TDFM-136(A)

VHF/FM DIGITAL AIRBORNE TRANSCEIVER

OPERATOR'S GUIDE

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Table of Contents

This section provides the user with a reference of the keypad accessible programming features of the Technisonic TDFM-136(A) VHF FM Digital Transceiver.

1.1 Command Levels

In order to accommodate the necessary commands, the commands have been divided into different levels, each command level has up to 12 commands numbered 0-9, # and *; the zero (0), and the ESC (*) key are functions for every level, they allow the user to move between levels as follows:

| 0 PROG | step **up** through command levels |

| * ESC | step **down** through command levels |

When stepping through command levels, the indicated level is shown in subscript in the 4th character position on the lower line of the display. Note that this display position is left blank for the default level (level1). Table 1 shows the character for each command level, the accompanying figure shows the level character position:

Table 1. Command Levels	
Level	Display
Operator L1	blank
Operator L2	'2'
Operator L3	'3'

```
● 001 Control   w136.0000Rx
● GD1₃Forestry n156.5000Rt
```
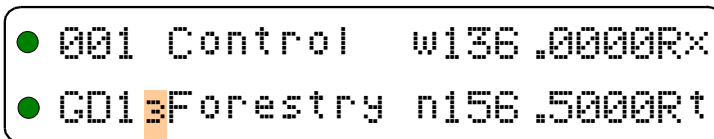
1.2   Command Types

There are two basic command types: Inherent and Interactive. An **Inherent** command is one that requires no additional input from the user, such as the 'memory brightness' or 'scroll memory' commands. An **Interactive** command requires further input from the user.

Inherent commands
These are simple 'one-touch' commands, they do not need any further input from the user.

Interactive commands
These commands require further input from the user, and they must end as follows:

| # ENTER | accept the entry and exit

| * ESC | abandon the entry and exit

The commands that allow the user to choose an option from a list, will always use the up/down arrows: (key2 and key8) to step UP and DOWN – respectively - through the available choices. In addition, the key that was used to *enter* the function can be used to step UP through the available choices.

Example: the user selects the L1-3 (Op Mode) command, once the user has selected the command they can press [2] and [3 MODE], to step up, or [8] to step down through the choices. The

advantage of the 'entry key' step method is that the user does not have to move their finger to a different key to make the choice once the command has been selected.

1.3   Command Scope

Most, but not all, edit commands can affect either the Main or the Guard Channel. The channel to be edited depends on the position of the **MN/GD** and the **G1/G2** front panel switches. In this manual, the scope of the command is given on the command title line as follows:

(MN/GD)   for a command that is valid for both Main and Guard,
(MN)   for a command that is valid for Main only
Blank   for a command that is not subject to channel restrictions.

1.4 Command Reference

Table 2 below shows the commands divided into command levels: one, two, and three.

Table 2. Command Level Reference			
Key	Level 1	Level 2	Level 3
1 CHAN	Select Main Memory	Program New Memory	Select Boot Memory
2 up	Display – Brighter	Copy Guard to Main	Set Encr key by KeyTag
3 MODE	Edit Operating Mode	Lock Keypad	Select HEX/Decimal Edit
4 back	Scroll Memory Down	n/u	Show Firmware Revision
5 SCAN	Scan ON/OFF	Edit Scan	Set Scan Parameters
6 fwd	Scroll Memory Up	Edit Description	Set PTT Timer
7 FREQ	Edit Frequency	Create Shadow Channel	Set Side-tone Audio
8 down	Display – Dimmer	Copy Main to Guard	PC Communications
9 SQL	Edit Squelch Mode	Enable/Disable Encryption	Display Squelch Values
0 PROG	Go to next level	Go to next level	Go to next level
# ENTER	Toggle Memory: Home/current	Set 'Home' memory.	n/u
* ESC	Toggle Talk Around	Go to Previous level	Go to Previous level
2+4+6	Emergency Erase Keys	n/u	n/u

NOTE: n/u indicates command keys that are not currently implemented.

This section describes the commands available to the user, they are organized into three (3) levels (L1-L3). Current level is indicated by 4th character on bottom row: blank=L1, 2=L2, 3=L3.

2.1 Operator Level 1 Commands

Level 1 commands are accessed directly from the keypad by pressing the desired command key. The command level indicator will be blank. The available commands are described below.

```
  1
CHAN
```
L1-1. Select the Operating Memory for the Main Channel (MN)

This command allows the user to select the memory for MAIN channel operation.

The cursor appears at the first digit in the channel number.

```
● 000
● Enter Number (0-9,#*)
```

Valid edit keys are:	
`0 PROG` to `9 SQL`	Enter digit, cursor automatically advances and wraps
`# ENTER`	accept the entry and continue
`* ESC`	abandon the entry and exit

Note: The user must enter the number for an existing memory (in the range 001 to 230). If the memory does not exist, the editor will return to the previously displayed memory.

⌂2 L1-2. Increase Display Brightness

Press and hold the up arrow (2) key to increase the brightness of the LED display, it stops at maximum.

3 MODE L1-3. Edit Channel Operating Mode (MN/GD)

This command will edit the Operating Mode of the selected channel, the available modes are shown in table 3. Upon selecting this command the cursor will appear at the MODE position:

```
● 001 Main      D136.0000Rg
● Edit Mode (↑↓3,#*)
```

Valid edit keys are:		
⌂2	3 MODE	step up through available operating modes (w, n, D)
8↓		step down through available operating modes (w, n, D)
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

Table 3 Operating Modes	
Operating Mode	Indicator
Analog Wide (25 kHz)	'w'
Analog Narrow (12.5 kHz)	'n'
Digital (12.5 kHz)	'D'

Note: If an Operating Mode is selected that is incompatible with the current Squelch Mode, then the Squelch mode will automatically be changed to one that is acceptable for that Operating Mode (ie 'x' for analog, 'm' for Digital Rx and 'g' for Digital Tx).

L1-4. Scroll Backwards through Available Memories

This command will scroll the Main Channel BACK, or down, through the programmed memories until reaching the lowest memory programmed, it will then wrap around and restart from the top. Once the user releases the button the displayed characteristics will be programmed. The scroll speed will increase as the button is held.

L1-5. Start/Stop Scan (MN)

Scan memories that are in the same scan list as the currently displayed Main memory. Scan must be enabled for the memory to be scanned, if so once scan starts, the scan list digit flashes to indicate that the unit is in SCAN mode. The lock symbol, this indicates that most keypad keys are disabled.

During scan: Scan digit flashes, lock indicator shown.	Valid keys are:	
● 001₁Main D136 .0000Rg ● GD1🔒Guard1 n154 .0000Rt	[5 SCAN] [* ESC]	Stop scan
	[2↑] [8↓]	change display brightness

Switch operation is modified as well: operation of **MN/GD** or **G1/G2** *will terminate scan* and restore normal operation. The front panel **Squelch Defeat** button is disabled. The **HI/LO** power switch is unaffected.

If you try to start scan on a channel or memory that doesn't support scan, you will see:

● 001₁Main   D136 .0000Rg
● Error Non—Scanned Chan

L1-6. Scroll Forward through Available Memories (MN)

This command will scroll FORWARD, or up, through the existing channels, scroll speed will increase as the button is held and the scroll will wrap around and restart from the bottom. Once the user releases the button the displayed characteristics will be programmed.

L1-7. Edit Channel Operating Frequency (MN/GD)

Edit the **Operating Frequency** of the selected channel. The frequency will be edited first Receive, then Transmit. Once the receive parameter is entered, the 2nd last character in the line will switch from "R" to "T", the user can now enter the transmit value. The editor will operate according to the current frequency mode, that is: If the frequency is currently simplex, then the edit will continue in simplex mode (the value entered for receive will automatically be carried to transmit), if the frequency is currently duplex, then the edit will continue in duplex mode (the receive value will not be automatically carried to transmit).

The editor will not accept a value outside the limits of 136.0000 MHz. to 174.0000 MHz. In addition frequency selection is limited to 2.5 kHz increments and valid 6.25kHz frequencies in all Operating modes.

The cursor appears at the second character in the Frequency field of the channel to be edited.	Valid edit keys are:	
	$\boxed{\begin{array}{c}0\\\text{PROG}\end{array}}$ to $\boxed{\begin{array}{c}9\\\text{SQL}\end{array}}$	Enter digit, cursor automatically advances and wraps
	$\boxed{\begin{array}{c}\#\\\text{ENTER}\end{array}}$	accept the entry and continue
	$\boxed{\begin{array}{c}*\\\text{ESC}\end{array}}$	abandon the entry and exit

```
● 001 Main      w136.0000Rx
● Edit Frequency (0-9,#*)
```

# L1-8. Decrease Display Brightness

Press and hold the down arrow (8) key to decrease the brightness of the LED display, it stops at minimum.

L1-9. Edit Channel Squelch Mode (MN/GD)

Edit the **Squelch Mode** of the selected channel, and then allow the user to edit the associated Squelch Mode Value. The Squelch Edit is in duplex mode, Receive followed by Transmit.

The cursor is placed on the Squelch character.

```
● 001 Control  w136.0000Rx
● Edit Sql Mode (↑↓9,#*)
```
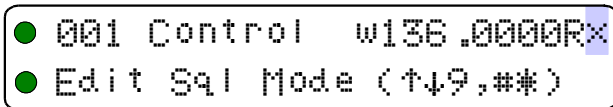
Valid edit keys are:	
9 SQL 12 8	step up/up/down through available squelch modes.
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

The available options are constrained by the operating mode, that is, different Squelch Modes are available for the analog Operating Modes (wide and narrow) than for the P25 operating mode. See table 4 below.

Table 4. Receive and Transmit Squelch Modes							
Analog Rx		Analog Tx		Digital Rx		Digital Tx	
Noise	✕	CTCSS Tones	t	Monitor	m	TalkGroup + NAC	g
CTCSS Tones	t	DCS Codes	c	NAC Only	n	ID Call	i
DCS Code	c	Inhibit	--	TalkGroup + NAC	g	Inhibit	--

The Squelch Modes that may be edited are: Noise, CTCSS Tones, and DCS Codes for analog operating modes, and TalkGroup, NAC, and ID Call for digital operating mode.

Analog - Noise Squelch Value. Scope: receive only, range 0-16 ($0-$F)

If Noise (Rx) is chosen, the prompt line will display the current value for noise squelch level and place the cursor on the first digit available for the user to edit:

```
● 001 Control  w136.0000Rx
● Noise Level:         10
```

Valid edit keys are:		
0 PROG to 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER	accept the entry and continue	
* ESC	abandon the entry and exit	

Analog - CTCSS Tone. Scope: receive & transmit, 42 tones (see appendix 4.2)

The prompt line displays the current CTCSS Tone:

```
● 005 Landar   n156.5000Rt
● CTCSS Tone (↑↓,#*): 67.0
```

Valid edit keys are:	
⌂2 ⌂8↓	step up/down through CTCSS tones
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

Edit Analog - DCS Code. Scope: receive & transmit, 83 codes (see appendix 4.2)

If DCS Codes are chosen, the prompt line will display the current code value:

```
● 005 Holden    n156.5000Rc
● DCS Code (↑↓,#✳):      23
```

Valid edit keys are:		
⟨2⟩	⟨8⟩	step up/down through DCS codes
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

Edit P25 Digital - Talkgroup Value. Scope: receive and transmit, range 0-65535 ($0000-$FFFF)

If the P25 TalkGroup was chosen the, the prompt line will display the current TalkGroup value, the cursor will be on the first digit:

```
● 005 Holden    D156.5000Rg
● P25 TalkGroup:       0001
```

Valid edit keys are:		
⟨4⟩	⟨6⟩	hex edit: move cursor backward/forward through the digits
⟨2⟩	⟨8⟩	hex edit: step up/down through the hex digits (0-9, A-F)
0 PROG to 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

Note: If P25 Talkgroup was chosen, the editor will drop into Edit NAC upon accepting the Talkgroup value.

Edit P25 Digital - NAC Value. Scope: receive and transmit, range 0-4095 ($000-$FFF)

If the P25 NAC was chosen (or after entering the P25 TalkGroup) the prompt line will display the current NAC value, with the cursor on the first digit:

Valid edit keys are:		
⟨4⟩ ⟦6⟧	hex edit: move cursor backward/forward through the digits	
⟨2⟩ ⟦8⟧	hex edit: step up/down through the hex digits (0-9, A-F)	
0 PROG to 9 SQL	Decimal mode: enter number, cursor automatically advances and wraps	
# ENTER	accept the entry and continue	
* ESC	abandon the entry and exit	

```
● 005 Holden    D156.5000Rg
● P25 NAC:            001
```

Edit P25 Digital - ID Call Value. Scope: transmit only, range 0-9,999,999

This transmit only mode allows the user to try to contact a specific radio by transmitting that radio's user ID. If no radio has that ID then this will fail.

If the P25 ID Call was chosen, the prompt line will display the current ID Call value:

Valid edit keys are:		
0 PROG to 9 SQL	Decimal mode: enter number, cursor automatically advances and wraps	
# ENTER	accept the entry and continue	
* ESC	abandon the entry and exit	

```
● 005 Holden   D156.5000Ti
● P25 Call Unit #: 0000001
```

`[0 PROG]` L1-0. Command Level Up

This key selects the next HIGHER Command Level, the Command Level is indicated by a subscript digit in the 4th character position on the lower row of the display. See table 2-1.

Upon pressing this key, the radio will remain in the new Command Level for 5 seconds, if there is no further user input within this time then the radio will revert to Level 1. The Direct Command Level (level 1) is the normal operating mode for the radio and is indicated by a blank space.

`[# ENTER]` L1-#. Toggle Main Memory: Home/Current (MN)

This key toggles between the current memory and the designated 'Home" memory for the Main channel. If no 'Home' memory has been chosen the system will default to memory 001.   he lower row of the display. See table 2-1.

`[* ESC]` L1-*. Toggle Talk Around (MN)

This key toggles the Talk Around function on and off. Talk around is indicated by an up arrow placed at the decimal point position in the frequency field. When Talk Around is enabled for a duplex memory the memory uses it's receive parameters for transmit, and thus functions like a simplex channel. Simplex channels are unaffected.

2.2   Operator Level 2 Commands

Access the **Level 2 Commands** by pressing the **"PROG"** key from the **Operator Level 1** once, the Menu Level indicator will show a subscript **"2"**.   This is a 'timed' level, if a command is not selected within 5 seconds the unit automatically returns to level 1. Upon exit from a command the timer is restarted and you have a further 5 seconds to select another command on this level. If you wish to return immediately to level 1 press the 'ESC' (*) key, if you wish to advance to level 3 press the 'PROG' (0) key.

1 CHAN

L2–1. Create/Edit All Channel Information (MN/GD restricted)

This command allows the user to create a new memory position (for Main channel only) or to edit all the parameters of an existing memory position (Main or Guard channels). The editor steps through the channel parameters in sequence from left to right across the screen. The edit functions here match those used to edit an individual parameter; in this case however selecting the ENTER key accepts the data and proceeds to the next step, rather than returning. Only after the last step does selecting enter save the data and exit.. The ESC key will abandon the entire edit session without changing an existing channel or creating a new one.

ENTER

accept the entry and continue – exit only after all edits completed.

* ESC

abandon the entry and exit

L2-1.1. Entering a Memory Number (refer to L1-1 for details)

Upon selecting this command, the first step is to enter the number of the memory position that you wish to Create or Edit, for Main Channel memories, the valid range is (001 to 230).

Once a number has been entered, the system checks to see if the memory location has already been programmed, if so, then the existing data will be loaded; if the location has NOT been previously programmed then the default template data will be loaded. In each case the user can edit the channel parameters in the same way as shown in the following steps.

L2-1.2. Enter a Scan Zone & Enabling/Disabling Scan (refer to L2-5 for details)

After entering a MEMORY number the cursor will move to the fourth (4th) position on the top line, the default scan list is shown in subscript. If there is a bar over top of the character, this indicates that scan is disabled for this memory, if there is no bar, then scan has been enabled. The 'PROG' key (key 0) toggles the scan enabled/disabled state.

L2-1.3. Enter a Text Description (refer to L2-6 for details)

After SCAN, the cursor advances to the first position in the eight (8) character text description field, the user may now edit the existing text as desired. The editor allows you to select all upper and lower (A-Z, a-z) case alphabetic characters, the numbers from zero to nine (0-9), and a selection of extra characters including the space.

L2-1.4. Enter an Operating Mode (refer to L1-3 for details)

After TEXT, the cursor advances on the one (1) character Operating Mode (Mode) field, this single character represents the operation of the radio: analog wide, analog narrow, or digital.

L2-1.5. Enter a Frequency (refer to L1-7 for details)

After MODE, the cursor advances to the frequency parameter field, this is a seven (7) digit decimal parameter, though the first digit is always one so the user cannot edit that digit. The frequency parameter may be edited to any number between 136.0000 and 174.0000 in 2.5 kHz. steps. (ie 150.0025 is valid, 150.0046 is not), or frequencies in the 6.25kHz plan (see appendix D)

The frequency will be edited first Receive, then Transmit; once the receive parameter is entered, the 2nd last character in the line will switch from "R" to "T", the user can now enter the transmit value. The editor will operate according to the current frequency mode, that is: when you start editing if the frequency is currently simplex (Rx and Tx frequencies are the same), then the edit will continue in simplex mode (the value entered for receive *will* automatically be carried to transmit). If the frequency is currently duplex (Rx and Tx frequencies are different), then the edit will continue in duplex mode (the receive value will *not* be automatically carried to transmit).

L2-1.6. Enter the Squelch Parameters (refer to L1-9 for details)

After FREQUENCY, the cursor advances to the Squelch Mode field. A single character field shows the Squelch Mode selected. This is a duplex parameter so a different mode can be chosen for transmit than was chosen for receive. Note that the modes available will be restricted by the Operating Mode (ie the modes available are different for analog and digital operation).

Once the user is finished and selects 'ENTER' then the newly edited channel parameters are selected and displayed for the appropriate channel. This may take a moment as the information is programmed into the appropriate RF module at this time as well.

⌂2 L2–2. Copy Guard to Main

Copy the currently displayed Guard information UP to the Main channel. This is irreversible, so be sure you wish to do this. As a safety precaution this command is disabled from the factory.

3 MODE L2-3. Lock Keypad

This command locks the keypad to prevent accidental change to parameters of the radio unbeknownst to the operator. This will disable all keyboard functions (except keyboard unlock and display luminance).

Edit Keys

3 MODE   Lock the keypad, display 'locked' until key release.

* ESC   Unlock the keypad (after 2 seconds), display 'unlocked' until key release.

←4 L2–4. Not Used.

L2–5. Edit Scan List & Enable/Disable Scan (MN)

This command allows the user to select which SCAN LIST - if any - that the selected channel is included in. The memory must be a member of one of the fifteen (15) scan lists that are supported. In addition, it allows the user to select whether or not the scan is enabled for the current memory.

The cursor will move to the fourth (4th) position on the top line, the default scan list is shown in subscript. If there is a bar over top of the character, this indicates that scan is disabled for this memory, if there is no bar, then scan has been enabled.

Valid edit keys are:	
⟮2⟯	step up through available scan lists
⟮8⟯	step down through available scan lists
0 PROG	toggle the scan enable / disable (bar = disabled)
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

```
● 001ī Main      w136.0000Rx
● Edit Zone/Scan (↑↓0,#*)
```

Note: If a scan list is full, it will NOT appear in the list. This includes the default list, if this happens, the unit will display the next higher available list, this will stop at list 15 and then loop back to list 1.

L2–6. Edit Channel Text Description (MN/GD)

Edit the text description for the selected memory. There are four groups of characters that may be used; upper case (A-Z), lower case (a-z), numbers (0-9), and 16 extra characters (see table 3-4 below). The user can change character groups *at any time* and as many times as desired during a description edit session.

The cursor will be placed in the first position of the text description field:

```
● 006 Desc        w141.0000Rx
● Edit Text (↑↓↔→3,#*)   AZ
```

Valid edit keys are:		
3 MODE	step up through available edit groups	
2	8	step up/down through the characters in each edit group
4	6	move backward/forward through the available characters
# ENTER	accept the entry and continue	
* ESC	abandon the entry and exit	

Note: the up/down arrow keys are *scroll* enabled, that is, if you hold them you will scroll through the character set rather than having to press each time you want to advance.

Table 3-4. Extra Characters for Text Edit															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	!	"	#	$	%	&	´	(	)	*	+	,	—	.	/

 Note: the first character in the table is a blank space.

L2–7. Create Shadow Channel

This command allows the user to create a shadow of an existing memory on the Main channel. up to seven other memories can be linked to this one primary as 'shadows'.   It is a two step process: select a Primary memory to base the shadow on, then create the shadow. The process is described below:

L2-7.1. Select a Primary Memory to Base the Shadow On

First, pick an existing memory to act as the primary:

```
● 006 Primary Memory
● Enter Number (0-9,##)
```

Valid edit keys are:		
0 PROG **to** 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L2-7.2. Create a Shadow of the Primary Memory

To create a shadow memory, start by entering a number for the shadow memory:

```
● 006 Shadow Memory
● Enter Number (0-9,##)
```

Valid edit keys are:		
0 PROG **to** 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

For Example: Assume that the user entered '061' as the desired shadow channel number. The radio will now display the data from the chosen Primary channel:

```
●  006 Chan 6   D166.0000Rg
●  Edit Text (↑↓↔→3,#*)  AZ
```
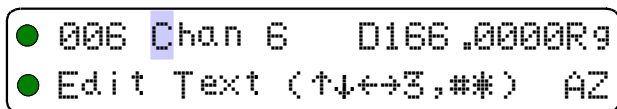
The user may now edit those data fields that are valid for a shadow channel. These are:

- Text Description
- Operating Mode
- Squelch Mode and associated value

The editor functions and keys are the same as for any of the independent editor operation, the difference, as with Create New / Program All (L2-1), is that the ENTER key will advance to the next editor until all valid fields have been entered, then the ENTER key accepts and exits.

Note that there are some parameters that cannot be edited:

- Frequency is fixed to that of the Primary channel
- Shadow channels cannot be scanned.
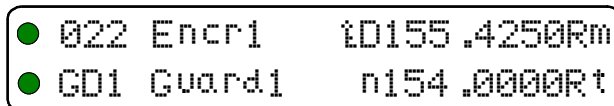- Shadow channels cannot use the Digital Squelch Mode IDcall (i).

⤓ 8   L2–8. Copy Main to Guard

Copy the currently displayed Main information DOWN to the selected Guard channel. This is irreversible, so be sure you wish to do this. As a safety precaution this command is disabled from the factory. (see Command Permissions L4-2).

9 SQL   L2–9. Encryption ON/OFF (MN/GD)

This command allows the user to turn Encryption ON or OFF providing that the current channel is a digital channel with an encryption key assigned to it. If so, you will see something like:

```
● 022 Encr1    tD155.4250Rm
● GD1 Guard1    n154.0000Rt
```


0 PROG   L2–0. Command Level Up

This key selects the next HIGHER Command Level, the Command Level is indicated by a subscript digit in the 4th character position on the lower row of the display. See section 2.1 above.

* ESC   L2–*. Command Level Down

This key selects the next LOWER Command Level, the command Level is indicated by a subscript digit in the 4th character position on the lower row of the display. See section 2.1 above.

L2-#. Set Home Memory (MN)

This command allows you to directly select the home memory for the MAIN channel. The memory selected must already have been created.

```
● 001 Set Home Memory
● Enter Number (0-9,##)
```

Valid edit keys are:			
0 PROG	to	9 SQL	Decimal mode: enter number, cursor automatically advances and wraps
# ENTER			accept the entry and continue
* ESC			abandon the entry and exit

23

2.3   Operator Level 3 Commands

Access the **Level 3 Commands** by pressing the **'PROG'** key (0) from **Level 1** twice, the Menu Level indicator will show a subscript **'3'**. This is a 'timed' level, if a command is not selected within 5 seconds the unit automatically returns to level 1. Upon exit from a command the timer is restarted and the user has a further 5 seconds to select another command on this level. To return immediately to level 2 or level 1, press the 'ESC' (*) key. Higher command levels are locked, and not to be used in flight.

1
CHAN

L3-1. Select Boot Memory

Select which memory that will be used for the Main Channel when the unit is turned on: the *last Selected memory,* the *last Programmed memory or the Home memory*.

The default is: *last Selected memory.*

```
● 3-1 Set Boot Memory
● Boot On: Last Selected
```

Valid edit keys are:	
[2↑] [8↓] [1 CHAN]	step up/down through available boot memory choices
[# ENTER]	accept the entry and continue
[* ESC]	abandon the entry and exit

24

L3-2. Assign Key by Key Tag

This command allows the user to select a memory, and then assign an Encryption key, via the KeyTag, to that memory. A KeyTag is simply a name associated with a key to make selection easier.

L3-2.1. Select existing Memory to assign a key to.

```
● 3-2 Assign Key by KeyTag
● Main Memory (←→,#*):001
```

Valid edit keys are:		
⌂2	8↓	step up/down through available boot memory choices
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L3-2.2. Select Key by 'Key Tag'.

Once a memory has been selected, then pick a KeyTags to assign to the selected memory.

```
● 3-2 Assign Key by KeyTag
● KeyTag(↑↓,#*):Key Tag 01
```

Valid edit keys are:		
⌂2	8↓	step up/down through available KeyTags
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L3-2.3. Select Key by 'Key Tag'.

After assigning the key, set how the decrypt function is applied to receiving on this memory: by only decrypting signals encrypted with the assigned key, or by decrypting if the received signal was encrypted using any key currently loaded into the radio.

```
● 3-2 Assign Key by KeyTag
● Set Rx Key: Any Key
```

Valid edit keys are:		
⌂2 ⌄8		toggle Receive Key Option: Any Key / Selected Key.
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L3-2.4. Assign more or Exit.

Once a key has been assigned, you are given the chance to assign another key, or to exit.

```
● 3-2 Assign Key by KeyTag
● Assign More? #=OK *=exit
```

Valid edit keys are:	
# ENTER	Assign another
* ESC	exit

L3-3. Select Hex/Decimal Edit Mode

Select whether to edit the TalkGroup and the NAC numbers as Hexadecimal (Hex) or as Decimal numbers. The other parameters are edited in decimal only. Note that 'HEX' is indicated by a preceding dollar sign (ie $014 is hex 14 which is equivalent to 20 in decimal).

```
● 3-3 Set Hex/Decimal Edit
● Edit in: Hex
```

Valid edit keys are:	
🔼2 🔽8	toggle Edit Mode Option: Hex / Decimal Edit.
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

L3-4.   Display Software Release and Version Information

Display the current firmware release and version information for the various firmware objects in the transceiver including: Main Code, Bootloader Code, RF Module Code. This information is displayed on the bottom row as follows:

```
● 3-4 Show Code Versions
● Main: 3.0.0/e
```

Valid edit keys are:	
🔼2 🔽8 ◀4	Step through firmware information
* ESC	exit

L3–5. Edit Scan Parameters (MN)

Edit the parameters that govern the SCAN operation. There are 4 (four) parameters that may be configured: Revert Mode, Reply Timer, Monitor Timer, and Delay Timer. As with the Create/Edit All command (L2-1), this command is sequential, allowing the user to move between parameters using the enter key, at the last parameter, this key accepts all and exits.

L3-5.1. Setting the Revert Mode Default: last contacted

The Revert Mode refers to whether the radio will, when keyed, transmit on the *selected* memory channel, or on the last *contacted* memory channel. The radio will only respond on the last contacted channel for a time determined by the Delay timer setting, once the timer times-out, then the unit always transmits on the selected channel. The Revert Mode screen is as follows:

```
● 3-5 Edit Scan Parameters
● Revert Mode: Contacted
```

Valid edit keys are:	
[2↑] [8↓]	toggle Revert Mode: Selected / Contacted
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

L3-5.2. **Setting the Reply Timer** Range: 0-20s, Default: 3 seconds

Set the scan Reply time. This is the time that the radio will monitor a channel on which RF was received, after all activity on the channel has ended (Rx or Tx). If there is further receive or transmit activity on the channel, the timer will reset, and start again once the activity has ended. When the timer times-out the unit will resume scan. If set to zero (0), the unit will resume scan immediately when channel activity ends.

```
● 3-5 Edit Scan Parameters
● Reply Timer:            03
```

Valid edit keys are:		
0 PROG to 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L3-5.3. **Setting the Monitor Timer** Range: 1-90s, Default: 10 seconds

Tthe scan Monitor time is the time that the radio will monitor a channel on which RF was received, before resuming scanning. Once the timer expires, the unit will break and resume scan, if the value is set to zero (0) then the unit will monitor the signal as long as it is received.

```
● 3-5 Edit Scan Parameters
● Monitor Timer:         10
```

Valid edit keys are:		
0 PROG to 9 SQL		Decimal mode: enter number, cursor automatically advances and wraps
# ENTER		accept the entry and continue
* ESC		abandon the entry and exit

L3-5.4. Setting the Delay Timer Range: 0-15s, Default: 5 seconds

The Delay time is the time that the radio will remain monitoring a channel after receiving on that channel has ended. If the timer is set to zero, (0), then the unit will resume scanning immediately after receive activity ends. This is the timer that affects the Revert Mode 'Contacted'.

● 3-5 Edit Scan Parameters
● Delay Timer: 05

Valid edit keys are:		
`0 PROG` to `9 SQL`		Decimal mode: enter number, cursor automatically advances and wraps
`# ENTER`		accept the entry and continue
`* ESC`		abandon the entry and exit

L3-6. Configure the PTT Timer

The PTT timer runs whenever the user holds PTT. The PTT timer duration may be set using this command: step through the available selections: OFF, 30 seconds, 60 seconds and 90 seconds.

● 3-6 Set PTT Timer
● Timer Set: 90 sec

Valid edit keys are:		
`2` `6`		Step up through PTT timer settings
`8`		Step down through PTT timer settings
`# ENTER`		accept the entry and continue
`* ESC`		abandon the entry and exit

L3-7. Side tone Audio Level Adjust

This command allows the user to adjust the level of side tone, the range of adjustment is 0 to 85, the default level is 35. The screen shows the currently selected level as shown:

```
● 3-7 Set Sidetone Audio
● Audio Level: (0-85):   22
```

Valid edit keys are:	
0 PROG to 9 SQL	Decimal mode: enter number, cursor automatically advances and wraps
# ENTER	accept the entry and continue
* ESC	abandon the entry and exit

L3-8. PC Data Upload/Download

This command allows a user to exchange channel memory files (records) between a PC and the transceiver. The unit must be connected to a PC running Windows 95, 98, NT 4.0, 2000, XP, or Win7 and the TiL TDP-136 Radio Communication Software package. When in this mode, the communication is controlled by the PC software. The transceiver will wait for 25 seconds to receive a valid record before timing out. The radio will indicate which memory is being transferred, and when the transfer is complete.

```
● Communicate with PC
● Ready
```

Valid edit keys are:	
* ESC	exit

If the transceiver has to swap memory space during the download, the activity will be displayed on the front panel and the download will be completed after a SWAP and ERASE cycle is finished.

| 9 |
| SQL |

L3-9. Display Channel Squelch Parameters

Display the Squelch parameters for the currently selected channel. When displaying the receive parameters, the noise squelch level appears beneath the "Rx" that starts the line, this space is blank in the transmit parameters display:

```
● Rx: Tone Code TalkG NAC
● A 167.0   23   $0001$293
```

```
● Tx: Tone Code TalkG NAC
●    167.0   23   $0001$293
```

Valid edit keys are:

[2]	[8]	[9 SQL]	toggle the squelch parameter display between receive and transmit .
[* ESC]			abandon the entry and exit

| 0 |
| PROG |

L3-0. Command Level Up

This key selects the next HIGHER Command Level, the Command Level is indicated by a subscript digit in the 4th character position on the lower row of the display. See section 2.1 above.

| * |
| ESC |

L3-*. Command Level Down

This key selects the next LOWER Command Level, the command Level is indicated by a subscript digit in the 4th character position on the lower row of the display. See section 2.1 above.

| # |
| ENTER |

L3-#. Unused

The table below shows the supported CTCSS tones.

CTCSS Tone Table		
67	107.2	173.8
69.3	110.9	179.9
71.9	114.8	186.2
74.4	118.8	192.8
77	123	203.5
79.7	127.3	206.5
82.5	131.8	210.7
85.4	136.5	218.1
88.5	141.3	225.7
91.5	146.2	229.1
94.8	151.4	233.6
97.4	156.7	241.8
100	162.2	250.3
103.5	167.9	254.8

The table below shows the supported DCS codes.

DCS Codes Table					
23	114	174	315	445	631
25	115	205	331	464	632
26	116	223	343	465	654
31	125	226	346	466	662
32	131	243	351	503	664
43	132	244	364	506	703
47	134	245	365	516	712
51	143	251	371	532	723
54	152	261	411	546	731
65	155	263	412	565	732
71	156	265	413	606	734
72	162	271	423	612	743
73	165	306	431	624	754
74	172	311	432	627	