USER'S GUIDE

THALES 25 PORTABLE RADIO

PC Programmer

THALES COMMUNICATIONS, INC.
22605 GATEWAY CENTER DRIVE
CLARKSBURG, MD 20871
www.thalescomminc.com

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Thales 25 PC Programmer User's Manual
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NOTICE

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FOREWORD

The PC Programmer is the most efficient method of setting up the Thales 25 portable radio.

Once a program is set up it can be used to download to radios at about 1 minute per radio. Actual time varies depending on the size of the channel configuration file.

Organization of Manual

Each section in this manual describes a different major screen. There is also a “Miscellaneous” section for features that do not fit well into one category (such as Upload / Download):

The main portion of the manual includes information on all standard features of the Thales 25 radio. The appendices provide information on the optional features; currently Encryption, Over-The-Air-Rekeying (OTAR), and Fire Features. References are provided in the main portion where it helps to clarify programming.

The PC programmer is capable of programming all standard and optional features.

CHAPTER 1 – INTRODUCTION

Chapter 1 covers all the basics of the PC Programmer. This includes information such as file management, PC requirements, and a general overview.

CHAPTER 2 – GLOBAL Screen

"Global" parameters are the parameters that affect the radio on a radio-wide (not per channel) basis. Some examples of these are scanning items, switch and button definitions, and passwords.

CHAPTER 3 – CHANNEL screens

Channel screens are completely discussed in this chapter. The programming of analog and Project 25 digital channels are separated into different sections since they are significantly different.

CHAPTER 4 – ZONE screen

Zone screens are where the channels are assigned to channel positions within a zone. Each zone is a group of 16 channels.

CHAPTER 5 – BANK screen

The bank screen is where the order of zones is assigned within a bank. This is also where special channels, such as Home, Emergency, and Priority channels are assigned.

CHAPTER 6 – Miscellaneous

As implied, this chapter is dedicated to everything else. Some of these features are

- Download to radio
- Upload from radio
- Drag and Drop (Channels and Zones)
- Report Generation

Appendices

APPENDIX A – ENCRYPTION KEYS

The Encryption screens are where the PC Programmer can be used to generate encryption keys to be assigned to channels. A separate entry screen exists for DES keys and AES keys. These encryption keys are the same keys that can be generated by a KVL device, or through Over-The-Air-Rekeying (OTAR).

APPENDIX B – Over-The-Air-Rekeying (OTAR)

This appendix provides a complete overview of the requirements of setting up a radio to operate with the OTAR feature enabled.

APPENDIX C – Fire Features

This appendix provides an overview of programming all PC Programmer aspects of the Fire Features. This includes the various picklists, zone passwords, and the Event Bank programming.

CHAPTER 1.0 INTRODUCTION

PC / LAPTOP REQUIREMENTS

The minimum PC requirements are:

- Pentium computer, 233 MHz or faster
- 16 MB RAM
- Windows 2000 or later (except Windows ME)
- An internet browser
- 10 MB available Hard Drive space
- 600 x 800 video resolution
- Serial RS232 port (usually COM1 or COM2)
- CD-ROM (to install software)

NOTE 1: less capable machines may work, but have not been fully tested

NOTE 2: Windows ME may work, but due to its short time on the market was not tested, and is not supported

Thales Item requirements:

- PC Programmer software
- PC Programmer cable

NOTE: A radio and battery will be required to upload and download between the PC and radio, but is not required to set up the channel configuration

SOFTWARE INSTALLATION

Remove any existing Thales 25 PC Programmer installations using the Windows Control Panel “Add or Remove Programs”.

Insert the CD into the computer. If the computer is set up to auto-run CD’s, a screen will pop up that will guide you through the installation. There are many default computer paths. You may accept these or define your own.

If the install screen does not appear, use explorer to find “Setup.exe” and double-click to start installation. Depending on your computer’s setup, the file extension “.exe” may be hidden. In that case, look for the File entitled “Setup” with an icon that looks like a computer.

Once the software is installed, it may be necessary to restart your computer, depending on what files were installed. The Install program will prompt you if necessary.

RS232 PORT SETUP

The default COM Port is COM 1. If you need (or want) to use a different COM port, follow these steps:

Launch PCProgrammer application

- Desktop Icon if created or click START → Programs → Thales Communications → PCProgrammer

From the File Menu, click TOOLS → OPTIONS → Communications
Select the desired COM port, and click OK.

The required RS232 setup parameters are:

BAUD	9600
DATA BITS	8
PARITY	NONE
STOP BITS	1
H/W FLOW CONTROL	NONE

FILE MANAGEMENT

The Thales 25 files are extremely portable. They may be moved using the Window's explorer or Emailed to other users. It is suggested to create a folder on the computer where all PC Programmer files can be stored. The actual folder name and location is up to the programmer, but a suggestion would be to create a folder called "THALES" in the "My documents" folder. This folder could then be used to store all Thales 25 related files (PC Programmer files, Firmware update files, updated manuals, etc.)

File structure

All PC Programmer files have the extension ".pcp." Each file is also a completely independent file, similar to document or spreadsheet files. They are opened, closed, altered, saved, and Emailed the same as any other files of these types. This is especially useful for creating similar files, or Emailing configurations to various locations to pre-setup radios or gain assistance in troubleshooting the files.

Forward / backward Compatibility

The Thales 25 development team has successfully designed the Thales 25 PC Programmer to ensure that a PC programmer file you create (Version 2.0 or higher) is compatible with a Thales 25 portable radio (Version 4.0 or higher) with any feature set. What this means is that you will be able to create (or use) a channel configuration file that is completely capable of everything that the radio can do with the latest released PC Programmer software, and use it to program a stripped down radio that has not had its firmware updated for several years. Similarly, an obsolete PC Programmer version will be able to program a fully capable, newly updated radio. This was done to enable radio users from all over the country to be able to be programmed by anyone with any version software.

The radio programming will be limited to the lesser capable of the system. For updates, visit the Customer Center Technical Resource Area at *www.thalescomminc.com* (registration required), or contact customer support at 1-800-914-0303.

FILE MENU'S AND SPEEDBAR ICONS

The file menu is used for all setups of the radio, but the SpeedBar offers the ability to do almost all of the same functions with fewer keystrokes. The speedbar should be used whenever possible. Hints pop-up over the speedbar items to let you know what they do. The uses of these functions are discussed in greater detail in the later chapters.

MENU ITEMS

SPEEDBAR

NOTE: In the descriptions below, whenever it states: "Creates a NEW", a new object is created, this is not used to select a group of objects (for example channels)

Open New File

Open an existing file

Save File

Close file

Create a NEW bank

Create a NEW zone

Create a new channel

Adds a new CryptoGroup (OTAR only)

Adds a new KeySet (OTAR only)

Create a new DES key

Create a new AES key

Create a Event Zone

Download file to radio

Upload file from radio

Generate report

Drag and Drop Tool – Opens configuration to be able to drag and drop channels and zones

ABILITY TO CUSTOMIZE VIEW OF PC PROGRAMMER

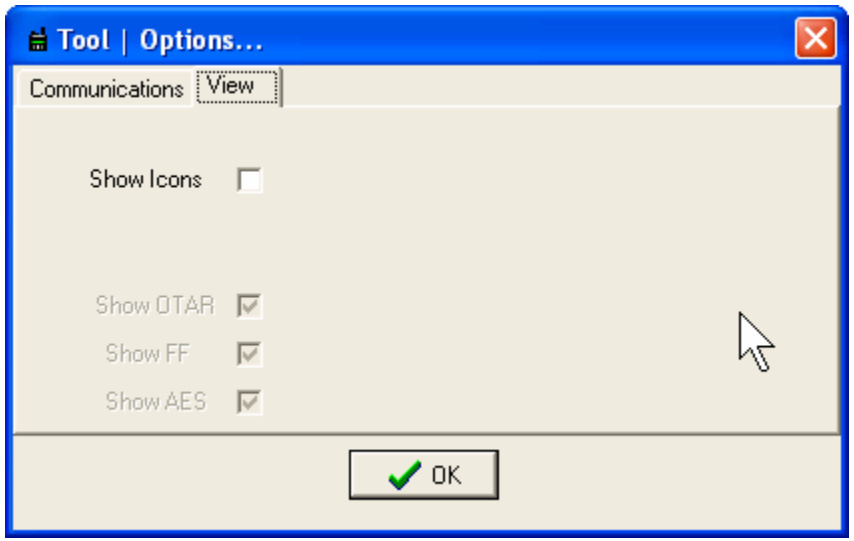
The Thales 25 programmer is versatile enough to program all Thales 25 radios. While this flexibility is innovative, we recognize that not all radio users want all features. As a result, we have added the ability to hide all fields associated with major features to simplify programming for users that do not intend to use them.

The fields that may be disabled in the PC Programmer 5.0 release are:

- OTAR
- Fire Features
- AES

To access this tool:

- CLOSE any configuration that may be open.
- Click Tools → Options
- Choose the VIEW tab, and check / uncheck the desired features.



If a configuration file that does not match the current working environment is opened, the programmer will be provided the option to convert the file or automatically switch to the supporting view.

STARTING A CONFIGURATION

There are two ways to work on a channel configuration. A brand new configuration can be created from scratch, or an existing configuration can be modified.

Starting from scratch

Click on the "Open New file" button  A new configuration will be created. Expand this by double-clicking on the folder. Start filling out the details (covered in the other chapters).

Starting from an existing configuration

New in Version 3.1: You may find the desired file using Windows and double-click on it. This will open the file and application if necessary.

Click on the "Open an existing file" button.  A dialog box will appear. Browse to the channel configuration file you want to work from, then click open. An alternative way would be to choose FILE → OPEN from the Menu List. Double-click on the file and start filling out the details.

COMPLETING THE RADIO CONFIGURATION

Detailed instructions are provided in each chapter, but to get started, the programmer should start at the bottom of the tree with “Global” and work their way up the tree. When starting with a brand new configuration, there are no objects – they all need to be created. The reason for starting at the bottom is to have some Keys to assign to Channels, some channels to assign to zones, and some zones to assign to banks.

This progression would be:

- Global
- Keys (skip if not using encryption)
- Keysets (skip if not using OTAR)
- CryptoGroups (skip if not using OTAR)
- Channels
- Zones
- Banks

The new Fire Features picklists (A/D TXSQ, Talkgroup, and P25 UnitID) are independent and may be filled out at any time. If any Main Bank items will be copied into the Event Bank, they should be created first.

As experience is gained, each programmer will develop the style that works best for them.

Filling out Fields

As the various screens are filled out, there will be several types of input requested.

Text Boxes

These are the input fields on the various screens that require freelance typing. Limits do exist (such as maximum characters for the channel and zone names and frequency checks for the RX and TX frequencies). The program automatically checks all fields or protects against entering invalid data, and alerts the programmer.

Combo Box (a.k.a Drop-Down boxes)

These have a triangle next to them indicating that a list is present for the programmer to select from (an example is Power Levels on the channel screen). To enter data, click on the triangle, select the desired value, and press enter.

Radio Button

These are the round boxes that force the programmer to choose between a set of values. An example of these in the Channel MODE – the programmer must select Analog or Digital, but not both.

Check Boxes

These are a list of square boxes that are checked or clear. The programmer may select as many of these as desired.

List Boxes

List boxes are used on screens such as the Bank and Zone screen. As an example, a list of available channels is provided in a list box (in alphabetical order) to be assigned to a channel selector position within the zone.

HEX / DEC Button

The hex / dec button can be used to convert the numeric format of the Identifiers on the Global screen, and various fields on the channel screen. Whatever the box is displaying is the numeric format being displayed.

SAVING CONFIGURATION

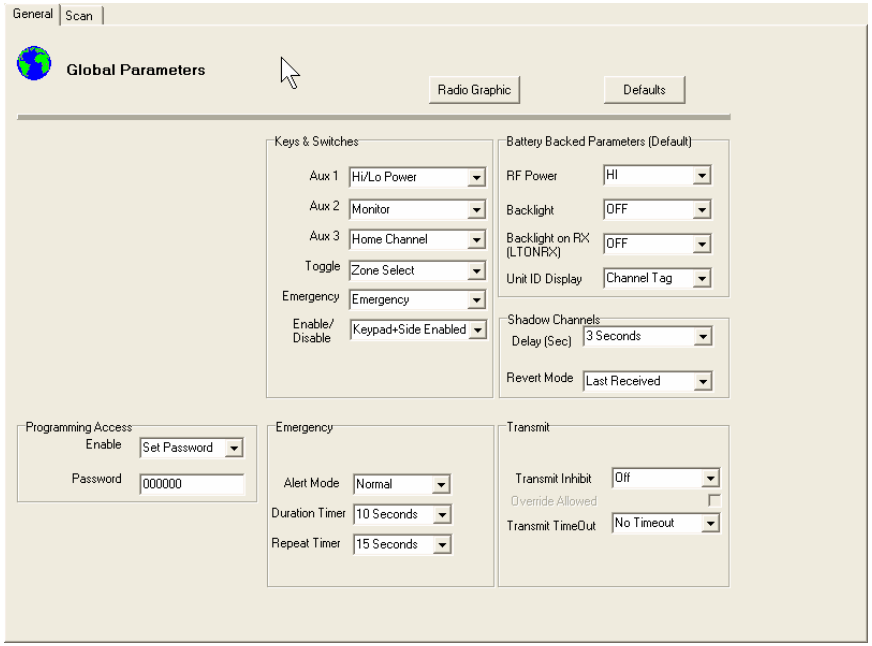
When finished, choose "FILE → Save" if saving as the same file, or "FILE →Save As" if the older configuration is desired to be kept. The speedbar button "Save" can also been used.

CHAPTER 2.0 GLOBAL SCREEN

The Global are split into 2 screens, accessible by the tabs – Scanning setups are done on the SCAN tab. Everything else is done on the GENERAL tab.

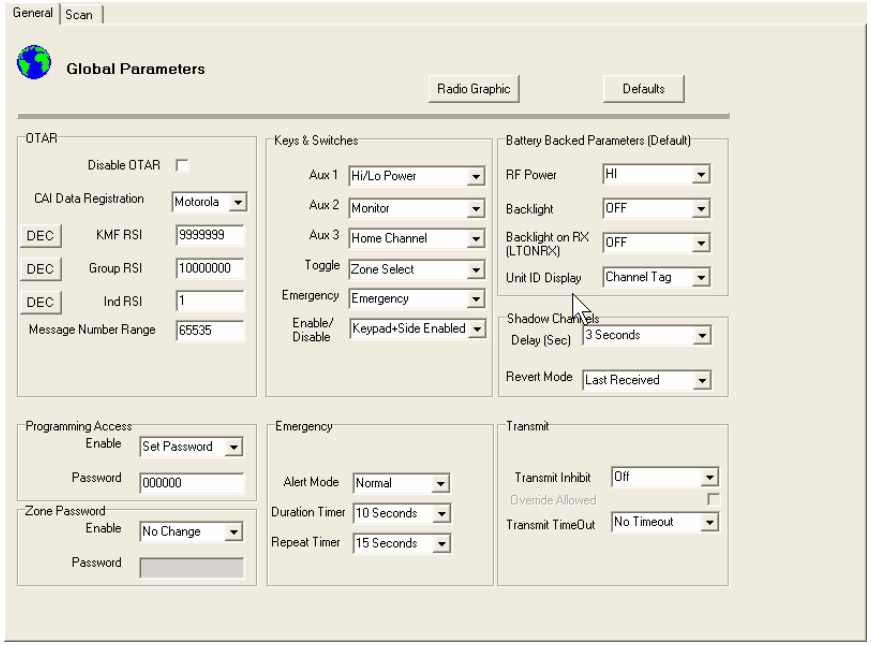
The view below (GENERAL TAB) is shown after hiding the OTAR and Fire Features view by the following sequence:

Tools → Options → View → uncheck OTAR and Fire Features.



The following screen is shown with all options turned ON. If fields are filled out then sent to a radio that doesn't support them, they will be ignored.

If files are opened that have additional features that the current view doesn't support, the programmer will be given the option to automatically switch to the desired view.



GLOBAL SECTIONS

For simplicity, the Global screens are broken down into several groups of similar items. These are:

GENERAL TAB

- OTAR specific items
- Programming Access
- Zone Password (new for Version 4.0)
- Keys and Switches
- Emergency
- Battery Backed Parameters (Default) (New for Version 4.0)
- Shadow Channels
- Transmit Limiters

SCAN TAB

- Normal Scan settings
- Priority Scan settings

(optional) OTAR specific items (not visible if OTAR is hidden)

These items are used for OTAR enabled radios. If the radios being programmed are not OTAR-enabled, these fields are ignored.

- Disable OTAR
- CAI registration
- KMF RSI (Radio Set Identifier)
- Group RSI
- Ind RSI
- Message Number Range

(optional) Fire Features items (not visible if Fire Features is hidden)

These items are used for Fire Features enabled radios. If the radios being programmed are not Fire Features enabled, these fields are ignored.

- Zone Password (Enable and Password)

FIELD DEFINITIONS

OTAR Specific Items (not visible if OTAR is hidden)

The various identifiers can be entered in Decimal (Default) or Hexadecimal.

They are not needed until Project 25 OTAR will be used. In addition, all RSI's are not needed unless OTAR will be used.

Disable OTAR

This checkbox allows the radio programmer to disable all OTAR functions in an OTAR enabled radio. When checked, OTAR is disabled. When unchecked (default), OTAR is enabled. Note that the radio must have the OTAR option for this to have any effect.

KMF RSI (OTAR only - default 9,999,999)

The Key Management Facility (KMF) Radio Set Identifier (RSI) is used to designate which KMF is to be used by the portable to be Over-The-Air-Rekeyed (OTAR). KMF's are infrastructure network devices that are used to manage and update all encryption keys of all validated radios.

Group RSI (OTAR only – default 10,000,000)

This field is to install a group RSI into the radio, which is usually immediately overwritten by the KMF. There is usually no need to change it from the default at this time.

Ind RSI (OTAR only – default 1)

The Ind RSI being on the Global screen is a holdover from prior releases. It should be entered on the download pop-up window. In a later release, it is anticipated that this will be removed from the Global screen.

Message Number Range (OTAR only – default 65535)

This is an anti-spoofing feature. The default setting effectively disables this feature.

PROGRAMMING ACCESS

The Programming Access area is where password options are set. If the password is set, it will be needed to access the PROGRAM, ALERTS, and KMGR (Key Manager) screens. Factory default passwords in the radios are "000000". The choices are:

Enable (default NO CHANGE)

Sets password preferences. The choices are:

- No change – does not alter the password already in the radio
- No password – allows keypad programming without a password
- Set Password – allows a programmer specified password – password can be changed by the keypad
- Set and Lock – allows a different password to be specified and prohibits changing it from the keypad
- Not Allowed – prohibits the user from accessing or keypad programming

Password (default N/A, "000000" when activated)

Allows the programmer to specify the 6 digit numeric password.

ZONE PASSWORD (FIRE FEATURES ONLY)

The zone password is a feature that allows programmers to protect desired zones in the main bank. The desired zones are selected in the zone screen. The Global screen section allows the password to be activated / deactivated and set.

If a zone is protected, it will require a password to change it by keypad programming, cloning, or PC Programming.

IMPORTANT NOTE: Any channel that is in a zone that is password protected will become password protected. If that channel is used in an unprotected zone, it will require that zone to become protected. If this situation arises, it is recommended to use 2 different channels – one to assign to the protected zones, and 1 to assign to the unprotected zones.

Enable – Activates or de-activates the password. Selections are "No change", No Password", and "Set".

Password – Specifies the password value (6 digits) when enabled

KEYS AND SWITCHES

Programmable Side Buttons (Aux 1, Aux 2, and Aux 3) (All are defaulted to Disabled)

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.

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 – can also be used for Priority Scan***

(This list is in alphabetical order)

Backlight – Toggles the radio's backlight from OFF to (BRIGHT+RX) to (DIM+RX) to BRIGHT to DIM with each side 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 for channels programmed with encryption enabled ONLY (will not affect channels without encryption enabled). RX encryption is unaffected. Globally affects radio. The individual channel screens now include an encryption lock option. If this is checked, this button will have no affect (encryption will stay enabled)

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 and side keys through the lockout sequence below.

Keypad enable, Side/Toggle enabled
Keypad disabled, Side/Toggle enabled
Keypad disabled, Side/Toggle 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>. If the side keys are disabled, this alternate method of re-enabling everything must be used.

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), the ZONE will revert to the first zone programmed into the radio.

Priority Scan – Toggles the scan mode from OFF to ON. Globally affects radio. Note that the priority scan operates independently from SCAN.

Scan – Toggles the scan mode from OFF to ON. Globally affects radio. If this button is held for about 1 second, the radio enters SCAN and PRIORITY SCAN.

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 side 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 (Default Disabled)

The three-position toggle switch, located on top of the radio can be programmed using the PC Programmer for the following:

NOTE: The most commonly used toggle switch function is:

- Radios with 2 or 3 zones: **ZONE SELECT**
- Otherwise: **MONITOR or SCAN**

(This list is in alphabetical order)

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

Encryption – Toggles TX encryption from OFF to ON for 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 Select (Previously Scan) – Provides options for Normal Operation, regular scanning, priority scanning only, or scanning and priority scanning. Position C is reserved for all scan modes OFF. Positions A and B are programmable for scan and priority scan to be turned ON or OFF. Globally affects radio.

To program Positions A and B, select Scan Select, and choose from the following options:

Scan OFF / Prscan OFF
Scan OFF / Prscan ON
Scan ON / Prscan OFF
Scan ON / Prscan ON

NOTE: To redefine the Scan Select parameters, click on Scan Select which will cause the scan definition window to appear.

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) (Default DISABLED)

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.

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 have 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.

Zeroize – Will erase all encryption keys in the radio.

Enable / Disable

This function controls the access to the keypad, side keys, and toggle switch after initial download. User access to turn them back on is still provided, except in the "Keypad Locked & Disabled" option. The side keys and toggle switch control are combined.

Keypad + Side Disabled – This option shuts down the keypad, side keys, and toggle switch, but allows the operator to regain access by pressing and holding the "circle" key, then pressing and holding the <ENTER> key.

Keypad Disabled – This option shuts down the keypad, but allows the operator to regain access by pressing and holding the "circle" key, then pressing and holding the <ENTER> key.

Keypad Locked & Disabled – This option shuts down the keypad and does not allow access to turn it back on.

Keypad + Side Enabled – This option allows complete access to the keypad, side keys, and toggle switch.

EMERGENCY

The Emergency mode is activated only when the Emergency Button is defined as “Emergency”.

Emergency mode is normally used only in Project 25 signaling, and automatically sets the Project 25 Emergency bit to alert the console or other radio users. It cycles repeatedly until deactivated by the user (turning the radio OFF, or pressing the Emergency button again).

Alert Mode (default NORMAL)

The Alert Mode can be set to NORMAL, which generates an audio tone when activated, or SILENT which suppresses the tone.

Duration Timer (default Minimum)

The duration timer is the length of time the transmitter is ON during each transmission.

Minimum – transmit only long enough to send the Emergency bit

10 seconds – transmits for 10 seconds

Open mic – continually transmits (should be used with caution)

Repeat Timer (default 15 seconds)

The Repeat timer is set to the length of time that the Emergency cycle repeats. As an example, if the duration timer is set for 10 seconds and the repeat timer is set for 15 seconds, each cycle will consist of transmitting for 10 seconds and receiving for 5 second.

Available values are 15 seconds, 1 minute, or 5 minutes.

BATTERY BACKED DEFAULT PARAMETERS

Many battery backed parameters default values can now be set by the radio programmer. Battery backed values return to their original state after the battery has been removed for some time (varies with each radio, but is usually in the range 10 – 60 minutes). Some examples of these are the bank returning to Bank1, HI / LO power returning to LO power, etc.

The default Bank is set on the Bank screen. Many others are set here. These values may be changed by the user, but if the battery is left off for an extended time, the radio will return to these values.

RF Power (HI (default)/ LO)
The RF Power level programmed into the radio.

Backlite (OFF (default)/ DIM / BRIGHT)
The backlite setting. Extra current is used when the backlite is ON. Minimal battery life reduction will result.

Backlite on RX (OFF (default)/ ON)
Used in conjunction with DIM or BRIGHT to turn the backlite on when a signal is received. The backlite must be turned ON for this to function.

Unit ID Display (Channel Tag (default) / Unit ID Display On a Project 25 signal, allows the UnitID to be displayed when a signal is received. If used, it returns to the channel tag when reception is complete.

TRANSMIT LIMITERS

There are a few transmit control parameters that are entered in this section.

Transmit Inhibit (default OFF)

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:

OFF	All transmissions are allowed
CARR	Prevents transmissions on a busy channel (if any RF is detected – any modulation)
TONE	Prevents transmissions on a busy channel with analog squelch values (CTCSS or DCS) other than programmed for RX
NAC	Prevents transmissions on a busy P25 channel with a different NAC than programmed for RX
P25 busy	Inhibits transmissions if P25 status bits indicate “BUSY”. This is particularly useful when using automated data modes.

The override function (if enabled) allows “double-clicking” the PTT button to override the Transmit Inhibit function.

SHADOW CHANNELS

This section sets the characteristics of the shadow channel reply. It is similar to the scan reply parameters.

Delay (default 5 seconds)

This sets the dwell time that the radio stays on a shadow channel after a signal is detected. This may be set from 0 seconds to 15 seconds.

Revert Mode (default LAST RECEIVED)

Sets what channel the radio will reply back on. Last Received replies on the shadow channel received. "Last selected" will transmit on the selected primary (or other selected shadow) channel.

Transmit Timeout (default OFF)

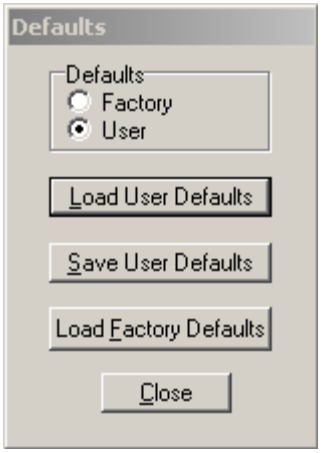
Transmit Timeout allows the radio to have a preset time that shuts the transmitter down after that pre-determined time. This is especially useful to prevent accidental long transmissions due to the PTT button being accidentally pressed. Transmit timeout is defaulted to OFF, but can be programmed from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

DEFAULT SELECTIONS (GLOBAL)

The global default section can be used to store desired global values once they have been selected.

EVERY TIME A NEW CONFIGURATION IS CREATED, the parameter values are created with the defined defaults.

The top section is used to choose whether to use the factory or user-defined defaults effective with the creation of new configurations.



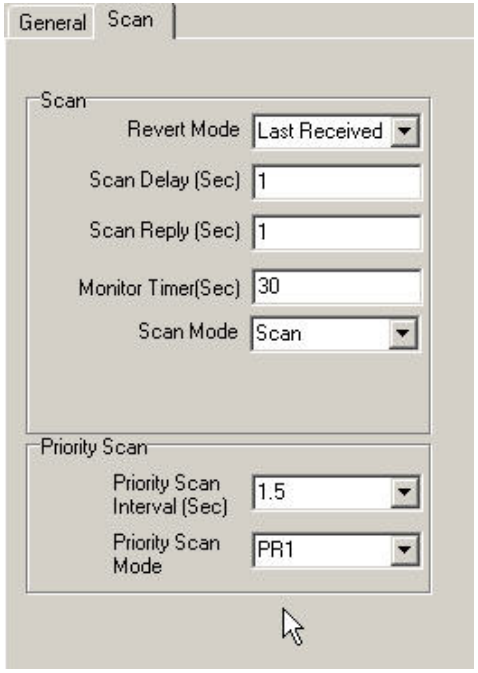
LOAD USER DEFAULTS overwrites the current Global with the user-defined defaults.

SAVE USER DEFAULTS saves the current Global settings into the user-defined defaults.

LOAD FACTORY DEFAULTS loads the factory defaults into the current Global.

SCAN (ON SCAN TAB)

The SCAN section in Global is used to define the Revert Mode and Various Scan Timers.



Scan Revert Mode (default LAST RECEIVED)

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

Scan Delay Timer

The recommended starting value is 1 or 2 seconds.

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

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 recommended starting value is 1 or 2 seconds.

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

Recommended starting values vary with application. For busy voice traffic where monitoring more channels is desired, this number may be lowered. A monitor timer of less than 10 seconds is NOT recommended (except 0, which is override). 90 seconds is a recommended starting value.

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.

Scan Mode

Scan mode is a Battery-Backed Parameter, so it may be changed by the user via keypad, but will return to this programmed state if the battery is removed for an extended period of time.

SCAN

Will scan all channels marked as scanlist channels in the current zone, and the currently selected channels.

ZONE

Will scan all channels marked as scanlist channels in the current zone PLUS all channels marked as scanlist channels in all zones marked as scanlist zones. The current channel and zone are considered in the scanlist.

SEARCH

Scans all channels programmed in the radio regardless of scanlist designation.

REFER to the Thales 25 Detailed User's Manual for more details and an example.

PRIORITY SCAN

Priority scan now interrupts receive signals. With the exception of turning it ON or OFF, it is now also programmable by the PC Programmer.

Priority Scan Interval

Determines how often the Priority Scan samples for RF traffic. It may be set for 1.0 to 5.0 seconds in ½ second increments. The default is 1.5 sec. Setting to a fast rate reduces audio intelligibility, but receives priority signals faster. Setting this to a slower rate increases audio intelligibility, but causes delays in receiving priority channel receptions. The default rate is based upon early field testing preferences.

Priority Scan Mode

The option previously available in the radio of OFF is no longer available. It has been separated into its own function, which allows the radio to be in SCAN MODE or PRIORITY SCAN mode or BOTH.

The choices are now PR1 (default) and PR1 + PR2. It is recommended to only use PR1 scanning unless scanning 2 channels is absolutely required for maximum audio clarity.

CHAPTER 3.0 CHANNEL SCREEN

NOTE: If encryption keys will be used, refer to ***Appendix A – Encryption Keys*** for details. If encryption keys will be created with the PC Programmer, create them prior to building channels.

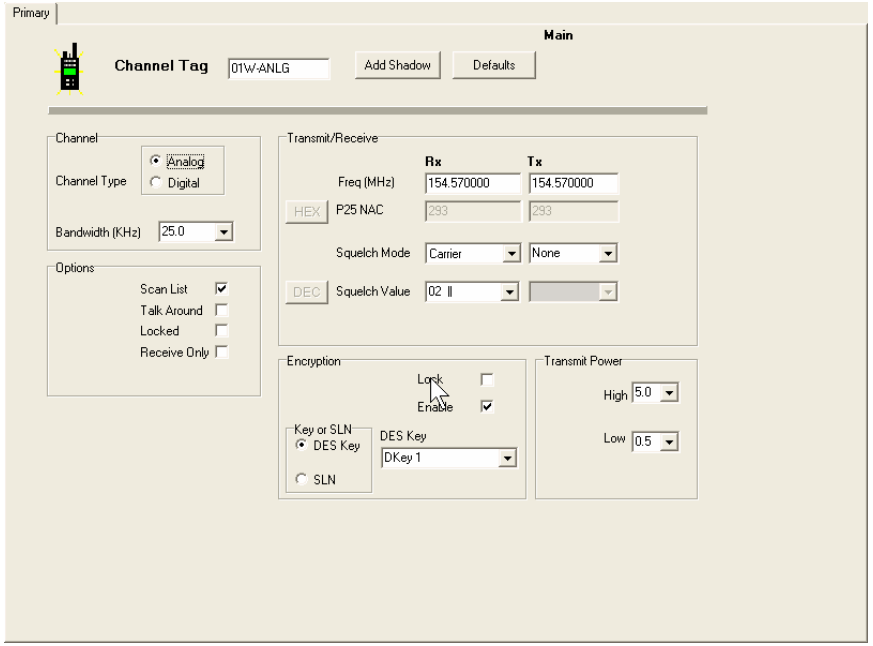
The channel setup explanations have been split into separate analog and digital channels for simplicity. Shadow channels can be used with either type and will be discussed separately.

To create a new channel (any type), click on the "Create new channel" icon. 

To edit / view existing channels, click on the desired channel in the treeview.

NOTE: Be sure to read the DEFAULT section at the end of this chapter. Understanding it will help to speed channel configuration setups.

ANALOG CHANNELS



To make the channel an Analog channel, select Channel type = "ANALOG". Fill out the remaining channel parameters. The section "Analog Channel Definitions" provides more details if they are needed.

NOTE: With this programmer, it is important to fill out the "RX" parameters first; they are always copied to the "TX" parameters, which then may be changed. (If the "TX" parameter is entered first, it will be modified when the "RX" parameter is entered.)

LEGACY ANALOG SYSTEMS

Most of the time when an analog frequency owner provides channel information, it will be from an old system and they are unaware of all the options provided in this radio. In addition, most of the time it will be an analog channel and they are unaware of the existence of digital channels

An example of the information that is given is:

TX Frequency = xxx
RX Frequency = yyy
PL tone = tone (i.e. 82.5 Hz) or code (i.e. YZ)

> CTCSS is the standard name for other brand names such as PL, Private Line, CodeGuard, Tone, and various other names. They will also be given in either the actual tone representation or a code representation. Both are provided in the drop-down list.

Usually no other information is provided. In that case, make the following assumptions unless told otherwise:

Channel Type = Analog
BW = 12.5 kHz for federal users, 25.0 kHz for all others
RX Squelch Mode = Carrier
RX Squelch Level = 2
Encryption = Disabled
TX Squelch Type = CTCSS

Other parameters are at the radio programmer's discretion.

ANALOG CHANNEL DEFINITIONS

Channel

Channel Type (default Digital)

Must be set to Analog for analog FM channels.

Bandwidth (default is 25.0 kHz for Analog Channels)

Choices are 25 kHz (default) and 12.5 kHz. Federal users should be using 12.5 kHz. Other systems may be at 12.5 kHz or 25.0 kHz. Ensure this is set correctly.

The following will occur if the bandwidths are not matched:

Thales 25 is set to Analog 12.5 kHz:

- Transmitting to a 25 kHz system – will seem quiet to receiving radio.
- Receiving from a 25 kHz system – will be distorted, but audible.

Thales 25 set to Analog 25 kHz:

- Transmitting to a 12.5 kHz system – depending on the receiving equipment, will either be distorted or no communication at all since not all equipment can handle overdeviated signals (squelch blocking).
- Receiving from a 12.5 kHz system – received signal will seem quiet.

Options

Scan List (default unchecked)

This check box is used to preload the channel as a tagged scanlist channel when it is downloaded to the radio.

Talk Around (default unchecked)

This check box is a “talkaround enable”. Unless it is checked, talkaround mode will not be allowed on this channel when it is downloaded to the radio. If this is not a repeater channel, the value of this field does not apply.

Locked (default unchecked)

Checking this box locks all parameters of the channel when it is downloaded to the radio. Keypad programming will NOT be allowed on this channel (Keypad programming will still be allowed on all other channels or blank channels.)

Receive Only (default unchecked)

Checking this box will force all TX parameters to “0”, disabling transmit on the channel.

Transmit / Receive

RX Freq and TX Freq (default blank)

Enter RX Frequency first. The TX frequency will be copied from the RX frequency. The valid ranges are 136.000000 MHz to 176.000000 MHz. Splinter frequencies are allowed. All frequencies entered must be in 2.5 kHz steps. If an incorrect frequency is entered, the program will alert the programmer.

Squelch Modes and Values

Enter in the following order

- RX Squelch Mode
- TX Squelch Mode
- RX Squelch Value
- TX Squelch Value

RX and TX squelch modes may be mixed (i.e. RX Carrier with TX CTCSS)

For analog channels the squelch mode options are carrier squelch, CTCSS, and DCS.

Carrier Squelch (RX only)

NOTE that the TX equivalent is NONE. Some will also refer to this as CSQ.

This is the mode that only looks at RF level and provides noise if the level is set incorrectly. It ignores all CTCSS and DCS squelch tones and will open squelch on any FM analog signal. The Carrier squelch value should always be set to a value of “2” to provide maximum range and increased in value if external interference is a problem.

CTCSS

Many other manufacturers refer to this as many different names, “PL”, “Private Line”, “Tone”, “CodeGuard”, etc.

This is typically always set on the TX side for repeater channels and is optional on the RX side. For DIRECT radio communications, it is optional. If used, it will provide some filtering from other users of the same frequency.

The CTCSS tones are either provided as the actual audio tone (i.e. 127.3 Hz) or the Code (i.e. 3A). The dropdown list provides both – select the required tone.

The 42 valid CTCSS tones are:

67.0 Hz (XZ)	97.4 Hz (ZB)	141.3 Hz (4A)	206.5 Hz (8Z)
69.3 Hz (WZ)	100.0 Hz (1Z)	146.2 Hz (4B)	210.7 Hz (M2)
71.9 Hz (XA)	103.5 Hz (1A)	151.4 Hz (5Z)	218.1 Hz (M3)
74.4 Hz (WA)	107.2 Hz (1B)	156.7 Hz (5A)	225.7 Hz (M4)
77.0 Hz (XB)	110.9 Hz (2Z)	162.2 Hz (5B)	229.1 Hz (9Z)
79.7 Hz (WB)	114.8 Hz (2A)	167.9 Hz (6Z)	233.6 Hz (M5)
82.5 Hz (YZ)	118.8 Hz (2B)	173.8 Hz (6A)	241.8 Hz (M6)
85.4 Hz (YA)	123.0 Hz (3Z)	179.9 Hz (6B)	250.3 Hz (M7)
88.5 Hz (YB)	127.3 Hz (3A)	186.2 Hz (7Z)	254.8 Hz (07)
91.5 Hz (2Z)	131.8 Hz (3B)	192.8 Hz (7A)	
94.8 Hz (2A)	136.5 Hz (4Z)	203.5 Hz (M1)	

DCS

Many other manufacturer's refer to this as other names, the most notable being "DPL". There are not many of these systems in the field, so many will never encounter them.

The 83 valid DCS tones are:

023	114	174	315	445	631
025	115	205	331	464	632
026	116	223	343	465	654
031	125	226	346	466	662
032	131	243	351	503	664
043	132	244	364	506	703
047	134	245	365	516	712
051	143	251	371	532	723
054	152	261	411	546	731
065	155	263	412	565	732
071	156	265	413	606	734
072	162	271	423	612	743
073	165	306	431	624	754
074	172	311	432	627	

Encryption (default unchecked)

Enabled

This is the field to assign an encryption key to a channel. When the encryption checkbox is checked, the DES Key / SLN and Key selection fields become visible.

DES Key or SLN

DES Key contains keys that are made in the DES Key screen.

SLN (other manufacturer's call this CKR) is a slot that will be designated for a key to be assigned to. The SLN is then indexed to the channel.

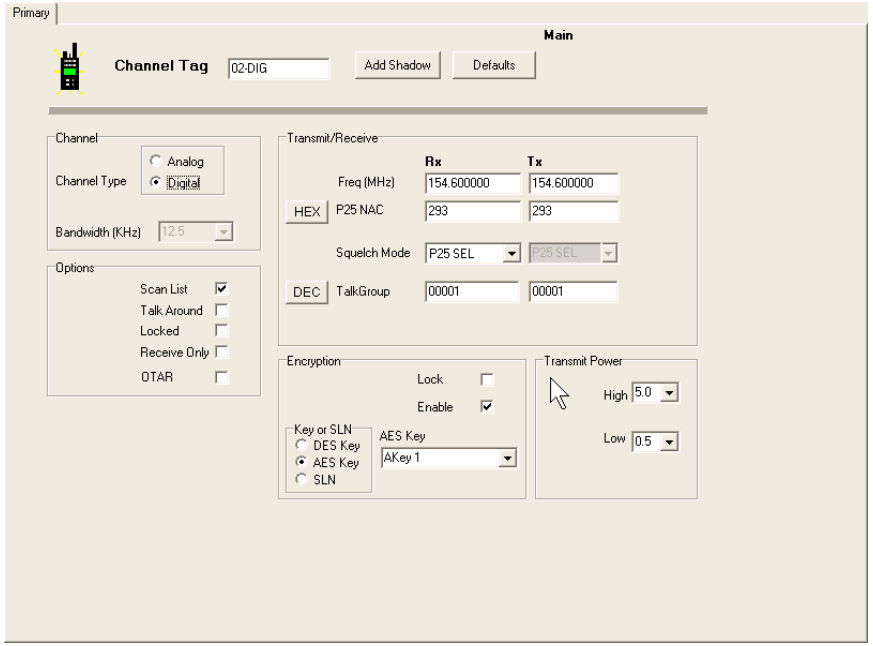
DES Key / SLN (value)

Clicking this dropdown box lists all created keys or SLN's. If none are listed, go back and create them first.

Transmit Power (default Low 1.0W, High 5.0W)

These dropdown boxes provide the RF HI / LO settings that can be selected by the radio operator. There are no restrictions, such as HI power must be higher than LO power, etc. The possible values are 0.1W, 0.5W, 1.0W, 2.0W, and 5.0W.

DIGITAL CHANNELS



To make the channel a Project 25 Digital channel, select Channel type = “DIGITAL”. Fill out the remaining channel parameters. The section “Digital Channel Definitions” provides more details if they are needed.

NOTE: With this programmer, it is important to fill out the “RX” parameters first; they are always copied to the “TX” parameters, which then may be changed. (If the “TX” parameter is entered first, it will be modified when the “RX” parameter is entered.)

DIGITAL CHANNEL DEFINITIONS

Channel

Channel Type (default Digital)

Must be set to Digital for Project 25 Digital channels.

Bandwidth (default 12.5 kHz)

Must be 12.5 kHz.

Options

Scan List (default unchecked)

This check box is used to preload the channel as a tagged scanlist channel when it is downloaded to the radio.

Talk Around (default unchecked)

This check box is a “talkaround enable”. Unless it is checked, talkaround mode will not be allowed on this channel when it is downloaded to the radio. If this is not a repeater channel, the value of this field does not apply.

Locked (default unchecked)

Checking this box locks all parameters of the channel when it is downloaded to the radio. Keypad programming will NOT be allowed on this channel (Keypad programming will still be allowed on all other channels or blank channels.)

Receive Only (default unchecked)

Checking this box will force all TX parameters to “0”, disabling transmit on the channel.

OTAR (OTAR radios only – default OFF)

Checking this box designates that the channel will be used for data registration and OTAR.

Transmit / Receive

RX Freq and TX Freq (default blank)

Enter RX Frequency first. The TX frequency will be copied from the RX frequency. The valid ranges are 136.000000 MHz to 176.000000 MHz. Splinter frequencies are allowed. All frequencies entered must be in 2.5 kHz steps. If an incorrect frequency is entered, the program will alert the programmer.

RX and TX NAC's (default 293)

The Project 25 is primarily used for repeater access similar to Analog channel CTCSS tones. The values must be Hexadecimal 001 to FFF, and may be entered in Hexadecimal or Decimal. Some special values are:

293	default
F7E	opens on all NAC's (as interpreted by portable)
F7F	opens on all NAC's (as interpreted by portable)

RX Squelch Modes

The following Project 25 squelch modes may be selected (Encryption is not included in this section):

P25MON

Project 25 Monitor Squelch Mode -opens on all valid Project 25 signals (similar to open squelch in Analog)

P25NOR

Project 25 Normal Squelch Mode – NAC's must match, but Talkgroups are ignored

P25SEL

Project 25 Selective Squelch Mode – NAC's and Talkgroups must match

Talkgroups

Talkgroups are an additional filtering mode not available in Analog FM channels. It allows multiple groups to share a repeater. Valid values are "00001" to "65535" decimal. They may be entered in decimal (default) or hexadecimal. Some special values are:

00000	reserved for individual calls
00001	default
65535	open on all values

Encryption (default unchecked)

Enabled

This is the field to assign an encryption key to a channel. When the encryption checkbox is checked, the DES Key / AES Key / SLN and Key selection fields become visible.

DES Key or AES Key or SLN

DES Key contains keys that are made in the DES Key screen.

AES Key contains keys that are made in the AES Key screen.

SLN (other manufacturer's call this CKR) is a slot that will be designated for a key to be assigned to. The SLN is then indexed to the channel.

DES Key / AES Key / SLN (value)

Clicking this dropdown box lists all created keys or SLN's. If none are listed, go back and create them first.

Transmit Power (default Low 1.0W, High 5.0W)

Same as analog

Shadow Channels

The Thales 25 portable uses shadow channels to operate in Mixed – Mode operation. Up to 7 shadows may be created per primary channel. Every shadow channel counts as one of the 256 channels.

To create a shadow channel, make sure the desired primary channel or one of its shadows is displayed, and then click on “SHADOW”. The shadow channel will appear with a TAB. The tabs are how to switch back and forth between the primary channel and various shadow channels.

Parameters that can be changed in shadow channels:

General parameters

- Channel tag (Channel name)
- Channel type
- Bandwidth
- Encryption keys / SLN’s

Digital parameters

- NAC’s
- Squelch mode (P25MON, P25NOR, P25SEL)
- Talkgroups

Analog Parameters

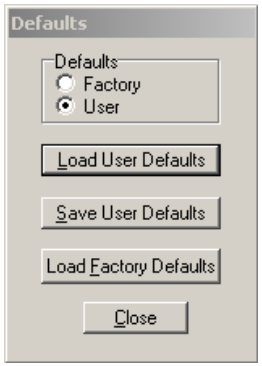
- Squelch Mode (Carrier, CTCSS, DCS)
- Squelch values

All others must remain the same as the primary channel and are locked.

DEFAULT SELECTIONS (CHANNEL)

The channel default section can be used to store commonly used values. It can be changed at any time during the process of creating a channel configuration.

EVERY NEW CHANNEL is created with the defined defaults, except for the channel name.



The top section is used to choose whether to use the factory or user-defined defaults effective with the creation of new channels.

LOAD USER DEFAULTS overwrites the current channel with the user-defined defaults.

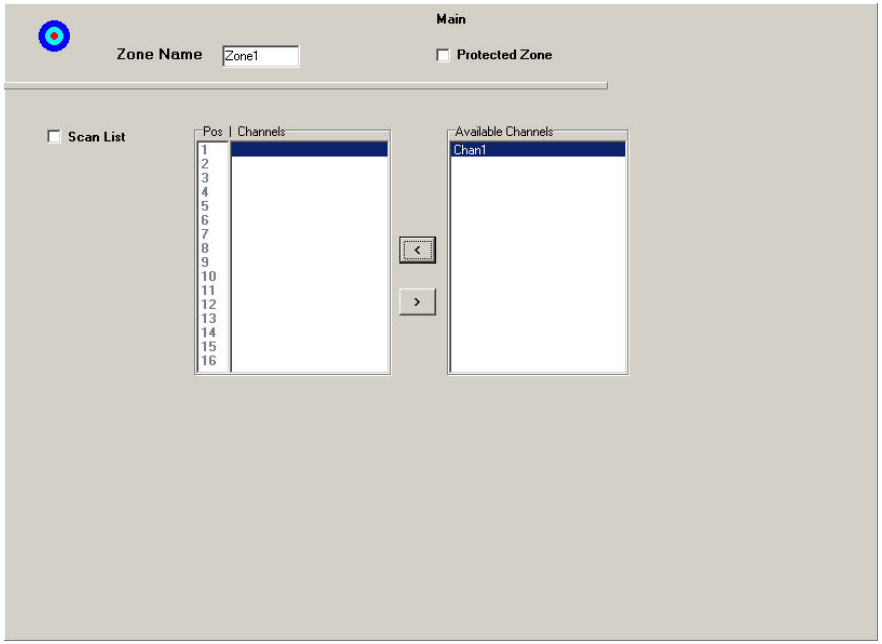
SAVE USER DEFAULTS saves the current channel settings into the user-defined defaults.

LOAD FACTORY DEFAULTS loads the factory defaults into the current channel.

CHAPTER 4.0 ZONES SCREEN

A zone is a group of up to 16 channels. The Zones Screen is primarily used to assign channels to their channels position within a zone. It can also be used to pre-assign a zone is the scanlist.

To create a new zone, click on the “Create New Zone” icon. To edit / view existing zone, click on the desired zone in the treeview.



ZONE NAME

This is where the 8 character alphanumeric name is entered.

SCAN LIST

Checking this box will pre-assign the zone into the scan list.

PROTECTED ZONE

Checking this box will protect the zone. If a zone is protected, a zone password must be entered on the Global screen. Protected zones can not be altered by the keypad, cloning, or PC programming without entering the password.

Zone protection is available on Fire Feature enabled radios only.

AVAILABLE CHANNELS

This is a list of all available channels programmed into the radio.

CHANNELS

This is a list of channels that have been assigned to a position or positions available that can be assigned.

ASSIGNING AVAILABLE CHANNELS TO CHANNEL POSITION

To assign a channel to a position, scroll down the available channel list box. Once the desired channel is found, click on it. It will be highlighted in Blue.

At this point, click on the position it is to be assigned. It will also be highlighted in blue. Click on the arrow button between the screens indicating that the channel will be assigned to the assignment section.

To remove a channel, highlight the channel to be removed, and click the arrow button indicating it will be removed.

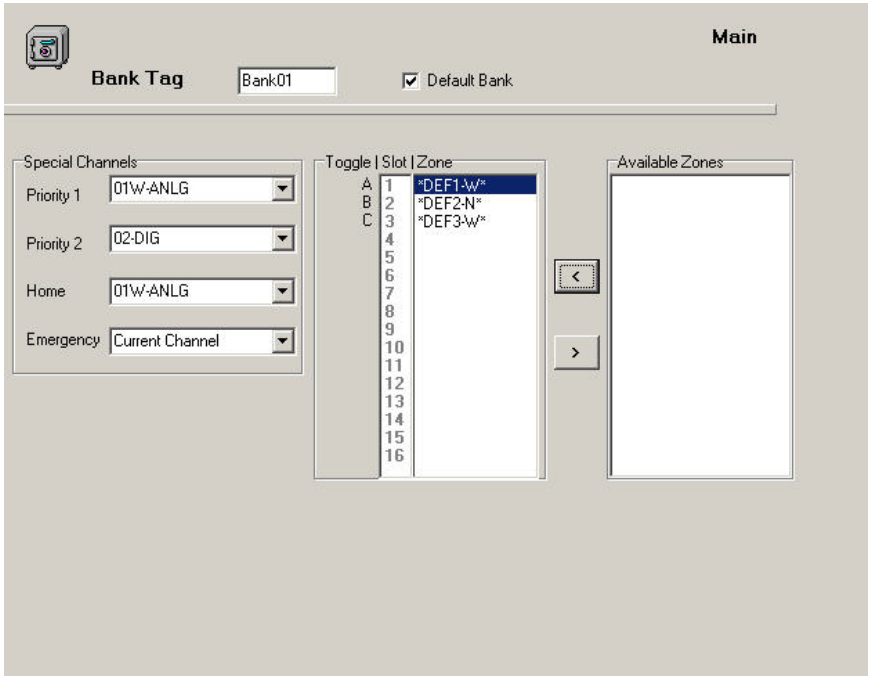
NOTE: There are no restrictions on channels. They may be assigned to multiple positions. Positions may be left blank.

CHAPTER 5.0 BANKS SCREEN

IMPORTANT NOTE: Zones must be assigned to a Bank to be downloaded to the radio.

The Banks screen is used to assign zones into a bank.

To add a new bank, click on the “Create new bank” icon. 
To edit / view an existing bank, click on the desired bank in the treeview.



BANK TAG

The Bank tag is the 8 character alphanumeric name that can be assigned.

SPECIAL CHANNELS

This section is where the special channels can be assigned (Home, Emergency, and Priority channels). To select them, click on the dropdown box. All channels programmed in the radios will be listed in alphabetical order. Choose the desired channel and click to select it. The defaults are also provided to leave the channels unassigned.

If the Emergency channel or Priority channels are not assigned, the radio's currently selected channel will be used for the mode when selected.

AVAILABLE ZONES

This is a list of all available zones programmed into the radio.

ZONES

This is a list of zones that have been assigned. Note the special positions A, B, and C, which designates the position that is used in the 3-position toggle switch, is defined as "Zone Select".

ASSIGNING AVAILABLE CHANNELS TO CHANNEL POSITION

To assign a zone, scroll down the available zone list box. Once the desired channel is zone is found, click on it. It will be highlighted in Blue.

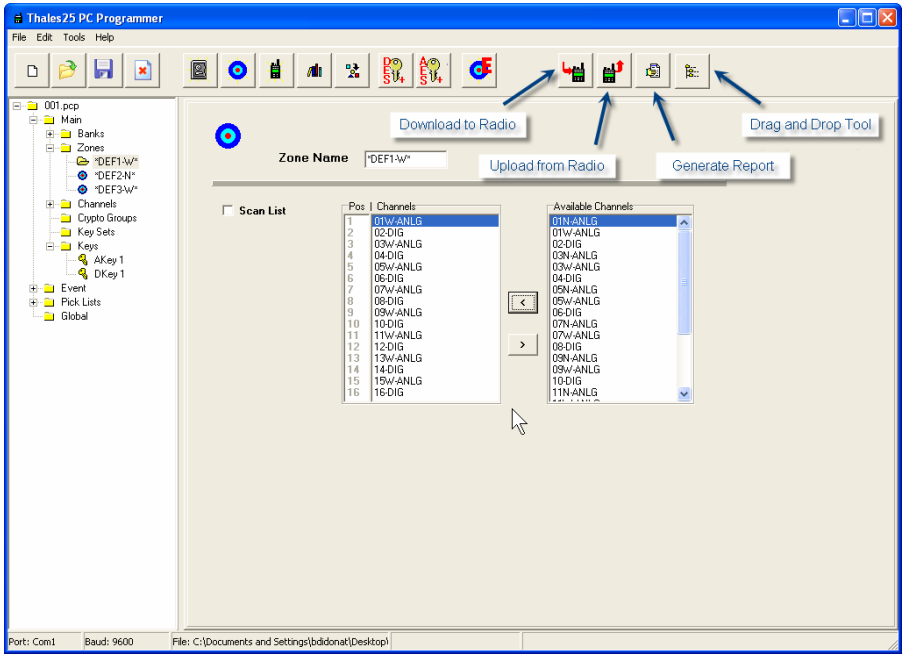
Click on the arrow button between the screens indicating that the channel will be assigned to the assignment section.

To remove a zone, highlight the zone to be removed, and click the arrow button indicating it will be removed.

NOTE: Zones may only be assigned to a bank once.

CHAPTER 6.0 MISCELLANEOUS

The primary areas of focus in this section are uploading and downloading to the radio, generating reports and using the Drag and Drop tool.



REPORT GENERATION

In most configurations, a great deal of information has been manually entered. Generating a report provides a concise hardcopy to check the entries. Reports can also be handed out to radio operators to inform them of how the entire radio is organized (channels, side buttons, etc)

NOTE: An internet browser must be installed on the system to generate a report. It is NOT required to be online. The report is in HTML format, but does not go onto the internet.

To begin generating a report, click on the “Generate Report” button.

The Internet Browser installed will launch (usually Netscape or Internet Explorer), and the report will be generated. To print the report, be sure to set the Page Setup to print landscape (Internet Browser: File Menu → File→ Page Setup (set to landscape). The data will not fit on an 8 1/2” x 11” page in portrait mode.

At this point the report can be printed. File Menu: File → Print

DOWNLOAD TO RADIO

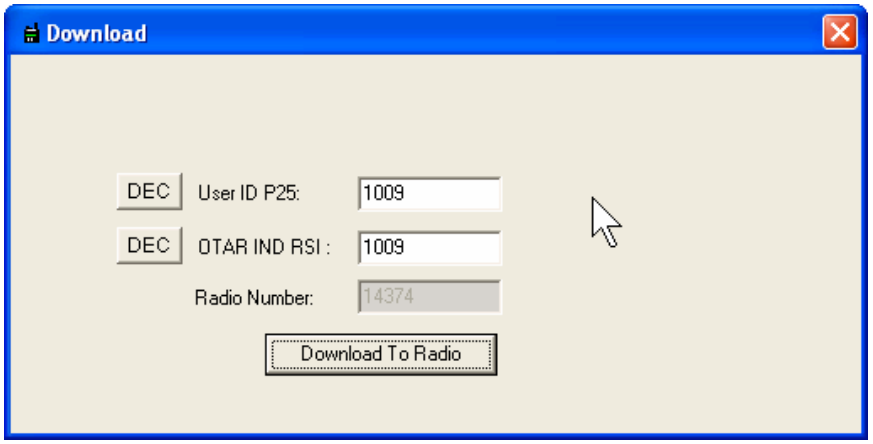
Follow these steps.

- Load the desired configuration.
- Turn the radio ON.
- Connect the radio.

Click the Download button. 

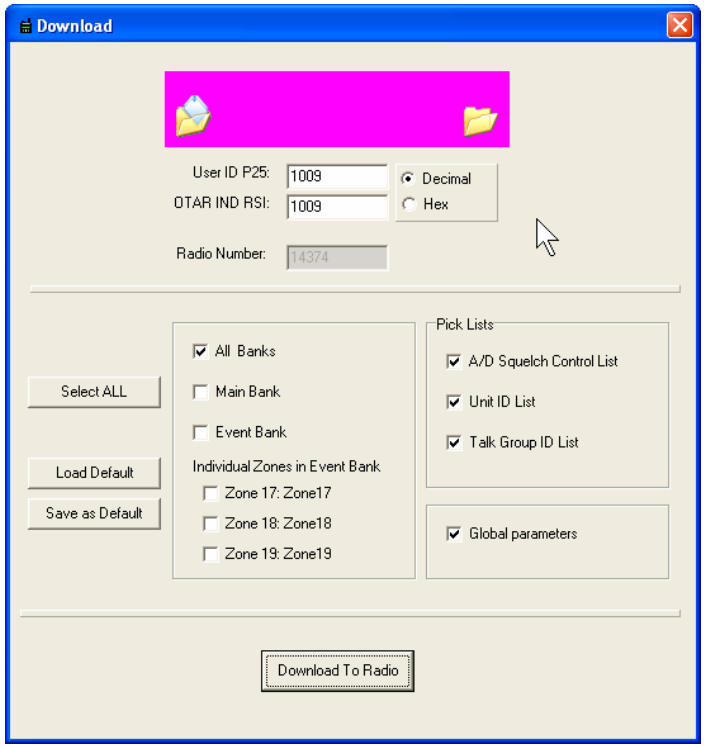
The Download screen will appear. This is the place to enter Individual Unit ID's (and Individual RSI's for OTAR radios). Enter the desired values and click OK.

The UserID P25 and OTAR IND RSI are read from the radio instead of the Global screen. This prevents always having to enter the P25 UnitID, but allows it to be changed if required.



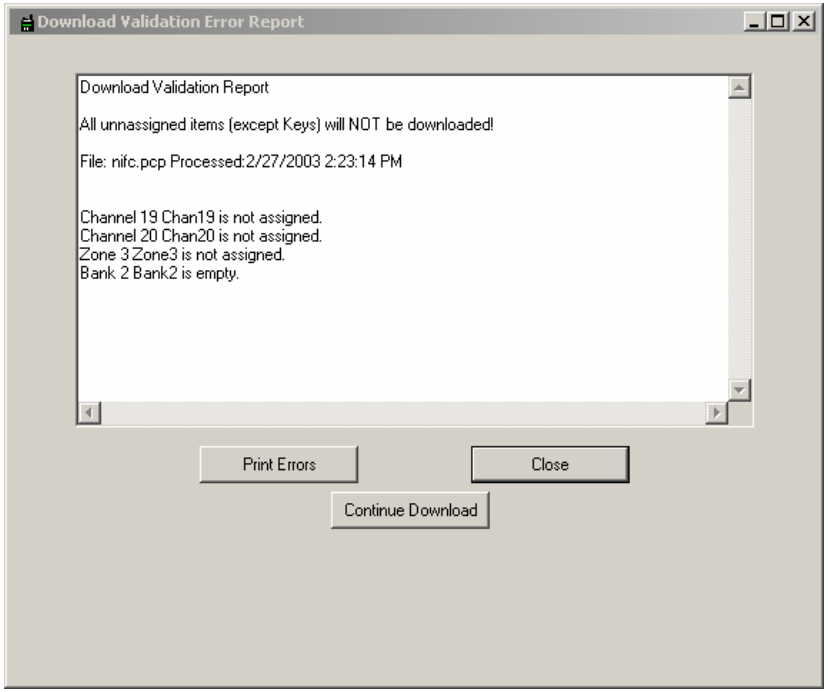
Partial Download (Fire Features only)

If downloading to a Fire Features radio, it is now possible to download certain components of the configuration while leaving the other components in the radio intact. An example of this is to download channels, while leaving the global variables in the radio unchanged. The other options should be obvious from the illustration below:



At this point the Thales 25 PC Programmer will validate the configuration. If everything is in order, the PC Programmer will begin downloading.

If errors are detected in the configuration, the Download Validation Error screen will appear. It lists possible errors (such as zones not assigned to banks or channels not assigned to zones). These unassigned objects will not be downloaded.



The programmer has the chance to fix these errors, or if the objects are not needed, the file may be downloaded anyway. If the list is extensive, it can also be printed.

UPLOAD TO RADIO

Follow these steps.

- Turn the radio ON.
- Connect the radio.
- Click the Upload button.

The Upload screen will appear. Click OK and the radio will start sending its information to the computer. When complete, the upload status will appear.

The program assigns a default filename the same as the radio serial number. This can be used or altered to anything desirable.

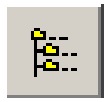
To keep this file, it must be saved. The default filename is the serial number of the radio (but may be changed to any name desired).

DRAG AND DROP

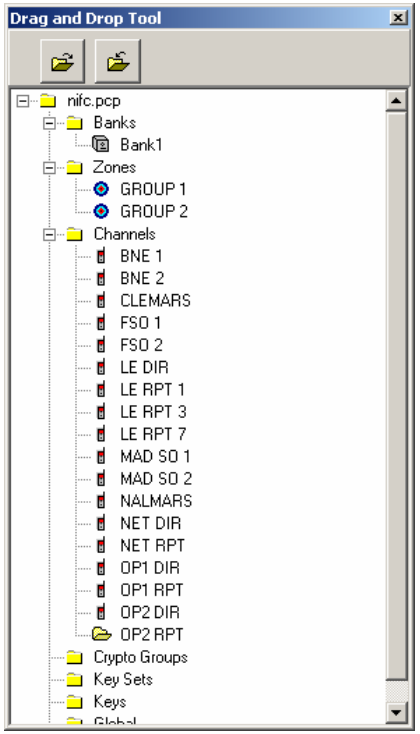
The radio also has a Drag and Drop feature. This tool can be used to copy channels, zones, and/or picklists from an existing configuration into the configuration currently being worked on. Encryption keys are never copied.

To perform a drag and drop operation:

Open the configuration you want to drag and drop into.

Click on the Drag and Drop icon. 

The drag and drop tool will launch.



Open the file with the channels or zones you want to copy into the current configuration using the speed bars within the drag and drop tool.

Choose the channel or zone and drag it to the treeview in the main configuration.

All required channels will be created. Since duplicate names are not allowed, you will be prompted to replace any encountered duplicate names.

APPENDIX A - ENCRYPTION KEYS

SECURITY PROCEDURES

This section provides guidance on proper secure communications use with the Thales 25 portable radio. Many agencies have established their own security policies and procedures, which exceed the guidance provided within this section.

WARNING: When using the Thales 25 for secure communications, it is important to physically control the radio. Its location and access should be controlled at all times. It should be locked up when not in use. Use by an unauthorized person could compromise all other authorized users safety and security. Sensitive information could also be inappropriately divulged.

The supported encryption algorithms are :

- CVSD DES (for interoperability with Analog 25 kHz channels)
- P25 DES
- P25 AES

The P25 AES is the only FIPS 140-2 approved algorithm in the Thales 25 radio. The practices outlined within this appendix should be practiced for all modes of encryption,.

Encryption Key Transfer From Radio

Once an encryption key has been loaded into a radio, it may not be extracted. This applies to uploading data from radio to the PC Programmer, serial interface queries, cloning from radio-to-radio, and all other methods. Key structures may be maintained, but the actual cryptographic key material is not transferred. To remove a key from the radio, it must be written over, or erased (zeroized).

Security Roles / Authentication Methods

The Thales 25 radio supports the following security roles. Individuals within an organization may perform one, two, or all three roles. Role assignment is to be determined by the agency.

User

Users use the portable to communicate via radio with other users. They have all configuration data and encryption data loaded by the Administrator or crypto officer. Access to users of security functions are controlled by the following authentication methods:

- Programming Password
- Zone Password
- Encryption Lock
- OTAR RSI / uKEK
- Feature License (CVSD DES, P25 DES, P25 AES, KVL)
- Authorization onto KMF network
- KVL Possession
- Cryptographic Key Knowledge

Administrator

The Administrator loads configuration data (channels, button assignments, etc.) into the radio. Note that a pure Administrator role does not have access to cryptographic material, but the same individual may perform the role of Crypto Officer, which has access.

- Zone Password
- Feature License (CVSD DES, P25 DES, P25 AES, KVL)
- Authorization onto KMF network
- KVL Possession

Crypto Officer

Loads keys into the radio.

- Zone Password
- KVL possession
- Feature License (CVSD DES, P25 DES, P25 AES, KVL)
- Authorization onto KMF network
- Cryptographic Key Knowledge

Authentication Methods

Possession of a Thales 25 radio enables secure communications ***when authorized***.

Authentication methods describe how access to secure communications is denied to each of the roles (user, Administrator, and crypto officer) unless authorized.

Physical Radio Possession

The first layer of protection in the T25 portable is physical access to the radio. The portable radio includes several functions that require no authentication. For example until a configuration is loaded in the portable with a zone password (see description below) anyone with the applicable PC Programmer software, cable, and access to the radio can program the portable. However these are all proprietary items and even a modest, common sense access control policy for the portables and accessories will secure T25 operation.

Programming Password

The Administrator may configure the T25 portable with a programming password. This is a 6 digit PIN stored internally to the portable. The password protects modification of all channel programming data, including frequencies and other channel parameters.

The programming password does allow encryption to be enabled/disabled on a channel, and allows the channel encryption key to be changed – either manually through the keypad, or through an OTAR re-key request if the portable is licensed and configured for OTAR operation.

Once a programming password is entered it is valid until power is cycled on the portable. Be sure to turn the portable OFF whenever it will be out of use to force the next user to have to enter the programming password again.

The Administrator can overwrite the programming password from the PC Programmer, without having to know the existing programming password. This password is intended to restrict operator access and is not intended to authenticate an Administrator or Crypto officer.

Zone Password

The zone password allows more complete protection of specific zones in the portable. Each zone (collection of up to 16 channels assigned to the channel selection knob) can be configured as a "Protected Zone". Multiple zones can be password protected with the same zone password. The Zone Password provides similar access protection as the programming password with the following exceptions:

- Only applies to protected zones. Unprotected zones can be modified without requiring entry of the Zone Password.

- If ANY zone in the portable is protected the Administrator cannot reprogram the radio without first entering the Zone Password. This allows the Zone Password to provide the User with protection against non-authorized from re-programming his radio, even if that non-authorized person has access to a PC Programmer.

The zone password can be used for Administrator authentication. Like the programming password, the Zone Password once entered remains in effect until power is cycled on the portable.

Encryption Lock

Each channel in the portable can be programmed by the Administrator, using the PC Programmer for "Encryption Lock". When this parameter is enabled a User cannot disable encryption on a channel that is configured for encrypted operation. This ensures that the User cannot transmit on the secure channel without using encryption. This parameter can only be changed by using the PC Programmer and can be protected by a Zone Password.

Feature License (OTAR, CVSD DES, P25 DES, P25 AES)

The Thales 25 offers several features at an additional cost. T25 portable feature licenses are maintained in an encrypted form on TCI's software upgrade server. All security features that are feature license enabled require further effort and authentication for use. For example OTAR has strong authentication procedures as defined in the TIA specifications. As a matter of security policy however systems should not be configured with security features that are not expected to be used as part of the system's normal security policy and operation. An exception to this would be to configure the radio with the Fire Features option, as it is the option which includes Zone Password Protection.

The features which relate to Security functions described are:

- Over The Air Re-keying (OTAR) – DES (non-FIPS)
- CVSD DES, non-FIPS (for interoperability with Analog 25 kHz channels)
- P25 DES, non-FIPS (for legacy interoperability with P25 DES)
- P25 AES (FIPS 140-2, Level 1)
- KVL Interface (for loading keys via Motorola KVL 3000, KVL 3000+)

- Fire Features (for applying Zone Passwords)

OTAR RSI and other parameters

OTAR operation requires several identification and authentication items to be programmed in the radio. These parameters are mentioned here, but refer to the listed user documentation and the TIA specifications for details. All of these parameters can be set only from the PC Programmer and can be protected from unauthorized modification by a Zone Password. These parameters are specific to the OTAR Key Management Facility and should only be available on a need to know basis. The uKEK can be loaded from the PCP or from a KVL just like other encryption keys.

- KMF RSI
- Group RSI
- Individual RSI
- Unique Key Encryption Key (uKEK)

The Individual RSI is displayed by the Portable (cannot modify) , but the User does not have access to the other parameters.

Motorola KVL Possession

A Motorola KVL is a cryptographic piece of equipment that is not readily available. A KVL with a system's encryption keys is a critical part of a system's security and must be handled in an appropriate manner (beyond the scope of this security policy). Restricted physical access to the key loading device is the primary authentication method for KVL key loading, and the transfer of keys from the device is neither encrypted nor authenticated further. It also has many other authentication methods. Refer to its documentation for more details.

Authorization onto (Key Management Facility) KMF network

A radio may have all necessary Individual RSI, uKEK, and other OTAR parameters properly configured. The KMF adds an additional layer of protection that requires a KMF operator to authorize individual radios access onto the KMF network. Without this authorization, attempted OTAR rekeys will fail.

Cryptographic Key Knowledge

Radios that have passed all forms of authentication still need to know the actual cryptographic key algorithm and values to decrypt secure communications.

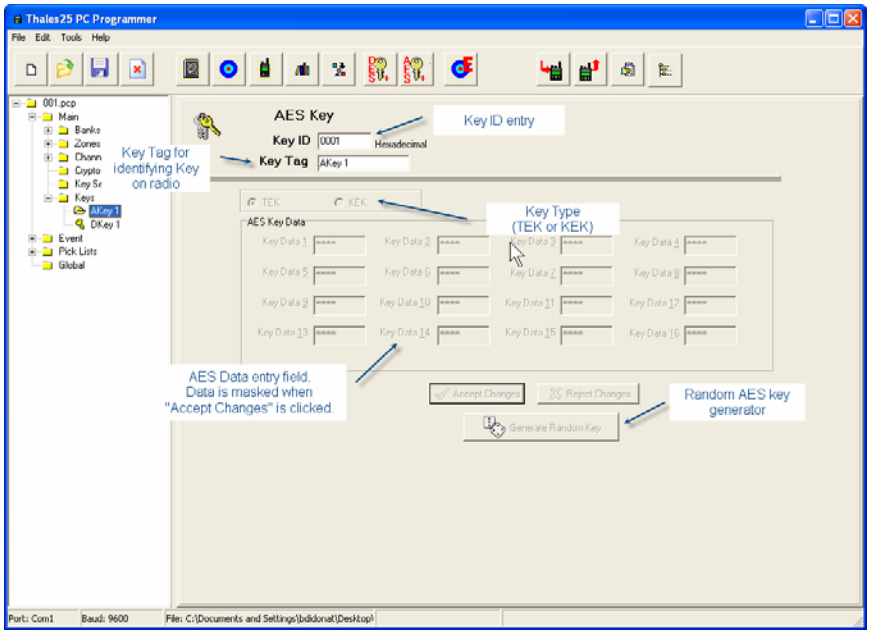
ADVANCED ENCRYPTION STANDARD (AES)

The AES keys screen is the Thales 25 PC Programmer's access to loading and assigning AES encryption keys to channels. These keys may only be used on Project 25 channels.

To create a new AES key, click on the "Create new AES key" icon.

Once any encryption key has been created, the key data is masked. If key editing is desired, the Key Tag and Key ID may be edited. Key Data and Key type cannot. If it is desired to edit the Key Data or Key Type, it is necessary to delete the key and replace it.

.



TEK / KEK (default TEK)

TEK's (Traffic Encryption Keys) are the encryption keys used to encrypt voice or data on channels. KEK's (Key Encryption Keys) are keys used to encrypt other encryption keys and are used for OTAR only. Once this selection is made and the key is saved, it cannot be changed. If it is desired to change this, it will be necessary to delete the key and start from scratch.

Key ID (default 0001)

The KeyID is a field which points to a key. Operationally it can be thought of as a "key squelch" condition. If the incoming key does not match the radio's KeyID, it will not break squelch. Key ID is any 4 digit hexadecimal character from 0001 to FFFF (KeyID 0000 opens on any key data – it is operationally impractical to use).

IMPORTANT – All keys assigned within a radio MUST have different KeyID's. The PC Programmer validates that within AES or DES, KeyID's are only used once. (It is possible for an AES and DES key to have the same KeyID since their Algorithm ID's distinguish them.)

Key Tag (default ASSIGNED SEQUENTIAL NAME)

The Key Tag can be any 8 character alphanumeric name.

Key Data

The Key Data is the critical portion of the key. If the KeyID matches, but the Key Data does not, the radio will break squelch, but the audio will not be decoded correctly and will be unintelligible. In this case, the analog channels would sound like noise – a familiar ear would barely be able to tell the difference between this and open squelch. The digital channels sound like a series of tones incorrectly re-assembled.

Once the key data is entered and accepted (pressing OK), it will be hidden by turning data into asterisks. At this point, it will never be visible again, so be sure to check it first.

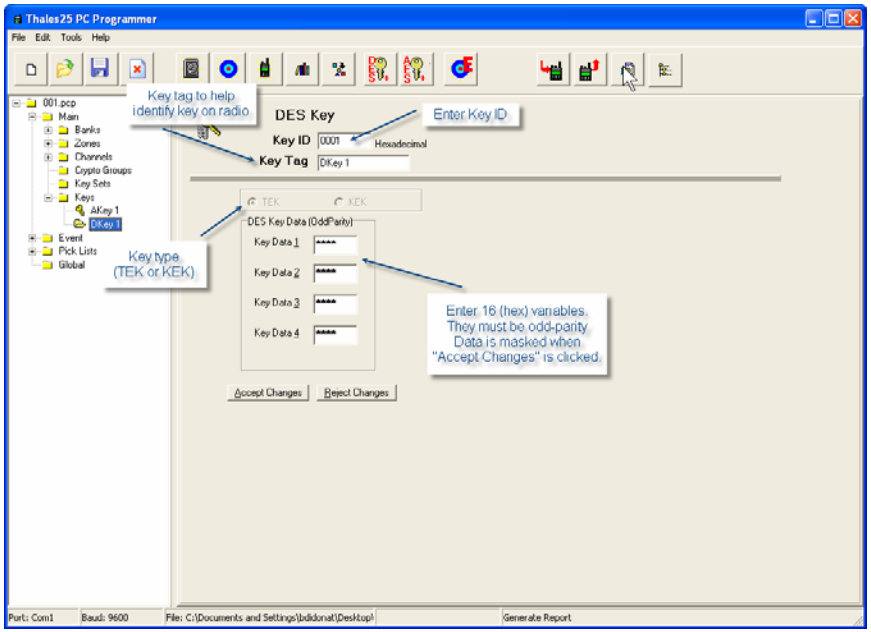
Key Data is a 64 – character hexadecimal field (256 bit encryption).

DES KEYS

The DES encryption keys screen is the Thales 25 PC Programmer's access to loading and assigning encryption keys to channels. These keys may only be used on Analog 25 kHz or Project 25 channels. The same encryption key may be used for both types of channels.

To create a new DES key, click on the "Create new key" icon.

Once any encryption key has been created, the key data is masked. If key editing is desired, the Key Tag and Key ID may be edited. Key Data and Key type cannot. If it is desired to edit the Key Data or Key Type, it is necessary to delete the key and replace it.



TEK / KEK (default TEK)

TEK's (Traffic Encryption Keys) are the encryption keys used to encrypt voice or data on channels. KEK's (Key Encryption Keys) are keys used to encrypt other encryption keys and are used for OTAR only. Once this selection is made and the key is saved, it cannot be changed. If it is desired to change this, it will be necessary to delete the key and start from scratch.

Key ID (default 0001)

The KeyID is a field which points to a key. Operationally it can be thought of as a "key squelch" condition. If the incoming key does not match the radio's KeyID, it will not break squelch. Key ID is any 4 digit hexadecimal character from 0001 to FFFF (KeyID 0000 opens on any key data – it is operational impractical to use).

IMPORTANT – All keys assigned within a radio MUST have different KeyID's. The PC Programmer validates that within AES or DES, KeyID's are only used once. (It is possible for an AES and DES key to have the same KeyID since their Algorithm ID's distinguish them.)

Key Tag (default ASSIGNED SEQUENTIAL NAME)

The Key Tag can be any 8 character alphanumeric name.

Key Data

The Key Data is the critical portion of the key. If the KeyID matches, but the Key Data does not, the radio will break squelch, but the audio will not be decoded correctly and will be unintelligible. In this case, the analog channels would sound like noise – a familiar ear would barely be able to tell the difference between this and open squelch. The digital channels sound like a series of tones incorrectly re-assembled.

Once the key data is entered and accepted (pressing OK), it will be hidden by turning data into asterisks. At this point, it will never be visible again, so be sure to check it first.

Key Data is a 16 – character hexadecimal field. Each byte (2 digit hexadecimal pair) must have odd-parity. Odd parity is defined as converting all hexadecimal bytes in binary representation, counting the "1"'s. If the count is odd, then its odd parity. Some examples of odd parity are provided on the next page:

Some even and odd parity explanations

01 (0000 0001) - total of one "1"s, so it's odd parity

02 (0000 0010) – total of one "1"s, it is also odd parity

06 (0000 0110) – total of two "1"s, so this is even parity

ODD PARITY BYTES

01	20	40	61	80	A1	C1	E0
02	23	43	62	83	A2	C2	E3
04	25	45	64	85	A4	C4	E5
07	26	46	67	86	A7	C7	E6
08	29	49	68	89	A8	C8	E9
0B	2A	4A	6B	8A	AB	CB	EA
0D	2C	4C	6D	8C	AD	CD	EC
0E	2F	4F	6E	8F	AE	CE	EF
10	31	51	70	91	B0	D0	F1
13	32	52	73	92	B3	D3	F2
15	34	54	75	94	B5	D5	F4
16	37	57	76	97	B6	D6	F7
19	38	58	79	98	B9	D9	F8
1A	3B	5B	7A	9B	BA	DA	FB
1C	3D	5D	7C	9D	BC	DC	FD
1F	3E	5E	7F	9E	BF	DF	FE

APPENDIX B - OTAR SCREENS

NOTE: If not using OTAR/ KVL3000+, AES keys can be created in the PC Programmer, assigned to channels and loaded directly into the radio.

LOADING AES KEYS WITH OTAR

To load AES encryption keys via P25 OTAR the following procedure will be necessary. Instructions for each step are included within this appendix.

- Create CryptoGroup 1 to create the appropriate SLN's that will be used for TEKs
- Create CryptoGroup 16 to create the appropriate SLN's that will be used for the KEK.
- Assigned SLN's to each channel as necessary
- Download configuration to Thales 25
- Load the KEK into the radio from the KVL3000+
- Load AES Encryption Keys / Keysets / CryptGroups as desired via P25 OTAR

LOADING AES KEYS WITH KVL3000+

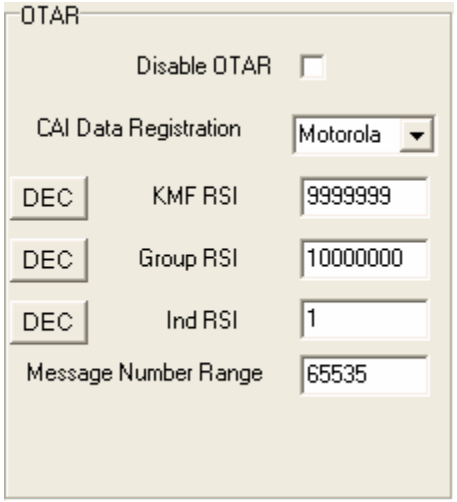
To load AES encryption keys via KVL3000+, the following procedure will be necessary. Instructions for each step are included within this appendix.

- Create CryptoGroup 1 to create the appropriate SLN's that will be used for TEKs
- Assigned SLN's to each channel as necessary
- Download configuration to Thales 25
- Zeroize the radio (removes DES format Keyset/CryptoGroup, but leaves SLN assignments)
- Load AES Encryption Keys / Keysets / CryptGroups as desired via KVL 3000+

OTAR SCREENS

The primary OTAR screens are the Keyset screen and CryptoGroup screens. To properly set up OTAR, there are also entries on the following screens: GLOBAL, CHANNEL, and KEY. All OTAR setup requirements will be covered in this chapter.

GLOBAL SCREEN ENTRIES FOR OTAR



Disable OTAR

This enables or disables OTAR for the entire radio (radios enabled with the OTAR option only).

CAI Data Registration

This allows the radio to register on Motorola ® OTAR systems, or to be turned OFF.

Identifiers

All identifiers may be entered in decimal (default) or hexadecimal. The KMF RSI (default 9,999,999) is required to target the desired KMF. The Group RSI (default 10,000,000) is available to set here, but when re-keyed by a KMF, will have its Group RSI modified. The Ind RSI is required to identify the portable on the KMF systems, but is better entered on the DOWNLOAD screen.

Valid Message Number Range

The message number range is an anti-spoofing security parameter. Its value must be a value between 0 and 65535 (default). The higher the number, the less secure the anti-spoofing feature will provide.

KEY SCREEN ENTRIES FOR OTAR (OPTIONAL)

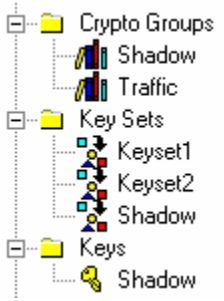
Any radio that is being setup for OTAR will need a Unique Key Encryption Key (UKEK) installed. This may be entered by the KVL3000 (see Motorola's KVL3000 documentation for its use), or via the Keys screen on the Thales 25 PC Programmer.

If the Keys screen will be used, the Key entry is identical to traffic keys (see Keys screen chapter) EXCEPT that the Key type KEK must be selected.

NOTE that the UKEK is typically entered here, and CKEK's are loaded into the radio by the KMF.

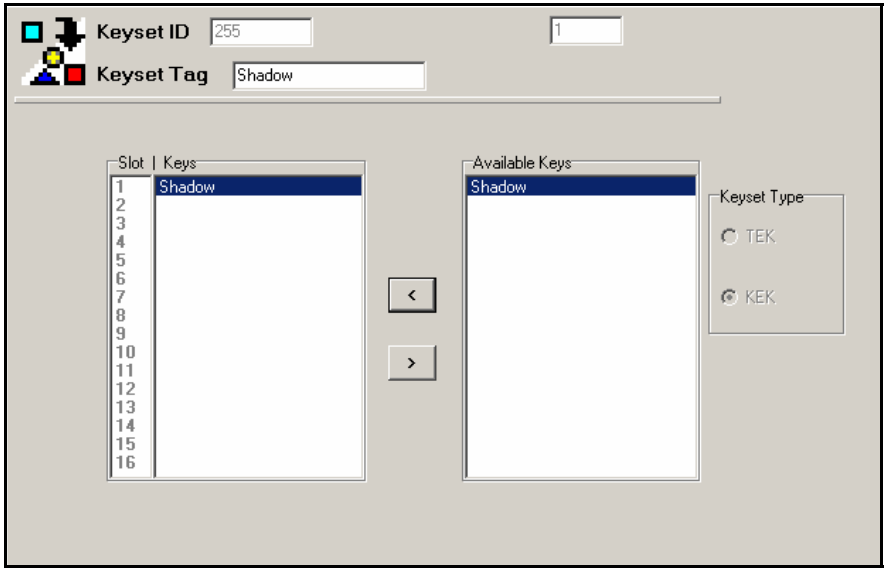
KEYSET SCREEN

Typically, a minimum of three (3) keysets must be created and configured for OTAR radios:



One (1) that will be a keyset for the Key Encryption Keys (KEK's), and two (2) or more that will be used for the Traffic Encryption Keys (TEK's). TEK Keysets are used for key indexing (switching entire sets of keys).

To create a keyset, click on the "Create Keyset" icon. 



Keyset ID

This field is automatically set by the PC Programmer, and cannot be changed by the User.

Keyset Tag

This is the 8-character alphanumeric keyset name.

Keyset Type

The programmer must select which type of keys (TEK or KEK) will be assigned to this keyset. Once this selection is made, the type of keys that have been created will be shown in the “Available Keys” list box.

NOTE: The keysets must be created here, but it is not necessary to assign any keys prior to download to radio, if the keys will be entered by alternate means (via the KVL device or OTAR).

Available Keys

All keys of the same type (KEK or TEK) will be visible here in alphabetical order. In they are to be assigned to the keyset, click on the desired key in the “Available Keys” and the position in the “Keys” section and click the arrow indicating to assign it.

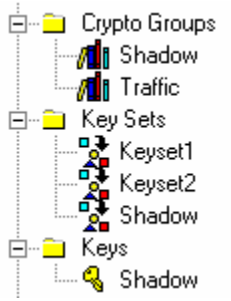
Keys

This lists all assigned keys.

CRYPTOGROUP SCREEN

Typically, a minimum of two (2) CryptoGroups must be created and configured for OTAR radios:

One (1) that will be a keyset for the Key Encryption Keys (KEK's), and one (1) or more that will be used for the Traffic Encryption Keys (TEK's).



To create a CryptoGroup, click on the "Create CryptoGroup" icon. 

Examples of setting up the two different types of Keysets are provided at the end of this section.

CryptoGroup ID

This field is the assigned CryptoGroup ID.

NOTE: To be interoperable with the KMF, the following rules apply.

- For Traffic Encryption Keys CryptoGroups, CryptoGroup MUST be "1."
- For Key Encryption Keys CryptoGroups, CryptoGroup MUST be "16".

CryptoGroup Tag

This is the 8-character alphanumeric CryptoGroup name.

Available Keysets

All keysets will be visible here in alphabetical order. In they are to be assigned to the CryptoGroup, click on the desired key in the “Available Keysets” and the position in the “Keyset Name” section and click the arrow indicating to assign it.

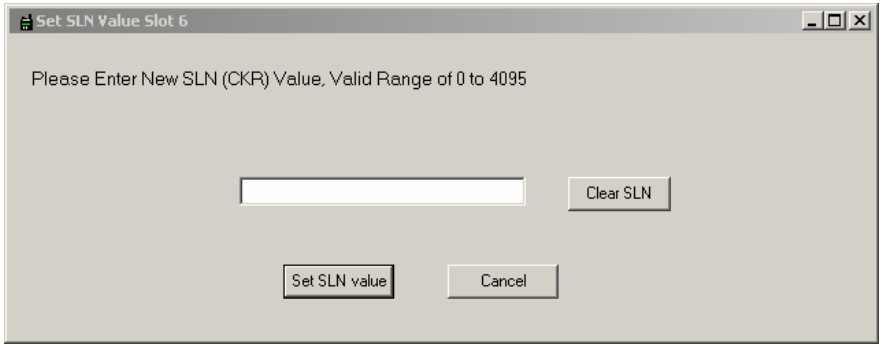
Keyset Slot and Assignment

This lists all assigned keysets and their assignment. Also note that one must be selected as the Active Slot.

SLN Assignment

SLN's (KMF refers to them as CKR's) are assigned on the CryptoGroup screen.

Click on the desired slot, and the SLN assignment window will appear with the allowable values.
Enter a value and click OK.

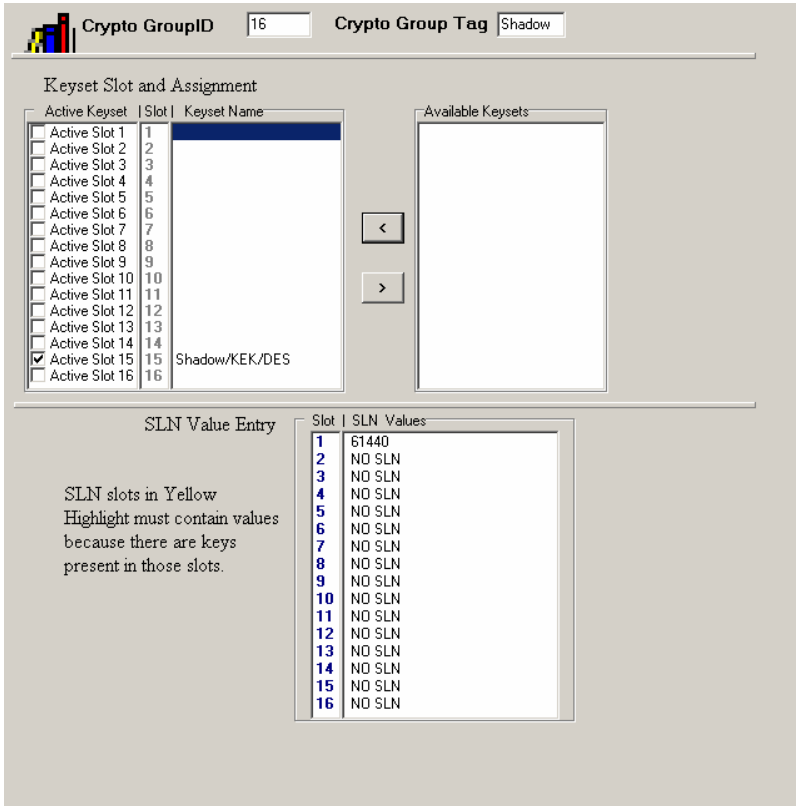


If a SLN line is highlighted YELLOW, it has a key assigned to the Keyset and must be assigned.

SLN assignment is important here to have available SLN's to assign to the channels. All created SLN's will be available in the dropdown SLN list on the channel screens.

Assigning a SLN to a channel lets the channel know which key (from OTAR or KVL) to use.

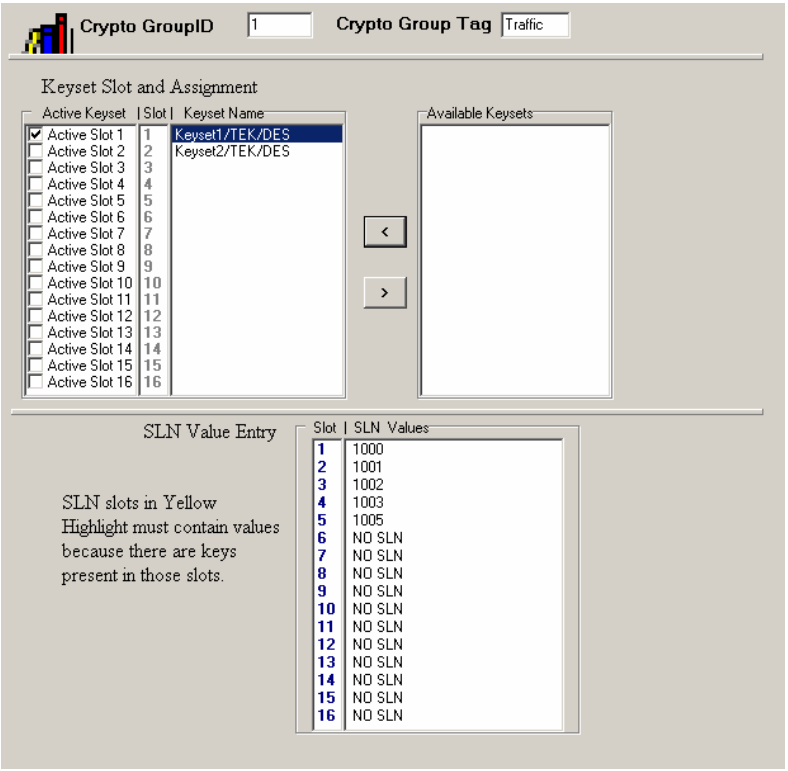
KEK CryptoGroup Setup



NOTE the following which is typical for KEK CryptoGroups.

- The CryptoGroup ID = 16 for KEK CryptoGroups.
- The keyset is assigned to position 15.
- Its SLN is 61440 (must be 61440 to 65535 since it is in CryptoGroup 16).

TEK CryptoGroup Setup

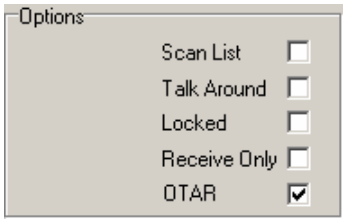


NOTE the following which is typical for TEK Keysets

- The CryptoGroup ID =1
- Usually two TEK keyset are assigned.
- They are usually assigned in slots 1 and 2.
- Their SLN's must be in the range 1 to 4095 since they are in CryptoGroup.

CHANNEL SCREEN ENTRIES FOR OTAR

Options

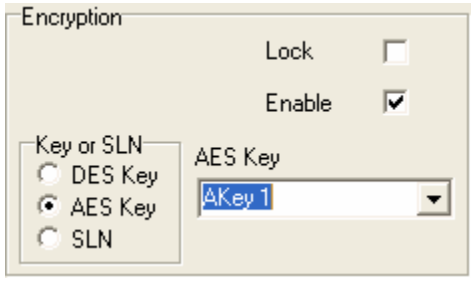


OTAR must be assigned on a Project 25 digital channel. An extra OTAR field is present on digital channels which must be selected on channels that will enable OTAR.

Several channels may exist that will access repeaters that are connected to the KMF. Each channel should have its OTAR option checked.

In addition to enabling OTAR on these channels, this option will also cause the channels that it assigned to attempt to register on the network each time the radio operator turns to that channel.

Encryption



Each channel that will have one of the OTAR'ed keys assigned to it must have the corresponding SLN assigned on the channel screen.

The channels that use OTAR'ed (or KVL'ed) keys may be either Analog 25 kHz (DES only) or Project 25 digital channels.

KEY MANAGEMENT FACILITY (KMF) SETUP

In addition to setting up the radio, the KMF infrastructure must be set up to allow the radio to be on its system. Refer to the KMF's manufacturer documentation for further details.

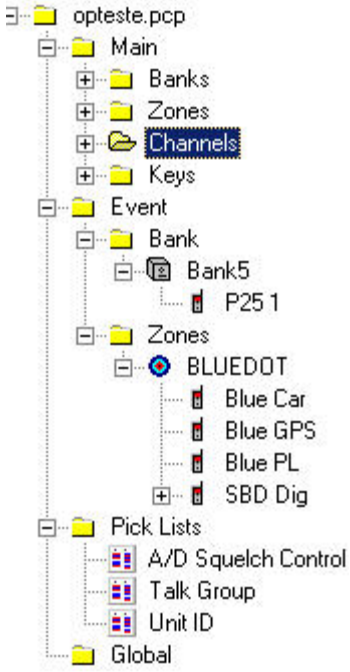
APPENDIX C – FIRE FEATURES

The Thales 25 Fire Features are available in version 6.0 and later.

The Fire Features option bundle adds the following features to the Thales 25 portable radio:

- Tone picklists
- Project 25 talkgroup picklists
- Project 25 UnitID picklists
- “Event” bank, which includes additional 3 zones of 16 channels each (also referred to as ICP bank)
- Protected zone capability
- Enhanced radio-to-radio cloning (no PC Programming)

The treeview diagram below shows the additional items included with the Fire Features option bundle. This is available with PC Programmer 4.0 and higher.



If the Fire Feature items are not visible, check if they're available (TOOLS → OPTIONS → VIEW → ensure Fire Features box is checked. If it needs to be changed, close the configuration then set it as desired).

Note the subtle differences in the way that the Event Bank's zones and channels are presented. Unlike the main bank, the event bank has channels and zones that are completely independent of each other.

The "tone picklist" is the also referred to as the A/D Squelch Control picklist.

PICK LISTS

There are 3 different picklists included with the Fire Features Option Bundle:

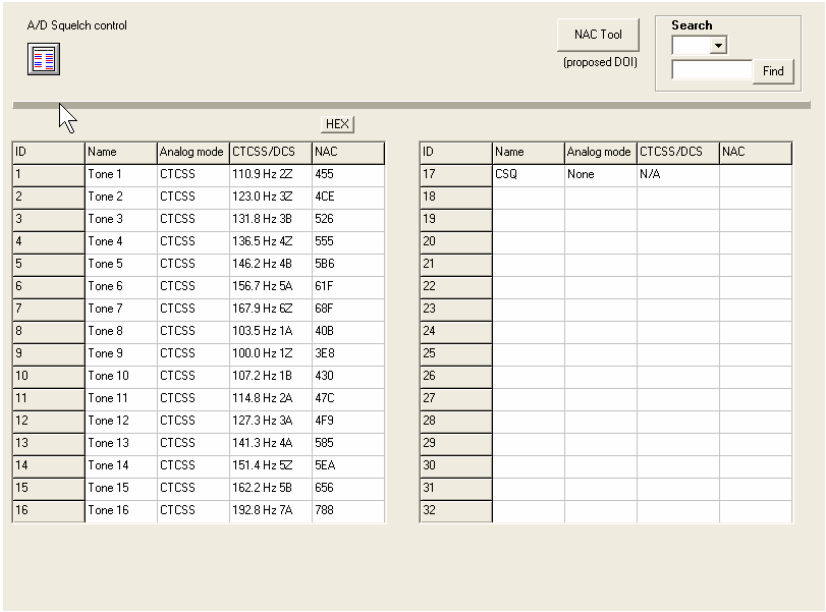
- A/D Squelch Control picklists (tone picklist)
- Project 25 Talkgroup Picklist
- Project 25 UnitID picklist

All three of these are programmed similarly by the PC Programmer. They each contain a tagname for identification, and a value to enter. The index is fixed and cannot be changed by the user. In addition, the A/D squelch control (tone) picklist contains two values, one analog and one digital. The radio uses the appropriate one depending upon the channel parameters when selected.

Each screen also contains a search tool to easily find values.

Analog / Digital Squelch Control (Tone) Picklist

This picklist allows the programmer to set the tone that is available in the radio. The radio user would press the # and desired keys on the radio keypad.



ID	Name	Analog mode	CTCSS/DCS	NAC
1	Tone 1	CTCSS	110.9 Hz 2Z	455
2	Tone 2	CTCSS	123.0 Hz 3Z	4CE
3	Tone 3	CTCSS	131.8 Hz 3B	526
4	Tone 4	CTCSS	136.5 Hz 4Z	555
5	Tone 5	CTCSS	146.2 Hz 4B	5B6
6	Tone 6	CTCSS	156.7 Hz 5A	61F
7	Tone 7	CTCSS	167.9 Hz 6Z	68F
8	Tone 8	CTCSS	103.5 Hz 1A	40B
9	Tone 9	CTCSS	100.0 Hz 1Z	3E8
10	Tone 10	CTCSS	107.2 Hz 1B	430
11	Tone 11	CTCSS	114.8 Hz 2A	47C
12	Tone 12	CTCSS	127.3 Hz 3A	4F9
13	Tone 13	CTCSS	141.3 Hz 4A	585
14	Tone 14	CTCSS	151.4 Hz 5Z	5EA
15	Tone 15	CTCSS	162.2 Hz 5B	656
16	Tone 16	CTCSS	192.8 Hz 7A	788

ID	Name	Analog mode	CTCSS/DCS	NAC
17	CSQ	None	N/A	
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

As illustrated by the figure, the values entered may be for analog channels, digital channels or both. The radio will determine the channel type and use the appropriate tone from the list.

The tone picklist allows programming of up to 32 analog tones and 32 digital tones.

The “Hexadecimal / Decimal” button is provided for quick entries of NAC values in either format.

At the time this manual was created, several DOI agencies were considering standardized conversions from CTCSS / DCS tones to NAC tones. Since this is not a Project 25 standard nor universally adopted yet, the conversion cannot be automatically performed by the radio, but the following table is provided for reference. The NAC tool may be used to calculate these values.

DOI Proposed DCS to NAC conversion

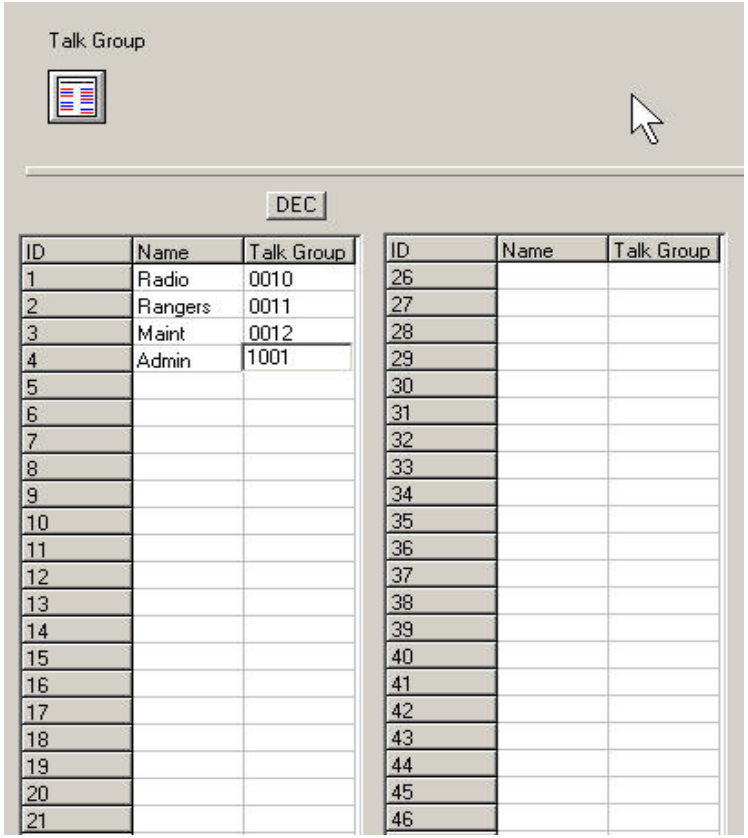
NAC = DCS tone

DOI Proposed CTCSS to NAC Conversion			
CTCSS tone	**NAC (hex)**	**CTCSS tone**	**NAC (hex)**
67.0 Hz (XZ)	29E	136.5 Hz (4Z)	555
69.3 Hz (WZ)	2B5	141.3 Hz (4A)	585
71.9 Hz (XA)	2CF	146.2 Hz (4B)	5B6
74.4 Hz (WA)	2E8	151.4 Hz (5Z)	5EA
77.0 Hz (XB)	302	156.7 Hz (5A)	61F
79.7 Hz (WB)	31D	162.2 Hz (5B)	656
82.5 Hz (YZ)	339	167.9 Hz(6Z)	68F
85.4 Hz (YA)	356	173.8 Hz (6A)	6CA
88.5 Hz (YB)	375	179.9 Hz (6B)	707
91.5 Hz (ZZ)	393	186.2 Hz (7Z)	746
94.8 Hz (ZA)	3B4	192.8 Hz (7A)	788
97.4 Hz (ZB)	3CE	203.5 Hz (M1)	7F3
100.0 Hz (1Z)	3E8	206.5 Hz (8Z)	811
103.5 Hz (1A)	40B	210.7 Hz (M2)	83B
107.2 Hz (1B)	430	218.1 Hz (M3)	885
110.9 Hz (2Z)	455	225.7 Hz (M4)	8D1
114.8 Hz (2A)	47C	229.1 Hz (9Z)	8F3
118.8 Hz (2B)	4A4	233.6 Hz (M5)	920
123.0 Hz (3Z)	4CE	241.8 Hz (M6)	972
127.3 Hz (3A)	4F9	250.3 Hz (M7)	9C7
131.8 Hz (3B)	526	254.8 Hz (0Z)	9F4

Project 25 Talkgroup Picklist Screen

This screen provides the PC Programmer method of programming the Talkgroup picklist. The valid programmable fields are the talkgroup tagname and value. The index is used by the radio user to select the programmed talkgroup.

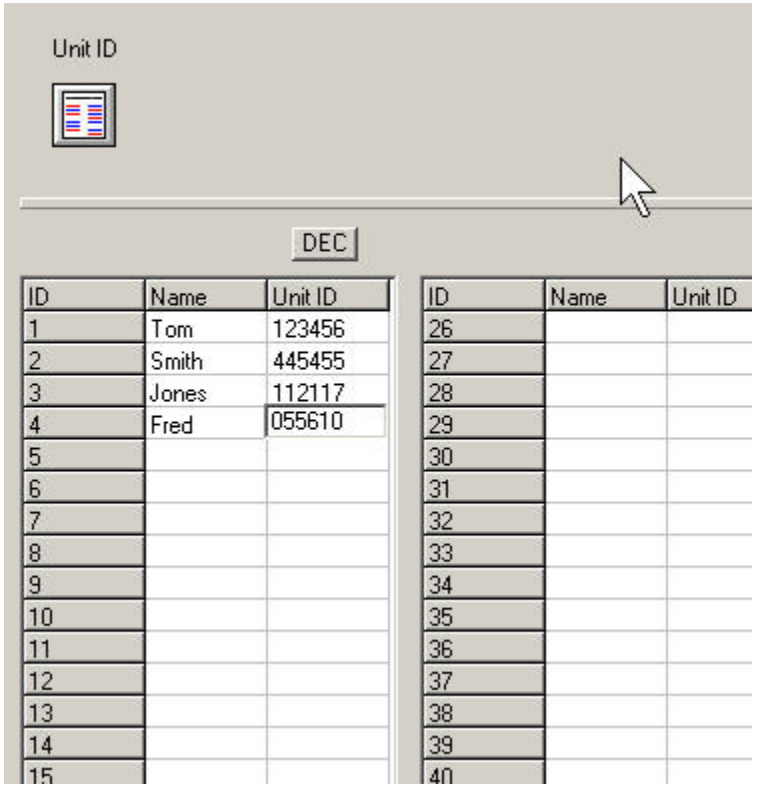
The talkgroup list may contain up to 99 entries.



Project 25 UnitID Picklist Screen

This screen provides the PC Programmer method of programming the Project UnitID's picklist. The valid programmable fields are the UnitID talkgroup tagname and value. The index is used by the radio user to select the programmed Individual Call and CallerID.

The talkgroup list may contain up to 99 entries.



ZONE PROTECTION

The Fire Features package includes Zone Protection. This allows radio programmers to “lock” a home configuration into the radios. The event bank provides three incident zones. Zone protection is offered only for zones in the main banks (event bank zones cannot be protected).

NOTE: If zones are protected, the radio will not be able to accept any form of clone from a non-Fire Features radio unless the password is provided.

If a zone is protected, all channels in that zone will also be protected. By similarity, all zones (except event zones) that contain those channels will be protected.

If a zone is protected in a radio, the zone password will be required to perform any of the following actions:

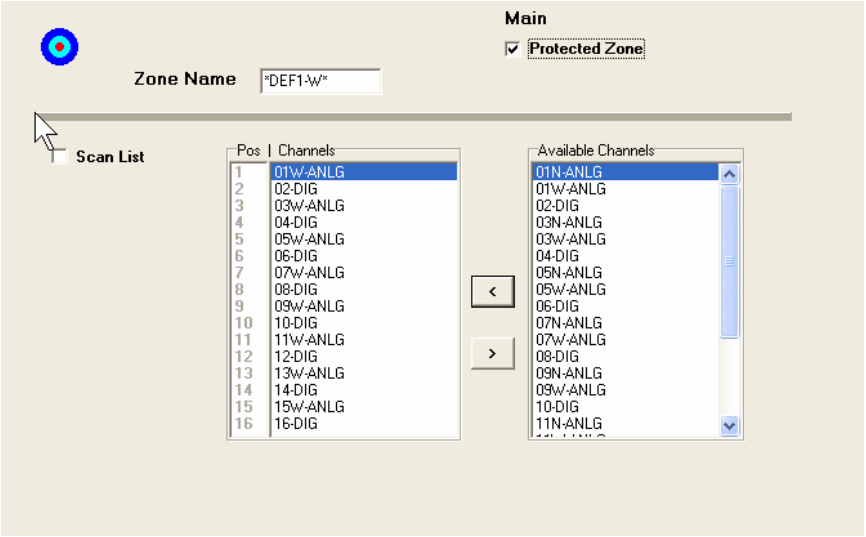
- Clone over the protected zone.
- Keypad edit / program any channels in the protected zone.
- Download channels from the PC Programmer over the protected zone.

Zone protection does not prevent any action in the PC Programmer. It only prevents undesired programming in radios that have had protected zones loaded into them.

Protected Zone Setup

Step 1

Protect the zone on the zone screen. Check the "Protected Zone" box.



Step 2

Choose the zone password on the GLOBAL screen. The zone will not be protected unless a password is selected.

EVENT BANK

The Event Bank (ICP Bank) is the Thales 25 solution to individual zone cloning. It provides an entire extra bank with the following additional channel capabilities:

- One extra bank (Bank 5)
- Three extra zones in that bank (Zones 17, 18, 19)
- 16 channels in each event zone (additional 48 channels)
- One shadow channel per event channel
- 4 additional channel locations for priority channels, home channel, and emergency channel

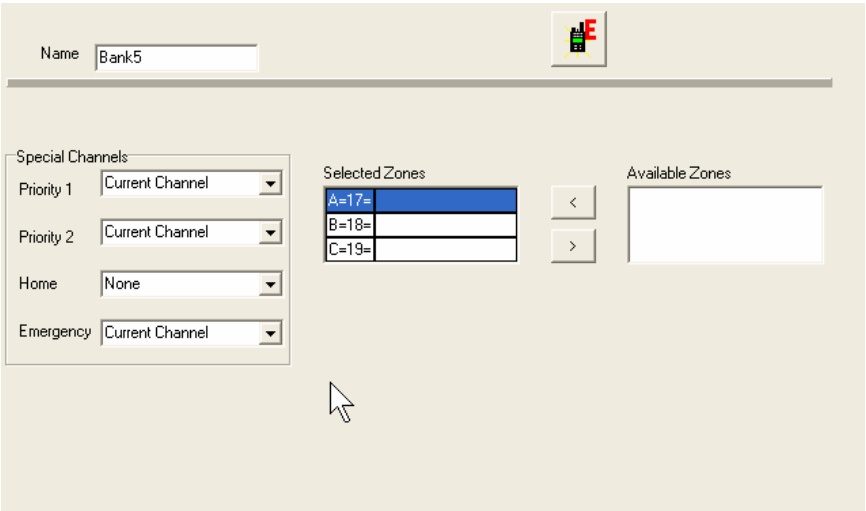
The Event zones and channels are organized differently than the Main banks and channels resulting in the following characteristics:

- Each channel is independent – if a "CAR-CAR channel exists in both zones 17 and 18, a change to the "CAR-CAR" in zone 17 will NOT affect the CAR-CAR is zone 18.
- Zones are independent of each other.

The event bank was primarily created to accommodate individual zone cloning (see Thales 25 radio user's guide for more details), but the PC Programmer has been modified to allow event channels and zones to be uploaded / downloaded to radios.

Channels and zones may be either created specifically for event bank use or dragged and dropped directly from the Main Bank treeview.

Event Bank Screen



Event Bank Special Channels

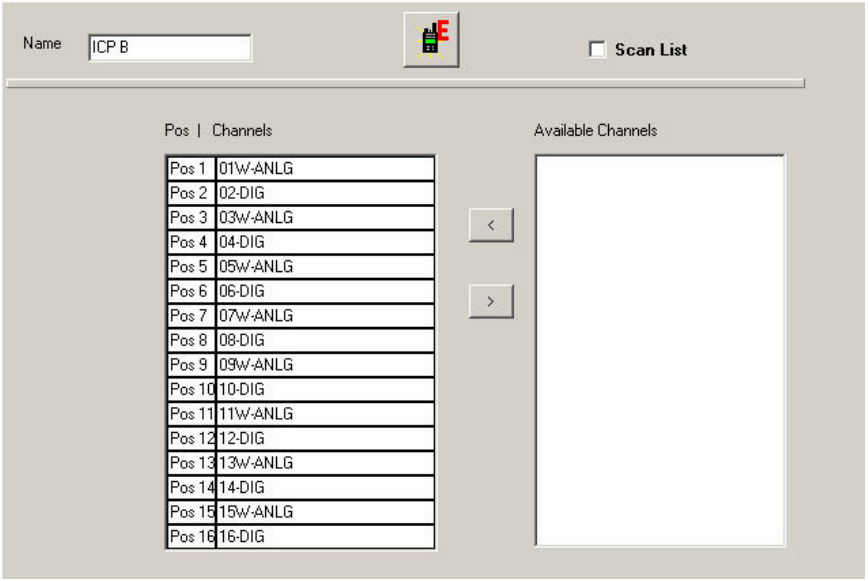
To assign a priority channel, emergency channel or home channel in the event bank, a channel may be dragged onto the event bank treeview folder, or created from the event bank screen. Clicking on the “Add Event Channel” icon will allow a channel to be created to be assigned as one of the event bank special channels.

Adding Event Zones

Event zones may be created by dragging and dropping main bank zones into the event bank. They may also be created by clicking on the “add event zone” icon.

To re-arrange the order of event zones, highlight the desired zone to be moved, and then click on the UP or DOWN arrow on the event bank until the desired position is achieved.

Event Zone Screen



As seen above, the event zone programming is very similar to the main zone programming. The differences are:

- To get channels into the event zone, they may be dragged into the event zone from the main bank section.
- Channels may also be created by the “Create Event Channel” icon on the Event Zone screen.
- Event zones cannot be protected.

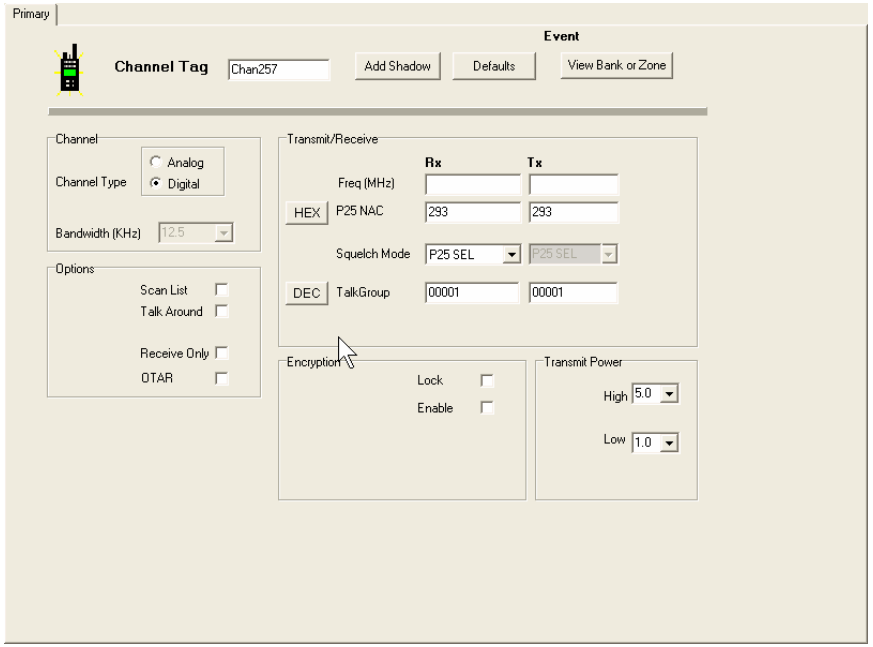
The ability to view a channel by double-clicking on a channel in the event zone has been added.

Event channel screen

Programming is similar to the main channel screens.

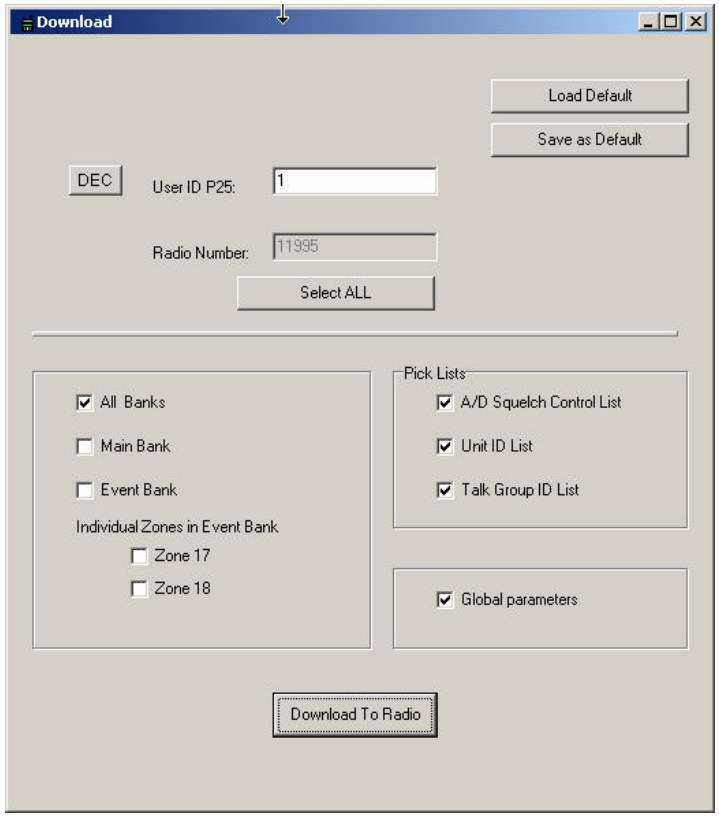
Additionally, a :View Bank or Zone" button is provided to view the zone that contains the channel.

NOTE that the "Locked option" is not available since Event Channels cannot be locked.



Partial Download

New in PCP version 4.0: If downloading to a Fire Features radio, it is now possible to download certain components of the configuration while leaving the other components in the radio intact. An example of this is to download channels, while leaving the global variables in the radio unchanged. The other options should be obvious from the illustration below:



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THALES COMMUNICATIONS, INC.
22605 GATEWAY CENTER DRIVE
CLARKSBURG, MD 20871
www.thalescomminc.com