GP 68

Portable Radios

User Manual

MOTOROLA

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NOTE
Keep this page open for easy reference as you go
through the user guide.

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Introduction

Congratulations on your purchase of a Motorola two-way radio. Your radio is a product of Motorola's more than 50 years of experience as a world leader in the designing and manufacturing of communications equipment. This radio offers superior quality, superior performance, ultimate flexibility and years of reliable and effective communications.

This radio incorporates the latest technology available in two-way radio communications. The use of micro-computer technology makes changing radio character-istics such as operating frequencies and squelch codes both economical and fast. Any computer equipped dealer can easily reprogram your radio's operating characteristics.

The radio meets tough environmental demands while providing cost-effective and reliable communications. It meets established standards for low pressure, high temperature, low temperature, temperature shock, solar radiation, rain, humidity, salt fog, dust, vibration, and shock. This radio also meets the Electronic Indus-try Association RS316B electrical and mechanical specifications. The Motorola Accelerated Life Test (ALT) assures that possible failures brought on by field stress and abuse are identified and designed out of your radio before it reaches your hands.

All of these features provide for better, yet more cost effective communications for you.

Coverage of this User Guide

This user guide describes the operation of radios with and without a keypad.
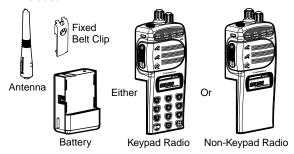

NOTE

The keypad symbol shown here indicates that the feature is only available on radios with keypads. This will be the convention used throughout this user guide.

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Packing Information

When you receive your packaged Motorola radio, inspect the shipping carton for any signs of damage. Next, remove and check the contents of the packing case to be sure that all items ordered have been included.

Fixed Belt Clip

Antenna

Battery

Either

Or

Keypad Radio   Non-Keypad Radio

Standard Packaged Model Contents

- *Keypad Radio or Non-Keypad Radio*
- *Battery*
- *Antenna*
- *Fixed Belt Clip*
- *User Manual*

Inspect the equipment thoroughly. If any part of the equipment has been damaged in transit, report the extent of the damage to the transportation company immediately.

NOTE

The radio as shipped accepts rechargeable NiCd battery cell-pack (available as standard or high capacity packs). Please refer to page 54 for a complete list of available accessories.

Knobs, Buttons, Connectors and Others

NOTE
The numbers in brackets below refer to the locations of the control buttons, knobs, etc. as shown in the illustration on the inside front cover.

On / Off and Volume Knob (1)

Turns the radio on and off and adjusts the volume level.

Channel Selector Knob (2)

❶ Selects the channel and squelch level.

❷ Changes the direction of scanning when the radio is in scan mode.

Antenna Connector (3)

Connects antenna to the radio.

Toggle Light / Enter Button (4)

❶ Toggles display backlight status.

❷ Confirms user input (quick press).

Monitor Button (5)

Monitors the channel for activities (squelch is disabled).

Push-To-Talk (PTT) Button (6)

❶ Push to talk, release to listen.

❷ Press and hold when making DTMF dialling.

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Signal Button (7), $\underset{\text{A}}{\overset{\text{SIG}}{\frown}}$

❶ Toggles between *Carrier*, *Coded* (*PL / DPL*), and *Signalling Squelch* modes.

❷ DTMF (Dual Tone Multiple Frequencies) digit 'A'.

Squelch Button (8), $\underset{\text{B}}{\overset{\text{SQL}}{\frown}}$

❶ Selects Carrier Squelch level.

❷ DTMF digit 'B'.

Low Power Button (9), $\underset{\text{C}}{\overset{\text{LOW}}{\frown}}$

❶ Toggles between high and low transmit power.

❷ DTMF digit 'C'.

Scan / Nuisance Delete Button (10), $\underset{\text{N-DEL}}{\overset{\text{SCAN}}{\underset{\text{D}}{\frown}}}$

❶ Enables / disables scanning (quick press).

❷ Deletes a Nuisance Channel (long press).

❸ DTMF digit 'D'.

Microphone (11)

Used in the process of transmitting messages.

Speaker (12)

Used in the process of receiving messages.

Backspace Button (13), ✏

When editing phone numbers and IDs, this key acts as a backspace (rub-out) key.

*Left Scroll Button (14)***,**

Scrolls to the left when editing phone numbers and IDs.

*Right Scroll Button (15)***,**   (non-keypad models)

(keypad models)

❶ Scrolls to the right when editing phone numbers and IDs.

❷ If held on power-up, radio enters into *Special Pro-gramming* mode.

❸ Stores / recalls phone numbers, phone access and phone deaccess code (keypad models only).

Accessory Connector (16)

Connects accessories such as remote speaker microphone or external handset to radio.

SCI Port (17)

Used to service and to clone the radio.

LCD Screen (18)

Displays information about the current state of the radio (see ***"LCD Segments and Indicators"*** on page 38).

NOTE

Items 19 to 21 are only applicable to keypad / display models.

Numeric Keypad (19)

DTMF digits '0' to '9'.

6

*Enable / Disable PTT ID Key (20)***,** `#`

   ❶ Enables / disables PTT ID (long press).

   ❷ DTMF digit '#'.

   ❸ Pressing this key after 🔘 sends the programmed phone deaccess code.

   ❹ Pressing this key immediately following 🔒✳, inserts a pause.

*Lock / Unlock Key (21)***,** 🔒✳

   ❶ Locks / unlocks the keypad (long press).

   ❷ DTMF digit '✳'.

   ❸ Pressing this key after 🔘 sends the programmed phone access code.

Battery Pack (22)

   Power supply to the radio.

Battery Latches (23)

   For attaching battery tray / pack to the radio.

Getting Started

Attaching and Removing the Antenna

Attaching

❶ *Fasten the antenna to the radio by placing the threaded end of the antenna into the Antenna Connector (3).*

❷ *Rotate the antenna clockwise until tight.*

Removing

• *Turn the antenna in an anti-clockwise direction until it disengages from the radio.*

Attaching and Removing the Belt Clip

Attaching

❶ *Align mounting rails of the radio with the grooves of belt clip.*

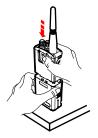❷ *Slide belt clip downwards until it clicks into place.*

Removing

❶ *Insert the end of a key between the release tab and the back surface of the radio.*

❷ *Lift the release tab; slide the belt clip upwards.*

Installing and Removing Batteries

Installing

❶ *Align the Battery Pack (22) with the back of the radio.*

❷ *Slide the Battery Pack (22) into place.*

Removing

❶ *Release the Battery Latches (23).*

❷ *Slide the Battery Pack (22) away from the radio.*

Charging NiCd Battery Pack

Before using your radio with a rechargeable (NiCd) battery, you must charge the battery.

WARNING
DO NOT attempt to charge your radio if you are using alkaline batteries. Doing this may cause the batteries to leak or explode, leading to severe skin burns or eye injuries.

IMPORTANT
Transmitting a message while your radio is charging can cause the radio or the charger to operate improperly. **DO NOT** transmit when your radio is charging.

NOTE
Your radio may take twice as long to charge if it is not turned off during charging.

Charging your Battery for the FIRST time

New batteries are supplied in a totally uncharged state. To ensure maximum battery performance, a new battery MUST be FULLY charged. Refer to the following table for guidelines.

Table 1: Length of time required to fully charge a new battery

	Standard Capacity NiCd Battery Pack	High Capacity NiCd Battery Pack
Wall Charger (with/ without Wall Charger Base)	16 hours	20 hours
Standard Desktop Charger	16 hours	16 hours
Quick Charge Desktop Charger	16 hours	16 hours

Charging your Battery Subsequently

Refer to the following table for guidelines on recharging your batteries.

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Table 2: Length of time required to fully recharge a used battery

	Standard Capacity NiCd Battery Pack	High Capacity NiCd Battery Pack
Wall Charger (with/ without Wall Charger Base)	10 hours	20 hours
Standard Desktop Charger	10 hours	10 hours
Quick Charge Desktop Charger	3 hours	3 hours

NOTE
A battery that is left unused for several months will be completely discharged. In this case, follow guidelines in Table 1 on page 10 to recharge the battery.

Charging with Wall Charger

❶ *Make sure the battery pack is attached to the radio.*

NOTE
With the Charger Base, the battery can be charged when connected or not connected to the radio.

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❷ *Turn the radio off (if it is turned on).*

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If not using the Charger Base:

❸ *Lift the dust cover covering the Accessory Connector (16).*

❹ *Insert one end of the Wall Charger into the lower port of the Accessory Connector (16), and the other into an electrical outlet.*

If using the Charger Base:

❸ *Insert the radio / battery into the charging docket.*

❹ *Refer to Table 1 and 2 on pages 10 and 11 for an estimation of the duration involved for charging the battery pack.*

❺ *Unplug the Wall Charger from the radio when charging is complete.*

NOTE

The LED on the *Wall Charger* is lit (red) continuously during charging.

Charging with Desktop Charger

NOTE

With Desktop Chargers, the battery can be charged when connected or not connected to the radio.

❶ *Place the Charger Insert into the Desktop Charger.*

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❷ *Insert the radio / battery into the charging docket.*

If using the Quick Charge Desktop Charger:

❶ *Press the Quick Charge button.*

❷ *Refer to Table 1 and 2 on pages 10 and 11 for an estimation of the duration involved for charging the battery pack.*

❸ *Remove the radio / battery from the charger when charging is complete.*

NOTE

The LED on the charger lights up continuously during charging. For the Standard Desktop Charger, it is red for the whole charging period. For the Quick Charge Desktop Charger, it changes from yellow (before charging begins) to red (during charging) to green (when charging is completed).

CAUTION

The Quick Charge Desktop charger runs on a 3-hour timer which begins counting each time you press the *Quick Charge* button**.** Removing the battery or radio from the charger before the battery is fully charged, or removing and replacing battery / radio repeatedly during charging, and then pressing the *Quick Charge* button again can overcharge or damage the battery. Press the *Quick Charge* button only when the battery needs to be fully charged.

Basic Operations

Turning the Radio On

- *Rotate the **On / Off and Volume Knob (1)** clockwise to turn the radio on.*

Turning the Radio Off

- *Rotate the **On / Off and Volume Knob (1)** anticlockwise until a click is heard to turn the radio off.*

Adjusting the Volume

- *Rotate the **On / Off and Volume Knob (1)** clockwise to increase your radio's volume level, or anticlockwise to decrease it.*

NOTE
To do an initial setting of the volume, press and hold the **Monitor Button (5)** until the background noise is heard. Continue holding the **Monitor Button (5)** while adjusting to the desired volume.

Selecting a Channel

The radio is preconfigured by the dealer for use with your communications system. Up to 20 programmed channels may be available. Each channel consists of a frequency pair - one transmit frequency and one receive frequency.

- *Rotate the **Channel Selector Knob (2)** to the desired channel.*

The **LCD Screen (18)** shows the channel that the radio is operating on.

```
Ch. 10
```

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NOTE

Empty memory / unprogrammed channels are not displayed.

High / Low Power Output

- *Press* $\overset{\text{LOW}}{\text{C}}$ *to toggle between high and low power output levels.*

NOTE

The indicator **LOW** lights up on the *LCD Screen (18)* when the radio is operating in *low power* mode.

NOTE

High power mode can improve the clarity of voice activity in areas where signals are weak while low power mode extends battery life.

Transmitting

❶ *Select the desired channel by rotating the Channel Selector Knob (2).*

❷ *Press and hold the Monitor Button (5), and listen for channel activity.*

❸ *If the channel is clear, press the Push-To-Talk (PTT) Button (6) and speak clearly into the Microphone (11) (see "Information For Safe, Efficient Operation" on page 43 for more information).*

```
TX
 Ch. 10
```

15

Basic Operations

NOTE

Unless disabled ('dot' indicator flashes on the **LCD Screen (18)**), *PTT ID tones* are heard as they are being transmitted (see "**PTT ID"** on page 17). You can start your conversation when the tones end.

NOTE

The '**TX**' indicator lights up on the **LCD Screen (18)** when the **Push-To-Talk (PTT) Button (6)** is pressed.

IMPORTANT

Whenever you transmit a message, you are using the resources of the transmitting channel. Speaking for long periods of time would deprive others from using that channel.

NOTE

The maximum duration for transmission is determined by the value of the *Time-Out-Timer* (see "***Editing the Time-Out Timer Duration"*** on page 33). Once you reach the time limit, a *Time-Out Timer Alert tone* is sounded, and the transmission is cut off.

Receiving

- *If the **Push-To-Talk (PTT) Button (6)** is pressed, release it and listen for incoming messages.*

NOTE

Make sure the volume level is set properly, or else you may receive a message but are unaware about it.

16

Additional Operations

Display Backlight

- *Press the Toggle Light / Enter Button (4) to turn on / off the backlight.*

NOTE

To conserve power, the backlight is programmed to automatically turn off after 5 seconds.

NOTE

Pressing either the *Push-To-Talk (PTT) Button (6)* or the *Monitor Button (5)* has no effect on the backlight.

PTT ID

If programmed, the radio transmits a DTMF identification code (unit ID), indicating which portable is in operation.

During a conversation, the code is normally sent only on the initial *Push-To-Talk (PTT) Button (6)* press (unless PTT ID has been disabled). The '**TX**' indicator lights for the duration of the PTT ID. If there is no PTT or receive activity for 7 seconds, or if you change the channel (or scan resumes), the PTT ID is once again transmitted on the next *Push-To-Talk (PTT) Button (6)* press.

- *Press and hold # to enable / disable PTT ID.*

NOTE

Upon pressing #, you will hear a beep. Hold the button down until you hear a second beep, indicating that the PTT ID status has been changed. When PTT ID is *disabled*, the 'dot' indicator flashes on the display (To enable / disable PTT ID on non-keypad radios, please contact your dealer).

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Locking / Unlocking the Radio's Function

Locking the radio will disable all buttons except the *Toggle Light / Enter Button (4)*, *Monitor Button (5)*, *Push-To-Talk (PTT) Button (6)* and 🔒✻. Pressing a locked button will result ⌐⌐⌐ being shown on the *LCD Screen (18)*.To lock / unlock the radio:

• *Press and hold* 🔒✻ *(for about 2 seconds) until two beeps are heard.*

NOTE

The *lock* / *unlock* status remains unchanged even when the power is turned off.

Changing Squelch Modes

Squelch acts as a kind of filtering system which helps to control the amount of signals the radio receives. Configuring the radio to receive only the desired signals minimizes interference from other users of the same channel.

This radio supports *Carrier Squelch (CSQ), Coded Squelch - Tone Private-Line (PL)*, *Digital Private-Line (DPL)* and *Signalling Squelch - Voice Selective Call (SelCall)* operations on a per channel basis.

Carrier Squelch transmission allows all radios tuned to the selected receive channel (frequency) to hear the conversation. *Coded Squelch* transmission only allows radio(s) having the same *PL / DPL* code on the selected receive channel (frequency) to hear the conversation. S*ignalling Squelch* transmission can only be decoded by radios with the valid *Voice Selective Call (SelCall)* identification code (see **"Voice Selective Call (Optional)"** on page 27).

18

NOTE

To perform *Signalling Squelch (SelCall)* operation, the radio must be equipped with an optional *DTMF Decode board.*

To temporarily override the default receive squelch mode for the channel:

• *Press ＳＩＧ/Ａ to change between Carrier (CSQ), Coded (PL / DPL) and Signalling (SelCall) squelch modes.*

NOTE

The '**CTCSS**' indicator lights up continuously when the radio is operating in *Coded (PL / DPL)* mode, flashes when operating in *Signalling (SelCall)* mode and is not displayed when operating in *Carrier (CSQ)* mode.

NOTE

To select *Coded Squelch* mode while receiving, the channel must be pre-programmed with a receive PL / DPL code. The transmit squelch mode is fixed and cannot be changed by the user. The squelch mode is reset to the pre-programmed receive squelch mode for the channel whenever you change channels.

NOTE

Whenever you switch from one channel to the other, the default squelch mode of the new channel takes effect.

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Setting Squelch Level

An open (low) squelch level sets the threshold for the receiving signal strength to be low. This means that the radio would receive a great variety of signals, both weak and strong. A tighter (higher) squelch level raises the threshold, thus filtering weak signals and only accepting the stronger ones. To set the squelch level:

❶ *Press $\frac{SQL}{B}$.*

```
 5qL.02
```

❷ *Rotate the Channel Selector Knob (2) to select the desired squelch level.*

❸ *Press the Toggle Light / Enter Button (4) (or any other button) momentarily to adopt the selected squelch level and return to normal operating mode.*

IMPORTANT

The radio automatically adopts the new squelch level and returns to normal operation after 5 seconds of inactivity.

NOTE

If you reach the upper ('**15**') or lower ('**00**') limit of the squelch range, the squelch level does NOT wrap around to the opposite limit but remains where it is.

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Scan Operations

Scan operation tells the radio to monitor a list of pre-programmed channels (see *"Editing the Channel Scan List"* on page 31). When there are some activities at a particular channel, the radio stops scanning and changes to that channel.

NOTE

Each channel is given the same scan priority i.e. *non-priority* scan.

IMPORTANT

The radio will not recall the scan state if it is powered off while scanning.

NOTE

Channels may be temporarily removed from the scan list using the Nuisance Channel Delete feature (see *"Deleting a Nuisance Channel"* on page 22).

• *Press* ^{SCAN}(D)_{N-DEL} *momentarily to begin channel scanning.*

```
Ch.08      SCAN
```

NOTE

While scanning is in progress, the *Home Channel* (the channel the radio was active at before (D) was pressed) is displayed until activity is received on another channel.

To stop the scan operation:

• *Press* ^{SCAN}(D)_{N-DEL} *again momentarily.*

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NOTE

While scanning is in progress, if the *Push-To-Talk (PTT) Button (6)* is pressed, the radio would transmit on the *Home Channel*. However, if the radio has stopped scanning and is receiving signals from a particular channel, all transmit and receive activity would be performed on that channel. Once the scan locks at a channel, a short "hang time" (about 7 seconds) occurs. This is to allow a response to be made before scanning resumes.

Deleting a Nuisance Channel

When the radio is scanning, it would stop at any channel with activity. A channel that generates unwanted signals continuously is called a *Nuisance Channel*. To temporarily remove the channel from the scan list:

• *Press and hold* $\overset{\text{SCAN}}{\underset{\text{N-DEL}}{\boxed{\text{D}}}}$ *(for about 2 seconds) while scan locks on the Nuisance Channel.*

NOTE

Two medium-pitched "beeps" are sounded, indicating that the radio has temporarily removed the *Nuisance Channel* from its scan list.

NOTE

If an attempt to perform a *Nuisance Channel Delete* on the *Home Channel* is made, an *Invalid Button Press* alert tone will sound and no action will be taken. This ensures the availability of a channel when the radio is used to transmit.

IMPORTANT

To add a deleted channel back into the scan list, exit and reenter the scan function or restart the radio.

22

DTMF Telephone Interconnect

Dual Tone Multiple Frequency (DTMF) tones are encoded by the radio to dial into (**access**) the landline telephone network and return (**deaccess)** to conventional radio operation.

Once the telephone network has been accessed, phone numbers can be dialled either manually or from memory. The keypad provides support for DTMF digits **0** to **9**, and the characters **A**, **B**, **C**, **D**, ∗ and **#**.

NOTE
The radio is capable of storing a maximum of 9 pre-programmed phone numbers (up to 12 digits each).

Placing a Telephone Call

To place a call:

➊ *Press and hold the Push-To-Talk (PTT) Button (6).*

➋ *Dial the access code manually using the DTMF keys or press 🔘 then 🔲 to send the prepro-grammed access code.*

➌ *Release the Push-To-Talk (PTT) Button (6) and wait for a dial tone.*

➍ *Press and hold the Push-To-Talk (PTT) Button (6) and either manually dial the telephone number or press 🔘 and the phone number location that stores the preprogrammed telephone number.*

➎ *Press the Push-To-Talk (PTT) Button (6) to talk; release to listen.*

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NOTE

If you press a phone number location which has not been programmed, the radio will sound an *Invalid Button Press* tone and no further action is taken.

To hang up:

❶ *Press and hold the Push-To-Talk (PTT) Button (6).*

❷ *Manually dial the deaccess code or press* ✎ *then* [#] *to send the preprogrammed deaccess code.*

Last Number Redial

Manually dialled phone numbers (up to 16 digits long) are stored in numeric location "**0**" for quick redial capabilities. They are sent exactly as preprogrammed telephone numbers are. After you receive a dial tone:

• *Press and hold Push-To-Talk (PTT) Button (6), then press* ✎ *and* [0] *.*

NOTE

Last Number Redial only stores manually dialled numbers and NOT preprogrammed telephone numbers. The number set is stored in phone location 0 until the radio is turned off or until another DTMF sequence is manually dialled.
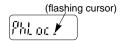

NOTE

If you attempt to perform a last number redial where no manual numbers have yet been dialled since radio power-up, the radio will sound an *Invalid Button Press* tone.

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Storing a Phone Number

A maximum of 9 telephone numbers (up to 12 digits each) can be stored into the radio memory. Each phone number is stored and recalled via a unique number on the keypad in the range of **1** to **9**. The following procedure can also be used to store the access / deaccess codes (up to 8 digits each):

❶ *Press and hold* ![MEM] *until you hear a second Valid Button Press tone (takes about 2 seconds).*

(flashing cursor)

PhLoc↗

❷ *Enter a phone number location (in the range of **1** to **9**) to store a phone number or press* 🔒✳ *to store the access code or* #️⃣ *to store the deacess code.*

❸ *Enter the phone number (up to 12 digits long), or access / deaccess code (up to 8 digits long).*

NOTE

Valid digits are DTMF digits **0** to **9**, the characters **A**, **B**, **C**, **D**, ∗ and **#**, and pause digits.

NOTE

Pause digit (🔒✳ #️⃣)causes the radio to wait in between transmission of the digits programmed before and after it. One or more pause digits can be entered between successive digits of the phone number (or access / deaccess code). When a pause digit is successfully entered, two beeps are heard; the display changes from '**A**' to '**-**'. Pause digits placed at the end of a phone number are not remembered by the radio.

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NOTE

If you make a mistake, press ✎ to scroll the cursor to the left and erase the incorrect entry. To view a numeric sequence of more than 6 digits, press ✎ or ✎ to scroll the cursor to the left or right.

NOTE

All undefined digits are represented by underscores on the *LCD Screen (18)*. A flashing '_' indicates the position for the next number entry. If you reach the maximum number of entries, the cursor position is under the last digit. An *Invalid Button Press* tone will sound if you attempt to enter more than the maximum number of digits.

---

❹ *Press the Toggle Light / Enter Button (4) to store the phone number (or access / deaccess code) into the designated location and return to normal operation.*

Displaying a Stored Phone Number

❶ *Press* ✎ *momentarily in the receive mode. A Valid Button Press tone is heard.*

❷ *Enter a one-digit phone number location (in the range of 1 to 9) to view the stored phone number or press* 🔒✱ */* # */ to view the access / deaccess code or press* 0 *to review the last number dialled.*

NOTE

If the keypad entry is valid, the *LCD Screen (18)* displays the first 6 digits of the stored phone number or code. For number sequences more than 6 digits, after 2 seconds the number begins auto-scrolling to the left in 1 second increments until the last digit is displayed. If the selected phone location is empty, an *Invalid Button Press* tone is heard.

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Voice Selective Call (Optional)

To support Voice Selective Call (SelCall) operation, the radio must be equipped with an optional DTMF Decode board.

NOTE

For more information about the availability of this option, contact your dealer.

If your radio is equipped with the Voice Selective Call option, your radio can be called individually by another user, or as part of a small group.

Receiving a Voice Selective Call

When the radio decodes a Voice Selective Call, the *LCD Screen (18)* indicates the type of SelCall message being received:

Individual Call ⎹ IndCAL ⎹

Group Call ⎹ GrPCAL ⎹

ALL Call ⎹ ALLCAL ⎹

NOTE

The radio will give an alert tone when it successfully decodes a Voice Selective Call. If either *Selective Call Tone Status* or *Alert Tone Volume* is set to "**OFF**" (see page 33 and 35), no tone is heard.

For an *Individual Call*, the radio automatically transmits an *Acknowledgement* message back to the calling radio, if an *Acknowledgement ID* has been preprogrammed by the dealer.

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Voice Selective Call (Optional)

When the radio decodes a Voice Selective Call, it enters the carrier squelch mode for a period of time. If there is no receive activity, the radio resumes the selected squelch mode and the *LCD Screen (18)* reverts to the appropriate receive mode display.

IMPORTANT

If the *Channel Selector Knob (2)* is rotated or any buttons pressed while the *SelCall* signal is in progress, the *SelCall* message disappears and the *Selective Call* is lost.

Sending a Voice Selective Call

❶ *Press and hold the Push-To-Talk (PTT) Button (6).*

❷ *Dial the required Selective Call ID.*

❸ *Release the Push-To-Talk (PTT) Button (6).*

NOTE

For an *Individual Call*, the radio indicates that the call was received by generating two short ringing tones.

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Special Programming Mode (SPM)

The Special Programming mode (SPM) allows you to edit all user-modifiable parameters within your radio, such as the *Channel Scan list*, *Phone Access / Deaccess codes*, and *Alert Tone Settings*. Certain parameters (such as the *Selective Call Tone Status*) are only accessible with the installation of an option board. Upon entry to the Special Programming mode, the radio initiates the *SPM Browse* menu which provides you with a menu of available parameters and their current settings.

Entering SPM

❶ *Turn the radio off (if it is on).*

❷ *Turn the radio on while holding* ⬮ *(or* MEM *).* *Keep holding this button until a SPM start-up tone sounds.*

NOTE

At power-up, all display segments light up for about 2 seconds. If successful, the *LCD Screen (18)* displays 5cnJ 5t.

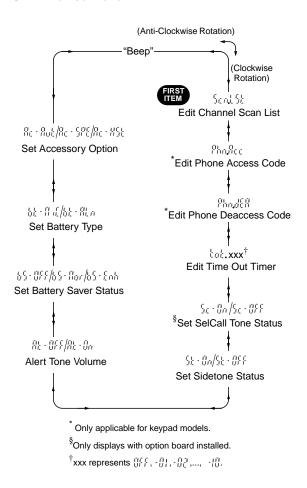**NOTE**

If the battery level is low, the display indicates rPLbAt and the '**BATT**' indicator flashes. The radio also sounds a *Low Battery* alert tone. Turn off the radio and replace or recharge the battery.

Exiting SPM

• *Turn off the radio to exit SPM.*

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SPM Browse Menu

(Anti-Clockwise Rotation)

"Beep"

(Clockwise Rotation)

FIRST ITEM ScnLSt
Edit Channel Scan List

Ac - Aut/Ac - SPE/Ac - HSt
Set Accessory Option

*Edit Phone Access Code
PhnAcc

bt - N iC/bt - ALn
Set Battery Type

*Edit Phone Deaccess Code
PhndEA

bS - OFF/bS - Nor/bS - Enh
Set Battery Saver Status

tot.xxx†
Edit Time Out Timer

§Set SelCall Tone Status
Sc - On/Sc - OFF

At - OFF/At - On
Alert Tone Volume

Set Sidetone Status
St - On/St - OFF

* Only applicable for keypad models.

§Only displays with option board installed.

†xxx represents OFF, -01, -02,..., -10.

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Editing SPM Parameters

Editing the Channel Scan List

❶ *In SPM, rotate the Channel Selector Knob (2) to select the Edit Channel Scan List (ScnLSt) menu item.*

❷ *Use ▱ or ▱ (or ⬙) to scroll through the channels (01 to 20).*

NOTE
The channel scan list does not wrap around to the opposite end of the list. Instead, an *Invalid Button Press* tone sounds when you have reached the upper or lower limit of the list.

NOTE
A flashing channel number indicates that the channel is excluded from the scan list.
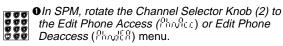
---

❸ *Press the Toggle Light / Enter Button (4) to toggle the status of a channel i.e. being included or excluded from the scan list.*

NOTE
A *Valid Button Press* tone sounds when the new setting is stored.

---

❹ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

Editing the Phone Access / Deaccess Codes

❶*In SPM, rotate the Channel Selector Knob (2) to the Edit Phone Access (PhnAcc) or Edit Phone Deaccess (PhndCA) menu.*

❷ *Press ▱ or ⬙ to enter the edit mode.*

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NOTE

The *LCD Screen (18)* displays the current access /
deaccess code. For a code which exceeds the 6-
digit display length, the rightmost digit flashes to
indicate that more digits exist on the right.

---

❸ *Enter the new access / deaccess code (up to 8 dig-*
its) using any of the numeric keys, A, B, C, D, and*
#.

NOTE

The *LCD Screen (18)* shows the new digits as they
are being entered. When the cursor is flashing
under a digit, the maximum number has been
entered. Use ✐ or ✐ to scroll through the
existing code and ✐ to erase unwanted digits.

NOTE

Pause digit (⊡✕ #)causes the radio to wait in
between transmission of the digits programmed
before and after it. One or more pause digits can be
entered between successive digits of the phone
access / deaccess codes. When a pause digit is
successfully keyed, two beeps are heard; the dis-
play changes from '**A**' to '**-**'. Pause digits placed at
the end of a phone number are not remembered by
the radio.

---

❹ *Press the Toggle Light / Enter Button (4) to store*
the new code and return to SPM Browse Menu.

NOTE

A *Valid Button Press* tone sounds when the new
setting is stored.

---

❺ *To abort data entry, select another menu item by*
turning the Channel Selector Knob (2) or wait until

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the edit mode time-out (after 5 seconds of inactivity).

Editing the Time-Out Timer Duration

❶ *In SPM, rotate the Channel Selector Knob (2) to the Edit Time Out Timer (ƚoƚ.xxx) menu.*

NOTE

xxx represents one of 𝘖𝘍𝘍, ·𝟢𝟣, ·𝟢𝟤, ..., ·𝟣𝟢. The default display of ƚoƚ·𝟢𝟣 shows the time-out timer setting of one minute. If the display shows ƚoƚ.𝘖𝘍𝘍, this indicates that the time-out timer is disabled. This means that there is no limit on the transmit time.

---

❷ *Use ⬮ or ⬮ (or ⬮) to change the current status.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

Setting the Selective Call Tone Status

Selective Call alert tones give an audible indication of receipt of a **Voice Selective Call** (*SelCall*). If disabled, the alert tones do not sound when *Voice Selective Call* messages are received by the radio.

NOTE

Setting the Alert Tone Volume to off disables all tones regardless of the setting of this parameter (see *"Setting the Alert Tone Volume"* on page 35).

---

❶ *In SPM, rotate the Channel Selector Knob (2) to the Set SelCall Tone Status (Sc-On or Sc-OFF) menu.*

❷ *Use ◁ or ▷ (or MEM) to toggle between On and Off.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

Setting the Sidetones Status

If transmit sidetones is disabled, DTMF sidetones such as phone number and PTT ID sidetones are not heard during transmission.

❶ *In SPM, rotate the Channel Selector Knob (2) to the Set Sidetones Status (St-On or St-OFF) menu.*

❷ *Use ◁ or ▷ (or MEM) to toggle between On and Off.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

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Setting the Alert Tone Volume

❶ *In SPM, rotate the Channel Selector Knob (2) to the Alert Tone Volume (⌁⌁-⌁⌁⌁ or ⌁⌁-⌁⌁) menu.*

❷ *Use ⬮ or ⬮ (or ⬮) to toggle between On and Off.*

NOTE

When ⌁⌁-⌁⌁ is chosen, the alert tone volume follows the volume control setting (see **"Adjusting the Volume"** on page 14).

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

Setting the Battery Saver Status

When enabled, the Battery Saver feature increases the amount of time between battery replacement or charging. Battery power is conserved by turning off the receiver circuitry, except for periodic checks for carrier activity.

❶ *In SPM, rotate the Channel Selector Knob (2) to the Set Battery Saver Status (⌁⌁-⌁⌁⌁ - Off, or ⌁⌁-⌁⌁⌁ - Normal, or ⌁⌁-⌁⌁⌁ - Enhanced) menu.*

❷ *Use the ⬮ or ⬮ (or ⬮) to scroll through the three options.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

NOTE

The Battery Saver feature is not active during channel scanning, when the *Push-To-Talk (PTT) Button (6)* is pressed, or when the radio is receiving a signal.

Setting the Battery Type

❶ *In SPM, rotate the Channel Selector Knob (2) to the Set Battery Type (bt·ALn - Alkaline (standard battery) or bt·Ad - NiCd (rechargeable battery)) menu.*

❷ *Use the ⬅ or ➡ (or ⬆) to scroll through the three options.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

IMPORTANT

The *Battery Type* must be correctly set for **Low Battery Alert** to perform accurately.

Setting the Accessory Sense Option

This menu item determines the type of accessory in use by the radio (if any), such as a headset, earpiece, or speaker microphone. There are three options available: *Autosense*, *Headset Only* and *Speaker Microphone Only.*

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❶ *In SPM, rotate the Channel Selector Knob (2) to the Set Accessory Option (* Ac - Aut *- Autosense or* Ac - SPE *- Speaker Microphone Only or* Ac - HSE *- Headset Only)* menu.

❷ *Use the* 🔘 *or* 🔘 *(or* 🔘 *) to scroll through the three options.*

CAUTION

The new setting is stored immediately.

---

❸ *To exit this menu, select another menu item by turning the Channel Selector Knob (2).*

NOTE

When *Autosense* is selected, the radio checks the accessory jack to see what type of accessory is connected. When *Headset Only* is selected, the radio supports only an earpiece or headset, and all external PTT inputs are ignored. When *Speaker Microphone Only* is selected, the radio assumes that an accessory with an external PTT switch will be used to transmit voice. The radio's internal microphone will not transmit voice whenever an accessory is connected.

IMPORTANT

The radio should be turned off when an audio accessory with a microphone is connected to the radio. This is to ensure the proper operation of the *Push-To-Talk (PTT) Button (6)*.

LCD Segments and Indicators

Indicators

TX - Lights up when radio is transmitting.

LOW - Lights up when radio is in low transmit power mode.

CTCSS - Lights up continuously for Coded Squelch mode; Off for Carrier Squelch mode; Flashes for Signalling Squelch mode (if available).

SCAN - Flashes when radio is scanning; Lights up continuously when scan is suspended.

BATT - Flashes when battery voltage is low.

SAVE - Flashes quickly when Normal Battery Saver mode is enabled; flashes slowly when Enhanced Battery Saver mode is enabled; nothing displayed when Battery Saver is disabled.

Indicators with Segments

SIGNAL - uses six bar segments to indicate the relative receive (Rx) signal strength. **SIGNAL** lights up upon receiving a Rx signal strength greater than 10 dB SINAD. As the signal strength increases, additional bar segments light up, starting from the left-most bar segment.

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Alert Tone Indicators

Successful Power-Up

A short, high-pitched tone when the radio is turned on indicates that the radio has passed its power-up self-test and is ready for use.

Unsuccessful Power-Up

A short, low-pitched tone immediately following the *Successful Power-Up* tone indicates that the radio has detected an error and has failed to power-up properly.

Valid Button Press

A short, high-pitched tone indicates that the last button pressed was valid.

Invalid Button Press

A short, low-pitched tone indicates that the last button pressed was invalid.

Low Battery

Three low-pitched tones indicate a low battery condition.

DTMF Sidetones

Each DTMF tone is heard as it is transmitted.

Time-Out Timer Alert

A low-pitched continuous tone indicates that your present transmission has been disabled.

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Individual Selective Call Decode

Two short "ringing" tones indicate that an *Individual Selective Call* has been decoded by the radio. The radio automatically sends an *Acknowledgment ID*.

Acknowledgment ID Decode

A short "ringing" tone indicates that a correct *Acknowledgment ID* has been decoded by the radio.

Group and All Call Selective Call Decode

Two medium-pitched tones indicate that a Group or All Call Selective Call has been decoded by the radio.

Cloning Mode Start-up

A short "ringing" tone indicates entry into the Cloning mode.

Nuisance Channel Delete

During channel scanning, two medium-pitched tones indicate that an unwanted channel has been temporarily deleted from the scan list.

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Radio to Radio Cloning

Cloning duplicates the contents of one radio (the master radio) into another (the slave radio). Only current radio configuration, channels and phone numbers are copied from one radio to another. Tuning and alignment information are not affected by cloning. You need a cloning cable in order to perform this operation.
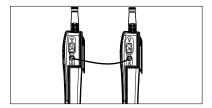
SCI

SCI stands for Serial Communications Interface. It is used to configure the radio and for radio to radio cloning.

To Clone a Radio

CAUTION
Make sure both master and slaves radios are turned off.

---

❶ *Lift the flap covering the SCI Port (17) of the master radio.*

❷ *Insert the cloning cable jack into the SCI Port (17).*

❸ *Lift the flap covering the SCI Port (17) of the slave radio.*

❹ *Insert the other end of the cloning cable jack into the SCI Port (17) of the slave radio.*

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❺ *Turn on the slave radio.*

❻ *Press and hold $\overset{\textbf{SIG}}{\underset{\textbf{A}}{\frown}}$ before turning on the master radio.*

NOTE

The master radio displays *CLONE* on the *LCD Screen (18)* if cloning can proceed, otherwise an error message will be shown.

NOTE

The slave radio displays *Prob* while it is being programmed. If battery level is low, the slave radio displays *rPLbat*. You will need to replace the battery before repeating the process.

NOTE

When cloning is completed, both radios will reset automatically.

---

❼ *Disconnect the radios from the cloning cable when the process is completed.*

Error Conditions

Error Message	Problem	Solution
Err.01	Incompatible software options error.	Cloning from the master radio to the slave radio cannot be performed.
Err.02	Timeout error a. The cloning cable connection is not properly connected or slave radio is not turned on. b. Communication between the two radios is disrupted during the cloning process.	a. Check the cloning cable connection and also verify that the slave radio is turned on. b. Check the cloning connection and all other connections.
Err.03	Master radio checksum error	Although the master radio may still function, it should be serviced by a dealer.
Err.04	No Programmed Channels Error	a. If this occurs on the slave radio, repeat cloning procedure. If it persists, the radio must be serviced by a dealer. b. If this occurs on the master radio, the radio must be serviced by a dealer.

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Information For Safe, Efficient Operation

Exposure To Radio Frequency Energy

In August 1996 the Federal Communications Commission (FCC) adopted updated RF energy exposure guidelines for wireless products regulated by the FCC. Those guidelines are consistent with the safety standards* previously set by both U.S. and international standards bodies. The design of your Motorola two-way radio complies with the FCC guidelines and these standards.

*American National Standards Institute (C95.1 - 1992);

*National Council on Radiation Protection and Measurements (NCRP-1986);

*International Commission on Non-Ionizing Radiation Protection (ICNRP- 1986)

To assure optimal radio performance and to insure that exposure to RF energy is within the guidelines in the above standards, the following operating procedures should be observed:

For Portable Two-way Radios:

- For hand held operation, the radio should be held in a vertical position with the microphone one to two inches (2.5 to 5 cm) away from the mouth, and the antenna should be kept one to two inches (2.5 to 5 cm) from the head or body when transmitting.

- For body worn operation, the antenna should be kept at least one inch (2.5 cm) from the body when transmitting.

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Electromagnetic Interference/compatibility

Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed or otherwise configured for electromagnetic compatibility.

- Turn your radio OFF in any facilities where posted notices instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

- Turn your radio off when on board aircraft when instructed to do so. Any use of the radio must be in accordance with Federal Aviation Administration (FAA) and FCC regulations or crew instructions.

CAUTION

- Do not use the radio with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result.

- All batteries can cause property damage, injury or burns if a conductive material such as jewelry, keys or beaded chains touches exposed terminals. The material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse or other container with metal objects.

Potentially Explosive Atmospheres

Areas with potentially explosive atmospheres are often, but not always, clearly marked. They include fuelling areas such as below deck on boats, fuel or chemical transfer or storage facilities; areas where the air contains chemicals or particles, such as grain, dust, or metal powders; and any other area where you

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would normally be advised to turn off your vehicle engine.

WARNING

- Turn your radio OFF when in any area with a potentially explosive atmosphere, unless it is a type especially qualified for such use (for example, FMRC Approved). Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

- Do not replace or charge batteries in a hazardous atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion.

Blasting Caps And Areas

WARNING

To avoid possible interference with blasting operations, turn your radio OFF near electrical blasting caps or in a "blasting area" or in areas posted: "Turn off two-way radio". Obey all signs and instructions.

For Vehicles With An Air Bag

WARNING

An air bag inflates with great force. Do not place objects, including portable or mobile two-way radios, in the area over the air bag or in the air bag deployment area. If improperly installed or placed wireless equipment is in the air bag deployment area and the air bag inflates, serious injury could result.

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Recycling / Disposal of NiCd Batteries

The U.S. Environmental Protection Agency (EPA) classifies used NiCd batteries as hazardous waste, unless certain exemptions apply.

At the end of your battery's useful life, it can be recycled. However, recycling facilities may not be available in all areas. Under various state or local laws, such batteries must be recycled or disposed of properly, and cannot be dumped in landfills or incinerators.

Motorola fully endorses and encourages the recycling of NiCd batteries. The following is a list of recycling facilities around the world, where you can ship your NiCd batteries post paid to be recycled:

United States

INMETCO
P.O. Box 720
245 Porteville Road
Ellwood City, PA 16117
Tel:(412) 758-5515
Fax:(412) 758-9311

Europe

S.N.A.M.
Rue de la Garenne
Z.I. Chesnes Tharabie -BP733
Saint Quentin Fallavier
38297 La Verpilliere Cedex,
France
Tel: 033-74-94-59-85
Fax: 033-74-94-13-18

Asia

Hanil Metal Recycle Co. Ltd.
2404 Palryong-dong
Changwon-Shi
Kyongsangnam-Do, Korea
Tel: 082-551-93-1911
Fax: 082-551-96-0050

Japan

Marubeni Co.
Head Office/Attn. B6B2
4-2 Ohtemachi 1-Choma
Ciyoda-Ku, Tokyo, Japan

Nippon Recycle Ctr., Corp.
6-3-19, Nishitamma, Kita-Ku
Osaka, 530, Japan
Tel: 081-6-311-9071
Fax: 081-311-0949

You should consider the methods of collecting, labeling, and shipping used NiCd batteries. Consult your federal, state, or local EPA for specific legal requirements and for recycling options in your area.

Motorola, as a responsible corporate citizen, has always been concerned with the protection of the environment. Please feel free to call our toll-free number,1-800-422-4210, for further battery information.

Licensing & Service Information

Licensing

This radio operates on FM radio communication frequencies and is subject to the **rules and regulations of the local communications governing agencies**. These agencies may require that all operators using general mobile radio frequencies obtain a radio license before operating their equipment. To determine the specific requirements, contact your local communications governing agency. This agency can supply information required to properly obtain and complete the license application form and various operational issues.

Service

Because this unit contains a radio transmitter, most local governments prohibit anyone from making internal adjustments to the transmitter unless specifically licensed to do so by government regulations. If your radio fails to operate or any operational difficulties arise, contact your local Motorola dealer.

Proper repair and maintenance procedures assure efficient operation and long life for this radio.

Troubleshooting

Radio is dead.

Possible Problem (1): Batteries may be dead (alkaline) or not properly charged (NiCd).

Solution :If the display does not light, or the 'BATT' indicator flashes on and off, you should replace the alkaline batteries, or if you are using NiCd batteries, recharge them.

Possible Problem (2): Batteries may not be positioned correctly in the radio.

Solution :See "Installing and Removing Batteries" on page 8 for the appropriate battery installation instructions.

NiCd battery does not charge or last long enough.

Possible Problem (1): Battery may be incorrectly charged.

Solution :If you use a desktop charger, make sure the battery is positioned properly in the charger base. If you are using a wall charger, make sure that the LED on the charger glows red, indicating correct charging status. See "Charging with Wall Charger" on page 11 and "Charging with Desktop Charger" on page 12.

Possible Problem (2): Battery may not be fully charged.

Solution :Turn radio off while charging battery. Charging time will be doubled if the radio is turned on while charging.

Troubleshooting

Possible Problem (3): The battery life is based on a duty cycle where the radio is transmitting 5%, receiving 5%, and in standby mode 90% of the time. Usage that differs from this will change the typical battery life expectancy accordingly.

Solution : *If you use your radio for a longer period of time than the standard duty cycle, you may need to recharge your battery again.*

Possible Problem (4): Battery or charger contacts may be dirty.

Solution : *Clean battery and charger contacts often.*

Alkaline Battery does not last long enough (<10 minutes).

Possible Problem (1): Operating the radio at high power with alkaline batteries.

Solution : *When used with alkaline batteries, the radio should operate at low power unless absolutely necessary.*

NOTE

It is recommended to operate your radio in Low Power when using alkaline batteries. Using alkaline batteries in High Power might result a *Low Battery Alert* (3 low pitched tones) shortly after transmitting. This is NOT a malfunction. The alert sounds because alkaline batteries cannot maintain the power needed to transmit at High Power for a long interval. However, APC is immediately activated when this alert sounds. It automatically adjusts the radio's power requirements to maintain the radio's operation. Without APC, the radio would instead reset itself and refuse to transmit.

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Radio will not talk to other radios in system.

Possible Problem (1): Radios may be on different frequencies, or having different Coded Squelch Codes.

Solution : *Verify that frequencies and Coded Squelch Codes are the same for all radios in your talk group.*

Hearing other conversations or noise on your radio.

Possible Problem (1): Users do not have exclusive use of frequencies. Frequencies must be shared using proper radio etiquette.

Solution : *Use proper radio etiquette.*

NOTE

Coded squelch screens out other users' conversations on your radio, but other users who share your frequency may still hear your conversations.

Limited talk range.

Possible Problem (1): Using your radio in basements, steel structures, concrete buildings, automobiles, or heavy foliage decreases its range.

Solution : *These are standard characteristics of transmitters. External magnetic mount antennas are recommended for best range when communicating in an automobile. If the radio supports the High/Low Power Output option, check that the radio is not in Low Power Transmit Mode; the 'LOW' indicator on the* LCD Screen (18) *lights in this mode.*

Troubleshooting

Possible Problem (2): Operating the radio while it is close to your body (i.e. in a pocket or on a belt) and while you are using audio accessories decreases its range because of the shielding effect of your body.

Solution : The higher the radio is held, the better the talk range. Use of audio accessories is only recommended in close range situations for best results.

Possible Problem (3): The Carrier Squelch Level may be set too high.

Solution : Set the Carrier Squelch Level to a lower value (see "Setting Squelch Level" on page 20).

You hear constant static from speaker.

Possible Problem (1): The alkaline batteries may be weak (or the NiCd battery may be discharged).

Solution : Press and hold the Push-To-Talk (PTT) Button (6) ***while looking at the*** LCD Screen (18)***. If the 'BATT' indicator flashes continuously while still holding the*** Push-To-Talk (PTT) Button (6)***, the batteries should be replaced or recharged.***

Possible Problem (2): When using your radio around computers or electronic equipment, you may hear static or interference from these devices.

Solution : Enable Coded Squelch. Coded squelch screens out this type of interference (see "Changing Squelch Modes" on page 18).

You have tried a solution for any of the above symp-

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Troubleshooting

toms, without success.

Possible Problem (1): The radio may need to be repaired.

Solution : **If the unit is still under warranty, return it to the place of purchase for repairs, or contact your nearest Motorola dealer listed in your local yellow pages.**

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Accessories

NOTE
Please note that all accessories may not be available in all markets. Contact your dealer for more information.

Battery & Charging Accessories:

2580162R02	220V Transformer (must be ordered with ETN4609)
ETN4609	GP68 3 Hour Charger Pocket (has to be ordered in conjunction with transformer 2580162R02 and and insert PMLN4069)
HTN9002	220V - Wall Charger Adapter - Euro Plug
HTN9016	220V - 10 Hour Desktop Battery Charger with Euro Plug (PMLN4069 required)
PMLN4069	Charger Insert (for use with HTN9016 and ETN4609)
PMNN4000	1200 mAH High Capcity Battery Pack
PMNN4001	600 mAH Standard Battery Pack

Antennas:

NAE6483	UHF Whip Antenna, 403-520 MHz
NAE6522	UHF Stubby Antenna, 462-470 MHz
PMAD4012	VHF Stubby Antenna, 136-155 MHz
PMAD4013	VHF Stubby Antenna, 154-174 MHz
PMAD4014	VHF Standard Antenna, 136-155 MHz
PMAD4015	VHF Standard Antenna, 154-174 MHz
PMAE4003	UHF Heliflex Antenna, 438-470 MHz

Audio & Signalling Accessories for all models:

BDN6647	Medium Weight Headset with Swivel Boom Microphone (w/out VOX)
HLN9132	Earbud
HLN9133	External Vox Adapter (requires the use of BDN6647 or HMN9787)
HMN9036	Earbud with Clip Microphone and PTT
HMN9725	Remote Speaker Microphone

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| HMN9787 | Light Weight Headset with Swivel Boom Microphone (w/out VOX) |

Carrying Cases & Accessories:

HLN8240	Replacement 2 1/2" Belt Clip (Black)
HLN8255	Spring Action Belt Clip 3" (Black)
HLN9985	Waterproof Bag

Radio to Radio Cloning Accessory:

| PMLN4068 | Radio to Radio cloning cable |
| PMLN4074 | Programming cable |