

Two-Way Radios

User Guide



RMU2080 & RMV2080 Non-Display models

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<http://businessonline.motorolasolutions.com>

Go to: Resource Center > Product Information > Manual > Accessories.

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PRODUCT SAFETY

PRODUCT SAFETY AND RF EXPOSURE COMPLIANCE



Caution

Before using this product, read the operating instructions and RF energy awareness information contained in the Product Safety and RF Exposure booklet enclosed with your radio.

ATTENTION!

This radio is restricted to occupational use only to satisfy FCC RF energy exposure requirements.

For a list of Motorola-approved antennas, batteries and other accessories, visit the following website which lists approved accessories:

www.motorolasolutions.com/RMseries

INTRODUCTION

Thank you for purchasing the Motorola® RM Series™ Radio. This radio is a product of Motorola's 80 plus years of experience as a world leader in the designing and manufacturing of communications equipment. The RM Series™ radios provide cost-effective communications for businesses such as retail stores, restaurants, schools, construction sites, manufacturing, property and hotel management and more. Motorola professional two-way radios are the perfect communications solution for all of today's fast-paced industries.

Note: Read this user guide carefully to ensure you know how to properly operate the radio before use

**Business Radios,
Mailstop 1C15, Motorola
8000 West Sunrise Boulevard
Plantation, Florida 33322**

PACKAGE CONTENTS

- Radio
- Holster
- Lithium-Ion Battery
- Power Supply
- Quick Reference Guide
- Warranty Card
- Drop-in Tray Charger
- Product Safety & RF Exposure Booklet

For a copy of a large-print version of this user guide or for product-related questions, contact

1-800-448-6686 in the USA

1-800-461-4575 in Canada

1-888-390-6456 on TTY (Text Telephone)

For product related information, visit us at:

www.motorolasolutions.com/RMseries

FCC LICENSING INFORMATION

INTERFERENCE INFORMATION

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

RM Series™ Business two-way radios operate 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. Application is made available on FCC Form 601 and Schedules D, H, and Remittance Form 159.

To obtain these FCC forms, request document 000601 which includes all forms and instructions. If you wish to have the document faxed, mailed or have questions, use the following contact information.

Faxed contact the Fax-On-Demand system at:	Mailed call the FCC forms hotline at:	Questions regarding FCC license contact the FCC at:
1-202-418-0177	1-800-418-FORM 1-800-418-3676	1-888-CALL-FCC 1-888-225-5322 Or: http://www.fcc.gov

Before filling out your application, you must decide which frequency(ies) you can operate on. See “Frequencies and Code Charts”. For questions on determining the radio frequency, call Motorola Product Services at:

1-800-448-6686

Changes or modifications not expressly approved by Motorola may void the user's authority granted by the FCC to operate this radio and should not be made. To comply with FCC requirements, transmitter adjustments should be made only by or under the supervision of a person certified as technically qualified to perform transmitter maintenance and repairs in the private land mobile and fixed services as certified by an organization representative of the user of those services.

Replacement of any transmitter component (crystal, semiconductor, etc.) not authorized by the FCC equipment authorization for this radio could violate FCC rules.

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

BATTERIES AND CHARGERS SAFETY INFORMATION

This document contains important safety and operating instructions. Read these instructions carefully and save them for future reference.

Before using the battery charger, read all the instructions and cautionary markings on

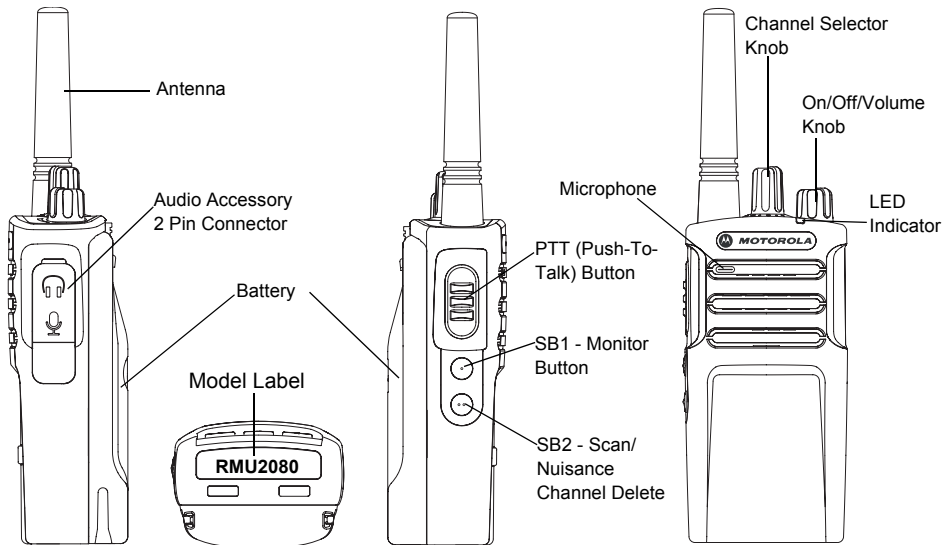
- the charger,
 - the battery, and
 - the radio using the battery
1. To reduce risk of injury, charge only the rechargeable Motorola-authorized batteries. Other batteries may explode, causing personal injury and damage.
 2. Use of accessories not recommended by Motorola may result in risk of fire, electric shock, or injury.
 3. To reduce risk of damage to the electric plug and cord, pull by the plug rather than the cord when disconnecting the charger.
 4. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in risk of fire and electric shock. If an extension cord must be used, make sure that the cord size is 18AWG for lengths up to 100 feet (30.48 m), and 16AWG for lengths up to 150 feet (45.72 m).
 5. To reduce risk of fire, electric shock, or injury, do not operate the charger if it has been broken or damaged in any way. Take it to a qualified Motorola service representative.
 6. Do not disassemble the charger; it is not repairable and replacement parts are not available. Disassembly of the charger may result in risk of electrical shock or fire.
 7. To reduce risk of electric shock, unplug the charger from the AC outlet before attempting any maintenance or cleaning

OPERATIONAL SAFETY GUIDELINES

- Turn the radio OFF when charging battery.
 - The charger is not suitable for outdoor use. Use only in dry locations/conditions.
 - Connect charger only to an appropriately fused and wired supply of the correct voltage (as specified on the product).
 - Disconnect charger from line voltage by removing main plug.
 - The outlet to which this equipment is connected should be nearby and easily accessible.
 - In equipment using fuses, replacements must comply with the type and rating specified in the equipment instructions.
 - Maximum ambient temperature around the power supply equipment must not exceed 40°C (104°F).
 - Power output from the power supply unit must not exceed the ratings stated on the product label
- located at the bottom of the charger.
- Make sure that the cord is located where it will not be stepped on, tripped over, or subjected to water, damage, or stress.

RADIO OVERVIEW

PARTS OF THE RADIO



On/Off/Volume Knob

Used to turn the radio ON or OFF and to adjust the radio's volume.

Channel Selector Knob

Used to switch the radio to different channels.

Accessory Connector

Used to connect compatible audio accessories.

Model Label

Indicates the model of the radio.

Microphone

Speak clearly into the microphone when sending a message.

Antenna

For models **RMU2080**, and **RMV2080** the antennas are non-removable.

LED Indicator

Used to give battery status, power-up status, radio call information and scan status.

Side Buttons***Push-to-Talk (PTT) Button***

- Press and hold down this button to talk, release it to listen.

Side Button 1 (SB1)

- The Side Button 1 is a general button that can be configured by the Customer Programming Software - CPS. The default setting of SB1 is 'Monitor'.

Side Button 2 (SB2)

- The Side Button 2 is a general button that can be configured by the CPS. The SB2 default setting is 'Scan/Nuisance Channel Delete'.

The Lithium-Ion (Li-Ion) Battery

RM Series comes with a Standard Capacity Li-Ion battery. Other batteries may be available. For more information, see "Battery Features" on page 14.

This User Guide covers multiple RM Series models, and may detail some features your radio does not have. The radio's model is shown on the bottom of the radio and provides the following information:

Table 1: RM Series Radio Specifications

Model	Frequency Band	Transmit Power (Watts)	Number of Channels	Antenna
RMU2080	UHF	2	8	Non-removable
RMV2080	VHF	2	8	Non-removable

BATTERY FEATURES

RM Series radios provide Lithium-Ion batteries that come in different capacities that defines the battery life.

About the Li-Ion Battery

The RM Series radio comes equipped with a rechargeable Li-Ion battery. This battery should be fully charged before initial use to ensure optimum capacity and performance.

Battery life is determined by several factors. Among the more critical are the regular overcharge of batteries and the average depth of discharge with each cycle. Typically, the greater the overcharge and the deeper the average discharge, the fewer cycles a battery will last. For example, a battery which is overcharged and discharged 100% several times a day, lasts fewer cycles than a battery that receives less of an overcharge and is discharged to 50% per day. Further, a battery which receives minimal overcharging and

averages only 25% discharge, lasts even longer.

Motorola batteries are designed specifically to be used with a Motorola charger and vice versa. Charging in non-Motorola equipment may lead to battery damage and void the battery warranty. The battery should be at about 77°F (25°C) (room temperature), whenever possible. Charging a cold battery (below 50° F [10°C]) may result in leakage of electrolyte and ultimately in failure of the battery. Charging a hot battery (above 95°F [35°C]) results in reduced discharge capacity, affecting the performance of the radio. Motorola rapid-rate battery chargers contain a temperature-sensing circuit to ensure that batteries are charged within the temperature limits stated above.

Battery Recycling and Disposal

Li-Ion rechargeable batteries can be recycled. However, recycling facilities may not be available in all areas. Under various U.S. state laws and the laws of several other countries, batteries must be recycled and cannot be disposed of in landfills or incinerators. Contact your local waste management agency for specific requirements and information in your area. Motorola fully endorses and encourages the recycling of Li-Ion batteries. In the U.S. and Canada, Motorola participates in the nationwide Rechargeable Battery Recycling Corporation (RBRC) program for Li-Ion battery collection and recycling.

Many retailers and dealers participate in this program. For the location of the drop-off facility closest to you, access RBRC's Internet web site at:

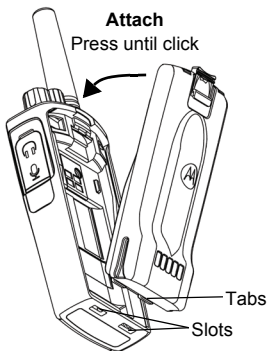
www.rbrc.com

or call:

1-800-8-BATTERY

This internet site and telephone number also provides other useful information concerning recycling options for consumers, businesses and governmental agencies.

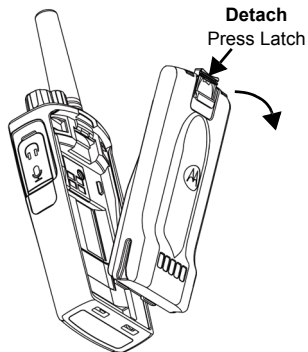
Installing the Lithium-Ion (Li-Ion) Battery



1. Turn OFF the radio.
2. With the Motorola logo side up on the battery pack, fit the tabs at the bottom of the battery into the slots at the bottom of the radio's body.
3. Press the top part of the battery towards the radio until a click is heard.

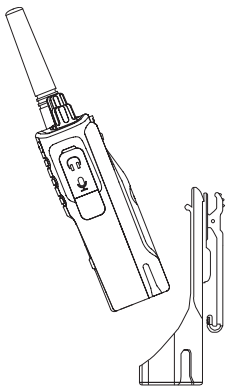
Note: To learn about the Li-Ion Battery Life features, refer to "About the Li-Ion Battery" on page 14

Removing the Lithium-Ion (Li-Ion) Battery



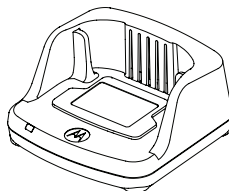
1. Turn OFF the radio.
2. Push down the battery latch and hold it while removing the battery.
3. Pull the battery away from the radio.

Holster

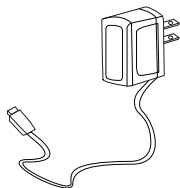


1. Insert the radio into the base of the holster at an angle. Press the radio against the back of the holster until the hooks on the holster are inserted in the top recesses of the battery.
2. To remove, using the top tab on the holster, detach the hooks of the holster from the top recesses of the battery. Slide the radio at an angle and remove from the holster.

Power Supply, Adaptor and Drop-in Tray Charger



Drop-in Tray Charger



Power Supply

The radio is equipped with one Drop-in Tray Charger and one Power Supply with Adaptor. For more information, refer to “Chargers” on page 74.

Battery Life Information

When the Battery Save feature is set to ON (enabled by default), the battery life lasts longer. The following table summarizes battery life estimations:

Table 2: Li-Ion Battery Life with Tx Power 2 Watts

Battery Type	Battery Save OFF	Battery Save ON
Standard	12 Hours	15 Hours
High Capacity	N/A	N/A

Note: Battery life is estimated based on 5% transmit / 5% receive / 90% standby standard duty cycle.

Charging the Battery

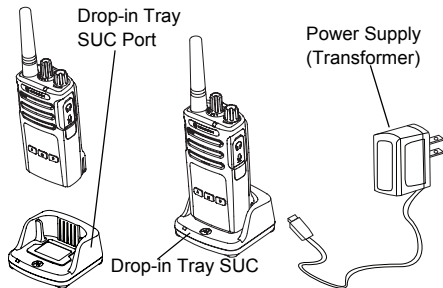
The RM Series radio offers two types of Power Supplies:

- Standard Power Supply and,
- Rapid Power Supply

Note: The radio comes with a Standard Power Supply.

To charge the battery (with the radio attached), place it in a Motorola-approved Drop-in Tray Single Unit Charger or Drop-in Tray Multi Unit Charger.

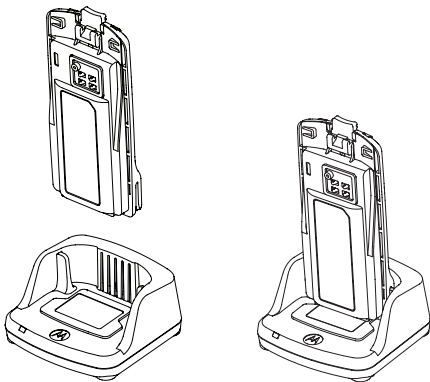
Charging with the Drop-in Tray Single Unit Charger (SUC)



1. Place the Drop-in Tray Charger on a flat surface.
2. Insert the connector of the Power Supply into the charger port on the back of the Drop-in Tray Charger.
3. Plug the AC Adaptor into a power outlet.
4. Insert the radio into the Drop-in Tray Single Unit Charger with the radio facing the front, as shown.

Note: When charging a battery attached to the radio, turn the radio OFF to ensure a full charge. See “Operational Safety Guidelines” on page 10 for more information.

Charging A Stand-Alone Battery



To charge only the battery - at step 4 on page 19, insert the battery into the tray, with the inside surface of the battery facing the front of the Drop-in Tray Single Unit Charger as shown









above. Align the slots in the battery with the alignment ribs in the Drop-in Tray Single Unit Charger.

Table 3: Motorola Authorized Batteries

Part Number	Description
PMNN4434_R	Standard Li-Ion Battery
PMNN4453_R	High Capacity Li-Ion Battery

Drop-in Tray Charger LED Indicators

Table 4: Charger LED Indicator

Status	LED Indicator	Comments
Power On	Green for approximately 1 second 	
Charging	Steady Red 	
Charging Complete	Steady Green 	
Battery Fault (*)	Red Fast Flash 	
Waiting to Charge (**)	Amber Slow Flash 	
Battery Level Status	N/A	Battery empty
	Flash Red 1 Time 	Battery low
	Flash Amber 2 Times 	Battery medium
	Flash Green 3 Times 	Battery High

(*) Normally, re-positioning the battery pack will correct this issue.

(**) Battery temperature is too warm or too cold or wrong power voltage is being used.

If there is NO LED indication:

1. Check if the radio with battery, or the battery alone, is inserted correctly. (refer to step 4 of "Charging with the Drop-in Tray Single Unit Charger (SUC)" on page 19)
2. Ensure that the power supply cable is securely plugged into the charger socket using an appropriate AC outlet and there is power to the outlet.
3. Confirm that the battery being used with the radio is listed in Table 3 on page 20.

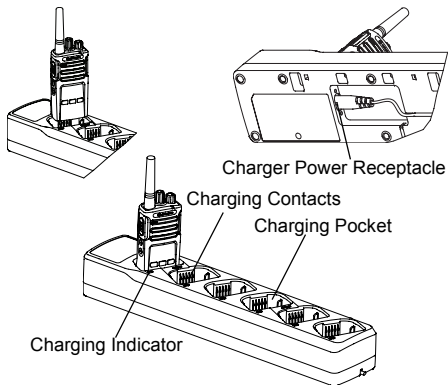
Estimated Charging Time

The following table provides the estimated charging time of the battery. For more information, see "Battery" on page 74.

Table 5: Battery Estimated Charging Time

Charging Solutions	Estimated Charging Time	
	Standard Battery	High Capacity Battery
Standard	≤ 4.5 Hours	N/A
Rapid	≤ 2.5 Hours	N/A

Charging a Radio and Battery using a Multi Unit-Charger - MUC (Optional Accessory)



The Multi-Unit Charger (MUC) allows drop-in charging of up to 6 radios or batteries. Batteries can be charged with the radios or removed and placed in the MUC separately. Each of the 6 charging pockets can hold a radio (with or without the Holster) or battery, but not both.









1. Place the Multi-Unit Charger on a flat surface.
2. Insert the power cord plug into the MUC's dual pin connector at the bottom of the MUC.
3. Plug the power cord into an AC outlet.
4. Turn the radio OFF.
5. Insert the radio or battery into the charging pocket with the radio or battery facing away from the contacts.

Note:

- This Multi-Unit Charger clones up to 2 radios (2 Source radios and 2 Target radios). Refer to "Cloning with a Multi Unit Charger (MUC)" on page 47 for more information.
- More information on the Multi-Unit Charger's operation is available in the Instruction Sheets provided with the MUC. For more information on the parts and their part numbers, refer to Chapter "Accessories" on page 74.

Multi-Unit Charger LED Indicators

Table 6: Charger LED Indicator

Status	LED Indicator	Comments
Power On	Green for approximately 1 second 	
Charging	Steady Red 	
Charging Complete	Steady Green 	
Battery Fault (*)	Red Fast Flash 	
Waiting to Charge (**)	Amber Slow Flash 	
Battery Level Status	N/A	Battery empty
	Flash Red 1 Time 	Battery low
	Flash Amber 2 Times 	Battery medium
	Flash Green 3 Times 	Battery High

(*) Normally, re-positioning the battery pack will correct this issue.

(**) Battery temperature is too warm or too cold or wrong power voltage is being used.

If there is NO LED indication:

1. Check if the radio with battery or the battery alone, is inserted correctly (refer to step 5 of "Charging a Radio and Battery using a Multi Unit-Charger - MUC (Optional Accessory)" on page 23).
2. Make sure the power cord is securely plugged into the MUC and the appropriate AC outlet. Make sure there is power to the AC outlet.
3. Confirm that the battery being used with the radio is listed in Table 3 on page 20.

GETTING STARTED

For the following explanations, refer to “Parts Of The Radio” on page 11.

TURNING RADIO ON/OFF

To turn ON the radio, rotate the On/Off/Volume Knob clockwise. The radio plays one of the following:

- Power up tone and channel number announcement, or
- Battery level and channel number announcements, or
- Silent (Audible tones disabled)

The LED blinks red briefly.

To turn the radio OFF, rotate the On/Off/Volume Knob counterclockwise until you hear a ‘click’ and the radio LED Indicator turns OFF.

ADJUSTING VOLUME

Turn the On/Off/Volume Knob clockwise to increase the volume, or counterclockwise to decrease the volume.

Note: Do not hold the radio too close to the ear when the volume is high or when adjusting the volume

SELECTING A CHANNEL

To select a channel, turn the Channel Selector Knob until you reach the desired channel. An audible voice indicates the selected channel.

Each channel has its own Frequency, Interference Eliminator Code and Scan Settings.

TALKING AND MONITORING

It is important to monitor for traffic before transmitting to avoid ‘talking over’ someone who is already transmitting

To monitor, long press and hold the SB1(*) button to access channel traffic. If no activity is present, you will hear ‘static’. To release, press SB1 again. Once channel traffic has cleared, proceed with your call by pressing the PTT button. When transmitting, the LED Indicator stays solid red.

Notes:

- To listen to all activity on a current channel, short press the SB1 to set the CTCSS/DPL code to 0. This feature is called 'CTCSS/DPL Defeat (Squelch set to SILENT)'.
- (*) This assumes SB1 is not being programmed for a different mode.

RECEIVING A CALL

1. Select a channel by rotating the Channel Selector Knob until you reach the desired channel. An audible voice indicates the selected channel.
2. Make sure the PTT button is released and listen for voice activity.
3. The LED Indicator stays solid red when the radio is receiving a call.
4. To respond, hold the radio vertically 1 to 2 inches (2.5 to 5cm) from mouth. Press the PTT button to talk; release it to listen.

TALK RANGE

TALK RANGE		
Model	Industrial	Multi-Level
	Inside steel/ concrete Industrial buildings	Inside multi- level buildings
UHF 2W	Up to 250,000 Sq. Ft.	Up to 20 Floors
VHF 2W	Up to 220,000 Sq. Ft.	Up to 13 Floors

To establish a proper two-way communication, the channel, frequency, and interference eliminator codes must be the same on both radios. This depends on the stored profile that has been preprogrammed on the radio:

1. **Channel:** Current channel that the radio is using, depending on radio model.
2. **Frequency:** The frequency the radio uses to transmit/receive.
3. **Interference Eliminator Code:** These codes help minimize interference by providing a choice of code combinations.

4. **Scramble Code:** Codes that make the transmissions sound garbled to anyone listening who is not set to that specific code.
5. **Bandwidth:** Some frequencies have selectable channel spacing, which must match other radios for optimum audio quality.

For details on how to set up frequencies and CTCSS/DPL codes in the channels, refer to “Advanced Configuration Mode” on page 32.

RADIO LED INDICATORS

RADIO STATUS	LED INDICATION
Channel Busy	Solid Orange
Cloning Mode	Double Orange Heartbeats
Cloning In Progress	Solid Orange
Fatal Error at Power up	One Green Blink, One Orange Blink, One Green Blink, then repeat for 4 seconds
Low Battery	Orange Heartbeat
Low Battery Shutdown	Fast Orange Heartbeat
Monitor	LED is OFF
Power-Up	Solid Red for 2 seconds
'Idle' Programming Mode / Channel Mode	Green Heartbeat
Scan Mode	Fast Red Heartbeat
Transmit (Tx)/Receive (RX)	Solid Red
Transmit in Low Power Select	Solid Orange
VOX/iVOX Mode	Double Red Heartbeats

