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XG-25 Scan Model Portable Radio User's Guide for Orleans County, NY
Training Session Notes

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P25 Radio System

DIGITAL WIRELESS • SANS FIL • INALÁMBRICO • NUMÉRIQUE • DIGITAL

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 Harris authorized accessories.

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. The user 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.

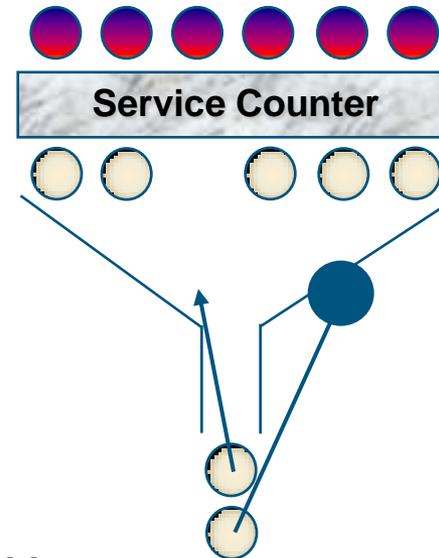It is a violation of FCC rules to send personal messages, unless in an emergency.

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

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Conventional vs. Trunked

Conventional

Service Counter
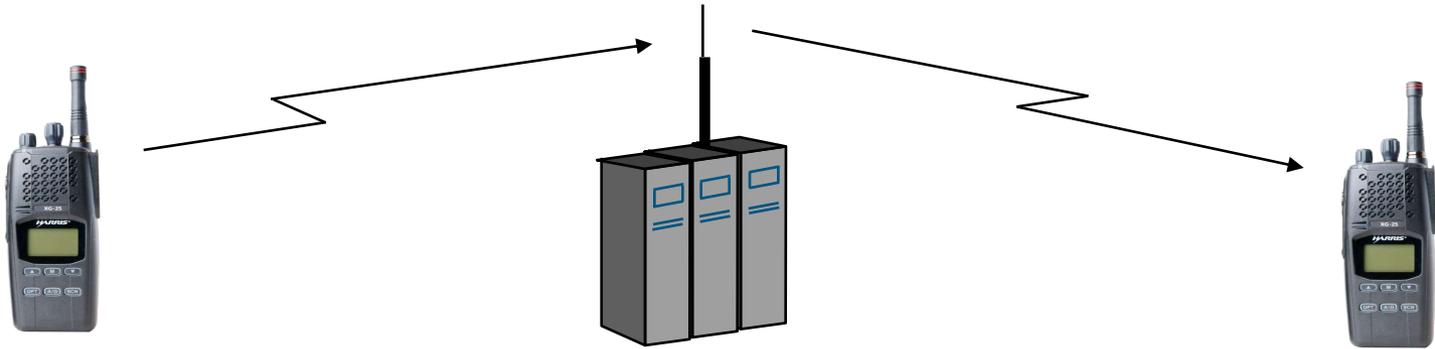
Trunked

Service Counter
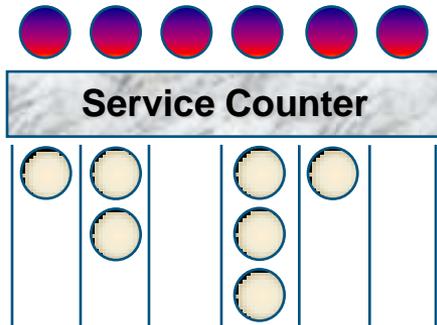
Service Employee

Customer

Computerized Assignment of Channels

Why P25 Trunking?

Trunking: <u>**Improves**</u> spectral efficiency

<u>**Relieves**</u> the user from managing the channel

<u>**Encourages**</u> cross agency / shared communications

<u>**Establishes**</u> communications privacy

<u>**Encourages**</u> private communications

<u>**Discourages**</u> eavesdropping by scanners

<u>**Establishes**</u> "queuing" rather than "waiting"

<u>**Enables**</u> priority use during busy times

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P25 Trunking System Features

To have more understanding of a trunked system, let's look at some features

Digital Control Channel

Multiple Working Channels

< 0.5 Second Access

Group & Individual Voice Calls

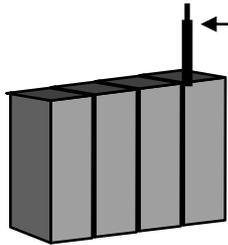Logical ID (LID) for each radio

Late or 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

Site 1   Site 2
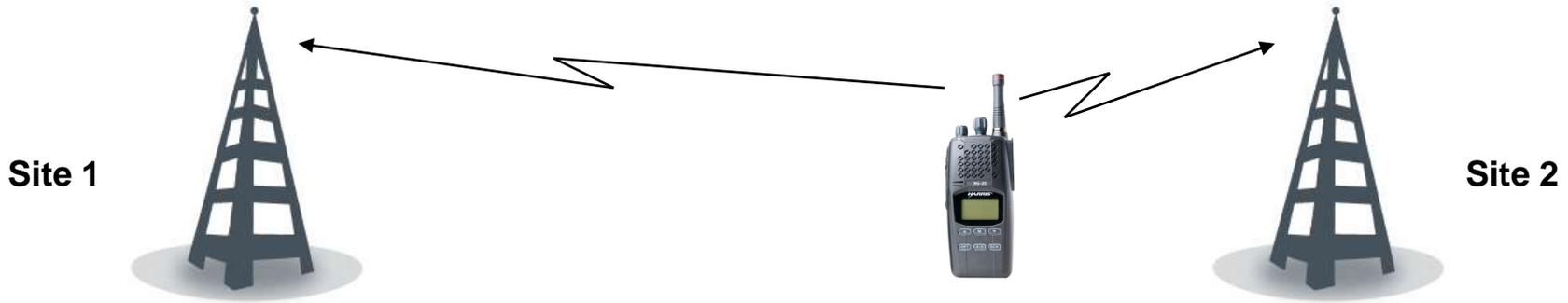
Units inform the System of their location:

   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

XG-25 Scan Model Operation

Front and Top Views

A / B Switch

Group Select Knob

Antenna

Power On/Off & Volume

Emergency Button

TX / RX Indicator

Option Button 1

Option Button 2

Push-to-Talk (PTT)

Universal Device Connector "UDC" (On Side)

Speaker

Microphone

Display

Battery (on Back)

Keypad

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Power On/Off & Volume

Group Select Knob

Antenna

TX / RX Indicator

A / B Switch

Emergency Button
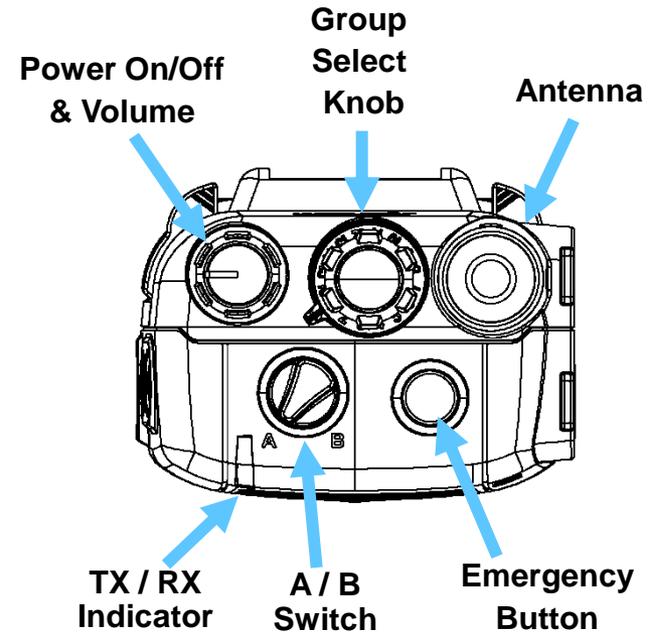
Line 1 & Line 2 Display Indicators

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 Talk Group 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

Line 1
T R A I N I N G

Line 2
T R N G   1

Line 3

Radio Status Icons

see next page for explanations of icons

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Line 3 Icons

↑ Radio is transmitting

Y ON - transmitting or receiving
FLASHING - call queued

🔔 T99 Mode enabled

Conventional channel
is enabled with
Channel Guard

↓ ON - low power transmit
OFF - high power transmit

⚷ Selected group
Encryption
enabled

25 Selected channel
Project 25 Enabled

D Selected group
Digital Voice

A Selected group
Analog Voice

F Failsoft mode

▶ SCAN enabled
(rotates clockwise)

||| Selected group
in scan list

|| Selected group
is priority-two scan
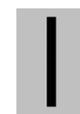
| Selected group
is priority-one scan

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

Full Charge ──────── Battery Level indicator icons ──────────→ Empty   Icon Flashing
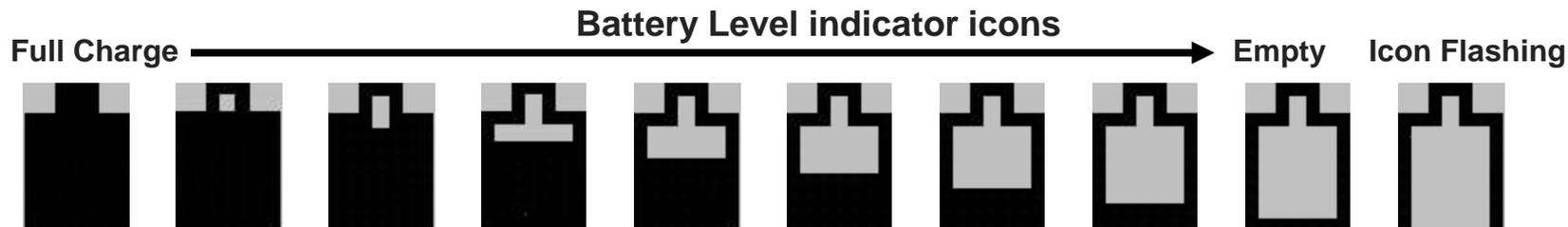
Keypad Function Keys

M — **Accesses pre-stored menus**

Acts as "Enter" key

▲▼ — **Scrolls through available systems, groups, or channels**

Changes the selection for an item within a menu list

OPT – **Activates one of any of the programmed software options**

A/D – **Adds or Deletes selected groups or channels from the Scan List**

SCN – **Toggles the 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 one low-pitched tone and one short mid-pitched

Missed I-Call telephone ring sounded when an incoming individual call is not answered

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Basic Radio Operation

Locking / Unlocking The Keypad

UPPER OPTION BUTTON

> CURSOR LOCATED AT KEY LOCK

> KEY LOCK
BCK LGHT
CONTRAST

KEYS

M KEY

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OPT   A/D   SCN

Lock the keypad –

Press and release the M key

Within 1 second, press the upper OPTION button on the side of the radio

Unlock the keypad –

Press the M key to access the menu

Use either of the two arrow keys ▲ ▼ to position the " > " cursor at KEY LOCK

Press and release the M key

Within 1 second, press the upper OPTION button on the side of the radio

Changing Talk Groups

GROUP SELECT KNOB

Turn the GROUP SELECT knob to select a group

Group names appear on the second line of the display

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TRAINNG
Train 3

GROUP NAME DISPLAYED

Making A Group Call

GROUP SELECT KNOB

INDICATOR LIGHT

PTT

XG-25

HARRIS

TRAINNG
Train 1

▲ M ▼

OPT A/D SCN

GROUP NAMES DISPLAYED

Select the group you want to reach with the Group Select knob

Group names appear on Line 2 of the display

Push-to-Talk (PTT)

radio busy icon displayed

radio transmitting icon will also be displayed

Indicator will light red while you are transmitting

Receiving A Group Call

GROUP
SELECT
KNOB

INDICATOR
LIGHT

PTT

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2345
TRAIN 4

CALLER'S
RADIO ID
(or Alias)
DISPLAYED

CALLER'S
GROUP
DISPLAYED

The caller's User ID (or alias) will appear on Line 1

Group that is transmitting appears on Line 2

⊤ radio busy icon is displayed

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

SYSTEM NAME DISPLAYED

LYNCHBG
Group 1

KEYS

If the radio is programmed to allow system selection from the keys,

Use either of the arrow keys ▲ ▼ on the front of the radio to scroll through the selectable system names

When the desired system name is displayed, stop scrolling

NOTE – The radio may be pre-configured to save the currently selected system when power is cycled to the radio

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OPT   A/D   SCN

Adjust Display Backlight Brightness

> CURSOR POINTING TO BCK LGHT

KEY LOCK
> BCK LGHT
CONTRAST

▲▼ KEYS

M KEY

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

> CURSOR POINTING TO CONTRAST

KEY LOCK
BCK LGHT
> CONTRAST

▲▼ KEYS

M KEY

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

Use either of the arrow keys ▲▼ to position the " > " cursor at CONTRAST

Press the **M** key to select the Contrast setting menu

Use the arrow keys ▲▼ to adjust the contrast level from 1 to 4

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

Changing the Power Level – *page 1*

> **CURSOR POINTING TO TX POWER**

XG-25

CONTRAST
REVISION
> TX POWER

▲▼ **KEYS**

M KEY

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*

**UPPER
OPTION
BUTTON**

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

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POWER=HIGH

**POWER=HIGH
OR
POWER=LOW
APPEARS
BRIEFLY**

▲ M ▼

OPT A/D SCN

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

RED EMERGENCY BUTTON

PTT

TRAINNG
TXEMER

* TXEMER * APPEARS IN DISPLAY

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

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**

ID 2346
RXEMER
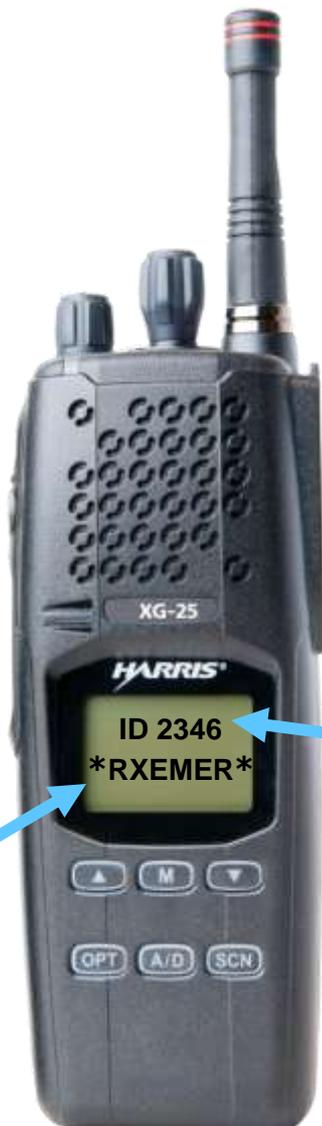
* RXEMER * APPEARS IN DISPLAY

UNIT ID OF DECLARING RADIO WILL BE DISPLAYED WHILE THAT UNIT IS TRANSMITTING

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Clearing an Emergency

RED EMERGENCY BUTTON

LOWER OPTION BUTTON

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TRAINNG
Train 1

DISPLAY RETURNS TO NORMAL

Only certain radios will be capable of clearing an emergency

This is typically a function reserved for dispatch consoles

Press and hold the red EMERGENCY button on the top of the radio and simultaneously press and hold the lower OPTION button on the side of the radio for a pre-programmed length of time (generally 2-5 seconds)

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Call Scanning

Group 1

?

Group 2

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

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 the scan function on

The scan icon ▊ will appear, and will rotate clockwise

Press the **SCN** key again to turn the scan function off

The scan icon disappears

SCAN ICON ROTATES

TRAINNG
Train 1
▶

NOTE – If "SCAN DIS" appears instead of the rotating icon, the radio has been programmed to not permit scanning

SCN KEY

XG-25

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Establishing A Scan List

In order to scan, you must develop a "Scan List", which determines which talk groups or channels will be scanned, and which ones will be ignored

Press the **SCN** key to turn the scan function off

The scan icon ⊦ disappears

At this point, you may either add talk groups or channels to your scan list or delete talk groups or channels from your scan list

TRAINNG
Train 1

SCN
KEY

Adding a Talk Group to the Scan List

GROUP SELECT KNOB

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TRAINNG
Train 2
III

III Bars Displayed

A/D KEY

With scan turned off, turn the group select knob to locate a Talk Group you want to add to your scan list

Press the A/D key once to add the Talk Group to the list

A 3-bar icon will appear III , indicating the group has been added to the scan list

Turn the group select knob to the next Talk Group to be added to the scan list and repeat the process

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

Creating A Priority 2 Talk Group

GROUP SELECT KNOB

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TRAINNG
Train 3
II

II Bars Displayed

A/D KEY

With scan turned off, turn the group select knob to locate the Talk Group you want to prioritize

Press the **A/D** key to change the Talk Group to a "Priority 2" scan level

The 3-bar icon will disappear, and be replaced with a 2-bar icon **II**

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

GROUP SELECT KNOB

I Bar Displayed

A/D KEY

With scan turned off, turn the group select knob to locate the Talk Group you want to prioritize to a "Priority 1" level

Press the **A/D** key twice to change the Talk Group to a "Priority 1" scan level

The 3-bar icon will disappear, and be replaced with a 1-bar icon **I**

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

NOTE – If "FIXED P1" appears instead of the 1-bar icon, a fixed "Priority 1" talk group has been programmed into your radio – you cannot change it

Deleting Talk Groups from the Scan List

GROUP SELECT KNOB

No Bars Displayed

TRAINNG
Train 1

A/D KEY

With scan turned off, turn the group select knob to locate a Talk Group you want to remove from your scan list

Press the **A/D** key until all scan icons (**I**, **II**, or **III**) disappear from the third line of the display

When no scan icons (**I**, **II**, or **III**) are present, the talk group will not be included in the scan list and will not be scanned

NOTE – If "FIXD LST" appears, a fixed scan list has already been programmed into the radio, and you will not be able to change it

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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

> CURSOR POINTING TO INDV CALL

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REVISION
> INDV CALL
APPLICTN

▲▼
KEYS

OPT A/D SCN

M KEY

Note: *While in the Individual Call mode, you will miss all normal Talk Group calls*

Sending an Individual Call – *page 2*

LOWER OPTION BUTTON

PTT

12001019
12001022
> 12001023

▲▼ KEYS

POSITION > CURSOR TO THE RADIO ID TO BE CALLED

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 normal Talk Group calls*

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Receiving an Individual Call

LOWER OPTION BUTTON

PTT

**ID 6543
* INDV ***

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The User ID or Logical ID number of the calling radio will be displayed on the top line

The second line will display "INDV"

To respond, press the PTT (only the 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 Individual Call mode, you will miss all normal Talk Group calls*

Missing an Individual Call

LOWER OPTION BUTTON

* WHC *
Train 2

If an Individual Call is not answered,

A ringing tone will be heard from the radio and the top line of the display will show: * WHC * (*for "who has called"*)

To stop the ringing, press the lower OPTION button on the side of the radio

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

PTT →

6543
WHCI = 1

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OPT   A/D   SCN

▲ ▼
KEYS

M
KEY

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 the feature is enabled, the radio can make a telephone call through a PSTN interchange to a telephone number pre-programmed into the radio

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 display the list of available telephone numbers that have been pre-programmed into the radio

The Special Call icon ▐ is displayed

> CURSOR POINTING TO PHN CALL

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APPLICTN
> PHN CALL
KEY LOCK

▲▼
KEYS

OPT A/D SCN

M KEY

Note: *While in the Telephone Call mode, you will miss all normal Talk Group calls*

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Sending an 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

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

LOWER OPTION BUTTON

PTT

434-455-9454
434-455-9458
>434-455-9521

▲▼ **KEYS**

POSITION > CURSOR TO THE NUMBER TO BE CALLED

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OPT A/D SCN

M ▼

Note: *While in the Telephone Call mode, you will miss all normal Talk Group calls*

Receiving a Telephone Call

LOWER OPTION BUTTON

PTT

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5551234
* PHONE *

▲ M ▼

OPT A/D SCN

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)

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

Note: *While in the Telephone Call mode, you will miss all normal Talk Group calls*

Special Licensed Features

Status & Message Alert Calls
Request-to-Talk Operation

Status & Message Operations

STATUS operation allows a pre-programmed status condition to be transmitted to a P25 (or EDACS™) trunked tower site

MESSAGE operation allows a pre-programmed text message to be transmitted to a P25 (or EDACS™) trunked tower site

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

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

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

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*)

> CURSOR POINTING TO STATUS

REVISION
TX POWER
> STATUS

▲ ▼ **KEYS**

M KEY

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Request-to-Talk Operation

UPPER OPTION BUTTON

PTT

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TRAINNG
Train 1

Press the upper option button on the side of the radio to send the "Request-to-Talk" message 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.

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 select the appropriate message to be sent

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

> **CURSOR POINTING TO MESSAGE**

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TX POWER
STATUS
> MESSAGE

▲ ▼ **KEYS**

M KEY

Radio Care

Troubleshooting Tips & Battery Replacement

Troubleshooting Tips

| Issue	What do you do?
Any talk group or system configuration or structuring (*fleet mapping*) 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** *Only noticeable when radios are in very close proximity*

Removing the Battery

Before removing the battery, turn the radio off!

Press or pull both latches on the sides of the battery toward the bottom of the radio simultaneously

Lift the battery pack up and away from the radio

POWER OFF

BATTERY RELEASE LATCHES

② LIFT UP AND AWAY
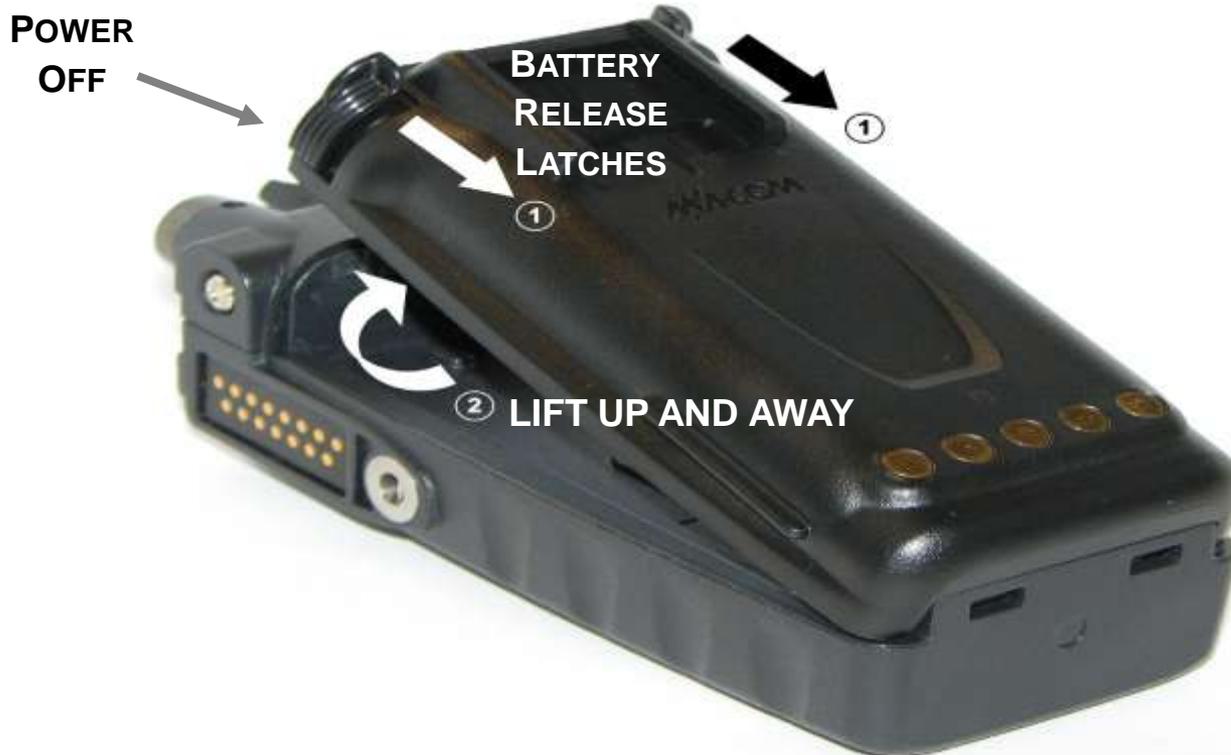
Installing the Battery

Align the tabs at each side of the battery pack with the slots at the bottom of the battery cavity

Push down on the top of the battery pack until the latches click, locking the battery in place

② PUSH DOWN GENTLY
UNTIL LATCHES CLICK

ALIGN BOTH TABS
AT THE BOTTOM OF
THE BATTERY PACK ①

Notes