



P7250 Portable Radio User's Guide for Orleans County, NY Training Session Notes

assuredcommunications[®]



Trunked Radio System

Project 25

Interoperable digital radio system standard

**Intended for all public safety LMR bands
(VHF, UHF, and 800 MHz)**

Developed Jointly by:

TIA

Association of Public-Safety Communications Officials (APCO)

**National Association of State Telecommunications Directors
(NASTD)**

**Various agencies of the Federal government (FED) in the early
90's to improve spectral efficiencies**

TIA/EIA Standard in 1999. Under TIA/EIA-102



Project 25 Benefits

Key benefits sought by the user community:

- Competitive procurement of equipment
- Interoperability of equipment
- Spectrum efficiency
- User-friendly operation equivalent to today's public safety equipment and common across all bands, system configurations, services, and manufacturers



* SAFETY ITEMS *

DO NOT...operate the portable radio near or in an area where blasting is taking place. Anyone using radio controlled explosives must post signs. If you see a caution sign about blasting in the area, you must turn your radio off. This applies to any radio equipment capable of transmitting: phones, CB's, etc.

DO NOT...operate the portable radio in an explosive atmosphere. The radio is an electrical device with switches that can cause an explosion in an explosive atmosphere. If you can operate your vehicle or any power tools, it is safe to use the radio.

* SAFETY ITEMS *

To ensure that user exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:

DO NOT operate the radio without a proper antenna

DO NOT transmit for more than 50% of the total radio use

Always use only those accessories that have been tested and authorized by the manufacturer

Always keep the antenna at least 5cm (2 inches) away from the body while transmitting

Operating Rules and Regulations

The Federal Communications Commission sets all rules for two-way radio use. All users of two-way radio equipment should be familiar with these basic rule requirements.

It is a violation of FCC rules to interrupt any distress or emergency message

Any use of profane or obscene language is prohibited

It is against the law to send false call letters or a false distress or emergency message

All messages must be brief and limited to the business need

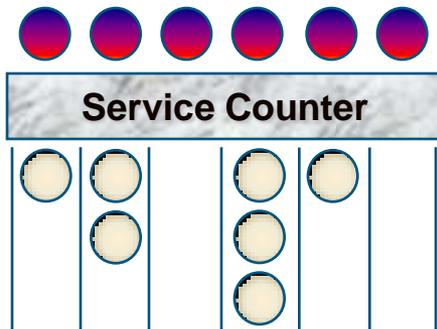
It is a violation of FCC rules to send personal messages, unless in an emergency

The FCC requires that radio systems be identified by use of the assigned Call Letters – the radio system does this automatically

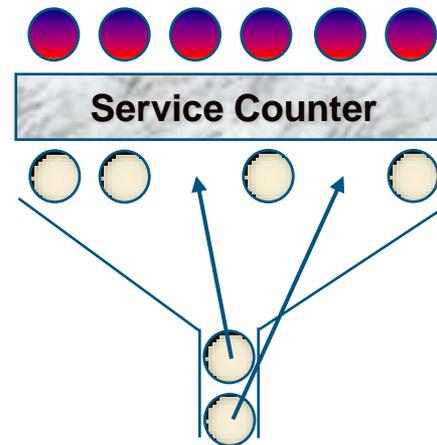
Conventional vs. Trunked

Computerized Assignment of Channels

Conventional



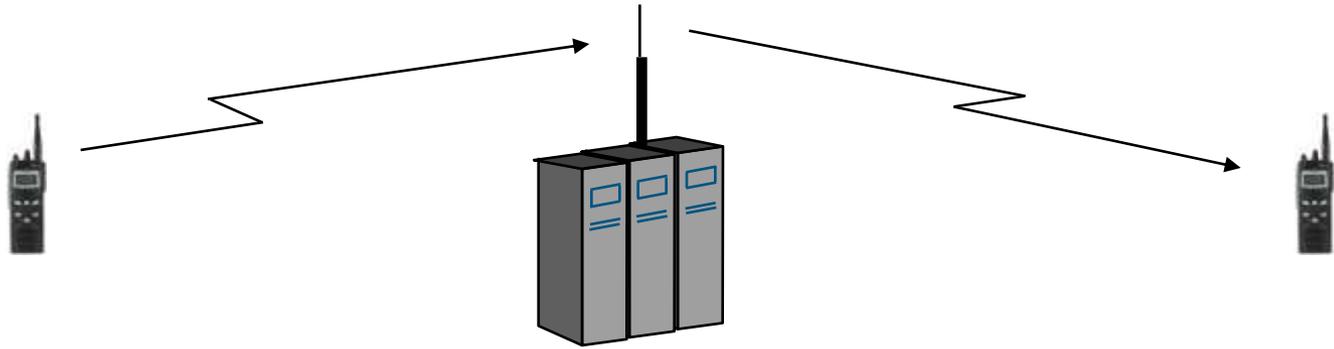
Trunked



 Service Employee

 Customer

Why Trunking?



- Trunking:**
- Improves** spectral efficiency
 - Relieves** the user from managing the channel
 - Encourages** cross agency/shared communications
 - Establishes** communications privacy
 - Encourages** private communications
 - Discourages** eavesdropping by scanners
 - Establishes** “queuing” rather than “waiting”
 - Enables** priority use during busy times

Trunked Radio System Features

Digital Control Channel

Multiple Working Channels

< 0.5 Second Access

Group & Individual Voice Calls

Logical ID (LID) for each radio

Late/Delayed Entry

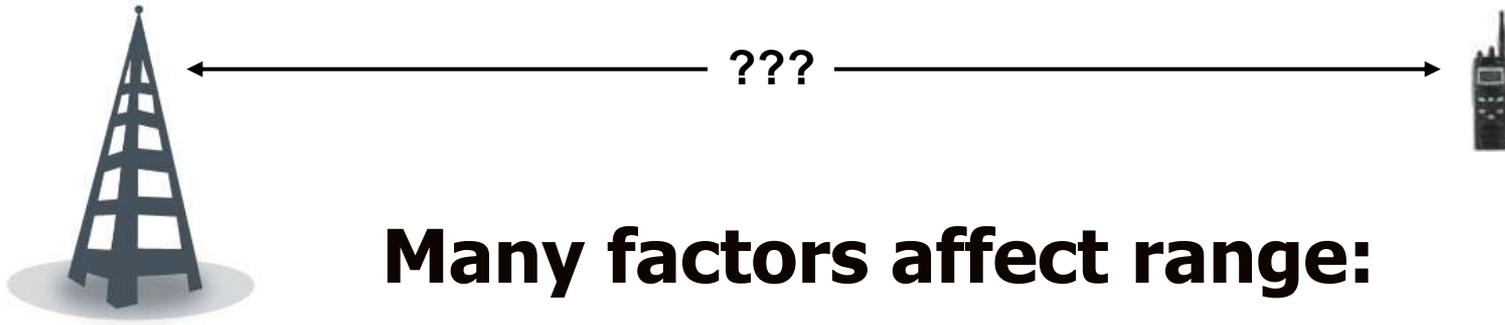
Emergency Calls

Queuing with Priority

Unit Enable/Disable

Wide Area Coverage

Communication Range



Many factors affect range:

- Site Location
- Urban Clutter
- Reflections/Multipath
- Ducting over Water
- Heavy vegetation
- Weather
- Frequency

Multisite - What the Radios Do



Units inform the System of their location:

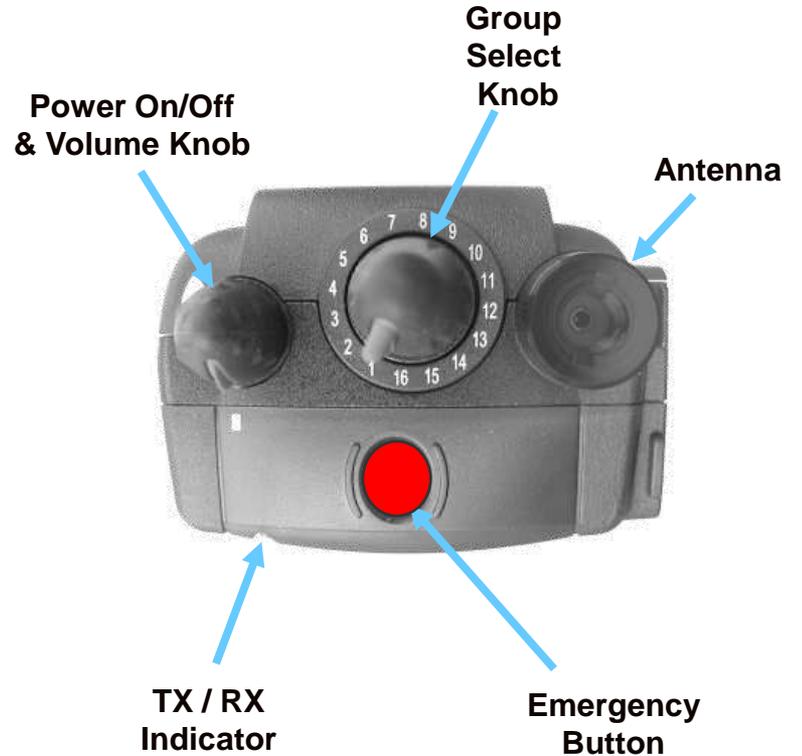
- Each time the Radio is powered up
- Each time a System selection is made
- Each time a Group selection is made

When Radio detects a high bit error rate on the Control Channel,
Radio will look for another site (algorithm pre-programmed in Radio)
Automatically switches to the new site when the criteria is met

P7250 Scan Model Operation



Front and Top Views



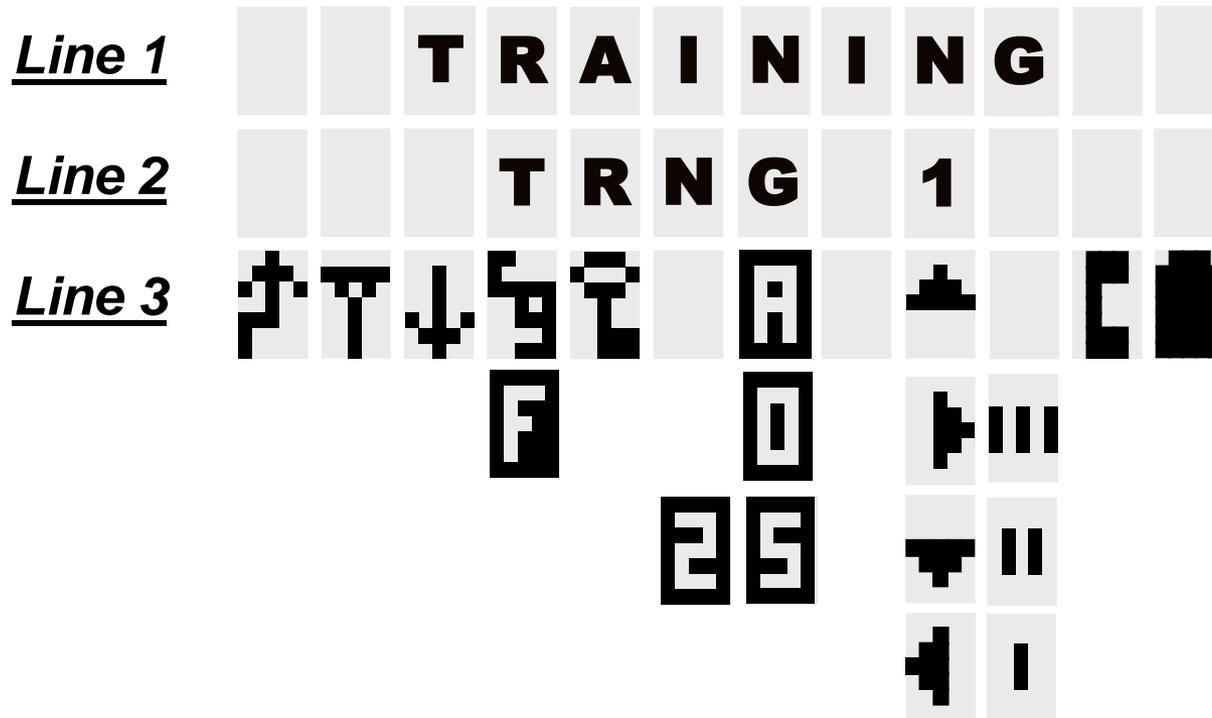
Line 1 & Line 2 Display Indicators

LINE 1: Current System Name (example: TRAINING)
Volume Level (VOL = 10)
Caller Identification (GR 1234)
Low Battery (LOW BATT)
'Who Has Called' (* WHC *)

LINE 2: Current Talkgroup Name (example: TRNG 1)
Call Queued (QUEUED)
System Busy (SYS BUSY)
Call Denied (DENIED)
Individual Call (* INDV *)
Control Channel Scan (CC SCAN)
Wide Area Scan (WA SCAN)
Receive Emergency (* RX EMER *)
Transmit Emergency (* TX EMER *)

LINE 3: Radio Status Icons (*see next page*)

Line 3 Display Status Icons



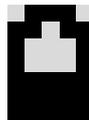
Radio Status Icons

see next page for explanations of icons

Line 3 Icons



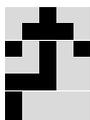
ON - transmitting or receiving
FLASHING - call queued



Battery level
indicator



SCAN enabled
(rotates clockwise)



Radio is transmitting



Failsoft mode



Selected group
in scan list



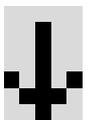
Radio in special call
select/entry mode (Individual or
Telephone Interconnect)



Selected group
Encryption
enabled



Selected group
is priority-two scan



ON - low power transmit
OFF - high power transmit



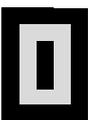
Selected group
Analog Voice



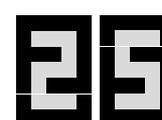
Selected group
is priority-one scan



Conventional channel
is enabled with
Channel Guard

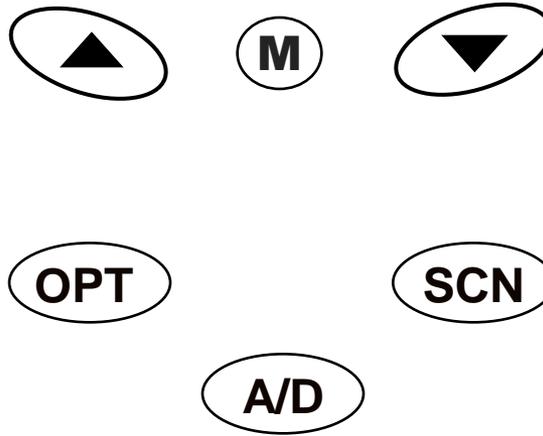


Selected group
Digital Voice



Selected channel
Project 25 Enabled

Keypad Function Keys



M – Accesses pre-stored menus
Acts as “Enter” key

OPT – Optional key

▲▼ – Scrolls through available systems, groups, or channels
Changes the selection for an item within a menu list

A/D – Adds (or deletes) talk groups or channels from the scan list

SCN – Turns Scan function on or off

Alert Tones

-  **Call Originate** short mid-pitched beep (“beep”)
-  **Autokey** short mid-pitched beep sounding after queued and an open channel is gained (“beep”)
-  **Call Queued** high-pitched tone (“beep”) sounded when the system places the call request in a queue
-  **System Busy** three low-pitched tones (“dut-dut-dut”), only with I-Calls
-  **Call Denied** low-pitched tone (“bomp”) sounded when the radio is not authorized on the selected system
-  **Timing Out** five short high-pitched warning tones (“beep..”) followed by a low-pitched tone (“bomp”)
-  **Key Press Alert** short tone “beep”= access; low-pitched “bomp”= denial
-  **Low Battery** short quiet mid-pitched tone (“beep”)
-  **Missed I-Call** telephone ring sounded when an incoming individual call is not answered

Basic Radio Operation



Locking/Unlocking the Keypad

Press and release the M key and then press and release the upper Option button (▲) on the side of the radio to LOCK or UNLOCK the keypad

Upper
Option
Button



M
Key

All front keypad keys except **M** are locked

Emergency Button, PTT, and both knobs function normally

Changing Talk Groups



Turn the **GROUP SELECT** knob to select a group

Group names appear on **Line 2** of the display

Making a Group Call



Turn on the radio

Select the group you want to reach

Group names appear on Line 2 of the display

Push-to-Talk (PTT)

Indicator will light red while transmitting (*orange if transmitting in encrypted mode*)

Receiving a Group Call



The caller's Radio ID or alias appears on Line 1 (ex. 1234)

Group that is transmitting appears on Line 2

Indicator will light green while receiving

If in SCAN and you want to talk to the caller, change to the group that appeared in the display

PTT to respond

Changing Systems

Use the ▲ ▼ keys to select another system

System names appear on Line 1 of the display



Adjust Display Backlight Brightness



Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor at BCK LGHT

Press the **M** key to select the Backlight menu

Use the arrow keys ▲ ▼ to adjust the brightness level of the display backlight from “Off” up to 6

Press the **M** key to select the new setting

Adjust Display Contrast



Press **M** to enter the Menu mode

Use the ▲ ▼ keys to find and select **CONTRAST**

Press **M** a second time

CNTRST = 1, 2, 3, or 4 will appear in the display with the current setting

Use the ▲ ▼ keys to change the contrast level

Press **M** a third time to store the change

Changing the Power Level – page 1



If enabled, the transmit power level of the radio can be adjusted

Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to TX POWER

Press the **M** key to toggle between High and Low power

POWER=HIGH or **POWER=LOW**

will appear momentarily in the display

Changing the Power Level – *page 2*

If enabled, the transmit power level of the radio can be adjusted simply by pressing the pre-programmed “Option” button on the side of the radio

Press the upper option button on the side of the radio to toggle between High and Low power

POWER=HIGH or POWER=LOW
will appear momentarily in the display



Emergencies



Declaring an Emergency

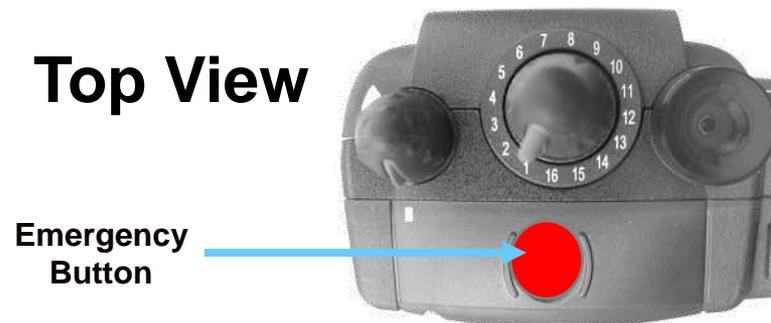


Press and hold the red EMERGENCY button on the top of the radio for a preprogrammed amount of time

TXEMER appears in display and will remain until the emergency is cleared

The microphone will be active for a programmed length of time, but the PTT can be depressed to extend the time needed to report the emergency circumstances

Top View



Receiving an Emergency



RXEMER appears in display and will remain until the emergency is cleared

The microphone will be deactivated for a programmed length of time (while the unit that declared the emergency is transmitting) but the radio will function normally after the initial transmission is complete

PTT to respond if appropriate

Clearing an Emergency



Press and hold the lower option (CLEAR) button () on the side of the radio

Simultaneously press and hold the EMERGENCY button until ***TXEMER*** stops flashing in the display

NOTE –

Only certain radios and specific radio operators will be authorized to clear emergencies (*the portable radio must be pre-configured and the operator must be specifically authorized in order to clear emergencies*)

Call Scanning



Group Call Scanning

The radio is able to monitor multiple groups, but the radio can only receive one group at a time

The radio can scan only those groups on a “Scan List”

This list can be programmed by the user, or

The list may be directly programmed into the radio by the Network Administrator

Turning the Scan function On or Off can be:

Fixed in programming by the Network Administrator, or

Controlled by the radio user

The radio can have up to two “Priority Talk Groups” designated

Priority 1 Talk Group

Priority 2 Talk Group

Priority Talk Groups can be assigned by the radio user, or they might be fixed in the programming by the Network Administrator

The radio will be extracted from listening to a scanned call if a call with a higher priority is received

Turning SCAN On/Off



Press the SCN key to turn on the Scan function

The ► icon rotates clockwise to indicate the radio is scanning.

Press SCN again to turn off the Scan function and the icon ► will disappear.

Establishing a Scan List

To Scan, you must have a Scan List, and to create or edit your Scan List, you must have Scan turned off

If necessary, turn Scan off by pressing the SCN key

The ► indicator will disappear from the display



Adding Groups to the Scan List



Turn the **Group Select knob** to the group you wish to add to your **Scan List**

Press the **A/D key** once to add the group to the **Scan List**

III will appear in the display indicating the addition of the group to the **Scan List**

Turn to the next group and repeat the process to add that group to your **Scan List**

NOTE – If “FIXD LST” appears instead of the 3-bar icon, a fixed scan list has been programmed into the radio, and you will not be able to change it

Creating a Priority 2 Talk Group



Turn the **Group Select knob** to the group you wish to make your **Priority 2** for scanning

Press the **A/D** key once to add the group to the **Scan List**

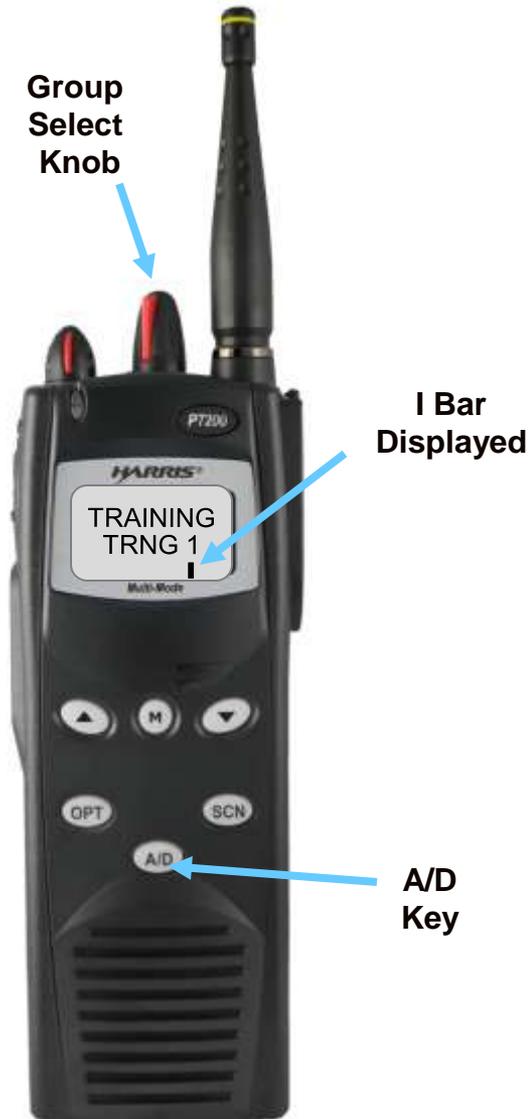
III bars appear in the display

Press **A/D** again to prioritize the group to **Priority 2**

II bars appear in the display to indicate this is the **Priority 2** group

NOTE – You can only have one “Priority 2” talk group in your scan list – changing another talk group to “Priority 2” will cause the previously-designated talk group to revert to a non-priority scanned group (**III**)

Creating a Priority 1 Talk Group



Turn the **Group Select knob** to the group you wish to make your **Priority 1** for scanning

Press the **A/D** key once to add the group to the **Scan List (III)**

Press **A/D** again to prioritize the group to **Priority 2 (II)**

Press **A/D** again to prioritize the group to **Priority 1**

I bar is displayed to indicate this is the **Priority 1** group

NOTE – You can only have one “Priority 1” talk group in your scan list

Deleting Talk Groups from the Scan List



Turn the **Group Select knob** to the group you wish to delete from your Scan List

Press the **A/D key** until none of the scan priority bars (**III**, **II**, or **I**) are displayed

The talk group will no longer be scanned until you replace the group in your Scan List

III = in scan list – no priority
II = in scan list – Priority 2
I = in scan list – Priority 1
no bars = not in scan list

Special Calls

Individual Calls & Telephone Calls



Sending an Individual Call – page 1



If this feature is enabled, the radio can initiate individual radio-to-radio calls to another radio

Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to INDV CALL

Press the **M** key to select this feature

A list of available radios that can be called individually will be displayed

Sending an Individual Call – page 2



Use either of the arrow keys ▲ ▼ to position the “ > ” cursor beside the ID number (*User ID or Logical ID*) of the radio to be called

PTT to send the call

The Special Call icon  will appear while the individual call is in progress

To end the individual call, press the lower option button  on the side of the radio

Note: While in the individual call mode, you will miss all talk group calls

Receiving an Individual Call



Line 1 shows the alias of the caller or the LID of the unit sending the message

Line 2 shows * INDV *

The Special Call icon  appears on Line 3

To answer: PTT
(Only the caller can hear you)

To end the call, press the lower option button  on the side of the radio

Note: While in the individual call mode, you will miss all talk group calls

Missing an Individual Call

If an Individual Call is not answered:

**Line 1 will display * WHC *
and the radio will begin
ringing**

**To stop the ringing, press the
lower option (CLEAR)
button**



Returning a Missed Individual Call

Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to INDV CALL

Press the **M** key to select this option

Line 2 shows the WHCI (*Who Has Called Index*) entry number

Line 1 shows the LID, User ID or alias of the unit that tried to call

Use the arrow keys ▲ ▼ to scroll through other radio numbers if desired

PTT to initiate the return call



Telephone Interconnect Calls



In order to connect to a telephone scan, your system must be equipped with a Public Service Telephone Network (PSTN) interface device of some type

You will receive specific instructions regarding disclosure of the direct-dial-in capabilities of your telephone interface system as they apply to your radio system utilization and to your organization

Sending a Telephone Call – page 1



If this feature is enabled, the radio can make a telephone call through a PSTN interchange to a telephone

Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to PHN CALL

Press the **M** key to select this feature

A list of available telephone numbers that have been pre-programmed into the radio will be displayed

Sending a Telephone Call – page 2



Use either of the arrow keys ▲ ▼ to position the “ > ” cursor beside the telephone number to be called

PTT to initiate the call

The special call icon ☎ will appear and will remain displayed until the call is concluded

To end the telephone call, press the lower option button on the side of the radio

Note: While in the phone call mode, you will miss all talk group calls

Receiving a Telephone Call



The telephone number of the network PSTN interface will be displayed on the top line

The second line will display the “PHONE”

To respond, press the PTT (only the telephone caller can hear you)

The special call icon  will appear

To end the call, press the lower OPTION button on  the side of the radio

Note: While in the phone call mode, you will miss all talk group calls

Special Licensed Features

Status & Message Alert Calls
Request-to-Talk Function



Status & Message Operations

STATUS operation allows a pre-programmed status condition to be transmitted to a P25 trunked tower site

MESSAGE operation allows a pre-programmed text message to be transmitted to a P25 trunked tower site

Each **STATUS** and **MESSAGE** is assigned an ID that is cross-referenced to a determined condition (ie., Off Duty, In Service, Transporting, or some similar message)

The messages are routed from the tower site to a specific dispatch console (or to several specific consoles) that have been pre-designated to receive that particular message (based on the assigned ID number)

Each **STATUS** condition message and each **MESSAGE** text is pre-programmed by the system administrator – individual radio operators cannot enter their own messages as “text” entries nor can they choose which console(s) receive the message

Status Message Operation



Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to STATUS

Press the **M** key to select STATUS operation

Use either of the arrow keys ▲ ▼ to position the “>” cursor to the status message to be sent (up to 10 different status messages can be pre-programmed)

Press the **M** key again to send the message (or to save it in the radio's memory where it can be retrieved by the site later)

RTT Message Operation



Press the **M** key to access the menu

Use either of the arrow keys ▲ ▼ to position the “>” cursor to **MESSAGE**

Press the **M** key to select **MESSAGE** operation

Use either of the arrow keys ▲ ▼ to position the “>” cursor to the status message to be sent (up to 10 different messages can be pre-programmed)

Press the **M** key again to send the message (or to save it in the radio's memory where it can be retrieved by the site later)

Request-to-Talk Function

Press the **OPT** key to send a “Request-to-Talk” notification to the dispatcher

When the dispatcher acknowledges your request, press the PTT and transmit normally

Note – Each customer may have a different method to signal RTT (RTT-Normal, RTT-Priority, or RTT-Cancel), which may result in certain keypad keys being mapped to perform specific functions.

Always verify RTT operation & methods with your management.



Radio Care

Troubleshooting Tips & Battery Replacement



Troubleshooting Tips

Issue	What do you do?
Any talk group or system configuration or structuring (<i>fleet mapping</i>) issue, or any RF coverage issues	Contact your management to report the issue
Any physical radio equipment issues	Contact your management to report the issue
Any failure of the radio or any error code appears in the display that is not explained	Contact your management to report the issue
Slight delay in audio	All digital communications have a slight delay in audio <i>Only noticeable when radios are in very close proximity</i>

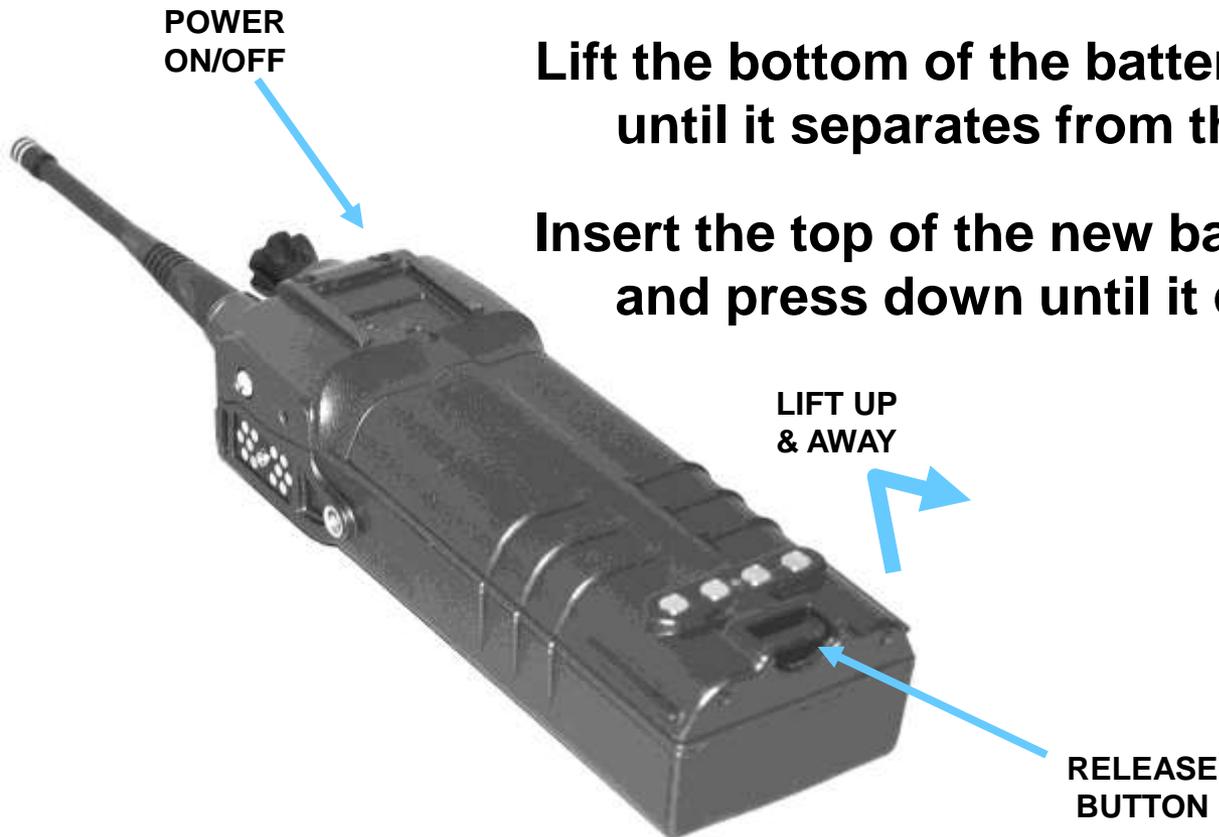
Changing the Battery

Before changing the battery, turn the radio off

Press the battery release button on the bottom of the battery

Lift the bottom of the battery pack up and away until it separates from the radio

Insert the top of the new battery onto the radio and press down until it clicks in place



Notes



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