



M7300 Scan Model Mobile 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 mobile radio when someone is outside the vehicle within two feet of the antenna. This is a recommendation from OSHA that applies to any type of radio transmitter such as a cellular telephone, CB radio, our old radio system, or our new radios.

DO NOT...operate the mobile radio if any of the antenna connectors are loose. This is a basic safety precaution. If the antenna cable or connectors are loose, please place a service call for repair.

DO NOT...operate the mobile 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, CBs, etc.

DO NOT...operate the mobile 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.

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

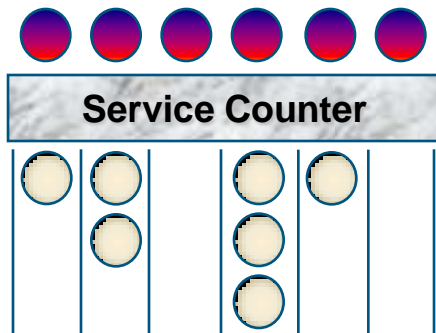
It is a violation of FCC rules to send personal messages, unless in an emergency

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

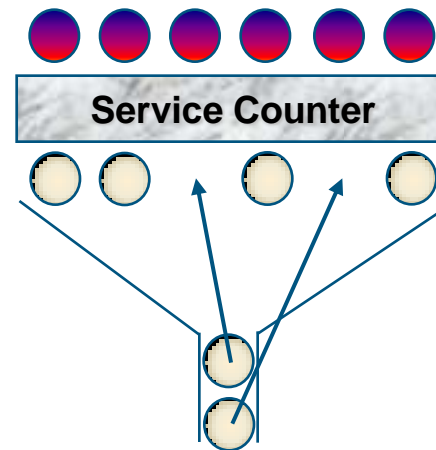
Conventional vs. Trunked

Computerized Assignment of Channels

Conventional



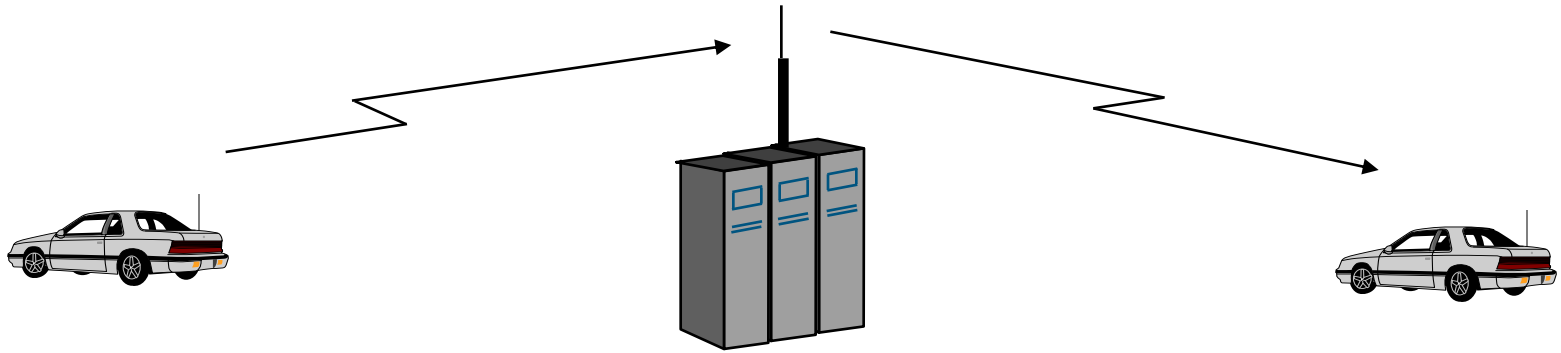
Trunked



 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

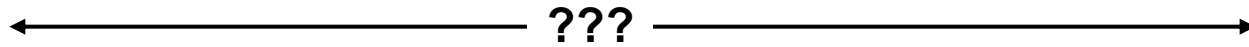
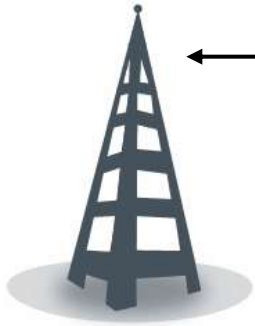
Emergency Calls

Queuing with Priority

Unit Enable/Disable

Wide Area Coverage

Communication Range



Many factors affect range:

Site Location

Urban Clutter

Reflections/Multipath

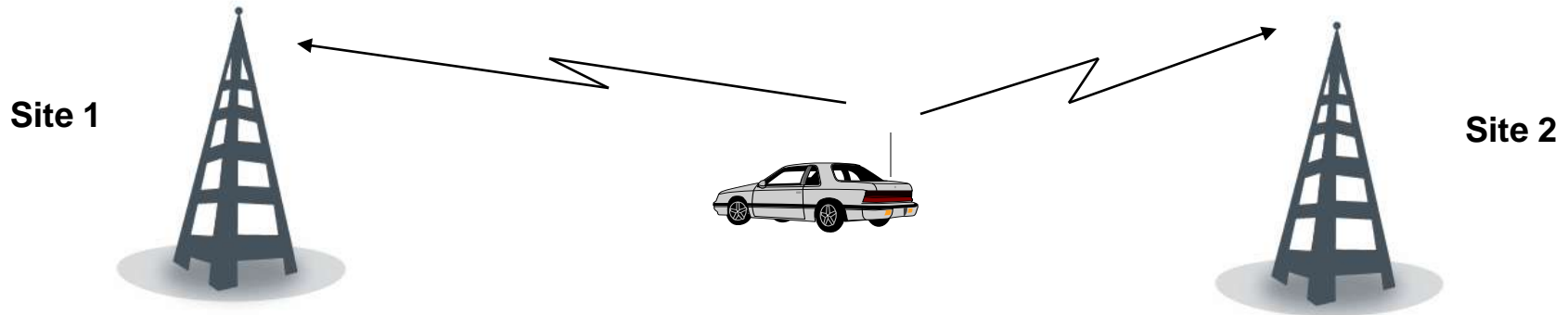
Ducting over Water

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,

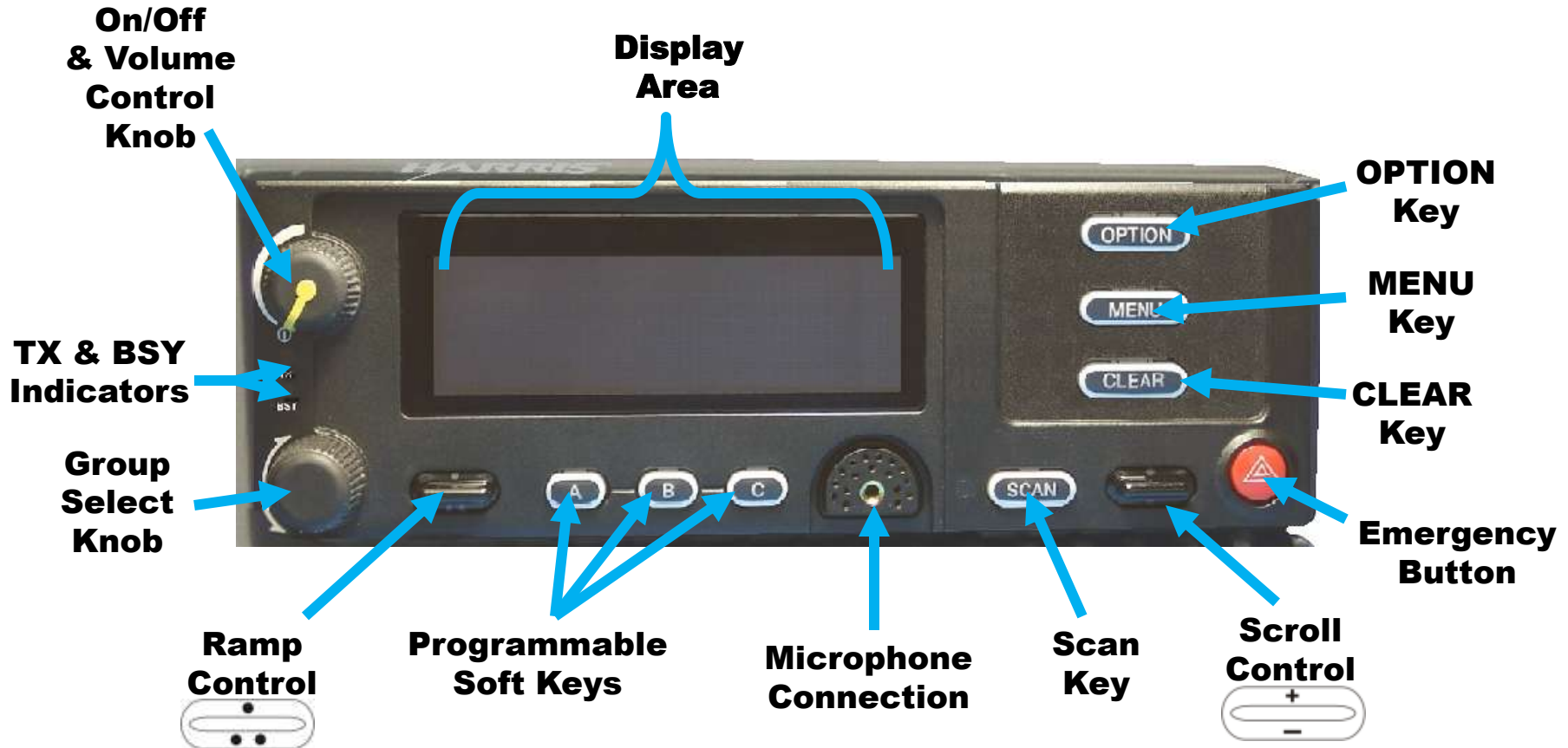
Radio will look for another site (algorithm programmed in radio),

Automatically switches to new site when criteria met

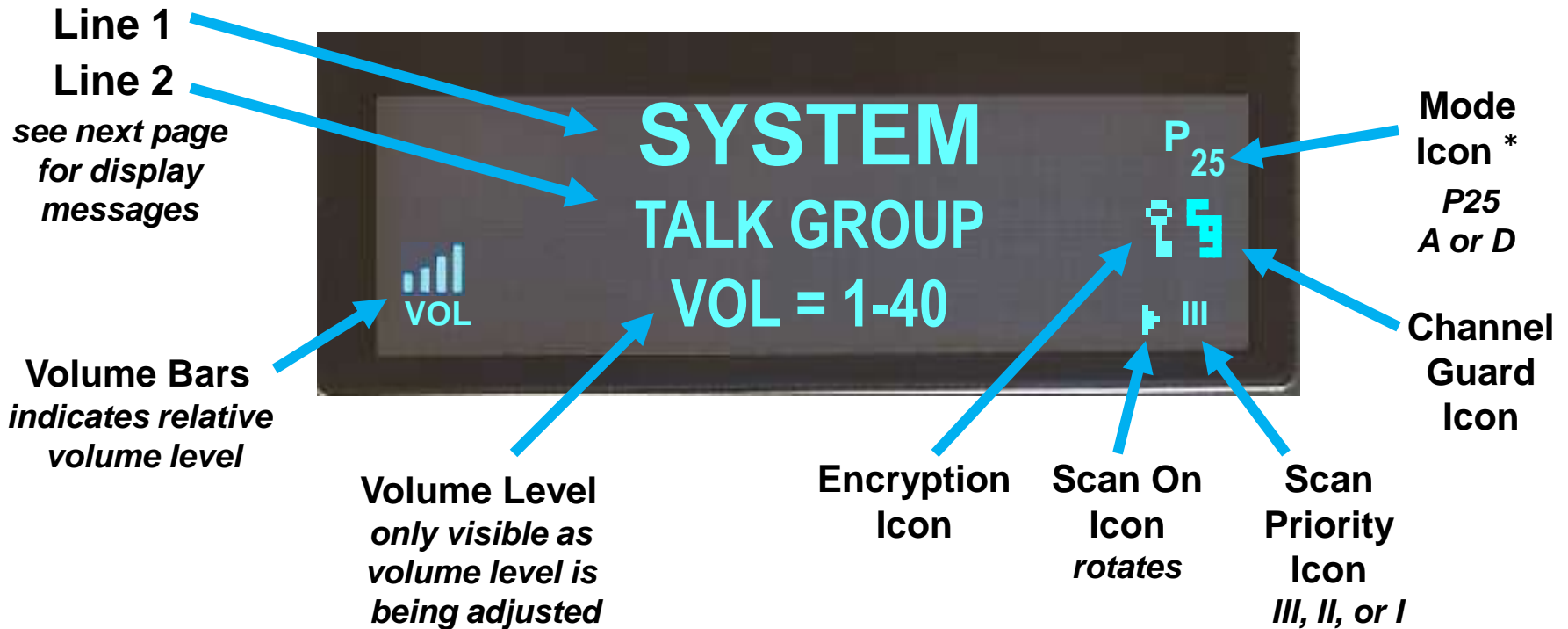
M7300 Scan Model Operation



Control Head Functions



Display Information



* Mode Icon Information

If you are attached to a P-25 system, the P25 icon will appear
If you are attached to an analog system, an A icon will appear
If you are attached to a digital system, a D icon will appear

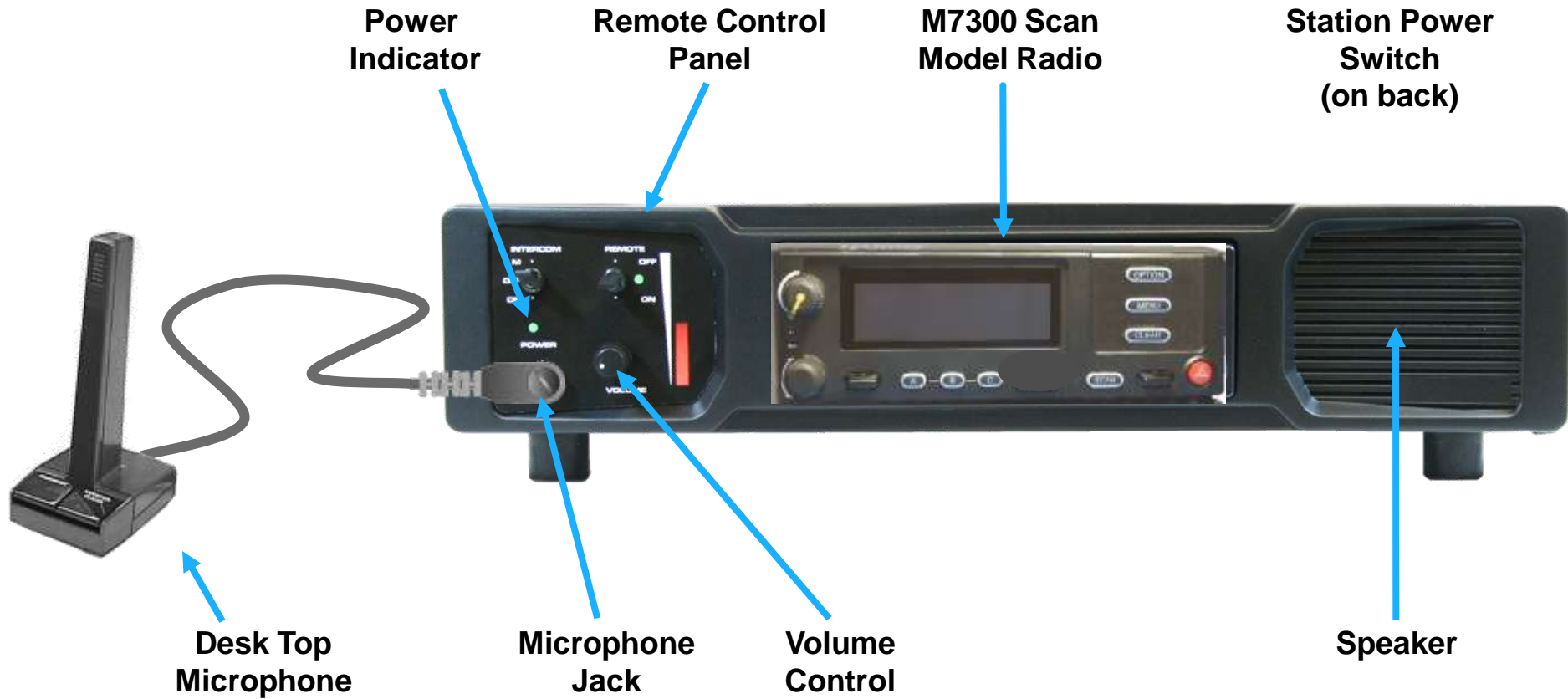
Displayed Messages

LINE 1: Current System Name (example: **SYSTEM**)
Volume Level (VOL = 10)
Caller Identification (GR 1234)
Call Queued (QUEUED)
'Who Has Called' (* WHC *)









LINE 2: Current Talk Group Name (example: **TALK GROUP**)
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: Volume Level (VOL = 30)
Range: OFF (*minimum*) – 40 (*maximum*)
Line 3 only visible while adjustment is being made

M7300 Desk Top Station



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

Basic Radio Operation



Changing Talk Groups



Turn the **GROUP SELECT** knob to select a group or a channel
Group/channel names appear on Line 2 of the display

Adjusting the Volume



Turn the **VOLUME CONTROL** knob to set the desired volume level of received traffic (minimum = OFF / loudest = 40)

The numeric volume level is only displayed as the knob is being turned, and will disappear when knob movement is stopped

The 1-5 bars Relative Volume Icon remains visible

Making A Group Call



Rotate the **GROUP SELECT** knob to select the group you want to reach

The Group names appear on Line 2 of the display

PTT to transmit to the talk group

Receiving A Group Call



Line 1 displays the caller's Radio ID

Line 2 displays the talk group

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

PTT

Changing Systems



SYSTEM NAMES
DISPLAYED

RAMP
CONTROL

SYSTEM TYPE MAY CHANGE
P-25 – D (digital) – A (analog)

Toggle the **RAMP CONTROL** button to select a system

System names appear on Line 1 of the display

The type of the new System may change appearance of icon

Changing the Display Brightness

BRIGHTNESS
LEVEL
DISPLAYED



MENU
KEY

RAMP
CONTROL

Press the **MENU** key

Use the **RAMP CONTROL** to find BCK LIGHT

Press the **MENU** key again

BCKL ADJ will appear in the display

Use the **RAMP CONTROL** button to change the brightness of the display intensity

Press the **MENU** key again to save the new setting

Changing the Display Contrast

CONTRAST
LEVEL
DISPLAYED



MENU
KEY

RAMP
CONTROL

Press the **MENU** key

Use the **RAMP CONTROL** to find CONTRAST

Press the **MENU** key again

CNTRST = 1, 2, 3, 4, 5, 6, 7, 8 will appear in the display,
along with the current setting

Use the **RAMP CONTROL** button to change the contrast level

Press the **MENU** key again to save the new setting

Emergencies



Declaring an Emergency*



Press and hold the **EMERGENCY** key for a pre-programmed amount of time

Wait until ***TXEMER*** appears in display

TXEMER will flash, alternating with the current group

PTT and talk

Note: This feature only available when in the trunked mode – not available in conventional modes

Receiving an Emergency



The Radio ID or Alias of the radio that declared the emergency will appear on Line 1 while that person is transmitting

RXEMER will appear in display, flashing alternatively with the current talk group until the emergency is cleared

PTT and respond if appropriate

Clearing an Emergency*

DISPLAY
RETURNS
TO NORMAL



CLEAR
KEY

EMERGENCY
BUTTON

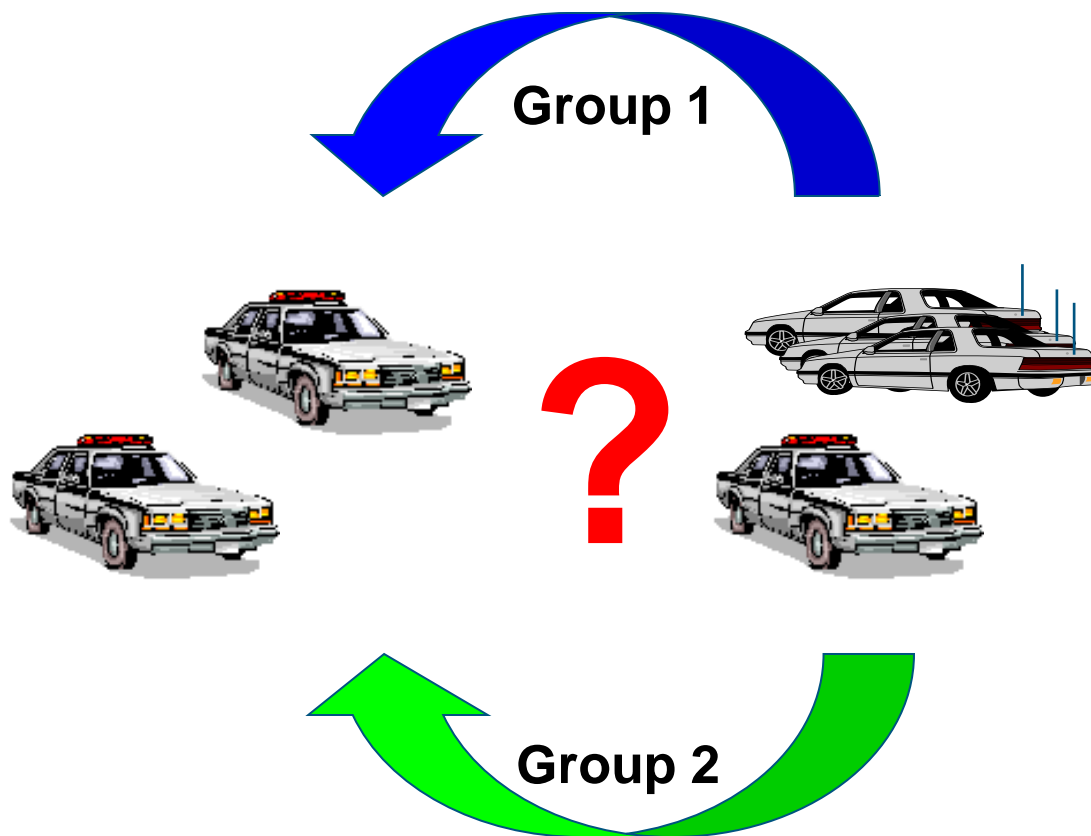
Press and hold the CLEAR key

Press and hold the EMERGENCY key

The display will return to the condition previous to the emergency state

**Supervisory radios only*

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

Radio can have up to two “Priority Talk Groups” designated

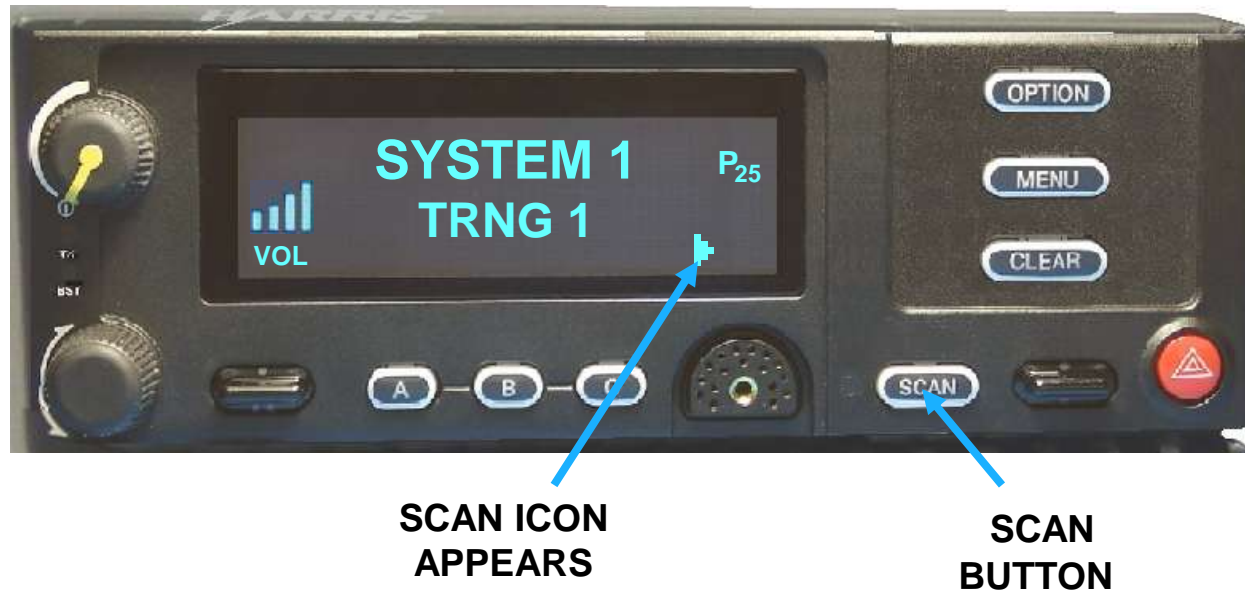
Priority 1 Talk Group

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



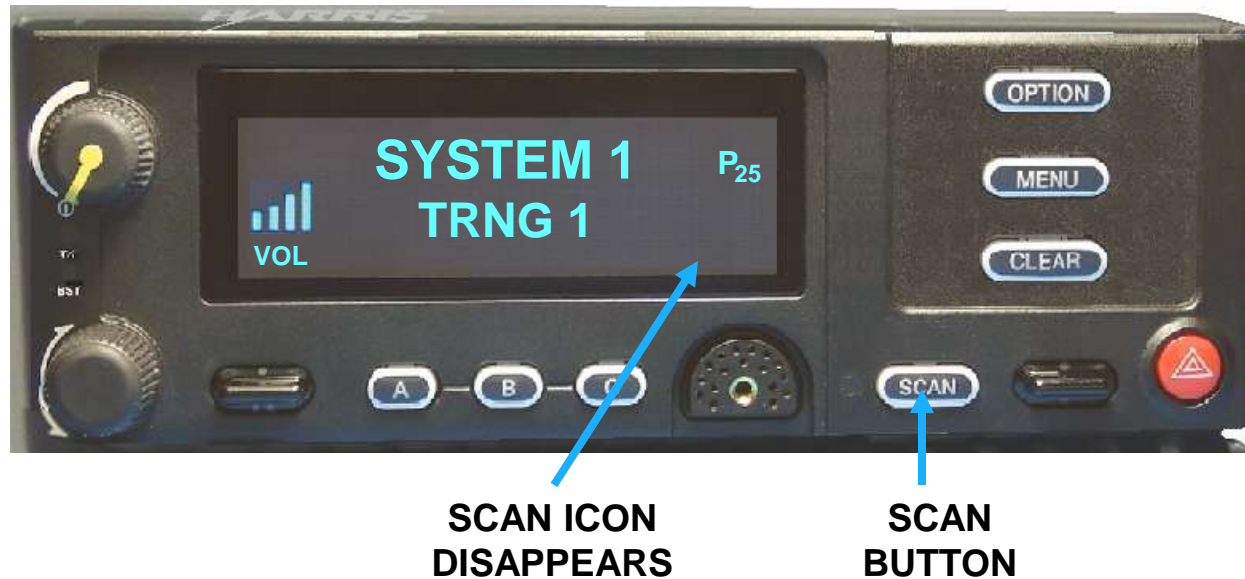
Press SCAN to turn on the scan function – any group in the scan list will be scanned

The rotating icon displayed (▶) indicates SCAN is on

Press SCAN again to turn off the scan function (*no icon*)

Note: The microphone may need to be on hook for scanning to function

Establishing A Scan List



To Scan, you must have a Scan List

To create a Scan List (or edit an existing Scan List) you must have the Scan function turned off

Press the **SCAN** button to turn scan off (the scan icon disappears)

Adding a Talk Group to the Scan List

S APPEARS BRIEFLY



Select the group you wish to scan

Make sure Scan is turned OFF (no rotating scan icon ▶)

Press scan ramp up (+) to add the group to the scan list

An **S** will appear briefly to indicate the group is in the scan list

The scan priority icon (III) will also be displayed

Creating a Priority 2 Talk Group

2 APPEARS BRIEFLY



Select the group you wish to make your priority 2 talk group

Press scan ramp up (+) once to make the group the Priority 2 scanned talk group

A “2” will appear briefly

The Scan priority icon will also change to a ||

Creating a Priority 1 Talk Group

1 APPEARS BRIEFLY

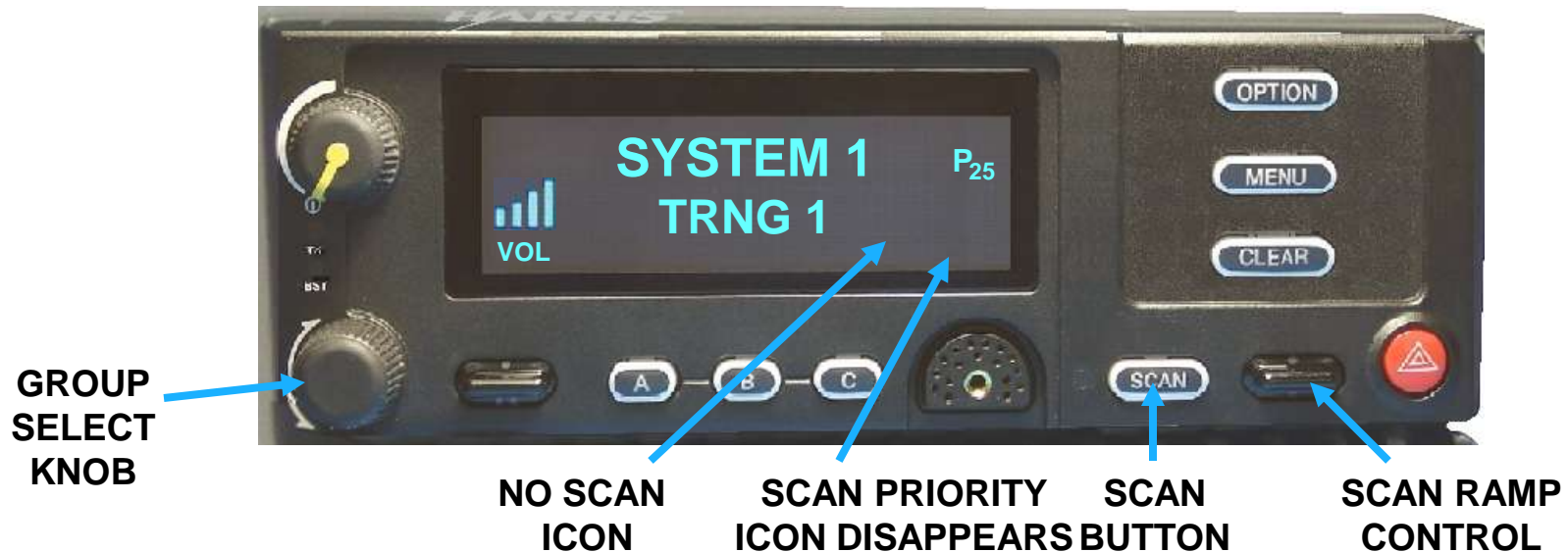


Select the group you wish to make your priority 1 talk group
Press scan ramp up (+) once to make the group the Priority 1 scanned talk group

A “1” will appear briefly

The Scan priority icon will also change to a █

Deleting Groups from the Scan List



Select the group you wish to delete from the Scan List

Make sure Scan is turned OFF (no rotating Scan icon)

Press the scan ramp down (–) to delete the group from the Scan List

Notice the **III**, **II**, or **I** icons disappear from the display

Special Calls

Individual Calls & Telephone Calls



Sending a Individual Call



Push the **MENU** key

Use the **RAMP CONTROL** to locate INDIVIDUAL

Push **MENU** key again to access the pre-programmed list of radio units or aliases

Use the **RAMP CONTROL** to find the desired unit

PTT – *only that radio will hear you*

Press the **CLEAR** key to return to group call mode

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

Receiving an Individual Call



Line 1 displays the Radio ID of the caller

Line 2 displays * INDV *

PTT to answer the caller

Press the CLEAR key to return to group call mode

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

Missing an Individual Call

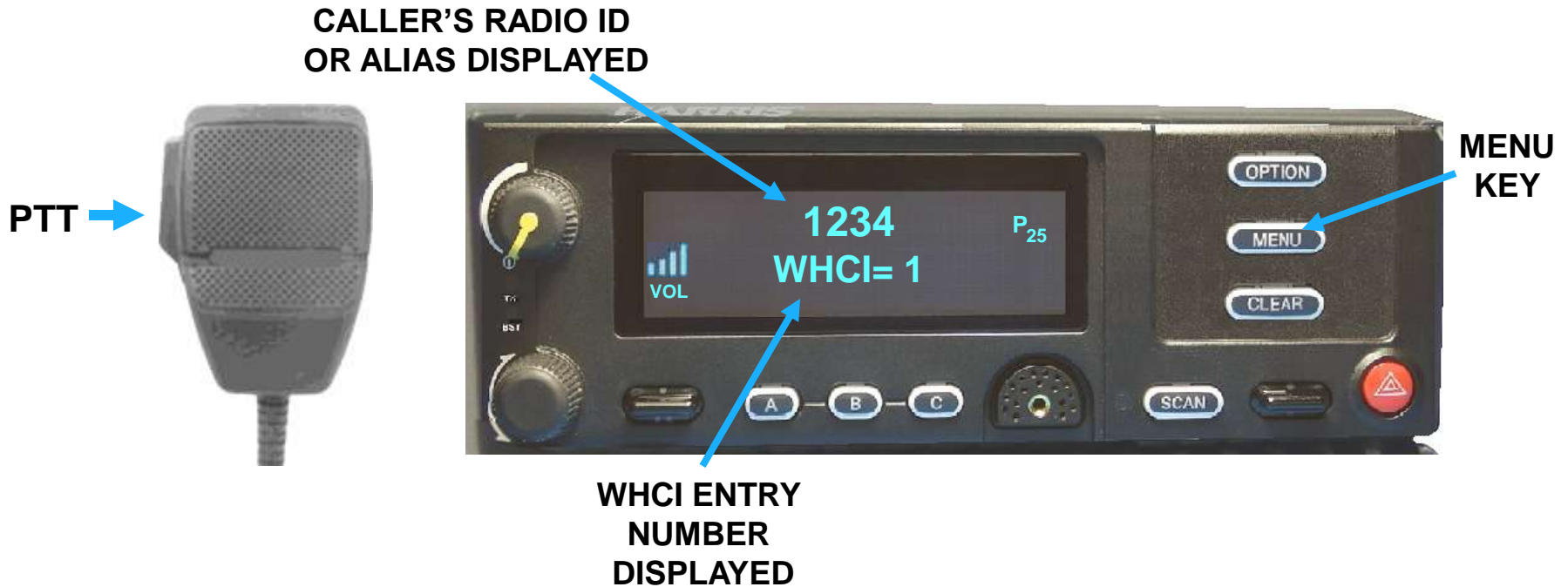
* WHC * DISPLAYED



If an Individual Call is not answered:

**Line 1 will display * WHC * and the radio will begin ringing
To stop the ringing, press the **CLEAR** button**

Returning a Missed Individual Call



Push the **MENU** key

Use the **RAMP CONTROL** to locate **INDIVIDUAL**

Push **MENU** key again

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

Line 1 shows the LID or alias of the unit that sent the message

PTT to return the call

Note: The last ten individual calls received are stored in the WHC Index list

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 Phone Call



Push the **MENU** key

Use the **RAMP CONTROL** to find PHN CALL

Push **MENU** key again

Use the **RAMP CONTROL** to find the desired number

PTT

Press the **CLEAR** key to return to group call mode

Note: The radio is capable of one-way conversation only –
The caller *cannot* be heard if the radio PTT is pressed

Receiving a Phone Call



PTT to answer the call

Note: The radio is capable of one-way conversation only – The caller can only hear the radio when the PTT is pressed and the caller can only be heard when the PTT is released

Special Licensed Features

Status & Message Alert Calls

Request-to-Talk Function

Public Address Feature

Intercom Feature

External Speaker Option



Note – Your radio may be using any of these features (or none of them), and the feature used may be enabled differently – Always check with your management to determine if these features are to be used and how they will be used.

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

STATUS
MESSAGE
NUMBER
DISPLAYED



MENU
KEY

RAMP
CONTROL

Press the **MENU** key

Use the **RAMP CONTROL** to find STATUS

Press the **MENU** key again

Use the **RAMP CONTROL** to locate the status message to be sent
(up to 10 different status messages can be pre-programmed)

Press the **MENU** key again to send the status message

RTT Message Operation

MESSAGE
NUMBER
DISPLAYED



MENU
KEY

RAMP
CONTROL

Press the **MENU** key

Use the **RAMP CONTROL** to find MESSAGE

Press the **MENU** key again

Use the **RAMP CONTROL** to locate the RTT message to be sent (up to 10 different messages can be pre-programmed)

Press the **MENU** key again to send the RTT message

“Request-to-Talk” Function



Press and release the **OPTION** 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 or control head buttons being mapped to perform specific functions.

Always verify RTT operation & methods with your management.

Public Address Feature

NOTE – Additional Equipment Required



Press the **MENU** key to access the radio menu options

Use the **RAMP CONTROL** to locate “PubAddr”

Push **MENU** key again to enable the Public Address feature

PTT will route voice traffic to the PA speaker and will not transmit to the talk group

Press the **CLEAR** key to exit the PA feature and return to normal talk group mode

Intercom Operation

NOTE – Additional Equipment Required



Press the **MENU** key to access the radio menu options

Use the **RAMP CONTROL** to locate “Intercom”

Push **MENU** key again to enable the Intercom feature

When enabled, PTT from any microphone will route voice traffic to other control head speakers and will not transmit to the talk group

Press the **CLEAR** key to exit the Intercom feature and return to normal talk group mode

External Speaker Feature

NOTE – Additional Equipment Required



Press the **MENU** key to access the radio menu options

Use the **RAMP CONTROL** to locate “ExtSpkr”

Push **MENU** key again to enable the External Speaker feature

All received voice traffic will be re-routed to the vehicle’s external speaker and will not be carried by the vehicle’s internal speaker

Press the **CLEAR** key to disable the external speaker and return to normal radio operation

Radio Care

Troubleshooting Tips



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> |



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