

VL50 TWO-WAY RADIO

USER GUIDE



Contents

Documentation Copyrights	1	Turning Your Radio On and Off	20
Disclaimer	1	Adjusting the Volume	21
Computer Software Copyrights	2	Reading the Display	21
Batteries, Chargers, and Audio		Talking and Receiving	22
Accessories Safety Information	3	Basic Radio Operation	22
Operational Safety Guidelines	4	Signal Strength and Channel Busy	
Acoustic Safety	5	Indicators	22
FCC Licensing Information	7	Talk Range	23
Supplier's Declaration of Conformity	9	Locking the Keypad	23
Class B Digital Device	10	Monitoring a Channel	24
Radio Frequency Exposure Safety		Scanning	24
Standards	11	Advanced Configuration Mode	26
Product Safety and RF Exposure		Factory Default Settings	27
Compliance.	11	Entering Advanced Configuration Mode	
Notice to Users	12	28	
Introduction	13	Feature Summary Chart	36
Radio Controls	14	Features	36
Getting Started	15	Backlight	36
Installing the Batteries	15	Call Tones	36
Installing the Swivel Belt Holster ..	16	Channels	37
Charging the Battery	17	Cloning Mode	38

Contents

Frequencies	38	Batteries	56
Bandwidth Range	39	Audio Accessories	56
Codes, Interference Eliminator Codes (CTCSS/DPL)	39	Carry Accessories	56
Keypad Beep (or Keypad Tone) ...	39	Chargers	57
Keypad Lock	39	Programming Accessories	57
Low Battery Alert - Shutdown	40	Warranty	58
Maximum Channels	40		
Microphone Gain Level	40		
Monitor	40		
Nuisance Ch Delete	41		
Scan Advanced	41		
Reset to Factory Defaults (2)	42		
Reverse Burst	42		
Scan	42		
Cloning Radio Settings	43		
Advanced Features	44		
Troubleshooting	46		
Use and Care	49		
Frequencies and Bandwidths	50		
Accessories	56		

Documentation Copyrights

No duplication or distribution of this document or any portion thereof shall take place without the express written permission of Motorola Solutions.

No part of this manual may be reproduced, distributed, or transmitted in any form or by any means, electronic or mechanical, for any purpose without the express written permission of Motorola Solutions.

Disclaimer

The information in this document is carefully examined, and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies.

Furthermore, Motorola Solutions reserves the right to make changes to any products herein to improve readability, function, or design. Motorola Solutions does not assume any liability arising out of the applications or use of any product or circuit described herein; nor does it cover any license under its patent rights, nor the rights of others.

Computer Software Copyrights

The information in this document is carefully examined, and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies.

Furthermore, Motorola Solutions reserves the right to make changes to any products herein to improve readability, function, or design. Motorola Solutions does not assume any liability arising out of the applications or use of any product or circuit described herein; nor does it cover any license under its patent rights, nor the rights of others.

Batteries, Chargers, and Audio Accessories 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
 - the radio attached with battery
1. To reduce risk of injury, charge only the rechargeable Motorola Solutions-authorized batteries. Charging the other batteries may cause explosion, personal injury, and damage.
 2. Use of accessories not recommended by Motorola Solutions may result in fire, electric shock, or injury.
 3. To reduce damage to the electric plug and cord, pull by plug rather than the cord when disconnecting the charger.
 4. An extension cord should not be used unless necessary. Use of an improper extension cord may result in fire and electric shock. If an extension cord must be used, make sure that the cord size is 18 AWG for lengths up to 2.0 m (6.5 feet), and 16 AWG for lengths up to 3.0 m (9.8 feet).
 5. Do not operate the charger if it has been broken or damaged in any way. Take it to any qualified Motorola Solutions service representatives.
 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 off the radio while charging.
- The charger is not suitable for outdoor. Use only in dry locations or conditions.
- Connect charger to an appropriately fused and wired supply of the correct voltage (as specified on the product only).
- Disconnect charger from line voltage by removing main plug.
- Connect the equipment to an outlet which is easy to access and near.
- For 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 the cord is not stepped on, tripped over, subjected to water, damage, or stress.

Acoustic Safety



Caution

Exposure to loud noises from any source for extended periods of time may temporarily or permanently affect your hearing. The louder the radio volume, the less time is required before your hearing can be affected. Hearing damage from loud noises is sometimes undetectable at first and can have a cumulative effect.

To protect your hearing:

- Use the lowest volume necessary to do your job.
- Increase the volume only if you are in noisy surroundings.
- Reduce the volume before connecting headset or earpiece.
- Limit the amount of time you use headsets or earpieces at high volume.
- If you experience hearing discomfort, ringing in your ears, or speeches that are muffled, you should stop listening to your radio through your headset or earpiece, and have your hearing checked by your doctor.

Notes

FCC Licensing Information

This device complies with Parts 90 and 15 of the Federal Communications Commission (FCC) Rules. Operation is subject to the condition that this device does not cause harmful interference. The radio operates on radio frequencies that are regulated by the Federal Communications Commission (FCC). To transmit on these frequencies, you are required to have a license issued by the FCC. 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.

- Fax - Contact the Fax-On-Demand system at 1-202-418-0177
- Mail - Call the FCC forms hotline at 1-800-418-FORM or 1-800-418-3676
- Contact - For questions regarding FCC license, contact 1-888-CALL-FCC, 1-888-225-5322, or <http://www.fcc.gov>.

Before filling out your application, you must decide which frequency you can operate on. Refer to “Frequencies and Bandwidth” section for frequency information. For questions on determining the radio frequency, call Motorola Solutions Product Services at: 1-800-448-6686.


Changes or modifications not expressly approved by Motorola Solutions may void the user 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 such as crystal, semiconductor, and others not authorized by the FCC equipment authorization for this radio could violate FCC rules.

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

Supplier's Declaration of Conformity

	<p>Supplier's Declaration of Conformity Per FCC CFR 47 Part 2 Section 2.1077(a)</p> <p>Responsible Party Name: Motorola Solutions, Inc. Address: 2000 Progress Pkwy, Schaumburg, Il. 60196, U.S.A. Phone Number: 1-800-927-2744 Hereby declares that the product: Model Name: VL50 conforms to the following regulations: FCC Part 15, subpart B, section 15.107(a), 15.107(d), and section 15.109(a)</p>
---	---

Class B Digital Device


For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

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/TV technician for help.

Radio Frequency Exposure Safety Standards

Product Safety and RF Exposure Compliance.

-  Before using the radio, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet contained with your radio.

Caution

ATTENTION

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

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

<http://www.motorolasolutions.com>

Notice to Users

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.



Caution

Changes or modifications made to this device, not expressly approved by Motorola Solutions, could void the authority of the user to operate this equipment.

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 maintenance procedures that helps promote longer radio life?

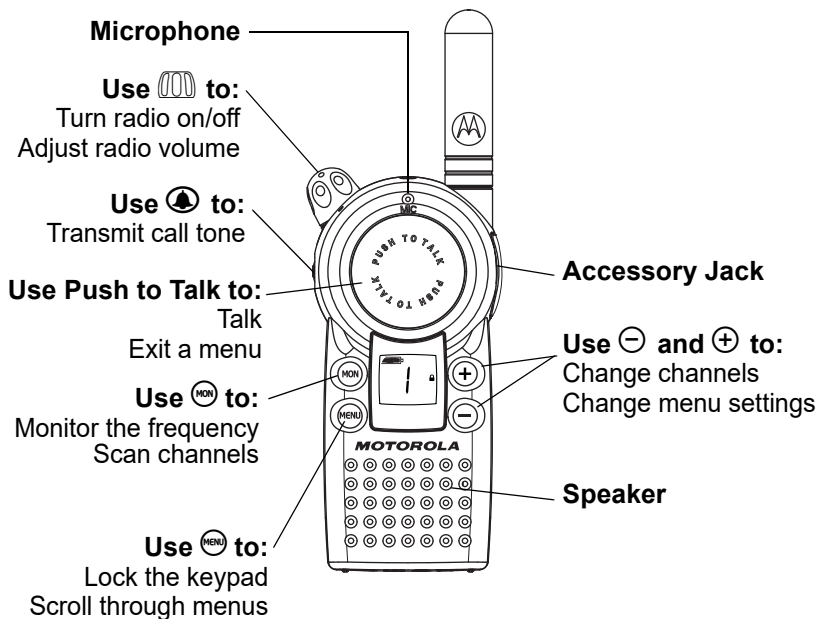
Package Contents

- VL50 Radio
- Swivel Belt Holster
- Lithium Ion Battery
- Drop-In Charger with Transformer
- Quick Reference Guide

For product information, refer to www.motorolasolutions.com/VL50

For product related questions, contact **1-800-448-6686**

Radio Controls



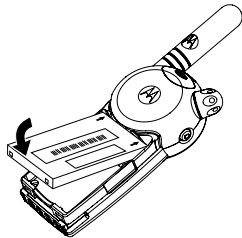
Getting Started

Installing the Batteries

Your radio uses a rechargeable Lithium Ion (Li Ion) battery.

Li Ion Battery

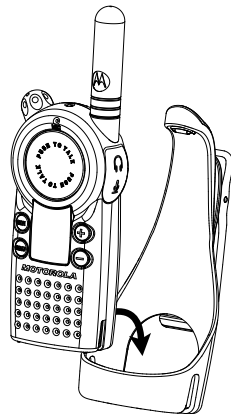
1. If the battery door is already in place, push down on the recess on the door and slide it off the radio.
2. Insert the battery, printed arrows first, into the battery compartment and press down to secure firmly in place.
3. Slide and snap the battery door into place.



Installing the Swivel Belt Holster

1. Slide the bottom of the radio into the holster until it snaps into place.
2. To remove, push the tab on the holster and pull the radio away from the holster.

Note: In case of loss, please contact your point-of-sale or call 1-800-448-6686 to request replacement part.



Swivel
Belt Holster

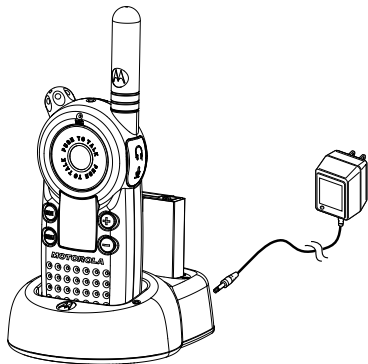
Charging the Battery

Use only the charger supplied with the radio, or other VL50 power accessories. For optimum battery life, do not charge the battery for prolonged periods after it is fully charged. Charging the battery over the weekend is acceptable.

Using the Drop-in Charger

1. Place the charger on a flat surface.
2. Insert the plug of the power cord into the jack on the charger.
3. Plug the cord into an AC outlet.
4. Turn the radio off.
5. Insert the radio (with battery installed) into the front charging pocket.

Note: The radio will fit in the charger with the holster on.

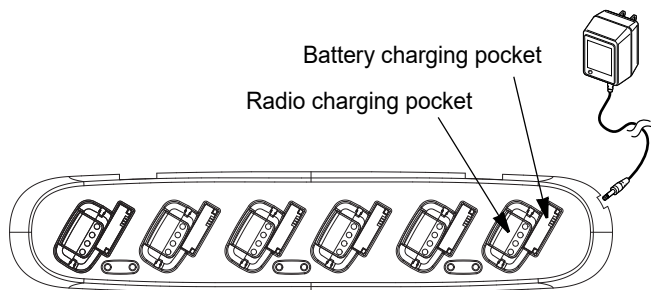


The drop-in charger will also sequentially charge a spare Li Ion battery. The spare battery will not begin to charge until the radio battery is fully charged. Both batteries will charge in approximately 8 to 10 hours.

Using the Multi-Unit Charger

The Multi-Unit Charger (MUC) allows drop-in charging of up to 6 radios or batteries. Batteries can be charged inside the radios or removed and placed in the MUC separately. Each of the 6 charging pockets can hold a radio or battery, but not both.

1. Place the charger on a flat surface.
2. Insert the power cord plug into the jack on the MUC.
3. Plug the cord into an AC outlet.
4. Turn the radio off.
5. Insert the radio or battery into the charging pocket.







Charging Status LEDs

On the drop-in charger, the radio and battery charging pockets have their own LEDs. On the MUC, each of the 6 charging pockets has an LED. The LEDs are grouped into pairs to show which charging pockets are paired (for cloning, see page 43).

The LED is solid red when the battery is charging, and solid green when charging is complete.

Battery Meter

The battery meter in the upper left corner of the display (see page 21) shows how much battery power is remaining.

Battery Type	3 Bars	2 Bars	1 Bar	Blinking
				
Li Ion	100% – 70%	70% – 30%	30% – 10%	Final 10%

Battery Life


Based on 5% transmit, 5% receive, 90% standby (standard duty cycle):

PMNN4497_ (Li Ion 1800mAh) - 18.0 Hours

SNN5571_ (Li Ion 1200mAh) - 12.5 Hours

Turning Your Radio On and Off

See page 14 for a basic radio diagram.

Turn  clockwise to turn the radio on, and counterclockwise to turn the radio off. When the radio is on, the transmit light on the top of the radio blinks every 3 seconds.

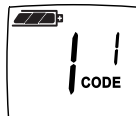
When you turn the radio on, the radio chirps and the display briefly shows all features and display segments.




The radio then displays the current channel (larger number in the center) and the frequency assigned to that channel (on the right indicated by **FREQ**).



The Interference Eliminator Code displays briefly (indicated by **CODE**), then the current channel remains displayed.

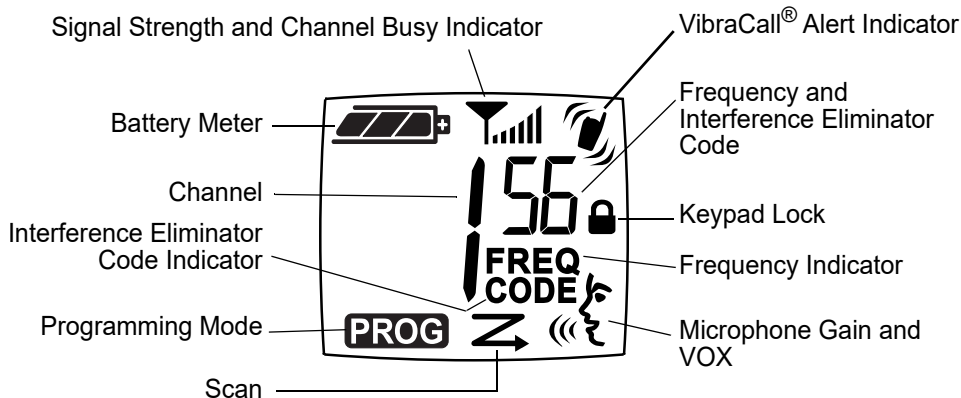


Adjusting the Volume

Turn  clockwise to increase the volume, and counterclockwise to decrease the volume.



Note: Do not hold the radio too close to your ear when adjusting the volume.

Reading the Display




Talking and Receiving


Basic Radio Operation

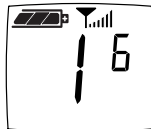
1. Press and hold  to check for channel activity. If you hear static, the channel is clear to use. Do not transmit if someone is speaking on the channel. Press  again to stop monitoring.
2. To talk, press and hold **Push to Talk** and speak into the microphone. Hold the radio 2 to 3 inches away from your mouth.
3. To listen, release **Push to Talk**.

The transmit LED on the top of the radio is red when transmitting.

Signal Strength and Channel Busy Indicators

When there is activity on a frequency, the radio displays  and the transmit light blinks at a faster rate of once per second.

When there is activity on the same frequency and code as your radio (your radio is receiving), the radio displays  and a signal strength from 1 (weakest) to 6 (strongest). This can help determine when a radio is moving out of range.





Note: Obstacles that block the signal path may affect the strength of the incoming signal.

Talk Range

Industrial	Multi-Level
Inside steel/concrete industrial buildings	Inside multi-level buildings
Up to 200,000 sq. ft.	Up to 15 floors





Locking the Keypad

You can lock the keypad to avoid accidentally changing your radio settings.

1. Press and hold  for 3 seconds.
2. To unlock, press and hold  for 3 seconds.

Monitoring a Channel





Monitoring allows you to check for activity on a channel.

1. Press and hold . If the channel is clear to use, you will hear static and  and  will display.
2. Press  again to stop monitoring.



Scanning

You can scan up to 4 channels and frequencies. When the radio detects activity, it stops scanning and locks in on the active channel. This allows you to talk and listen to the person transmitting without changing channels.

1. To start scanning, briefly press .
The scan icon  displays and the radio begins to scan the channels. When the radio detects activity, it stops on that channel and displays  and the channel number.
2. To talk to the person transmitting without switching channels, press **Push to Talk** within 5 seconds. If no transmission occurs within 5 seconds, scanning resumes.
3. To stop scanning, briefly press .

If you press **Push to Talk** while the radio is scanning, the radio transmits on the channel you were on before you started scanning.

Skipping and Removing Channels While Scanning

Scan has two temporary features to make it easier to use.

- Scan advance
If the radio stops scanning on a channel you do not want to listen to, press ⊕ to resume scanning for the next active channel.
- Nuisance delete
Press and hold ⊖ to temporarily remove a channel from the scan list. The channel return the next time you use the scan feature.

Advanced Configuration Mode

Programming mode allows you to change the following settings on your radio:

- Channel
- Configure the operating frequency from a pre-programmed frequency list
- Interference eliminator code
- Call tones
- Microphone gain
- Scan list
- Available channels


Note:

- To talk with someone on your two-way radio, the channel, frequency, and interference eliminator code must be the same on both radios.

Factory Default Settings


Your radio is programmed at the factory to the following settings:

Channel	Frequency
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
Code	1
Call Tone/ VibraCall®	Off (0)
VOX	Off (0)
Microphone Gain	2 (medium sensitivity)

To restore the factory settings, turn the radio on while holding **Push to Talk** and  for 3 seconds.





Entering Advanced Configuration Mode

Advanced Configuration Mode allows you to configure special settings in your radio without the need of a computer.

Press and hold **Push to Talk** and  for 3 seconds while turning the radio on. The radio beeps and displays **PROG**, the channel number blinks, and the frequency (indicated by **FREQ**) and code (indicated by **CODE**) display alternately.





Note: If you press and release the **Push to Talk** button when programming CSL1410 models, you will return to the front of the Advanced Configuration Mode.

Selecting a Channel

1. In advanced configuration mode, press  until the channel number blinks and the frequency and code display alternately (this is the first setting after you enter advanced configuration mode).
2. Press  or  to select the channel.
3. Press and hold **Push to Talk** to exit, or press  to continue programming.



Configuring the Operating Frequency from a Pre-programmed Frequency List





1. In advanced configuration mode, press  until **FREQ** displays and the frequency number blinks.
2. Press  or  to select the frequency.
3. Press and hold **Push to Talk** to exit, or press  to continue programming.

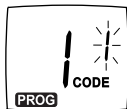


Note: See page 50 for information on frequencies for communicating with other business radios.

Programming the Interference Eliminator Code





The interference eliminator code helps minimize interference by providing code combinations that filter out static, noise, and unwanted messages.

1. In Advanced Configuration mode, press  until **PROG** displays and the code number blinks.
2. Press  or  to select the code (see page 53).
3. Press and hold **Push to Talk** to exit, or press  to continue programming.



Programming the Available Channels

If you need fewer channels, you can reduce the number of available channels.

1. In Advanced Configuration mode, press  until **CH** displays and the channel number blinks.
2. Press  or  to select the number of channels you want available.
3. Press and hold **Push to Talk** to exit, or press  to continue programming.







Note: The radio retains settings for channels made unavailable.


Programming Call Tones and VibraCall®


Your radio can transmit call tones to other radios in your group so you can alert them that you are about to talk. Your radio is programmed at the factory with call tones turned off (set to 0), but you can change this setting to choose a distinctive call tone.

The VibraCall® feature is an additional call tone option that makes the radio vibrate briefly when it receives if you have not transmitted or received in the last 30 seconds. Select call tone 4 to turn VibraCall® on. 📞 displays on the radio when VibraCall® is on.

1. In advanced configuration mode, press  until **CA** displays.
2. Press  or  to hear and select the call tone. Select call tone 4 for VibraCall®.
3. Press and hold **Push to Talk** to exit, or press  to continue programming.












To transmit your call tone, press  on the side of the radio.

Note: When VibraCall (call tone 4) is selected,  button is disabled and radio does not transmit call tone.

Programming Microphone Gain











You can adjust the microphone sensitivity to suit different users or operating environments.

1. In advanced configuration mode, press  until  and  display.
2. Press  or  to select the sensitivity level:
 = High sensitivity, for quiet environments
 = Medium sensitivity (default)
 = Low sensitivity, for loud environments
3. Press and hold **Push to Talk** to exit, or press  to continue programming.



Editing the Scan List

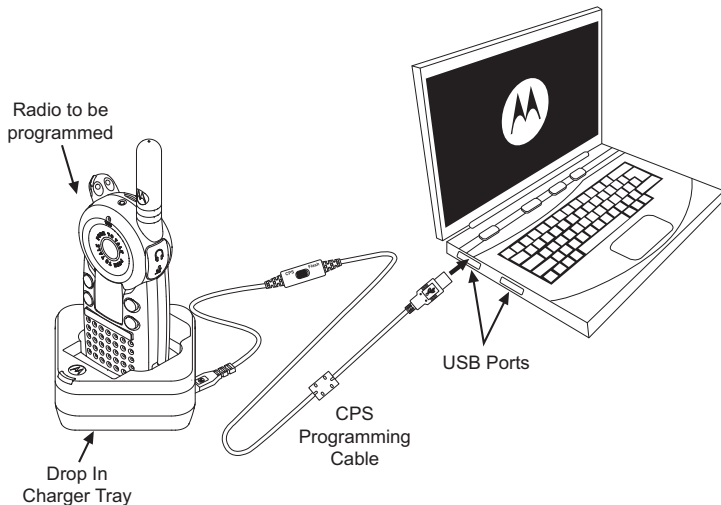
For faster scanning and to avoid hearing unwanted transmissions, you can edit the scan list to skip channels.

1. In advanced configuration mode, press  until  displays and the channel number and  or  blink.
2. Press  or  to select the channel you want to remove from the scan list.
3. Press  to display either  to include the channel or  to exclude the channel.
4. Press and hold **Push to Talk** to exit, or press  to continue programming.



Programming with Customer Programming Software

The easiest way to program or change features in your radio is by using the Customer Programming Software (CPS) and the CPS Programming Cable(*). CPS Software is available for free as web based downloadable software at www.motorolasolutions.com/VL50.



To program, connect the VL50 Series radio via the Drop-in Charger Tray and CPS Programming Cable to your computer as shown in the picture above. Prior to programming, verify that the switch in the Programming Cable is in the 'Analog(**)' position.

CPS allows you to easily program features such as frequency configuration, programming frequencies, PL/CTCSS codes, as well as other features such as: Call Tones, Reverse Burst etc. For more information, refer to Features Summary Chart Section.

Note: (*) CPS Programming Cable P/N# is HKKN4027.

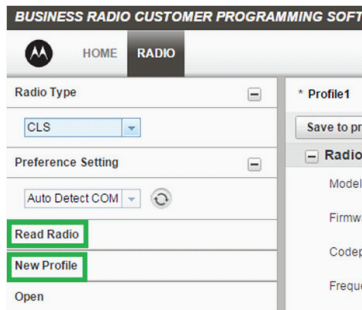
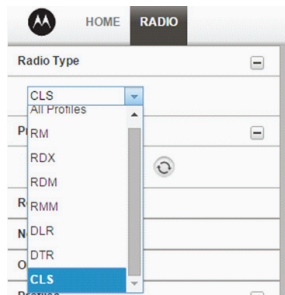
(**) If your CPS Programming Cable is showing "CPS / Flash", make sure to position it to "CPS".

CPS Basic Menu Instructions

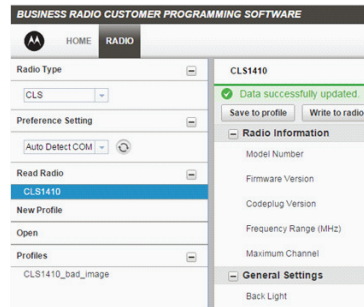
1. Open the CPS software and click on the "RADIO" top tab.
2. Click on the "READ" tab to read the radio(*), or On the drop down menu "Radio Type", select "VL50" if you want to open a new profile or an existing one.

Note: (*) You only need to select the Radio Type, if you want to open a new or pre-determined profile. The CPS is smart enough to determine what model it is reading.

3. Click "Read Radio". Radio sounds a series of beeps to indicate reading is in progress and will upload your radio profile settings, or Click "New Profile" to create customized profile based on the default profile.



4. Once you have changed all the settings, click “Write to radio” in order to program your radio with the new settings. The CPS will display a window confirming the writing (programming of your radio) is successful. You can also save your profile at any time in order to use the same settings when programming other radios by clicking on “Save to profile”. This will save the profile to current default path in your computer. To specify a different path to save the profile, click on the “Save As” button.



Feature Summary Chart

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Backlight	No	Yes	5 sec	Enable or disable backlight by using CPS.
Call Tones	Yes	Yes	OFF	Advanced Configuration available for VL50 Models by going into Advanced Configuration Mode(1). Values available are 0 (OFF), 1, 2, 3 and 4 (Vibrator). To enable/disable Call Tones press Call Button.

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Channels	Yes	Yes	Model Dependent	You can select channels using the + or - button. You can also add or delete channels using the CPS. Note: Enabling/disabling channels via CPS automatically affects the Maximum Channels you are able to program via front panel.

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Cloning Mode	Yes	No	Enabled	Enables radio to enter cloning mode in order to clone its profile settings into other radios (using Radio to Radio Cloning Cable or Multi-Unit Charger). Press PTT, MON while turning radio ON. Note: You can clone radios using the CPS.
Frequencies	Yes	Yes	Channel and Model Dependent	There are 56 UHF frequencies available. Use Advanced Configuration Mode (1) for configuration via the front panel radio programming. Refer to Frequencies and Codes Charts Section for details

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Bandwidth Range	N/A	N/A	Model Depend ant	Radios Bandwidth is fixed and non-programmable. Bandwidth Range for 1W radios: UHF 461-470 Mhz.
Codes, Interference Eliminator Codes (CTCSS/DPL)	Yes	Yes	Channel and Model Depend ant	Use Advanced Configuration Mode for front panel radio configuration. There are 121 codes available. For details refer to Frequencies and Codes Charts Section.
Keypad Beep (or Keypad Tone)	Yes	No	On	Press - button while turning ON radio to enable/disable keypad beep.
Keypad Lock	Yes	No	UNLOCKED	Press and hold (MENU) button for 4 seconds to lock the radio keypad. To unlock, press (MENU) button for 4 seconds.

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Low Battery Alert - Shutdown	N/A	N/A	On	Gives a sequence of loud and high beep tones to alert battery level is low. This a non-programmable feature.
Maximum Channels	Yes	Yes	Model and CPS program mable dependa nt	Use the Advanced Configuration Mode to get the Active Channels Menu option. Note: Default value is set to the maximum number of channels that the radio supports.
Microphone Gain Level	Yes	Yes	Medium (Level 2)	For front panel programming enter Advanced Configuration Mode (1).
Monitor	Yes	N/A	MON Button	Long Press MON to monitor and press SB1 again to release. Note: PL/ DPL defeat feature should be disabled in order to monitor.

Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Nuisance Ch Delete	Yes	N/A	"-" Button	Press MON Button to start scanning and wait until the radio lands on the channel you want to delete. Long press "-" button to delete the channel. Note: The nuisance deleted channel will be restored into the scan list when the radio is turned OFF or you exit SCAN. One channel radio does not support scan.
Scan Advanced	Yes	N/A	"+" Button	Press MON Button to start scanning and wait until the radio lands on the channel you want to skip. Short press "+" button to skip the channel. One channel radio does not support scan.



Features	Programmable via Advanced Configuration	Programmable via CPS	Default	Programming Tips
Reset to Factory Defaults (2)	Yes	N/A	Enabled	Allows to restore radio's factory defaults. Press PTT, Menu simultaneously for 3 seconds while turning ON radio.
Reverse Burst	Yes	Yes	180	Reverse Burst eliminates unwanted noise (squelch tail) during loss of carrier detection. Press PTT, Call Button simultaneously while turning ON radio to toggle between 180 or 240 or use CPS to select values 180 or 240.
Scan	Yes	Yes	MON Button	Short press MON button to enable/disable scan. One channel radio does not support scan.

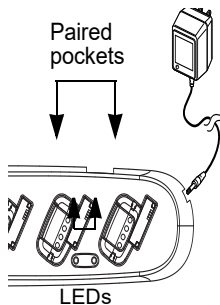
Note: To enter Advanced Configuration Mode, press and hold both PTT and MON simultaneously for 3-5. Short press Menu to get to the different programming options.

Cloning Radio Settings

You can copy VL50 radio settings from one radio (the source) to a second radio using the Multi-Unit Charger (MUC) optional accessory. See the *MUC User's Guide* for more information.


You can clone only one radio at a time. A multi-channel radio can clone to a single-channel radio, but only the first channel is cloned. The MUC does not have to be plugged in for cloning, but both radios require charged batteries.


1. On the source radio, press and hold **Push to Talk** and  for 3 seconds while turning the radio on. The radio beeps and displays **PROG**.
2. Place the source radio in one of the charging pockets.
3. Turn the target radio on and place it in the charging pocket that is paired with the pocket containing the source radio. There are 3 paired charging pockets as indicated by the 3 pairs of charging status LEDs.
4. Press and hold  on the source radio. The source radio transmits its settings to the target radio. If cloning was successful, P or Pass or "F" for Fail displays on the source radio and the target radio displays all feature icons. If cloning was not successful, F or Fail displays on the source radio.
5. Turn the target radio off and back on again to use.
6. To clone another radio, repeat steps 3 and 4.
7. To exit programming mode on the source radio, press and hold **Push to Talk** until **PROG** no longer appears.



Advanced Features


You can set the following features by pressing and holding additional buttons **while turning the radio on**.

To Do This	Press This Button While Turning the Radio On	Default Setting
Turn Keypad Tones On/Off Turns keypad beeps off for silent keypad operation.	⊖	On
Turn End-of-Transmission Tone On/Off If enabled, your two-way radio transmits a tone when you finish transmitting. If keypad tones are off and end-of-transmission tone is on, you will not hear the end-of-transmission tone, but it is transmitted.	⊕	Off
Turn Battery Save Mode On/Off Decreases attack time, which is the brief period of time between when the radio receives a transmission on its frequency and broadcasts audio. Turning battery save mode off decreases battery life by approximately 20%.	Push to Talk 	On

To Do This	Press This Button While Turning the Radio On	Default Setting
Restore Factory Defaults Returns radio to its original factory settings.	Push to Talk 	---

Troubleshooting

Symptom	Try This:
No Power	Recharge or replace Li Ion battery.
Message not transmitted	Make sure Push to Talk is completely pressed while transmitting. Recharge, replace, and/or reposition batteries. Verify the transmit light is illuminated while speaking. Verify Channel, Frequency, and Code settings are correct.
Hearing other noises or conversation on a channel	Frequency may be in use. Change on all radios if possible (see page 28 and 29).
Poor audio quality	Bandwidth does not match. For optimal audio quality when communicating with VL50 radios, the bandwidth of other radios should be set to 12.5 kHz, if possible.
Limited talk range	Steel and/or concrete structures, heavy foliage, buildings, or vehicles decrease range (see page 23). Check for clear line of sight to improve range. Wearing radio close to body such as in a pocket or on a belt decreases range. Change location of radio.

Symptom	Try This:
Message not received	<p>Confirm radios have the same channel, frequency, and interference eliminator code settings (see page 26).</p> <p>Recharge, replace, and/or reposition batteries.</p> <p>Move to another location. Obstructions and operating indoors or in vehicles may decrease range.</p> <p>Verify radio is not in scan mode (see page 24).</p>
Heavy static or interference	<p>Radios are too close. They must be at least 5 feet apart.</p> <p>Radios are too far apart or obstacles are interfering with transmission.</p>
Keypad locked	<p>Unlock by holding  for 3 seconds.</p>
Low batteries	<p>Recharge or replace batteries. Extreme operating temperatures affect battery life.</p>
Charger light does not come on	<p>Reinsert radio and/or battery.</p> <p>Clean battery and/or charger contacts.</p> <p>Verify that the charging pin on the transformer is inserted correctly into the drop-in charger.</p>

Symptom	Try This:
Low battery meter reading although new batteries are installed	Verify radio is set to the correct battery type (see page 16).
Cannot enter PROG mode	Unplug audio accessories and retry.
If Cloning Fails	<p>A) Ensure that there is no debris in the charging tray or on the radio contacts.</p> <p>B) Ensure that the Target radio is turned ON.</p> <p>C) Ensure that the Source radios is in cloning mode.</p> <p>D) Ensure that the two radios are both from the same type (i.e : VL50 Series), same region.</p>

Use and Care



Use a soft damp cloth to clean the exterior.



Do not immerse in water.



Do not use alcohol or cleaning solutions.

If the radio is submerged in water...



Turn radio off and remove batteries.



Dry with soft cloth.



Do not use radio until completely dry.

Frequencies and Bandwidths

These charts provide frequency information and are useful when using Motorola Solutions VL50 radios with other business radios. Frequency Display Number is identical to Spirit M, GT, and S-Series frequency position (where applicable), but bandwidth may be different.

UHF Frequencies

Display Number	Frequency (MHz)	Bandwidth
1	464.5000	12.5
2	464.5500	12.5
3	467.7625	12.5
4	467.8125	12.5
5	467.8500	12.5
6	467.8750	12.5
7	467.9000	12.5

Display Number	Frequency (MHz)	Bandwidth
8	467.9250	12.5
9	461.0375	12.5
10	461.0625	12.5
11	461.0875	12.5
12	461.1125	12.5
13	461.1375	12.5
14	461.1625	12.5

UHF Frequencies (Continued)

Display Number	Frequency (MHz)	Bandwidth
15	461.1875	12.5
16	461.2125	12.5
17	461.2375	12.5
18	461.2625	12.5
19	461.2875	12.5
20	461.3125	12.5
21	461.3375	12.5
22	461.3625	12.5
23	462.7625	12.5
24	462.7875	12.5
25	462.8125	12.5

Display Number	Frequency (MHz)	Bandwidth
26	462.8375	12.5
27	462.8625	12.5
28	462.8875	12.5
29	462.9125	12.5
30	464.4875	12.5
31	464.5125	12.5
32	464.5375	12.5
33	464.5625	12.5
34	466.0375	12.5
35	466.0625	12.5
36	466.0875	12.5

UHF Frequencies (Continued)

Display Number	Frequency (MHz)	Bandwidth
37	466.1125	12.5
38	466.1375	12.5
39	466.1625	12.5
40	466.1875	12.5
41	466.2125	12.5
42	466.2375	12.5
43	466.2625	12.5
44	466.2875	12.5
45	466.3125	12.5
46	466.3375	12.5

Display Number	Frequency (MHz)	Bandwidth
47	466.3625	12.5
48	467.7875	12.5
49	467.8375	12.5
50	467.8625	12.5
51	467.8875	12.5
52	467.9125	12.5
53	469.4875	12.5
54	469.5125	12.5
55	469.5375	12.5
56	469.5625	12.5

Interference Eliminator Codes

Display Number	Code (Hz)
1	67.0
2	71.9
3	74.4
4	77.0
5	79.7
6	82.5
7	85.4
8	88.5
9	91.5
10	94.8
11	97.4
12	100.0
13	103.5

Display Number	Code (Hz)
14	107.2
15	110.9
16	114.8
17	118.8
18	123.0
19	127.3
20	131.8
21	136.5
22	141.3
23	146.2
24	151.4
25	156.7
26	162.2

Display Number	Code (Hz)
27	167.9
28	173.8
29	179.9
30	186.2
31	192.8
32	203.5
33	210.7
34	218.1
35	225.7
36	233.6
37	241.8
38	250.3

Carrier Squelch (0) disables interference eliminator codes.

Digital Interference Eliminator Codes

Display Number	Digital Code
39	023
40	025
41	026
42	031
43	032
44	043
45	047
46	051
47	054
48	065
49	071
50	072
51	073
52	074
53	114

Display Number	Digital Code
54	115
55	116
56	125
57	131
58	132
59	134
60	143
61	152
62	155
63	156
64	162
65	165
66	172
67	174
68	205

Display Number	Digital Code
69	223
70	226
71	243
72	244
73	245
74	251
75	261
76	263
77	265
78	271
79	306
80	311
81	315
82	331
83	343

Digital Interference Eliminator Codes (Continued)

Display Number	Digital Code
84	346
85	351
86	364
87	365
88	371
89	411
90	412
91	413
92	423
93	431
94	432
95	445
96	464

Display Number	Digital Code
97	465
98	466
99	503
100	506
101	516
102	532
103	546
104	565
105	606
106	612
107	624
108	627
109	631

Display Number	Digital Code
110	632
111	654
112	662
113	664
114	703
115	712
116	723
117	731
118	732
119	734
120	743
121	754

Accessories

Batteries

Part No.	Description
PMNN4497_	Li-Ion Battery 1800mAh

Audio Accessories

Part No.	Description
HKLN4599_	Earpiece w/PTT, Mic, Slim Plug, PVC Free
HKLN4601_	Dual Pin Surveillance w/PTT, Slim Plug, PVC Free
HKLN4604_	Swivel Earpiece w/PTT, Slim plug, PVC Free
HKLN4606_	Remote Speaker Mic w/PTT, Slim Plug, PVC Free
HKLN4608_	Transparent Acoustic Tube

Carry Accessories

Part No.	Description
HCLN4013_	Swivel Belt Holster

Chargers

Part No.	Description
PMPN4529A	CLS Single Unit Charger Kit
56531	Multi-Unit Charger

Programming Accessories

Part No.	Description
PMLN7140_	Programming Kit (*)
HKKN4027_	Business Radio CPS Cable Kit
HKKN4028_	Business Radio Cloning Cable Kit

(*) HKKN4027_ CPS Cable Kit must be used with the Programming Cradle

Note: Certain accessories may be or may not be available at the time of purchase. For latest information on accessories, contact your Motorola Solutions point of purchase or visit: www.motorolasolutions.com/VL50.
For product-related questions, contact: 1-800-448-6686

Warranty

Limited Warranty for Motorola Solutions Personal Communications Products Purchased in the United States and Canada

I. What This Warranty Covers

- Subject to the exclusions contained below, Motorola Solutions, Inc. warrants its telephones, pagers, and consumer and business two-way radios (excluding commercial, government or industrial radios) that operate via Family Radio Service or General Mobile Radio Service, Motorola Solutions branded or certified accessories sold for use with these Products ("Accessories") and Motorola Solutions software contained on CD-ROMs or other tangible media and sold for use with these Products ("Software") to be free from defects in materials and workmanship under normal consumer usage for the period(s) outlined below. This limited warranty is a consumer's exclusive remedy, and applies as follows to new Motorola Solutions Products, Accessories and Software purchased by consumers in the United States, which are accompanied by this written warranty.

II. Products and Accessories

- **Products and Accessories as defined above, unless otherwise provided for below.** One (1) year from the date of purchase by the first consumer purchaser of the product unless otherwise provided for below.
- **Decorative Accessories and Cases.** Decorative covers, bezels, PhoneWrap™ covers and cases.

Limited lifetime warranty for the lifetime of ownership by the first consumer purchaser of the product.

- **Business Two-way Radio Accessories.**

One (1) year from the date of purchase by the first consumer purchaser of the product.

- **Products and Accessories that are Repaired or Replaced.**

The balance of the original warranty or for ninety (90) days from the date returned to the consumer, whichever is longer. One (1) year from the date of purchase by the first consumer purchaser of the product.

III. *Products and Accessories (Exclusions)*

- **Normal Wear and Tear.**

Periodic maintenance, repair and replacement of parts due to normal wear and tear are excluded from coverage.

- **Batteries.**

Only batteries whose fully charged capacity falls below 80% of their rated capacity and batteries that leak are covered by this limited warranty.

- **Abuse & Misuse.**

Defects or damage that result from: (a) improper operation, storage, misuse or abuse, accident or neglect, such as physical damage (cracks, scratches, etc.) to the surface of the product resulting from misuse; (b) contact with liquid, water, rain, extreme humidity or heavy perspiration, sand, dirt or the like, extreme heat, or food; (c) use of the Products or Accessories for commercial purposes or subjecting the Product or Accessory to abnormal

usage or conditions; or (d) other acts which are not the fault of Motorola Solutions, are excluded from coverage.

- **Use of Non-Motorola Solutions Products and Accessories.**

Defects or damage that result from the use of Non-Motorola Solutions branded or certified Products, Accessories, Software or other peripheral equipment are excluded from coverage.

- **Unauthorized Service or Modification.**

Defects or damages resulting from service, testing, adjustment, installation, maintenance, alteration, or modification in any way by someone other than Motorola Solutions, or its authorized service centers, are excluded from coverage.

- **Altered Products.**

Products or Accessories with (a) serial numbers or date tags that have been removed, altered or obliterated; (b) broken seals or that show evidence of tampering; (c) mismatched board serial numbers; or (d) nonconforming or non-Motorola Solutions housings, or parts, are excluded from coverage.

- **Communication Services.**

Defects, damages, or the failure of Products, Accessories or Software due to any communication service or signal you may subscribe to or use with the Products Accessories or Software is excluded from coverage.

IV. Software

- **Products Covered**

Software. Applies only to physical defects in the media that embodies the copy of the Software (e.g. CDROM or floppy disk).

- **Length of Coverage**

Ninety (90) days from the date of purchase.

V. Software (Exclusion)

- **Software Embodied in Physical Media**

No warranty is made that the software will meet your requirements or will work in combination with any hardware or software applications provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected.

- **Software NOT Embodied in Physical Media**

Software that is not embodied in physical media (e.g. software that is downloaded from the internet), is provided “as is” and without warranty.

VI. Who is Covered?

This warranty extends only to the first consumer purchaser, and is not transferable.

VII. *How to Obtain Warranty Service Or Other Information?*

Contact your Motorola Solutions point of purchase.

VIII. *Software Copyright Notice*

The Motorola Solutions products described in this manual may include copyrighted Motorola and third party software stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola Solutions and third party software providers certain exclusive rights for copyrighted software, such as the exclusive rights to distribute or reproduce the copyrighted software. Accordingly, any copyrighted software contained in the Motorola Solutions products may not be modified, reverse-engineered, distributed, or reproduced in any manner to the extent allowed by law.

IX. *Software Copyright Notice*

The Motorola Solutions products described in this manual may include copyrighted Motorola Solutions and third party software stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola Solutions and third party software providers certain exclusive rights for copyrighted software, such as the exclusive rights to distribute or reproduce the copyrighted software. Accordingly, any copyrighted software contained in the Motorola Solutions products may not be modified, reverse-engineered, distributed, or reproduced in any manner to the extent allowed by law. Furthermore, the purchase of the 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 or any third party software provider, except for the normal,

nonexclusive, royalty-free license to use that arises by operation of law in the sale of a product.

X. *Patent Notice*

This product is covered by one or more of the following United States patents.

5896277 5894292 5864752 5699006 5742484

D408396 D399821 D387758 D389158 5894592

5893027 5789098 5734975 5861850 D395882

D383745 D389827 D389139 5929825 5926514

5953640 6071640 D413022 D416252 D416893

D433001

XI. *Export Law Assurances*

This product is controlled under the export regulations of the United States of America. The Governments of the United States of America may restrict the exportation or re-exportation of this product to certain destinations. For further information contact the U.S. Department of Commerce.

VL50 Series Programming Quick Reference



Press and hold **Push to Talk** and **MON** for 3 seconds while turning the radio on. The radio beeps and displays **PROG**, the channel number blinks, and the frequency (indicated by **CODE**) and code (indicated by) display alternately.

Set the Channel



Press **⊖** or **⊕**.

Set the Frequency



Press **MON** until **FREQ** displays.
Press **⊖** or **⊕** to change the frequency.

Set the Interference Eliminator Code



Press **MON** until **CODE** displays.
Press **⊖** or **⊕** to change the code.

Set Available Channels*



Press **MON** until **CH** displays.
Press **⊖** or **⊕** to select number of available channels.



VL50 Series *Programming Quick Reference*

Set a Call Tone




Press **MENU** until **CA** displays.

Press **-** or **+** to select **1**, **2**, or **3** for audible call tones, **4** for VibraCall, or **0** for off (default).

Set the Microphone Gain



Press **MENU** until **G** and  display.

Press **-** or **+** to select:

- 1** Low sensitivity
- 2** Medium sensitivity
- 3** High sensitivity

Edit the Scan List



Press **MENU** until **Z** displays and the channel number and **Y** or **n** blink.

Press **-** or **+** to select the channel, then press **MON** to select **Y** (include channel) or **n** (exclude channel).



MOTOROLA SOLUTIONS

Motorola Solutions, Inc.
500 W. Monroe Street
Chicago, IL 60661 U.S.A.

MOTOROLA, MOTO, MOTOROLA SOLUTIONS and the Stylized M logo are trademarks or registered trademarks of Motorola Trademark Holdings, LLC and are used under license. All other trademarks are the property of their respective owners.

© 2003 and 2023 Motorola Solutions, Inc.

All rights reserved.



6881096C37-RC