

THALES

TRAINING GUIDE

THALES 25 PORTABLE RADIO

RADIO OPERATION



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FORWARD

The Thales 25 radio was developed using the Project 25 EIA / TIA-102 specifications. It is compatible with any radio that is Project 25 compliant, as well as any conventional FM radio operating in the 136 – 174 MHz band.

Before getting into any explanation at all, it is important for everyone to know the default password programmed into the radio, therefore:

THE DEFAULT PASSWORD IS “000000”.

Organization of Manual

The Thales 25 portable has many features to make it usable to a wide variety of radio users. Not all features will be used by everyone. This manual attempts to break itself down into sections to make it easy to find information needed. The breakdown is as follows:

CHAPTER 1 – INTRODUCTION

Chapter 1 covers all the basics of the radio. It describes what all the switches are and also how to navigate the keypad. A brief description of all the possible programmable buttons is also provided here.

CHAPTER 2 – COMMONLY USED FEATURES

Chapter 2 covers the features that are currently being used by almost all current radio operators. At the time, these are scanning, and programming channels via the keypad, including keypad programming of a channel. Once Project 25 systems come online, a few of the features in Chapter 3 (such as shadow channels) will probably be moved here.

CHAPTER 3 – ADDITIONAL FEATURES

Chapter 3 covers all remaining features currently implemented in the radio. Most of these are used by select customers. They are listed in alphabetical order to make them easy to find.

CHAPTER 4 – ACCESSORIES

Chapter 4 provides a brief overview on the operation of the available accessories. In some cases, the operation is so obvious, they are just mentioned.

CHAPTER 5 – COMING SOON

Chapter 5 covers anything, whether it is new features, accessories, or anything else that is currently under development, but not yet available for purchase. Due to its preliminary nature, everything in this Chapter is subject to change, but it should provide some advance information for these types of items.

CHAPTER 1.0 INTRODUCTION

RADIO CONFIGURATION

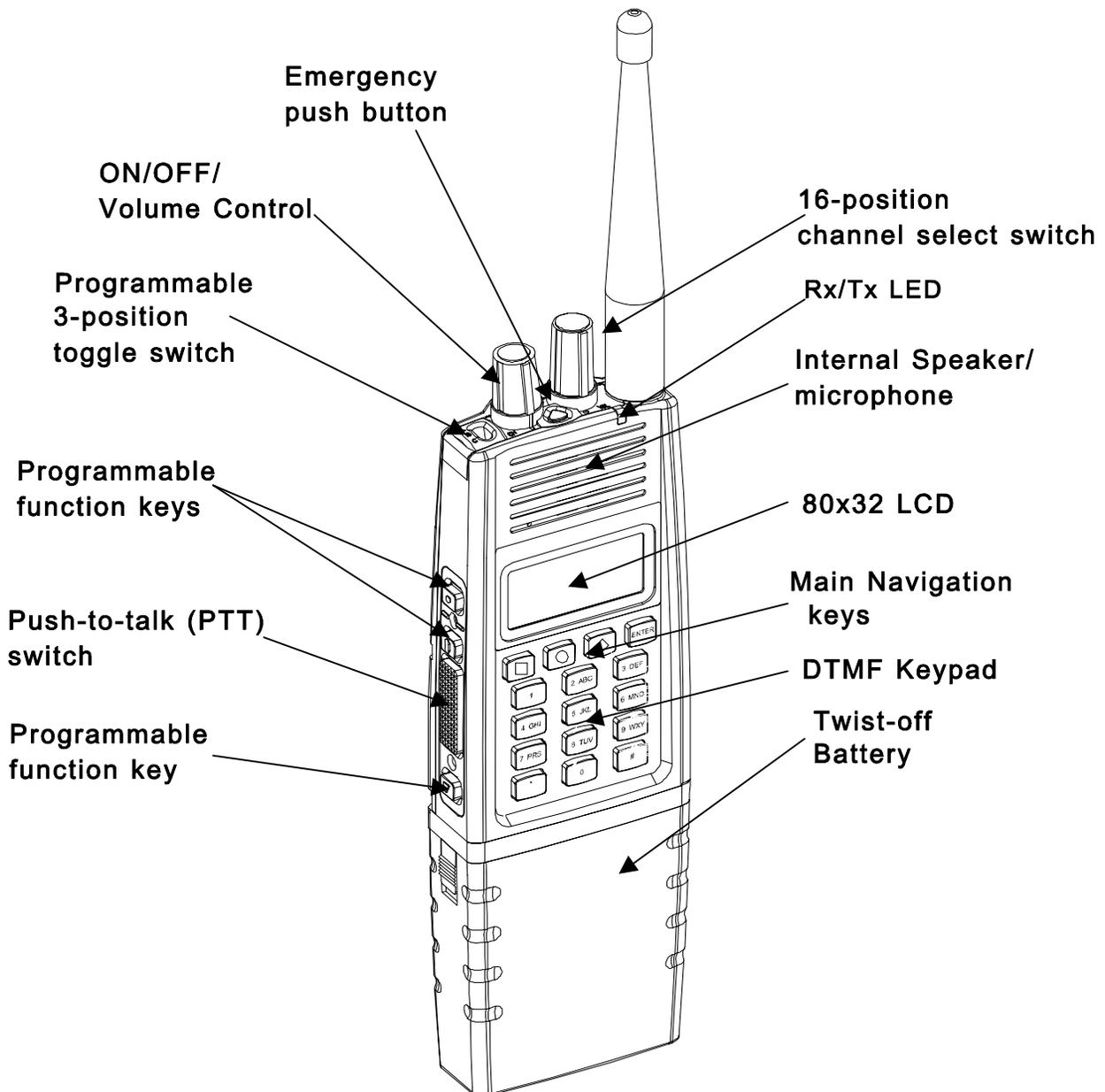
Channels contain all the information required to transmit and receive. The radio has a total of 256 programmable channels. Each channel may be programmed for receive and transmit frequencies, squelch, modulation, encryption, and transmit power using the MA6941C PC Programmer. With the exception of the special purpose channels, a channel **must** be assigned to a zone prior to use.

Zones are to provide a means to rapidly switch groups of channels. Each zone can contain up to 16 channels. If the toggle switch is set to “Zone Select”, the radio provides easy access to 48 channels using the toggle switch, and the channel select knob. In addition, up to sixteen zones can be accessed from the radio keyboard and display. Channels can be mapped to the channel switch positions within each zone using the MA6941C PC Programmer. A zone **must** be assigned to a bank prior to use.

Banks are to provide a means of easily switching a set of zones (which contain channels) with a few key presses. This would be particularly useful when frequently traveling. For example, the Banks can be programmed with different geographic frequency plans. Up to 4 banks (with a maximum of sixteen zones each) can be programmed into the Thales 25 radio. Each bank contains a collection of zones, as well as defining priority channels, a home channel, and an emergency channel.

PORTABLE RADIO

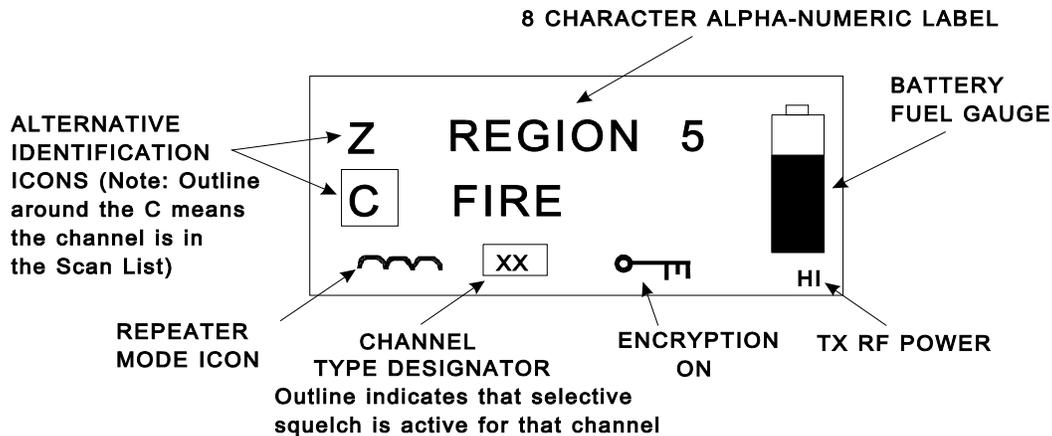
The figure below shows the various parts of the radio. Detailed of each function follows on the next pages



The Thales 25 Portable Radio

Default Display Screen

On initial power-up, the radio momentarily displays the radio title and the software version numbers. After a few seconds, this display is replaced by the default Display screen shown below. The display includes a battery "fuel gauge" indicator, a transmit power indicator, an encryption mode icon, a channel type designator, a repeater or talk-around mode icon, and two display labels and alternative identification icons for the two labels.



Default Display Screen

Available Channel Type Designators are:

- Aw - Analog wide channel spacing (25 kHz)
- An - Analog narrow channel spacing (12.5 kHz)
- DG - Digital

If the Channel type Designator is outlined, some form of selective squelch is active for the channel (i.e. NAC, CTCSS, or DCS).

Alternative Identification icons identify the channel, zone, home channel, receive frequency, and transmit frequency. Alternative identification icons are:

- C - Channel
- H - Home
- Rx - Receive Frequency
- S - Shadow Channel
- Tx - Transmit Frequency
- U - Unit ID Call Mode
- Z - Zone

CONTROLS AND INDICATORS

NOTE: Refer to The Thales 25 Portable Radio figure for this section.

Push-to-Talk (PTT)

The Thales 25 radio is normally in a ready to RX mode. (PTT is NOT depressed). To transmit, press PTT and speak into the radio in a normal voice. Distance from the radio is not critical, but 2-6 inches from the radio is optimal. To return to receive mode, release PTT.

LED

The LED indicates several conditions of the radio as follows:

- **RED** – radio is transmitting
- **Solid GREEN** – Radio has detected RF traffic on the channel
- **Flashing GREEN** – Radio has detected an encrypted signal on the channel
- **Yellow** – Radio is indicating an Alarm condition. These can be low battery, failed Power-On-Self-Test (POST), Transmit timeout has occurred, etc.

Internal Speaker and Microphone

The internal speaker is active whenever external audio accessories are not being used. The internal microphone (located at the white dot) is active whenever the portable's PTT is pressed.

Volume Control

The volume knob is a 16-position rotary switch. The volume increases the volume as it is turned clockwise. Fully counterclockwise is OFF. **Position 1 (1 past OFF) provides a special mode where the radio is ON, but the speaker is OFF.** This will be indicated by "MUTE" in the repeater icon space. This feature was in response to customer requests, since the remaining 14 volume positions provided adequate volume range.

Channel Selection

The channel switch is a 16-position rotary switch. The current channel is displayed on the LCD screen.

Typically, when the radio is programmed with more than 16 channels, the 3-position toggle switch is programmed as a zone select switch. Each zone is a grouping of up to 16 channels. By selecting one of the 3 zones, and one of the available channels, this provides the user quick and easy access to 48 channels. The additional channels can be selected via the keypad, which will be described in more detail in section on keypad navigation.

Keypad

The keypad is not required for basic operation of the radio. All channel information, and switch definitions can be programmed by the PC Programmer. The keypad may be used to either select options within the radio, or to re-program almost any parameter. It is used for DTMF signaling, keypad programming, feature selection, amongst other things.

Programmable Auxiliary Buttons

Three programmable side keys are located on the left side of the radio, two above and one below the PTT switch. These keys can be programmed using the PC Programmer (Global parameters screen). There are no restrictions on order of programming, or duplication of functions. The following is a list of the available functions and a brief description of them. See your radio programmer to ask how the buttons were programmed.

NOTE: The three most commonly used auxiliary functions are:

- **Hi / Lo Power** – especially useful when trying to conserve battery life.
- **Monitor** – Extremely valuable when using analog FM channels (also includes squelch control)
- **Scan**

Backlight – Toggles the radio's backlight from OFF to BRIGHT to DIM with each auxiliary key press. The backlight timer is not affected. Globally affects radio.

Disabled – ignores any attempted use, and provides an error warning tone. Globally effects radio.

Encryption – Toggles TX encryption from OFF to ON on channels programmed with encryption enabled ONLY (will not affect channels without encryption enabled). RX encryption is unaffected. Globally affects radio.

Hi/Lo Power – Toggles the radio power setting from HI to LO. HI and LO power settings are as programmed into each individual channel, and may be the same power level. Globally affects radio.

Home Channel - Toggles the active channel from the Home Channel to the current channel selector switch channel. Normal operation resumes on channel, zone, or bank change. This function can also be accessed via the front keypad by pressing <ENTER>, selecting home, then pressing <ENTER>.

Keypad Disable – Toggles the keypad from enabled to disabled. NOTE THAT THIS KEY MUST BE HELD FOR APPROXIMATELY 1 SECOND TO ACTIVATE IT. Globally affects radio. This function can also be accessed from the keypad by pressing AND HOLDING the SQUARE key, and then pressing and holding <ENTER>.

Monitor (includes squelch adjust) – Provides monitor and carrier squelch adjust functions. Globally affects radio. The function is described below:

- **Momentary press** – momentarily opens squelch (any mode).
- **Press and hold for 2 seconds** – locks radio into squelch open condition. To return to normal mode, momentarily press the monitor button.
- **Press and hold for 4 seconds** – activates carrier squelch adjust (on carrier squelch adjust channels only). To return to normal mode, momentarily press the monitor button.

Next Zone – Cycles the radio through all zones programmed into the radio. This zone selection is stored in battery-backed RAM and will be retained as long as the battery is kept on the radio. If the battery is removed for an extended period of time (>10 minutes), eventually the ZONE will revert to the first zone programmed into the radio.

Scan – Toggles the scan mode from OFF to ON. Globally affects radio.

Scan List add/delete – Toggles the channel's scan list flag from ON to OFF. Affects current channel only. Note that this function is readily available from the keypad (middle two keys on top row), so this feature is recommended only when extra auxiliary keys are available.

Talkaround – Toggles channels enabled for talkaround from talkaround mode to repeater mode. Talkaround allows radio users to bypass a repeater and talk direct (DIRECT, CAR-CAR, TAC, etc) on a repeater channel). NOTE that the channels MUST have Talkaround enabled from the PC Programmer for this to have any affect. Globally affects radio

3-position Toggle Switch

The three-position toggle switch, located on top of the radio can be programmed using the PC Programmer for the following. See your radio programmer to ask how the buttons were programmed.

NOTE: The most commonly used toggle switch function is:

- Radios with more than 16 channels: **ZONE SELECT**
- Radios with 16 channels or less: **MONITOR or SCAN**

Disabled – ignores any attempted use, and provides an error warning tone. Globally effects radio.

Encryption – Toggles TX encryption from OFF to ON on channels programmed with encryption enabled ONLY (will not affect channels without encryption enabled). RX encryption is unaffected. Globally affects radio.

The toggle positions have the following effect:

Position A: TX encryption enabled
Position B: TX encryption disabled
Position C: TX encryption disabled

Hi/Lo Power – Toggles the radio power setting from HI to LO. HI and LO power settings are as programmed into each individual channel, and may be the same power level. Globally affects radio.

The toggle positions have the following effect:

Position A: RF Power HI
Position B: RF Power LO
Position C: RF Power LO

Monitor (includes squelch adjust) – Provides monitor and carrier squelch adjust functions. The switch settings provide the setting described below:

The toggle positions have the following effect:

Position A: Squelch adjust mode (carrier squelch only).
Position B: Monitor ON
Position C: Programmed squelch mode (monitor OFF)

Scan on/ priority/off – Sets scan mode to ON, Priority (scan ON), or OFF. Scan mode will be as chosen via the keypad (Scan, Zone, or Search). Globally affects radio.

The toggle positions have the following effect:

- Position A: Scan (non-priority) ON
- Position B: Priority Scan ON
- Position C: All scan modes OFF.

Talkaround – Toggles channels enabled for talkaround from talkaround mode to repeater mode. **NOTE that the channels MUST have Talkaround enabled from the PC Programmer for this to have any affect.** Globally affects radio.

The toggle positions have the following effect:

- Position A: Talkaround enabled
- Position B: Talkaround disabled (repeater mode)
- Position C: Talkaround disabled (repeater mode)

Zone Select – Selects Zone A, B, or C as programmed via the PC Programmer. **NOTE** that if a current zone has been replaced, such as via the “Next Zone” auxiliary function, it will no longer match the PC Programmer zone assignments.

The toggle positions have the following effect:

- Position A: First zone (A) assigned in current bank via PC Programmer
- Position B: Second zone (B) assigned in current bank via PC Programmer
- Position C: Third zone (C) assigned in current bank via PC Programmer

Emergency button (Red button)

The emergency button on the top of the radio is typically used for the Project 25 Emergency operation, but can be programmed by the PC Programmer for any of the following functions. See your radio programmer to ask how the buttons were programmed.

Disabled – ignores any attempted use, and provides an error warning tone. Globally effects radio.

Emergency Mode – Pressing and holding for about ½ second will put the radio in emergency mode. The emergency message will be a duration on a repeat interval programmable by the PC Programmer. The emergency channel is programmed by the PC Programmer, or the radio keypad. In the event that it is left blank, the current channel will serve as the emergency channel. In Project 25 mode, the emergency bit is set. Since analog modes had no similar function, the radio performs an open-mic function for the duration and interval programmed by the PC Programmer. The emergency mode will continue until the radio's power is turned off, or the emergency button is pressed and held for about ½ second again.

Two types of operation are available for the emergency mode – Alert and Silent. The preferred mode is selected in the PC Programmer GLOBAL screen.

In Alert Emergency mode, each time the radio transmits or receives emergency signals, the LED flashes YELLOW, an audible alarm is sounded, and the LCD display indicates EMERGENCY.

In Silent Emergency mode, the LCD still indicates EMERGENCY, but the flashing lights and sounds are disabled.

Zeroize – Will erase all encryption keys in the radio.

KEYPAD NAVIGATION

This section is to describe the basics of Thales 25 keypad navigation. Only basic maneuvering is covered. An example is also provided, and a keypad navigation tree is provided. The PC Programmer will overwrite any information changed via keypad programming.

Top Row of Keys

The top row of keys change with the menu that is on the menu. Here are some basic rules:

Left Key – almost always ESC – goes back one level

Middle keys – wide variety of functions. When Arrow keys are present, it usually means to pick a value from a list. If they are blank, it usually means to directly enter a number

Right Key – Always ENTER. Selects or accepts a value

MAIN MENU Navigation

Press <ENTER> key on the keypad top row to access the Main Menu. The following screen will be displayed: (NOTE: If OTAR is enabled in the radio, the <ENTER> key will need to be pressed twice)

SCAN	PROGRM
SELECT	ALERTS
HOME	KMGR
ESC	ENT

To select one of the main menu items

Use the UP / DOWN arrow keys until the desired menu item is highlighted, then press <ENTER>. This will put the radio in the sub-menu mode.

NOTE: If programmed, passwords (Default password is “000000”) will be required for the following menu items:

PROGRM
ALERTS
KMGR

Once a password has been entered, it will not be required again (for any menu) until the radio's power is recycled.

SUB MENU Navigation

Once a main menu item had been selected, its Sub Menu will appear. With the following exceptions, all Sub Menus follow the navigation described below:

Exceptions:

HOME has no submenu. It is a direct access to the HOME channel.

PROGRM will access an interim menu similar to the Main Menu prior to its ultimate Sub Menus.

A representative sub menu screen of the SELECT menu item is:

ZONE =	Zone1
BANK =	Bank1
PHON =	-EMPTY-
ESC	▼ ▲ ENT

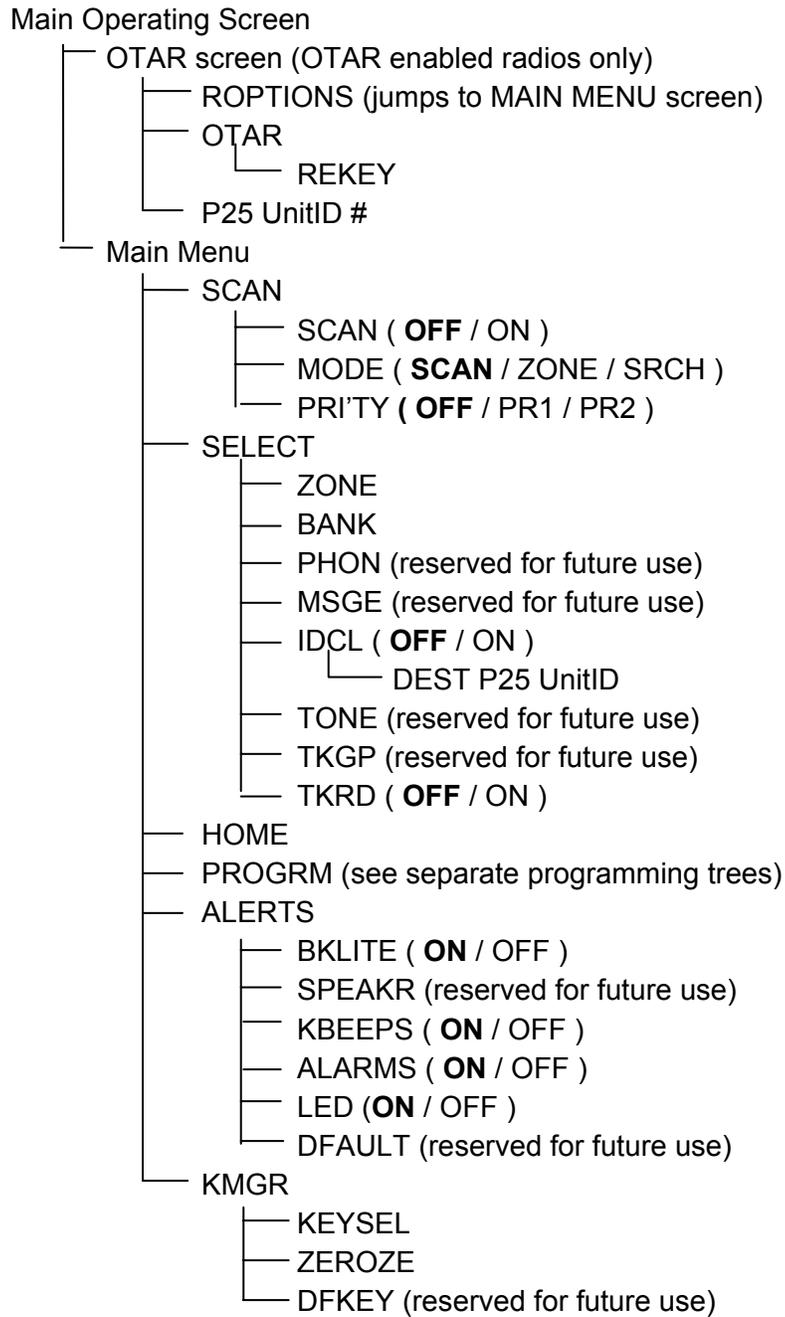
To enter the mode to change a bank, for example, scroll down to BANK until it is **highlighted**, then press the <ENTER> key on the keypad top row. This action will put the radio in a mode where only the Bank can be changed. At this point, since the arrow keys are visible, use them to select the desired bank and press <ENT> to accept, or press <ESC> to reject all changes and return to the previous menu. The arrow in the bottom left indicates that there are more bank selections available. All changes or selections are made in this manner.

BNK	01BANK1	
	02BANK2	
	03BANK3	▼
ESC	▼ ▲	ENT

Another way of looking at keypad navigation is that the left side of the sub-menus are the variables that you want to change (Bank, Zone, etc.) and the right side of the sub-menus are where the variable data (Bank1, Bank2, Bank3) list appears to select from.

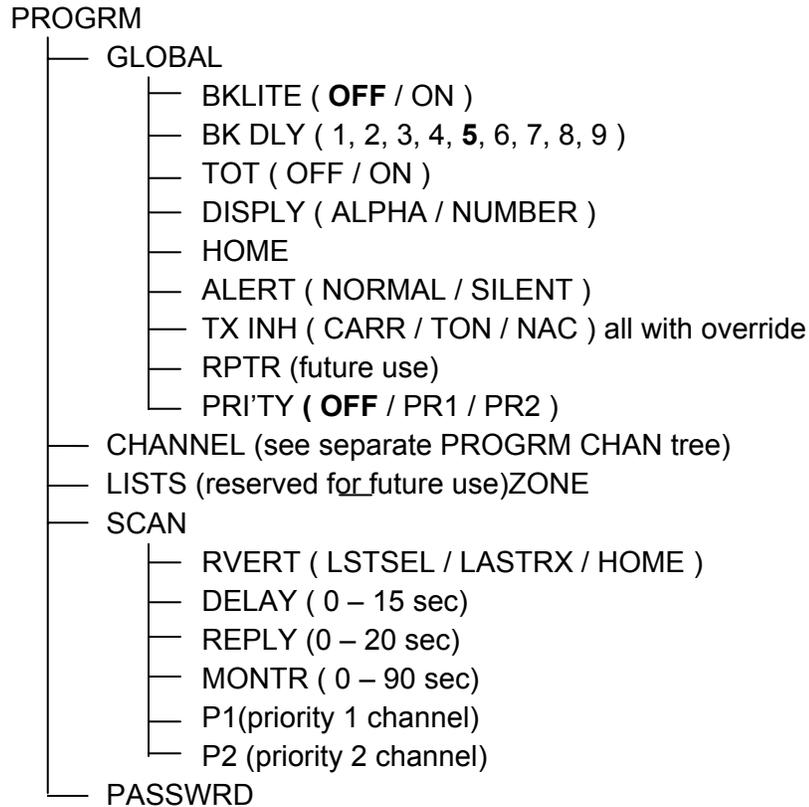
Keypad Navigation Tree

Default values, where applicable are in **BOLD**



PROGRAM Keypad Navigation Tree

Default values, where applicable are in **BOLD**



PROGRAM CHANNEL Keypad Navigation Tree

Default values, where applicable are in **BOLD>**

PROGRAM

CHANNEL (Analog)

- ID (Internal radio use)
- TAG (8 character alphanumeric)
- MODE (Analog for Analog Channel)
- B/W (25.0 / 12.5)
- ENCRYPT
- RX (Receive Frequency)
- RXSQMD (NOISE / DCS / CTCSS / NONE)
- RX SQ Value (list appropriate for mode)
- TX (Transmit Frequency)
- TXSQMD (None / DCS / CTCSS)
- TX SQ Value (list appropriate for mode)
- LO POWER (0.1 / 0.5 / 1.0 / 2.0 / 5.0)
- LO POWER (0.1 / 0.5 / 1.0 / 2.0 / 5.0)

CHANNEL (Digital)

- ID (Internal radio use)
- TAG (8 character alphanumeric)
- MODE (Digital for Project 25 Channel)
- ENCRYPT
- RX (Receive Frequency)
- RXNAC (001 to FFF Hex)
- RXSQMD (P25 MON / P25 NOR / P25SEL)
- Talkgroup (RX - If RXSQMD = P25SEL)
- TX (Transmit Frequency)
- TXNAC
- TXSQMD (P25SEL)
- Talkgroup (TX)
- LO POWER (0.1 / 0.5 / 1.0 / 2.0 / 5.0)
- LO POWER (0.1 / 0.5 / 1.0 / 2.0 / 5.0)

CHAPTER 2.0 COMMONLY USED FEATURES

SCANNING

Scanning is available on the Thales 25 portable at a rate of about 8 channels / sec. Various types of scanning exist for flexibility. The radio can be programmed to talkback on the received channel or on the switch-selected channel.

NOTE: To maximize the hits of desired channels, use the following guidelines:

- Keep the number of channels in a scanlist to the minimum required. Since the radio scans at about 8 per second, each channel will be scanned faster.
- If scanning channels with noise squelch settings, higher carrier squelch values will provide faster results (improvements above values of 8 are minimal)
- If scanning multiple channels with the same frequency (regardless of squelch values), use shadow channels where possible. A primary channel with all its shadows still scans at the rate of about 8 per second.

Instructions for setting up scanning, and all definitions of Thales 25 scanning terms follow on the next pages.

STEPS FOR SCANNING

These are the steps to scan. Details and definitions of the terms follow:

1. Set-up scanlist - Select channels and / or zones to be included in Scanlist
2. Select Scan Mode (SCAN, ZONE, or SRCH)
3. Turn Scan ON or OFF. You will know that you are scanning when the top row of the display indicates one of the following:

SCAN****

ZONE****

SRCH****

Scanlist Set-up

Selecting channels to be included in the scanlist

To add a channel to be included in the scanlist, set the radio to that channel, then briefly press and release the <diamond> key. A square will appear around the “C” indicating that the channel is in the scanlist.

To remove a channel from the scanlist, set the radio to that channel, then briefly press and release the <circle> key. The square will disappear from around the “C” indicating that the channel is no longer in the scanlist.

Selecting zones to be included in the scanlist

To add a zone to be included in the zone scanlist, set the radio to that zone, then press and hold the <diamond> key until the square appears around the “Z”. This indicates that the zone is in the scanlist.

To remove a zone from the scanlist, set the radio to that zone, then press and hold the <circle> key until the square disappears from around the “Z”. This indicates that the zone is no longer in the scanlist.

Scan Mode Selection

Keypad navigate to the Scan Mode area

- Press <ENTER>
- With SCAN highlighted, press <ENTER> again.
- Use the Arrow keys to scroll down to “MODE”
- With MODE highlighted, press <ENTER>.
- Use the arrow keys to select the desired SCAN MODE, then press <ENTER>

At this point, the radio’s scan mode has been selected, and will be retained until the battery is removed for an extended time or, until the scan mode is changed.

Turn SCAN ON or OFF

Scanning can be toggled ON or OFF by one of the following methods:

- Keypad navigation
- Pre-programmed side button
- Pre-programmed toggle switch.

Scanning will be evident by the display indicating the mode, with several asterisks walking across the screen. The examples are:

```
SCAN****  
ZONE****  
SRCH****
```

SCANNING DEFINITIONS

Scan Modes

The active scan list, or list of frequencies to be scanned during each scan sequence is built based on the radio programming. The following scan modes can be chosen:

Normal Scan Mode - The active scan list is comprised of the currently selected channel and all channels within the current zone designated as scanned channels (box around the channel icon).

Zone Scan Mode - The active scan list is comprised of the currently selected channel, all channels within the current zone designated as scanned channels (box around the channel icon), and all channels in Zones designated as scanned zones (box around the zone icon). Since this mode typically includes more channels, the number of hits on each channel will be reduced accordingly.

Search Scan Mode - The active scan list is comprised of all channels programmed into the radio, regardless of their scan list flag or assignments.

NOTE: If any channels exist with a squelch value of "NONE", or signals that are always present (Weather), the radio will always stop while in SEARCH Scan mode. Pressing the <SQUARE> key on the keypad top row will terminate the reception and continue the scan sequence.

EXAMPLE - SCAN MODES:

The following table provides an example of what channels would be received with the various scan modes:

In the example, assume:

- The radio is on Zone 1, Channel 1
- Scanlist channels are indicated by an "X" in the cell
- Zone 3 is the only zone that is in a scanlist

- **SCAN MODE – SCAN detects**
 - *ZONE 1, Chans 1,4,7*
- **SCAN MODE - ZONE detects**
 - *ZONE 1, Chans 1,4,7*
 - *ZONE 3, Chans 4,8,12*
- **SCAN MODE – SEARCH**
 - *detects all channels*

ZONE	1	2	3 - SL
CHAN 1	current	X	
CHAN 2			
CHAN 3		X	
CHAN 4	X		X
CHAN 5		X	
CHAN 6			
CHAN 7	X		
CHAN 8			X
CHAN 9		X	
CHAN 10			
CHAN 11		X	
CHAN 12			X
CHAN 13			
CHAN 14			
CHAN 15		X	
CHAN 16			

Priority Scanning

The radio can provide scanning with none, one (P1), or two (P1 and P2) priority channels. Priority channels are selected in the BANK programming screen in the PC Programmer, or via keypad programming.

The current implementation of priority scanning interleaves the priority channel into the scan sequence. It does not break into active receive to check for signals on the priority channel(s)

For example, the scan sequences of 5 channels, C1 through C5, and 2 priority channels, P1 and P2 would be:

Priority 1 Scan P1, C1, P1, C2, P1, C3, P1, C4, P1, C5, P1, ...

Priority 2 Scan P1, P2, C1, P1, P2, C2, P1, P2, C3, P1, P2, C4, P1, P2, C5, P1, ...

To activate (default is OFF):

- (1) Use the keypad to activate from SCAN main menu. Priority options are OFF, PR1, and PR2
- (2) If the 3-position toggle switch is programmed for SCAN, it may be used.

Scan Revert Mode

Scan Revert mode refers to the channel that the radio will transmit on for the Scan Reply timer period. The possible modes are:

- Last Selected - The channel selected by the channel by the channel selector switch.
- Last Received - The channel on which the message was received.
- Home - The designated Home channel. If Home channel is undefined, revert mode will be set to "Last Selected."

In all scan revert mode cases, at the expiration of the scan reply timer period, the radio will revert back to its original operation of transmitting on the channel selected by the channel selector switch.

Scan Timers

All Scan timers can be programmed by either the PC Programmer or the radio keypad.

Scan Delay Timer

Scan delay allows a user to monitor a channel that was picked up while scanning prior to re-entering the scan sequence. This is required to hear both sides of a conversation for example.

The scan delay timer can be programmed for 0 to 15 seconds. If the scan delay timer is set to zero seconds, the receiver will start scanning as soon as the detected reception ends.

Scan Reply Timer

The scan reply timer assures time for a reply if the PTT interrupts the scan delay timer. The radio's transmit channel will remain on the last received channel for the duration of the scan reply timer period. This is the time in seconds that begins with the end of reception or the release of the PTT until the end of the programmed time period. If the PTT is pressed or the receiver activated, the timer is reset.

The scan reply timer can be programmed for 0 to 20 seconds. If the Scan Reply timer is set to zero seconds, the receiver will start scanning as soon as the PTT is released.

Monitor Timer

Monitor timer is the amount of time the radio will sample a channel picked up during a scan before the radio returns to scan operation. **At the end of the monitor period, the radio will break reception, and continue with the scan sequence.**

The monitor timer can be programmed for 1 to 90 seconds. If a value of 0 seconds is selected, this will override this feature, and the signal will remain for as long as a signal is present.

FIRMWARE UPGRADES

Firmware upgrades on the Thales 25 are extremely easy. They are sent out periodically to all users on file via CD.

The following is required:

- The upgrade file
- Desktop or laptop PC running Windows95 or higher
- A PC Programming cable
- Portable to be upgraded including battery.

Double-click the Update file and follow the instructions. The entire update takes approximately 7 minutes at 38,400 BAUD (default)

Typical thing that go wrong (but rarely):

- Radio is not turned ON
- Laptop battery runs too low to operate RS232 port
- PC Programmer cable is not properly connected
- Another program is running on the PC tying up the COM port (such as PDA sync software)
- Connection is interrupted during upload.

If the connection is interrupted during the upload, the radio will not have the sufficient firmware to be a radio. This is easy to recover from.

- Turn the radio OFF
- Short pins 17 and 18 on the radio (tweezers work well. Pins 17, 18 are the two pins on the bottom on the back of the side connector)
- With the pins still shorted, turn the radio ON.
- A beep may be heard.
- Restart the firmware update program.



KEYPAD PROGRAMMING

NOTE: It is assumed that keypad parameters will be provided to the radio operator. For a more detailed description of how the channel parameters are defined, refer to the PC Programming manual.

The Thales 25 portable radio has far more capabilities than what existed in infrastructures prior to Project 25 or Analog narrowband. As a result, there are many more variables to choose from when entering a channel.

To simplify programming, assume the following defaults unless told otherwise by the person assigning the channel parameters:

- RX Frequency will always need to be specified
- TX Frequency will always need to be specified (unless RX Only)
- TAG is any 8 character alphanumeric value
- ID is internal radio information and cannot be changed
- If using a repeater, a Transmit CTCSS, DCS, or NAC code will also need to be assigned

Analog Channel Defaults

- MODE = Analog
- B/W = 25 kHz
- ENCRYPT = DISABD (optional feature)
- RXSQMD = NOISE
- SQ (level) = 2 (bar to the left, then to the right 1)
- TXSQMD = None for CAR-CAR, probably CTCSS for repeaters
- (value = specified)
- LO POWER = 2W
- HI POWER = 5W

Digital Channel Defaults

- MODE = Digital
- ENCRYPT = DISABD (optional feature)
- RXNAC = 293
- RXSQMD = P25NOR
- TXNAC = 293
- TXSQMD = P25SEL
- TALKGP (TX) = 00001
- LO POWER = 2W
- HI POWER = 5W

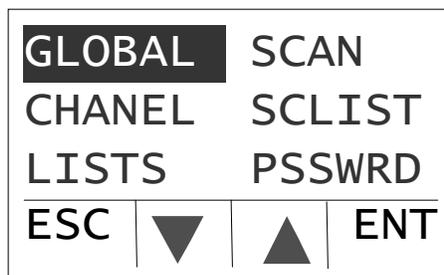
Example - Keypad Programming

The following is an example of programming a new channel into an empty slot. This same process can be used to modify existing channels. For simplicity, the radio programmer may have provided a few channels meant to be programmed over, but this is not necessary.

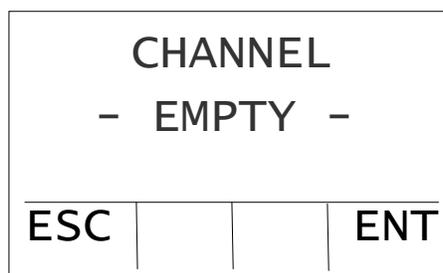
NOTE: The new channel will be assigned to whatever channel position the radio was selected to at the time of initial programming.

BEGIN

- *Enter Password, then press <ENTER>*
- *NOTE: If the Radio is OTAR enabled, the OTAR screen will appear → Press <ENTER>*
-



- *Use Arrow buttons to highlight "CHANEL", then press <ENTER>*



- Press <ENTER>
-

CHANNEL			
ID = 005			
TAG= - - - - - ▼			
ESC	▼	▲	ENT

- Press <ENTER>, enter channel name (use cell phone techniques), then press <ENTER>. Each key press advances letter. (i.e. – To select a “K”, press the “5” key twice). Press <ENTER> to complete.

CHANNEL			
ID = 005			
TAG= NEW ▼			
ESC	▼	▲	ENT

- Use arrow keys to scroll down to next screen. Use same technique to change mode to “ANALOG”

CHAN NEW			
MODE=ANALOG			
B/W = 25 kHz ▼			
ESC	▼	▲	ENT

- Use arrow keys to scroll down to Receive Frequency screen, and set RX to 154.570000 MHz

CHAN NEW			
RX =154.570000			
▼			
ESC	▼	▲	ENT

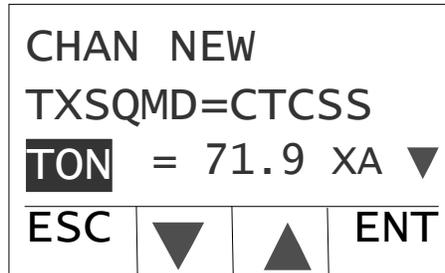
- Use arrow keys to scroll down to next screen. Set RXSQMD to “CTCSS” and TON to “71.9 XA”

CHAN NEW			
RXSQMD=CTCSS			
TON = 71.9 XA ▼			
ESC	▼	▲	ENT

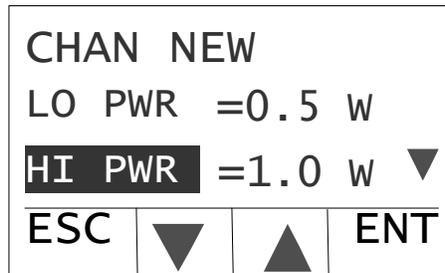
- Use arrow keys to scroll down to Transmit Frequency screen, and set TX to 154.570000 MHz

CHAN NEW			
TX =154.570000			
▼			
ESC	▼	▲	ENT

- Use arrow keys to scroll down to next screen. Set TXSQMD to “CTCSS” and TON to “71.9 XA”



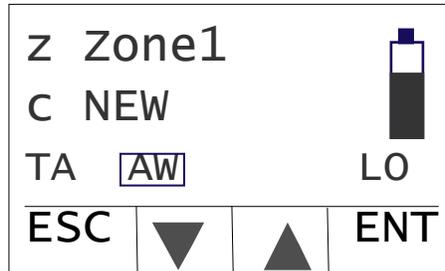
- Use arrow keys to scroll down to RF Power screen, and set LO PWR to “0.5W” and HI PWR to “1.0W”



- Use arrow keys to scroll down to next screen. Press <ENTER> to accept channel parameters.



- Press the <ESC> key several times to get back to operating screen. The new channel is ready to use !



SHADOW CHANNEL KEYPAD PROGRAMMING

Shadow channel programming is done the same way as primary channels.

To edit an existing shadow channel, enter Programming Mode and select the desired shadow channel, in either order.

To add a shadow channel to a primary channel, perform the steps in the following sequence:

- Determine the next available shadow channel (press *1, *2, etc until an error tone is heard).
- Enter Programming mode on the desired PRIMARY channel
- Press *x to get to the desired new shadow channel
- Use the techniques for adding a primary channel.

CHAPTER 3.0 ADDITIONAL FEATURES

ALERTS FUNCTIONS

Programming / Activation:

- Keypad Navigation (default OFF for all functions)

The radio's covert mode, is programmed through the Alerts (ALERTS) menu. The Alerts operations screens allow the user to select operational parameters that can be disabled for covert operation. Covert operation controls override all other programming. The Alerts parameters are:

- **BKLITE** Backlight - Enable/disable display backlight.
- **KBEEPS** Audible Tones and DTMF Keypad Beeps - Enable/disable all audible tones, including beeps when keys are pressed.
- **ALARMS** Audible Alarms - Enable/disable audio alarms.
- **LED** LED Operation -Enable/disable the LED.
- **SPEAKR** Speaker - reserved for future use.
- **DFAULT** Default - reserved for future use

To activate COVERT selections:

Use the keypad to select from COVERT main menu. All are programmed to ON or OFF. The default is ON.

BACKLITE

Programming / Activation:

- Keypad Navigation (default OFF)
- Side Button (toggles through settings)

The LCD is equipped with a backlite for low light settings. The Backlite can be set to OFF, Dim, or Bright, with a programmable hold time (Backlite Delay) from 0 to 9 seconds. There will be a slight reduction in battery life if using the backlite, but not significant. The power drain difference between DIM and BRIGHT is negligible.

BANK SELECTION

Programming / Activation:

- Keypad Navigation (Banks must be pre-programmed via PC Programmer)

The 4-bank organization allows the operators to have 4 entirely different radios in one (subject to the maximum number of 256 channels). To access effectively changed radios, select one of the other banks programmed in the radio. **Bank selection reverts to the default Bank if the battery is removed for an extended time.**

To select a different bank:

Select a different bank via the keypad SELECT main menu.

CLONING (RADIO TO RADIO)

An alternative programming option that the Thales 25 offers is radio-radio cloning. The cloning function enables the transfer of channel parameters from one radio into another radio.

Information that is cloned

- All channel parameters (frequencies, squelch parameters, scanlist designations, power levels, etc.)
- Channel assignment to zones
- Zone assignments to banks
- Special function channels and assignments

Information that is not cloned

Encryption keys

Passwords

Project 25 Unit ID

Auxiliary function definitions

Toggle switch definitions

Emergency switch definitions

Other global parameters (revert modes, transmit inhibit, etc)

To clone radios:

NOTE: Do not turn radios off or disconnect cable during cloning process

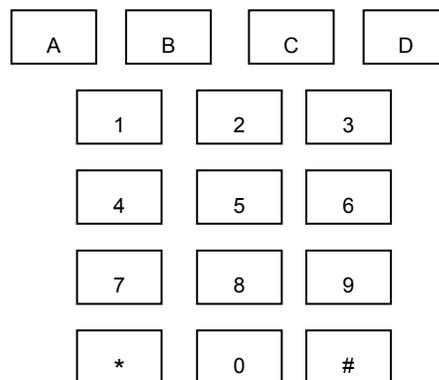
- Turn both radios on
- Connect the “SOURCE” end of the cloning cable to the side connector of the Source radio (the radio with the information to be cloned)
- Connect the “TARGET” end of the cloning cable to the side connector of the Target radio (the radio to receive the information)
- After the source radio’s LCD screen indicates cloning mode, press PTT on the Source radio.
- When cloning is complete, the radio screens will indicate as such. The Source radio can then be used to clone another radio if desired.

DTMF DIALING –

To access: While in any analog mode, press the PTT button, and press the desired key.

Description: Transmits (including sidetone) the DTMF tone corresponding to the key pressed. DTMF tones A,B, C, and D are accessed by pressing the keys across the top row of the keypad. DTMF tones are typically used for access into remote weather stations, but other applications exist.

DTMF Keypad Layout



EMERGENCY MODE

Programming / Activation:

- Keypad Navigation (programs emergency channel and alert modes)
- Emergency Button

NOTE: To access the emergency mode, the emergency button must be programmed as “EMERGENCY”.

The emergency mode transmits an emergency message that will be a duration on a repeat interval programmable by the PC Programmer. The emergency channel is programmed by the PC Programmer, or the keypad. In the event that it is left blank, the current channel will serve as the emergency channel. In Project 25 mode, the emergency bit is set. Since analog modes had no similar function, the radio performs an open-mic function for the duration and interval programmed by the PC Programmer.

Two types of operation are available for the emergency mode – Alert and Silent. The preferred mode is selected in the PC Programmer GLOBAL screen.

In Alert Emergency mode, each time the radio transmits or receives emergency signals, the LED flashes YELLOW, an audible alarm is sounded, and the LCD display indicates EMERGENCY.

In Silent Emergency mode, the LCD still indicates EMERGENCY, but the flashing lights and sounds are disabled.

To activate Emergency mode:

Press and hold the Emergency button (must be programmed as “EMERGENCY”) for about ½ second. The emergency mode will remain active indefinitely until de-activated.

To de-activate Emergency mode:

- (1) Press and hold emergency button for about ½ second again, or
- (2) Turn the radio OFF then ON.

ENCRYPTION

Programming / Activation:

- Keypad Navigation (keys must be available in radio)
- Side Button (toggles encrypted channels ON/ OFF)
- Toggle switch (toggles encrypted channels ON / OFF)
- KVL device (to add keys to radio)
- OTAR (via KMF) to add keys (assigned to SLN's) to radio

The radio is capable of secure communications by means of software-based encryption and is fully compatible with any radio using Project 25 Digital Encryption standard (DES) encryption or CVSD DES Encryption for conventional Analog 25 kHz channels. When the radio is operating in the secure mode, the transmission of all tone squelch signals is disabled. The radio 's LCD displays a key icon indicating that encryption is active. Encryption keys are assigned on a channel by channel basis via PC Programmer or Keypad.

An auxiliary button may be programmed for "ENCRYPTION", which will enable / disable TX encryption. Receive encryption is unaffected by this function.

For all Project 25 (digital) channels, the Thales 25 uses OFB DES.

For all Conventional FM (analog) channels, the Thales 25 uses CVSD DES.

Conventional CVSD DES Encryption

CVSD DES encryption is available as an option. The received Key encryption data must match that of the transmitting radio to be unsquelched and properly decoded. Due to the technology it was developed with, there are a few undesired effects:

Reduced range (about 60%)

Reduced audio intelligibility

Project 25 OFB DES Encryption

Project 25 DES solved many of the operational issues that the CVSD DES presented. There is no reduction in range, and the audio intelligibility is identical to the Project 25 unencrypted signal.

KVL Key-Fill

Key-fill is accomplished through the radio side connector using the PC Programmer or a Motorola® DES/DES-XL Key Variable Loader (KVL). Non-OTAR enabled radios utilize the KVL CX or KVL DX device. OTAR enabled radios can be key-filled by the newer KVL3000 device. The PC Programming cable or DES Encryption cable is used to load keys. The radio can store up to sixteen (16) encryption keys. The radio retains encryption keys until they are zeroized. To use any of the Motorola KVL devices, use Motorola Cable Part# TK8531B.

Key Assignment to Channels

Encryption keys can be assigned to channels through the PC Programmer Channel parameters screen or through the keypad and display using the Key Select (KEYSEL) sub-menu of the Encryption (ENCRPT) menu.

Key Zeroize

The radio can immediately zeroize all encryption keys through the manual panic zeroize control. Panic zeroization can be accomplished by pressing and holding the top key on the side panel and then pressing the emergency button. The radio can also zeroize all encryption keys, or can selectively zeroize individual keys, through the radio keypad and display using the Zeroize (ZEROZE) sub-menu of the Encryption (ENCRPT) menu. The emergency key can be programmed, using the Global Parameters screen of the PC Programmer, to panic zeroize all encryption keys.

HOME CHANNEL

Programming / Activation:

- Keypad Navigation (toggles between HOME and selected channel, can also program the home channel from a list of channels in the current zone)
- Side Button (toggles between HOME and selected channel)

The Home channel is a convenience that allows a commonly used channel to be accessed with a limited number of keystrokes. It can be programmed via the PC Programmer (bank screen), or via the Global (GLOBAL) sub-menu of the Program (PROGRM) menu.

If the HOME channel is accessed, any channel change operation will revert back to the normal channel selection.

To access the HOME channel:

- (1) Use the keypad to activate from HOME main menu.
- (2) Any of the auxiliary buttons may be programmed for HOME channel use.

KEYPAD SHORTCUT FUNCTIONS

The following sets of functions have been developed as limited keystroke keypad shortcuts:

Keypad Disable / Enable –

To access: Press and hold the <SQUARE> key on the keypad top row, then press and hold the <ENTER> key on the top row until “KEYPAD DISABLED” or “KEYPAD ENABLED” is displayed.

Description: When disabled, will lock out all keypad functions, except keypad enable. This is a toggle function, so performing the same sequence will re-enable the keypad.

Resume Scan sequence –

To access: While stopped on a channel during scan, press the <SQUARE> key on the keypad top row.

Description: Terminates the current scan function, and resumes the normal scan sequence. Used to terminate an unwanted reception.

Scanlist (Channel) add / delete -

To access: First, select the channel to modify its scanlist.

To remove a channel from the scanlist: - Press the <CIRCLE> key on the keypad top row to remove a channel's scanlist flag. The square around the channel indicator icon will disappear.

To add a channel from the scanlist - Press the <DIAMOND> key to activate a channel's scanlist flag, adding it to the scanlist. The square around the channel indicator icon will appear.

Description: Used to modify a channel's scanlist flag.

Scanlist (Zone) add / delete –

To access: First, select the zone to modify its scanlist.

To remove a zone from the scanlist: - Press **AND HOLD for 2 seconds** the <CIRCLE> key on the keypad top row to remove a zone's scanlist flag. The square around the zone indicator icon will disappear.

To add a zone from the scanlist - Press the **AND HOLD for 2 seconds** the <DIAMOND> key to activate a zone's scanlist flag, adding it to the scanlist. The square around the zone indicator icon will appear.

Description: Used to modify a channel's scanlist flag.

Shadow Channel selection –

To access: Shadow channels must be programmed into the radio to access them.

Description: Press the * key and the desired shadow channel (0 through 7). To return to the primary channel, press **, or *0, or press the <SQUARE> key.

<u>TO ACCESS</u>	<u>PRESS KEYS</u>
Primary channel	** <i>or</i>
(Shadow 0)	*0 <i>or</i>
	<SQUARE> key
Shadow 1	*1
Shadow 2	*2
Shadow 3	*3
Shadow 4	*4
Shadow 5	*5
Shadow 6	*6
Shadow 7	*7

PROJECT 25 INDIVIDUAL CALLS

Project 25 radios include a mode that allows an individual radio to be targeted to transmit to. This is accomplished by the unique UnitID that all radios can be programmed with that is transmitted in the P25 CAI waveform. This UnitID can have a value of 1 to 9,999,999 (decimal).

NOTE: If secure communications is desired, use encryption keys. Do not rely on P25 Individual Call alone.

To initiate a P25 Individual Call:

- Select desired Project 25 channel
- Choose select from the keypad Main Menu
- Scroll down to IDCL and turn it ON.
- Type in the destination UnitID
- Press the <SQUARE> button on the keypad top row until the Individual Call operational screen is displayed on the LCD display (If the <SQUARE> button is pressed too many times, individual call mode will be exited, and the normal operating screen will be displayed)
- Press PTT – A special tone will indicate that an Individual Call is being placed

To exit P25 Individual Call mode:

- Press the <SQUARE> button on the keypad front panel - individual call mode will be exited, and the normal operating screen will be displayed

When a P25 Individual Call is received:

- The radio will generate a special tone indicating that an individual call is being received
- The RX radio will respond to the calling radio in Individual Call mode if transmitted within 10 seconds.
- To exit to normal operation prior to the 10 second timeout, press the <SQUARE> button on the keypad front panel - individual call mode will be exited, and the normal operating screen will be displayed

PROJECT 25 OVER-THE-AIR-REKEYING (OTAR)

Programming / Activation:

Keypad Navigation (sends OTAR Rekey request)

Over-The-Air-Rekeying is an optional feature in the Project 25 feature set. It provides a mechanism for the radio to receive encryption keys without having to bring the radio to the radio shop. The Thales 25 is capable of being OTAR'ed with any Key Management Facility (KMF) that is compliant with the Project 25 standards.

From a radio user's perspective, the only possible action is to request a Rekey. All other aspects of setup are beyond the scope of this manual. Specific PC Programming is required, as well as authentication into the KMF infrastructure.

To request a Rekey

Go to a channel that has been designated an OTAR channel

Press <ENTER> on the keypad

Use the Arrow keys to Scroll down to select OTAR

With OTAR highlighted, press <ENTER>

With REKEY highlighted, press <ENTER>

At this point, the radio will be displaying one of the two following screens:

REKEYING (walking across the screen)

- If this appears, the radio is registered on the network, and is currently being Re-keyed
- When complete, the radio display will change briefly to "REKEY PASSED", then return to the normal operating screen.
- If REKEY FAILED appeared after several seconds, either the radio or the KMF may have timed out prior to receiving all encryption keys. Repeat the OTAR process until all encryption keys have been received (REKEY PASSED).

REKEY FAILED (immediately)

If this appears, data registration was not successful. Data registration may be attempted again by changing channels to another channel then back to the desired OTAR channel.

Possible causes:

- Channel was not enabled for OTAR in PC Programming
- KMF is not operational
- Radio was rejected by KMF as being unauthorized
- Radio is out of range of repeater
- Other radio interference.

SHADOW CHANNEL (MIXED MODE) OPERATION

Programming / Activation:

Keypad Selection (selects TX shadow channel, RX is automatic)
Keypad Navigation (Ability to program / modify shadow channels)
PC Programmer

The Thales 25 can be programmed to detect any type of analog FM signals and any combination of Project 25 digital signals, up to a set of 8 sets of analog / digital parameters. This is done with the use of shadow channels, which are described in more detail in the Thales 25 Advanced Operations Chapter. Once received, the radio is programmable to transmit either in kind, or strapped to its channel selector.

This is a powerful mode of operation that has enabled digital systems to be seamlessly integrated into older analog systems without disruption. The preferred signaling mode can be set up to be a Project 25 digital signal, with all the benefits **AND** be able to receive any analog signal **AND** respond back to the operator or the analog radio.

Shadow Channels

In addition to the primary channels, the radio may be programmed with up to additional seven (7) shadow channels. Shadow channels are used to enable mixed-mode operations on the radio.

Parameters that may be changed are:

- Channel type: (Analog / Digital)
- Bandwidth:
- Key assignment
- Squelch Parameters (CTCSS, DCS, P25 NAC, P25 Talkgroup)

All other parameters must remain unchanged (transmit and receive frequencies, options (scan list, talk around, locked, and receive only), and transmit power levels as the primary channel). Each shadow channel counts toward the maximum 256 channels that can be programmed into one radio.

Shadow Channel applications –

Some applications that are available by using shadow channels are:

- Simultaneous analog and digital operation
- CTCSS (or DCS) picklists used to choose repeaters
- Project 25 NAC picklists used to choose repeaters
- Multiple encryption use
- Supervisory talkgroups

Transmit Revert Modes -

Shadow channels can be programmed to transmit back on the mode just received or the mode selected by the channel selector switch. This is valid only for the Shadow Channel delay period. The delay period can be overridden which would allow transmissions on the primary channel at any time by pressing the keypad <SQUARE> key on the top row. Allowable values are:

Revert Mode	Last Received (transmits in kind to signal just received) Last Selected (transmits on channel selector switch)
Delay	0 to 15 seconds (increments of 1 second)

Keypad Selection –

Shadow channels may be selected by the front keypad by pressing * then the appropriate shadow channel number (i.e. – Pressing *3 selects shadow channel 3). The primary channel can be returned to by pressing **, *0, or the keypad <SQUARE> on the top row.

TALKAROUND

Talkaround is a convenient mode of bypassing repeaters, and performing local communications. A channel must have its “TA” flag set to allow Talkaround.

To access Talkaround (default is OFF):

- (1) Use the keypad to SELECT from the SEL main menu.
- (2) Any of the auxiliary buttons may be programmed for TA use.

Advantages of using Talkaround are to gain additional effective channels in a zone by bypassing the repeater when out of range.

Disadvantages of allowing Talkaround is the possibility that someone may accidentally be in TA mode, when they expect to be hitting the repeater.

While in Talkaround Mode, the Display will show “TA” (also displayed on direct channels)
While in Repeater Mode, this symbol changes to the repeater symbol “∩∩∩”.

TRANSMIT INHIBIT

Programming / Activation:

- Keypad Navigation (programs parameters in Global screen)

Transmit Inhibit is a feature that locks the PTT switch to keep users from talking over other radio conversations. Each transmit inhibit mode offers an override option (i.e. NAC+O). The override option allows the operator to transmit over the signal anyway if the PTT switch is pressed twice within approximately ½ second. Transmit inhibit options are:

CARR	Prevents transmissions on a busy channel (if any RF is detected – any modulation)
CARR+O	Carrier Transmit Inhibit with override
TONE	Prevents transmissions on a busy channel with analog squelch values (CTCSS or DCS) other than programmed for RX
TONE+O	Tone Transmit Inhibit with override
NAC	Prevents transmissions on a busy P25 channel with a different NAC than programmed for RX
NAC+O	NAC Transmit Inhibit with override

TONE (transmit inhibit on busy channel with wrong squelch code) prevents transmission on an active channel with a squelch code other than your own. NAC+O, CARR +O, and TONE+O add a quick-override feature, which allows the user to override the transmit inhibit state by quick-keying the radio (i.e., two PTT presses within a short time frame - default value is 0.5 second). If the user tries to transmit on an active channel, an alert tone will be generated and transmission will be inhibited.

Transmit Inhibit can be enabled either through the Global Parameters screen of the PC Programmer or through the Global (GLOBAL) sub-menu of the Program (PROGRM) menu.

TRANSMIT TIMEOUT

Programming / Activation:

- Keypad Navigation (programs transmit timeout (TOT) parameter via Global screen.

Transmit Timeout allows the radio to have a preset time that shuts the transmitter down after a pre-determined time. This is especially useful to prevent accidental long transmissions due to the PTT button being accidentally pressed. Transmit timeout is defaulted to OFF, but can be programmed from 0 minutes (OFF) to 5 minutes in 30 second increments.

ZONE SELECTION

Programming / Activation:

- Keypad Navigation (zone selection from pre-programmed zones)
- Side Button (Next zone scrolls through all zones)
- Toggle switch (Select between 3 PC Programmed selected zones)

Zones, or channel groups, can contain a maximum of 16 channels, one per position. Channels may be duplicated in zones (same channel on multiple positions) for convenience, or left blank.

To select a different zone:

- (1) Select a different zone via the keypad SELECT main menu. If a zone is selected by this method, it will replace the current zone, until another is selected.
- (2) If the 3-position toggle switch is programmed to “ZONE SELECT”, it allows quick selection of 3 zones.
- (3) Any auxiliary switch may be programmed to “NEXT ZONE”. If a zone is selected by this method, it will replace the current zone, until another is selected.

NOTE: If the toggle switch is set to Zone Select, and a zone is selected via the keypad navigation method that zone will permanently be in the toggle switch setting. The original zone will be available for selection through keypad navigation.

CHAPTER 4.0 THALES 25 ACCESSORIES

BATTERIES

Lithium Ion (Lilon) Rechargeable Battery

The Lithium Ion Battery contains an Internal Fuel Gauge that enables the radio to accurately display the current charge state. It is 12.6 VDC when fully charged, and will power the radio down to 8.0 VDC. The current capacity of the Lilon Battery is 1800 mA/H. It should supply 1000 recharge cycles

Additionally, Lithium Ion Batteries do not have the memory problems of NiCAD batteries, and may be charged when fully depleted or topped off at any time.

They charge to 95% in 1.3 hours, and provide over 11 hours of 5W radio operation at a 5-5-90 duty cycle.

IMPORTANT NOTE: Be sure to periodically charge batteries if in storage. If they are left uncharged for an extended period of time, permanent damage may result. For the standard battery, charging at least every 12 weeks is recommended.



AA Alkaline Clamshell Battery

The AA Alkaline Clamshell Battery uses 10 AA Alkaline cells to power the radio. It contains a regulator to more efficiently use the cells. With a fresh set of batteries, it supplies 16 VDC to the regulator, which presents about 12.3 VDC to the battery. The raw voltage can be measured on the side of the battery.

Since the AA clamshell does not have a fuel gauge, the best way to use the radio's fuel gauge is to check it while transmitting.

The AA clamshell provides 8 hours of 2 Watt radio operation at the 10-10-80 duty cycle.



BATTERY CHARGERS

Desktop / Automobile DC Lithium Ion Battery Charger Kit

(6-unit chargers also available)

This charger is the replacement to the original Lilon charger offered by Thales Communications. While the old charger will still charge batteries, this charger was improved to include the following features:

- RS232 Upgrade port to easily field install firmware upgrades (uses commercially available 9-pin RS232 extension cable)
- Separate AC power cord to allow traditional desktop charging
- DC cigarette lighter cord to allow vehicular charging
- Improved battery management (verifies and corrects battery data)



The battery charger charges the Thales 25 Lilon batteries to about 95% capacity in about 1.3 hours. It then slows to a trickle charge to complete the charge in about an hour.

If a battery is completely dead, it enters a wake-up charge for 30 seconds. Sometimes it may be necessary to repeat this procedure a second time by removing and re-inserting the battery

Batteries may be charged separately or with a radio attached (radio ON or OFF).

The normal process to charge a battery is as follows:

- Place the battery in the charger. IT IS NOT necessary to engage the blue latch unless mechanical support is required (vehicle charging). The charger LED will flash GREEN and ORANGE while it is attempting to communicate (the label states YELLOW, but the true shade looks ORANGE). Sometimes ORANGE is mistaken for RED. The charger always initially flashes GREEN and ORANGE at the beginning.)
- The LED will then turn solid ORANGE to indicate that it is charging
- When the charging is complete (or if the battery was already charged), the LED will turn GREEN.
- If the battery was latched, be sure to unlatch it prior to removal.

If the charger's LED turns a color other than ORANGE or GREEN, it indicated a problem. RED / GREEN may be able to be cleared by removing and re-inserting the battery. A complete LED color chart is included on the bottom of each charger. It is provided here for reference:

Charger LED Indications

(

Red Light = High Temp Exceeded

Red Flash = Over Discharged Battery

Orange Flash = Low Temp Exceeded (0°C)

Orange Light = Charging

Green Light = Charging Complete

Orange / Green Flash = Attempting Communications

Red / Green Flash = Battery Charging Error

Orange / Red Flash = Charger Error

The new 6-unit chargers operate in the same manner as the single-unit chargers, and have all the same features, including RS232 upgrade ports.

In addition to the charger kit, the charger unit and cables are available individually as replacement items.

PROGRAMMING EQUIPMENT

To set up channel programs for the radio, the PC Programmer is used. There is a kit, which included the software (minimum Windows 98 required) and a PC Programming cable.

The software is extremely easy to use, and is covered separately in the PC Programmer manual.

The cable used requires NO additional power sources or special adapter units. It can also be used for several other applications such as remote control (for testing), or firmware upgrades.



CABLES

PC Programming Cable

The PC Programming Cable is available separately, and may be used for additional tasks such as firmware upgrades.



Cloning Cable

The cloning cable enables a radio to be cloned to another radio.



AUDIO AND SURVEILLANCE EQUIPMENT

Speaker / Microphone

The speaker / microphone attaches to the side connector of the radio, and provides louder audio.

The audio flows through from the radio's volume setting. A HI / LO switch on the speaker / mic allows a quick change between 2 audio levels. An earphone jack exists to plug in an optional earphone (speaker is muted when earphone is in use).



Surveillance Equipment

If a surveillance application is desired, the minimum equipment required will be surveillance kit (2-wire or 3-wire) and an audio adapter. Optional wireless earpieces and neck loops are available that adapt to either surveillance kit.

The 3-wire surveillance kit has separate wires for the earpiece, the lapel microphone, and the PTT. The 2-wire surveillance kit integrates the microphone and PTT into 1 wire.



CASES

A wide variety of cases are available. A few are pictured. If ordering, be sure to get the proper case that fits a battery. Chest Packs are also available from 3rd party vendors

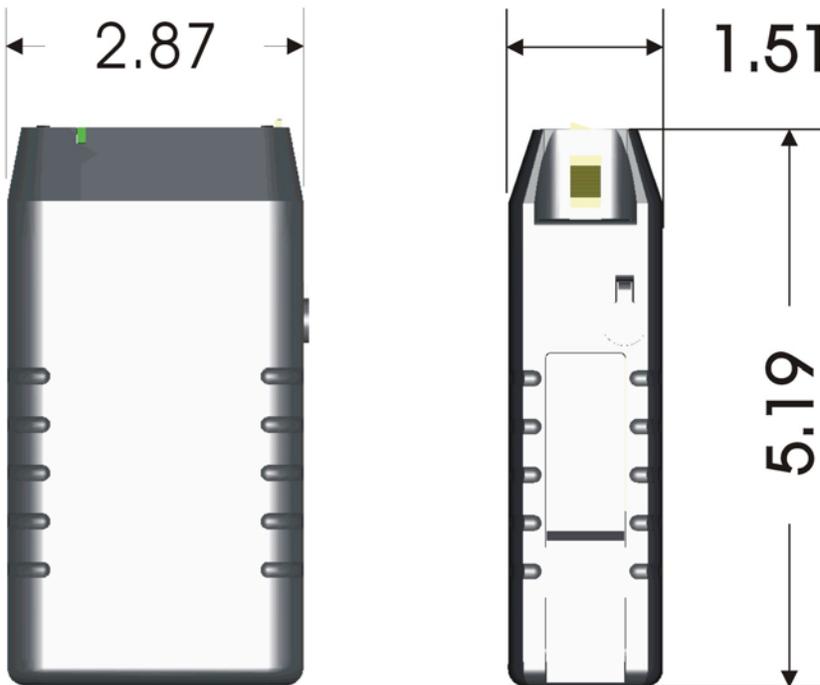


CHAPTER 5.0 COMING SOON

All items in this section are preliminary information, and subject to change or cancellation. At the time this manual were prepared, these new features / accessories have a high probability of being completed during 2003. There are also always several minor firmware upgrades being worked on that will be available under the 3-year free upgrade plan.

HYBRID BATTERY

The hybrid battery combines the benefits of a Lithium Ion battery (rechargeable, ability to deliver high current, i.e. 5W RF) with the portability and availability of the AA alkaline clamshell battery pack. It uses the Lilon cells available in the standard Thales25 rechargeable battery with an 8-cell compartment for AA batteries. The Lilon cells can be charged either by the AA cells or by either one of the cables available with the desktop / vehicular charger.



FIRE FEATURES

The Fire Features upgrade option provides many features that the DOI has asked for. At the same time the Fire Features option is released, we are also anticipating on including some significant firmware upgrades free to everyone under the 3-year free upgrade program.

Free features

Improved priority scan

Priority scanning currently does not break into active receptions. This will be added for this release. A highlight of the changes:

- Priority scan will break into active receptions
- Priority sampling will be available in 0.5 second increments (0.5 to 5.0 seconds)
- Priority scan and normal scans will be independent of each other. (May be used together or separately)

Enhanced PC Programmer Downloads

The PC Programmer will be modified to include all Fire Feature changes. In addition, several items that are currently available only on the keypad programming will be made available (HI / LO power default, Backlite settings, etc)

Enhanced Unit ID display

For Project 25 calls, the transmitting radio's Unit ID display will be displayed during active reception in the channel name area. In addition, the current implementation of making a unit ID call will be simplified and more "cell-phone" like.

Enhanced Backlight Capability

Additional settings will be added to the backlight. These allow the user to light the backlight on a received signal. In addition, an always ON backlight setting will be available. Since this draws more battery life, it will be necessary to reset this if used each time a radio is turned on.

Improved Busy Signal Indicator

The Green LED will be on for all RF traffic.

Paid Fire Features Option Features

Enhanced Cloning Capability (including extra Event Bank)

Currently, the radio clones only channels, zones, and banks, and also erases the entire channel set prior to programming. This will be improved dramatically. The following highlights the cloning improvements:

- Current cloning mode will still exist
- Additional optional cloning of globals (side buttons, etc)
- Additional EVENT Bank adds 3 zones containing 16 channels each. (48 channels). An additional 48 shadow channels will be available to assign within the event bank. This provides the capability of cloning up to 3 zones without affecting the remaining zones or channels in the radio

Protected Zones

The ability to protect zones on an individual basis will be added. A password will be needed to alter, clone over, or PC Program over these zones. For simplicity, if a source cloning radio and target cloning radio has matching zone passwords, the password criteria will be met.

Analog / Digital Transmit Squelch Tone Pick List

The ability to program up to 32 tones (CTCSS or DCS) will be added. These will be available to be quick-picked by the keypad. In addition, during programming, the ability to optionally map NAC's to CTCSS tones will be available to make the digital transition more transparent. The following table is an example of how this will look in the PC Programmer screen. The radio will automatically pick the analog or digital value depending on what kind of channel is in use. The channel tagname will be replaced by the tone name

TONE #	Tone Name	Analog Tone	Digital NAC
1	North	67.0 Hz XZ	29E
2	South	167.9 Hz 6Z	68F
3	East	85.4 Hz YA	356
4	West	051	051
5			
6	State	103.5 Hz	
7			
8	Local		556
9			

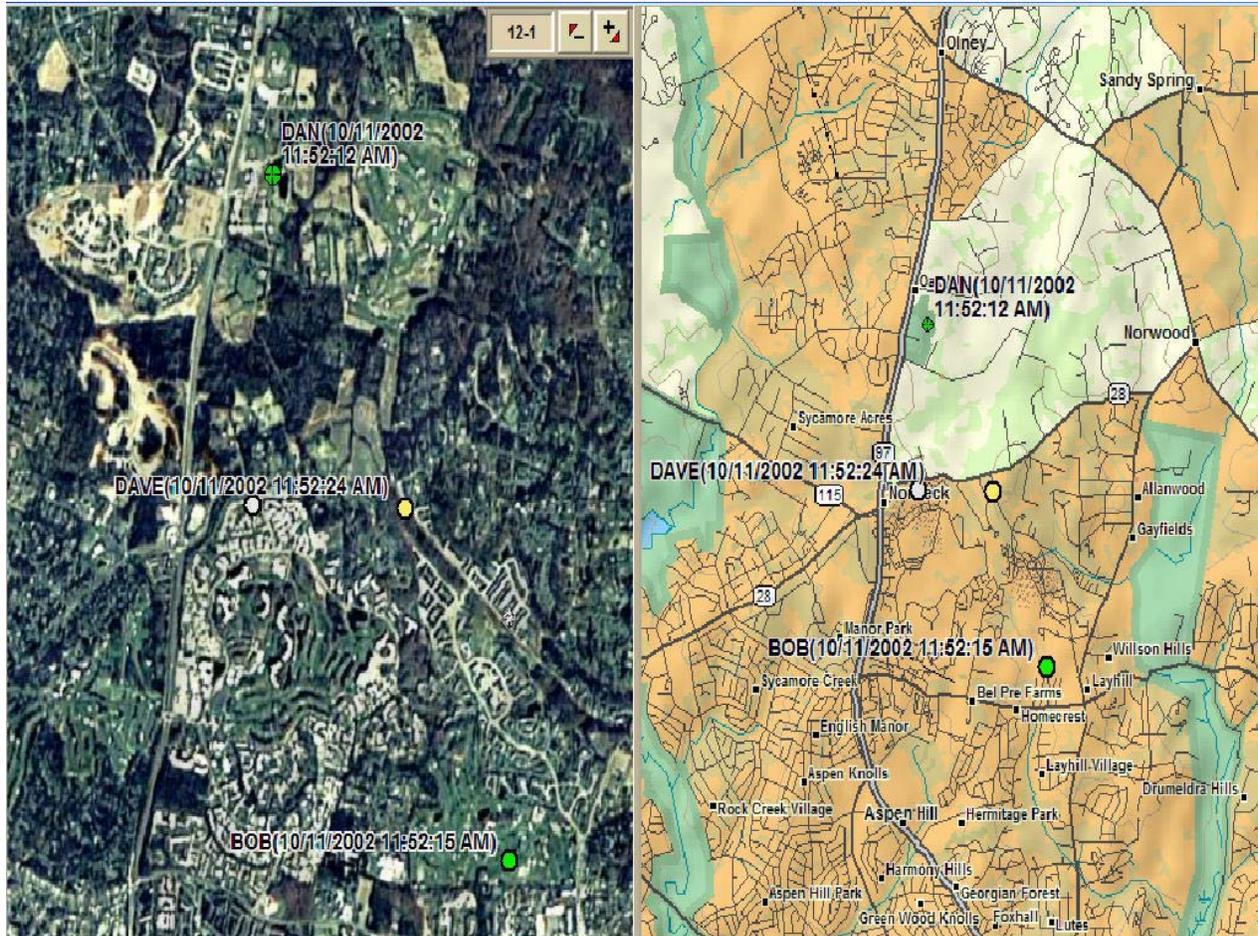
Unit ID Call Picklist

A Unit ID Picklist will be added to make it more “cell-phone” like. If a call is received with a matching UnitID in the lookup table, the name will be displayed. Otherwise, the actual UnitID will be displayed.

Talkgroup Picklist

The talkgroup picklist will be similar to the tone picklist.

GLOBAL POSITIONING SYSTEM (GPS) APPLICATION (OPTION)



The Thales25 is currently nearing completion of the initial GSP application. It will attach to a GPS Speaker / Mic (new accessory), which will provide the radio to transmit GPS data. GPS data can only be transmitted on a Project 25 channel. A Thales 25 radio will receive that data and display it on DeLorme XMaps application with a specially designed overlay to display location.

Some highlights include:

- GPS transmit bursts on programmable intervals OR after PTT's OR both
- GPS data stored in Access database
- Track data can include Timestamps, UnitID, programmed names

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