



motorola CP100d Non Keypad Portable Radio User Guide

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MOTOROLA SOLUTIONS

CP100d Non-Keypad Portable Radio
User Guide



American Communication Systems
Discover the Power of Communications



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Supplier's Declaration of Conformity

Per FCC CFR 47 Part 2 Section 2.1077(a)



Responsible Party

Name Motorola Solutions, Inc.

Address: 2000 Progress Pkwy, Schaumburg, IL. 60196

Phone Number: 1-800-927-2744

Hereby declares that the product:

Model Name: CP100d

conforms to the following regulations:

FCC Part 15, subpart B, section 15.107(a), 15.107(d), and section 15.109(a)

Class B Digital Device

As a personal computer peripheral, 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 received, including interference that may cause undesired operation.

NOTE:

This 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 or TV technician for help.

Important Safety Information

RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios

**CAUTION:**

This radio is restricted to Occupational use only. Before using the radio, read the RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable standards and Regulations.

Any modification to this device, not expressly authorized by Motorola Solutions, may void the user's authority to operate this device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with Motorola Solutions-approved antenna with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Notice to Users (FCC)

This device complies with Part 15 of the FCC rules per the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- Changes or modifications made to this device, not expressly approved by Motorola Solutions, could void the authority of the user to operate this equipment.

Notice to Users (Industry Canada)

The operation of your Motorola Solutions radio is subject to the Radiocommunications Act and must comply with the rules and regulations of the Federal Government's Department of Industry Canada. Industry Canada requires that all operators using Private Land Mobile frequencies obtain a radio license before operating their equipment.

Canada Licensing Information

Notice to Users (Industry Canada)

The operation of your Motorola Solutions radio is subject to the Radiocommunications Act and must comply with the rules and regulations of the Federal Government's Department of Industry Canada. Industry Canada requires that all operators using Private Land Mobile frequencies obtain a radio license before operating their equipment.

The License Application

1. Fill in the items as per the instructions. If you need additional space for any item uses the reverse side of the application.
2. Be sure to print legibly
3. Make a copy of your files.
4. Prepare a cheque or money made out to the "Receiver General for Canada", for an amount, which is on the following schedule, for each radio purchased. (License is renewed n April 1st each year, and issued for a period of 12 months).
5. Mail your completed application, along with your cheque or money order to the closest Industry Canada District office, according to the list on pages.

To obtain the latest Canadian License Application form, please go to http://www.ic.gc.ca/ic_wp-pa.htm.

Software Version

All the features described in the following sections are supported by the software version **R01.21.01.0000** or later. Contact your dealer or administrator for more information.

Intellectual Property and Regulatory Notices

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Open Source Content

This product may contain Open Source Software used under license. Refer to the product installation media for full Open Source Legal Notices and Attribution content. European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) Directive



■ The European Union's WEEE directive requires that products sold in EU countries must have the crossed-out trash bin label on the product (or the package in some cases).

As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service center for information about the waste collection system in their country.

Disclaimer

Please note that certain features, facilities, and capabilities described in this document may not be applicable to or licensed for use on a specific system, or may be dependent upon the characteristics of a specific mobile subscriber unit or configuration of certain parameters. Please refer to your Motorola Solutions contact for further information.

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Computer Software Copyrights

The Motorola Solutions products described in this manual may include copyrighted Motorola Solutions computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola Solutions certain exclusive rights for copyrighted computer programs including, but not limited to, the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola Solutions computer programs contained in the Motorola Solutions products described in this manual may not be copied, reproduced, modified, reverse-engineered, or distributed in any manner without the express written permission of Motorola Solutions. Furthermore, the purchase of Motorola Solutions products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Motorola Solutions, except for the normal non-exclusive license to use that arises by operation of law in the sale of a product. The AMBE+2 voice coding Technology embodied in this product is protected by intellectual property rights including TM patent rights, copyrights, and trade secrets of Digital Voice Systems, Inc.

This voice coding Technology is licensed solely for use within this Communications Equipment. The user of this Technology is explicitly prohibited from attempting to decompile, reverse engineer, or disassemble the Object Code, or in any other way convert the Object Code into a human-readable form.

U.S. Pat. Nos. #5,870,405, #5,826,222, #5,754,974,
#5,701,390, #5,715,365, #5,649,050, #5,630,011,
#5,581,656, #5,517,511, #5,491,772, #5,247,579,
#5,226,084 and #5,195,166.

Radio Care

This section describes the basic handling precaution of the radio.

Table 1: IP Specification

IP Specification	Description
IP54	Allows your radio to withstand adverse field conditions such as being exposed to water splashed from all directions or dust protected for 2–8 hours.

- Keep your radio clean and exposure to water should be avoided to help ensure proper functionality and performance.
- To clean the exterior surfaces of the radio, use a diluted solution of mild dishwashing detergent and freshwater (for example, one teaspoon of detergent to one gallon of water).
- These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

Introduction

This user guide covers the operation of your radios.

Your dealer or system administrator may have customized your radio for your specific needs. Check with your dealer or system administrator for more information. You can consult your dealer or system administrator about the following:

- Is your radio programmed with any preset conventional channels?
- Which buttons have been programmed to access other features?
- What optional accessories may suit your needs?
- What are the best radio usage practices for effective communication?
- What are maintenance procedures that help promote longer radio life?

Icon Information

Throughout this publication, the icons described are used to indicate features supported in either the conventional analog or conventional digital mode.



Indicates a conventional Analog Mode-Only feature.



Indicates a conventional Digital Mode-Only feature. For features that are available in both conventional analog and digital modes, both icons are not shown.

Conventional Analog and Digital Modes

Each channel in your radio can be configured as a conventional analog or conventional digital channel.

1: Channel Selector Knob

Certain features are unavailable when switching from digital to analog mode.

Your radio also has features available in both analog and digital modes. The minor differences in the way each feature works do not affect the performance of your radio.



NOTE:

Your radio also switches between digital and analog modes during a dual mode scan. See Scan on page 38 for more information.

Getting Started

Getting Started provides instructions to prepare your radio for use.

2.1 Charging the Battery

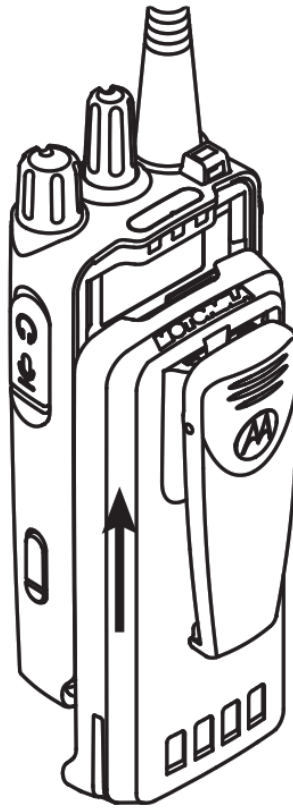
Your radio is powered by a Lithium-Ion (Li-Ion) battery. Turn off your radio when charging.

- To comply with warranty terms and avoid damage, charge the battery using a Motorola Solutions authorized charger as described in the charger user guide.
- Charge a new battery 14 to 16 hours before initial use for best performance. Batteries charge best at room temperature.

2.2 Attaching the Battery

Follow the procedure to attach the battery to your radio.

1. Align the battery with the rails on the back of the radio.
2. Press the battery firmly, and slide upwards until the latch snaps into place.

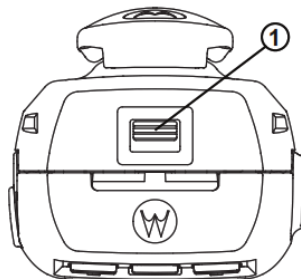


3. Slide the battery latch into the lock position.

2.3 Removing the Battery

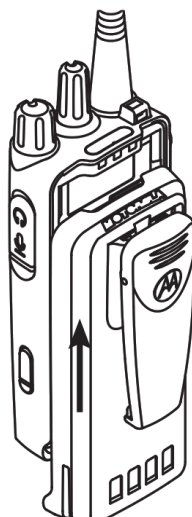
Follow the procedure to remove the battery from your radio. Ensure that the radio is turned off.

1. Move the battery latch into unlock position and hold.



1: Battery Latch

2. Slide the battery down and lift it off the rails.



2.4 Attaching the Antenna

Turn off your radio.

Set the antenna in the receptacle and turn clockwise.



NOTE:

To protect best against water and dust, ensure that antenna is tightly fitted.



NOTE:

To remove the antenna, turn the antenna counterclockwise.



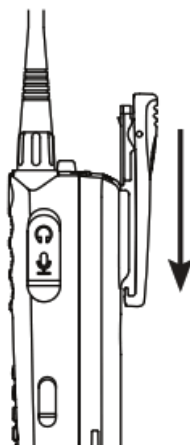
CAUTION:

To prevent damage, replace the faulty antenna with only MOTOTRBO antennas.

2.5 Attaching and Removing the Belt Clip

Attaching the Belt Clip

Align the grooves on the clip with the grooves on the battery and press it downwards until it clicks.



Removing the Belt Clip

1. To remove the clip, press the belt clip tab away from the battery.
2. Slide the clip upwards and away from the radio.

2.6 Turning the Radio On

Rotate the On/Off/Volume Control knob clockwise until it clicks.



If successful, your radio shows the following indications:

- A tone sounds.

NOTE:

If the Tones/Alerts function is disabled, there is no tone upon powering up.

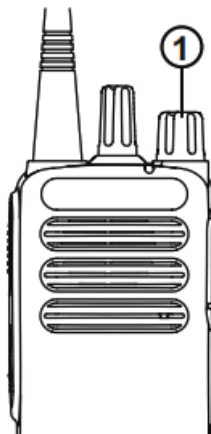
- The green LED lights up.

If your radio does not power up, check your battery. Make sure that the battery is charged and properly attached. Contact your dealer if your radio still does not power up.

2.7 Adjusting the Volume

To adjust the volume of your radio, perform one of the following actions:

- To increase the volume, turn the On/Off/Volume Control knob clockwise.
- To decrease the volume, turn the On/Off/Volume Control knob counterclockwise.



1: On/Off Volume Control Knob

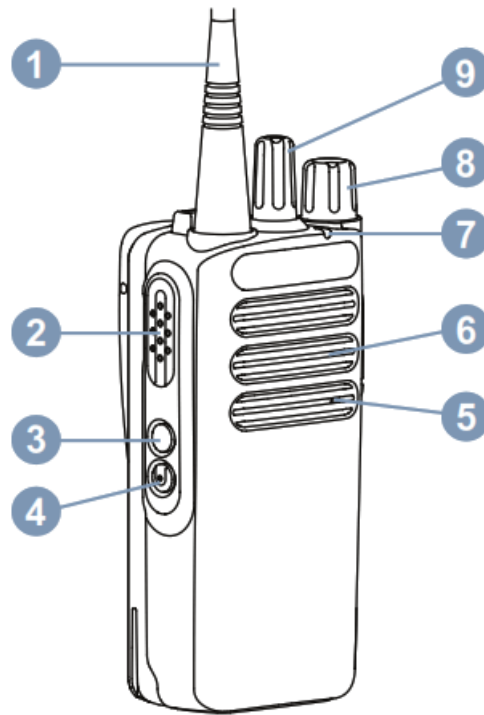


NOTE:

Your radio can be programmed to have a minimum volume offset where the volume level cannot be lowered past the programmed minimum volume.

Radio Controls

This chapter explains the buttons and functions to control the radio.



These buttons are programmable.

1. Antenna
2. Push-to-Talk (PTT) Button
3. Side Button 11
4. Side Button 2 1
5. Microphone
6. Speaker
7. LED Indicator
8. On/Off/Volume Control Knob
9. Channel Selector Knob

3.1 Programmable Buttons

Depending on the duration of a button press, your dealer can program the programmable buttons as shortcuts to radio functions.

Short press

Pressing and releasing rapidly.

Long press

Pressing and holding for the programmed duration.

Press and hold

Keeping the button pressed.

The programmed duration of a button press is applicable to all assignable radio/utility functions or settings.

3.1.1 Assignable Radio Functions

The following radio functions can be assigned to the programmable buttons.

Battery Type

Allows selection of battery type between Li-Ion and NiMH.

Mic AGC

Toggles the internal microphone automatic gain control (AGC) on or off.

Monitor

Monitors a selected channel for activity.

Nuisance Channel Delete

Temporarily removes an unwanted channel, except for the Selected Channel, from the scan list. The Selected Channel refers to the selected zone or channel combination of the user from which the scan is initiated.

One Touch Access

Directly initiates a predefined Private, Phone or Group Call, a Call Alert, or a Quick Text message.

Permanent Monitor

Monitors a selected channel for all radio traffic until the function is disabled.

Repeater/Talk around

Toggles between using a repeater and communicating directly with another radio.

Scan

Toggles scan on or off.

Voice Announcement On/Off

Toggles voice announcement on or off.

Voice Announcement for Channel

Plays zone and channel announcement voice messages for the current channel. This function is unavailable when Voice Announcement is disabled.

Voice Operating Transmission (VOX)

Toggles VOX on or off.

3.1.2 Assignable Settings or Utility Functions

The following radio settings or utility functions can be assigned to the programmable buttons.

Tones/Alerts

Toggles all tones and alerts on or off.

Power Level

Toggles transmit power levels between high and low.


Squelch


Toggles squelch level between tight and normal.

3.2 Push-To-Talk Button

The Push-to-Talk (PTT) button serves two basic purposes:

- While a call is in progress, the PTT button allows the radio to transmit to other radios in the call. The microphone is activated when the PTT button is pressed.
- While a call is not in progress, the PTT button is used to make a new call. If the Talk Permit Tone is enabled, wait until the short alert tone ends before talking.

 If the Channel Free Indication feature is enabled on your radio (programmed by your dealer), you hear a short alert tone the moment the target radio (the radio that is receiving your call) releases the PTT button, indicating the channel is free for you to respond.

 You hear a continuous Talk Prohibit Tone if your call is interrupted. You should release the PTT button if you hear a continuous Talk Prohibit Tone.

Status Indicators

This chapter explains the status indicators and audio tones used on the radio.

4.1 LED Indicators

LED indicators show the operational status of your radio. Blinking Red

The radio has failed the self-test upon powering up. The radio is receiving an emergency transmission. Radio is transmitted in a low battery state. Radio has moved out of range if Auto-Range Transponder System is configured.

Solid Green

The radio is powering up. Radio is transmitting.

Indicates full battery capacity when the programmed

The battery Strength button is pressed.

When pressing the Battery Type button to set the battery type as NiMH.

Blinking Green

Radio is receiving a call or data. Radio is detecting activity over the air.

Solid Yellow

Radio is monitoring a conventional channel. When pressing the Battery Type button to set the battery type as Li-Ion.

Indicates fair battery charge when the programmable button is pressed.

Blinking Yellow

The radio is scanning for activity. Radio has yet to respond to a Call Alert. Radio has Flexible Receive List enabled.

Double Blinking Yellow

Radio is actively searching for a new site. Radio has yet to respond to a Group Call Alert. The radio is locked.

4.2 Tones

The following are the tones that sound through on the radio speaker.



High Pitched Tone



Low Pitched Tone

4.2.1 Audio Tones

Audio tones provide you with audible indications of the status or response to data received on the radio.



Continuous Tone

A monotone sound. Sounds continuously until termination.



Periodic Tone

Sounds periodically depending on the duration set by the radio. The tone starts stops and repeats itself.



Repetitive Tone

A single tone repeats itself until it is terminated by the user.



Momentary Tone

Sounds once for a short duration set by the radio.

4.2.2 Indicator Tones

Indicator tones provide you with audible indications of the status after an action to perform a task is taken.



Positive Indicator Tone



Negative Indicator Tone

Channel Selections

This chapter explains the operations to select a channel on your radio.

Your radio supports up to 16 channels.

Each channel can be programmed with different features and or support different groups of users.

5.1 Selecting Channels

Follow the procedure to select the required channel on your radio.

Turn the Channel Selector Knob to select the channel, subscriber ID, or group ID.

Calls

This chapter explains the operations to receive, respond to, make, and stop calls.

You can select a subscriber alias or ID, or group alias or ID after you have selected a channel by using one of these features:

Volume/Channel Selector Knob

This method manually selects a subscriber alias or ID, or group alias or ID.

The LED lights up solid green while the radio is transmitting and blinks green when the radio is receiving.


6.1 Group Calls

Your radio must be configured as part of a group to receive a call from or make a call to the group of users.

6.1.1 Making Group Calls

Follow the procedure to make Group Calls on your radio.

1. Do one of the following:

- Select a channel with the active group alias or ID.
 - Press the programmed One Touch Access button.
2. Press the PTT button to make the call. The green LED lights up.
 3. Do one of the following:
 - Wait for the Talk Permit Tone to end and speak clearly into the microphone if enabled.
 - Wait for the PTT Sidetone to end and speak clearly into the microphone if enabled.
 4. Release the PTT button to listen. The green LED blinks when the target radio responds.
 5.  If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call. The call ends when there is no voice activity for a predetermined period.

6.1.2 Responding to Group Calls

To receive a call from a group of users, your radio must be configured as part of that group. Follow the procedure to respond to Group Calls on your radio.

When you receive a Group Call:

The green LED blinks.

Your radio unmutes and the incoming call sounds through the speaker.

1. Do one of the following:



If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call.



If the Voice Interrupt feature is enabled, press the PTT button to interrupt the audio from the transmitting radio and free the channel for you to respond. The green LED lights up.

2. Do one of the following:

- Wait for the Talk Permit Tone to end and speak clearly into the microphone if enabled.



- Wait for the PTT Sidetone to end and speak clearly into the microphone if enabled.

3. Release the PTT button to listen. The call ends when there is no voice activity for a predetermined period.

6.2 Private Calls

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

There are two ways to set up a Private Call. The first type sets up the call after performing a radio presence check, while the second type sets up the call immediately. Only one of these types can be programmed to your radio by your dealer.

If this feature is not enabled, a negative indicator tone sounds when you make a Private Call through the One Touch the Access button or the Channel Selector Knob.

6.2.1 Making Private Calls

Your radio must be programmed to initiate a Private Call. If this feature is not enabled, a negative indicator tone sounds when you initiate the call. Follow the procedure to make Private Calls on your radio.

1. Do one of the following:


- Select a channel with the active subscriber alias or ID.
- Press the programmed One Touch Access button.

2. Press the PTT button to make the call.

The green LED lights up.

3. Wait for the Talk Permit Tone to end and speak clearly into the microphone if enabled.
4. Release the PTT button to listen.

The green LED blinks when the target radio responds.

5.  If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call.

The call ends when there is no voice activity for a predetermined period. A tone sounds.



6.2.2 Responding to Private Calls

Follow the procedure to respond to Private Calls on your radio.

When you receive a Private Call:

- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.

1 Do one of the following:

-  If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call.
-  If the Transmit Interrupt Remote Dekey feature is enabled, press the PTT button to stop an ongoing interruptible call and free the channel for you to respond.

The green LED lights up.

2 Wait for the Talk Permit Tone to end and speak clearly into the microphone if enabled.

1. Release the PTT button to listen. The call ends when there is no voice activity for a predetermined period.

All Calls


An All Call is a call from an individual radio to every radio on the channel. An All Call is used to make important announcements, requiring full attention from the user. The users on the channel cannot respond to an All Call.

6.3.1 Receiving All Calls

When you receive an All Call:

- A tone sounds.
- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.

An All Call does not wait for a predetermined period before ending.

 If the Channel Free Indication feature is enabled, you hear a short alert tone when the transmitting radio releases the PTT button, indicating the channel is free for you to use. You cannot respond to an All Call.



NOTE:

The radio stops receiving the All Call if you switch to a different channel while receiving the call. You are not able to continue with any programmed button functions until the end of an All Call.

6.4 Broadcast Voice Calls



A Broadcast Voice Call is a one-way voice call from any user to an entire talk group.

The Broadcast Voice Call feature allows only the call initiating user to transmit to the talk group, while the recipients of the call cannot respond (no Call Hang Time).

Your radio must be programmed to allow you to use this feature. Check with your dealer or system administrator for more information.

6.4.1 Making Broadcast Voice Calls

Program your radio to make Broadcast Voice Calls.

1. Select a channel with the active group alias or ID.
2. Press the PTT button to make the call.

The radio returns to the previous menu after the call ends.

6.4.2 Receiving Broadcast Voice Calls

When you receive a Broadcast Voice Call:

- A tone sounds.
- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.

A Broadcast Voice Call does not wait for a predetermined period before ending.

You cannot respond to a Broadcast Voice Call.



NOTE:

The radio stops receiving the Broadcast Voice Call if you switch to a different channel while receiving the call. You cannot continue with any programmed button functions until the end of the Broadcast Voice Call.

6.5 Unaddressed Calls

An Unaddressed Call is a group call to one of the 16 predefined group IDs.

This feature is configured using CPS-RM. A contact for one of the predefined IDs is required to initiate and/or receive an Unaddressed Call. Check with your dealer or system administrator for more information.

6.5.1 Making Unaddressed Calls

1. Select a channel with the active group alias or ID.
2. Press the PTT button to make the call.
3. Release the PTT button to listen. A momentary tone sounds.
4. If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating that the channel is free or you to respond. Press the PTT button to respond to the call.

The call ends when there is no voice activity for a predetermined period.

6.5.2 Responding to Unaddressed Calls

When you receive an Unaddressed Call:

- The green LED blinks.
- A momentary tone sounds.
- Your radio unmutes and the incoming call sounds through the speaker.

1. Do one of the following:

- If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio

releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call.

- If the Voice Interrupt feature is enabled, press the PTT button to interrupt the audio from the transmitting radio and free the channel for you to respond.
2. Release the PTT button to listen. The call ends when there is no voice activity for a predetermined period.

6.6 Open Voice Channel Mode (OVCM)

An Open Voice Channel Mode (OVCM) allows a radio that is not preconfigured to work in a particular system to both receive and transmit during a group or individual call. The OVCM group call also supports broadcast calls. Program your radio to use this feature. Check with your dealer or system administrator for more information.

Making OVCM Calls

Your radio must be programmed for you to make an OVCM Call. Follow the procedure to make OVCM Calls on your radio.

1. Select a channel with the active group alias or ID.
2. Press the PTT button to make the call.

6.6.2 Responding to OVCM Calls

When you receive an OVCM Call:

- The green LED blinks.
- Your radio unmutes and the incoming call sounds through the speaker.

1 Do one of the following:

- If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button to respond to the call.
- If the Voice Interrupt feature is enabled, press the PTT button to interrupt the audio from the transmitting radio and free the channel for you to respond.

2 Release the PTT button to listen.

The call ends when there is no voice activity for a predetermined period.

Advanced Features

This chapter explains the operations of the features available in your radio. Your dealer or system administrator may have customized your radio for your specific needs. Check with your dealer or system administrator for more information.

7.1 Talk around

This feature allows you to continue communicating when your repeater is non-operational, or when your radio is out of range from the repeater but within the talk range of their radios.

The talk around the setting is retained even after power down.

7.1.1 Toggling Between Repeater and Talk around Modes

Follow the procedure to toggle between Repeater and Talk around modes on your radio. Press the programmed Repeater/Talk around the button.

One of the following tones sounds:

Positive Indicator Tone

Radio is in talk-around mode.

Negative Indicator Tone

The radio is in repeater mode.

7.2 Monitor Feature

The feature allows you to ensure that a channel is free before transmitting.

7.2.1 Monitoring Channels

Follow the procedure to monitor channels.

1. Long press the programmed Monitor button. The yellow LED double blinks when the channel is busy.
2. Press the PTT button to talk. Release the PTT button to listen.

7.2.2 Permanent Monitor

The Permanent Monitor feature is used to continuously monitor a selected channel for activity.

7.2.2.1 Turning Permanent Monitor On or Off

Follow the procedure to turn Permanent Monitor on or off your radio.

Press the programmed Permanent Monitor button. When the radio enters the mode:

- An alert tone sounds.
- The yellow LED lights up.

When the radio exits the mode:

- An alert tone sounds.
- The yellow LED turns off.

7.3 Scan Lists

Scan lists are created and assigned to individual channels or groups. Your radio scans for voice activity by cycling through the channel or group sequence specified in the scan list for the current channel or group.

Your radio can support up to 3 scan lists, with a maximum of 16 members in a list.

Each scan list supports a mixture of both analog and digital entries.

7.4 Scan

Your radio cycles through the programmed scan list for the current channel looking for voice activity when you start a scan.

There are two ways of initiating a scan:

Main Channel Scan (Manual)

Your radio scans all the channels or groups in your scan list. On entering the scan, your radio may, depending on the settings, automatically start on the last scanned active channel or group, or on the channel where the scan was initiated.

Auto Scan (Automatic)

Your radio automatically starts scanning when you select a channel or group that has Auto Scan enabled.

7.4.1 Turning Scan On or Off

Follow the procedure to turn the scan on or off on your radio.

Do one of the following:

- Press the programmed Scan button to start or stop Scan.
- Turn the Channel Selector Knob to select a channel programmed with Auto Scan enabled.

If the scan is enabled:


- The yellow LED blinks.
- A positive indicator tone sounds.

If a scan is disabled:

- The LED turns off.
- A negative indicator tone sounds.

7.4.2 Responding to Transmissions During Scanning

During scanning, your radio stops on a channel or group where activity is detected. The radio stays on that channel for a programmed duration known as hang time. Follow the procedure to respond to transmissions during scanning.

1.  If the Channel Free Indication feature is enabled, you hear a short alert tone the moment the transmitting radio releases the PTT button, indicating the channel is free for you to respond. Press the PTT button during hang time.
The green LED lights up.
2. Do one of the following:
 - Wait for the Talk Permit Tone to end and speak clearly into the microphone if enabled.
 - Wait for the PTT Sidetone to end and speak clearly into the microphone if enabled.
3. Release the PTT button to listen. The radio returns to scanning other channels or groups if you do not respond within the hang time.

7.4.3 Deleting Nuisance Channels

If a channel continually generates unwanted calls or noise, (termed a “nuisance” channel), you can temporarily remove the unwanted channel from the scan list. This capability does not apply to the channel designated as the Selected Channel. Follow the procedure to delete nuisance channels on your radio.

1. When your radio locks on to an unwanted or nuisance channel, press the programmed Nuisance Channel Delete button until you hear a tone.
2. Release the programmed Nuisance Channel Delete button. The nuisance channel is deleted.

7.4.4 Restoring Nuisance Channels

Follow the procedure to restore nuisance channels on your radio. Do one of the following:

- Turn the radio off and then power it on again.
- Stop and restart a scan using the programmed Scan button.
- Change the channel using the Channel Selector Knob.

7.5 Call Indicator Settings

This feature allows you to configure call or text message ringing tones.

7.6 Call Alert Operation

Call Alert paging enables you to alert a specific radio user to call you back.

7.6.1 Responding to Call Alerts

When you receive a Call Alert:

- A repetitive tone sounds.
- The yellow LED blinks.

Press the PTT button within 4 seconds of receiving a Call the Alert page to respond with a Private Call.

7.7 Auto-Range Transponder System



The Auto-Range Transponder System (ARTS) is an analog-only feature designed to inform you when your radio is out of range of other ARTS-equipped radios. ARTS-equipped radios transmit or receive signals periodically to confirm that they are within range of each other.

Your radio provides indications of states as follows:

First-Time Alert

A tone sounds.

ARTS-in-Range Alert

A tone sounds, if programmed.

ARTS-Out-of-Range Alert

A tone sounds. The red LED rapidly blinks.

NOTE:



Check with your dealer or system administrator for more information.

Utilities

This chapter explains the operations of the utility functions available on your radio.

8.1 Squelch Levels



You can adjust the squelch level to filter out unwanted calls with low signal strength or channels with noise higher than normal background.

Normal

This is the default setting.

Tight

This setting filters out unwanted calls and/or background noise. Calls from remote locations may also be filtered out.

8.1.1 Setting Squelch Levels

Follow the procedure to set the squelch levels on your radio. Press the programmed Squelch button. One of the following tone sounds:

Positive Indicator Tone

Radio is operating in tight squelch.

Negative Indicator Tone

Radio is operating in normal squelch.

8.2 Power Levels

You can customize the power setting to high or low for each channel.

High

This enables communication with radios located at a considerable distance from you.

Low

This enables communication with radios in closer proximity.

8.2.1 Setting Power Levels

Follow the procedure to set the power levels on your radio.

Press the programmed Power Level button. If successful:

- The Positive Indicator Tone sounds.
- The radio transmits at low power. If unsuccessful:
- The Negative Indicator Tone sounds.
- The radio transmits at high power.

8.3 Voice Operating Transmission

The Voice Operating Transmission (VOX) allows you to initiate a hands-free voice-activated call on a programmed channel. The radio automatically transmits, for a programmed period, whenever the microphone on the VOX-capable accessory detects voice. You can enable or disable VOX by doing one of the following:

- Turn the radio off and then power it on again to enable VOX.
- Change the channel by using the Channel Selector knob to enable VOX.
- Turn VOX on or off by using the programmed VOX button.
- Press the PTT button during radio operation to disable VOX.

If the Talk Permit Tone is enabled, use a trigger word to initiate the call. Wait for the Talk Permit Tone to finish before speaking clearly into the microphone. See Turning Talk Permit Tone On or Off for more information.

NOTE:

Turning this feature on or off is limited to radios with this function enabled. Check with your dealer or system administrator for more information.

8.4 Turning Radio Tones/Alerts On or Off

You can enable and disable all radio tones and alerts, if needed, except for incoming Emergency alert tones. Follow the procedure to turn tones and alerts on or off your radio.

Press the programmed All Tones/Alerts button. If successful:

- The Positive Indicator Tone sounds.
- All tones and alerts are turned on. If unsuccessful:
- The Negative Indicator Tone sounds.
- All tones and alerts are turned off.

Authorized Accessories List

Motorola Solutions provides a list of accessories to improve the productivity of your radio.

Table 2: Antennas

Part Number	Description
PMAE4002_	UHF, 403-433 MHz, 9 cm Stubby Antenna
PMAE4003_	UHF, 430-470 MHz, 9 cm Stubby Antenna
PMAE4006_	UHF, 465-495 MHz, 9 cm Stubby Antenna
PMAE4016_	UHF, 403-520 MHz, Antenna Whip
HAD9742_	VHF, 146-162 MHz, 9 cm Stubby Antenna
HAD9743_	VHF, 162-174 MHz, 8 cm Stubby Antenna
NAD6502 R	VHF, 146-174 MHz, 15 cm Heliflex Antenna
PMAD4012_	VHF, 136–155 MHz, 9 cm Stubby Antenna
PMAD4014_	VHF, 136–155 MHz, 14 cm Antenna
PMAD4042_	VHF, 136–150.8 MHz, 14 cm Heliflex Antenna

Table 3: Batteries

Part Number	Description
PMNN4080_	High Capacity Li-Ion, 2150 mAh Battery (Without belt clip)
PMNN4081_	Li-Ion, 1500 mAH Battery
PMNN4092_	NiMH, 1300 mAH Battery
PMNN4476_	Li-Ion, 1750 mAh IP54 Battery

Table 4: Cable

Part Number	Description
PMKN4128_	Programming Cable USB

Table 5: Carry Devices

Part Number	Description
HLN6602_	Universal Chest Pack
HLN9844_	Spring Belt Clip (For 1.5 in. Belt Width)
HLN9985_	Waterproof Bag, Includes Large Carry Strap
NTN5243_	Adjustable Black Nylon Carrying Strap (Attaches to D-Ring on carrying Case)
PMLN7075_	Nylon Carry Case
RLN4570_	Break-A-Way Chest Pack
RLN4815_	Universal Radio Pack and Utility Case (Fanny Pack)

Table 6: Chargers

Part Number	Description
PMPN4132_	Desktop Single-Unit Charger, Base
PMPN4172_	Desktop Single-Unit Charger, US/NA Plug
PMLN6593_	Standard Multi-Unit Charger, INT
PMLN6597_	Standard Multi-Unit Charger, US/NA Plug

Table 7: Earbuds and Earpieces

Part Number	Description
AARLN4885_	Receive-Only Earbud
PMLN4620_	D-Shell Receive Only Earpiece (One Size) for Remote Speaker Microphone
PMLN6531_	Ear Receiver with In-Line Microphone/PTT/VOX Switch (Mag One)
PMLN6532_	Swivel Earpiece with In-Line Microphone and PTT
PMLN6533_	Earset with Combined Microphone and PTT
PMLN6534_	Earbud with In-Line Microphone/PTT/VOX Switch (Mag One)

Part Number	Description
PMLN6535_	D-Style Earpiece with Microphone/PTT
PMLN6537_	Earset with Boom Microphone and In-Line PTT/VOX Switch (Mag One)
RLN4941_	Receive-Only Earpiece with Translucent Tube for Remote Speaker Microphone
WADN4190_	Over-the-Ear Receiver for Remote Speaker Microphone
RLN4760_	Small Right Custom Earpiece used with NTN8371_
RLN4761_	Medium Right Custom Earpiece used with NTN8371_
RLN4762_	Large Right Custom Earpiece used with NNTN8371_
RLN4763_	Small Left Custom Earpiece used with NNTN8371_
RLN4764_	Medium Left Custom Earpiece used with NNTN8371_
RLN4765_	Large Left Custom Earpiece used with NNTN8371_
5080370E97	Standard Clear Eartip
RLN6230_	Foam or Acoustic Tube Earplugs, Black

Table 8: Headsets and Headset Accessories

Part Number	Description
PMLN6538_	Lightweight Headset with Swivel Boom Microphone
PMLN6541_	Lightweight Temple Transducer Headset
PMLN6542_	MagOne Ultra-Lite Headset, behind-the-head, adjustable with boom microphone and In-Line PTT
PMLN6854_	Heavy Duty Headset, Noise Cancelling Boom Mic Headset
PMLN7468_	Medium Weight Over-the-Head Dual Muff Headset

Table 9: Remote Speaker Microphones

Part Number	Description
PMMN4013_	Remote Speaker Microphone with 3.5 mm Audio Jack
PMMN4029_	Remote Speaker Microphone IP57
PMMN4092_	Remote Speaker Microphone (Mag One)

Table 10: Other Audio Accessories

Part Number	Description
5080384F72	Noise Attenuating Plugs
RLN6242_	Quick Disconnect Acoustic Tube

Table 11: Power Adaptor

Part Number	Description
PS000037A01	Power Supply Adaptor, Power Wall Cube, AC/DC, Switch Mode, 14 W, 207 V–253 V, Euro
PS000037A05	Power Supply Adaptor, Power Wall Cube, AC/DC, Switch Mode, 14 W, 207 V–253 V, China
PS000037A06	Power Supply Adaptor, Power Wall Cube, AC/DC, Switch Mode, 14 W, 207 V–253 V, Korea
PS000037A02	Power Supply Adaptor, Power Wall Cube, AC/DC, Switch Mode, 14 W, 207 V–253 V, UK/HK

Table 12: Surveillance Accessories

Part Number	Description
PMLN6445_	2-Wire Surveillance Kit with Clear Acoustic Earpiece, Beige (Palm Garden)
PMLN6530_	2-Wire Surveillance Kit, with Clear Acoustic Earpiece, Black (Palm Garden)
PMLN6536_	2-Wire Surveillance Kit with Quick Disconnect Acoustic Tube, Black (OTTO)

Batteries and Chargers Warranty

The Workmanship Warranty

The workmanship warranty guarantees against defects in the workmanship under normal use and service.

All MOTOTRBO Batteries	24 Months
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The Capacity Warranty

The capacity warranty guarantees 80% of the rated capacity for the warranty duration.

Nickel Metal-Hydride (NiMH) or Lithium-Ion (Lion) Batteries	12 Months
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Limited Warranty

MOTOROLA SOLUTIONS COMMUNICATION PRODUCTS

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

Motorola Solutions, Inc. ("Motorola Solutions") warrants the Motorola Solutions manufactured Communication Products listed below ("Product") against defects in material and the workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

Portable Radios	Two (2) Years
Product Accessories	One (1) Year

Motorola Solutions, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of the Product shall become the property of Motorola Solutions.

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STATE LAW RIGHTS:

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSIONS MAY NOT APPLY.

This warranty gives specific legal rights, and there may be other rights that may vary from state to state.

HOW TO GET WARRANTY SERVICE

You must provide proof of purchase (bearing the date of purchase and Product item serial number) in order to receive warranty service and, also, deliver or send the Product item, transportation, and insurance prepaid, to an authorized warranty service location. Warranty service will be provided by Motorola Solutions through one of its authorized warranty service locations. If you first contact the company which sold you the Product (for example, a dealer or communication service provider), it can facilitate your obtaining warranty service. You can also call Motorola Solutions at 1-800-927-2744.

WHAT THIS WARRANTY DOES NOT COVER

1. Defects or damage resulting from the use of the Product in other than its normal and customary manner.
2. Defects or damage from misuse, accident, water, or neglect.
3. Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
4. Breakage or damage to antennas unless caused directly by defects in material workmanship.
5. A Product subjected to unauthorized Product modifications disassembles or repairs (including, without limitation, the addition to the Product of non-Motorola Solutions supplied equipment) which adversely affects the performance of the Product or interferes with Motorola Solutions' normal warranty inspection and testing of the Product to verify any warranty claim.
6. A product that has had the serial number removed or made illegible.
7. Rechargeable batteries if:
 - any of the seals on the battery enclosure of cells are broken or show evidence of tampering.
 - the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
8. Freight costs to the repair depot.
9. A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product does not function in accordance with Motorola Solutions published specifications or the FCC certification labeling in effect for the Product at the time the Product was initially distributed from Motorola Solutions.
10. Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
11. Normal and customary wear and tear.

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Motorola Solutions will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or parts infringe a United States patent, and Motorola Solutions will pay those costs and damages were finally awarded against the end user purchaser in any such suit which is attributable to any such claim, but such defense and payments are conditioned on the following:

1. Motorola Solutions will be notified promptly in writing by such purchaser of any notice of such claim,
2. Motorola Solutions will have sole control of the defense of such suit and all negotiations for its settlement or compromise, and
3. Should the Product or parts become, or in Motorola Solutions' opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit Motorola Solutions, at its option and expense, either to procure for such purchaser the right to continue using the Product or parts or to replace or modify the same so that it becomes non-infringing or to grant the such purchaser a credit for the Product or parts as depreciated and accept its return? The depreciation will be an equal amount per year over the lifetime of the Product or parts as established by Motorola Solutions.

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GOVERNING LAW

This Warranty is governed by the laws of the State of Illinois, U.S.A.

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Motorola Solutions, Inc.


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Documents / Resources

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