

RES Help Manual



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Res (Radio Editing Software)



RES KNG Portable & Mobile Radio Configuration Editor

from **BK** Technologies

Differences between RES and NeoVision

AutoSave History

RES has a new **AutoSave** feature which periodically saves your file in case one needs to go a few sessions back. The **AutoSave window** can be found under **Utilities** on the main page.

- Utilities		
Feature Editing Software	Version Info	Audio Converter
Auto Save History	Child ASK Maker	Batch Programming

Index	File Name	Date Last Modified	Load Selected File
0	parms0.neo	03/22/2017 11:26:04	Auto Save Duration:
1	parms1.neo	03/22/2017 11:36:53	1 min
2	parms2.neo	03/22/2017 11:51:18	- 1101
3	parms3.neo	03/22/2017 14:43:31	
4	parms4.neo	03/22/2017 16:37:07	
5	parms5.neo	03/22/2017 16:37:50	
6	parms6.neo	04/03/2017 14:41:07	
7	parms7.neo	04/04/2017 08:56:01	
8	parms8.neo	04/04/2017 08:56:31	
9	parms9.neo	05/31/2017 10:38:56	

This feature saves up to **10 files**. The **duration** between each save can be adjusted. The user can open a previously saved file by selecting the file and clicking the **Load Selected File** button.

AutoSave can be enabled under Options->Auto Save.

File	Opti	ons	Window	Tools	View	He	elp
		Rac	dio Type			>	
[Def	ault Band			>	
	\checkmark	Aut	to Save			i	0
		Ov	erride Nari	rowban	ding		
	~	Wri	ite OTAR F	RSI -			
		Sho	w UID/TG	iID as H	ex		
(~	Sho	ow NACs a	as Hex			

Email Delivery Service and Error Logging

Upon starting RES for the first time, a popup window will prompt the user to **register**. This feature is used for **bug reporting** that may occur to improve and help minimize customer issues.

When a **bug** occurs, an **email** will be generated with the **error information** and sent to the **RES software support team**.

The registered email address can be changed under Help -> Change Registered Email.

/iew	Help		
		Parameter Search	Ctrl+F
		Help Doc	
Т		Check For Updates	
		Contact Customer Service	
nels:		Check Support Ticket Status	
		Change Registered Email	
ı Z		About	

Contact Software Support will prompt the user to send an email to software support.

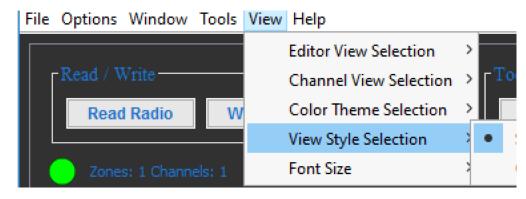
RES ¹ Contact Customer Service	_	×
Issue Type:		
From: pbeuhler@bktechnologies.com		
Summary:		
Description:		
Read and Package All Versions From Attached Radio		
Send Attach File		

The "Read and Package All Versions From Attached Radio" checkbox will automatically download information from the connected radio to help with debug requests.

Look and Feel

RES allows the user to modify a few cosmetics to make the application more appealing based on individual preference.

View Style Selection - Changes the "Look and Feel" of RES. This option is found in the menu under **View->View Style Selection**. Note: The "Look and Feel" cannot be changed on Mac or OS X systems.



Color Theme Selection - Changes the color scheme of RES. Currently supports 7 different color themes. This option is found in the menu under View->Color Theme Selection.

File Options Window Tools	View Help		
	Editor View Selection	, <u> </u>	
Read / Write	Channel View Selection		'ools
Read Radio W	Color Theme Selection	•	Blu
	View Style Selection		Cla
Zones: 1 Channels: 1	Font Size		Ora
			Bee
Global System Zon	e*		Lig
Common Convent	ional		Lig
	~		Lig

ASK (Advance System Key)

RES now supports importing of both Legacy Keys and ASKs via the standard RES build. This means there is no separate ASK version of RES, but is rather built in the standard version. Keys may be imported or cleared at any time. Simply navigate to Tools->System Keys. No options will be editable on foreign systems.

If system keys are reset after creating a non RX-only system, the system will be denoted as foreign and no further changes can be made.

File Options Window	Tools View Help	
	System Keys >	Load USB Key
Read / Write	Voice Announcement	Load Software Key
Read Radio	Clone Multiple Zones	Load Legacy Keys
	Clone Current Zone To Radio Ctrl+W	View Current Permissions
Zones: 1 Chann	Write Alignment Data	Reset Permissions
	Audit Info	

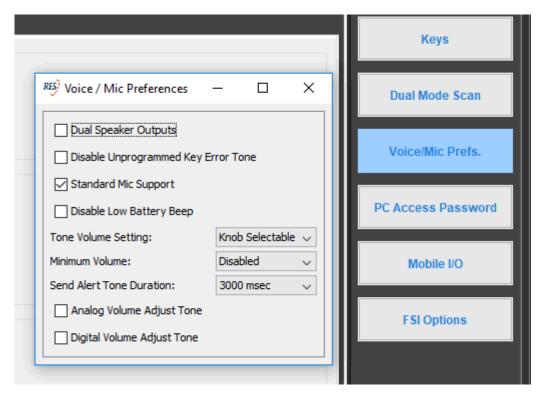
RES 5.5.1 File Options Window Tools View Help		- 0
Read / Write Read Radio Write Radio OTAP	Tools Feature Editing Software Version Info Audio Converter Batch Programming Menus Buttons	7
Zones: 1 Channels: 1		
Global System Zone*		
Conventional Radio	General	Keys

Global Common Differences

Various Global Common Options have been relocated from the "Other" sub-group in NeoVision to the Global Common Main Tab.

Global System Zone			
Common Conventional	General		Keys
Band: VHF Radio Name:	Home Zone: (1) ZONE 1 Decimal MDC IDs Home Channel: (1) CHAN 0001 Disable Display Own UID	DTMF Live Dial Global Handset Offhook Mute All	Dual Mode Scan
ESN: 10 00 00 00 00 00 00 00 00	Soft Power Down Timer: 0.0 Remember Last Selected Channel C		Voice/Mic Prefs.
Backlight Backlight On Display Change	GPS General Periodic Trigger Time: 3 Mode Selection: On Destination ID: 1	Date And Time Time Zone: (UTC) Coordin Time Source: GPS	PC Access Password
Duration (s): 3 Display Timeout: Always On V	Destination ID: 1 Peer To Peer Dedicated Zone: (1) ZONE 1 Base Station Relay Dedicated Channel: (1) CHAN 0001 V V Lise Main Channel	Date And Time Manual Override	Mobile I/O
Toggle Switch Zone Select Toggle On Zone:	GPS Trigger Conditions	AMBE Avg. Voice Level: -22 ~	FSI Options
Toggle Mid Zone: V Toggle Off Zone: V	Periodic User Request Brergency Host Request	AMBE Noise Suppression AMBE Automatic Gain Control AMBE Automatic Tone Detection	
Password User: •••••• Power Up: •••••• Admin: •••••	Control Lockout Keypad Skie Buttons Emergency Toggle Switches Collar Switch Channel Knob PTT	Mobile Accessory Serial Port Accessory Baud Rafe: 1200 v IP 224 Enable ACU 1000 Enable	
Ethernet IP Address: 0 . 0 . 0 . 0 Subnet Mask: 0 . 0 . 0 . 0 Default Gateway: 0 . 0 . 0 . 0 Passovord:	Mobile Ignition Line Low Timer: Off HHCH Master of RCH Vol Control HHCH Master Volume Control Control Head Monitor Tx Audio Disable HHCH Speaker		

Options related to **Voice and Mic** have been moved to the **Voice/Mic Preferences Window**. This window can be accessed from the **Global Common Main Tab**.



GPS features have been moved to the Main Tab under Global Common.

GPS General				
Periodic Trigger Time:	3	Mode Selection:	On 🗸	
Destination ID:	1	Peer To Peer		
Dedicated Zone:	(1) ZONE 1 \sim	Base Station Relay		
Dedicated Channel:	(1) CHAN 0001 $ \smallsetminus $	🗸 Use Main Channel		
GPS Trigger Cond	itions			
П ЫТТ	Power On/Off	Distance Change		
Periodic 🗸	User Request			
Emergency	Host Request			
Control Lockout				
🖂 Keypad	Keypad Side Buttons			
Emergency	Toggle Switches			
Collar Switch Channel Knob				
🗌 РТТ				

Global Conventional Differences

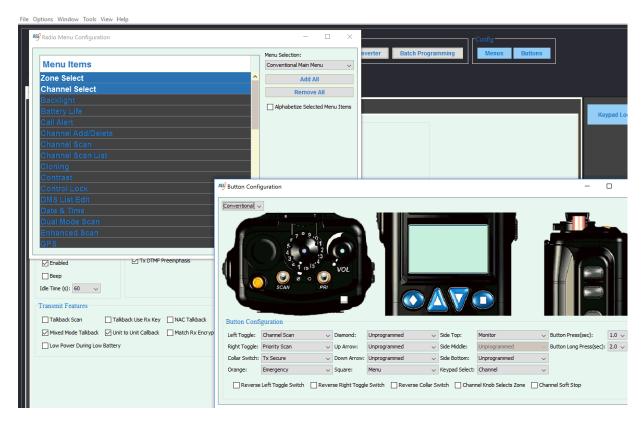
The **Options** in the **Features Tab** located in NeoVision have been moved to the **Global Conventional Tab** in RES.

Global System Zone*			
Common Conventional			
Display	Other		
Top Line: Channel Label Middle Line: Frequency Bottom Line: Channel Number	Alt. Top Line: None		
Analog Signaling	Radio Features		
Analog Signaling Deviation (%): 60 Pre-Delay (ms): 330 Pre-Tx ANI Go-Ahead Beep Unit Call Enabled Beep Idle Time (s): 60	Kadio Features Unmute Only After Encryption Parameters Available Mixed Mode Signal Quality Holdoff (ms): 0 Priority Scan Period (s): 0.75 Nuisance Channel Delete Legacy Mode Tx DTMF Preemphasis		
Transmit Features			
Talkback Scan Talkback Use Rx Key NAC Talkback Mixed Mode Talkback Unit to Unit Callback Match Rx Encryption Talkback Low Power During Low Battery How Power During Low Battery			

The Keypad Editing Lockouts Tab has been moved to its own Window.

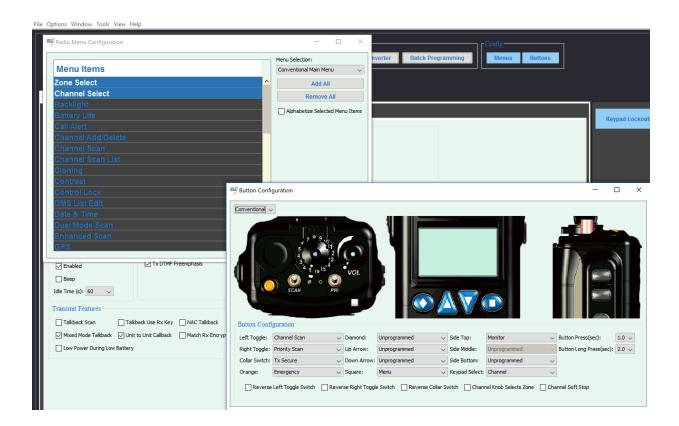
Keypad Editing Lockouts Settings	– 🗆 X
Global Password Dual Speaker Display Top Line Control Lockout Display Middle Line Disable HCH Speaker Display Bottom Line HCH Master Volume Priority Scan Period Display Timeout	Pick Lists CxCSS Talkgroup NAC Call List Channels Bandwidth Rx Frequency Talkgroup ID
Systems a Priority 1 Channel P25 Unit ID Transmit On Priority 1 Scan Hold Time Priority 2 Channel	Rx Mode Tx Power Rx Guard DTMF Live Dial Rx NAC Squelch Mode Tx Frequency Tx Frequency
Zones Zone Label Zone Add Zone Priority 1 Channel Zone Delete Zone Transmit on Priority 1 Channel Add Zone Priority 2 Channel Channel Delete	Tx Guard
	Select All Deselect All

The **Menus and Button Configuration Tabs** have been moved to the **Main Screen** in the top right. The user is able to program both conventional and trunking.



Global Trunking Differences

The Menus and Button Configuration Tabs have been moved to the Main Screen.



Conventional System Differences

The Encryption Tab has been moved to the Main Tab.

Conventional System		
IDs	Emergency	
P25 ID (DEC): 1	Channel Mode: Current Channel 🗸 🗸	
Priority 1	Impolite Tries: 5 🗸	
	Polite Tries: 15 V	
	Hot Mic Tx Period: 10 V	
Use Main Channel	Revert Zone: (1) ZONE 1	
Zone: (1) ZONE 1 ~	Revert Channel: (1) CHAN 0001	
Channel: (1) CHAN 0001 ~	Rx Alert Tone Emergency Call	
	Emergency Alarm Emergency Hot Mic	
Priority 2	Encryption	
✓ Disabled	Clear Transmit Talk Permit Tone	
Use Main Channel	Secure Transmit Talk Permit Tone	
Zone: (1) ZONE 1 ~	Allow Key Set Selection	
Channel: (1) CHAN 0001 V	Talk Permit Tone Delay: 0.0 🗸	
Voice Mute	Vote Scan	
Reset Time: 0 🗸 Reset Mode: Manual 🗸	RSSI Threshold: 63 🗸	
Man Darme Cattinger	Delay Timer (ms): 0 🗸	
Man Down Settings	Hold Time (s): 0.0 \checkmark	
Trigger: Disabled ~ Pre-Warning Timer (s): 5		
Pre-Warning Timer (s): 5 Post-Warning Timer (s): 1		
roschvaring inner (s).		

All other tabs are now windows that can be opened.

Conventional System		Add. Options
IDs	Emergency	
P25 ID (DEC): 1	Channel Mode: Current Channel 🗸	Unit ID Alias List
Priority 1	Impolite Tries: 5	
Disabled Tx Pri 1	Polite Tries: 15	CxCSS Picklist
Use Main Channel	Hot Mic Tx Period: 10 V	
Zone: (1) ZONE 1	Revert Zone: (1) ZONE 1 V	NAC Picklist
	Revert Channel: (1) CHAN 0001 V	HAC FICKIN
Channel: (1) CHAN 0001 V	Kx Alert Tone Emergency Call Emergency Alarm Emergency Hot Mic	Talkgroup Picklist
Priority 2	Encryption	Two-Tone List
Use Main Channel	Secure Transmit Talk Permit Tone	
Zone: (1) ZONE 1	Allow Key Set Selection	DTMF List
Channel: (1) CHAN 0001	Talk Permit Tone Delay: 0.0 V	MDC List
Voice Mute	Vote Scan	
Reset Time: 0 🗸 Reset Mode: Manual 🗸	RSSI Threshold: 63 V Delay Timer (ms): 0 V	Five-Tone List
Man Down Settings Trigger: Disabled ~	Hold Time (s): 0.0 V	User Status
Pre-Warning Timer (s): 5 Post-Warning Timer (s): 1		Text Messages
		Data/OTAR
		Phone

Trunking System Differences

Options in the "Other" sub group have been moved to the Additional Options Window.

Trunking System			Add. Options
	arm: Normal V Emergency Call		Channel IDs
WACN (How): 1	etry Counter: 8 Emergency Call Cancel		
Home RFSS: 1 Home Site: 1	Tone on Received Emergency Call		Control Channels
Reg. System ID: 0			Unit Calls
	ilsoft activity Time: 30 Failsoft By Personality		Talk Groups
ISP Retry Counter: 3 🗸	ey: Emergency Blocked		Ann. Groups
Fade Protect Timer (ms): 525	an Down Settings igger: Disabled		Sites
PC	e-warning Timer (5 - 120 sec): 5		Data / OTAR
Full Spectrum Scan			Scan Lists
Scan Time (s): 5			
			Preferred Site Lists
			Sentinel IDs
			User Status
			Short Msg Update
			Interconnect
RES) Additional Trunking Syst	em Settings	_	
RES ⁾ Additional Trunking Syst	em Settings	_	
RES ⁾ Additional Trunking Syst Transmit Power:	em Settings Selectable		
	-	Talk Permit Tone	
Transmit Power:	Selectable QPSK		2
Transmit Power: Digital Rx Modulation Type:	Selectable QPSK	Site Trunking	e ine
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time:	Selectable QPSK	Dite Trunking	e ine
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key:	Selectable CQPSK 575		e ine eset
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type:	Selectable CQPSK 575 Wide Area		e ine eset
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode:	Selectable CQPSK 575 Wide Area Manual	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time:	Selectable CQPSK 575 Wide Area Manual 0		e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone: Dynamic Regrouping	Selectable CQPSK 575 Wide Area Manual 0 PTT ID 15 Elector Locked Dynamic Regrouping	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone: Dynamic Regrouping Dynamic Regrouping Se Group ID:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID 15 Elector Locked Dynamic Regrouping 65535	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone: Dynamic Regrouping Dynamic Regrouping Se Group ID: Zone:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID 15 Elector Locked Dynamic Regrouping 65535 (1) ZONE 1	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone: Dynamic Regrouping Dynamic Regrouping Se Group ID: Zone: Channel:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID 15 Elector Locked Dynamic Regrouping 65535 (1) ZONE 1	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter
Transmit Power: Digital Rx Modulation Type: PTT Warning Tone Start Time: Patch Key: Coverage Type: Voice Mute Reset Mode: Voice Mute Reset Time (s): Conversation Type: Transmit Time: Radio Accountability Tone: Dynamic Regrouping Dynamic Regrouping Se Group ID: Zone:	Selectable CQPSK 575 Wide Area Manual 0 PTT ID 15 Elector Locked Dynamic Regrouping 65535 (1) ZONE 1	Site Trunking PTT Warning To Force System R Radio Monitor Enhanced Roam Ultra Narrowbar Ultra System ID F	e ine eset ning nd Filter

Zone selection is now in a combobox at the top of the tab.

G	obal	System	Zone				
	(1) Z	ONE 1 V		+Z		Z	
		Alias			Sys	stem	
	2	CHAN 000)2		Trun	king Sys	st
	3	CHAN 000)3		Conv S	System 1	\sim
	4	CHAN 000)4		Conv	v Systen	n

- +Z Add new Zone
- -Z Delete selected Zone

Channel Differences

Some channel options from the "Other" sub group have been moved to the Zone Settings Window under Additional Options.

Global System Zone	
(1) ZONE 1 V +Z -Z Alias System 2 CHAN 0002 Trunking Syst 3 CHAN 0003 Conv System I Vice Annunciation: Nor 4 CHAN 0004 Conv System I Vice Annunciation: Nor	AN 0003 Clear V DES-CFB Re V Des-CFB Key: 1 Key Lock Proper Key Detect
Additional Options	ction On All Channels
Disable Keypad P	Programming
Command Zone	Zone Scan
Incoming Clone:	Accept ~

- +CC adds a Conventional Channel
- +TC adds a Trunking Channel
- ++C brings up a window to add\delete channels in one action based on indexes.
- -C deletes currently selected channel
- M displays the multi-channel editor.

Configuration Software

RES is the configuration software for RELM Wireless' KNG APCO Project 25 digital radio product line. This product line supports Wide band and Narrow band Analog, P25 Digital Conventional and P25Trunking protocols.

All RES files use the file extension ".neo".

Title Bar

RES's title bar displays the radio configuration file that is currently under review. Also displayed is RES's version information.

RES 5.6.0				
File Options Tools View Help				
Read / Write Read Radio Write Radio OTAP	Utilities Feature Editing Software	Version Info	Audio Converter	Config Menus
Zones: 1 Channels: 1	Auto Save History	Child ASK Maker	Batch Programming	Buttons

Menu Bar

The Menu bar provides the user with typical Windows functionality features.

File Options Tools View Help

File Menu

The File menu allows the user to manage RES programming files.

RES	RES 5.5.1*		
File	Options	Window Too	
	New	>	
	Recent	>	
	Open	Ctrl+O	
	Save	Ctrl+S	
	Save As	Ctrl+Alt+S	
	Info	Ctrl+I	
	Import	>	
	Export	>	
	Exit	Alt+F4	

New:

Opens a new default file.

Recent:

Shows a list of recently loaded files to open into RES.

Open:

Opens a file from an archive directory.

Save:

Save changes to the active working file.

Save As:

Saves and names the active working file.

Info:

Details the version of RES used to save the current file.

File Info	\times
Saved with Editor: RES (0.30.4)	
ОК	

Export:

Exports all Global, System, Zone, and Channel data to an Excel ™ (.XLS) spreadsheet file.

Import:

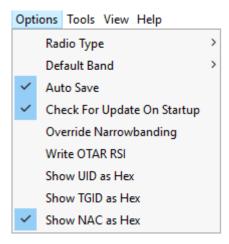
Imports all Global, System, Zone, and Channel data from an Excel ™ (.XLS) spreadsheet file.

Exit:

Exits RES.

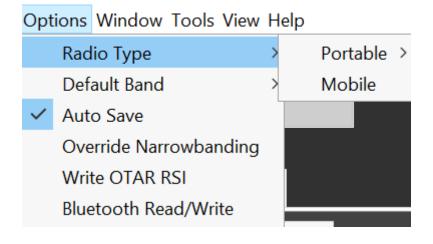
Options Menu

The Options menu allows communication with the radio.



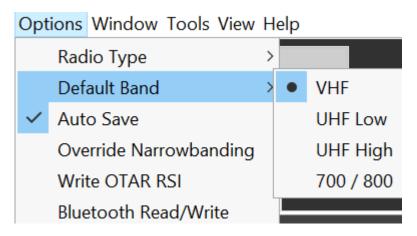
Radio Type:

Selects the radio type [portable, mobile] for the active working file



Default Band:

Sets the frequency band of the active working file.



Auto Save:

Automatically saves after a duration set by the user under Window -> Auto Save History. Auto-saving will only occur if the user is active for that duration.

Override Narrowbanding:

Allows Wideband operation.

Write OTAR RSI:

Allows editing of the radio set identifiers and message number period under the Keys tab. These values are used when operating on a system capable of performing over-the-air-rekeying.

Show UID as Hex:

Shows values in the Unit ID Alias List as both decimal and hex. Values must still be entered as decimal.

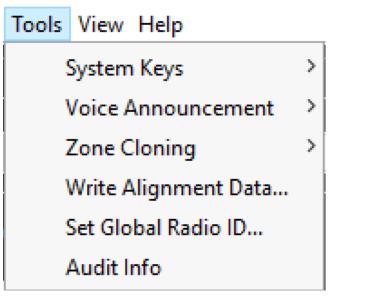
Show TGID as Hex:

Shows values in the Talkgroup Picklist as both decimal and hex. Values must still be entered as decimal.

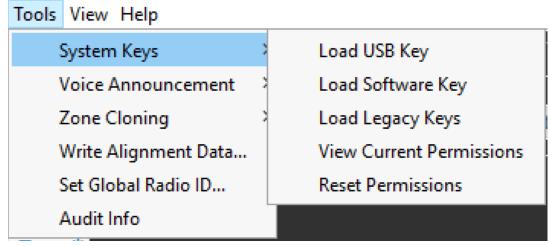
Show NACs as Hex:

Displays NACs in hexadecimal format instead of decimal.

Tools Menu



System Keys:

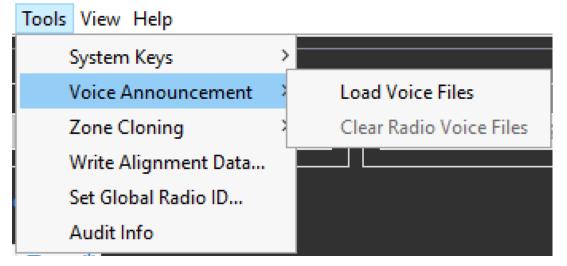


Loads a system key from one of three locations. RES requires a system key to access critical system lists in P25 Trunking files.

System keys can only be generated by RELM Wireless.

Reset Permissions will clear all permissions given from loaded system keys.

Voice Announcement:



Loads or clears the voice announcement files from a chosen directory

Zone Cloning:

Tools View Help	
System Keys	>
Voice Announcement	> Tools
Zone Cloning	Clone Multiple Zones
Write Alignment Data	Clone Current Zone To Radio Ctrl+W
Set Global Radio ID	Set Single Clone Destination >
Audit Info	

Allows the user to clone single or multiple zones from a source radio to an unlimited number of targets. See the Zone Cloning Documentation for more details.

Baud Rate Changer:

Tools	View Help		
Sj	/stem Keys		>
V	oice Annou	Incement	>
Z	one Clonin	g	>
B	aud Rate C	hanger	
W	rite Alignn	nent Data	
Se	et Global R	adio ID	
A	udit Info		

The Baud Rate Changer application provides an easy alternative to changing the Baud Rate of the RS-485 communication line between the RF deck and any attached control heads. Plug in the device as if you are programming the radio. Select the desired Baud Rate, and click "Write".

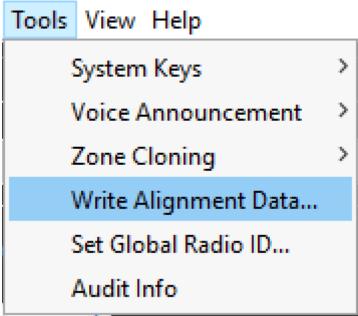
Different Baud Rates set on a control head versus the mobile will cause the control head to not boot. Be sure to program all units connected with the same Baud Rate.

Baud Changer	- 🗆 X
Select Baud Rate:	B115200 -
Read Baud Rate	Write Baud Rate

The Baud Rate is configurable per device. For example, a control head set to 115200 and an RF deck set to 2000000 Baud can be connected together.

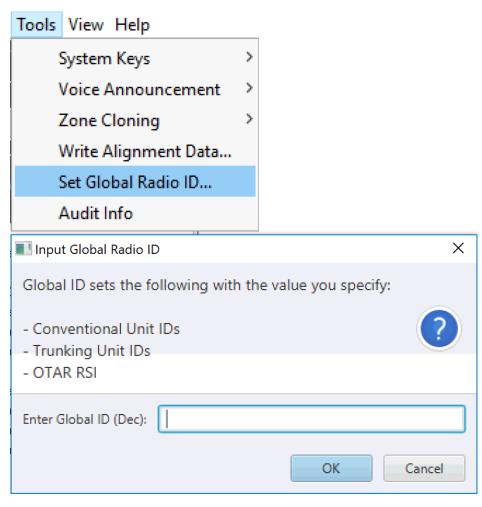
However, the control head will **not** properly boot until one of the units has been changed to match the Baud Rate of the other.

Write Alignment Data:



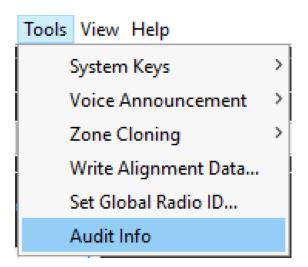
Adds a BK provided alignment file to the connected radio.

Set Global Radio ID:



Sets Conventional UID's, Trunking UID's, and OTAR RSI with one field.

Audit Info:



Pulls Audit info from the currently connected radio.

<u>View Menu</u>

View	Help	
	Editor View Selection	>
	Channel View Selection	>
	Color Theme Selection	>
	View Style Selection	>
	Font Size	>

Editor View Selection:

View Help

Editor View Selection	> (•	Full Editor
Channel View Selection	>		Simple Conventional
Color Theme Selection	>		Simple Trunking
View Style Selection	>		Simple All
Font Size	>		

Switches between editing views. Switching to a different editor will change how RES is formatted and may hide some features that are less commonly used.

Channel View Selection:

Viev	v Help			
	Editor View Selection	>		
	Channel View Selection	>	•	Single Channel View
	Color Theme Selection	>		Multi-Channel View
	View Style Selection	>		
	Font Size	>		

The **Zone/Channel View** feature allows single and multi-channel views so that all channel parameters can be viewed at a glance.

Selecting the "Single Channel" view displays all the programmable parameters for a single channel location in the channel pane.

Selecting "Multi Channel" view splits the right side channel pane horizontally.

The highlighted Zone information will be shown in the top pane. An index of the high-lighted zone's activated channels will be displayed in the lower pane.

The index will show all programmable parameters for each channel location and their current state.

(The Zone tab will have to be selected to view this feature.)

Multi-Channel View

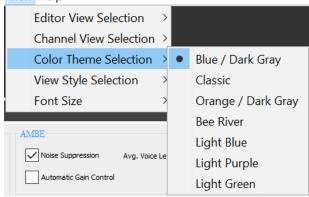
tones: 2 Channels: 3													
Global System Zone*										·			
(1) ZONE 1 \sim +Z -Z +CC +TC -C +/-C									Zone Settings				
		System	Label	Voice Ann.	Rx Freq	Rx Mode	Rx CG	Rx CG Index	Rx NAC	Rx NAC Index	Rx CG Invert	Tx Free	
	3	Trunking Conv Sy Conv Sy			136.00000 136.00000	Digital Analog	67.0 None	None None	293 293	None None		136.0000(136.0000(

Single Channel View

Glob	al System Zone		
(1)	ZONE 1 V	7 -7	Channel Settings
2 3 4	Alias CHAN 0002 CHAN 0003 CHAN 0004	System Trunking Syst Conv System Conv System	Identification Alias: CHAN 0003 Voice Annunciation: None Scan Scan Scan: Off
			Receive Frequency (MHz): 136.00000 Mode: Digital Squelch (CXCSS: CxCSS: 67.0 CXCSS Ir NAC (Hex): 293 NAC Index

Color Theme Selection:

View Help



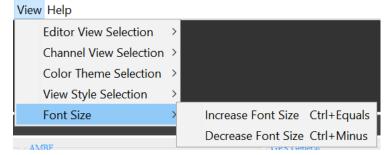
Changes the color theme of RES and all its windows.

View Style Selection:

	View	Help			
		Editor View Selection	>		
		Channel View Selection	>		
		Color Theme Selection	>		
		View Style Selection	>	•	System
i		Font Size	>		Cross Platform

Switches between system and cross-platform themes.

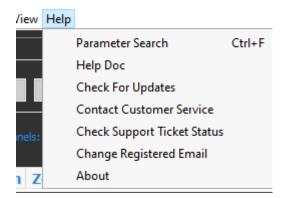
Font Size:



Increases or decreases the font size. This can also be achieved by pressing Ctrl+= to increase and Ctrl+- to decrease.

Help Menu

Help is a resource for information and assistance regarding RES functionality.



Parameter Search:

RES Parameter Search —		×
DTMF	✓ Transfe	er Focus
DTMF Live Dial Global(global) DTMF live dial(global conventional keypad editing lockout) DTMF list entry(system conventional) DTMF live dial enabled(channel conventional) DTMF ID(channel P25 trunking) DTMF live dial enabled(channel P25 trunking) TX_DTME preemphasis(global conventional)		

Allows the user to search for radio parameters. The "transfer focus" option will automatically take the user to the place where the parameter can be changed and highlight the field. Shortcut for Search is Ctrl+F

Global System Zone				
Common Conventional P25 Trunking				
	General			
Band: UHF-High	Home Zone: ((1) ZONE 1 \sim	Decimal MDC IDs	DTMF Live Dial Globa
Radio Name:	Home Channel:	~	Disable Display Own UID	Handset Offhook Mute All
Radio UHF-High Radio Name:	Soft Power Down Timer:	0.0 ~	Remember Last Selected Channel Of Zone	
Help Doc				

Opens the help document.

Check For Updates:

Looks for a new release of Radio Editing Software

Contact Customer Service:

RES ¹ Contact Customer Service	_	Х
Issue Type:		
From: pbeuhler@bktechnologies.com		
Summary:		
Description:		
Read and Package All Versions From Attached Radio		
Send Attach File		

Sends an email to the support email line.

The "Read and Package All Versions From Attached Radio" checkbox will automatically download information from the connected radio to help with debug requests.

Check Support Ticket Status:

RES Enter Support Ticket #	×
Enter your support number below (Typically in the format of AA-11)	?
ОК	Cancel

Checks the status of a support ticket. Support ticket numbers are generated automatically and emailed to the registered email

Change Registered Email:

Change your registered email that we may use to contact you about errors or issues with RES.

About:



Provides information regarding RES's version number and release date.

Tabs

The main page of NeoVision's programming software includes 3 tabs that display the primary organization of the parameters for the radio: **Global**, **System** and **Zone**.



Global: The Global tab is divided into two sub-pages: Common and Conventional.

The Common page contains parameters which apply to radio operation at all times, regardless of the system or channel type actually selected.

The radio RF band and the radio Electronic Serial Number (ESN) are shown on this page.

The Conventional page contains those parameters which globally affect all conventional channels in the radio, regardless of the conventional system currently selected.

The Trunking page contains those parameters which globally affect all trunking functionality in the radio regardless of the trunking system currently selected.

System: The System tab contains parameters which relate only to a specific system. A radio may be able to operate on multiple conventional or trunking LMR systems. On each of these systems it may be assigned a different Unit ID, for example.

Zone: The Zone tab is where specific zone and channel locations are populated. This includes zone and channel specific parameters such as transmit and receive frequencies, CTCSS/DCS call guards, talk groups and power levels.

Icon Bar

con	Bar

The Icon bar allows quick selection of functions associated with the File menu via the icons.

The "Task" bar allows the user to manage files and communicate with the radio with the click of an icon.

RES 5.6.0

File Options Tools View Help

Read Radio Write Radio OTAP Feature Editing Software Version Info Audio Converter Auto Save History Child ASK Maker Batch Programming Buttons	Read / Write			[Utilities			Config
	Read Radio	Write Radio	ΟΤΑΡ	Feature Editing Software	Version Info	Audio Converter	Menus
	Zones: 1 Channel			Auto Save History	Child ASK Maker	Batch Programming	Buttons

Read Radio:

Click the Read Radio button to upload information from the connected radio.

Write Radio:

Click the Write Radio button to download load the file information to the connected radio.

OTAP:

Clicking the OTAP button allows for Over-the-air programming of a radio

Many items previously located at Menu Bar->Window can now easily be access via the title bar.

Feature Editing Software:

RES Feature Editing Se	oftware 5.6.01		– 🗆 ×	(
File				
ESN: 10 00 00 0	0 00 00 00 00		Connected	
Display	Versions		Conventional Options	
O Phoenix	Logic Board Version: RF Board Version:		Vote Scan Enabled	
) sTek Phoenix II Mobile	PCB Revision: Date of Manufacture:	0 00/00/0000	Trunking Options	
 None 	Tier:	1 ~	Phase II Enabled Authentication	
Hardware Option	IS		Data Options	
Mobile High Po	wer Enabled 🛛 GPS En	abled	P25 OTAR Enabled	
Continuous Ch	annel Knob 📃 Base S	tation	OTAP Enabled	
Bluetooth Enab	oled Encryp	tion Enabled		
Three Way Price	ority Switch			
[Read		Write	

Allows the user to set some extra hardware options on the radio.

Version Info:

RES Version Info -	- 🗆	×
Release:	1.5.5	i.23
Software:	5.5.2	3
DSP:	5.5.9)
File Format:	5.5	
BSP:	5.5.9)
Band:	VHF	
PCB Revision:	1	
Date of Manufacture:	3/29	/2011
Encryption Device:	FIPS	сом
FIPSCOM Bootloader Date C	ode: 34.6	F.57.46
FIPSCOM Application Date C	ode: FF.FF	F.EE.2
TDMA Capable:	No	
Copy To Clipboard		

Reads the firmware version information from the radio.

"Copy To Clipboard" allows users to easily copy and paste the version information, for instance, if desired to put it in a help request.

Audio Converter:

A utility that allows users to record and convert audio files to the needed format for the Radio's voice announcement feature.

RES Audio Converter		-		×
Help				
	Disconnected		•	
▼ Set Directories				_
Input Directory				
C:\Users\Pbeuhler	Select Input Directory			
Output Directory				
C:\Users\Pbeuhler	Select Output Directory			
 Record Audio (Optional) 				
 Text To Speech (Optional) 				
Select and Review				
► Convert				

Auto Save History:

№ Auto Save History	_		Х
		Load Selected Cancel Auto Save Duration: [1 min	

A log of the files saved by the auto save feature. The auto save duration can also be set here.

ptions							
Password:			F	Require Passwo	rd (HW Only)		
Exp. Date (mm/dd/yy): 09/15/18 Key Type: HARDWARE -							
Max Cycles:		10000)				
Sys	tems		Lock Editing	UID Ra	inges (Dec)	TGID Ra	nges (Dec)
System ID	WAC	4	✓ Chan IDs	Lower	Upper	Lower	Upper
			✓ Control Chans	0	0	0	0
			✓ Sites	0	0	0	0
			✓ Data/OTAR	0	0	0	0
No conte	ent in table		✓ Pref Site Lists	0	0	0	0
			0	0	0	0	
				Add L	JID Range	Add TG	ID Range

Child ASK Maker:

A replacement for the original Child Key Maker program. Provides the ability to create Child ASKs (Advanced System Keys) for restricting users on what P25 programs are available for programming. Changes from the original Child Key Maker include:

-The a	ability to convert	legacy keys i	into ASKs	(requires	Master Key)

- Program up to 20 TGID/UID ranges

- Ranges are now defined as "Lower and "Up	per" instead of "Base" and "Span"
--	-----------------------------------

Batch Programming:

RES Batch Programming						_		×
								^
File Options Tools Help								
▼ Unit IDs			 P25 Trunking OTAI 	۶				
 P25 Conventional ID Increment P25 Trunking ID Increment Radio Name 	0	0	RSI Increment RSI KMF RSI	0 0 0 0	MNP Group RSI	0		
System Number Syste	т Туре	System WAC	Syste	m ID	Syste	em Unit	ID	
		No co	ntent in table					
Read Radio	Write F	ladio	Start Batch Progra	mming	Log V	Window		

An application that helps when programming the same file to multiple radios. Also allows the user to increment certain identifiers when programming multiple radios.

Configure Menus:

Changes what options are available on the radio's menu.

Configure Buttons:

Changes what the buttons on the radio are programmed to do.

<u>Menus</u>

Conventional - Menu Items

- Y KED SIGIO				
File Options Tools View Help				
Read / Write Read Radio Write Radio OTAP	r Utilities Feature Editing Software	Version Info	Audio Converter	Config
Zones: 1 Channels: 1	Auto Save History	Child ASK Maker	Batch Programming	Buttons

There are 2 menu lists available, Main Menu and Programming Menu.

Reference the "Menu and Function Buttons" help page to view all available menu features.

Main Menu:

Assigned Main Menu items are displayed when the radio's menu button is pressed.

RES Radio Menu Configuration		_		×
		Menu Selection:		
Menu Items		Conventional Main Me	nu	\sim
Accessory I/O Enable	^	Add Al	I	
Backlight		Remove	All	
Call Alert				
Channel Add/Delete		Alphabet	ize	
Channel Scan				
Channel Scan List				
Cloning				
Control Lock				
DMS List Edit				
Date & Time				
Dual Mode Scan				
Enhanced Scan				
Evacuation Tones				
Force Power Down				
GPS				
Hang Up	~			

Programming Menu:

The Programming menu contains functions that allow editing from the keypad.

If any or all of the programming functions are assigned, "Keypad Programming" is automatically assigned as the last item in the Main Menu.

🤒 Radio Menu Configuration	_		×
Menu Items	Menu Selection	n: Programming Me	nu 🖂
Call Picklist CxCSS Picklist		Add All	
Keypad Programming		Remove All	u Items
NAC Picklist TGID Picklist			

Click items that should be added to the menu and they will become highlighted. Highlighted items will be moved to the top of the list and added to the radio's menu.

By selecting the Add All key, all available items(not designated as button functions) can be moved to the "Assigned" list. To remove an item from the menu, simply click it to un-highlight it. To remove all the assigned items select the Remove All key.

To move an item, click and drag it to the desired position.

P25 Trunking Menu

RES 5.6.0

File Options Tools View Help

Read / Write			Utilities			ח ר	Config
Read Radio	Write Radio	OTAP	Feature Editing Software	Version Info	Audio Converter		Menus
			Auto Save History	Child ASK Maker	Batch Programming		Buttons
Zones: 1 Channe							

Reference the "Menu and Function Buttons" help page to view all available menu features.

🥗 Radio Menu Configuration Х Menu Selection: **Menu Items** Trunking Main Menu Add All Backlight ~ Battery Life **Remove All** Alphabetize Selected Menu Items Call Alert Channel Add/Delete Channel Select Contrast Control Lock DMS List Edit Date & Time Dual Mode Scan GPS Keyset Select Message Update Minimum Volum

Click items that should be added to the menu and they will become highlighted. Highlighted items will be moved to the top of the list and added to the radio's menu.

By selecting the Add All key, all available items (not designated as button functions) can be moved to the "Assigned" list. To remove an item from the menu, simply click it to un-highlight it. To remove all the assigned items select the Remove All key.

To move an item, click and drag it to the desired position.



NOTE: Conventional and P25 Trunking buttons are assigned independently. It is recommended that common functions be assigned to the same button or switch *Reference the "Menu and Function Buttons" help page to view all available button features.*

To adjust whether you are modifying Trunking vs. Conventional buttons, select the appropriate system type in the combo box in the upper left hand corner.

Portable

Button Configuration	
Left Toggle: Channel Scan V Diamond: Unprogrammed V Side Top: Monitor V Button Press(see	c): 1.0 🗸
Right Toggle: Priority Scan 🗸 Up Arrow: Unprogrammed 🗸 Side Middle: Unprogrammed 🗸 Button Long Pre	ss(sec): 2.0 🗸
Collar Switch: Tx Secure V Down Arrow: Unprogrammed V Side Bottom: Unprogrammed V	
Orange: Emergency V Square: Unprogrammed V Keypad Select: None V	

Keypad Select:

Keypad direct entry mode can be selected via the drop down menu. The options are None, Channel or Zone.

Reverse Left Toggle Switch:

Flips the operation of the left toggle switch.

Reverse Right Toggle Switch:

Flips the operation of the right toggle switch.

Reverse Collar Switch:

Flips the operation of the collar switch.

Channel Knob Selects Zone:

Enabling this check box will cause the channel select knob to become the zone select knob.

Channel Soft Stop:

(Mobile and CMD Portables only) Enabling this check box will prevent the mobile radio from wrapping from the last channel in the selected zone to the first channel if the channel knob continues to be rotated.

Button Press:

Sets how long the side buttons & emergency button must be pressed to activate.

Button Deactivate Time:

Sets how long the side buttons & emergency button must be pressed to deactivate.

Generation 2

Button Config	guration								-		×
Conventional >	guration										
Left Toggle:	Channel Scan	\sim D	Diamond:	Unprogrammed	\sim	Side Top:	Monitor	~	Button Press(sec):	1.0	\sim
Right Toggle:	Priority Scan	~ U	Jp Arrow:	Unprogrammed	\sim	Side Middle:	Unprogrammed	~	Button Long Press(sec):	2.0	~
Collar Switch:	Tx Secure	~ D	own Arrow:	Unprogrammed	\sim	Side Bottom:	Unprogrammed	~]		
Orange:	Emergency	~ S	Gquare:	Unprogrammed	~	Keypad Select:	None	~			
Reverse	Left Toggle Switch [Reverse	e Right Toggle	Switch 🗹 Reverse	Collar Sv	vitch 🗌 Chanr	nel Knob Selects Zone	Cha	innel Soft Stop		

Clicking on the desired button will display a drop down menu listing the functions that may be assigned to that button.

Double clicking on the item will then assign that function to the selected button and populate the associated description below with the assigned function.

Mobile

Button Conf	iguration					— C	X
Conventional	Figuration)) }	T.tl F2 F3	M M N U F4			
Orange:	Emergency ~	F1:	Unprogrammed \lor	Home:	Unprogrammed \sim	Button Press(sec):	1.0 🗸
Side Top:	Monitor 🗸	F2:	Unprogrammed \sim	HCH Top Right:	Tx Secure 🗸	Button Long Press(sec):	2.0 🗸
Side Middle:	Unprogrammed \lor	F3:	Unprogrammed \sim	Keypad Select:	None 🗸]	
Side Bottom:	Unprogrammed \checkmark	F4:	Unprogrammed V				
Channe	I Knob Selects Zone 🗌 Chan	nel Se	oft Stop				

Channel Knob Selects Zone:

Enabling this check box will cause the channel select knob to become the zone select knob.

Channel Soft Stop:

(Mobile and CMD Portables only) Enabling this check box will prevent the mobile radio from wrapping from the last channel in the selected zone to the first channel if the channel knob continues to be rotated.

Clicking on the desired button will display a drop down menu listing the functions that may be assigned to that button.

Double clicking on the item will then assign that function to the selected button and populate the associated description below with the assigned function.

Global

The Global tab is divided into three sub-pages: Common, Conventional and P25 Trunking.



The Common page contains parameters which apply to radio operation at all times. The Conventional page contains those parameters which globally affect all conventional operation. The Trunking page contains those parameters which globally affect all trunking operation. The Trunking tab will only show up if a trunking system has already been added.

Global - Common

The Global -Common tab is divided into five main sections: General, Keys, Dual Mode Scan, Mobile I/O, and GPS.

Global System Zone			
Common Conventional P25 Ti	runking		
Radio Band: VHF Radio Name: ESN:	AMBE Voice Suppression Avg. Voice Level: -22 Automatic Gain Control Control Lockout Enables Keypad Side Buttons PTT Energency Toggle Switches Collar Switch Channel Knob	GPS General Periodic Trigger Time: Dedicated Zone: (1) ZONE 1 GPS P2P Transmit Dedicated Channel: (1) CHAN 0001 ✓ Destination ID: 1	User Prefs. Keys Dual Mode Scan Voice/Mic Prefs.
Backlight D Display Change On Key Press Duration (s): 3 Display Timeout: Always On Password User: Power Up: Admin:		GPS Trigger Conditions □ PTT □ Power On/Off □ Periodic ✓ User Request □ Emergency	Mobile I/O FSI Options

General:

The General parameter settings are over all settings and are not system dependent. This page contains information relating to the Radio, Backlight settings, Passwords and Other setting such as knob functions.

Keys:

The Keys tab contains the encryption key CKR/SLN table for assigning key locations and their associated labels.

Dual Mode Scan:

The Dual Mode Scan list allows the selection of channel locations to be scanned when Dual Scan Mode is active.

Dual Mode Scan allows the radio to scan the designated channel locations regardless of the system type.

Mobile I/O:

This tab is used for selecting the operation of a mobile radio's input and out connections.

GPS:

This GPS tab is used to setup the Global Positioning settings on radio's with optional GPS.

Common - General

This page contains parameters which apply to radio operation at all times, regardless of the system or channel type selected.

Global	Sys	stem Zone*	
Comn Radio	non	Conventional	
Radio)		

<u>Radio</u>

Radio		
Band:		VHF
Radio Name:		
ESN:	10	00 00 00 00 00 00 00
Code Plug Version:		

ESN:

The radio's Electronic Serial Number (ESN) is a display only field. It shows the ESN that has been assigned to the radio when manufactured. A NeoVision parameters file is tied to a specific radio via the ESN. This allows NeoVision to control the distribution of radio program files when security is a concern, for example, to inhibit the duplication of unauthorized radios on a trunking system.

Change ESN:

Brings up a window to enter a new Electronic Serial Number.

Band:

The Band field indicates the RF frequency band on which this particular radio will operate.

Radio Name:

Assigns an alphanumeric name to the radio. This value will appear on the display of a correctly programmed receiving KNG radio.

Code Plug Version:

Allows the user to track and organize code plugs. Optional, so may be left blank. Version information is found on the "Radio Info" screen next to "CP".

Backlight

On Display Change							
On Key Press							
3	${}^{\rm M}$						
Always On	${\bf v}_{\rm r}$						
	3						

On Display Change:

(Portable only) If checked the display/keypad will illuminate any time display information or indicators change.

Display changes include: channel selection, transmit, receive and scan indicators.

On Key Press:

(Portable only) If checked the display/keypad will illuminate anytime a button is pressed.

Duration:

Selects the desired length of time for the display to be illuminated after either of the above settings is activated. Selectable from 1 to 6 seconds.

Display Timeout:

(Portable Only) Sets the length of time before the display blanks.

Passwords

Password		
User:	•••••	
Power Up:	•••••	
Admin:	•••••	

Passwords can be used to control access to the radio.

User:

Enter the 6-digit User Password that is required to enter Keypad Programming mode. Providing the correct User Password allows programming access to any fields not locked by the Keypad Editing Lockout selections on the associated page.

Power Up:

This password is required on radio power up in order to interact with normal radio functionality.

Admin:

Using the radio's Administrator Password overrides the Keypad Editing Lockout selections and allows keypad programming of all available functions.

To use the keypad editing lockout options, the user and Administrator passwords must be set to different values.

Disable All:

This selection will disable all current passwords.

AMBE

AMBE						
Avg. Voice Level:	-22 🗸					
Noise Suppression						
Automatic Gain Control						
Automatic Tone Detection						

Noise Suppression:

This setting enables/disables the AMBE+2[™] vocoder's noise suppression feature.

Automatic Gain Control:

This setting enables/disables the AMBE+2[™] vocoder's voice Automatic Gain Control (AGC) feature.

Average Voice Level:

This setting allows adjustment of the AMBE+2[™] vocoder's AGC set point. AGC attempts maintain the incoming voice level to this level.

Automatic Tone Detection:

Allows the AMBE+2[™] vocoder to detect and correct tones received over a P25 digital channel.

General

General				
Home Zone:	(1) ZONE 1	~	Decimal MDC IDs	DTMF Live Dial Global
Home Channel:	(1) CHAN 0001	~	Disable Display Own UID	Handset Offhook Mute All
Soft Power Down Timer:	0.0	~	Remember Last Selected Channel Of Zone	

Home Zone and Channel:

Use the drop boxes to select what channel the radio returns to when the programmed Home button is pressed.

Soft Power Down Timer:

When soft power down is selected, this is the time until the radio goes into hard power down.

Display MDC IDs as Decimal:

Displays the numeric MDC ID of received signal.

Disable Display Own Unit ID:

When checked, a display line programmed for "Unit ID" will only show the P25 ID, or associated label, of an incoming digital signal.

If unchecked, a display line programmed for "Unit ID" will display your radio's P25 ID whenever an incoming signal is not being received.

Remember Last Channel in Zone:

Upon a zone change, sets the channel to the channel last selected in that zone, regardless of the position of the channel select knob.

DTMF Live Dial Global:

Sets DTMF for all channels in all zones

Date and Time

Date And Tit	me		
Time Zone:	(UTC) Coordin	~	Enable Daylight Savings Time
Time Source:	GPS	\sim	
Date And	Time Manual Overr		

Time Source:

Sets the top priority for setting date and time

Date and Time Manual Override:

Allows for manually setting a time with highest priority

Enable Daylight Savings Time:

Adjust for daylight savings (add an hour)

Toggle Switch Zone Select

Toggle Switch Zone Select							
~							
~							
~							

Toggle Zone 1:

In conjunction with Toggle Zone 2, this sets the two zones for a toggle switch when it is assigned the Zone Select function.

Toggle Zone 2:

In conjunction with Toggle Zone 1, this sets the two zones for a toggle switch when it is assigned the Zone Select function.

Control Lockout Enables

Control Lockout	:
🗹 Keypad	Side Buttons
Emergency	Toggle Switches
Collar Switch	Channel Knob
PTT	

A check in the checkbox beside a control indicates that it will be locked out when Control Lockout is activated.

GPS General

GPS General		
Periodic Trigger Time:	3	Peer To Peer
Mode Selection:	On 🗸	Base Station Relay

Periodic Trigger Time:

Time in seconds between auto transmit of GPS information. (3 - 65,535) NOTE: "Periodic" must be selected in the Trigger Condition window.

Mode Selection:

Determines whether a subscriber can turn off GPS on the radio On: GPS is always on Off: GPS is always off Selective: Enable/disable GPS via radio using the "GPS menu or button

Peer to Peer:

Enabling this check box will allow Peer to Peer GPS capability.

Base Station Relay:

When enabled, GPS coordinates received over the air are forwarded to a connected PC. Base station relays can be used with compatible GPS mapping software.

GPS Trigger Conditions

GPS Trigger C	onditions	
PTT 🗌	Power On/Off	
Periodic	User Request	
Emergency		

PTT:

GPS information is sent with each push-to-talk.

Periodic:

GPS information is automatically transmitted at the programmed "Periodic Trigger Time". NOTE: Interval is set in the "General" window.

Emergency:

GPS information is sent during emergency transmissions.

User Request:

Allows radio user to manually select a target ID and send GPS information.

GPS Tier 1

GPS Tier 1		
Destination ID:	1	Use Main Channel
Dedicated Zone:	(1) ZONE 1 \sim	Send as Impolite Data
Dedicated Channel:	(1) CHAN 0001 ${\scriptstyle\bigtriangledown}$	Send PTT Trigger Pre-Tx

Destination ID:

Default Unit ID of the radio to send GPS information to.

Dedicated Zone/Channel:

When transmitting GPS data, the radio will temporarily jump to this zone/channel to perform any GPS transmissions. The radio will jump back to the previously selected zone/channel afterwards. This function only works when "Use Main Channel" is disabled.

Use Main Channel:

When enabled, all GPS transmission are sent on the currently selected channel. If disabled, the radio will perform the GPS transmissions on the "Dedicated Zone/Channel"

Send as Impolite Data:

By default, GPS Tier 1 data transmissions are done after the radio has ensured the channel is clear of all communications (polite).

When this is enabled, the radio will transmit their GPS data as "impolite", which will send the data regardless of if the channel is open or not.

Send PTT Trigger Pre-Tx:

By default, the PTT trigger is sent after the PTT has been released. When enabled, the radio will instead send the GPS data as soon as PTT is pressed.

Mobile Accessory Serial Port

Mobile Accessory Se	erial P	ort
Accessory Baud Rate:	1200	\sim
Enable IP 224		
Enable ACU 1000		

Accessory Baud Rate: Sets the accessory Baud rate

Enable IP 224: Enables the use of IP 224

Enable ACU 1000:

Enables ACU 1000 on the mobile accessory.

Control Lockout Enables

Control Lockout Enables						
Keypad	Side Buttons	PTT				
Emergency	Toggle Switches					
Collar Switch	Channel Knob					

A check in the checkbox beside a control indicates that it will be locked out when Control Lockout is activated.

Ethernet Settings:

Ethernet Settings							
IP Address:	0		0		0].	0
Subnet Mask:	0		0].	0].	0
Default Gateway:	0		0].	0].	0
Password:]	

Mobile:

Off 🗸 🗸
H Vol Control
ne Control
or Tx Audio
ker

Ignition Line Low Timer:

Sets a power down timer for a mobile. Once the timer expires, the radio will power off.

HHCH Master of RCH Volume:

When selected, volume control will only be on the Handheld Control Head.

HHCH Master Volume Control:

When selected, volume is controlled either through the Remote Head or the Handheld Control Head.

Control Heads Monitor Tx Audio:

(Mobile only) Allows non-transmitting control heads to monitor TX audio.

Disable HHCH Speaker:

Turns off audio on the Handheld Control Head.

Common - Keys

This page contains encryption key parameter settings.

Zones: 1 Channels: 1 Global System Zone*		
Common Conventional	General	Keys
Radio VHF Radio Name:	Home Zone: (1) ZONE 1 Display MDC IDs as Decimal Home Channel: (1) CHAN 0001 Display Covin Unit ID	Dual Mode Scan
ESN: 10	Time Zone (UTC) Coordinated Control Coordinated Control Coordinated Channel Of Zone Soft Power Down Timer:	Voice/Mic Prefs.

P25 Encryption

🤒 Global Common Keys

	SLN	Alias	Add Row
1	1651	Blue Team	Delete Row
2	4556	Red Team	
3	8961	Special	

The Keys Table page contains SLN's (Storage Location Numbers) and Label information for the encryption keys contained in the radio's encryption module.

SLN:

Enter SLN's (Storage Location Numbers) in the table that corresponds to the location of the keys loaded into the radio.

Alias:

Labels can be assigned to each key.

RCE Encryption

SLN	ALG ID	KEY ID	KEY (HEX)	Add Row	
1	RCE	0	******	Delete Row	
1	RCE	0	*****	Infinite KEK Retention	
1	RCE	0	*****	☐ Infinite TEK Retention	
1					
1	RCE	0	*****	Authentication Keyload Port:	49165
1	RCE	0	*****	RSI:	N/A
1	RCE	0	*****	KMF RSI:	N/A
1	RCE	0	*****	MNP:	N/A
1	RCE	0	*****	Group RSI:	N/A

RCE (RELM Compatible Encryption) is a method of encryption which is compatible with Motorola's ADP.

SLN:

Enter SLN's (Storage Location Numbers) in the table that corresponds to the location of the keys loaded into the radio.

SLNs must be unique across all types of keys. The programmed RCE key must have its SLN in the P25 encryption table, the channel key selection then goes off that. (Range: 1-61439).

Key ID:

ID of the encryption key (this is transmitted over the air) (Range: 1 - FFFF).

Key:

The key variable, the 16 hex-digit DES encryption variable. This is stored within the radio and cannot ever be read out. This is not transmitted over the air.

Infinite KEK Retention:

A check mark here means that Key Encryption Keys will be retained after the radio is turned off. No check mark means that the KEKs will be erased upon power down.

Infinite TEK Retention:

A check mark here means that Traffic Encryption Keys will be retained after the radio is turned off. No check mark means that the TEKs will be erased upon power down.

Authentication Keyload Port:

Selects the UDP port number for the port used to communicate with the KVL for supplying authentication keys to the radio.

<u>RSI</u>

RSI:	N/A
KMF RSI:	N/A
MNP:	N/A
Group RSI:	N/A

RSI:

Radio Set Indicator. When radio registers with the system, a data connection is established and the radio supplies KMF with the radio's IP address and the RSI

KMF RSI:

Key Management Facility. Default is 9999999. Required to operate in the OTAR system.

MNP:

Message Number Period. Provides additional security in the over the air rekeying of subscriber units.

Group RSI:

During OTAR delivery to a group of radios with the same encryption information, a group of RSI is used for more efficient delivery.

Common - Dual Mode Scan

Dual Mode Scan will scan Conventional and P25 Trunking channel locations from within the same scan list.

Global System Zone			
Common Conventional			
Radio	AMBE	GPS General	User Prefs.
Band:	VHF Voise Suppression Avg. Voice Level: -22 V	Periodic Trigger Time: 3	User Preis.
Common Conventional Radio Band: Radio Name: ESN:	Automatic Gain Control	Dedicated Zone: (1) ZONE 1 Sase Station Relay	Keys
	Handheld Control Head	Dedicated Channel: (1) CHAN 0001 V GPS P2P Transmit	Dual Mode Scan
		Destination ID: 1	·
•			

Settings

Scan Hold Time (s):	0.0 🖂	Talkback:	Tx on Selected Channel 🖂	
---------------------	-------	-----------	--------------------------	--

Scan Hold Time:

The Scan Hold Time allows the user to hear responses to calls before the radio resumes scanning. The Scan Hold Time can be programmed from 0 to 7.5 seconds.

Talkback:

The Talkback feature controls how the radio responds to scanned traffic. There are 2 modes of

operation.

<u>Tx on Selected Channel:</u> The radio will always transmit on the knob selected channel after receiving scan traffic.

<u>Tx on Active Channel</u>: The radio will transmit on the same channel as the last received scan traffic if the radio is keyed before the hang time expires.

Scan List Table

The

res) Du	ial Mode Scan Comm	on Settings —	
Scan Hold	d Time (s): 0.0 ∨ Talkback: Tx	on Selected Channel $ \!$	
	Zone	Channel	Add Row
1	(1) ZONE 1	(1) CHAN 0001	Delete Row
2	(1) ZONE 1	(1) CHAN 0001	
3	(1) ZONE 1	(1) CHAN 0001	
4	(1) ZONE 1	(1) CHAN 0001	
5	(1) ZONE 1	(1) CHAN 0001	

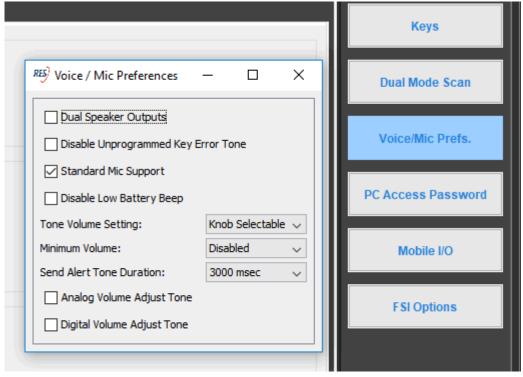
Highlight the Zone entry box and click on the drop down arrow to select the desired zone. Highlight the Channel entry box and click on the drop down arrow to select the desired channel.

Add Row and Delete Row

buttons are used to enable/disable list entries.

The list entries will then display the selected channel locations.

Common - Voice/Mic Prefs



Dual Speaker Output:

(Portable only) When checked audio is available on both the internal speaker and the speaker microphone speaker when attached.

Disable Unprogrammed Switch Error Tone:

Disables the audible tones.

Standard Mic Support:

Should be selected for mobile radios with a standard microphone for proper hang-up function.

Disable Low Battery Audible Alert:

When selected, low battery audible alert is disabled.

⊺one Volume:

Selects the tone volume (Knob, Low, Medium, High).

Minimum Volume:

Prevents the volume from decreasing below a pre-set level, regardless of the setting of the volume knob. Use the drop box to select either User Selectable, Level 1, Level 2, Level 3, Level 4, or Disabled.

Send Alert Tone Duration:

Used in conjunction with the "Send Alert Tone" button, when pressed and held the radio will transmit a 781.3Hz tone for the programmed duration. Works on analog/digital/mixed-mode or trunking channels.

Analog Volume Adjust Tone:

A tone will play any time the volume knob is adjusted while on an analog channel.

Digital Volume Adjust Tone:

A tone will play any time the volume knob is adjusted while on a digital channel.

Change PC Access Password:

Change or assign a password to access the saved file.

PC Access Password

Enter Password	×
Password:	
Re-Enter Password:	Confirm Password
	Confirm

Common - Mobile I/O

This page is used to set mobile radio input and output functions.

Global System Zone			
Common Conventional			
Common Conventional Radio Band: VHF Radio Name: ESN:	AMBE	GPS General	User Prefs.
Band: VHF Radio Name:	Noise Suppression Avg. Voice Level: -22 V	Periodic Trigger Time: 3 Use Main Channel	
ESN:	Automatic Gain Control	Dedicated Zone: (1) ZONE 1 V Base Station Relay	Keys
	Handheld Control Head	Dedicated Channel: (1) CHAN 0001 V GPS P2P Transmit	Dual Mode Scan
	Disable HCH Speaker HCH Master of RCH Volume	Destination ID: 1	Voice/Mic Prefs.
Backlight	HCH Master Volume Control	GPS Trigger Conditions	voice/mic Preis.
Backlight		PTT Power On/Off	Mobile I/O

Outputs

RES Mobile I/O Comm	– 🗆 ×
Output	
Output 1 Mode	None v
Output 1 Active Level	Low 🗸
Output 2 Mode	None 🗸
Output 2 Active Level	Low 🗸
Output 3 Mode	None 🗸
Output 3 Active Level	Low 🗸
Output Binary Mod	de

There are three output ports available from the 25-pin connector on both mobile radios and remote control heads.

Output Mode:

Determines what event will cause the output to toggle.

Auxiliary 1 Button - Toggles when Aux 1 button is pressed or selected from the menu.

Auxiliary 2 Button - Toggles when Aux 2 button is pressed or selected from the menu.

Auxiliary 3 Button - Toggles when Aux 3 button is pressed or selected from the menu.

Carrier Detect - Toggles on whenever carrier is detected, off when carrier drops.

Active Rx - Toggles when the receiver is active.

<u>Voice Mute Trip</u> - Toggles when Volume Mute is triggered.

Call Alert Received - Toggles when a Call Alert is received.

Active Tx - Toggles when the transmitter is active.

Active MSAT - Toggles when the MSAT is active.

Output Active Level:

Determines whether the output is high or low when enabled.

Binary Mode:

Indicates that the output lines are to be used as binary address lines to communicate a Call Alert in a trunking system.

See Sentinel IDs under P25 Trunking. Inputs

Input	
Input 1 Mode	None 🗸
Input 1 Active Level	Low ~
Input 1 Type	Momentary ~
Input 2 Mode	None 🗸
Input 2 Active Level	Low ~
Input 2 Type	Momentary ~

There are two inputs available from the 25-pin connector from both mobile radios and remote control heads. These inputs can invoke various radio functions.

Input Mode:

Emergency - Detected input initiates emergency call.

PTT - Detected input initiates push-to-talk.

Monitor - Detected input places the radio in monitor mode.

Zeroize - Detected input removes all encryption keys.

<u>Voice Mute</u> - Detected input puts radio in Voice Mute mode.

<u>Tx Encryption</u> - Detected input enables/disables encryption on switchable encryption channels.

<u>Tx Mode</u> - Detected input toggles digital/analog transmit on selectable Tx mode channels.

<u>Tx Power</u> - Detected input toggles high/low Tx power on selectable Tx power channels.

Channel Scan - Detected input initiates Channel Scan.

Zone Scan - Detected input initiates Zone Scan.

Priority Scan - Detected input initiates Priority Scan.

Handset off Hook - Detected input initiates Handset off Hook.

ACC PTT - Detected input initiates Accessory PTT.

Input Active Level:

Determines whether the input is triggered by high or low input.

Input Type:

Switch - Indicates that the selected action is initiated be a single change in the input (low to high, or high to low).

Momentary - Indicates that the selected action is initiated be a change, then a revert, in the input (low-high-low).

Common - FSI Options Fixed Station:

🤊 Fixed Sta	ti	_	×
Fixed Station			
Control UDP Port:	7000		
Voice UDP Port:	0		
Audio Type:	PCM	\sim	
Channel Index Ze	ro: 🗸		

Network settings used to configure a mobile radio as a digital fixed station interface. Must be used in conjunction with an authorized fixed station console application.

IP Address:

IP is a numerical label assigned to each device participating in a computer network that uses the Internet Protocol for communication.

Subnet Mask:

32-bit value that is used to distinguish the network ID from the host ID in an arbitrary IP address.

Default Gateway:

The node on the computer network that the network software uses when an IP address does not match any other routes in the routing table.

Control UDP Port:

Indicates the transport port used to receive RTP packets from remote gateway. The P25 DFSI Standard identifies port 7000 as the default control port.

Voice UDP Port:

Indicates the port used for VOIP. No default port is identified for the Voice UDP Port.

Audio Type:

Audio media type and codec.

Channel Index Zero-Based:

For DFSI channel change operations, the console and the fixed-station must agree that the channels either begin with channel 0 or channel 1.

If the console expects the channels to start at 0, this parameter should be enabled; otherwise it should be disabled (meaning the channels start at 1).

Global - Conventional

The **Global - Conventional** tab contains features that control radio operation on any conventional system.

The tab contains one main section that contains Display, Analog Signaling, Radio Features, Unit Call, Transmit Features, and Other settings.



General:

The General parameter settings control generic conventional functionality regardless of the active conventional system.

Features:

The Features parameters controls radio functions such as Priority Scan timer, Talk Back Scan and Busy channel modes.

Keypad Editing Lockouts:

Settings on this page control what functions are accessible via Keypad Programming.

Menus:

Determines which conventional system features will be accessible via the radio's Menu list.

Buttons:

Assigns conventional system functions to the radio button controls.

Conventional - General

This page contains parameters which apply to radio operation when the active system/channel type is conventional.

Global Sys	stem Zone				
Common	Conventional	P25 T	runking		
Display					
Top Line:	Channel Label	~	Alt. Top Line:	None	~
Middle Line	: Frequency	~	Alt. Middle Line:	None	~
Bottom Line	e: Channel Number	~	Alt. Bottom Line:	None	~

Display

Display					
Top Line:	Channel Label	\sim	Alt. Top Line:	None	200
Middle Line:	Unit ID	\sim	Alt. Middle Line:	None	\sim
Bottom Line:	Channel Number	\sim	Alt. Bottom Line:	None	200

The settings in this section determine what information is visible on the radio display when a conventional channel is selected. The display supports three lines of text.

All three display lines can be programmed to alternate displayed information. Each line is individually programmable. Each of the display lines can be populated with one of the following items:

Channel Label, Frequency, Channel Number, Unit ID, Received Talkgroup ID, Rx Pick List selections, Tx Pick List selections, Zone Label, Zone Number/Channel Number,

Zone Number, Rx/Tx Key, Received Subaudible tone, Received DTMF, Received MDC, Channel Number/Zone

Label, Radio Name, Date and Time or None. Analog Signaling

Analog Signalir	ng	
Deviation (%):	60	$\sim 10^{-10}$
Pre-Delay (ms):	330	\sim
Pre-Tx ANI	Go-Ahea	d Beep

Deviation:

This drop down menu sets the modulation level of an analog DTMF or MDC signal.

Pre-Delay:

This drop down menu sets the time between PTT and the start of the selected DTMF/MDC signaling. This front porch time allows repeaters in a conventional system to perform squelch detection and decode any sub audible signaling before the signaling is transmitted.

Pre-Tx ANI Go-Ahead Beep:

If checked the radio emits a beep after the Pre-Tx ANI is sent.

Unit Call

60	\sim
	60

Unit Call:

The settings in this section govern Conventional Unit Call functionality.

Enabled:

Selecting the check box enabled the conventional digital unit call functionality in the radio.

Beep:

If checked the radio will emit an alert tone whenever receiving unit call traffic.

Idle Time:

Determines the amount of time the radio waits before automatically exiting Unit Call mode. This time relates to both unanswered calls and active calls that have gone idle.

<u>Other</u>

Other	
Discriminator Monitor	Talkaround Persistence
Tone Remote Interface	
Default Squelch Level: 6 🗸	

Discriminator Monitor:

When enabled, supplies discriminator (unfiltered) audio to the speaker during open monitor. When disabled, supplies filtered and de-emphasized audio to the speaker during open monitor.

This feature allows the radio to be used in conjunction with an external decoder for various types of signaling that are sensitive to filtering and de-emphasis.

Tone Remote Interface: (Mobile only)

This selection must be active if the radio is to be interfaced with a Tone Remote station.

Talkaround Persistence:

Indicates that Repeater Talkaround will not revert to inactive after a channel change.

Default Squelch Level:

Sets the default level when squelch is adjusted through the Squelch Adjust menu, or when new channels are created in keypad programming.

Radio Features

Radio Features	
readio i cataros	
Ignore Transmissions from Own UID	Nuisance Channel Delete
Unmute After Encryption Parameters	Tx DTMF Preemphasis
Mixed Mode Signal Quality Holdoff (ms):	0 ~
Priority Scan Period (s):	0.75 🗸

Ignore Transmission from Own UID:

Causes the radio to mute any received transmissions from a unit's own P25 UID.

Unmute only after Encryption Parameters Available:

If checked, encrypted channels unmute only after receiving encrypted signals that match the encryption key assigned to the channel.

Mixed Mode Signal Quality Holdoff:

Delays the unmuting of a qualified mixed mode signal for the programmed amount of time.

Priority Scan Period:

Use the drop down menu to program the rate at which the Priority Channels are sampled when the radio is operating in Priority Scan Mode.

Note: A sampling rate of at least .5 seconds is recommended when scanning digital priority traffic.

Nuisance Channel Delete Legacy Mode:

If checked and Channel Scan is active, a nuisance channel can be temporarily removed from the scan list using this function.

Press and hold the button while the nuisance traffic is active and scanning will no longer stop on that channels traffic.

A removed channel will be restored to the list on a channel change, scan on/off or upon radio power cycle.

TX DTMF Pre-emphasis:

Turns on pre-emphasis when sending DTMF Tones.

Mobile Microphone Offhook Monitor:

(Mobile only) When the radio is taken off hook, any scanning is halted and the radio enters monitor mode. The radio only unmutes when voice traffic is present.

Offhook Scan Enabled:

(Mobile only) With this feature selected, the radio will continue to scan when in the "Offhook" state.

Offhook Talkback Enabled:

(Mobile only) When enabled, if the mobile is scanning and the mic is taken off hook, scan will temporarily be disabled and the mobile will switch to the channel of the last reception. Once the mic is put back on hook, scan will resume and the radio will return to the idle channel

Transmit Features

Transmit Features		
Talkback Scan	Talkback Use Rx Key	NAC Talkback
Mixed Mode Talkback	Unit to Unit Callback	Match Rx Encryption Talkback
Low Power During Low	Battery	

Talkback Scan:

If checked, pressing PTT while a scanned channel is active or before the scan hold time expires causes the radio to transmit on the frequency of the active receive channel.

If unchecked, the radio will transmit on the frequency of the selected channel.

If Priority Scan is active and Transmit on Priority 1 is enabled, all transmissions will occur on the designated Priority 1 channel.

Mixed Mode Talkback:

Channels programmed to receive in Mixed mode will receive both digital and analog traffic exhibiting the proper signaling (CTCSS/DCS, NAC, talk group, etc...)

If checked, pressing the PTT during the hang time will cause the radio to transmit in the same mode, analog or digital, as the received traffic.

If unchecked, the radio will transmit using the channels programmed mode.

NAC Talkback:

Indicates that the received NAC/Talkgroup ID will be used for transmit.

Talkback Use Rx Key:

If checked, after receiving encrypted traffic, the radio will respond using the same encryption key as the received traffic.

If unchecked, the radio will use the encryption key assigned to the channel when responding to the call.

Unit to Unit Callback:

Allows the radio to accept and respond to unit calls received while scanning.

Conventional - Features

This page enables and configures a variety of conventional features.



Radio Features

Nuisance Channel Delete
Tx DTMF Preemphasis
0 ~
0.75 🗸

Ignore Transmission from Own UID:

Causes the radio to mute any received transmissions from a unit's own P25 UID.

Unmute only after Encryption Parameters Available:

If checked, encrypted channels unmute only after receiving encrypted signals that match the encryption key assigned to the channel.

Mixed Mode Signal Quality Holdoff:

Delays the unmuting of a qualified mixed mode signal for the programmed amount of time.

Priority Scan Period:

Use the drop down menu to program the rate at which the Priority Channels are sampled when the radio is operating in Priority Scan Mode.

Note: A sampling rate of at least .5 seconds is recommended when scanning digital priority traffic.

Nuisance Channel Delete Legacy Mode:

If checked and Channel Scan is active, a nuisance channel can be temporarily removed from the scan list using this function.

Press and hold the button while the nuisance traffic is active and scanning will no longer stop on that channels traffic.

A removed channel will be restored to the list on a channel change, scan on/off or upon radio power cycle.

TX DTMF Pre-emphasis:

Turns on pre-emphasis when sending DTMF Tones.

Mobile Microphone Offhook Monitor:

(Mobile only) When the radio is taken off hook, any scanning is halted and the radio enters monitor mode. The radio only unmutes when voice traffic is present.

Offhook Scan Enabled:

(Mobile only) With this feature selected, the radio will continue to scan when in the "Offhook" state.

Offhook Talkback Enabled:

(Mobile only) When enabled, if the mobile is scanning and the mic is taken off hook, scan will temporarily be disabled and the mobile will switch to the channel of the last reception. Once the mic is put back on hook, scan will resume and the radio will return to the idle channel.

Transmit Features

Transmit Features		
Talkback Scan	Talkback Use Rx Key	NAC Talkback
Mixed Mode Talkback	Unit to Unit Callback	Match Rx Encryption Talkback
Low Power During Low	Battery	

Talkback Scan:

If checked, pressing PTT while a scanned channel is active or before the scan hold time expires causes the radio to transmit on the frequency of the active receive channel.

If unchecked, the radio will transmit on the frequency of the selected channel.

If Priority Scan is active and Transmit on Priority 1 is enabled, all transmissions will occur on the designated Priority 1 channel.

Mixed Mode Talkback:

Channels programmed to receive in Mixed mode will receive both digital and analog traffic exhibiting the proper signaling (CTCSS/DCS, NAC, talk group, etc...)

If checked, pressing the PTT during the hang time will cause the radio to transmit in the same mode, analog or digital, as the received traffic.

If unchecked, the radio will transmit using the channels programmed mode.

NAC Talkback:

Indicates that the received NAC/Talkgroup ID will be used for transmit.

Talkback Use Rx Key:

If checked, after receiving encrypted traffic, the radio will respond using the same encryption key as the received traffic.

If unchecked, the radio will use the encryption key assigned to the channel when responding to the call.

Unit to Unit Callback:

Allows the radio to accept and respond to unit calls received while scanning.

Conventional - Keypad Edits Lockout

From this page all available keypad programmable options can be locked to prevent changes by the radio operator.

Global Sys	Global System Zone				
Common	Conventional	P25 Trunking			
Display				Other	
Top Line:	Channel Label	✓ Alt. Top Line:	None 🗸	PC Write Requires Password	Keypad Lockouts
Middle Line	Frequency	P25 Trunking V Alt. Top Line: V Alt. Middle Line:	None 🗠	Tone Remote Interface	

Any function selected in the Keypad Editing Lockout screen will not be available when the User Password is used to enter keypad programming mode.

Keypad Editing Lockouts Settings	- 🗆 X
Global Password Dual Speaker Display Top Line Control Lockout Display Middle Line Disable HCH Speaker Display Bottom Line HCH Master Volume Priority Scan Period Display Timeout	Pick Lists CxCSS Talkgroup NAC Call List Channels Bandwidth Dus Secondary Talkgroup
Systems Priority 1 Channel Priority 1 Channel Transmit On Priority 1 Scan Hold Time Priority 2 Channel	Rx Frequency Talkgroup ID Rx Mode Tx Power Rx Guard DTMF Live Dial Squelch Mode Tx Frequency
Zones Zone Label Zone Add Zone Priority 1 Channel Zone Delete Zone Transmit on Priority 1 Channel Add Zone Priority 2 Channel Channel Delete	Tx Mode Tx Guard Tx NAC

!!! Warning !!!

If the passwords are disabled keypad lockouts are ignored and all keypad programming functions are accessible. Keypad lockouts can be overridden by entering keypad programming mode using the Administrator Password. If you are using lockouts, be sure to set the Administrator and User passwords differently under the "Common -General" tab.

Global - P25 Trunking

The **Global - P25 Trunking** tab contains trunking features that control radio operation regardless of the active P25 Trunking system.

The tab contains a small **General** section. Also, Trunking Systems have different **Menus** and **Buttons** than conventional systems.



General:

The General parameter settings control generic trunking functionality for all programmed P25 Trunking systems. This page contains settings such as Display, Site Trunking and Out of Range indication settings.

Menus:

Determines which trunking features will be accessible via the radio's Menu list.

Buttons:

Assigns trunking functions to the radio button controls.

P25 Trunking - General

This page contains parameters which apply to radio operation when the active system/channel type is P25 Trunking.



<u>Display</u>

Display					
Top Line:	Channel Label	\sim	Alt. Top Line:	None	\sim
Middle Line:	Unit ID	\sim	Alt. Middle Line:	None	\sim
Bottom Line:	Channel Number	\sim	Alt. Bottom Line:	None	~

The settings in this section determine what information is visible on the radio display when a P25 Trunking channel is selected. The display supports three lines of text.

The display supports three lines of text. All three display lines can be programmed to alternate displayed information. Each line is individually programmable.

Each of the display lines can be populated with one of the following items:

Channel Label, Channel Number, Unit ID, Received TG, Zone Label, Zone# : Channel#, Zone Number, Rx/Tx Key, Channel # + Zone Label, Radio Name, Site Affiliation Alias, Date and Time or None.

Trunking Indicators

Trunking		
Site Trunking Warning:	None	\sim
Trunking out of Range Indication:	None	$- \mathbf{N}_{\mathbf{n}}$
Roaming Notification:	None	\sim

Site Trunking Warning:

Determines what will be displayed and/or heard when the radio is operating in a site trunking condition. The optional selections are Tone and Display, Display Only, Tone Only or None.

Out of Range Indications:

Determines what will be displayed and/or heard when the radio is out of range of the system. The optional selections are Tone and Display, Display Only, Tone Only or None.

Roaming Notification:

If active, it will give an audio or display indication when the radio roams to a new site.

Menu and Function Buttons & Switches

The chart below details the features available for assignment to the "Main" menu or as a function button.

The features are system dependent.

The chart below shows available for menu, switch or button assignment.

				Í l		
	Menu	Switch	Button	Label	Trunk	Conv.
Accessory I/O Enable	x		x	IO-EN	х	x
Auxiliary 1/2/3	X		x	AUX1/2/3	X	X
Backlight	X	x	x	LITE	x	X
Battery Life	X		x	LIFE	x	X
Bluetooth (KNG2 Feature)	x		×	BT	x	X
Call Alert	X		x	ALRT	x	X
Channel Add/Delete	x		x	CHAN+/-		x
Channel Scan	x	x	x	SCAN		X
Channel Scan List	X		x	SCN+		X
Channel Select	X		x	CHAN	x	X
Cloning	x			-		X
Contrast	x			-	x	x
Control Lock	X	x	x	LCK	x	x
Date and Time	x		x	DATE	x	x
Dual Mode Scan	x	X	x	DSCN	x	X
Dual Mode Scan List	x		x	DSED	x	X
Emergency ¹			x	-	x	X
Enhanced Scan	x	X	x	ESCN		X
Evacuation Tones	x		x	ET		X
GPS*	x		x	GPS	X	X
Hang Up	x		x	HANG		X
Hard Power Down			x	PWRD	X	X
Home Channel	x		x	HOME	X	X
nhibit	x		x	INH		X
Keyset Select	x		x	KSET	x	x
Venu			x	MENU	X	X
Minimum Volume	x		x	VOL	X	X
Monitor	x		x	MON		X
Nuisance Delete			x	DEL		X
Phone	x		x	PHN		X
Picklist - Rx CxCSS	x		x	RXCG		X
Picklist - Rx NAC	x		x	RXNC		x
Picklist - Talkgroup ID	X		X	TGID		X
Picklist - Tx CxCSS	X		X	TXCG		x
Picklist - Tx NAC	X		X	TXNC		X
Picklist-KEY**	x		x	KEY		x
Priority Channel Select	X		x	PRI	I	x
Priority Scan	X	X	x	PSCN	x	x
Priority Scan List	X		x	PSED	X	
Quick User Status 1/2/3/4			x	STS1/2/3/4	X	

Radio Accountability Tone	x		x	RAT	X	x
Radio Check	x		x	RCHK		х
Radio Info	x			-	x	х
Rekey Request***	x		x	RKEY	x	х
Repeater Talkaround ²	x	x	X	T/A		Х
Send Alert Tone			x	SNDT	X	x
Send Signal			x	SEND		х
Short Message Update	x		x	MSG	x	
Site Display****	x		x	STDS	x	
Site Lock****	x		x	STLK	X	
Site Search****	x		x	STSR	x	
Squelch Adjust	x		x	SQL		х
Surveillance Mode	х	x	x	SURV	x	х
Talkback	x		x	тквк		х
Text Message	x		x	тхт		х
Two-Tone Select	x		x	TONE		x
Tx Digital/Analog	x	x	x	TXAD		x
Tx Inhibit	x		x	-	x	x
Tx Power	x	x	x	PWR	x	x
Tx Secure**	x	x	x	SEC	x	x
Unihibit	x	-	x	UNINH		x
Unit Call	x		x	UNIT	X	x
User Status	x		x	STS		x
Version	X			-	x	x
Voice Mute ²	x		x	MUTE		x
Zeroize Keys**	X		x	ZERO	x	x
Zone Scan	X	x	x	ZSCN		x
Zone Scan List	X		X	ZSC+		x
Zone Select	x	x	X	ZONE	X	x

¹ Emergency button can only be assigned to the orange button.

² Works on a per-channel basis.

* Requires GPS option.

** Requires Encryption option.

***Requires Encryption and OTAR options.

****Requires P25 Trunking option.

Keypad programming menus are accessible in conventional systems only. Assigned programming items are accessed by selecting "Keypad Prog" from the radio's programmed menu items.

Available Programming Menus	
P25 ID Call List	
CxCSS Pick List	
Keypad	
NAC Pick List	
Talkgroup ID Pick List	

Systems

The second tab on the main page is titled "**System**". This tab accesses those parameters that are likely to change when a radio is to operate on different systems.

"System" refers to any set of RF infrastructure equipment (trunking or conventional) that is administered by some controlling agent or agency. A state vs county system, for example.

A radio's assigned Unit ID may change when it operates on the county trunking system vs the state trunking system due to the different agencies administering the systems.

The available features on one system may differ depending on the FNE (Fixed Network Equipment) that make up the system or the manner the equipment is configured.



Add/Delete a System

To add a new conventional system, click the +CS button. To add a new P25 trunking system, click the +TS button.

To Delete a system, highlight the system and click the -S button.

System - Conventional

The System - Conventional tab will display parameters for the selected conventional system.



Each conventional system has some general options and these other subcategories:

Add. Options, Unit ID Alias List, CxCSS Picklist, NAC Picklist, Talkgroup Picklist, Two-Tone List, DTMF List, MDC List, Five-Tone List, User Status, Text Messages, Data/OTAR, and Phone.

Conventional System		
IDs	Voice Mate Text Message	
Pasito (Dec): 1	Ranet Time: B Control	Add. Options
Priority 1	Inepacy	Unit ID Alian Lint
Deabled Tx PH 1 Use Main Channel Zone: (0) 2016 1 V Channel (0) GUAN (001 V	Owned Hole Outer Owned Venet Anne: 00 2006 1 Septist Tree 5 Net trees 15 Net trees 15 N	Call SS Picking
Priority 2	Encryption	NAC Picklist
Use Main Channel Zone: (1) 20HE 1 Channel: (1) DHW 0001	Allew Key Set Soluciton Talk Permit Tone Delay: 0.0 V	Talkgroup Picklist
Man Down Settings Friggen Deabled Warning Timer:	Voe Scas 855 threshold: €3 ✓ Delay Time (inc): 0 ✓ Inidi Time (c): 8.0 ✓	Two-Tone List
		DTM List
		MDC List
		Fire-Tone List
		User Status
		Text Mennagen
		Data/91AR
		Phone

Conventional System: General

The **Conventional - General** page contains parameters which apply to radio operation on the selected conventional system.

Global System Zo	ne		
+CS	+TS	-S	Conventional System
	System	ID	P25 ID (Hex): 1
1	Conventional	1	

P25 Unit ID

IDs	
P25 ID (DEC):	1

The **ID** section programs the conventional P25 Unit ID. The available unit id range is from 1 to 9999999.

Priority Scan Mode (System)

Priority 1							
🗹 Disable	d Tx Pri 1						
Use Ma	in Channel						
Zone:	(1) ZONE 1 \sim						
Channel:	(1) CHAN 0001 \lor						
Priority 2	Priority 2						
🗹 Disable	d						
Use Main Channel							
Zone:	(1) ZONE 1 \sim						
Channel:	(1) CHAN 0001 \smallsetminus						

For each system, up to two channels can be designated as priority channels. In Priority Scan mode these priority channels, Pri 1 and Pri 2 are periodically checked for activity even when monitoring a non-priority channel's active traffic. Activity on Pri 2 preempts traffic on any of the non-priority channels. Activity on Pri 1 preempts traffic on any channel including Pri 2. System Priority Scan will automatically scan across zones when enabled.

Use the drop box to assign the Priority 1 and Priority 2 channels. When "Use Main Channel" is selected, the currently selected channel will be either Pri 1 or 2. Use Main Channel cannot be assigned to Pri 1 and 2 concurrently.

Tx on Priority 1:

If the radio is programmed to "Transmit on Priority 1", all transmissions will occur on PR1 when Priority Scan is enabled.

NOTE: System Priority Settings override the "Zone" based priority settings. To set Zone specific priority channels, the System Pri must be disabled.

Voice Mute

Voice Mute	;			
Reset Time:	0 ~	Reset Mode:	Manual	\sim

When Voice Mute is selected from the radio's menu or programmed switch or button, the radio speaker is muted until a programmed two-tone, MDC or DTMF paging call is received.

Voice Mute Reset:

This setting will determine how the radio resets after being activated by a Paging event. "Manual" will require the user press the "Voice Mute" function button/menu item to reset the radio to idle.

"Auto" and "Auto w/Carr" settings will reset based on the Auto Reset timer. Using the Auto w/Carr selection will keep the radio active if additional carrier activity is received during the reset time and will only return to its idle state after an appriar activity has been

during the reset time cycle and will only return to its idle state after no carrier activity has been detected for duration of the Reset time.

Voice Mute Reset Time:

This setting will determine when the radio will automatically reset after a Paging event has occurred.

Man Down Settings

Man Down Settings					
Trigger:	Disabled 🗸				
Pre-Warning Timer (s):	5				
Post-Warning Timer (s):	1				

The Man Down feature, if enabled, will put the radio in Emergency Mode after a specified period in a horizontal position.

Trigger:

<u>Horizontal</u> - Indicates that Emergency Mode will be triggered after the radio has been horizontal for the specified interval.

<u>Horizontal + Motionless</u> - Indicates that Emergency Mode will be triggered after the radio has been horizontal and motionless for the specified interval.

Pre-Warning Timer:

Countdown to the warning beep. Indicates the length of time, after meeting the trigger condition, before the warning timer begins beeping.

Post-Warning Timer:

Countdown to Emergency Mode. Indicates the length of time that the warning beep sounds. Once these seconds are counted down, Emergency Mode is activated.

P25/MDC Emergency Mode

Channel Mode:	Current Channel				
Channel Mode:	Current Channel	~			
Impolite Tries:	5	\sim			
Polite Tries:	15	\sim			
Hot Mic Tx Period:	10	\sim			
Revert Zone:	(1) ZONE 1	\sim			
Revert Channel:	(1) CHAN 0001	\sim			
Rx Alert	Call				
Alarm	Hot-Mic				
Enable Evacuation Tone Sequence					

P25 Emergency Mode Operation

When Emergency mode is activated, each transmission will contain a bit in the data stream indicating an emergency condition as defined in the APCO Project 25 standards. P25 Emergency operation only applies to channels programmed for Digital or Mixed mode transmissions. If the channel is programmed for Mixed mode transmit, the "Tx Digital" switch must be on.

To place an emergency group call, press and hold the programmed emergency button (as assigned in the Conventional - Buttons page) until the radio beeps and the display flashes, then press PTT.

All scanning and priority scanning functions will be disabled. If the radio is in Unit-to-Unit call mode, that mode will be exited and the radio placed in Emergency mode.

Each subsequent press of PTT will cause the radio to transmit on the designated emergency zone/channel location with the emergency bit set, indicating an emergency condition. A press and hold of the emergency button or power cycling the radio will return the radio to normal operation.

MDC Emergency Mode Operation

When Emergency mode is activated on an analog channel, MDC emergency information is transmitted providing that the emergency channel is part of a zone populated with an MDC ID. (See "Zone Settings" to set an MDC ID.)

Emergency Settings

Zone/Channel:

This setting indicates the emergency zone and channel location for all conventional emergency calls.

A P25 digital or MDC analog emergency is sent according to the emergency channels transmit mode.

Tone on Received Emergency Call:

An alert tone will sound when an emergency call is received.

Emergency Alarm:

An emergency signaling bit is automatically sent on a digital conventional channel when the emergency button is pressed.

This alarm will inform the console and other radio users that an emergency situation is occurring. When an Emergency Alarm is sent, the radio listens for an acknowledgment message from a console.

Alarm Tries:

An emergency alarm can be sent multiple times in an attempt to receive an acknowledgment. Impolite Tries: The alarm is sent regardless of receiver status.

Polite Tries: The alarm is sent only when the channels are not busy.

Emergency Call:

This feature consists of an emergency signaling bit being sent with each PTT on the designated emergency channel that indicates an active emergency status of the call.

Emergency Hot Mic:

This check box enables Emergency Hot Mic functionality.

When an emergency call has been initiated the radio will automatically transmit the emergency call for the duration of the Hot Mic Tx Period and then dekey.

Enable Evacuation Tone Sequence:

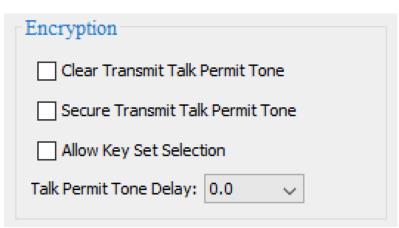
Allows the evacuation tone to be sent when the user presses and holds the PTT button and then presses the orange emergency button.

This tone will continue to send for the duration that the user holds PTT.

Hot Mic Tx Period:

This setting determines the length of time the radio will automatically transmit an emergency call if Hot Mic is enabled.

Encryption



Radios with digital encryption options can hold up to 32 DES or AES keys.

Each channel is assigned a default key for transmit. The channel can be locked to a specific

transmit key or a key may be selected from the encryption key list (ex Global-Common-Keys).

Received encrypted traffic is decoded by any key residing in the radio.

A keyloader and keyload interface cable are required to program keys to the radio.

Clear Transmit Talk Permit Tone:

The radio plays a low single beep to notify the user they are transmitting an unencrypted signal.

Secure Transmit Talk Permit Tone:

The radio plays a low triple beep to notify the user they are transmitting an encrypted signal.

Allow Key Set Selection:

Allows the user to select a different keyset via the menu or function button.

Vote Scan

Vote Scan					
RSSI Threshold:	63	\sim			
Delay Timer (ms):	0	\sim			
Hold Time (s):	0.0	\sim			

RSSI Threshold:

Determines the Receive Signal Strength indicator (RSSI) level at which a voted site's signal level is acceptable.

If the radios current site falls below this threshold, it will attempt to find a stronger signal from one of the other voting sites.

Delay Timer:

This setting determines the time the radio will delay before taking RSSI measurements.

Hold Time:

Determines the amount of time the radio will remain on the voted repeater after receiving voice traffic.

Additional Options

Additional Conventional System Settings $ \Box$ \times						
Receive						
Scan Hold Time (sec):	0.0	~	Beep	On Pric	ority	
Call Alert Reset Time (see): None	~				
Digital Rx Modulation Typ	e: C4FM (Non Sim	ulcast) 🗸				
Transmit						
Tx Timeout Period (sec):	60	\sim				
High Power:	5.0 W	\sim				
Low Power:	1.0 W	\sim				
Mobile Power:	Medium	\sim				
Busy Channel Lockout:	Off	\sim				
General						
ANI Disable Time (m):	Off 🗸	Disabl	e Priority	Chann	el Selectio	n
Radio Accountability Tone		Ringb	-			

Scan Hold Time:

The Scan Hold Time allows the user to hear responses to calls before the radio resumes scanning.

It also allows time for the user to respond to a call when Talk Back Scan or Mixed Mode Talk Back enabled.

Call Alert Reset Time:

Allows call alert to expire after the set time period

Digital RX Modulation Type:

Specifies the type of modulation expected to be received on conventional channels as: C4FM, CQPSK, both, or Widepulse. It should always be set to C4FM unless otherwise directed by engineering.

Beep on Priority 1 Rx:

Indicates that a beep will sound when Priority 1 channel becomes active.

Tx Time Out Period:

The Transmit Time-Out Period limits the duration of calls and guards against accidentally keying of the transmitter and tying up the radio system.

The timer can be turned Off or set for a duration of 15 to 255 seconds, in 15 second increments.

Power:

This feature allows the radios "High" power level to be adjusted to either the highest possible output power range (High) or to roll back that level to a lower predetermined threshold.

Busy Channel Lockout:

Busy Channel Lockout prevents the radio from transmitting when other traffic is occurring on the active channel.

Off: No busy channel transmit limiting will occur.

<u>Indicate:</u> This setting will display "Busy" momentarily and an alert tone will sound if conflicting traffic is present, but the radio is still allowed to transmit.

Lockout: This setting prevents the radio from transmitting, "Busy" will be displayed and an alert tone will sound until the PTT is released.

Lockout with Override: This setting prevents the radio from transmitting, "Busy" will be displayed and an alert tone will sound until the PTT is released.

However a rapid release and press of the PTT will allow the radio to transmit.

<u>Automatic:</u> The setting will display "Busy" momentarily and an alert tone will sound. The radio will then revert back to receive mode and monitor the active receive traffic. (carrier mode only)

ANI Disable Time:

When not 0, this specifies the period during which ANI will not be sent if PTT is pressed during this time on a channel for which ANI is enabled.

When properly set, this produces the result that ANI will only be sent once on the first PTT of a typical conversation involving multiple PTTs.

Radio Accountability Tone:

Allows the user to transmit a pre-programmed set of DTMF digits by pressing and holding the "RAT" soft-key. The user can program up to 10 DTMF digits.

Disable System Priority Channel Selection from Keypad:

Indicates that a System Priority Channel cannot be changed from the keypad menu.

Ringback Enabled:

When enabled, this causes a radio receiving a DTMF voice mute signal to key the transmitter and send a 697Hz tone for 1sec, which serves to inform the user that sent the DTMF voice mute signal that this signal was received by the target radio.

Conventional System: Unit ID Alias List

The Conventional - Unit Call tab contains parameters which apply to radio operation on the

Global System		stem.			Add. Options
+^ ٢		+TC	-0	Conventional System	Unit ID Alias List
		IJ		1103	CxCSS Picklist
	Systen	n	ID	P25 ID (Hex): 1	NAC Picklist
1	Conventi	onal			Talkgroup Picklist

P25 Unit ID/Unit Call List

RES Conventior	ジ Conventional System Unit ID Alias List						Х
Unit Call S	ecurity						
Encryption:	Selectable 🗸 🗸						
Key:	1 ~						
	Alias		ID (DEC)		<u></u>	dd Row	
1	Radio #1		1561		De	lete Rov	/
2	Radio #2		1511				

Security

Unit Call Key:

Selects which SLN is used to encrypt Unit-to-Unit calls.

Unit ID Table

Entries in this table will be assigned to the Unit Call list and be accessible to the user via the Unit Call/Call Alert menu or function button.

Rx ID's and Unit Calls received from the ID's populated on this table will then be displayed as the assigned Label instead of the actual unit id number.

Alias:

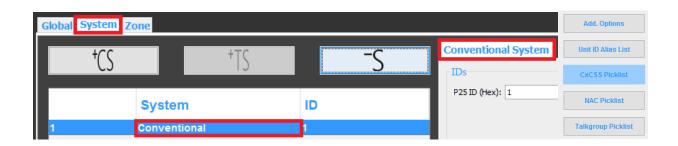
The label that is displayed when activity to/from a radio with associated P25 ID is detected.

ID:

P25 ID number for the associated label.



Conventional System: CxCSS Picklist



CxCSS Picklist

AE	Conventiona	l System Code Guard Picklist		- 0	×
	Value Invert DCS		Invert DCS	Add Row	
	1	77.0	False	Delete Rov	v
	2	123.0	False		

The list allows the user to choose CTCSS/DCS guard values for analog receive and transmit channels.

Value:

To program a standard CTCSS tone or CDCSS code, select the picklist entry and click on the right side of the Value field to bring up the drop-down list. Scroll through the list and select the desired call guard for the current line.

To program a non-standard CTCSS tone or CDCSS code, select the picklist entry key and enter the desired value. CDCSS codes must start with a D. Non-standard tones or codes will be displayed in RED.

Invert DCS:

A true value will invert the programmed DCS tone.

Conventional System: NAC Picklist

(Global System Zo	one				Add. Options
	+CS	+*	S		onventional System	Unit ID Alias List
					IDs P25 ID (Hex): 1	CxCSS Picklist
	1	System Conventional		_		NAC Picklist

NAC Picklist

AE	Convention	_		Х	
		Value (HEX)	4	dd Row	
	1	2E4	De	elete Row	/
	2	125			

The NAC Pick list allows the user to choose NAC codes for digital receive and transmit channels. The associated menu selection items are Rx NAC and Tx NAC.

To program the NAC codes select Value, type the desired NAC value for the current channel (32 max).

Conventional System: Talkgroup Picklist

	Global System Zo	one				Add. Options
	+^ (+TC	-0	Conventional System	n Unit ID Alias List
	0		1)		D	CxCSS Picklist
		System		ID	P25 ID (Hex): 1	NAC Picklist
l	1	Conventio	nal	1		Talkgroup Picklist

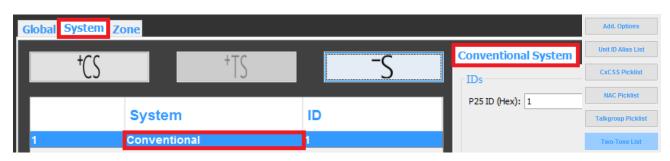
Talkgroup Picklist

🦈 Conven	🦻 Conventional System Talkgroup Picklist				×
	ID (DEC)			Add Row	
1	12345		D	elete Rov	v
2	64321				
3	211				

The Talkgroup Pick List allows the user to choose the Talkgroup for digital conventional receive and transmit channels (32 max).

Talk Group ID's range is from 1 to 65535.

Conventional System: Two Tone List



Two-Tone Call List

🥗 Conven	tional System Two-Tone Pick	list				_	
	Tone A (Hz)	Tone A Code	Tone B (Hz)	Tone B Code	Alias	Ad	Id Row
1	384.6	DZ	2094.5	203	Tone 1	Del	ete Row
2	832.5	127	582.1	HZ	Tone 2		

This list is populated with frequency pairings that will be used to alert the radio that specific voice traffic is being received.

The radio will idle, ignoring other voice traffic until it receives the proper two tone sequence. The radio will then awaken and receive specific voice traffic designated for the user. Two-Tone list entries are selected on the "Zone" tab.



Conventional System: DTMF List

Global System Zone							
	+00		+TC		-C	Conventional System	Talkgroup Picklist
	.(?)		.12		2	IDs	Two-Tone List
		0		10		P25 ID (Hex): 1	DTMF List
		System		U			MDC List
1		Conventio	onal	1			Five Tone List

DTMF List

AES C	Conventional System DTMF Picklist	_		×
	DTMF ID		Add Row elete Row	^
1	32			
2	A3			
3	5432			

Creates a list of Unit IDs which is used by the Voice Mute and ANI features (Channel General tab).



Conventional System: MDC List

Global System Z	one			I alkgroup Picklist
+^ (+T	-	-C Convention	Two-Tone List
	System		P25 ID (Hex):	Five-Tone List
1	Conventional	100 C		User Status

MDC List

🥗 Conventi	– 🗆 X		
	Group (DEC)	Unit (DEC)	Add Row Delete Row
1	1	3	
2	2	2	
3	3	1	

Creates a list of Unit IDs which is used by the ANI feature (Channel General tab).



Conventional System: Five-Tone List

Global System Zone						I WO-I ONE LIST
+^ C		+TC		-C	Conventional System	DTMF List
		1)		3	IDs	MDC List
	System		ID		P25 ID (Hex): 1	Five-Tone List
1 Conventional 1					User Status	

Five-Tone List

res Conve	entional System Five-Tone Picklist	- 0	×	
	Five Tone ID		Add Row	
1	1		Delete Rov	N
2	2			
3	3			

Creates a list of five-tone CCIR selcalls used by the Voice Mute and ANI features (Channel General tab). Each entry must contain five digits.

The	Add Row	and	Delete Row	buttons are used to enable/disable additional

Five-Tone ID entries (100 max).

Conventional System: User Status List

(Global System Zon	e					
	100		LTC			Conventional System	MDC List
	Ť		*15		-5	IDs	Five-Tone List
					_	P25 ID (Hex): 1	User Status
		System		ID			Text Messages
	1 0	onventional					Data/OTAD

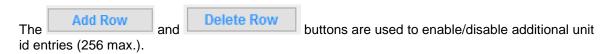
By populating specific status messages in this list, the user can send status updates to a specific unit id, talk group or a console using the User Status menu item or via function button.

AE	Convention	al System User Status		_		×
		Alias	ID		Add Row	
	1	Available	1	De	elete Row	1
	2	En Route	2			

Enter the status Label and its associated number.

The list members will now be available when the User Status feature is selected.

When sending a User Status Message, only the ID is sent. The receiving radio displays the Label associated with the ID number.



Conventional System: Text Messages

(Global System Zone				User Status
	+CS	+TS	-S	Conventional System	Text Messages
	Sys	stem	ID	P25 ID (Hex): 1	Data/OTAR
	1 Con	ventional			Phone

RES	Conventional System Text Messages		– 🗆 X
	Message	ID	Add Row
	5		Delete Row
			Options
			Receive Receive Broadcast
			Send Send Broadcast
			Use Unconfirmed Data

Message:

Enter text for predefined text messages.

ID:

Enter an ID associated with the message.

NOTE: When receiving a text message the radio looks for the message ID and displays the text associated with the ID.

The	Add Row	and	Delete Row	buttons are used to enable/disable additional Te	ext
	age entries (32 n				571

Text Message				
Receive	Receive Broadcast			
Send	Send Broadcast			
Use Unconfirmed Data				

These selections determine if a radio can receive and/or send text messages. To send or receive Broadcast messages, the corresponding Send or Receive Text Messages box must be checked.

C	Conventional System: Data/OTAR					
J	Global System Zone	e			FIVE-TONE LIST	
	+00	+TC	-	Conventional System	User Status	
	.(2	.12	2	IDs	Text Messages	
		System	ID	P25 ID (Hex): 1	Data/OTAR	
		onventional			Phone	

RES Conventional System Data /	- 🗆 X	
Max Tx Attempts:	4	OTAR Enable
Time Between Attempts (ms):	3000 ~	Tactical Rekey Enable
Rekey Request Timeout (s):	60 🗸	Data Registration
RX Security Level:	Basic \lor	🗌 Radio Inhibit
Tx Security Level:	Basic \lor	🖂 Radio Check
Queue Dwell Timer (s):	60 ~	Auto-Gen IP Address
Data Scan Hold Timer (s):	0.0 ~	
Data Scan Preamble Length (ms):	1000 ~	
System Target Address:	FFFFFC	
Subscriber IP Address:	0.0.0.0	

Max Tx Attempts:

Specifies the number of times the radio attempts to send confirmed data before the attempt is considered a failure and ends. (non-registration)

Time Between Attempts:

Specifies the time that the radio waits before attempting to resend a confirmed data packet.

OTAR Enable:

Select to enable OTAR (Over the Air Rekeying) of encryption keys on a conventional digital system.

Rekey Request Timeout:

When rekeying is initiated by the radio (Rekey Request message) this setting determines the maximum length of time the radio will wait for the Rekey Request procedure to complete. Times of 15 to 240 seconds can be programmed. Default is 60 seconds.

Rx Security Level:

Enhanced: The radio accepts only encrypted and authenticated KMM's from the KMF.

Basic: The radio accepts any KMM that is in a format allowed by the OTAR standard.

Tx Security Level:

<u>Enhanced</u> - All OTAR procedures originating from the radio are encrypted and authenticated. If they cannot be encrypted and authenticated, the radio does not send the KMM.

<u>Basic</u> - The radio always sends unencrypted KMM's if the OTAR standard allows them to be unencrypted and unauthenticated.

Tactical Rekey Enable:

Enables unit-to-unit tactical rekey operation for situations where over-the-air-rekeying is not available. *Must be used in conjunction with an authorized mobile data terminal and keyloader.*

Queue Dwell Timer:

Specifies the amount of time data can stay in the data output queue. Times are from 15 to 120 seconds.

Data Registration:

When enabled, the radio will attempt to data register when a conventional digital channel is selected.

Data Scan Hold Timer:

Sets the amount of time the radio will hold on a data channel after transmitting data. Only applicable during scan operation.

System Target Address:

Specifies the Radio Control Manager used as the target address of Inbound Signaling Packet (ISP) transmissions such as status and message events. The range is from 000000 to FFFFF. Default is FFFFFC.

Subscriber IP Address:

Specifies the IP Address to be used by the radio in Tactical OTAR operation.

Radio Inhibit:

If checked, allows the radio to be disabled over-the-air.

Enable Radio Check:

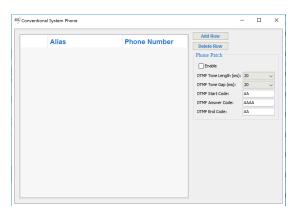
If enabled, this allows a console to send a query to a radio to check to see whether it is turned on and within range or not. If this option is disabled, the radio will not respond to radio check queries from the console.

Auto-Generate IP Address:

Auto-generates an IP Address for the radio. Used in Tactical OTAR operation and must be used in conjunction with the target radio's Autogenerate Destination IP feature.

Conventional System: Phone Global System Zone User Status +(C) +TS -S Conventional System Text Messages +(C) +TS -S IDs Data/OTAR System ID Phone Phone

Allows the use of a phone patch when connected to a subscriber network that supports this feature.



Enabled:

When checked, allows phone patch placement to be enabled for specified channels on the system.

DTMF Tone Length:

The length of time, in milliseconds, of each tone in the phone number.

DTMF Tone Gap:

The length of time, in milliseconds, between each tone in the phone number.

DTMF Start Tone:

A two-tone sequence that prepends every phone number

DTMF End Tone:

A two-tone sequence that appends every phone number.

DTMF Answer Tone:

A four-tone sequence the subscriber radio will send when answering a call.

Alias:

A label up to 16 characters used to reference the number

Phone Number:

A DTMF phone number up to 14 digits.

The Add Row and Delete Row buttons are used to add/delete phone number entries (100 max).

System - P25 Trunking

P25 Trunking systems can only be programmed by authorized personnel. A P25 Trunking System Key file is required to edit setting in a trunked system.

Global System Z	one	
+CS	+TS	-S
	System	ID
1 2	Conventional P25 Trunking	1 100

The **System - P25 Trunking** tab will display parameters for the highlighted P25 Trunking system. The "2" designation to the left of "P25 Trunking" denotes the second system in the file. Each system enabled in the file will be assigned an incrementing number. The [100] to the right of P25 Trunking is the System ID. This assists when making zone/channel assignments.

Each P25 Trunking system will have a general settings section and also the following sub pages: Add. Options, Channel IDs, Control Channels, Unit Calls, Talk Groups, Announcement Groups, Sites, Data/OTAR, Scan Lists, Preferred Site Lists, Sentinel IDs, User Status, Short Msg Update and Interconnect.

IDs Empro	
Lee DRC) 2000 dann: Yomal V Energeny Cal Seren Fect: 2001 V Energeny Cal Rado (rec) 2001 V Energeny Cal	Add. Options
None-VIII: 1 Internet Tel VIII: 1 Internet Tel VIII	Channel Ds
Table? Fabre? In Trans. The life In In Trans. The life In With Support the life In With Support the life In With Support the life In Up to provide In	Control Channels
Namination the left). If the second based of t	Biol Calls
The (1 - 107 web)	Talk Greepe
	Ann, Groups
	-
	Base CEBI
	Boan Lints
	Professor Sile Lists
	Sectors Do
	Deer Dates
	Size 1 Mag Sprinte
	Mexaniet

P25 Trunking - System Keys

A P25 Trunking System Key file is required to edit setting in a trunked system. System Keys are generated by RELM Wireless and can only be issued to authorized system coordinators.

Storing System Keys

For best results system key files should be stored in the same folder. System key files have a file extension of ".key".

Accessing System Keys

To load system keys select "System Keys" from the tools menu and choose one of the loading options.



Select the folder containing the keys and click Enter.

P25 Trunking - General

The **P25 Trunking - General** page contains parameters which apply to radio operation on the highlighted P25 Trunking system.



Some system lists may not be available depending on your system key. If RES does not recognize a system key for the desired system in the "Key" archive the "Critical

System Lists Locked" message will be displayed above the system tabs.

IDs

IDs		
Unit (DEC):	1000]
System (Hex):	100 ~]
WACN (Hex):	1000]
Home RFSS:	1]
Home Site:	1]
Reg. System ID:	0]

Unit ID:

The Unit ID identifies a particular radio on the system. Enter the desired unit id (decimal) in this box. Unit ID range is from 1 to 16777215.

System ID: The System ID designates the "Home" system to which the radio is restricted. The System ID (hex) can only be populated by reading the "system key" values. Use the drop down menu to view which system id's are available and select the desired system.

Home WACN:

The "Home WACN" ID identifies the "Wide Are Communications Network" to which the radio is restricted.

The WACN ID (hex) can only be populated by reading the "system key" values. It will automatically be populated when the System ID is selected.

Home RFSS:

The "Radio Frequency Subsystem" ID designates a zone with in the system. Enter the Home RFSS for the zone in which the radio will reside.

Home Site:

The "Home Site" designates a specific site within an RFSS. Enter the Home Site ID for the desired home site.

Registration System ID:

The system ID the radio uses in registration attempts when the System ID parameter is set to the wild-card value (0xFFF).

If programmed as 0, the radio will use the system ID it receives in over-the-air messages.

Time/Timers

Timer / Timers	
Tx Timeout Timer Enable	60 🗸
RFSS Response Time (ms):	225 🗸 🗸
ISP Retry Counter:	3 🗸 🗸
Fade Protect Timer (ms):	325 🔍
Inactivity Reaffiliation Timer	4 ~ ~
Slot Time:	6-Microslot $ \smallsetminus $
Call Alert Reset Time (sec):	None 🗸 🗸

Tx Timeout timer:

The Tx Timeout timer determines how long a radio can continuously transmit on the system before it must be dekeyed.

The radio will emit an alert tone and then stop transmitting.

The operator must release the PTT before transmissions will again be allowed.

The default time setting is 60 seconds.

RFSS Response Time:

The RFSS Response timer determines how long the radio will wait between affiliation attempts on an RFSS site.

The default setting is 775ms.

ISP Retry Counter:

The ISP Retry Counter determines the maximum number of ISP retries the radio will send when trying to gain system access. The default setting is 4.

Fade Protect Timer:

The Fade Protect timer determines the amount of time the radio will wait on a control/voice channel after synchronization is lost before attempting to re-sync.

This allows the radio to recover from momentary loss of sync without performing a full resynchronization on the control channel.

This timer will also affect loss of sync on the active control channel.

The radio will wait until this timer expires before attempting to locate a control channel with a stronger signal.

Inactivity Re-affiliation Timer:

The Inactivity Re-affiliation timer determines the amount of time that must expire before the radio will automatically attempt to re-affiliate on the system. The default time is 4 hours.

Slot Time:

The Slot Time is determined by the microSlot scheme used by the system. This setting is system specific. The default setting is 6microSlot.

Call Alert Reset Time:

Allows call alert to expire after the set time period

Full Spectrum Scan

Full Spectrum	i Sca	n
Enable Full	Spect	rum Scan
Scan Time (s):	5	\sim

When enabled, Full Spectrum Scan allows the radio to search its specific band for system control channels if none can be found via its Dynamic Site Array or its programmed Control Channel list.

Scan Time:

This setting determines how often the radio will leave an active spectrum scan to check the radio control channel list to see if one of the programmed channels can be accessed. **P25 Trunking Emergency**

Alarm: Normal Emergency Call Retry Counter: 8 Emergency Call Cancel Hot Mic Tx Period: 10 Emergency Hot Mic Tone on Received Emergency Call

This section details the P25 Trunking emergency settings. Upon activating an emergency, these settings will determine how the radio will report an emergency situation to the designated personnel.

Emergency Alarm:

This check box enables Emergency Alarm. This feature is special signalling sent on a trunking control channel when the emergency button is pressed.

This alarm will inform a console and other radio users that an emergency situation is occurring.

Retry Counter:

Determines the number of times the radio attempts to send the emergency bit when an acknowledgement has not been received from the console.

Tone on Received Emergency Call:

With this feature active, a tone will sound when an emergency call is received.

Emergency Call:

This check box enables Emergency Call.

When an Emergency call is declared, the radio will display "Emergency" and be assigned a voice channel for the emergency traffic.

The system will designate and hold this voice channel for the duration of the emergency call. The system won't release this emergency channel until the Emergency Call system hang timer has expired.

Emergency Call Cancel:

Enabling this check box allows the radio to cancel an Emergency Call. (Harris systems)

Emergency Hot Mic:

This check box enables the Emergency Hot Mic feature.

When an Emergency Call has been initiated with the Hot Mic active, the radio will automatically transmit the emergency call for the duration of the Hot Mic Tx Period and then de-key.

Hot Mic Tx Period:

This setting determines the length of time the radio will automatically transmit an emergency call if Emergency Hot Mic is enabled.

Failsoft

Failsoft		
Inactivity Time:	30 🗸 🗌 Failsoft By Personality	
Key:	1 v Emergency Blocked	

Failsoft is a condition where the site on which the radio is operating suffers a control channel failure. When this occurs the site will revert to basic repeater functionality with no overlying control. The repeaters will send out a "Failsoft Tone", which the radios will detect. At this point the radios will revert to using their pre-assigned failsoft frequency pair.

This allows limited communication until the controller is brought back on line.

Inactivity Timer:

This setting will determine how often the radio will initiate a control channel search in an effort to find a recently reactivated control channel, or to find an active wide area site that it might move too.

Failsoft Key:

Sets the encryption key SLN location to use during Failsoft.

Failsoft By Personality:

Scans the last active control channel and the control channel list for failsoft activity. Once detected, the radio will use the active failsoft channel.

Emergency Blocked:

With this feature active, no emergency mode communication will be allowed when the radio is in failsoft mode.

Man Down Settings

Disabled \lor
5
1

Trigger:

<u>Horizontal</u> - Indicates that Emergency Mode will be triggered after the radio has been horizontal for the specified interval.

<u>Horizontal + Motionless</u> - Indicates that Emergency Mode will be triggered after the radio has been horizontal and motionless for the specified interval.

Warning Timer:

Countdown to the warning beep. Indicates the length of time, after meeting the trigger condition, before the warning timer begins beeping.

Timer:

Countdown to Emergency Mode. Indicates the length of time that the warning beep sounds. Once these seconds are counted down, Emergency Mode is activated.

Additional Options

Additional Trunking Syste	- 🗆 ×		
Transmit Power:	Selectable	~	✓ Talk Permit Tone
Digital Rx Modulation Type:	CQPSK	\sim	Site Trunking Operation
PTT Warning Tone Start Time:	575	\sim	PTT Warning Tone
Patch Key:	1	~	Force System Reset
Coverage Type:	Wide Area	~	Radio Monitor
Voice Mute Reset Mode:	Manual	\sim	Enhanced Roaming
Voice Mute Reset Time (s):	0	\sim	Ultra-narrowband Channel Filter
Conversation Type:	PTT ID	\sim	Use System ID For Sites
Transmit Time:	15	\sim	RX Only
Radio Accountability Tone:			
Dynamic Regrouping			
Selector Locked	Enabled		
Group ID: 655	35		
Zone: (1)	ZONE 1 $ \smallsetminus $		
Channel:	\sim		
Channel Encryption: Sele			
Dynamic Regroup Key: 1	\sim		

Transmit Power:

The Transmit Power feature determines what power level the radio is allowed to use when transmitting.

The options for this feature are:

<u>Selectable</u>: The transmit power level can be adjusted using the menu or a function button.

Fixed High: The radio will always transmit using its highest power level.

Fixed Low: the radio will always transmit using its lowest power level.

<u>Automatic</u>: The radio will sense the signal level from its current site and will automatically lower or raise its transmit power level based on this reading.

Signal levels above the signal level threshold will cause the radio to transmit using its low power level.

Signal levels that fall below this threshold will cause the radio to transmit using its high power level.

*** Automatic Setting: Sudden signal level shifts may occur (such as entering buildings) which may cause momentary system access issues until the radio re-samples the signal levels and adjusts the power level accordingly. ***

Digital Rx Modulation:

The Rx Modulation feature allows the radio to adapt its modulation scheme to specific system types.

The options for this feature are: C4FM (non-simulcast) CQPSK (Simulcast) or Both.

PTT Warning Tone Start Time:

The PTT Warning tone timer determines how long the radio will wait before emitting the Talk Prohibit tone

The default setting is 575ms.

Patch Key:

The encryption key location used when the radio is involved in a Group Regroup call. (patch call)

Coverage Type:

Dictates the radio's roaming capabilities.

Wide Area - The radio will roam system wide, across multiple sites.

<u>Single Site</u> - The radio will only be able to access a single site. The "Home Site" in the "ID" section of the P25 Trunking tab determines the allowed site.

Voice Mute Reset Mode:

Manual - Once voice mute has been triggered, it will stay disabled until the user manually enables it.

<u>Automatic</u> - Once voice mute has been triggered, the voice mute reset timer determines how long until voice mute is automatically re-enabled.

<u>Automatic with Carrier</u> - Once voice mute has been triggered, carrier must disappear for the duration of the voice mute reset timer before voice mute is automatically re-enabled. If carrier returns before the timer expires, the timer will be reset.

Voice Mute Reset Time:

Timer used in conjunction with the Automatic and Automatic with Carrier Voice Mute Reset Modes.

Conversation Type:

<u>Message</u> - During hang time, a radio may key up directly on the traffic channel without returning to the control channel first.

<u>PTT-ID</u> - During hang time to key up on the active call, the radio must first return to the control channel to register its PTT-ID and then can begin transmitting audio.

<u>Transmission</u> - There is no hang time. Once a radio dekeys from its active call, the system deallocates the traffic channel. All PTT attempts must request a new channel grant.

Transmit Time:

The amount of time the unit will transmit after receiving a radio monitor message from the system console.

Radio Accountability Tone:

Allows the user to transmit a pre-programmed set of DTMF digits by pressing and holding the "RAT" soft-key. The user can program up to 10 DTMF digits.

Talk Permit Tone:

Enabling the Talk Permit Tone will cause an alert tone to sound when the system has allocated a voice channel grant.

This allows the operator to know when to begin speaking. Its default condition is on.

Site Trunking Operation:

Enabling the Site Trunking check box allows the radio to continue to operate on its current site if the RFSS (zone) controller fails, which prevents wide are communications.

All transmission will be limited to the current site and communications will not be passed to other sites.

If this feature is not enabled the radio will attempt to find a site that still has wide are coverage. If unsuccessful, the radio will enter an Out of Range condition until the zone controller has been restored and wide are communications are once again allowed.

PTT Warning Tone:

This tone warns the user that a PTT request to the system is being processed and the user should dekey the radio.

Force System Restart:

Forces the radio to refresh the system information if switching between systems with the same System ID/WACN.

Radio Monitor:

Allows a system console to remotely enable transmit on this unit.

Enhanced Roaming:

Gives the radio the ability to switch more easily between strong sites. It adds additional thresholds so that the radio can react to small signal level changes on strong sites.

Ultra-narrowband Channel Filter:

Enabled for systems with high adjacent channel interference environments such as simulcast systems. Disabled uses a 7.8khz intermediate frequency filter. Enabled uses a 5.76khz filter.

Use System ID For Sites:

When enabled, it allows users the ability to define sites by a system ID as well as the traditional site ID.

Rx Only:

Enables a unit to listen to traffic on the corresponding trunking system, but the unit will not be allowed to transmit.

Dynamic Regrouping:

Allows Dynamic Regrouping in the selected system.

Dynamic Regrouping Channel Encryption:

These encryption settings take precedence over talk group level encryption settings or are used to set encryption parameters if regrouped to a talk group that is not programmed in the talk group list.

Dynamic Regrouping Key:

The encryption key location used when the radio is involved in a Dynamic Regrouping call.

Unit Call Usage:

Enabling the Unit Call Usage feature will allow the operator to make Unit-to-Unit calls on the system, based on the selected usage settings. The options for this feature are:

Disabled - which prevents the user from initiating or receiving any unit calls.

Response Only - which only allows the user to respond to incoming unit calls.

List Only - which allows the user to initiate unit calls only to members or the programmed unit call list.

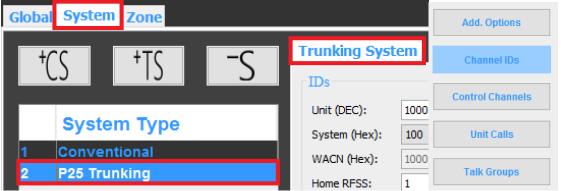
<u>Unlimited</u> - which allows the operator to use direct id entry or the id list to initiate and receive unit calls.

Unit Call Type:

The Unit Call Type selection specifies the type of unit call the radio is allowed to initiate. This is usually dependent on system type/programming.

P25 Trunking - Channel IDs

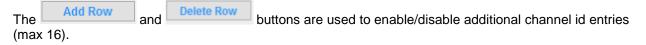
The **P25 Trunking - Channel ID** page contains channel parameters for the highlighted P25 Trunking system.



Channel ID Table

/IE	P25 Trunking	Channel IDs						_		Х
		Bandwidth(KHz)	Tx Offset +/-	Tx Offset(MHz)	Spacing(KHz)	Base Freq(MHz)	System Type		Add Row Delete Roy	
	1	12.5	-(Minus)	45.000	6.25	138.00000	TDMA			
	2	12.5	+(Plus)	30.000	6.25	136.00000	FDMA			

The parameters within this table control how the radio decodes Voice and Control channel frequency identifiers provided over the air by the system.



Bandwidth (KHz):

Specifies the channel bandwidth in KHz.

Tx Offset (+/-):

Specifies whether the Tx frequency is offset positively or negatively from the base frequency.

Tx Offset (MHz):

Offset from the RX frequency used to derive the TX frequency.

Spacing (KHz):

Specifies the channel spacing in KHz.

Base Frequency (MHz):

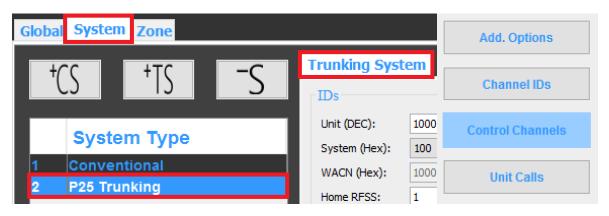
Specifies the base frequency used to determine all channel calculations for this channel split.

System Type:

Details the traffic channel protocol the system uses on channels defined by the table entry. FDMA = Frequency Division Multiple Access. TDMA = Time Division Multiple Access. The radio's ability to use the designated protocol is radio option dependent. *** Channel ID table parameters must match system programming. Contact the System Administrator for the correct Channel ID table information. ***

P25 Trunking - Control Channels

The **P25 Trunking - Control Channels** page is used to designate control channels on the highlighted P25 Trunking system.



Control Channel Table

925 Tru	inking Control Channels		—		×
	Rx Freq (MHz)	Tx Freq (MHz)		Add Roy	
1	154.00000	136.00000		Delete IN	
2	139.00000	162.00000			

This table is used as a reference by the radio to find control channels upon power up.

Rx Frequency (MHz):

The receive frequency of the control channel pair.

Tx Frequency (MHz):

The transmit frequency of the control channel pair.

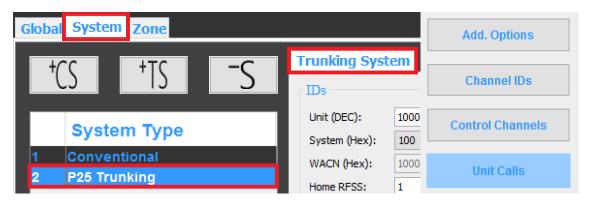
The Add Row and Delete Row buttons are used to enable/disable additional control

channel entries (max 256).

*** The control channel frequency pairs in this chart are shown from the subscriber viewpoint. When referencing control channel frequencies from the system view point, the transmit and receive frequencies are inverted. ***

P25 Trunking - Unit Calls

The **P25 Trunking - Unit Calls** page contains parameters for allowed Unit calls in the highlighted P25 Trunking system.



Unit Call Table

RES P25 Trunking Unit Calls	_	X

Alias	ID (DEC)	Add Row			
Allas			Delete Row		
		Key:	1	\sim	
		Usage:	Disable	\sim	
		Type:	With Availability Check	\sim	
		Encryption:	Selectable	\sim	

Entries in this table will be assigned to the Unit Call list and be accessible to the user via the Unit Call/Call Alert menu or function buttons.

Rx ID and Unit Calls received from id's populated on this table will then be displayed as the assigned Label instead of the actual unit id number.

The Unit Call Key selects the SLN used to encrypt Unit-to-Unit calls.

Add Row **Delete Row** The and

buttons are used to enable/disable additional Unit ID

entries (max 1024).

P25 Trunking - Talk Groups

The **P25 Trunking - Talk Groups** page contains talk group parameters for the highlighted P25 Trunking system.

Globa	System	Zone				Add. Options
+	\sim	+TC	-C	Trunking Syst	em	Channel IDs
	-J	12	3	IDs		Control Channels
	Curata			Unit (DEC):	1000	
	Syster	m Type		System (Hex):	100	Unit Calls
1	Convent	tional		WACN (Hex):	1000	
2	P25 Trur	iking		Home RFSS:	1	Talk Groups

Talk Group Table

	Alias	ID (D	Receive Only	Key	Encrypt	Preferred Sit	Failsoft Ena	Failsoft Rx	Failsoft Tx
1	Alias	1	Yes	1	Clear	None	No	136.00000	136.00000
2	Alias	1	Yes		Clear	None	No	136.00000	136.00000
3	Alias	1	Yes		Clear	None	No	136.00000	136.00000

Talk groups enabled for assignment to specific channel locations are entered in this table. Once populated, these talk groups will appear in the Talk Group drop down menu on each trunking channel page.

Category 1-4: Partitioned talk groups for ease of access while programming.

Alias: The Label assigned to the specific talk group id.

ID: Actual talk group id (decimal).

Receive Only: Allows talk group to be set to receive only.

Key: The SLN location of the encryption key assigned to this talk group.

Encryption Strapping: Determines the encryption strapping assigned to this talk group. The options are Clear, Secure or Selectable via the menu or a function button.

Preferred Site: Allows a site preference to be assigned to this talk group from the "Sites" table.

Failsoft Enabled: The radio will be able to operate under a system Failsoft condition when enabled. <u>Failsoft Rx Frequency</u>: The receive frequency used in failsoft mode. <u>Failsoft Tx Frequency</u>: The transmit frequency used in failsoft mode.

The Add Row and



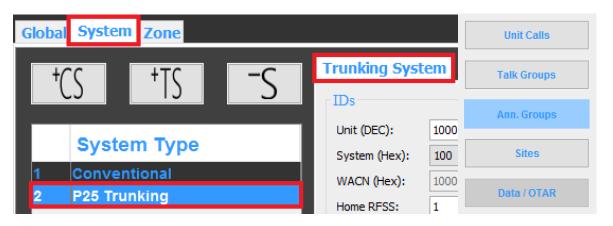
buttons are used to enable/disable additional talk group

entries (max 8192).

Show All: When active, all talk groups (across categories) are displayed regardless of which category is selected.

P25 Trunking - Announcement Groups

The **P25 Trunking - Announcement Groups** tab is used to edit announcement group information for the highlighted P25 Trunking system.



Announcement Group Table

<i>RES</i> P	B ^P P25 Trunking Ann. Groups										×
							S	elected Ann. Group's TG List:			
	Alias	ID	Re	Key	Encrpytion	Pr		TalkGroup ID (DEC)		Add Row	_
								Alias (1)		Delete Ro	w
								Alias (1) Alias (1)			

Announcement groups enabled for assignment to specific channel locations are entered in this table.

Once populated, these announcement groups will appear in the Announcement Group drop down menu on each trunking channel page.

Alias:

The Label assigned to a specific announcement group id.

ID:

Actual announcement group id (decimal).

Receive Only:

Enables the Announcement Group as receive only.

Key:

The SLN location of the encryption key assigned to this announcement group.

Encryption Strapping:

Determines the encryption strapping assigned to this announcement group. Options are: Clear, Secure or Selectable via the menu or a function button.

Preferred Site:

Allows a site preference to be assigned to this announcement group from the "Site" table.

Selected Ann. Group TG List:

This list allows the selection of specific talk groups to be designated as sub-members of this announcement group.

The Add Row and Delete Row buttons are used to enable/disable additional

announcement group entries (max 8192).

P25 Trunking - Sites

The **P25 Trunking - Sites** tab contains repeater site parameters for the highlighted P25 Trunking system.

Globa	Syster	n Zone				Talk Groups
+(<u>``</u>	+TC	- C	Trunking Syst	tem	Ann. Groups
	20	13	3	IDs		Sites
	Quest			Unit (DEC):	1000	
	Syste	em Type		System (Hex):	100	Data / OTAR
1	Conve	ntional		WACN (Hex):	1000	
2	P25 Tru	inking		Home RFSS:	1	Scan Lists

Site Table

RE	P25 Trun	king Sites			- 🗆 X
		Alias	RFSS ID	Site ID	Add Row Delete Row
	1	Douglas	2	2	Delete Row
	2	Johnson	5	5	

Use System ID for Sites:

When active, the radio uses the System ID along with the RFSS and Site ID when making roaming decisions.

Sites entered into this table can be assigned Labels and can also be assigned as preferred sites to talk and announcement groups.

Site Labels will also be visible when making selections from the Site Display, Site Search and Site Lock menu or function button items.

Alias:

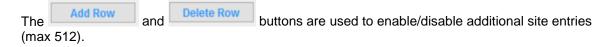
The Label assigned to a specific site id.

RFSS ID:

The RFSS (zone) to which the specified site is assigned.

Site ID:

Actual site id.



P25 Trunking - Data/OTAR

The **P25 Trunking - Data/OTAR** page is used to set data and over-the-air-rekeying on the highlighted P25 Trunking system.

Global	System	Zone				Ann. Groups
+(<u> </u>	+TC -C	Trunking System		Sites	
	2)	12	2	IDs		
	System Type 1 Conventional 2 P25 Trunking		Unit (DEC):	1000	Data / OTAR	
			System (Hex):	100	Scan Lists	
1			WACN (Hex): 1000		Preferred Site Lists	
2	P25 Iru	пкіпд		Home RFSS:	1	Preferreu Sile Lists

Confirmed Data

Confirmed Data	
Max Tx Attempts:	4 ~
Time Between Attempts (ms)	: 3000 🗸

Max Tx Attempts:

Specifies the number of times the radio attempts to send confirmed data before the attempt is considered a failure and ends. (non-registration)

Time Between Attempts:

Specifies the time that the radio waits before attempting to resend a confirmed data packet.

<u>OTAR</u>

OTAR		
OTAR Enable		
OTAR Deregistration		
Rekey Request Timeout (sec):	60	\sim
Rx Security Level:	Basic	\sim
Tx Security Level:	Basic	\sim

OTAR Enable:

Select to enable OTAR (Over the Air Rekeying) of encryption keys on the P25 Trunking system.

OTAR Deregistration:

When enabled the radio will deregister when switching from one system to another.

Rekey Request Timeout:

When rekeying is initiated by the radio (Rekey Request message) this setting determines the maximum length of time the radio will wait for the Rekey Request procedure to complete. Times of 15 to 240 seconds can be programmed. Default is 60 seconds.

Rx Security Level:

Set the receive security setting for OTAR operations.

Enhanced: The radio accepts only encrypted and authenticated KMM's from the KMF.

Basic: The radio accepts any KMM that is in a format allowed by the OTAR standard.

Tx Security Level:

Set the transmit security setting for OTAR operations.

Enhanced: All OTAR procedures originating from the radio are encrypted and authenticated.

If they cannot be encrypted and authenticated, the radio does not send the KMM.

Basic: The radio always sends unencrypted KMM's if the OTAR standard allows them to be unencrypted and unauthenticated.

Network Settings

Network	
KMF IP Address:	0.0.0.0
KMF UDP Port:	64414
Subscriber UDP Port:	64414

KMF IP Address:

The KMF's IP address.

KMF UDP Port:

The UDP port the radio uses when it sends KMM's to the KMF. The default value is 64414.

Subscriber UDP Port:

The UDP port the radio uses for OTAR. The default value is 64414.

Location Services

Location Services							
Subscriber UDP Port:	49198		Services Enabled				
Server IP Address:	0.0.	0.0					

Services Enabled:

Select to enable location services on the P25 Trunking system.

Server IP Address:

The IP Address of the Location Service server.

Services UDP Port:

The UDP Port the radio uses when it contacts the Location Service.

Text Messaging:

Text Messaging		
Messsaging Enabled	Messaging UDP Port:	49168

Messaging Enabled:

Enables text messaging for the radio. **Messaging UDP Port:** Sets the specific UDP port to use for the messaging.

Other Data Settings

Other			
Voice Interrupts Data	SNDCP Registration		
OTAP Enabled	Allow Keyset Selection		
Force Mutual Authentication	Persistent Data Registration		
Queue Dwell Timer (s):	60 🗸		
SNDCP Version:	0 ~		
Registration Type:	Dynamic 🧹		
Authentication Timeout (s):	30 🗸		
Voice Interrupts Data Holdoff Timer (s):	0.0 🗸		
Other			
	. 0 . 0		

Voice Interrupts Data:

When enabled, a voice call will interrupt the data activity, including OTAR.

Voice Interrupts Data Holdoff Timer:

Determines the amount of time the radio will remain on the voice channel before attempting to return to the data channel after voice traffic had interrupted an active data event.

Queue Dwell Timer:

Specifies the amount of time data can stay in the SNDCP output queue. Settings are from 15 to 120 seconds. Default setting is 60 seconds.

SNDCP Registration:

If enabled, the radio will attempt to activate an SNCDP context after it registers with the system.

SNDCP Version:

The SNDCP protocol version used by the radio when communicating with the system.

Registration Type:

Selects what type of IP addressing the radio will use.

Dynamic - If the system will provide the subscriber IP address if the radio requests dynamic registration.

Static - If the radio subscriber has been configured with a static IP address.

Subscriber IP Address:

Enter the radio's static IP address here.

OTAP Enabled:

Enables over-the-air radio programming.

OTAP UDP Port:

The UDP port the radio uses for OTAP. The default value is 64414.

Allow Keyset Selection:

Allow radio use to select encryption keysets.

Authentication Timeout:

The period of time allowed before the subscriber unit determines that the authentication process (if enabled) has failed.

Force Mutual Authentication:

Select if the infrastructure supports mutual authentication.

P25 Trunking - Scan Lists

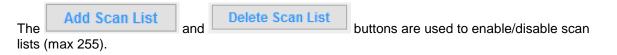
The **P25 Trunking - Scan Lists** page is used to setup scan lists for the highlighted P25 Trunking system.

Globa	Systen	n Zone				Sites
+	\sim	+TC	- C	Trunking System		Data / OTAR
	6	12	2	IDs		Scan Lists
	Quetern Truce			Unit (DEC):	1000	
	System Type		System (Hex):	100	Preferred Site Lists	
1		Conventional		WACN (Hex):	1000	
2	P25 Trunking		Home RFSS:	1	Sentinel IDs	

Scan Lists

Scan List 4 ∨ Scan List 1	Add Scan List	Delete Scan List		
Scan List 2	Zone	Char		
Scan List 3 Scan List 4	Lone	Unan		

This list displays the all active scan lists.



General Settings

Scan Options						
Scan Hold Time (s): 0.0 $$						
Beep On Pri	i Rx					
Per List Options						
Priority Type:	Programmed	\sim				
Talkback Type:	Talkback Type: Selected Channel					
Priority 1: None						
Priority 2:	None	\sim				

Scan Hold Time:

This setting determines the amount of time the radio will wait on the active voice channel after ending a call before returning to control channel.

This time is cumulative to any programmed "system" hang time.

Beep on Pri Rx:

Indicates that a beep will sound when Priority 1 channel becomes active.

Priority Type:

This setting determines the Priority setting of the selected scan list. There are three options.

Priority: This scan list will allow designation of up to two priority talk group/channel locations.

<u>Priority 1 on Selected:</u> This scan list will use the currently selected talk group/channel location as the Priority 1 selection. A "fixed" Priority 2 talk group/channel location can also be designated

<u>Non Priority:</u> A scan list designated as Non Priority will have no priority talk group/channel locations.

Talk Back Type:

The Talk Back Type setting will determine how the radio response to voice traffic.

<u>Selected:</u> This setting forces the radio to always respond to active scan traffic on its selected talk group/channel location.

<u>Active:</u> This setting allows the radio to respond to scan traffic on the active talk group/channel location.

Channel List

A	🦻 P25 Trunking Scan Lists				_		×
	Scan List 4 V Add Sca	an List Delete Sca	n List				
		Zone	Channel		1 Row		
	1	(1) ZONE 1	(2) CHAN 0002	Dele	te Row		
	2	(1) ZONE 1	(2) CHAN 0002	Scan Hold Time (s):	0.0		\sim
	3	(1) ZONE 1	(2) CHAN 0002	Priority Type:	Program	med	\sim
				Talkback Type:	Selected	Channe	el 🧹
				Beep On Pri Rx			
				Priority 1:	None		~
				Priority 2:			\sim

Zone:

Select the desired Zone from its drop down menu. Only Zones with active P25 channel locations will appear in the Zone list.

Channel:

Select the desired channel location from its drop down menu. Only P25 Trunking designated channels will appear in the Channel list.

Priority Channels Selection:

Only one channel each can be designated as Priority 1 and Priority 2 channels.

The Add Row and Delete Row buttons are used to add/delete the scan list channel

entries (max 16).

P25 Trunking - Preferred Site Lists

The **P25 Trunking - Preferred Site Lists** page is used to setup preferred site lists for the highlighted P25 Trunking system.



Preferred Sites Lists

Preferred Sites List 5 v Preferred Sites List 1	Add Site List	Delete Site List
Preferred Sites List 2	RFSS ID	Site ID S
Preferred Sites List 3	KF33 ID	Site ID S
Preferred Sites List 4		
Preferred Sites List 5		

This list displays the all active preferred sites lists.

The	Add Site List	and	Delete Site List	buttons are used to enable/disable
prefe	erred sites lists (max	255).		

Site Table

🦻 P25 Trunking Prefe	erred Site Lists			- 0	>
Preferred Sites List 5	✓ Add Site List	Delete Site	List		
	RFSS ID	Site ID	Site Prefe	Add Row	
1	5	5	Preferred	Delete Rov	V
2	3	3	Always		
3			Least		

RFSS ID:

The RFSS (zone) to which the specified site is assigned.

Site ID:

Actual site id.

Site Preference:

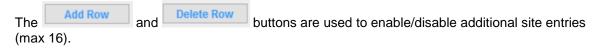
Details the roaming rank weighting added or subtracted to particular site to affect the radio's us of that site.

None - No additional weighting is added/subtracted to the site.

Least - Rank weighting is subtracted from this site so that other sites are ranked above it for use.

<u>Preferred</u> - Substantial rank weighting is added to the site so that it is preferred for use above all other sites.

<u>Always</u> - The rank weighting added is so high that the radio will always use this site unless it is unavailable.



P25 Trunking - Sentinel IDs

The **P25 Trunking - Sentinel IDs** page is used to setup Sentinel IDs for the highlighted P25 Trunking system.

Globa	Systen	n Zone				Scan Lists
+	\sim	+TC	-C	Trunking Syst	em	Preferred Site Lists
	CJ	13	2	IDs		Sentinel IDs
	Cuete	The second		Unit (DEC):	1000	
	Syste	em Type		System (Hex):	100	User Status
1 Conventional			WACN (Hex):	1000		
2 P25 Trunking			Home RFSS:	1	Short Msg Update	

Sentinel ID Table

🥗 P25 Trunking Se	ntinel IDs		– 🗆 X
	ID (HEX)	DTMF ID	Add Row Delete Row
1	1	1234	
2 3	2 3	4321 5421	_

Sentinel operation allows the radio to perform certain functions after receiving a call alert to a programmed unit ID.

ID:

The unit ID at which the radio will monitor for call alerts.

DTMF ID:

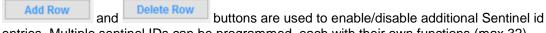
Upon receiving a call alert to the corresponding unit ID the radio will immediately transmit these DTMF digits.

Acc Output:

Used with the mobile I/O binary mode. Upon receiving a call alert to the corresponding unit ID the radio will enable the accessory output lines corresponding to the programmed accessory output value.

DTMF Output:

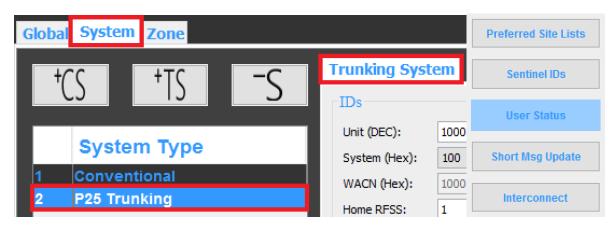
Whether or not the mobile unit will send the DTMF digits after receiving a call alert to the corresponding unit ID.



entries. Multiple sentinel IDs can be programmed, each with their own functions (max 32).

P25 Trunking - User Status

The **P25 Trunking - User Status** page is used to setup user statuses for the highlighted P25 Trunking system.



User Status ID Table

🦈 P25 Trunking User Status			_		×
Single Destination Destination ID (Dec/Hex)					
		Add Ro			
1	Douglas	2		Delete R	ow
2	Johnson	5			

Status updates are short numeric identifiers with corresponding status aliases that represent the status of the source unit.

Alias, ID:

The status alias and its corresponding identifier. When a radio receives a status update with this ID the alias will be displayed on the screen.

The	Add Row	and	buttons are used to enable/disable additional Sentinel id
entries	s. Up to 255 ali	iases can be	programmed into the radio (max 255).

Options:

Single Destination	
Destination ID (Dec/Hex)	16777212

Single Destination:

When enabled the user does not specify the destination unit on-screen. The status update is automatically sent to the corresponding destination ID.

Destination ID:

The P25 destination ID to which status updates can be automatically sent to.

P25 Trunking - Short Msg Update

The **P25 Trunking - Short Msg Update** page is used to setup short message updates for the highlighted P25 Trunking system.

Globa	System	Zone			_	Preferred Site Lists
+	\sim	+TC	-c	Trunking Sys	tem	Sentinel IDs
	6	1)	3	IDs		User Status
	Curata			Unit (DEC):	1000	
	Syste	т Туре		System (Hex):	100	Short Msg Update
1 Conventional		WACN (Hex):	1000			
2	P25 Tru	nking		Home RFSS:	1	Interconnect

Short Msg Update Table

🥗 P25 Trunking Short Messa	🦻 P25 Trunking Short Message Update					
Single Destination	16777212					
	Alias	ID (HEX)		Add Row		
1	Alias	1		elete Ro	w	
2	Alias	1				

Message updates, similar to status updates, are short numeric identifiers with corresponding message aliases that represent short forms of text communications.

Alias, ID:

The message alias and its corresponding identifier. When a radio receives a message update with this ID the alias will be displayed on the screen.

The Add Row and Delete Row buttons are used to enable/disable additional Sentinel id entries. Up to 255 aliases can be programmed into the radio (max 255).

Options:

Single Destination	
Destination ID (Dec/Hex)	16777212

Single Destination:

When enabled, the user does not specify the destination unit on-screen. The message update is automatically sent to the corresponding destination ID.

Destination ID:

The P25 destination ID to which message updates can be automatically sent to.

P25 Trunking - Interconnect

The **P25 Trunking - Interconnect** page is used to setup the trunking interconnect feature for the highlighted P25 Trunking system.

Globa	System Zone			Preferred Site Lists
+		Trunking Syst	em	Sentinel IDs
	2 <u>1</u> 2 2	IDs		User Status
	Sustan Tuna	Unit (DEC):	1000	
	System Type	System (Hex):	100	Short Msg Update
1	Conventional	WACN (Hex):	1000	
2	P25 Trunking	Home RFSS:	1	Interconnect

Interco	nnect Short Form Table		Add Row	Interconne	ect Long Form Table		Add Row
	Alias	PSTN	Delete Row		Alias	Digits	Delete Row
1	Jackie	1		1	Jenny	3218675309	Interconnect Options
2	Wilson	2		2	Billy	8007050156	Interconnect Usage:
							Disabled
							Interconnect Key:
							1
							Interconnect Active Dial:
							Live
							Interconnect Call Encryption Set
							Selectable

Interconnect Short Form Table

The short form table is similar to a speed dial of sorts. Sending a PSTN (Public Switched Telephone Network) value to the system will cause it to dial a phone number attached to that value.

Interconnect Long Form Table

The long form table is more straight forward. It contains a list of phone numbers. Users can send these phone numbers to the system to call that phone number.

Interconnect Options

ons
\sim
\sim
Dial:
\sim

Usage:

The interconnect usage can be Disabled, Answer Only, Short List Only, Lists Only or Unlimited.

Key:

The interconnect key from 1-64.

Active Dial:

The interconnect active dial can be either Live of Buffered.

Max List Entries

List Sizes

Maximum List Sizes

Each list has a maximum number of entries that may be added.

Convention System Lists

List Name	Max Entries
User ID Alias List	512
CxCSS Picklist	256
NAC Picklist	32
Talkgroup PickList	32
Two-Tone List	100
DTMF List	100
MDC List	512
Five-Tone List	100
User Status	256
Text Messages	32
Phone	100

Trunking System Lists

List Name	Max Entries
Channel IDs	16
Control Channels	256
Unit Calls	1024
Talk Groups	8192
Announcement Groups	8192
Sites	512
Scan Lists	255
Scan List Entry	16
Preferred Site Lists	255
Preferred Site List Entry	16
Sentinel IDs	32
User Status	255
Short Message Update	255

Zones & Channels

The Zone tab allows the programming of specific zones and channels.



The drop-down menu contains active zones. Zones can be added and deleted from this list by clicking the +Z button to add or the -Z button to delete.

Channel View

Channels may be viewed and edited in Single Channel or Multi-Channel viewing mode. The Channel View can be changed under **View -> Channel View Selection**.

View Help	
Editor View Selection	>
Channel View Selection	on > • Single Channel View
Color Theme Selection	on > Multi-Channel View
View Style Selection	>
Font Size	> Settings Zone Settings

Multi-Channel View

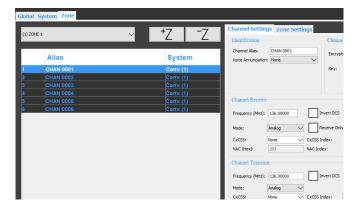
In Multi-Channel View, Zone Settings appear at the top of the window. Each channel is displayed as a row in the channels table.

Global Sy	ystem Multi-	Channel											
+7	-7		Zor	ne Priority		Zone Vote Scan			Zone A	dditional Optio	ns		
Z	-Z			-1 Off	\sim	Initial Vote Carri	er Only	Tx On Last Voted Channel		Allow Cxcss Selec	ton On All Ch	nnels	
(1) ZONE 1			✓ Pri	-2 Off	\sim	Fast Vote		Automatic Vote Scan		Xisable Keypad Pr	oorammino		
Zone Iden				Transmit o	n Priority 1	- ascrote		Automatic vote Scarr		изаше неурай н	og anning		
Zone Alias:	ZONE 1					Vote Carrier Onl	y .	Post-Tx Revote		Command Zone	Zone 8	ican	
100	+TC	-	10			Display Selected	Channel Only		Incomin	g Clone:	Accept	\sim	
ŤĹĹ	+TC	-C T					,		Data Sc	an Channel:	None	\sim	
	System	Label	Rx Freq	Rx Mode	Rx CG	Rx CG Index	Rx NAC	Rx NAC Index	Rx CG Invert	Tx Freq	Tx Mode	Tx CG	тх
	1 Conv (1)	CHAN 00	136.00000	Analog	None	None	293	None		136.00000	Analog	None	Non
				Analog							Analog		Non
													Non
													Non
													Non
													Non

Single Channel View

In Single Channel View, Zone settings are viewed by selecting the desired zone from the drop-down menu and clicking the Zone Settings tab.

Individual channels are viewed by selecting the desired zone from the drop-down menu and the specific channel from the left window.



Multi-Channel View

Channel View

Channels may be viewed and edited in Single Channel or Multi-Channel viewing mode. The Channel View can be changed under **View -> Channel View Selection**.

View Help Editor View Selection > Channel View Selection > Color Theme Selection > View Style Selection > Font Size > Settings Zone Settings Line Channel Service Settings

Multi-Channel View

In Multi-Channel View, Zone Settings appear at the top of the window. Each channel is displayed as a row in the channels table.

Global System Multi-Channel													
(1) ZONE 1 Zone Identif Zone Alias: 2	-Z		Pri	Priority Off Off Transmit of	V N Priority 1	Zone Vote Scan Initial Vote Carrie Fast Vote Vote Carrier Only Display Selected		Tx On Last Voted Channel Automatic Vote Scan Post-Tx Revote		Iditional Optio llow Cxcss Selec isable Keypad Pr ommand Zone I Clone: In Channel:	tion On All Cha		
	System	Label	Rx Freq	Rx Mode	Rx CG	Rx CG Index	Rx NAC	Rx NAC Index	Rx CG Invert	Tx Freq	Tx Mode	Tx CG	Тх
2 3 4		CHAN 00 CHAN 00 CHAN 00 CHAN 00 CHAN 00 CHAN 00	136.00000 136.00000 136.00000 136.00000	Analog Analog Analog Analog Analog Analog	None None None None None	None None None	293 293 293 293 293 293 293	None None None None None None		136.00000 136.00000 136.00000 136.00000 136.00000 136.00000	Analog Analog Analog Analog Analog	None None None None None None	Non Non Non Non Non

Zone Settings

In the left pane, select the zone to be edited from the drop-down menu.

G	lobal System	Zo	ne
	(1) ZONE 1	~	
	(1) ZONE 1		
	(2) ZONE 2 (3) ZONE 3		ę

Zone settings

al System Zone* $T = \frac{1}{2} + 1$	Zone Settin
System Label Voice Ann. Rx Freq Rx Mode	Rx CG Rx CG Index Rx NAC Index Rx CG Invert Tx Free
Conv Sy CHAN 00 None 136.00000 Analog	None None 293 None 🔲 136.00001
Identification Alias: ZONE 1 Voice Annunciation: None Zone Index: 1	Vote Scan Initial Vote Carrier Only Tx On Last Voted Channel Fast Vote Automatic Vote Scan Vote Carrier Only Post-Tx Revote Display Selected Channel Only
Priority Pri-1 Off Pri-2 Off Transmit on Priority 1	Additional Options Additional Options Allow Cxcss Selection On All Channels Disable Keypad Programming Command Zone Zone Scan Incoming Clone:

Identification

Alias:

Label for the selected zone can be entered in the Alias box. This entry will also be displayed directly above the General tab when in Single Channel view.

Voice Annunciation:

Enables voice annunciation of selected zone.

Zone Index: Sets the index of the zone.

Priority Options (Zone Priority Scan)

Zone Priority				
Pri-1	Off	\sim		
Pri-2	Off	\sim		
Transmit on Priority 1				

In each zone, up to two channels can be designated a priority channels. In Priority Scan mode, these two channels (Pri 1 & Pri 2) are periodically checked for activity, even if non-priority traffic is currently being monitored. Activity on Pi 2 preempts activity on any of the non-priority channels. Activity on Pri 1 has priority over any other channel in the zone, including Pri 2.

Priority Scan is automatically disabled when Zone Scan is active.

Use the drop down box to assign the Pri 1 and Pri 2 channels. Priority operation can be enabled/disabled via the menu or a function button.

Priority 1 Selection: Select the Priority 1 channel from the drop down menu.

Priority 2 Selection: Select the Priority 2 channel from the drop down menu.

Priority Transmissions: If the radio is programmed to Transmit on Priority 1, transmissions will occur on the Pri 1 channel when Priority Scan mode is active.

*** Zone Priority settings are overridden by System Priority settings. ***

Vote Scan Options

Zone Vote Scan				
Initial Vote Carrier Only	Tx On Last Voted Channel			
Fast Vote	Automatic Vote Scan			
Vote Carrier Only Post-Tx Revote				
Display Selected Channel Only				

Initial Vote - Carrier Only:

When active, upon radio power, the initial vote will be determined by using carrier signal strength only.

Fast Vote:

When active, if the signal level for the current repeater is above the RSSI threshold, no additional voting will occur and the current repeater will be used.

Vote Carrier Only:

When active, all voting will be based on carrier signal level only.

Display Selected Channel Only:

When active the radio will always display the selected channel instead of the repeater channel used once it has voted.

Tx On Last Voted Channel:

Causes the radio to transmit on the last voted channel, regardless of scan hold status or talkback scan setting.

Automatic Vote Scan:

Selection of a vote scan channel activates vote scan, without user interaction.

Post-Tx Revote:

Forces a revote at the end of transmission on vote scan channels, instead of waiting for a carrier dropout to revote.

Other Settings

Additional Options					
Allow Cxcss Selection On All Channels					
Disable Keypad Programming					
Command Zone Zone Scan					
Accept 🗸					

Allow CxCSS Selection On All Channels

If checked, tone selection is available on all analog and/or mixed mode channels.

If unchecked, only channels with no programmed tone (000.0) are available for tone selection.

Disable Keypad Programming:

With this check box enabled, the radio will not allow Keypad Programming in the highlighted zone.

Command Zone:

Designates the current zone as a Command Zone. Channels can be added or deleted to command zone during normal radio operation. Refer to the radio user's manual for operation details.

Zone Scan:

Enable the check box to add the currently highlighted zone to the Zone Scan List.

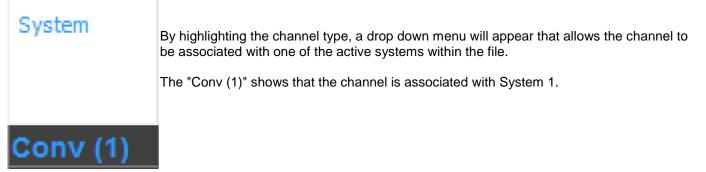
Incoming Clone:

Each zone can be blocked from receiving clone information from a "Master" radio. Use the drop down menu to allow or reject incoming cloning.

Channels - Conventional

Conventional Channels include the following settings:

System



Label

Label

The radio can be programmed with an Label for each channel within a zone. Each label can include up to 13 characters. Characters can include A-Z, 0-9 or a blank space.

CHAN 0001

Voice Annunciation



This allows you to select what voice you wish to play when that channel is selected. Note: These are AMBE files, for further information on how to convert and load Voice Annunciation files, go to the Audio Converter Help Docs

None

Rx Frequency

Rx Freq

Enter a Valid receive frequency. This entry must match the default band of the file.

136.00000

Rx Mode

Rx Mode

Select Analog, Digital or Mixed mode from the drop down menu.

Analog

Rx Code Guard

Rx CG	Analog channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.
	CTCSS: Select the desired signaling tone via the drop down menu.(67.0 - 254.1hz)
	CDCSS: Select the desired signaling code via the drop down menu.(023 - 754)
162.2	Carrier/Noise Squelch: For carrier or noise squelch, select None.

Rx Code Guard Index

Rx CG Index

Select the index of the desired code guard on the CxCSS Picklist.

None

Rx	NAC

Rx NAC Each Digital or Mixed Mode channel is programmed with a receive NAC. When an incoming signal's NAC matches the channel's programmed receive NAC, the radio unmutes.

Range:0 – FFF

The digital equivalent of carrier squelch is achieved by programming the receive NAC = F7E (3966 Decimal); the radio will unmute when a digital signal with any NAC is detected.

293

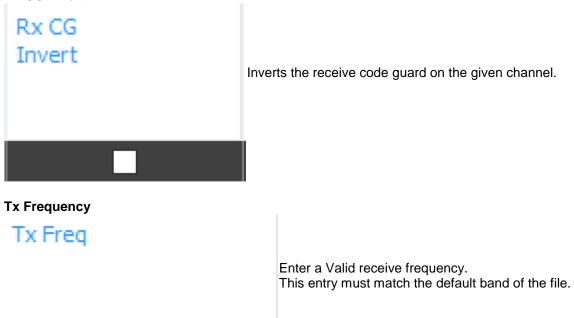
Rx NAC Index



Select the index of the desired NAC on the NAC Picklist.

None

Rx CG Invert



136.00000

TX Mode

Tx Mode

Select Analog, Digital or Mixed mode from the drop down menu.

Analog

Tx Code Guard

Tx CG

Analog channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.

CTCSS: Select the desired signaling tone via the drop down menu.(67.0 - 254.1hz) CDCSS: Select the desired signaling code via the drop down menu.(023 - 754) Carrier/Noise Squelch: For carrier or noise squelch, select None.

None

Tx CG Index

Tx CG Index

Select the index of the desired code guard on the CxCSS Picklist.

None

Tx NAC

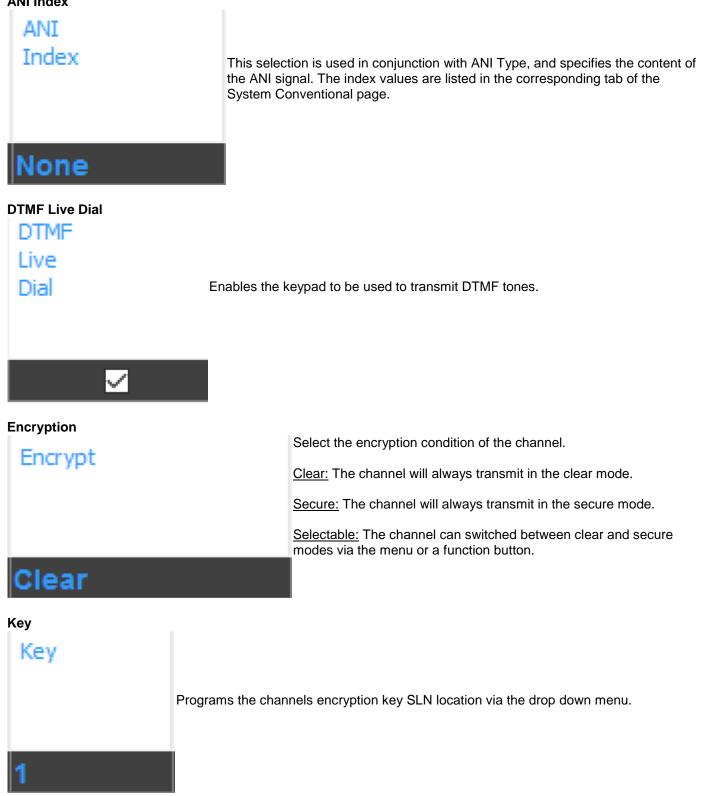
Tx NAC	Each Digital or Mixed Mode channel is programmed with a receive NAC. When an incoming signal's NAC matches the channel's programmed receive NAC, the radio unmutes.
	Range:0 – FFF The F7E NAC is reserved for receivers and is not allowed as a transmit NAC.
293	

Tx NAC Index

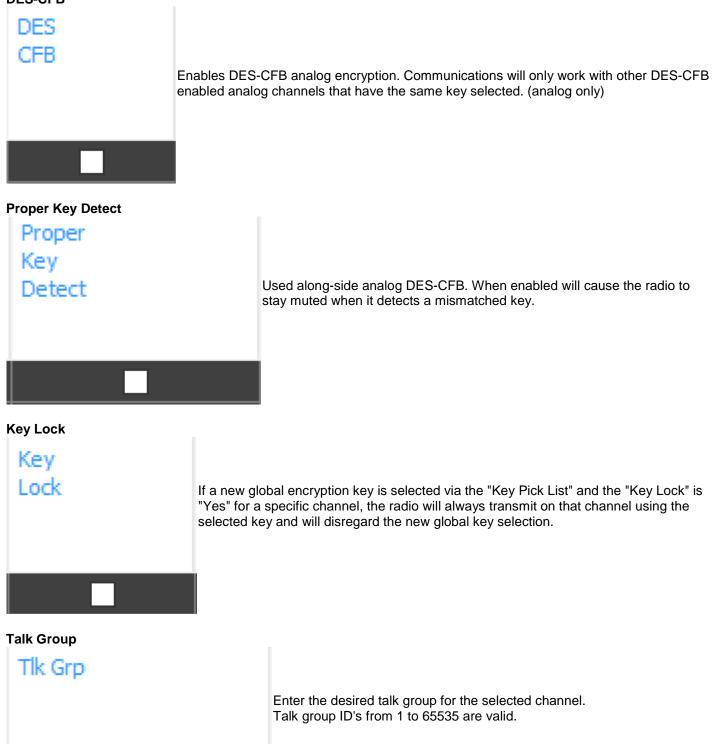
Tx NAC Index Select the index of the desired NAC on the NAC Picklist. None **Tx CG Invert** Tx CG Invert Inverts the transmit code guard on the given channel. **ANI Type** ANI Type Specifies the format of the ANI (Automatic Number Identification) signal to be transmitted. None **ANI Mode** ANI Mode Specifies when the ANI code is transmitted.

None

ANI Index



DES-CFB



Talk Group Index

TG Index

Select the index of the desired talk group from the talk group picklist.

None

Scan List

Scan	Designates this channel as part of the Channel Scan list.
List	Off: The channel is not a member of the Channel Scan list.
	On: The channel is a member of the Channel Scan list.
	<u>Vote:</u> This channel is a member of a Vote Scan list. (Vote scan option required)
Off	

Vote Scan Group

Vote Scan

Group

Denotes which vote-scan group this channel should belong to. Vote scan groups allow different sets of channels to be voted without requiring multiple zones.

Auto Scan

Auto Scan

Indicates that selection of this channel will initiate channel scan, regardless of the toggle switch setting. The toggle switch is still operational.

Data Mode

Data Mode				
Data Mode FNE	Data Modes selections include: FNE - Fixed Network Equipment Direct - Radio to radio Repeated - radio to repeater			
OTAR Chan				
OTAR				
Chan				
	Enables OTAR/Data operations on the selected channel.			
Digital Squelch				
Digital	Determines the active squelch mode for the selected channel.			
Squelch	Selective:			
oqueien	All voice traffic must be qualified before the radio will open squelch. For digital traffic, the NAC and talk group must be qualified to			
	unmute. For analog, CTCSS/CDCSS must be qualified to unmute.			
	Normal: For digital traffic, the NAC must be qualified for the radio to unmute.			
Normal	Talk Group will be ignored. Analog traffic will treat this mode the same as Selective.			
Bandwidth	Determines the modulation level for the selected			
Bandwidth	channel in analog mode.			
	<u>Wide:</u> Selects Wide Band modulation. (25Khz channel			
	spacing)			
	Narrow:			
Narrow	Selects Narrow Band modulation. (12.5Khz channel spacing)			

Tx Power

Tx Power Transmit power level for the selected channel. Low: The channel will transmit on its lowest power level. High: The radio will transmit on its highest power level. Selectable: The radio can be switched between high and low power levels via the menu or function button. liah **Busy Condition** Determines the "Busy" condition settings for the selected channel. Busy Carrier: A busy condition is declared when carrier is present on the selected Rx frequency. Non-Qualified: A busy condition is declared when a non-qualified signal is present on the Rx frequency. (No qualified = Incorrect CTCSS/CDCSS, talk group or NAC) Status Symbol: A busy condition is declared if a repeater outbound channels busy status symbol is present on the Rx frequency. Surveillance The Surveillance drop box allows this channel location to make use of the surveillance Surv feature. Off: Surveillance mode is not enabled on this channel location. On: Surveillance mode is always enabled for this channel location. Selectable: Surveillance can be enabled/disabled on this channel location by using the menu or function button. Selectable Voice Mute Type Voice Mute will unmute the receiver upon reception of the proper signal. Voice Two-Tone: Receiver listens for the Two-Tone signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or Mute button. <u>DTMF:</u> Receiver listens for the DTMF signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or button. Five-Tone: Receiver listens for the Five-Tone signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or button. one To activate these auto types, check Auto Voice Mute. Two-Tone Auto: Auto Receiver listens for the Two-Tone signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

<u>DTMF Auto:</u> Auto Receiver listens for the DTMF signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

<u>Five-Tone Auto:</u> Auto Receiver listens for the Five-Tone signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

Voice Mute Index

Voice Mute Index	This selection is used in conjunction with Voice Mute Type, and specifies the content of the Voice Mute signal. The index values are listed in the corresponding tab of the System Conventional page.				
None					
Phone Patch Phone Patch		<u>Disabled:</u> Phone patch is disabled for this channel. <u>List Only:</u> Phone patch may be invoked by selecting an entry from the Phone Number List.			
Disabled		List and Keypad: The user may enter a number from the keypad to establish a call. The Phone patch option will be disabled unless Phone Patch Enable is checked for the System.			

Hidden



Indicates that this channel cannot be selected from the keypad or menu, and is not on the list of channel selection choices. It can however be selected by the knob if it is one of the first sixteen channels.

Scan Penalization

Scan Penalize

 \checkmark

Scan Penalization entails checking the qualification (NAC or Code Guard) of a scanned channel only once while another frequency is active. This speeds up scanning, but may result in a Priority Channel not becoming active if it qualification changes while another frequency is active. Disabling Scan Penalization forces the qualifications to be checked every time.

Auto Voice Mute

Auto

Voice

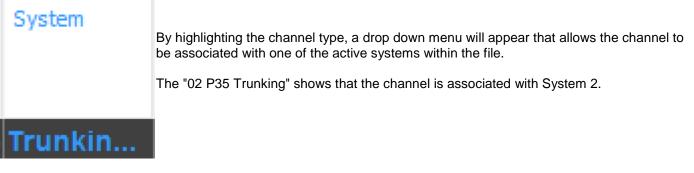
Mute

Toggles the auto version of each voice mute mode. For example, if voice mute type is set to two-tone, check the auto voice mute option to set it to two-tone auto.

Channels - P25 Trunking

P25 Trunking Channels include the following settings:

System



Label

Label

Enter the Label to be associated with the talk group assigned to the selected channel location. This Label will be displayed in the PTT-ID field when an active call from this talk group is received.

CHAN 0005

Voice Annunciation

Voice Ann.

The voice annunciation selector determines which voice annunciation file will play when the radio switches to this channel.

None

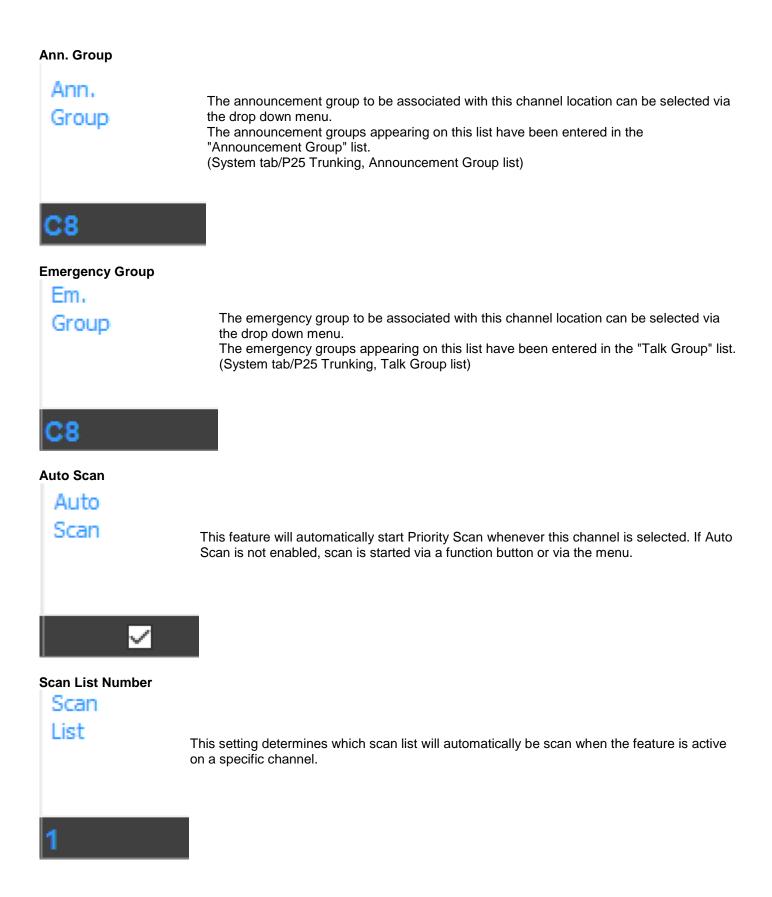
Talk Group

Talk Group

The talk group to be associated with this channel location can be selected via the drop down menu.

The talk groups appearing on this list have been entered in the "Talk Group" list. (System tab/P25 Trunking, Talk Group List)

C8



Surveillance

Surv

The Surveillance drop box allows this channel location to make use of the surveillance feature.

<u>Off:</u> Surveillance mode is not enabled on this channel location. <u>On:</u> Surveillance mode is always enabled for this channel location. <u>Selectable:</u> Surveillance can be enabled/disabled on this channel location by using the menu or function button.

Selectable

Dynamic Regrouping

Dyn. Regrp

Allow or block dynamic regrouping on the selected channel.



DTMF ID (Pri)

DTMF ID (Pri)

Used in conjunction with Voice Mute. Receiving these DTMF digits will cause voice mute to trip.

1123

DTMF ID (Sec)

DTMF ID (Sec)

Used in conjunction with Voice Mute. Receiving these DTMF digits will cause voice mute to trip.

1423

DTMF Live Dial

DTMF Live

Dial

Enables the keypad to be used to transmit DTMF tones.

Single Channel View

Channel View

Channels may be viewed and edited in Single Channel or Multi-Channel viewing mode. The Channel View can be changed under **View -> Channel View Selection**.

View Help

E	Editor View Selection	>		
(Channel View Selection	>	•	Single Channel View
0	Color Theme Selection	>		Multi-Channel View
۱ N	/iew Style Selection	>		
F	ont Size	>	Setti	ings Zone Settings

Single Channel View

In Single Channel View, Zone Settings appear at the top of the window. Each channel is displayed as a row in the channels table.

-							
	Global Sy	vstem Zone					
	(1) ZONE 1		~	+7 -7	7 Ch	annel Settings Zone Settin	gs
					- Z	one Identification	Zone Vote Scan
		Alias		System		Ione Alias: ZONE 1 Voice Annunciation: None	Initial Vote Carrier
	1	CHAN 0001		Conv (1)			Fast Vote
	2	CHAN 0002		Conv (1)		one Priority	
	3	CHAN 0003		Conv (1)	P	Pri-1 Off 🗸 🗸	Vote Carrier Only
	4	CHAN 0004		Conv (1)	P	ri-2 Off 🗸 🗸	
I	5	CHAN 0005		Conv (1)		Transmit on Priority 1	Display Selected C
Π		CHAN 0006		Conv (1)			

The Zone Settings tab contains zone specific settings.

The drop-down list displays active zones. Zones can be added and deleted from this list using the +Z and -Z buttons. The left pane displays active channels within the selected zone.

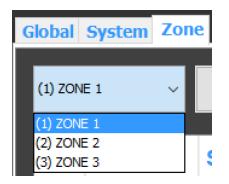
Channels can be added, deleted and set to a specific system type in this pane.

The Channel Settings tab displays the parameters for the selected channel.

Global	System Zone			
(1) ZON	E1 🗸	+Z -Z	Channel Settings Zone Settings	Channe
	Alias	System	Channel Alias: CHAN 0001 Voice Annunciation: None V	Encrypti
1 2 3 4	CHAN 0001 CHAN 0002 CHAN 0003 CHAN 0004	Conv (1) Conv (1) Conv (1) Conv (1) Conv (1)		Key:
5 6	CHAN 0005 CHAN 0006	Conv (1) Conv (1)	Channel Receive Frequency (MHz): 136.00000	Invert DCS
			Mode: Analog I CxCSS: None CxCSS NAC (Hex): 293 NAC Int	
			Channel Transmit Frequency (MHz): 136.00000	Invert DCS
			Mode: Analog V CxCSS: None V CxCSS	Index: -

Zones Settings

Zones



Zone Settings

Selecting the Zone tab will display the Zone General page.

The left pane shows the active zones.

A right mouse click in the left pane will bring up a drop down menu. The options for this menu are: Add Zone, Delete, Cut, Copy and Paste.

Single Channel View

The right pane displays the General parameters to be programmed for the zone highlighted in the left pane. The selected zone Label is also detailed directly above the General tab.

	Cones: 2 Channels: 3							
Gle	Global System Zone							
		+7 -7	Channel Settings					
	(1) ZONE 1 ~	- ⁺ Z [−] Z	Identification	Security				
			Alias: CHAN 0003	Encryption: Clear 🗸 DES-CFB				
	Alias	System	Voice Annunciation: None 🗸	Key: 1 V Key Lock				
	2 CHAN 0002			Proper Key Detect				
	3 CHAN 0003							
	4 CHAN 0004	Conv System	Scan	Data				
			Scan: Off 🗸 🗌 Auto Scan	Mode: FNE 🗸				
			Vote Group: 1 Vote Scan Penalization	OTAR/Data Enable				

The zone settings tab has been moved to the Zone Settings Window.

Global System Zone			
	e Annunciation: None v	Security Encrypton: Gear V DES-C Key: 1 V Rey Le Proper Key Detect Data	Zone Settings
Zone Settings		– 🗆 X	
Identification Alias: ZONE 1 Voice Annunciation: None Zone Index: 1		x On Last Voted Channel utomatic Vote Scan ost-Tx Revote	
Priority Pri-1 Off V Pri-2 Off V Transmit on Priority 1	Additional Options Additional Options Allow Cxcss Selection On All Ch Disable Keypad Programming Command Zone Zone Scar Incoming Clone: Accept		

Identification

Identification					
Alias:	ZONE 1				
Voice Annunciation:	None	~			
Zone Index:	1	~			

Alias:

Label for the selected zone can be entered in the Alias box. This entry will also be displayed directly above the General tab when in Single Channel view.

Priority Options (Zone Priority Scan)

Priority				
Pri-1	Off	~		
Pri-2	Off	~		
Transmit on Priority 1				

In each zone, up to two channels can be designated a priority channels. In Priority Scan mode, these two channels (Pri 1 & Pri 2) are periodically checked for activity, even if non-priority traffic is currently being monitored.

Activity on Pi 2 preempts activity on any of the non-priority channels.

Activity on Pri 1 has priority over any other channel in the zone, including Pri 2.

Priority Scan is automatically disabled when Zone Scan is active.

Use the drop down box to assign the Pri 1 and Pri 2 channels. Priority operation can be enabled/disabled via the menu or a function button.

Priority 1 Selection: Select the Priority 1 channel from the drop down menu.

Priority 2 Selection: Select the Priority 2 channel from the drop down menu.

Priority Transmissions: If the radio is programmed to Transmit on Priority 1, transmissions will occur on the Pri 1 channel when Priority Scan mode is active.

*** Zone Priority settings are overridden by System Priority settings. ***

Vote Scan Options

Vote Scan	
🗹 Initial Vote Carrier Only	Tx On Last Voted Channel
Fast Vote	Automatic Vote Scan
Vote Carrier Only	Post-Tx Revote
Display Selected Channe	l Only

Initial Vote - Carrier Only:

When active, upon radio power, the initial vote will be determined by using carrier signal strength only.

Fast Vote:

When active, if the signal level for the current repeater is above the RSSI threshold, no additional voting will occur and the current repeater will be used.

Vote Carrier Only:

When active, all voting will be based on carrier signal level only.

Display Selected Channel Only:

When active the radio will always display the selected channel instead of the repeater channel used once it has voted.

Tx On Last Voted Channel:

Causes the radio to transmit on the last voted channel, regardless of scan hold status or talkback scan setting.

Automatic Vote Scan:

Selection of a vote scan channel activates vote scan, without user interaction.

Post-Tx Revote:

Forces a revote at the end of transmission on vote scan channels, instead of waiting for a carrier dropout to revote.

Other Settings

Additional Options					
Allow Cxcss Selection On All Channels					
Disable Keypad P	Disable Keypad Programming				
Command Zone Zone Scan					
Incoming Clone:	Accept 🗸 🗸				

Zone Scan:

Enable the check box to add the currently highlighted zone to the Zone Scan List.

Disable Keypad Programming:

With this check box enabled, the radio will not allow Keypad Programming in the highlighted zone.

Command Zone:

Designates the current zone as a Command Zone. Channels can be added or deleted to command zone during normal radio operation. Refer to the radio user's manual for operation details.

User-Selectable Tx Tones:

Enabling this allows a user to change their code guard from the picklist (for all channels in the zone).

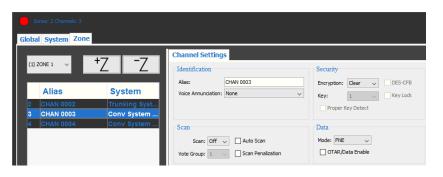
Incoming Clone:

Each zone can be blocked from receiving clone information from a "Master" radio. Use the drop down menu to allow or reject incoming cloning.

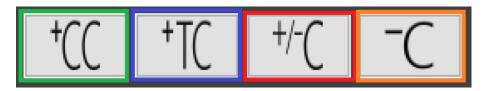
Channel Settings

Channels

The Channel Settings page allows the user to add and delete channels and edit their functional parameters.



On the left-hand side of the window, there is the channels list. At the bottom of the channels list are four buttons.



+CC	Green	Adds a conventional channel to the selected zone.
+TC		Adds a trunking channel to the selected zone. (There must be add a trunking channel.)
+/-C		Opens the Multi-Channel Add and Edit List interface. Allows th multiple channels at once.
-C	Orange	Deletes the selected channel.

Multi Channel Add and Edit List

Add / Delete Channels	Х		
Enter Range (Example: '1,4, 5-10')			
Conv System 1 - ID 1 🔹			
Add Delete			

To add multiple channels, first select the desired system for the new channels. Clicking the drop-down menu will list the system

1 : Conventional	~
1 : Conventional	
2 : P25 Trunking	

Type in the specific channels to be added separated by commas and ranges of channels to be added separated by dashes. For to add channels 2, 4, and every channel from 6 to 13, type **2**, **4**, **6-13**

Deleting channels uses the same formatting as adding channels, but it doesn't matter what system is selected. Even with a conchannel 7 is a trunking channel

and the interface is told to delete channel 7, it will still delete it.

Channels - Conventional

Highlighting the desired conventional channel allows access the General tab. All conventional channel specific parameters are programmed on this tab.

Global	System	Zon	e			
(1) ZON	E 1	~	+7	-7	L	Channel Settings
(1) 2014		Ý	L	L		Identification
	Alias		Syste	m		Channel Alias: Ch Voice Annunciation: Ne
1	CHAN 0	001	1 : Conv	entional		
2	CHAN 0	002	1 : Conv	entional		

Identification

Identification	
Channel Alias:	CHAN 0001
Voice Annunciation:	None 🗸 🗸

Channel Alias:

The radio can be programmed with a Label for each channel within a zone.

Each label can include up to 13 characters. Characters can include A-Z, 0-9 or a blank space. The programmed Label will also display in the channel list under the "Alias" column.

Voice Annunciation:

The voice annunciation selector determines which voice annunciation file will play when the radio switches to this channel.

Security (Digital/Mixed Mode channels only)

Security						
Encryption:	Clear	\sim	DES-CFB			
Key:	1	\sim	Key Lock			
Proper Key Detect						

These settings determine the encryption functionality for each channel location.

Encryption:

Select the encryption strapping condition of the channel. Available options are:

Clear: The channel will always transmit in the clear mode.

Secure: The channel will always transmit in the secure mode.

Selectable: The channel can switched between clear and secure modes via the menu or a function button.

Key:

Programs the channels encryption key SLN location via the drop down menu.

Key Lock:

Disallows encryption key picklist selection for the selected channel.

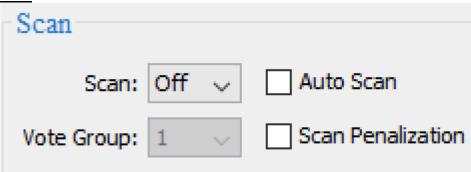
DES-CFB:

Enables DES-CFB analog encryption. Communications will only work with other DES-CFB enabled analog channels that have the same key selected. (analog only)

Proper Key Detect:

Used along-side analog DES-CFB. When enabled will cause the radio to stay muted when it detects a mismatched key.

<u>Scan</u>



Scan:

Designates this channel as part of the Channel Scan list.

Off: The channel is not a member of the Channel Scan list.

On: The channel is a member of the Channel Scan list.

Vote: This channel is a member of a Vote Scan list. (Vote scan option required)

Enable Autoscan:

Indicates that selection of this channel will initiate channel scan, regardless of the toggle switch setting. The toggle switch is still operational.

Vote Scan Group:

Denotes which vote-scan group this channel should belong to. Vote scan groups allow different sets of channels to be voted without requiring multiple zones.

Disable Channel Scan Penalization:

Scan Penalization entails checking the qualification (NAC or Code Guard) of a scanned channel only once while another frequency is active.

This speeds up scanning, but may result in a Priority Channel not becoming active if it qualification changes while another frequency is active. Disabling Scan Penalization forces the qualifications to be checked every time.

<u>Data</u>

Data				
Mode:	FNE	~		
OTAR/Data Enable				

Data Mode:

Data Modes selections include:

FNE - Fixed Network Equipment

Direct - Radio to radio

Repeated - radio to repeater

OTAR/Data Enabled:

Enables OTAR/Data operations on the selected channel.

Receive Options

Receive						
Frequency (MHz):	136.00000		Squelch Adj. :	6	~	Rx CDCSS Invert
Mode:	Analog	~	Squelch Op:	Normal	~	Receive Only
CxCSS:	None	~	CxCSS Index:	None	~	
NAC (Hex):	293		NAC Index:	None	\sim	

Receive Frequency:

Enter a Valid receive frequency. This entry must match the default band of the file.

Receive Mode:

Select Analog, Digital or Mixed mode from the drop down menu

Receive Code Guard (CxCSS):

Analog and Mixed Mode channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.

CTCSS: Select the desired signaling tone via the drop down menu. (67.0 - 254.1hz)

CDCSS: Select the desired signaling code via the drop down menu. (023 - 754)

None: Carrier/Noise Squelch.

NAC:

Each Digital or Mixed Mode channel is programmed with a receive NAC. When an incoming signal's NAC matches the channel's programmed receive NAC, the radio unmutes.

Range:0 – FFF

The digital equivalent of carrier squelch is achieved by programming the receive NAC = F7E (3966 Decimal); the radio will unmute when a digital signal with any NAC is detected.

The NAC label will show whether it is in hexadecimal or decimal mode. This setting can be changed under by clicking options in the menu bar and then toggling "Show NACs as Hex".

Squelch Adjust:

Sets the default level when new channels are created in keypad programming.

Squelch Operation:

Determines the active squelch mode for the selected channel.

<u>Selective</u>: All voice traffic must be qualified before the radio will open squelch. For digital traffic, the NAC and talk group must be qualified to unmute. For analog, CTCSS/CDCSS must be qualified to unmute.

<u>Normal:</u> For digital traffic, the NAC must be qualified for the radio to unmute. Talk Group will be ignored. Analog traffic will treat this mode the same as Selective.

Code Guard (CxCSS) Index:

When a Code Guard Index is selected, the channel will use the Code Guard from the associated picklist at initial power-up.

If a new Code Guard is selected during radio operation, this field shows the currently selected Code Guard when the radio is read.

NOTE: "Code Guard Index" must be checked in order to select this field.

NAC Index:

When a NAC Index is selected, the channel will use the NAC from the associated picklist at initial power-up. If a new NAC is selected during radio operation, this field shows the currently selected NAC when the radio is read.

Invert DCS:

Select to invert a DCS Code Guard.

Receive Only:

If enabled, the transmit mode will be disabled on this channel location. The radio will display "Rx Only" and sound an alert tone if PTT is pressed.

Transmit Options

Transmit						
Frequency (MHz):	136.00000		Busy Cond.:	Off	\sim	Invert DCS
Mode:	Analog	\sim	Tx Power:	High	\sim	
CxCSS:	None	\sim	CxCSS Index:	None	\sim	
NAC (Hex):	293		NAC Index:	None	\sim	

Transmit Frequency:

Enter a valid transmit frequency. This entry must match the default band of the file.

Busy Condition:

Determines the "Busy" condition settings for the selected digital channel.

Carrier: A busy condition is declared when carrier is present on the selected Rx frequency.

<u>Non-Qualified:</u> A busy condition is declared when a non-qualified signal is present on the Rx frequency. (No qualified = Incorrect talk group or NAC)

<u>Status Symbol</u>: A busy condition is declared if a repeater outbound channels busy status symbol is present on the Rx frequency.

<u>Correct NAC:</u> A busy condition is declared when receiving digital signal with the correct NAC, and declared not busy under all other conditions.

Transmit Mode:

Select Analog, Digital or Mixed mode from the drop down menu.

Tx Power:

Transmit power level for the selected channel.

Low: The channel will transmit on its lowest power level.

High: The radio will transmit on its highest power level.

Selectable: The radio can be switched between high and low power levels via the menu or function button.

Transmit Code Guard:

Analog and Mixed Mode channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.

CTCSS: Select the desired signaling tone via the drop down menu.(67.0 - 254.1hz)

<u>CDCSS</u>: Select the desired signaling code via the drop down menu.(023 - 754)

None: No Code Guard is transmitted.

Receive Code Guard Index:

When a Code Guard Index is selected, the channel will transmit the Code Guard from the associated picklist at initial power-up.

If a new Code Guard is selected during radio operation, this field shows the currently selected Code Guard when the radio is read.

NOTE: "Code Guard Index" must be checked in order to select this field.

NAC:

Each Digital or Mixed Mode channel is programmed with a transmit NAC. Range:0 – FFF The digital equivalent of carrier squelch is achieved by programming the receive NAC = F7E (3966 Decimal); the radio will unmute when a digital signal with any NAC is detected.

NAC Index:

When a NAC Index is selected, the channel will use the NAC from the associated picklist at initial power-up. If a new NAC is selected during radio operation, this field shows the currently selected NAC when the radio is read.

NOTE: "NAC Index" must be checked in order to select this field.

Invert DCS:

Select to invert a DCS Code Guard.

ANI Settings

ANI Settings					
ANI Type:	None ,	~	ANI Index:	None	\sim
ANI Mode:	None 🕔	~	DTMF Live Dial:	Off	\sim
			Auto Keypad PTT	Off	\sim

ANI Type:

Specifies the format of the ANI (Automatic Number Identification) signal to be transmitted.

ANI Index:

This selection is used in conjunction with ANI Type, and specifies the content of the ANI signal. The index values are listed in the corresponding tab of the System Conventional page.

ANI Mode:

Specifies when the ANI code is transmitted.

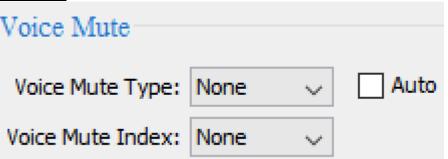
DTMF Live Dial:

Enables the keypad to be used to transmit DTMF tones.

Auto Keypad PTT:

Allows user to initiate repeater calls through they keypad without first having to hold PTT.

Voice Mute



Voice Mute Type:

Voice Mute will unmute the receiver upon reception of the proper signal.

<u>Two-Tone</u>: Receiver listens for the Two-Tone signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or button.

<u>DTMF:</u> Receiver listens for the DTMF signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or button.

<u>Five-Tone:</u> Receiver listens for the Five-Tone signal specified by the Voice Mute Index. The receiver is muted upon the activation of Voice Mute via menu or button.

Voice Mute Type Auto: Selecting this checkbox will toggle the voice mute type to auto.

<u>Two-Tone Auto:</u> Auto Receiver listens for the Two-Tone signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

<u>DTMF Auto:</u> Auto Receiver listens for the DTMF signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

<u>Five-Tone Auto:</u> Auto Receiver listens for the Five-Tone signal specified by the Voice Mute Index. The receiver is muted upon the selection of the channel.

Voice Mute Index:

This selection is used in conjunction with Voice Mute Type, and specifies the content of the Voice Mute signal. The index values are listed in the corresponding tab of the System Conventional page.

Talkgroup

Talkgroup				
TGID Index:	None 🗸	TGID:	1	

Talk Group ID:

Enter the desired talk group for the selected channel. Talk group ID's from 1 to 65535 are valid.

Talk Group Index:

When a Talk Group Index is selected, the channel will use the Talk Group from the associated picklist at initial powerup.

If a new Talk Group is selected during radio operation, this field shows the currently selected Talk Group when the radio is read.

NOTE: "Talk Group" must be checked in order to select this field.

Reference

Refere	nce			
Zone:	None	~	Channel:	None \sim

A Reference Channel uses the settings of the channel specified. No other channel settings are allowed when this is checked, and all changes to the Reference Channel also change the channel referring to it.

Zone:

In conjunction with Reference Channel, specifies the Zone/Channel that will be used in place of the knob-selected channel. All changes to the Reference Zone and Channel will also affect this channel.

Channel:

In conjunction with Reference Zone, specifies the Zone/Channel that will be used in place of the knob-selected channel. All changes to the Reference Zone and Channel will also affect this channel.

<u>General</u>			
General			
Bandwidth:	Narrow	\sim	Hidden
Surveillance:	Selectable	\sim	
Phone Patch:	Disabled	\sim	

Bandwidth:

Determines the modulation level for the selected channel in analog mode.

Wide: Selects Wide Band modulation. (25Khz channel spacing)

Narrow: Selects Narrow Band modulation. (12.5Khz channel spacing)

Hidden:

Indicates that this channel cannot be selected from the keypad or menu, and is not on the list of channel selection choices. It can however be selected by the knob if it is one of the first sixteen channels.

Surveillance:

The Surveillance drop box allows this channel location to make use of the surveillance feature.

Off: Surveillance mode is not enabled on this channel location.

On: Surveillance mode is always enabled for this channel location.

<u>Selectable:</u> Surveillance can be enabled/disabled on this channel location by using the menu or function button.

Phone Patch:

The Phone Patch option will be disabled unless Phone Patch Enable is checked for the System.

Disabled: Phone patch is disabled for this channel.

List Only: Phone patch may be invoked by selecting an entry from the Phone Number List.

List and Keypad: The user may enter a number from the keypad to establish a call.

Channels - P25 Trunking

Highlighting the desired P25 Trunking channel allows access the General tab. All P25 Trunking channel specific parameters are programmed on this tab.



Channel Identification

Identification	
Alias:	CHAN 0002
Talkgroup (Hex):	None 🗸 🗸
Announcement Group (Hex):	None 🗸 🗸
Emergency Group (Hex):	None 🗸 🗸
Voice Annunciation:	None 🗸 🗸

Alias:

The radio can be programmed with a Label for each channel within a zone. Each label can include up to 13 characters. Characters can include A-Z, 0-9 or a blank space. The programmed Label will also display above the General tab when a channel is selected

Talk Group Label:

Enter the Label to be associated with the talk group assigned to the selected channel location. This Label will be displayed in the PTT-ID field when an active call from this talk group is received.

Talk Group:

The talk group to be associated with this channel location can be selected via the drop down menu.

The talk groups appearing on this list have been entered in the "Talk Group" list. (System tab/P25 Trunking, Talk Group List)

Announcement Group:

The announcement group to be associated with this channel location can be selected via the drop down menu.

The announcement groups appearing on this list have been entered in the "Announcement Group" list.

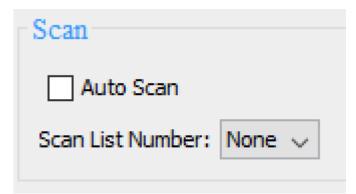
(System tab/P25 Trunking, Announcement Group list)

Emergency Group:

The emergency group to be associated with this channel location can be selected via the drop down menu.

The emergency groups appearing on this list have been entered in the "Talk Group" list. (System tab/P25 Trunking, Talk Group list)

<u>Scan</u>



Auto Scan:

This feature will automatically start Priority Scan whenever this channel is selected. If Auto Scan is not enabled, scan is started via a function button or via the menu.

Scan List Number:

This setting determines which scan list will automatically be scan when the feature is active on a specific channel.

<u>Other</u>

Other	
Surveillance: Off 🗸	
Dynamic Regrouping	
DTMF ID: (Prime) 0 (Secondary) 0	
DTMF Live Dial Enabled	

Surveillance:

The Surveillance drop box allows this channel location to make use of the surveillance feature.

Off: Surveillance mode is not enabled on this channel location.

On: Surveillance mode is always enabled for this channel location.

<u>Selectable</u>: Surveillance can be enabled/disabled on this channel location by using the menu or function button.

Dynamic Regrouping:

Check to allow dynamic regrouping of the selected channel.

DTMF ID:

Used in conjunction with Voice Mute. Receiving these DTMF digits will cause voice mute to trip.

DTMF Live Dial Enabled:

Enables the keypad to be used to transmit DTMF tones.

Copy, Paste & Shortcuts

Adding Channel

Channels may be added to a zone by using the buttons at the bottom of the channel list, copy and paste from another channel, or using keyboard shortcuts.

Shortcuts

Add Channels

To add a new conventional channel to the end of the channel list press Ctrl+N. To add a trunking channel press Ctrl+T.

Delete Channels

To delete a channel click the channel number field to highlight the channel then right click and press delete or click the -C button at the bottom of the table.

All channels below the deleted channel will move up one position.

Deleting Multiple Channels

To delete consecutive channels, press the +/-C button and enter the range of channels to be deleted.

🥗 Multi Channel A			×	
	System Selection:			
	1 : Conventional	~		
	1-4			
	Type channel numbers and/o ranges separated by commas For example, type 1, 3, 5-12	s.		
Add			Delete	

For non-consecutive channels, enter the channels and ranges of channels separated by commas.

For example, to delete channels 2 through 5, channels 9 through 12, and channel 14, type in 2-5,9-12,14 and hit delete.

🥗 Multi Channel Add and Edit List 🦳 —				×
	System Selection:			
	1 : Conventional	~		
	Channels:			
	2-5,9-12,14			
	Type channel numbers and/or ranges separated by commas. For example, type 1, 3, 5-12.			
Add			Delete	

Copy and Paste Channels

To copy an channel, click the desired channel to highlight. Press Ctrl+C to copy.

To select where to paste the copied channel, highlight a channel. Press Ctrl+V to paste the copied channel above the highlighted channel.

NOTE: Copied channels can be pasted below the highlighted channel by right clicking and selecting Paste Below.

1	CHAN 0001	1 : Conver	tional
2	CHAN 000	Delete	Ctrl+D
3	CHAN 000	Сору	Ctrl+C
4	CHAN 000	Paste Above	Ctrl+V
5	CHAN 000	Paste Below	Ctrl+Shift+V
6	CHAN 000	Cut	Ctrl+X
7	CHAN 0007	1: Conver	tional

Cut and Paste

Cutting a channel will remove the channel from its current location and copy to the clipboard. Press Ctrl+X to cut a channel.

Ctrl+V can be used to paste the channel in a new location as described above.

Editing Zones

To Add a zone, click the +Z Button.

To Delete a zone, select the zone and click the -Z button.

Radio Options Control/Feature Editing Software

Feature Editing Software

A radio's currently installed options can be viewed by selecting Feature Editing Software from the Icon bar. The Feature Editing Software can also update a radio's current option configuration by obtaining an upgraded "Option" file from the factory.

RES Feature Editing S	RES Feature Editing Software 5.6.01					
File						
ESN: 10 00 00 0	00 00 00 00	Connected				
Display O Phoenix O sTek O Phoenix II O Mobile () None	Versions Logic Board Version: RF Board Version: 0 PCB Revision: 0 Date of Manufacture: 00/00/0000 Tier: 1	Conventional Options Vote Scan Enabled Trunking Options P25 Trunking Enabled Phase II Enabled Authentication				
Hardware Option Hardware Option Mobile High Po Continuous Ch Bluetooth Enal Three Way Pri	wer Enabled GPS Enabled nannel Knob Base Station bled Encryption Enabled	Data Options P25 OTAR Enabled OTAP Enabled				
	Read	Write				

View the Factory Installed Options in a Radio

Click the Read button to upload information from the radio. The embedded Electronic Serial Number (ESN) is displayed on the top line. Display and Version information is for factory reference. Checked options are currently installed.

Hardware Options:

<u>Mobile High Power Enabled</u> - 110 watt transmit power option for mobile radio.

<u>GPS Enabled</u> - Global Positioning option for mobile radios.

<u>Continuous Channel Knob</u> - Portable radio has continuous channel switch instead of sixteen position switch. (Portable CMD versions)

<u>Base Station</u> - Indicates the radio is being used in a dispatch console environment and can limit the roaming capabilities. This can assist when the radio is to operate on a specific site.

The radio searches for a stable strong site. Once affiliated to that site, the radio will no longer attempt to roam unless the selected channel is no longer available.

Bluetooth Enabled - Allows Bluetooth functionality.

Encryption Enabled - Allows Encryption functionality.

<u>Three-way Priority Switch</u> - Should be checked if the radio has a three-way priority switch. When programmed as a three-way switch, it becomes a zone-select switch.

Conventional Options:

Vote Scan Enabled - Allows vote scanning.

Trunking Options:

P25 Trunking Enabled - Allows programming of P25 systems and channels.

Authentication - Enables Subscriber Unit Authentication Services for TDMA and FDMA trunking systems.

<u>Phase II Enabled</u> - Allows the radio to operate on P25 Trunking systems that support TDMA. Suitable hardware is required for this mode of operation.

Data Options:

P25 OTAR Enabled - Allows over-the-air rekeying.

OTAP Enabled - Allows over-the-air programming on P25 trunking systems.

Installing Radio Options

To install new radio options in the field a new options file must be provided by RELM Wireless Corporation. The file's embedded serial number must match the radio serial number.

Open the provided file and click Write to update the radio options.

<u>FAQ</u>

FAQ

Frequently Asked Questions

File Saving

A new conventional file can be saved without having a radio attached to RES. An ESN of all "0's" will be assigned to this file upon saving.

New P25 Trunking files require the radio be attached and the appropriate system key be present before RES will allow the file to be saved.

The same requirements apply if a P25 Trunking system is added to a new or archived conventional file.