



## RCA P25 Portable Radios 5 Watts, IP67 Submersible

### RPX4500 Series –

7 Function Keys w/ Display

RPX4500V - VHF (136-174 MHz)

RPX4500U - UHF (400-480 MHz)

RPX4500U2 - UHF (440-520 MHz)

### RPX4600 Series -

7 Function Keys, Full Keypad w/ Display

RPX4600V - VHF (136-174 MHz)

RPX4600U - UHF (400-480 MHz)

RPX4600U2 - UHF (440-520 MHz)

## PREFACE

This user manual covers the RPX4500/RPX4600 Series – RCA P25 Portable Radios.

Any performance figures quoted are subject to normal manufacturing and service tolerances. The right is reserved to alter the equipment described in this manual in the light of future technical development.

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# PERSONAL SAFETY

## SAFETY PRECAUTIONS

These Safety Precautions, Warnings and Cautions advise personnel of specific hazards which may be encountered when using this equipment and that control measures may be required to prevent injury to personnel, and damage to equipment and/or the environment.

Before using this equipment, users are to acquaint themselves with all risk assessments relevant to the equipment and area of use. Users must comply with the control measures detailed in the risk assessments.

References covering safety regulations, health hazards and hazardous substances are detailed under the WARNINGS section below. These are referred to in this user manual when they are encountered.

## GENERAL SAFETY PRECAUTIONS

Do NOT operate your portable radio without a hands-free kit while driving a vehicle (subject to local law).

Do NOT operate your radio in areas that contain hazardous material – unless the radio's level of IECEx approval is approved for use in that area.

Obey the 'Turn Off Two-way Radios' signs where they are posted, e.g. in a fueling station.

Do NOT touch the antenna while the radio is transmitting.

Do NOT dispose of batteries in a fire.

Dispose of batteries according to local recycling regulations. Do not dispose as household waste.

Do NOT attempt to disassemble the battery.

When charging a battery, keep it at a temperature between 41°F ~ 104°F (5°C ~ 40°C) to ensure a full charge. Temperatures outside this range significantly reduce battery life. The operating time (talk-time and standby time) is noticeably shorter than normal, replace the battery.

Before charging a battery attached to a radio, turn the radio off to ensure a full charge. Never leave a radio on while in the charger, as it can damage both the battery and the radio; the charger is not a radio stand.

Do NOT cut off the power supply or remove battery while charging.

Do NOT charge a battery that is wet. Dry it with soft cloth prior charging.

The battery will eventually weaken. When the operating time (talk-time and standby time) becomes noticeably shorter than normal, replace the battery.

Battery performance greatly decreases at temperatures below -4°F (-20°C). Having a spare battery is always necessary in extremely cold environments. A cold battery may work again when it returns to room temperature, so keep it for later use.

Dust on the battery contact may cause the battery not to work or charge properly. Use a clean dry cloth to wipe it before attaching the battery to the radio.

Batteries with damaged contacts can be extremely dangerous. Any battery with damage to one or more contacts should be replaced immediately and not used under any circumstances.

Do NOT operate the radio if the antenna has become disconnected or damaged. Recharge batteries only in an approved battery charger.

## HAZARDOUS SUBSTANCES

Before using the radio around any hazardous substance or material, the user must become acquainted with the safety precautions and first aid instructions:

- On the label of the container in which it was supplied.
- On the Material Safety Data Sheet.
- In any local Safety Orders and Regulations.

## WARNINGS

### Lithium Batteries



#### WARNING

**LITHIUM BATTERIES - THIS EQUIPMENT USES LITHIUM ION BATTERIES. REFER TO THE APPROPRIATE MATERIAL SAFETY DATA SHEET (MSDS) FOR SAFETY INFORMATION.**

### Radio Frequency Radiation



#### WARNING

**RADIO FREQUENCY RADIATION. A RADIO FREQUENCY (RF) RADIATION HAZARD EXISTS WHEN USING THIS EQUIPMENT. TO AVOID RF INJURY, DO NOT TOUCH THE ANTENNA WHEN THE TRANSMITTER IS IN USE AND DO NOT OPERATE THE TRANSMITTER WITH ANTENNA DISCONNECTED.**

### Dangerous Voltages

Dangerous voltages exist in the radio equipment. For the appropriate safety precautions, refer to the relevant Electrical Safety Regulations appropriate to the country of operation.



#### WARNING

**DANGEROUS VOLTAGES. DANGEROUS VOLTAGES EXIST IN ALL THE BATTERY CHARGERS USED WITH THIS RADIO. FOR THE APPROPRIATE SAFETY PRECAUTIONS REFER TO THE RELEVANT ELECTRICAL SAFETY REGULATIONS APPROPRIATE TO THE COUNTRY OF OPERATION.**

## HINTS FOR USING THE RADIO

When transmitting, hold the radio a few inches from your mouth and speak across it, rather than into it. The microphone is located near the bottom right hand corner of the portable radio's speaker grille.

Keep the length of your conversation to a minimum to conserve battery life.

When possible, avoid making calls from known poor signal-strength areas such as the radio systems fringe areas (limit of range) or from screened or shadowed areas, e.g. an underground parking garage or underpass.

## GENERAL NOTES

### PLEASE NOTE

Configuration is dependent upon the specification by the customer when the equipment was ordered and installed.

### CONVENTIONS

Where the word “generally” or “may” is used to describe a facility, this operation is an option that may be enabled with your Programming Software (PS).

In some cases, key functions will be determined by the customer configuration. When a key function is referred to in these instructions, it is possible the function may be assigned to another location than designated in this manual.

### PLEASE NOTE

When this manual refers to RPX4600, reference can also be applied to the RPX4500, except when the keypad is used. The RPX4600 model has a keypad and seven function keys. The RPX4500 model has seven function keys but no keypad.

## ABBREVIATIONS

The following abbreviations are used throughout this manual. When possible, whenever the abbreviation is first used, the full term is given with the abbreviation in parenthesis. After that only the abbreviation is used.

ABBREVIATION	MEANING
<b>ANSI</b>	American National Standards Institute
<b>APCO</b>	Association of Public Safety Communications Officials
<b>BER</b>	Bit Error Rate
<b>COSHH</b>	Control Of Substances Hazardous to Health
<b>CTCSS</b>	Continuous Tone Coded Squelch System
<b>DCS</b>	Digital Coded Squelch
<b>DSP</b>	Digital Signals Processor
<b>DTMF</b>	Dual Tone Multi Frequency
<b>FCC</b>	Federal Communications Commission
<b>FM</b>	Frequency Modulation
<b>GPS</b>	Global Positioning System
<b>ICNIRP</b>	International Commission on Non-Ionising Radiation Protection
<b>ID</b>	Identification
<b>IEC</b>	International Electrotechnical Commission
<b>IEEE</b>	Institute of Electrical and Electronic Engineers
<b>IP</b>	Internet Protocol
<b>LED</b>	Light Emitting Diode
<b>LMR</b>	Land Mobile Radio
<b>NAC</b>	Network Access Code
<b>PLA</b>	Programmable Logic Array
<b>PMR</b>	Private Mobile Radio
<b>PS</b>	Programming Software
<b>PSTN</b>	Public Switched Telephone Network
<b>PTT</b>	Press-To-Talk
<b>RF</b>	Radio Frequency
<b>RSSI</b>	Received Signal Strength Indicator
<b>Rx</b>	Receive/Receiver
<b>SMSG</b>	Short Message
<b>SW</b>	Software
<b>TGID</b>	Talk Group Identification
<b>TMR</b>	Trunked Mobile Radio
<b>Tx</b>	Transmit/Transmitter
<b>TXTMSG</b>	Text Message
<b>USB</b>	Universal Serial Bus
<b>WACN</b>	Wide Area Coverage Network



## GLOSSARY OF TERMS

A summary of common radio terms and some other terms used in this document, and their meanings, are given below.

BANK	SEE ZONE.
<b>Channel</b>	A logical combination of: Network Access Code (NAC); Radio Frequency; Default Talk Group Identity (TGID); Encryption Key Index (KID); and other channel associated parameters (CTCSS, Scan etc).
<b>PS</b>	Programming Software. Used to configure the radio options and parameters.
<b>DTMF</b>	Dual Tone Multi-Frequency signaling. Used to dial into telephone networks using tone dialing.
<b>IECEX Scheme</b>	The International Electrotechnical Commission Scheme for Certification to Standards Relating to Equipment for use in Explosive Atmospheres.
<b>Monitor</b>	Mode of Radio Receive – Any P25 signal regardless of NAC or TGID will be heard
<b>MPT1327</b>	A signaling standard for Trunked Private Land Mobile Radio Systems. Defined for systems in the UK but also used outside the UK. Issued January 1988.
<b>Muted</b>	Audio is prevented from being heard through the speaker.
<b>NAC</b>	Network Access Code – Used as a filter where multiple networks may share a common RF frequency.
<b>Normal Mute</b>	Mode of Radio Receiver – Only signals with matching NAC will be heard.
<b>P25 Channel</b>	Definition consisting of Tx and Rx RF frequencies, NAC and TGID.
<b>P25 Conventional</b>	Non-trunked digital, like digital Private Mobile Radio (PMR).
<b>PTT</b>	Press To Talk. This is the term given to the operator's key normally used to transmit a message.
<b>Radio Unit ID</b>	Unique identifier allocated to each radio (0-16,000,000).
<b>Selective</b>	Mode of radio receiver – Only signals with matching NAC and TGID or Unit ID will be heard.
<b>Unmuted</b>	Audio can be heard from the loudspeaker.
<b>Zone</b>	A collection of channels (usually organized by functional group of users).

# 1. INTRODUCTION

## 1.1. OVERVIEW

RCA's RPX4500 and RPX4600 Radios are a family of versatile Digital Signal Processor (DSP) controlled, software defined two-way portable radios.

This User Manual describes the operation of the Association of Public Safety Communications Officials (APCO) P25 Standard compliant Portable Radio.

RPX4600 P25 radios are software programmable and can be customized to the operational requirements of your particular needs using the Programming Software (PS). Your RCA representative can help program your radio to meet your present and future requirements.

A wide-range of accessories are available to complement the P25 radios including: chargers, antennas, headsets, covert kits, holsters and speaker microphones. Refer to RCA for comprehensive descriptions.

**Please Note: The RPX4600 model has seven function keys, a keypad and a display. The RPX4500 model has seven function keys, a display, but no keypad.**

## 1.2. CONFIGURATION

Before you can use your P25 Radio, it must be configured using the P25 Programming Software. The configuration process defines and loads the radio channels, signaling and user options/settings so that the radio will operate within your system.

### 1.2.1. PRODUCT INSPECTION

Prior to unpacking your RPX4500 or RPX4600 portable radio, please inspect the packaging for signs of damage and report any damage or missing components immediately to your RCA Communications Systems Sales and Service Outlet. Every RPX4500 or RPX4600 portable radio comes with the following items:

Item	Qty.
RXP4500 or RPX4600 Handheld Radio	1
B2245LI – Li-Ion Battery (2200mAh/Approx. 13 hrs.)	1
BC4500 (Belt Clip) and 2 screws	1
ANH4500U-6-400-480 (Antenna for UHF models) OR - ANH4500V-6-136-300 (Antenna for VHF models)	1
Instruction Manual	1
<hr/>	
CH4501* (Single Pocket Charger)	1
PS4501* (Power Supply)	1
* = Items sent in separate box if ordered.	

### 1.2.2. ATTACHING/REMOVING THE BELT CLIP

Using a small screwdriver, align the belt clip's screw holes to the back of the battery. Attach the belt clip by turning the screws clockwise into the screw holes. Remove by doing the reverse.

## 1.3. MODES OF RPX4600 P25 OPERATION

Your RPX4600 P25 Radio operates in Analog Frequency Modulation (FM), P25 Conventional Digital and P25 Trunked Digital modes.

Radio channels are organized in groups of up to 250 per zone. Up to 40 zones may be defined. Generally, zones can be programmed with channels belonging to common function groups.

A radio channel can be defined as; Analog, a Conventional P25 channel or Trunked P25 Talk Group. A Zone may contain a mix of Channel types.

## 2. CONTROLS

The controls of the RPX4600 P25 Portable radio are shown below in Figure 1.





Figure 1. RPX4600 Portable Layout.

The functions of each of the controls are detailed below in Table 1.

*Table 1. RPX4600 Control Functions.*

KEY/CONTROL	LABEL	FUNCTION
<b>On/Off/Volume</b>		Rotate clockwise to turn the radio on. Rotate counter-clockwise to turn the radio off. Rotate clockwise to increase volume to desired level.
<b>Selector Switch</b>		Rotate the switch to select the desired channel.
<b>ABC Switch</b>		Programmer configurable three position function switch.
<b>PTT</b>		Push-to-Talk. Hold the radio 3 – 4 inches from your mouth. Press and hold the PTT switch and speak. Release to listen.
<b>Function Key F1</b>	M	Programmer configurable function key. Programmed Default is <b>Menu Select</b> key.
<b>Function Key F2</b>	▼	Programmer configurable function key. Programmed Default is <b>Channel Down</b> key.
<b>Function Key F3</b>	▲	Programmer configurable function key. Programmed Default is <b>Channel Up</b> key.
<b>Function Key F4</b>	OK	Programmer configurable function key. Programmed Default is <b>OK</b> key.
<b>Function Key F5</b>	●	Programmer configurable function key.
<b>Function Key F6</b>	●	Programmer configurable function key. Programmed Default is <b>Reset/Cancel</b> key.
<b>Function Key F7</b>	●	Programmer configurable function key. Programmed Default is <b>Alarm/Emergency</b> key
<b>Keypad</b>	0 to 9 * & #	The Keypad can be used to select a Channel or Special Function. E.g. 12# will select channel 12.

INDICATOR LED	FUNCTION
	A Green LED when receiving a signal.
	A Red LED when the radio is transmitting.

#### PLEASE NOTE

When the manual refers to RPX4600, reference can also be applied to the RPX4500, except when the keypad is used.

## 3. MAIN SCREEN

### 3.1. LAYOUT

An example of the main or default screen that is displayed when the radio is switched on is shown below in Figure 2.



Figure 2. Main/Default screen.

The screen has three main areas: the Icon Area; the Text Panel; and the Soft Labels area.

#### 3.1.1. SOFT LABELS

The bottom of the screen is used to display the Soft Labels associated with the function buttons.

The soft label text is defined in the PS and can be assigned to the F1 to F4 function buttons. Each soft label can be up to five characters.

#### 3.1.2. TEXT PANEL

The main area of the default screen is the Text Panel, which displays textual information. This information contains both Persistent and Non-persistent text information as follows:

- Persistent Text, e.g. Channel Name, Zone Name.
  - \* The Channel Name shows the text associated with the currently selected radio channel.
  - \* The Zone Name shows the text associated with the currently selected radio zone.
- Non-persistent Text messages, e.g. keypad dial string entries, received status/data messages, error messages, etc.

### 3.1.3. ICONS

The lower part of the display is reserved for Standard and Special Icons.

There are only six positions for icons to be displayed (see Figure 3). However, the number of icons that can be displayed exceed the six positions. Therefore, some icons will share the same location.

RSSI (Received Signal Strength Indication) Bars is a special icon which is displayed at the left of the default screen when a signal is received. The bars indicate the signal strength of the current channel. The stronger the signal, the more bars will be displayed.

Battery Bars is a special icon, displayed on the right of the default screen. They indicate the condition of the battery charge level.

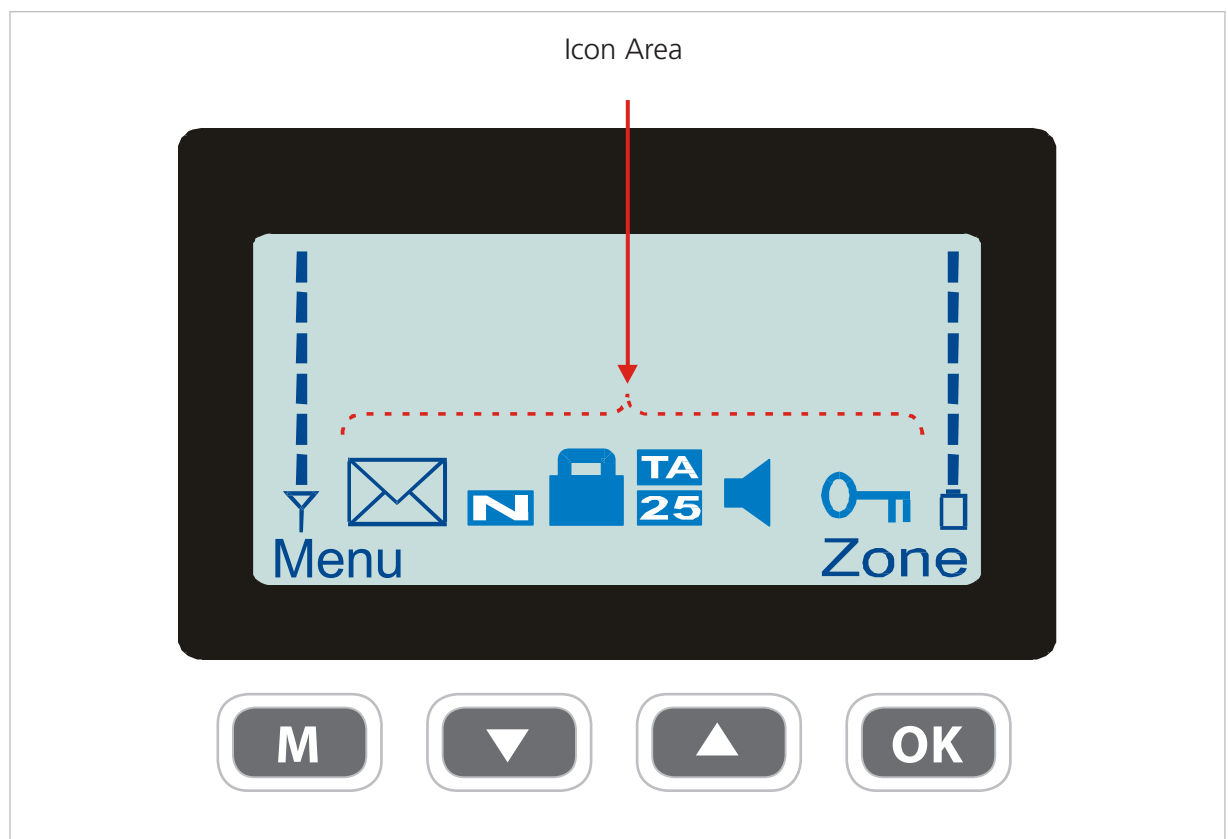























Figure 3. Icon Locations.

Details of the Icons that can be displayed in the Icon Area are contained below in Table 2.

*Table 2. Icon Details.*

ICON	INDICATION
	A filled speaker icon indicates that a signal is present and the audio can be heard from the speaker (unmuted).
	The outline speaker icon indicates that a signal is present and the radio is muted. This could be another user group, for instance.
	Scan/Search Indicator. When radio is on a scan channel and scanning, the arrow will rotate.
	Transmit indicator.
	Received Signal Strength Indication (RSSI). A stronger signal will display more bars above the antenna icon.
	Encryption Indicator. This icon is shown when the selected channel is programmed for encryption. If an unencrypted signal is received, the icon will not be displayed.
	25 = Digital Mode Indicator.
	Selective Mute. Only radio signals specifically directed to the user or the channel's defined talk group will be heard on the speaker.
	Normal Mute. Only radio signals from the users own network will be heard on the speaker.
	Monitor. All P25 digital radio signals on the channel will be heard.
	Key-lock indicator. All keys except PTT, or any function assigned as Alarm, will be disabled. Press the OK key for 2 seconds to unlock all keys.
	Talk Around enabled indicator. When shown, Talk Around is active.
	Scrambler indicator (analog only).
	Emergency mode. Blinking icon indicates that the emergency key has been pressed.
	Individual Addressing Mode. When shown, the radio will transmit to an individual address instead of a talk group.
	The Envelope icon. A steady icon indicates there is one or more stored messages. A flashing icon indicates an unread message(s) is stored.
	Battery charge indicator. Six vertical bars above the icon show the charge state of the battery.
	Trunking mode. Icon is displayed when a trunking system has been selected.
	Connecting icon. Displayed when a text message is being sent and the connection is in progress.
	Connection Fail icon. Displayed when a text message transmission has failed.
	The asterisk symbol indicates whether the radio has stopped on a scan channel.



## 4. MENU SYSTEM

Your RPX4600 P25 portable radio uses a programmed menu structure to access all the radio features and functions. The structure of the menu can be configured using the PS to meet your specific needs.

Normally the menus are divided into two menu lists, which are the Main menu list and the Setup menu list. Menu selections that are not frequently accessed are normally put under the Setup menu list.

The menu structure of the radio is illustrated in Figure 4.

Possible Menu entries are:

- Zone (usually the first menu as it is often accessed).
- Squelch.
- Mute Adjust (FM)/Monitor (Digital).
- Phonebook.
- Phonebook Edit.
- User Options.
- Setup.
- Contrast.
- Alert Volume.
- Location Report.
- Radio Info.
- Mode.
- RSSI.
- Crypto.
- Stored Calls.
- Messages.
- Scan Edit.
- Phone Call.
- Status
- Undefined (No Menu Entry).

The presence and order of the above menu selections is determined by your PS configuration.

The Setup menu is a special case entry. Setup is a subgroup that can have any of the menu selections assigned to it. This means that less frequently used selections can be partly hidden away under the Setup subgroup but still remain accessible.

The order and presence of the Setup subgroup selections is determined by your PS. For instance Info, RSSI and Contrast could be placed under the Setup Menu.

The User Options menu group is also a menu subgroup. This subgroup usually contains on/off functions, such as Key Beeps or Backlight.

To assist the user in menu key selection, a soft menu label will often appear above the function keys. The label shows the user the current function for that key, which may change between different menus.

Programming of menus is a configuration task normally performed by the system manager using the PS software.

## 4.1. MENU NAVIGATION

The M key is generally used to select Menu mode from the main Channel Screen. Once in Menu mode, the ▼/▲ keys cycle through the menus.

To exit Menu mode, press the M key again or the Menu timeout will exit automatically. Generally, pressing the M key while in a menu will navigate back to the next highest level of menu and the OK key selects the function.

The ▼/▲ keys are generally used to navigate through a list of options, such as channels, or to increase or decrease a value.

When the Menu key is first pressed, the numeric keys become short cut keys to functions. Numeric keys can be programmed with functions using the PS, i.e. Scan.

To access these functions, you can press the 'M' or menu key from the channel screen and then the numeric key assigned to that function.

**Note:** Example menus only shown.  
Other Menus may be configured with the PS.

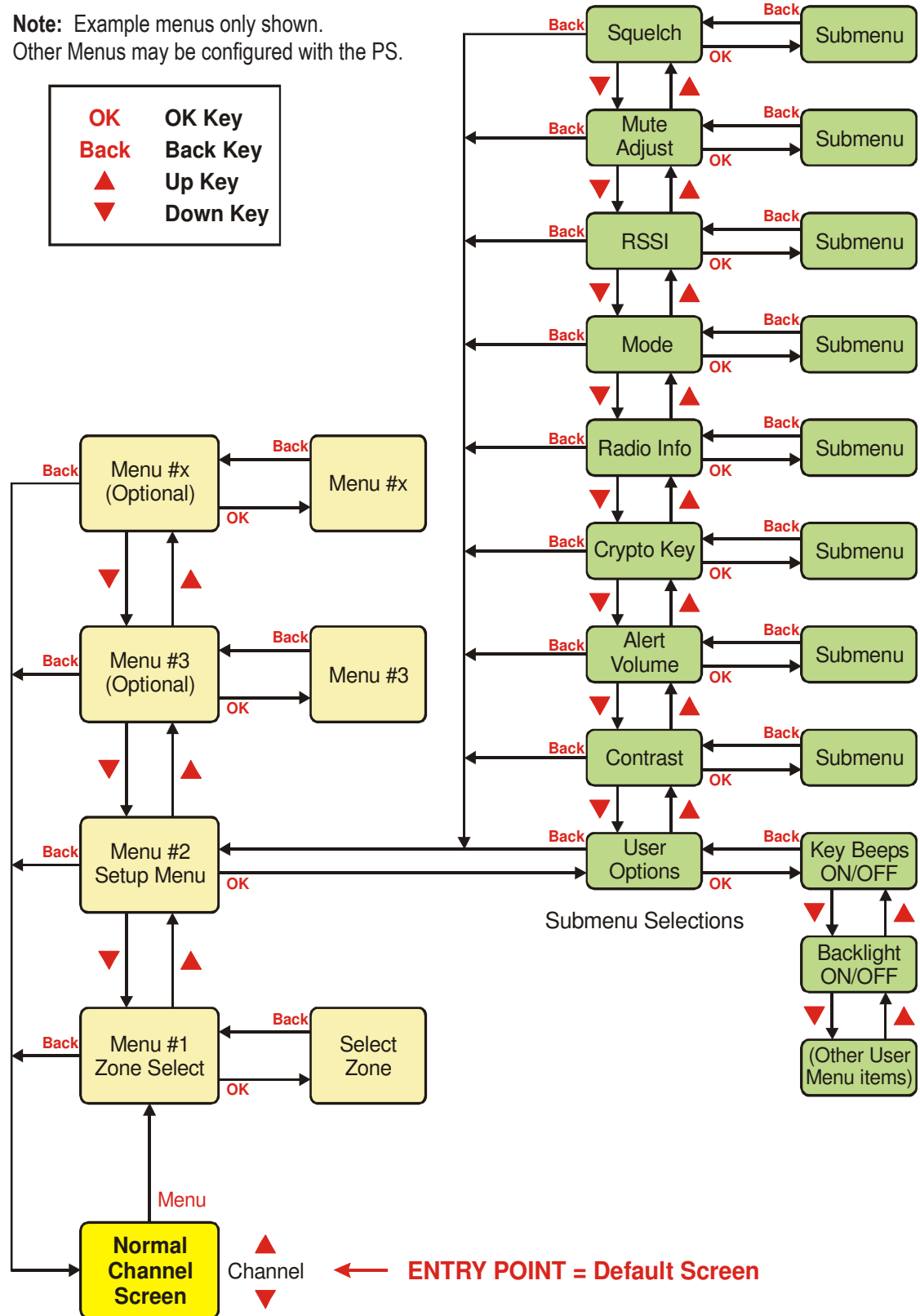
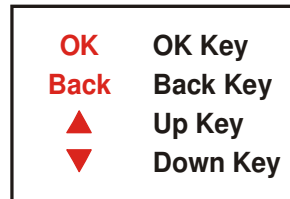


Figure 4. Menu Navigation

## 5. MENU SCREENS

The menu structure on the RPX4600 is configurable using the PS. In most cases, your system administrator will set up the order and presence of the menu options to your specific requirements.

This section describes all the menus that are currently available. It also describes the Channel Screen which is the main default screen that is displayed after the radio is switched on.

Normally, the menus are divided into two menu lists - the Main Menu list and the Setup Menu list.

In the default configuration, the Main Menu contains the Channel, Zone and Setup menus. This allows access to the second 'Setup' menu level.

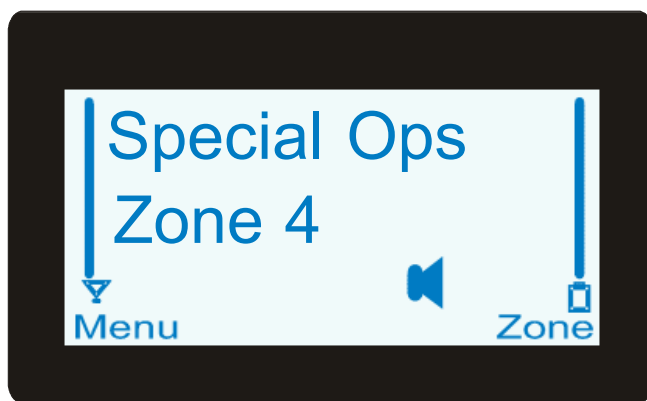
The Main Menu can be accessed from the default screen by selecting the 'M' (F1) button.

To access any of the menu options from the Main, Setup or User Options Menus, use the ▲ and ▼ keys to scroll through the menu options and then press the 'OK' button when the required menu is displayed.

Pressing the 'Back' key at any point will go back to the previous screen.

### 5.1. CHANNEL SCREEN

The Channel Screen shows the current channel and allows channel selection. Pressing the 'M' key enters the Menu mode.



Radio channels may be configured with the PS as specific frequencies or as auto-scan types. When an auto-scan channel is selected, it will immediately go into scan mode. Selecting another non-auto-scan channel will stop the scan.

If a radio channel is defined as a P25 Conventional Digital Channel, it will only receive P25 digital signals.

If a radio channel is defined as an Analog FM channel, it will receive both P25 Digital and Analog FM signals.

#### Note.

When an Analog FM channel is selected and in Monitor mode, all unencrypted digital P25 traffic will be heard regardless of NAC or Talk Group.

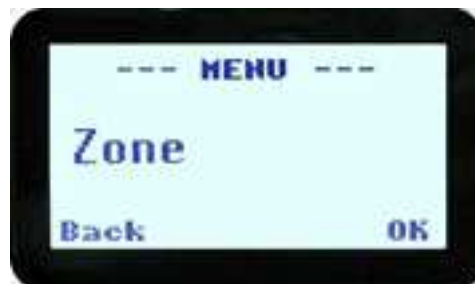
## 5.2. ZONE SCREEN

The Zone Screen is used for changing Zones. A Zone is normally defined as a group of radio channels with a common operational role.

From the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through menu options. With the Zone menu option displayed, press the OK key to enter the “Zone” select screen.

On the Zone select screen, use the ▼/▲ keys to scroll through and select the required Zone. Press the OK key to select the required Zone. The radio will return to the channel screen and select the first channel in the new Zone.

Direct access to the Zone menu from other screens can also be programmed to one of the function keys with the PS.



## 5.3. SQUELCH

The Squelch menu allows the channel's default squelch mode to be modified.

If the selected channel is changed or the radio is switched off, the channel's default squelch setting will be restored.

From the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through menu options. With the Setup menu option displayed, press the OK key to access the Setup sub-menus.

Use the ▼/▲ keys to scroll through sub-menu options and, with the Squelch menu option displayed, press the OK key to access the Squelch screen.

For a P25 digital channel, the ▼/▲ keys can be used to select either Monitor, Normal or Selective squelch mode.

For an analog channel, the ▼/▲ keys can be used to select either Monitor or Normal squelch mode.

For each channel type, after selecting the required squelch mode, press the OK key to confirm the selection and return to the default channel screen.

Press the Back or M key to return to the next highest menu level.



### 5.3.1. DIGITAL OPERATION

#### 5.3.1.1. Channel Monitor Mode

When Monitor squelch is selected, the radio will receive any encrypted or clear P25 digital voice signal. The NAC is not checked. An “M” icon on the display indicates Monitor mode.

#### 5.3.1.2. Digital Channel Normal Mode

When Normal squelch is selected, the radio will receive all encrypted or clear digital transmissions with the correct NAC. Reception is not conditional upon the Talk Group or Unit ID. An “N” icon on the display indicates Normal mode.

#### 5.3.1.3. Digital Channel Selective Mode

If Selective squelch is chosen, the radio will only receive encrypted or clear digital transmissions with the correct NAC and Talk Group ID (TGID) or correct NAC and Unit ID. An “S” icon indicates Selective mode.

### 5.3.2. ANALOG OPERATION

#### 5.3.2.1. Channel Monitor Mode

When Monitor squelch is selected, the radio will receive any Analog voice or P25 digital signals. Digital NAC or Analog Continuous Tone Controlled Sub-audible Squelch (CTCSS) is not checked. An “M” icon on the display indicates Monitor mode.

#### 5.3.2.2. Analog Channel Normal Mode

When Normal mute is selected, the radio will receive correctly addressed Analog radio transmissions and all encrypted or clear digital transmissions. An “N” icon on the display indicates Normal mode. Normal can only be selected if CTCSS/Digital Coded Squelch (DCS) is programmed for that channel.

## 5.4. MUTE ADJUST/MONITOR (ANALOG CHANNELS)

From the main channel screen, press the M key to enter Menu Mode.

Use the ▼/▲ keys to scroll through menu options and, with the Setup menu option displayed, press the OK key to access the Setup sub-menus.

With the Mute Adjust menu option displayed, press the OK key to access the Mute Adjust screen.

A numeric value of the present mute level will be displayed.

Use the ▼/▲ keys to adjust the mute threshold as required. Press the OK key to confirm the selected mute setting and return to the default channel screen.

The mute adjustment will be applied to all the radio's analog channels.



It is recommended that you use the default mute setting of 4. RPX4600 series radios have a carrier noise mute, which means the mute will open at the point where an analog signal is sufficiently noise free to be intelligible with a setting of 4.

Where the default mute setting is not acceptable, it may be adjusted for analog channels so that:

- 0 corresponds to 'no muting';
- 4 will hear all intelligible signals;
- 8 will hear slightly noisy signals; and
- 15 will only hear signals with no background noise.

Direct access to the Mute Adjust screen from other screens can also be programmed to one of the function keys with the PS.

## 5.5. PHONEBOOK SCREEN

From the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through menu options. With the PhoneBook menu option displayed, press the OK key to access the PhoneBook screen.

From the Phonebook screen, it is possible to view all of the phone entries in the Phonebook. These entries may be Individual Addresses, Telephone numbers or Talk Groups.

When the Phonebook screen is displayed, it will show the currently selected phonebook entry.

The second line shows the name of the selected entry.

The third line shows the unit identifier of the entry. This is the P25 ID that the radio will call.



The fourth line shows the IP address associated with the phonebook entry. IP addresses are used for data calls and text messages.

Use the ▼/▲ keys to scroll through and select the relevant phonebook entry. To return to the Menu screen, press either the Back or M keys.

A function key (when configured for Reset, or any other key configured for Reset) will exit back to the default channel screen.

### 5.5.1. MAKING AN INDIVIDUAL CALL

In Phonebook mode, when the PTT key is pressed:

- The radio is changed to individual call mode (individual call to the unit identifier of the selected phonebook entry). The Individual Call icon is displayed.
- If the radio is already in individual call mode addressed to a different unit, the destination unit ID is replaced by the newly selected phonebook entry.
- The radio will remain in Individual Call mode until the inactivity timeout has elapsed, i.e. No PTT or signal received for a set time period (typically 10 seconds). The inactivity timeout period is set with the PS.
- The radio will return to the default channel screen.

### 5.5.2. MAKING AN INDIVIDUAL CALL WITH CALL ALERT

From the PhoneBook Screen, with the required phonebook entry displayed, when the OK key is pressed:

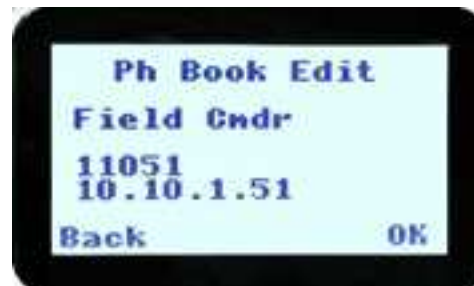
- A Call Alert is sent to the displayed ID.
- The called radio will sound a Call Alert.

## 5.6. PHONEBOOK EDIT SCREEN

The Phonebook edit screen provides a method to modify the phonebook entries. New entries can be added and existing entries can be modified or removed from the phonebook.

Phonebook entries may be Individual Addresses, Telephone numbers or Talk Groups.

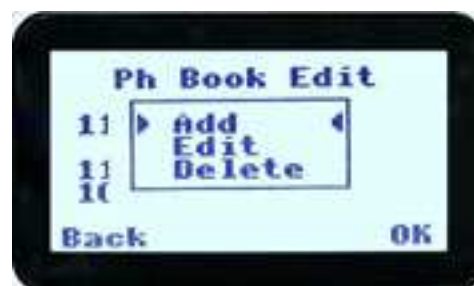
From the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through the menu options. With the 'Ph Book Edit' menu option displayed, press the OK key to access the Phonebook edit screen.



Use the ▼/▲ keys to scroll through and select a phonebook entry.

The displayed information is the same as the PhoneBook Screen display.

To access the 'Ph Book Edit' pop-up menu, press the OK key. The pop-up menu items are:



- **ADD.** Used to add a new phonebook entry.
- **EDIT.** Used to edit (modify) the selected phonebook entry.
- **DELETE.** Used to delete the currently selected phonebook entry.

#### Note.

Adding a new phonebook entry and editing an existing entry are very similar and carried out in several steps to ensure that all the required details are entered correctly. Details to be entered include: Entry Type; System ID; Wide Area Coverage Network ID (WACN ID); Unit ID; Internet Protocol (IP) Address; and Name.



To return to the Menu screen, press either the Back key or M key twice.

A function key (when configured for Reset, or any other key configured for Reset) will exit back to the default channel screen.

#### 5.6.1. PHONEBOOK EDIT – TO DELETE AN ENTRY

From the 'Ph Book Edit' screen, use the ▼/▲ keys to scroll through and select the phonebook entry to be deleted.

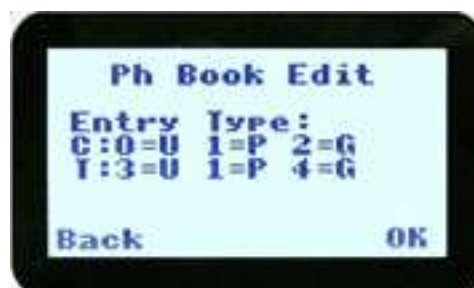
Press the OK key and the 'Ph Book Edit' pop-up menu will be displayed.

Use the ▼/▲ keys to select Delete and then press OK to delete the Entry and exit back to the default screen.

#### 5.6.2. PHONEBOOK EDIT – TO ADD A NEW ENTRY

From the 'Ph Book Edit' screen, (in any phonebook entry), press OK and the "Ph Book Edit" pop-up menu will be displayed.

Use the ▼/▲ keys to select Add from the pop-up menu and press OK. The first of the "Add New Entry" sub-menu screens will be displayed.



The first sub-menu screen is the 'Entry Type' screen.

There are seven possible types of Phonebook entries. These are:

Conv. Unit ID (Option 0)	Conv. PSTN (Option 1)	Conv. Group (Option 2)
Trunk Unit ID (Option 3)	Trunk PSTN (Option 1)	Trunk Group (Option 4)
	Dialstring (Option 5)	

Using the keypad, make the required selection (0 – 5) and select OK.

From here, follow the steps for entering the System ID in Section 5.6.3.1 below (part of Section 5.6.3, Phonebook Edit – To Edit an Existing Entry).

### 5.6.3. PHONEBOOK EDIT – TO EDIT AN EXISTING ENTRY

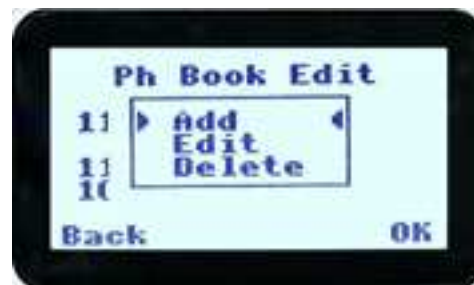
The operation is similar to adding a new phonebook entry in previous section. In this example, editing a P25 Trunked ID is shown. It is also possible to edit a P25 Conventional ID and a P25 Group Entry.

#### Note.

When editing a phonebook entry for a Conventional channel, not all the steps will be required.

From the 'Ph Book Edit' screen, at the phonebook entry to be edited, press OK and the "Ph Book Edit" pop-up menu will be displayed.

Use the ▼/▲ keys to select Edit from the pop-up menu and press OK. The 'Edit Sys ID' sub-menu screen will be displayed.

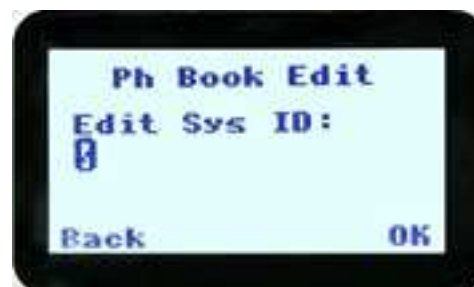


#### 5.6.3.1. System ID

Upon entering the Edit Sys ID screen, the current trunked System ID of the selected phonebook entry is displayed.

The System ID entry can then be changed using the numeric digits and ▼ key as a destructive backspace.

If the System ID has to be changed, use the keypad and the ▼ key to enter the new System ID as required and then press the OK key.



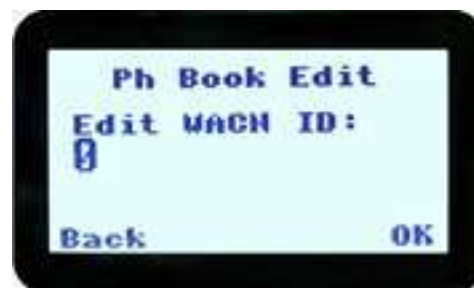
If the system ID does not have to be changed, press the OK key. The 'Edit WACN ID' sub-menu screen will be displayed.

#### 5.6.3.2. WACN (Wide Area Coverage Network) ID

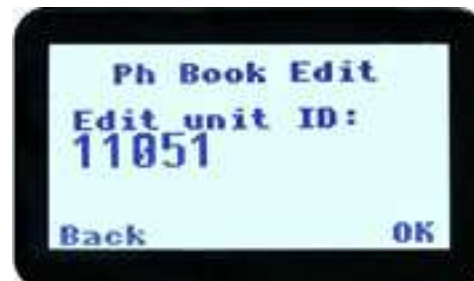
Upon entering the Edit WACN ID screen, the current WACN ID of the selected phonebook entry is displayed.

The WACN ID entry can then be changed using the numeric digits and ▼ key as a destructive backspace.

If the WACN ID has to be changed, use the keypad and the ▼ key to enter the new WACN ID as required and then press the OK key.



If the WACN ID does not have to be changed, press the OK key. The 'Edit Unit ID' sub-menu screen will be displayed.



#### 5.6.3.3. Unit ID

Upon entering the Edit Unit ID screen, the current Unit ID of the selected phonebook entry is displayed.

The Unit ID can then be changed using the numeric digits and ▼/▲ keys to move the cursor with Reset function key to delete.

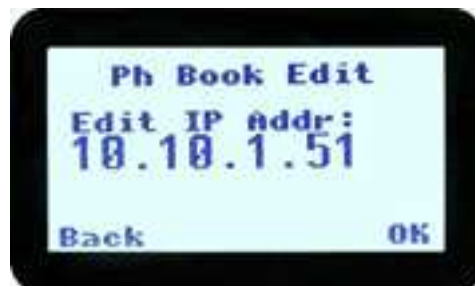
If the Unit ID has to be changed, use the keypad and the ▼/▲ keys to enter the new Unit ID as required and then press the OK key.

If the Unit ID does not have to be changed, press the OK key. The 'Edit IP Addr' sub-menu screen will be displayed.

#### 5.6.3.4. IP Address

Upon entering the Edit IP Addr screen, the current IP address of the selected phonebook entry is displayed.

The IP address can be changed using the numeric digits and the ▼/▲ keys to move the cursor with the Reset function key to delete. The “#” key is used to enter a “.” (full stop).



If the IP Address has to be changed, use the keypad and the ▼/▲ keys to enter the new IP Address as required and then press the OK key.

If the IP Address does not have to be changed, press the OK key. The 'Edit Name' sub-menu screen will be displayed.

#### 5.6.3.5. Name

Upon entering the Edit Name screen, the current Name of the selected phonebook entry is displayed.

The name entry can be changed using the numeric digits and the ▼/▲ keys to move the cursor with the Reset function key to delete.



If the Name has to be changed, use the keypad and the ▼/▲ keys to enter the new Name as required and then press the OK key.

If the Name does not have to be changed, press the OK key.

The editing of the phonebook entry is then complete. The phone entry will be modified in the radio, and the radio will return to the default screen.

### 5.7. SETUP

The Setup sub-menu screens allow the radio operator to edit/modify the operation of some of the general functions of the radio.

From the main channel screen, press the M key to enter Menu Mode.



Use the ▼/▲ keys to scroll through menu options and, with the Setup menu option displayed, press the OK key to access the Setup sub-menus.

Use the ▼/▲ keys to scroll through and select the required Setup sub-menu.

The Setup menu structure may include:

- User Options
- Contrast
- Alert Volume
- Crypto Key (Select Transmit Encryption Key)
- Radio Info (Radio software and hardware information)
- Mode
- RSSI
- Mute Adjust
- Squelch

#### 5.7.1. USER OPTIONS

The 'User Options' menu provides access to a list of Functions that may be toggled on or off. Up to 10 functions may be defined in this menu by the PS.

From the Setup menu, use the ▼/▲ keys to scroll through sub- menus and, with the User Options menu option displayed, press the OK key to access the User Options screen.



One of the programmable functions will be displayed. These functions may include: Key Beeps, Backlight, Talk-Around, Analog Scrambler and Low Power Override.

These functions can also be assigned directly to the radio's function keys, if required.



The functions can be toggled "On" or "Off" with the OK key.

Pressing the Back or M key saves all the function settings and returns to the next highest menu level.

### 5.7.2. CONTRAST

The Contrast menu allows the screen's contrast setting to be altered.

From the Setup menu, use the ▼/▲ keys to scroll through sub- menus and, with the Contrast menu option displayed, press the OK key to access the Contrast adjustment screen.



When the Contrast adjustment screen is displayed, a numeric value representing the contrast setting will be shown.

Use the ▼/▲ keys to adjust the contrast setting as required.

Press the OK key to save the changes and return to the main channel screen.

Press the Back or M key to save the changes and return to the next highest menu level.

### 5.7.3. ALERT VOLUME

The Alert Volume screen allows the user to set the level of the relative Alert Volume level in relation to the current Volume setting. The level can be set in 62 steps over the range –31 to +31, with 0 (zero) being about the same as the voice level. For example, if the alert volume is set to –6, it will be softer than received voice on the radio.



From the Setup menu, use the ▼/▲ keys to scroll through sub- menus and, with the Alert Volume menu option displayed, press the OK key to access the Alert Volume screen.

Use the ▼/▲ keys to adjust the alert volume numeric setting as required. A beep will sound at the indicated level each time the setting is changed.

Press the OK key to save the changes and return to the main channel screen.

Press the Back or M key to save the changes and return to the next highest menu level.

#### 5.7.4. CRYPTO KEY

The Crypto Key screen allows the digital channel's default transmit encryption key to be modified. On an encrypted radio channel, the radio will attempt to use any of the stored encryption keys to decrypt received signals.

If the Padlock symbol is displayed, the currently selected digital channel has encryption enabled. From the Setup menu, use the ▼/▲ keys to scroll through sub-menus and, with the Crypto Key menu option displayed, press the OK key to access the Crypto Key screen.



Digital



Analog

When the Crypto Key screen is displayed, the digital channel's Encryption Key ID (key name and the key identifier) is displayed.

The key name and the key identifier (1-32) for the selected channel can be changed using the ▼/▲ keys.

If the selected channel is changed or the radio is switched off, the channel's default encryption key will be restored.

Press the OK key to save the changes and return to the main channel screen.

Press the Back or M key to save the changes and return to the next highest menu level.

#### 5.7.5. RADIO INFO

The 'Radio Info' screens display information that identifies the PS File description, Radio ID, Serial Number, Software Version and IP Address.

From the Setup menu, use the ▼/▲ keys to scroll through sub-menus and, with the Radio Info menu option displayed, press the OK key to access the Radio Info screens. Use the ▼/▲ keys to scroll through and display the following information pages.



P25 Conv. ID and Radio Band



Radio SW Ver. & Serial No.





Application SW Ver. &amp; Date



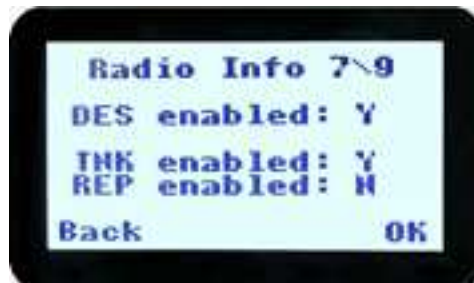
Application Upgrade Ver., Date &amp; PLA Code



P25 Radio Unit Trunked ID and IP Addr.



P25 Trunked SysID, WACN, GID and UID



Feature Authorization Enables



Encryption Status



External Application Memory Status

### 5.7.6. MODE

The Mode menu is used for changing from one radio to another, such as PMR/LMR mode to P25 or MPT1327 trunking.

From the Setup menu, use the ▼/▲ keys to scroll through the sub- menus and, with the Mode menu option displayed, press the OK key to access the Mode screen.

When the Mode screen is displayed, use the ▼/▲ keys to scroll through and select the required operating mode, such as APCO P25, PMR or MPT Trunking.

When the required mode is displayed, press the OK key to select that operating mode. The radio will then display the default screen for that mode.

Keypad shortcuts can be used to change modes from the keypad as follows:

- PMR (\*60#).
- P25 (\*80#).
- MPT Network 1 (\*71#).
- MPT Network 2 (\*72#).



### 5.7.7. RSSI (RECEIVED SIGNAL STRENGTH INDICATOR)

The RSSI screen displays the received signal strength in dBm. When the radio has been correctly calibrated, the reading is typically accurate to within  $\pm 2$  dBm between the range of  $-120$  dBm and  $-80$  dBm. For example,  $-90$  dBm is a strong signal and  $-120$  dBm is no signal.

On digital channels, the RSSI screen also shows the Bit Error Rate (BER). RSSI and BER are typically used to indicate signal quality.

From the Setup menu, use the ▼/▲ keys to scroll through the sub- menus and, with the RSSI menu option displayed, press the OK key to access the RSSI screen.

If a digital channel is selected, the BER (Bit Error Rate) will also be displayed.

The RSSI/BER will be displayed until either the M key is pressed to return to the next highest menu level or the OK key is pressed to return to the main channel screen.



A lower RSSI value indicates a stronger signal, i.e.  $-80$  dBm is a stronger signal than  $-100$  dBm.



## 5.8. STORED CALLS

The Stored Calls screen is used to display the records of individual calls received. When the Stored Calls screen is accessed, the record of the most recently received call is displayed.

The display will show either the Name of the caller from the phonebook or the User ID if the ID is not known to the phonebook. If the stored calls are empty, 'No Record' is displayed.

Use the ▼/▲ keys can be used to scroll through the stored calls. An error beep will sound if there are no more call records.

When the OK key is pressed, a pop-up menu is displayed with the following selections:

- CALL – to call back the caller (set individual call to the caller).
- DELETE – to delete the stored call record.
- CANCEL – to cancel the action selection.

With the Stored Calls pop-up menu displayed, press the M or Back key to return to Stored Calls screen. Press the 'Reset' function key (if configured) to return to the default screen.

### 5.8.1. TO CALL BACK A STORED CALL

From the Stored Calls screen, use the ▼/▲ keys to scroll through and select the required stored call record from the list.

Press the OK key and the stored calls pop-up menu will be displayed. From the pop-up menu, use the ▼/▲ keys to select the CALL option.

Press the OK key and the radio will be set to the individual calling mode with the ID of the stored call.

Press the PTT button within the configured time interval and an individual call to the ID of the stored call will be sent.

### 5.8.2. TO DELETE A STORED CALL RECORD

From the Stored Calls screen, use the ▼/▲ keys to scroll through and select the required stored call record from the list.

Press the OK key and the stored calls pop-up menu will be displayed. From the pop-up menu, use the ▼/▲ keys to select the DELETE option.

Press the OK key and the selected stored call record will be removed from the list. The radio will return to the Stored Calls screen and the next record will be displayed.

Press the 'Reset' function key (if configured) to return to the default screen. Press the M or Back key to return to the next highest menu screen.



Press the M or Back key to return to the next highest menu screen.

## 5.9. MESSAGES

A P25 radio can transmit and receive predefined short messages and text messages to/from another radio unit on a digital channel (P25 conventional only).

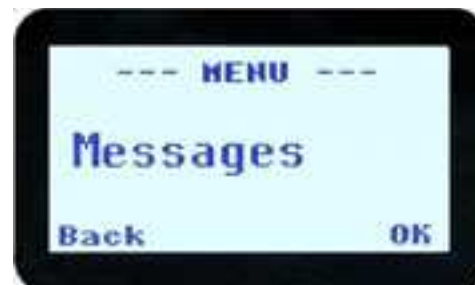
Messages received are stored in radio memory. They can be viewed and deleted as required.

If there are unread messages stored in the radio, the envelope icon on the default screen will flash.

If there are messages in the radio that have all been read, a steady envelope icon is shown on the default screen.

If there are no messages in the radio, the envelope icon will not appear on the default screen.

To view, send or delete messages, from the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through the menu options. When the 'Messages' menu option is displayed, press the OK key to access the Messages screen.



The Messages pop-up menu will be displayed.

### 5.9.1. MESSAGES – POP-UP MENU

The Messages pop-up menu selections are:

- VIEW. Used to view received messages.
- SMSG. Short Message. The radio can be programmed with a list of predefined messages. Selecting SMSG shows a list of predefined short messages, which can be sent to another radio unit. Only applicable when a digital channel is selected.
- TXTMSG. Text message. Enters the text message edit and send sub-menus. Only applicable when a digital channel is selected.



Use the ▼/▲ keys to select the required option.

With the 'VIEW' option selected, press the OK key to show the 'Messages View' screen.

With the 'SMSG' option selected, press the OK key to show the Short Message screen, which is for digital channels only; otherwise an error beep will sound.

With the 'TXTMSG' option selected, press the OK key to show the 'Edit Text' screen, which is for digital channels only; otherwise an error beep will sound.

Press the 'Reset' function key (if configured) to return to the default screen. Press the M or Back key to return to the next highest menu screen.

### 5.9.2. MESSAGES VIEW SCREEN

Received messages (both short messages and text messages) can be viewed from the 'Messages View' screen.

When this screen is displayed it will show the most recently received message.

The information displayed for each message includes the sender ID and the first two lines of the received message in text string.

If no messages are stored, 'NO MSG' is displayed.

To scroll through other stored messages, use the ▼/▲ keys. If there is no further message stored, an error beep will sound.

Press the 'Reset' function key (if configured) to return to the default screen. Press the M or Back key to return to the next highest menu screen.

Press the OK key to display the Messages View pop-up menu with further options available.



#### 5.9.2.1. Messages View – Pop-Up Menu

The Messages View pop-up menu selections are:

- DELETE – to delete the currently selected message.
- MORE – to view the full (entire) message.
- REPLY – to select the method of replying to the selected message.



Use the ▼/▲ keys to select the required option.

With the 'DELETE' option selected, press the OK key to delete the selected message from the radio. The radio will return to the Messages View screen with the next message being selected and displayed.

With the 'MORE' option selected, press the OK key to display the full message.

With the 'REPLY' option selected, press the OK key to display the 'MessagesReply' pop-up screen.

Press the 'Reset' function key (if configured) to return to the default screen. Press the M or Back key to return to the next highest menu screen.

#### 5.9.2.2. Messages View – More Screen

The Messages View More screen displays the selected message in full – six lines of message text per page of the selected message.

If a message is greater than six lines in length, use the ▼/▲ keys to select and view the other pages.



Press the M or Back key to return to the next highest menu screen (i.e. the Messages View pop-up menu screen).

Press the 'Reset' function key (if configured) to return to the default screen.

#### 5.9.2.3. Messages Reply – Pop-Up Menu

Selecting REPLY from the Messages View pop-up menu will bring up the MessagesReply pop-up menu.

The MessagesReply pop-up menu selections are:

- CALL – to call the selected sender.
- SMSG – to send a short message to the sender.
- TXTMSG – to edit and send a text message to the sender. Use the ▼/▲ keys to select the required option.



With the 'CALL' option selected, press the OK key. The radio will then be returned to the default screen and set to individual calling mode for a time out period determined by radio configuration. When the radio's PTT is activated, an individual voice call is sent to the message sender.

With the 'SMSG' option selected, press the OK key to displays the short message MessagesReply screen.

With the 'TXTMSG' option selected, press the OK key to display the message Reply Text screen. Press the M or Back key to return to the next highest menu screen.

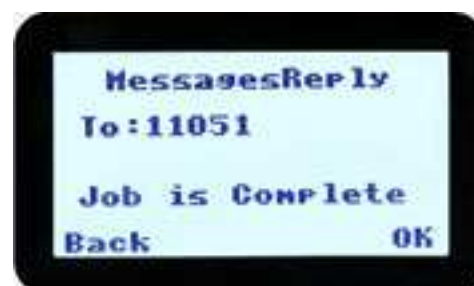
Press the 'Reset' function key (if configured) to return to the default screen.

#### 5.9.2.4. Short Message Reply Screen

The MessagesReply menu is used to reply to a received message with a pre-defined short message.

When the screen is displayed, it shows the destination unit identifier and a short message.

Use the ▼/▲ keys to scroll through and select the required short message to be sent from the pre-programmed list.



Press the OK key to send the selected short message in reply to the received message. The radio will then return to the default screen.

Press the M or Back key to return to the next highest menu screen.

Press the 'Reset' function key (if configured) to return to the default screen without sending a short message reply.

#### 5.9.2.5. Text Message Reply Screen

The Reply Text screen is used to reply to a received message with a free form text message.

The maximum length of text message that can be sent is 210 characters. The number of characters entered is displayed in the top right hand side of the screen.

The characters are entered via the keypad. When using the keypad to type text:

- Press the relevant keypad key the appropriate number of times until the desired character or number is selected.
- The current character position is identified by a flashing block cursor.
- Use the ▼/▲ keys to move to the next or previous character space to be entered/modified.
- Use the # key to select lower/upper case letters.
- The '0' (zero) key is the space key.
- Pressing and holding the 'Reset' key for less than one second will delete the character to the left of the cursor and move the cursor one position to the left.
- Pressing and holding the 'Reset' key for more than one second will delete all characters from the cursor position to the left until the 'Reset' key is released. A new character entered is put on the current cursor location.



Once the text message is complete, press the OK key to send the text message. The radio will then return to the default screen.

Press the M or Back key to return to the next highest menu screen.

Press the 'Reset' function key (if configured) to return to the default screen without sending a text message reply.

#### 5.9.3. SEND MESSAGE (SHORT OR TEXT)

This menu is used to send either a short message or a text message to another party.

Select Messages from the main menu and then choose either 'MSG' (Short Message) or 'TXTMSG' (Text Message).

This screen allows the user to view and select a short message. It displays the selected short message text.

The short message can be selected by using the ▲ and ▼ keys.

Press the 'Reset' function key (if configured) to return the radio to the default screen.

Press the Back or M key to return to the Message Pop-up screen.

Press the OK key to return to the Destination Pop-up screen.

#### 5.9.3.1. Text Message Screen

This screen allows editing and sending a free form text message. A text message can have a maximum length of 210 characters. The number of characters entered is displayed in the top right hand side of the screen.

The characters are entered via the keypad by pressing the relevant key one or more times to choose each character.

The ▼ key is used to move the cursor to the left. The ▲ key is used to move the cursor to the right.

A 'Reset' key press and hold for less than one second deletes the character to the left of the cursor, and moves the cursor position to the left by one.

Holding the 'Reset' key down for more than one second deletes all characters from the cursor position to the right. A new character entered is put on the current cursor location.

The '#' key is used to toggle upper and lower case.

When the Back key or M key is pressed, the radio returns to the Message Reply pop-up screen. When OK key is pressed, the Destination Selection Pop-up Menu screen appears.

#### 5.9.3.2. Destination Select Pop-Up Menu

This menu allows selection of the message destination. The selections are:

- PH.BK – to select the destination from the phone book.
- ENT.ID – to enter the destination Unit ID.
- CANCEL – to cancel the destination selection. Use the ▼/▲ keys to select the require option.

With 'CANCEL' selected, press the OK key to return to the previous screen, i.e. Short Message Screen, or Edit Text Message Screen.

With 'PH.BK' selected, press the OK key to display the 'Phone Entry' selection screen. With 'ENT.ID' selected, press the OK key to display the 'Enter Unit ID' screen".

Press the M or Back key to return to previous screen, i.e. Short Message Screen, or Edit Text Message Screen.

Press the 'Reset' function key (if configured) to return to the default screen display.

#### 5.9.3.3. Phonebook Entry Selection Screen

The Phone Entry selection screen allows the user to select the destination ID from the Phonebook.

Use the ▼/▲ keys to select the required phonebook entry.

Press the OK key to send the message to the chosen destination ID. The radio will then return to the default screen.

Press the 'Reset' function key (if configured) to return to the default screen display without sending the message.

Press the M or Back key to return to the Destination Selection Pop-up screen.



#### 5.9.3.4. Enter Unit ID Screen

The Enter Unit ID screen allows the user to enter the destination Unit ID manually using the keypad. The valid range of a Unit ID is 0 – 16,777,215.

The entered digits can be deleted by using the ▼ key.

Press the M or Back key to return to the Destination Selection pop-up menu screen. Press the 'Reset' function key (if configured) to return to the default screen display.

Press the OK key to send the message to the entered unit ID (providing it is valid). The radio will then return to the default screen.

If the entered Unit ID is not valid, or the IP address is not defined, an error beep will sound. Sending a short message or text message can fail if the destination radio is not available.

### 5.10. SCAN EDIT MENU

The Scan Edit menu allows the user to add or delete channels to or from a Scan Group.

Any changes to a Scan Group are stored permanently in the radio.

From the main channel screen, press the M key to enter Menu Mode. Use the ▼/▲ keys to scroll through menu options. With the Scan Edit menu option displayed, press the OK key to enter the 'Scan Group Edit' screen.



#### 5.10.1. SCAN GROUP EDIT SCREEN

When selected, the Scan Group Edit screen displays the details of a channel within the Scan Group.



The second line from the top shows the name of the selected channel in the scan group.

The next line shows the channel type, i.e. 'Member' if it is a normal member of the scan group, 'Priority' if it is the priority channel, or 'Skipped' if the channel is currently skipped from the scan group.

Use the ▼/▲ keys to scroll through and select a channel from the scan group list.

Press the OK key and the action selection pop-up menu will be displayed.

The Scan Group Edit pop-up menu selections are:

- Add – to add a channel to the scan group.
- Delete – to delete the currently selected channel from the scan group.
- Back – to return to previous menu screen. Use the ▼/▲ keys to select the required option.



With the 'Delete' option selected, press the OK key to remove the selected channel from the scan group and to return the radio to the default screen. If scanning is enabled on the current channel, scanning will start. The deletion is permanent.

With the 'Add' option selected, press the OK key to display the Scan Group Add – Priority Level screen.

The priority level of the channel to add to the scan group is selected from this screen. The options are:

- Member - A member channel is a normal channel with lowest priority in the scan group.
- Prty1 - A Priority 1 channel will have the highest priority in the scan group.
- Prty2 - A Priority 2 channel will have the second highest priority in the scan group.



Use the ▼/▲ keys to select the priority of the channel and press the OK key. The 'Scan Group Add' screen will be displayed.

Press the M or Back key to return to the next highest menu screen.

Press the 'Reset' function key (if configured) to return to the default screen.

#### 5.10.2. SCAN GROUP ADD SCREEN

The Scan Group Add screen shows channels that are not members of the Scan Group.

The second line of the display shows the name of a channel that is not a member of the Scan Group.

Other channels that are not members of the scan group can be selected using the ▼/▲ keys.



Press the 'Reset' function key (if configured) to return to the default screen display. Press the Back or M key to return the radio to the main Scan Edit screen.

When the OK key is pressed:

- If the scan group has less than 15 member channels, the selected non-member channel is added to the scan group. If scan is enabled on the current channel, the radio will resume scanning. The radio returns to the default screen. The added channel is permanent.
- Otherwise, an error beep will sound, and the radio will return to the default screen.



### 5.11. NO MENU

The 'No Menu' option exists in the PS when a menu entry is not required. If all entries are 'No Menu', there will be no menu system available. This may be desirable for simple configurations.

## 6. FEATURES AND FUNCTIONS

### 6.1. Battery

**PLEASE NOTE:** Be sure to charge the battery before using the radio for the first time.

#### 6.1.1. BATTERY REMOVAL AND INSTALLATION

To remove battery, slide the RCA button above the battery on the back of the radio down. With the button pushed down, grasp the top of the battery and pull it away from the radio body.



To install the battery, place the bottom of the battery into the bottom of the battery slot and press the top of the battery into place. You should hear a click when the battery is fully inserted into the radio.

Please use caution when removing or installing the battery to ensure that the battery “seats” properly into the radio body. Improper battery handling can cause foreign material to enter the radio when in use.

#### 6.1.2. BATTERY CHARGING

Please see the Battery Charger User Manual for Charging Safety Precautions and Operational Guidelines

**PLEASE NOTE:** The radio must be turned off prior to charging the battery. Battery life will be reduced if the radio is on when placed in the charger. Batteries should not be left in a charger for prolonged periods, i.e. 3 day weekend, as this will reduce the life of the battery. When using a charger, the ambient temperature around the power supply equipment must not be above 104°F (40°C) or below 23°F (–5°C). Chargers are designed to charge only within the listed temperature range. (Battery capacity will decrease under extreme temperatures.)

**For best performance, charge a new battery 12 to 14 hours before initial use.**

Place the battery pack, or the radio with the battery attached, into the charging pocket on the charger. Be sure the groove on each side of the battery is aligned with the corresponding ribs on each side of the charging pocket.

When the battery/radio is properly inserted into the charger, the LED will be solid red, indicating that the fast charging process has been initiated.

When the battery pack is fully charged, the charger will show a solid green LED.

### 6.1.3. BATTERY STORAGE

Fully charge a battery before storing it for an extended period of time to avoid battery damage due to over-discharge.

Recharge a battery after three months storage to avoid reduced battery capacity due to over-discharge.

When storing a battery, keep it in a dry place at room temperature.

## 6.2. SWITCH ON/SWITCH OFF

Turn the On/Off/Volume knob clockwise to switch the portable radio on.

The display will illuminate and show a “Welcome Message” as programmed by the PS.



After a brief time delay (approximately 2 seconds), the display will revert to the Channel Screen, at which time the radio is ready for use.

Turning the On/Off/Volume knob fully counter-clockwise will turn the radio off.

If the radio Power Down Timer is enabled, the radio will automatically turn off after a predefined duration of inactivity as set by the PS (i.e. no keys pressed). The radio will emit warning beeps for 10 seconds prior to switching off. Pressing any key will reset this timer.

### 6.2.1. DEFAULT SCREEN TRUNKED MODE

Once turned on, the radio will show the currently selected Zone and Channel. If the selected channel is a trunking channel, the radio will scan until it finds the trunked system. This will typically take a few seconds to determine if the trunked network is available.



Trunked mode is indicated by the **T** icon. The rotating arrow indicates that the radio is scanning for a trunked network. When the arrow is not shown, the radio is registered with the trunked network and ready to make or receive a call.

### 6.2.2. VOLUME ADJUSTMENT

The top On/Off/Volume knob adjusts the speech level at the loudspeaker or remote speaker microphone. Rotating clockwise increases the volume and counter-clockwise decreases the volume.

#### Note

The radio may be programmed so that the volume cannot be completely turned off.

### 6.3. CHANNEL SELECTION

Channels selection may be achieved by any of the following:

- Rotating the top mounted Channel Change control.
- Using the ▼/▲ keys while the default channel screen is displayed.
- Entering the desired channel number from the Keypad and pressing # (e.g. 1 2 #).

### 6.4. ZONE SELECTION

A zone may be selected by:


- Selecting the Zone menu (see Section 5.2) and using the ▼/▲ keys.
- Using the three position switch under the selector switch (if programmed).


### 6.5. THREE POSITION FUNCTION SWITCH

The Three Position Function Switch located below the Channel Change control is configurable via the PS. It is not configured by default.

### 6.6. RECEIVING (SINGLE CHANNEL SCREEN)

How to listen to messages on the displayed channel -

The Solid Speaker Icon  will be displayed when a valid signal is being received and audio can be heard through the loudspeaker.

An Outline Speaker Icon  will be displayed if a signal is being received that is not addressing this radio and is not audible. For example, another user group may be having a conversation on another Talk Group when receiving in Selective Mute.



The analog channel's receive mute setting can be altered from the Mute Adjust menu. While on an Analog channel, both P25 and Analog FM transmissions will be received. While on a P25 channel, only P25 transmissions will be received.

#### 6.6.1. RECEIVED INDIVIDUAL CALLS

Unanswered received individual calls addressed to the radio are stored in radio memory. The caller unit ID may be viewed, answered and deleted by the user as desired.

A newly received individual call addressed to the radio will produce an intermittent alert tone until any key is pressed.

If the caller unit ID of a newly received unanswered call is already in the Stored Calls list, the old Stored Call record of that unit ID will be replaced by the new record and added to the top of the list.

To view/answer/delete received call records, the Stored Calls screen is selected.




For further details of the Stored Calls Menu and functions see Section 5.7.

## 6.7. TRANSMITTING



### WARNING

**RADIO FREQUENCY RADIATION. A RF RADIATION HAZARD EXISTS IN THIS EQUIPMENT. TO AVOID RF INJURY, DO NOT TOUCH THE ANTENNA WHEN THE TRANSMITTER IS IN USE. DO NOT OPERATE TRANSMITTER WITH ANTENNA DISCONNECTED. REFER TO THE PERSONAL SAFETY PAGES.**

To avoid interfering with other users of the channel, listen prior to transmitting to ensure no transmissions are occurring. Make sure that the Outline Speaker Icon  is not shown. If required, the radio may be programmed to prevent transmission on a busy channel.

To determine if your radio is ready to transmit, push the PTT switch and check to see if the Tx Light Emitting Diode (LED) turns Red. If the Tx LED is red, hold the radio a few inches from your mouth, press the PTT switch, wait for a Grant tone, and then speak clearly across the face of the portable in a normal conversational manner.

### Note.

**The microphone is located near the bottom right hand corner of the portable radio's speaker grille.**

In most systems it is important to wait a short time between pressing the PTT and commencing to speak. This ensures that the path is properly established and avoids lost, truncated or distorted speech.

Use correct operating procedures and keep your transmissions short.

Release the PTT as soon as you finish speaking.

The talk group for a transmission is usually associated with a channel selection. A talk group will address all others that have the same TGID selected.

While on a P25 channel, the transmission will be P25 digital. For an analog channel, the transmission will be analog FM.

### Note.

**A Transmit Limit Timer may be setup that limits a continuous transmission on a channel. The last 10 seconds before the timer expires may be accompanied by warning tones.**

## 6.8. SCAN FUNCTIONS

The Scan/Vote Function allows the sequential searching of up to 16 channels if the selected zone channel is programmed as a Scan channel, and 15 channels if the selected zone channel is programmed as a Vote channel, for a valid signal (Carrier + CTCSS/DCS tone for Analog FM or NAC for P25). When found, the radio will stop on that channel until the signal disappears again.

To activate Scanning, select a channel that has been programmed as a Scan channel. Once selected, the scanning will either start automatically if programmed, or the programmed scan function key will have to be pressed. (Scanning is PS configurable.)

If a selected zone channel is programmed as a Vote channel, the voting will start automatically without any other user intervention.

While listening on the channel, the user is able to use the PTT on that channel. After the signal disappears, the radio will remain listening on the channel for a short time (Programming Software, typically 3 seconds) before resuming scanning or voting.

If a Priority Channel is assigned to Scan mode, the radio will check this channel between each normal Scan channel.

#### 6.8.1. SCAN/VOTE SCREEN

A Scan can be started by:

- Pressing the function key that has been assigned the scan function by the PS
- Selecting a zone channel that has been assigned to automatically scan by the PS
- Selecting the SCAN ON option under User Options menu

Selecting a channel that is associated to a Voting Group, with Scan/Vote enabled in the PS starts the voting process.

The top line of the display still shows the name of the current selected channel. The second line of the display shows the name of the current selected zone while scanning/voting.

The channel can be changed by using the ▼/▲ keys. Other channels may be either Scan or Normal channels, depending on the radio's configuration.

Scanning/Voting is indicated by a rotating arrow symbol.

When stopped on a channel, the second line from the top shows the name of the channel from the scan group that the radio stopped on.

If stopped on a channel, that channel can be "skipped" by pressing the skip programmed function key. Once a channel is "skipped" it will not be scanned for the duration of that Zone/Channel selection.


While stopped on a channel, the asterisk (\*) icon will display.

When transmitting on a channel, the second line of display shows the name of the current channel that the radio is transmitting on.



## 6.9. KEYPAD LOCK

The radio has a Keypad Lock function that prevents accidental key presses.

The keypad lock function may be enabled by the PS during configuration. If this function is activated, a key icon  will be displayed when the keypad is locked.


The PTT, Alarm Key (if assigned) and Reset Key (if assigned) are not locked.

To unlock the keypad, it is necessary to press and hold down the OK key for 2 seconds. After 2 seconds, the key icon will disappear and the keypad will be enabled.

The keypad will automatically re-lock after a period of 10 seconds following no key activity.

## 6.10. ENCRYPTION

In P25 Digital mode, radio channels may be programmed for encryption.

The encryption state of the selected channel is determined by the radio configuration. An encrypted channel will display the  encryption icon.

A radio channel that has been programmed for encryption will receive either clear or encrypted traffic. A transmission on this channel will be encrypted.

When the radio is on an encrypted channel, the encryption icon will not be shown if a received signal is not encrypted.

The current channel's transmit encryption key can be temporarily changed from the Crypto menu.

When in Analog FM mode, there is a simple voice inversion scrambler for low security applications.

A double beep will sound at the start of each PTT.

The scrambler function key is assigned through the PS.



## 6.11. EMERGENCY ALARM

### 6.11.1. RECEIVING EMERGENCY CALLS

When an emergency call is being received, a message will be displayed on the default screen 'RxEm' indicating the radio unit that is sending the emergency call.

### 6.11.2. MAKING AN EMERGENCY CALL

Your radio will change to emergency mode when the emergency key is pressed and held for a specific amount of time (determined by the PS). In emergency mode, the radio can operate in three PS configurable modes:

- Normal - The radio will continue to respond to PTT, channel change etc. while displaying the  icon.
- Frozen - The default screen will freeze, with the  icon displayed indicating emergency mode.

- Blank - The screen will become blank, giving no indication that the radio is in emergency mode.

When emergency mode is triggered, the radio can be configured by the PS to transmit and receive on a cyclic basis with PS programmed time periods. The display will show 'Tx Em': Channel No.

During Tx, the radio will generate an emergency broadcast call on either the currently selected channel or an PS selected channel.

Others may listen to the automatic transmissions to hear conversations near the radio. Turning the radio off and on will disable emergency mode.

### 6.12. Connecting Audio Accessories

The RCA audio accessory connection is located on the side of the radio, under the rubber accessory cover. To connect the desired audio accessory, pull the bottom of the accessory cover up until the accessory jack is exposed. Plug in the accessory and secure it to the body of the radio by turning the screw clockwise. Please be sure to loosen the screw prior to removing the audio accessory.

**Please Note:** The use of an audio accessory may affect the waterproof performance of the radio.

## 7. SPECIAL FUNCTION KEYS

Special function keys are simply short cuts to menu screens/options. Further information on the operation of these function keys is contained in Section 5.

This section lists Functions that may be programmed using Function keys F1 to F6. Selected functions may also be programmed into the Three Position Function Switch.

Consult RCA Communications Systems for the functions that are programmed into your radio.

### 7.1. ALARM

The Alarm function key (default F7) is used to put the radio into Emergency Mode. The Alarm function is supported in Digital mode only.

Pressing the Alarm key causes the radio to set the Emergency flag in the transmit voice messaging and, depending on the radio configuration, optionally enter Transmit/Receive cycle mode. In cycle mode, the radio will transmit live microphone audio at high gain for the configured duration and return to receive mode for the configured duration.

This cycle will repeat indefinitely or until the radio is turned off and on again.

### 7.2. ANNOUNCE

To send an Announce call on the channel, press this function key and then push the PTT to send the call. The next PTT after the Announce will call the default group.

### 7.3. CHANNEL UP AND DOWN

The current selected Zone's channel decreases whenever the key is pressed.

The Channel Up and Down functions are normally assigned to the ▼/▲ function keys. They can be assigned to other keys if necessary.

If the current channel is the first channel, then the lower channel will wrap around to the last channel in the current zone.

The new channel can be an analog or digital channel.

If pressed and held, the function auto repeats and updates the display for every 5<sup>th</sup> channel.

If the Talk Around function is enabled and selected, then Talk Around will be cancelled when the channel is changed.

### 7.4. CRYPTO

The Crypto function provides a shortcut to the Encryption select menu for user selection of the current encryption key.

### 7.5. DTMF SEND 1 and 2 (ANALOG)

This function transmits a predefined Dual Tone Multi-Frequency (DTMF) sequence of up to 16 DTMF tones. There are two DTMF send functions, DTMF1 and DTMF2.

Send DTMF is only supported in analog mode and can be assigned to keys F1 to F6.

If an analog channel is selected and transmit is allowed, then activating this function transmits a predefined DTMF sequence (up to 16 tones).

### 7.6. KEY LOCK

The Keyboard Lock function is dedicated to the OK key. To use Key Lock, the function has to be enabled through the PS. To unlock the keys, the OK key must be held down for 2 seconds. The keys will then auto-lock again 10 seconds after no user activity.

With the exception of Emergency, PTT and the function key that has been assigned as the Reset Function, keys are locked in this mode.

### 7.7. LOW POWER

This function forces the radio to low power transmit operation. Pressing the function key again puts the radio back to the power level defined for the current channel. The 'forced low power state' is not affected by channel/zone changes.

The RF power level is indicated by the letter L (low) or H (high) replacing the antenna icon when transmitting. The graph above this icon shows one bar for low power and six bars for high power.

### 7.8. MENU

The Menu function key is used for accessing the menu system. This is normally assigned to the "M" key (F1).



## 7.9. MODE

This function is a short cut to the Mode menu. The Mode menu is used to change radio modes, e.g. from P25 Conventional to MPT1327 Trunked.

Selections: Network 1 – 5. These networks may be PMR, MPT1327 Trunked, P25 Conventional or P25 Trunked.

Mode is supported in analog and digital modes.

Once pressed, the radio screen will display the Network menu. The user can then use the ▼/▲ keys to select the network and then press OK. The screen will then return to the channel screen of the new mode.

## 7.10. MUTE

This function allows the radio Carrier-Mute level to be adjusted. Supported in analog mode only.

This function is a shortcut to Mute Adjust menu.

On an analog channel, the mute level can be adjusted between the Programming Software Minimum Mute and Maximum Mute limits.

## 7.11. RESET

The reset function performs several tasks. In order of priority, it:

- Stops Alerts (if any Alerts are sounding).
  - Performs a Backspace (if there is a User entry pending).
  - Switches back to the Main Menu (if in a lower menu).
- It is used during text entry modes such as Phonebook Edit and Text Messaging for backspacing.

## 7.12. SCAN

The Scan key starts and stops the Scan mode on a channel that has been associated with a scan list and is enabled for scanning. Scanning is indicated with a rotating arrow icon.

Scan is supported in both analog and digital mode.

If scan is enabled for the current channel in the current zone and auto scan is not enabled, then start scanning the channels defined in the current channel's scan group.

The second press of the scan key will turn scanning off.

### Note.

If Auto-scan is programmed for that channel, the Scan key will not function.

## 7.13. SCAN EDIT

This key is used to enter the Scan Edit menu, where the members of a scan group can be added or deleted.

### 7.14. SCRAMBLER (ANALOG)

This function enables transmitted voice to be scrambled in order to prevent radios without a scrambler from listening in on the conversation.

This low security form of encryption is sufficient to make speech unintelligible to other casual listeners, however it does not offer high level security as other radios programmed with a scrambler function will be able to unscramble it.

Supported in analog mode only.

The speaker sounds a 'bip-bip' tone when PTT is pressed to indicate that scrambler is active. The Scrambler On/Off state is reset to Off at power-up and channel change.

A first press of the function key enables scrambler mode.

A second press restores the channel to normal (clear) mode.

### 7.15. SKIP

The Skip function key is used to temporarily remove members from a scan channel. The removal is temporary only until the channel is changed.

### 7.16. SQUELCH

The squelch mode is used to selectively receive P25 signals. It has three modes, **Monitor**, **Normal** and **Selective**. When set to **Monitor**, all P25 traffic on that channel will be heard, subject to presence of encryption. **Normal** mode will hear all P25 traffic with the correct NAC code. **Selective** mode will only receive calls to the channel default talk group and individual calls.

### 7.17. TALK AROUND

On a repeater channel only, this function key allows the radio to transmit on the base station's output channel, so the user can talk directly to other mobiles on the channel, while the repeater is out of service or out of range.

When the key is pressed again (or the Channel is changed) the mobile's transmitter channel reverts to its normal setting.

Talk Around mode is indicating to the user by a double beep at the start of each PTT.

### 7.18. ZONE

This function provides a shortcut to the detailed Zone menu.

## 8. ACCESSORIES

The following accessories are available for the RPX4600 portable radio. Contact RCA for additional information.



**WARNING**  
**LITHIUM BATTERIES. THIS EQUIPMENT USES LITHIUM ION BATTERIES.**  
**REFER TO THE PERSONAL SAFETY PAGES.**

### 8.1. Lithium Ion Battery (B4522LI)

Capacity of 2200mAh, non-intrinsically safe battery

### 8.2. Lithium Ion Battery (B4530LI)

Capacity of 3000mAh, non-intrinsically safe battery



**WARNING**  
**DANGEROUS VOLTAGES. DANGEROUS VOLTAGES EXIST IN ALL THE**  
**BATTERY CHARGERS. REFER TO THE PERSONAL SAFETY PAGES.**

### 8.3. Single Unit Charger (CH4501 PKG)

Single radio charger

### 8.4. Dual Unit Charger (CH4502 PKG)

Dual Unit charger for two portable radios

### 8.5. Six Bank Charger (CH4506 PKG)

Six Bank Charger for up to six portable radios

### 8.6. Single Unit Vehicle Charger (VCH4501)

Single radio charger for in-vehicle charging using 12V connector

### 8.7. Battery Belt Clip (BC4500)

Belt clip for spare batteries

### 8.8. VHF Moulded Antenna 136-300 MHz (ANH4500V 136-300)

Uncut; includes cutting chart. 136-300 MHz

### 8.9. Wideband UHF Whip Antenna 440-500 MHz (ANH4500U-6 440-500)

Moulded antenna. 440-500 MHz

### 8.10. Wideband UHF Whip Antenna 400-480 MHz (ANH4500U-6 400-480)

Moulded antenna. 400-480 MHz

### 8.11. Stubby UHF Whip Antenna 400-480 MHz (ANH4500U-3 400-480)

Moulded antenna. 400-480 MHz

### 8.12. Heavy Duty Speaker Microphone – IP56 (SM310-X43)

### 8.13. Heavy Duty Waterproof Speaker Microphone – IP68 (SM311WP-X43)

### 8.14. Speaker Microphone w/4 Function Keys (SM352-X43)

Four programmable function keys.

### 8.15. Deluxe Speaker Microphone – IP67 (SM352WPG-X43)

Speaker microphone with Global Positioning System (GPS) receiver, four programmable function keys and “man-down” feature

### 8.16. Surveillance Kit (SK22NE-X43)

Two wire, in-ear style

### 8.17. Noise Reduction Headsets – IP56 (HS61NR)

Over the head, high noise reduction headsets. (Requires X43 cord.)

### 8.18. Noise Reduction Headsets – IP56 (HS71NR)

Behind the head, high noise reduction headsets. (Requires X43 cord.)

### 8.19. Holsters

- Nylon Holster w/Fixed Belt Loop - RPX4500 (HN4500FL)
- Nylon Holster w/Swivel Belt Loop - RPX4500 (HN4500SL)
- Leather Holster w/Fixed Belt Loop - RPX4500 (HL4500FL)
- Leather Holster w/Swivel Belt Loop - RPX4500 (HL4500SL)
- Nylon Holster w/Fixed Belt Loop - RPX4600 (HN4600FL)
- Nylon Holster w/Swivel Belt Loop - RPX4600 (HN4600SL)
- Leather Holster w/Fixed Belt Loop - RPX4600 (HL4600FL)
- Leather Holster w/Swivel Belt Loop - RPX4600 (HL400SL)

## 9. ALERT TONES AND MESSAGES

TONE TYPE	TONE	MEANING
<b>Grant</b>	0.03 s, (1000 Hz)	Grant Tone
<b>Denied</b>	0.4 s, (440 Hz)	Denied Tone
<b>Ring</b>	8 short beeps 5 s(silence) repeat	After receiving Individual Call
<b>Missed Call</b>	2 short beeps 10 s (silence) repeat	Missed Individual Call
<b>Page</b>	3 short high tones	Received Page
<b>Missed Page</b>	2 short beeps 10 s(silence) repeat	A Page was sent

## 10. TROUBLESHOOTING

SYMPTOM	SOLUTION
Radio will not power on	<ol style="list-style-type: none"> <li>1. The battery needs charging. Recharge the battery or replace it with a fresh one.</li> <li>2. The battery is not properly installed. Remove the battery and reattach it.</li> </ol>
The operating time is noticeably shorter than normal even though the battery is properly charged.	<ol style="list-style-type: none"> <li>1. The battery is worn out; time to buy a new battery.</li> <li>2. The battery is not fully charged. Make sure the battery is removed after the LED indicator has turned green.</li> </ol>
Cannot talk to or hear transmissions from your group members	<ol style="list-style-type: none"> <li>1. Make sure that your radio operates on the same channel and / or has the same CTCSS/CDCSS settings as your group members.</li> <li>2. Make sure you are within communication range.</li> </ol>
Radio is on, but you cannot hear voice transmissions or they are not very loud	<ol style="list-style-type: none"> <li>1. Turn the volume control knob to maximum volume.</li> <li>2. Return the radio to your dealer to check for microphone damage.</li> </ol>

# 11. SPECIFICATIONS

GENERAL			
<b>Frequency Bands</b>	136 - 174 MHz (VHF "V"); 400 - 480 MHz (UHF "U"); 440 - 520 MHz (UHF "U2")		
<b>Dimensions</b>	(H) 5.8 inches (147mm) x (W) 2.5 inches (63mm) x (D) 1.4 inches (36mm)		
<b>Weight</b>	14.4 ounces (408g) with 3000 mAh battery		
<b>Power Supply</b>	Li-ion 2200 mAh or 3000 mAh		
<b>Battery Life</b>	>10 hours, high transmit power 2200 mAh battery, 90:5:5 duty cycle		
<b>Channel Stability</b>	<1.5 ppm		
<b>Display</b>	102 x 64 pixels		
<b>Switching Bandwidth</b>	Full band		
<b>Modulation</b>	Pre-emphasized FM, C4FM		
<b>Conformance</b>	EN 300 086, EN 300 113, EN 300 219, EN 300 489, EN 60950, AS4295, FCC, IC P25 CAP Compliant		
<b>Environmental Protection</b>	IP67 (Submersible/Dust Proof)		
Environmental Standards	MIL-STD-810 F	Method	Procedure
	Low Pressure (Altitude), Storage	500.4	I
	Low Pressure (Altitude), Operational	500.4	II
	High Temp, Storage	501.4	I
	High Temp, Operating	501.4	II
	Low Temp, Storage	502.4	I
	Low Temp, Operating	502.4	II
	Thermal Shock	503.4	I
	Solar Radiation	505.4	I(A2)
	Relative Humidity	507.4	
	Dust	510.4	I
	Sand	510.4	II
	General Vibration: Truck/trailer/tracked - restrained cargo	514.5	I Cat 24
	General Vibration: Minimum Integrity	514.5	I Cat 24
	Shock - Transit Drop	516.5	IV
<b>Operating Temperature</b>	-22°F (-30°C) - 140°F (60°C)		

TRANSMITTER SPECIFICATION	
<b>Power Output</b>	0.5 - 5 W, 3 programmable levels
<b>Audio Distortion</b>	<3% at 1 kHz, 60% deviation
<b>Audio Frequency Response</b>	+1 dB to -3 dB of pre-emphasized 300 to 3000 Hz on 25 kHz Channel (300 to 2550 Hz on 12.5 kHz Channel)
<b>Tx/Rx switching time</b>	<25 ms
<b>Hum and Noise</b>	>40 dB (12.5 kHz); >45 dB (25 kHz)
RECEIVER SPECIFICATION	
<b>Sensitivity</b>	<0.3 $\mu$ V for 12 dB SINAD <0.3 $\mu$ V for 5% BER
<b>Selectivity</b>	>73 dB (25 kHz) >65 dB (12.5 kHz)
<b>Intermodulation</b>	>70 dB
<b>Audio Frequency Response</b>	+1 dB to -3 dB of de-emphasized 300 to 3000 Hz on 25 kHz Channel (300 to 2550 Hz on 12.5 kHz Channel)
<b>Audio Output</b>	500 mW into 16 $\Omega$ <5% distortion
<b>Blocking</b>	>95 dB at +/- 1 MHz
<b>Hum and Noise</b>	>40 dB (12.5 kHz); >45 dB (25 kHz)
ANALOG CONVENTIONAL	
<ul style="list-style-type: none"> <li>• Single and two-frequency simplex</li> <li>• Sequential Tone (selcall)</li> <li>• 200 channels (RPX4500) • 1,000 channels (RPX4600)</li> <li>• 240 scan / vote groups (RPX4600) • CTCSS, DCS, FFSK, DTMF</li> <li>• Analog mode including scrambler</li> </ul>	
ANALOG TRUNKING	
<ul style="list-style-type: none"> <li>• Two-frequency simplex in MPT 1327 trunked systems</li> <li>• 1024 trunked channels in 50 sub bands</li> <li>• MPT 1327 • MPT 1343</li> </ul>	
P25 CONVENTIONAL AND TRUNKING	
<ul style="list-style-type: none"> <li>• P25 CAP Complaint • 40 zones • 1,500 channel pool</li> <li>• 5 Trunking systems • Scanning • Voting • Emergency call</li> <li>• DES OFB and AES 256 Bit Encryption • Individual Calls</li> <li>• CTCSS, DCS, DTMF • 2 Tone, 5 Tone • AMBE+2 Vocoder</li> </ul>	

## 12. WARRANTY

### WARRANTY STATEMENT

RCA Communications Systems warrants each new radio product it supplies to be free from defects in material and workmanship under normal use and service for the time period listed below, provided that the user has complied with the requirements stated herein.

The warranty period begins on the date of purchase from an Authorized RCA Communications Systems Sales and Service Outlet. This warranty is offered to the original end user and is not assignable or transferable. RCA Communications Systems is not responsible for any ancillary equipment which is attached to or used in conjunction with RCA Communications Systems products.

RCA Communications Systems offers to the original end user a Four (4) Year Limited Warranty on the RCA RPX4500/RPX4600 Radio Handset. The RPX4500/RPX4600 Antenna, RPX4500/RPX4600 Battery and the RPX4500/RPX4600 Battery Charger are covered under a One (1) Year Limited Warranty. The RPX4500/RPX4600 Belt Clip is not covered under the warranty.

During this period, if the product fails to function under normal use because of manufacturing defect(s) or workmanship, it should be returned to the Authorized RCA Communications Systems Sales and Service Outlet from which it was purchased. The Sales and Service Outlet will repair the product to full operating specifications or replace the product with a new product of the same make and model. The user is responsible for all charges incurred in returning the product to the Authorized RCA Communications Systems Sales and Service Outlet. RCA Communications Systems will be responsible for all charges in returning the product to the end user via standard ground shipping service.

RCA Communications Systems shall have no obligation to repair or replace the product, if there is damage as a result of normal wear and tear or if the damage is caused in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized alterations or repairs to the product, incorrect wiring, use of the product in a manner for which it was not designed, or by causes external to the product. This warranty is void if the product serial number is altered, defaced or removed.

THE EXPRESS WARRANTIES CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

FOR ANY PRODUCT WHICH DOES NOT COMPLY WITH THE WARRANTY SPECIFIED, THE SOLE

REMEDY WILL BE REPAIR OR REPLACEMENT. IN NO EVENT WILL RCA COMMUNICATIONS SYSTEMS BE LIABLE TO THE BUYER OR ITS CUSTOMERS FOR ANY DAMAGES, INCLUDING ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, OR THE LOSS OF PROFIT, REVENUE OR DATA ARISING OUT OF THE USE OR THE INABILITY TO USE THE PRODUCT.

RCA Communications Systems endeavors to achieve the accuracy and completeness of this manual, but is not liable for any possible omission and printing mistakes.

All the above specifications and design are subject to change without prior notice.

All the reproduction and translation of this manual without authorization is prohibited.

In this manual, we strive to achieve accuracy and completeness, but provide no warranty of accuracy or reliability. All the above specifications and design are subject to change without notice due to continuous development.

No part of this manual may be copied, reproduced, translated, stored in a retrieval system, distributed, or transmitted in any form or by any means, electronic or mechanical, for any purpose without the expressed, written permission from RCA Communications Systems.

The end-user of any two-way radio is solely responsible for obtaining any license or other authorizations required by the Federal Communications Commission (FCC). For further information visit [www.fcc.gov](http://www.fcc.gov) or call 1-888-CALL-FCC (1-888-225-5322).



## APPENDIX A

### COMPLIANCE WITH RF ENERGY EXPOSURE GUIDELINES (UNITED STATES AND CANADA)

#### RF (Radio Frequency) ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION, And OPERATIONAL INSTRUCTIONS FOR FCC OCCUPATIONAL USE REQUIREMENTS

Before using your RCA Communications Systems portable two-way radio, it is important that you read these RF Energy Awareness and Control Information and Operational Instructions in order to ensure compliance with the Federal Communications Commissions (FCCs) RF exposure guidelines.

#### NOTICE:

This portable radio is intended for use in Occupational/Controlled conditions in applications where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

This portable two-way radio uses electromagnetic energy in the Radio Frequency (RF) spectrum to provide communications between two or more users over a distance. It uses RF energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy. Other forms include, but are not limited to, electric power, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health and industry continue to work with organizations to develop standards for exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection. All two-way radios marketed in North America are designed, manufactured and tested to ensure they meet government established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of two-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it. Please refer to the following websites for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits.

- <http://www.fcc.gov/oet/rfsafety/rf-faqs.html>
- <http://www.osha.gov/SLTC/radiofrequencyradiation>

### FEDERAL COMMUNICATIONS COMMISSION REGULATIONS

The FCC rules require manufacturers to comply with the FCC RF energy exposure limits for portable two-way radios before they can be marketed in the US. When two-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. An exposure awareness label is attached to the equipment directing users to specific awareness information.

## COMPLIANCE WITH RF EXPOSURE STANDARDS

Your RCA portable two-way radio is designed to comply with a number of national and international standards and guidelines (listed below) regarding human exposure to RF electromagnetic energy. This radio complies with the Institute of Electrical and Electronic Engineers (IEEE), FCC and the International Commission on Non-Ionising Radiation Protection (ICNIRP) exposure limits for Occupational/Controlled RF exposure environment at duty factors of up to 50% talk, 50% listen and is authorized by the FCC for occupational use. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.

Your RCA two-way radio complies with the following RF energy exposure standards and guidelines:

- United States FCC, Code of Federal Regulations; 47CFR Part 2 Sub-part J
- American National Standards Institute (ANSI)/IEEE C95. 1-1992
- IEEE C95.1-1999 Edition
- Industry Canada RSS-102

## RF EXPOSURE COMPLIANCE AND CONTROL GUIDELINES AND OPERATING INSTRUCTIONS

To control exposure to yourself and others and to ensure compliance with the Occupational/Controlled environment exposure limits, always adhere to the following procedures.

### GUIDELINES:

- User awareness instructions should accompany the device when transferred to other users.
- This radio meets the FCC RF exposure guidelines when used with the RCA accessories supplied or designated for the product. Use of other accessories may not comply with the FCCs RF exposure guidelines and may violate FCC regulations.
- Do not use this device if the operational requirements described herein are not met.

### INSTRUCTIONS:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), press the Press-To-Talk (PTT) button. To receive calls, release the PTT button. Transmitting 50% of the time, or less, is important because this radio generates measurable RF energy exposure only when transmitting (in terms of measuring for standards compliance).
- Do not operate the radio without an approved antenna attached, as this may cause the FCC RF exposure limits to be exceeded. With this product, use only an antenna supplied or approved by RCA.

- Always keep the radio at least 2 inches (5 cm) from your face when transmitting and at least ½ inch (10 mm) from the body. This radio has been tested for RF exposure compliance at the distances listed in Table A1.

*Table A1. RF Exposure Compliance Distances*

FREQUENCY	BODY WORN	HANDHELD IN FRONT OF FACE
136 MHz – 174 MHz	1/2 inch (10 mm )	1 inch (25 mm )
400 MHz – 480 MHz	1/2 inch (10 mm )	1 inch (25 mm )
440 MHz – 520 MHz	1/2 inch (10 mm )	1 inch (25 mm )

### Approved Accessories

To obtain a list of other RCA approved accessories contact RCA Communications Systems.

### Contact Information

For additional information on exposure or any other item, please contact RCA Communications Systems.

For Sales, Warranty and Customer Support please contact:  
Discount Two-Way Radio Corporation – North American RCA Distributor  
1430 240th Street  
Harbor City, CA 90710  
Phone: 310-224-5100 / Fax: 310-224-5101  
[www.DiscountTwo-WayRadio.com](http://www.DiscountTwo-WayRadio.com)



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