Receiver

Audio Power	1W	
Audio Distortion	<10%	
Blocking	≥85dB	
Intermediation	≥60dB	≥55dB
Selectivity	≥65dB	≥60dB
Spurious Rejection	≥65dB	

Warranty Registration

Rugged Radios Intercoms, Radios, and Headsets are backed by a 3-year warranty. For more information, or to register your product, please visit our website.

Product Registration: **ruggedradios.com/warranty**

Questions: **888.541.7223**

When registering your product, or requesting a warranty over the phone, the following information will be required:



Model Number
Serial Number
Purchase Date
Purchase Location

General Information

Listen-Only Channels

Rugged Radios has licensed a variety of frequencies for our customers. However VHF channels 16-22 are licensed by various businesses, organizations, and governmental entities. Rugged Radios allows access to these channels as listen-only. Users are prohibited from transmitting on those frequencies.

FCC Licensing

Rugged two-way radios operate on frequencies regulated by the Federal Communications Commission (FCC). A license is required to transmit on these frequencies. To ensure compliance with federal regulations, Rugged Radio licenses 10 nation-wide commercial band frequencies and 60 area specific commercial band frequencies. Under this FCC license, Rugged Radios' customers are authorized to transmit on Rugged brand mobile and hand held radios only, on the pre-programmed channels, in the locations designated by its license. These frequencies/channels are available to transmit for business, recreational, or race use. For the latest information regarding the Rugged Radios license, please visit ruggedradios.com/licensing

Electromagnetic Interference/Compatibility During Transmission

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.

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.

General Information

Safety: This radio generates RF electromagnetic energy during transmit mode. This 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. This radio is NOT intended for use by the "General Population" in an uncontrolled environment. This radio has been tested and complies with the FCC RF exposure limits for "Occupational Use Only". In addition, this 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: FCC OET Bulletin 65 Edition 97-01 Supplement C, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Acids. 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 following accessories are authorized for use with this product. use of accessories other than those (listed in the instruction) specified may result in RE exposure levels exceed the FCC requirements for wireless RE exposure.

To ensure that your exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines: DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or antenna specifically authorized by the manufacturer for use with this radio. DO NOT transmit for more than 50% of total radio use time. Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded.

The radio is transmitting when the 'TX indicator' lights up red. You can cause the radio to transmit by pressing the PTT switch. ALWAYS keep the antenna at least 2.5 cm (1 inch) away from the body when transmitting and only use the provided belt-dip to ensure FCC RF exposure compliance requirements are not exceeded. To provide the recipients of your transmission the best sound quality, hold the antenna at least 5 cm (2 inches) from your mouth, and slightly off to one side. The information outlined in this manual provides the user with the information needed to make him or her aware of RF exposure and what to do in order to assure this radio is operated safely within the FCC exposure limits.

rugged.