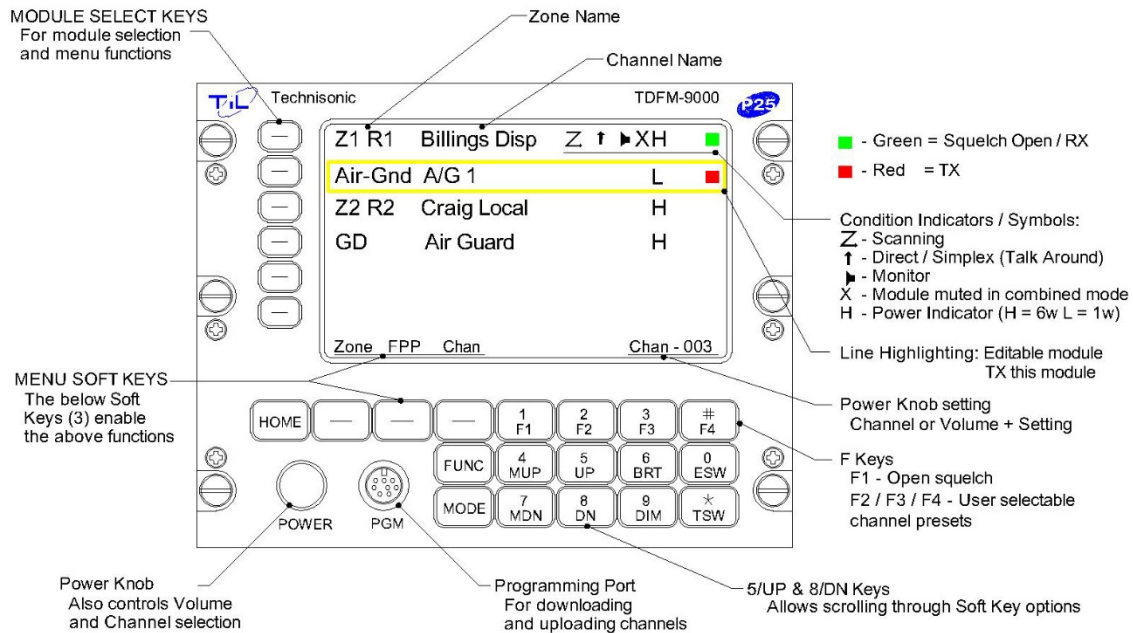




NIICD TDFM-9000 Radio Operator's Guide



October 1, 2018



Basic TDFM-9000 Information


- TDFM-9000 series radio's keys, buttons and option configurations are highly dependent on how they are configured by the Codeplug Manager. A Codeplug determines how the radio will operate, what keys and buttons do what, what frequencies are available and how they can be used. As such, these instructions only apply to TDFM-9000 series radios using a NIICD created Codeplug.
- A TDFM-9000 radio can have up to six radio modules (bands). Modules with information on the screen have a radio module installed. Blank modules have no radio module and are inactive.
- Each radio module can operate on up to three different frequency bands. The user may be locked out from accessing non-VHF-FM frequency bands.
- All NIICD supported radio modules operate on VHF-FM.
- All radio modules can support up to 3,000 different channels.
- Channels in each radio module are divided up into "Zones". Users cannot add zones.
- All regions have at least one Zone. Additional Zones include: Air-Ground, FPP-Analog and FPP-P25 digital.
- Only the two Front Panel Programmable (FPP) zones can have new frequencies loaded into them via direct entry. All other Zones are locked out from user editing.
- NIICD supported radio modules come pre-loaded with frequencies from across the country.
- National Flight Following (NFF – 168.6500 & 110.9 RT/TX), Air Guard (AG – 168.6250 & 110.9 TX) and Smokejumper Air/Ground (SMKJ A/G – 168.5500) are in all zones as channels 1, 2 and 3 respectively.
- The last radio module is dedicated to Air Guard. It has only two channels: 1 – Air Guard (168.6250 & 110.9 TX) and 2 – Air Guard RtTt (168.6250 & 110.9 RX/TX).
- There are three user selectable keys to save channels: **[F2]** (2/F2), **[F3]** (3/F3) and **[F4]** (#/F4).

Index

Abbreviations & Definitions	8
Brightness Adjustment	8
Changing Channels	3
Changing Zones	3
Channel Presets (F Keys)	7
CTCSS Tones (i.e. TPL) (FPP)	4
Function (FUNC) Key	6
Home Key	3
Menu Softkeys	3
Module Select Softkeys	2
Multiple Private Line (MPL)	5
Power Knob	2
Programming New Channels (FPP)	3
Scan List Creation	5
Scanning	5
Sidetone Adjustment	7
Squelch Open/Close (F Keys)	7
Transmitter Power Setting	5
Viewing Channel Information (FPP)	3
Volume Adjustment (POWER knob)	2

Keys and Functions

Module Select Softkeys (six keys to the left of the display screen)






- The box indicates that that module can be edited and programmed information viewed.
- Single transmitter line installations: The box indicates that module is set to transmit.
- Dual transmitter line installations: User 1 box is yellow. User 2 box is blue.
- Pressing the Module Select  Softkey a second time mutes that module and an “X” appears.

POWER knob

- Turn Radio on/off Push & hold **POWER** knob
- Adjust Volume Briefly press **POWER** knob until “Vol – xx” is displayed in the lower right corner of the screen then rotate **POWER** knob.
- Change Channel Briefly press **POWER** knob until “Chan – xxx” is displayed in the lower right corner of the screen then rotate **POWER** knob.

Note: The TDFM-9000 can be configured to power on and off when power is applied to the radio. In this instance the **POWER** knob only controls volume and channel changes.




Change Channels







1. Press the Module Select  Softkey to place a box around the desired module.
Then
2. Briefly press the **POWER** knob until “Chan-xxx” appears in the lower right corner of the display.
3. Turn the **POWER** knob until the desired channel is shown.
Or
2. Press the  (5/UP) or  (8/DN) keys.
Or
2. Press the **Chan**  Menu Softkey on the display.
3. Rotate the **POWER** knob until outline box highlights the desired channel.
4. Press the **Sel**  Menu Softkey on the display.

HOME key

- Returns display to the HOME screen from wherever the radio is currently at.






Menu Softkeys (three keys to the right of the (HOME) key)

- Selects function on display immediately above that Menu  Softkey. Up to three Menu Softkey functions are displayed at any one time.
Note: While on the home screen, the  (5/UP) and  (8/DN) keys step through all available Menu Softkey selections.

- **Zone** Allows operator to change between preloaded zones.
 1. Press Module Select  Softkey to place a box around the desired module.
 2. Press **Zone**  Menu Softkey.
 3. Rotate **POWER** knob,  (5/UP) or  (8/DN) keys to move cursor to desired Zone.
 4. Press the **Sel**  Menu Softkey to accept change.
 5. Press the **Exit**  Menu Softkey to abandon changing Zones.
























- **FPP** Front Panel Programmability. Allows viewing/editing channel information.








VIEWING









1. Press Module Select  Softkey to place a box around the desired module.
2. Change to desired channel.
3. Press **FPP**  Menu Softkey.
4. Press Module Select  Softkey to place a box around the information to be viewed.
5. Press Module Select  Softkey again to toggle between RX and TX settings.
6. Press  (HOME) to return to main screen.


EDITING



Only Zone “FPP Anlg” permits loading analog channels and “FPP P25” permits loading P25 digital channels. There are 20 channels available to program in each FPP zone.

1. Press Module Select  Softkey to place a box around the desired module.
 2. Change Zone to “FPP xxx”. FPP are the only Zones that can be edited.
 3. Change to desired channel. There are 20 channels available for editing.
 4. Press Module Select  Softkey to place a box around the desired information. If only changing TX information press Module Select  Softkey again until TX is displayed.
 5. Slowly enter desired changes then press the **OK**  Menu Softkey.
 - **Freq** Direct frequency editing. Press Module Select **Freq**  Softkey to toggle between Rx and Tx frequencies.
 - **TPL** Tones – Press Module Select **TPL**  Softkey to toggle between Rx and Tx tones. Rotate **POWER** knob to select desired tone then press the **OK**  Menu Softkey.
 - **DPL** Digital analog tones. Seldom used. Press Module Select **DPL**  Softkey to toggle between Rx and Tx. Rotate **POWER** knob to select desired tone then press the **OK**  Menu Softkey.
 - **NAC** P25 digital. Only editable on “FPP P25” Zone. Press Module Select **NAC**  Softkey to toggle between Rx NAC, Tx NAC and *Tlkgrp ID* (talkgroup).
 - Press **123**  Menu Softkey to type numbers.
 - Press **ABC**  Menu Softkey to type letters.
A = 1, B = 2, C = 3, D = 4, E = 5, F = 6
 - Press **Corr**  Menu Softkey to backup cursor.
 - Press **OK**  Menu Softkey to accept changes.
 - **RX Mode** Preset
 - **Zone Name** Press the Module Select  Softkey to toggle between *Zone Name* and *Chan Name*.
- DO NOT CHANGE ZONE NAME**
1. Press Module Select  Softkey until “Chan Name” is displayed.
 2. Rotate **POWER** knob to change the flashing character. All available characters appear one after the other: Capitals, lower case, numbers & special characters then it repeats.
 3. Press **Corr**  Menu Softkey to backup cursor.
 4. Press **Next**  Menu Softkey to move to the next character.
 5. Press **OK**  Menu Softkey to save information.
- **Chan** Allows operator to change selected radio’s channel.
1. Rotate **POWER** knob,  (5/UP) or  (8/DN) keys to move channel curser.
 2. Press the **Sel**  Menu Softkey to accept change.
 3. Press the **Exit**  Menu Softkey to abandon changing Zones.

- **MPL** Multiple Private Line (multiple tone selection). Not available on all channels. Some channels (mostly in R5 SZ) show MPL in their title. The MPL  Menu Softkey is available on these channels.
 1. Press Module Select  Softkey to place a box around the desired module.
 2. Change to a channel with MPL in its title.
 3. Press the  (5/UP) or  (8/DN) keys until MPL is displayed in the lower left corner of the screen.
 4. Press the **MPL**  Menu Softkey.
 5. Rotate **POWER** knob,  (5/UP) or  (8/DN) keys to move cursor to desired Tone. *Only the below tones are available for MPL.*

Tone 1-110.9	Tone 9-100.0
Tone 2-123.0	Tone 10-107.2
Tone 3-131.8	Tone 11-114.8
Tone 4-136.5	Tone 12-127.3
Tone 5-146.2	Tone 13-141.3
Tone 6-156.7	Tone 14-151.4
Tone 7-167.9	Tone 15-162.2
Tone 8-103.5	Tone 16-192.8
 6. Press the **Sel**  Menu Softkey to accept change.
- **ScnL** Loads channels into the module's scan list. Scan may not be available on all channels. There are 10 channel slots per module for the module's scan list.
 1. Press Module Select  Softkey to place a box around the desired module.
 2. Press the  (5/UP) or  (8/DN) keys until *ScnL* is displayed in the lower left corner of the screen.
 3. Press the **ScnL**  Menu Softkey.
 4. Rotate **POWER** knob,  (5/UP) or  (8/DN) keys to move cursor to desired channel.
 5. Press the below  Menu Softkey corresponding to desired operation.
 - **Sel** – Adds highlighted channel to scan list. A “Z” appears to the right of the channel's name. Pressing **Sel** again and a “P” appears indicating that this channel has priority.
 - **Del** – Removed highlighted channel from scan list.
 - **Rcl** – Rotates through all channels in the radio's scan list.

Note: A tone is audible if no channels are loaded into the modules scan list.
- **Scan** Starts scan on selected radio using operator enabled channel list. Not available on all channels.
 - Press the **Scan**  Menu Softkey to enable/disable scan. A “Z” appears on every channel in that Zone indicating scan is active whether or not those channels are part of the scan list.

Note: A tone is audible if no channels are loaded into the radios scan list and “Empty List” is displayed. Press the **Scan**  Menu Softkey again to remove the tone.
- **Pwr** Press **PWR**  Menu Softkey to toggle between “H” High TX power (6 watts) and “L” Low TX power (1 watt).

- **Info Radio Info**

Note: This information takes several seconds to load. Be patient.

- Displays firmware versions loaded into the radio.

IP Info

- Displays radio IP information





Control Map (VHF-FM modules)

- Displays settings for “Side” Buttons
 - Upper Side Button – Monitor (1/F1)
 - Middle Side Button – MS 1 (2/F2)
 - Bottom Side Button – MS 2 (3/F3)
 - Data Button – Blank
 - Orange Button – MS 3 (#/F4)
 - Rotary – Channel Select
 - 2-Position Switch selections – Blank
 - 3-Position Switch selections – Blank
 - Keypad selections – Unprogrammed


 **FUNC key**

- Configures basic radio settings. **ONLY EDIT SIDETONE. DO NOT EDIT ANY OTHER FUNCTION.**

1. Press the  (FUNC) key.
2. Press the **Next**  Softkey.
3. Press the Module Select **Configuration Menu**  Softkey.
4. Continue pressing the **Next**  Softkey until reaching the desired function.


Function	Default	Description
○ Knob Default	Channel	User able to edit the Channel or Volume setting (via pressing the POWER knob) after radio boots up.
○ Volume/Channel Mode	Both	Either <i>Vol</i> & <i>Chan</i> are available to edit (via pressing the POWER knob) or only where the above Knob Default setting has been set to.
○ Num Lock Mode	Disabled	Keypad keys set to a numeric keypad.
○ Recall Mode	Disabled	Recall of Zone & Chan available on POWER knob.
○ Backlighting (Radio)	28 VDC	Voltage of faceplate backlighting. DO NOT EDIT.
○ F1-F4 Keys	Normal	Normal or Channels <ul style="list-style-type: none"> <i>Normal</i> <ul style="list-style-type: none"> •  1/F1 Key – Opens module squelch. •  2/F2 Key – User selectable channel preset. •  3/F3 Key – User selectable channel preset. •  #/F4 Key – User selectable channel preset. <i>Channels</i> <ul style="list-style-type: none"> • All four “F” keys are user selectable channel keys. (No key available to open radio squelch).
○ Dual User Mode	Disabled	Only used when two users (i.e. pilot & co-pilot) can individually control the radio.
○ Always On Mode	Disabled	Radio powers on & off with avionics buss. Using this option runs a risk of creating errors In the radio.



Note: Enabling the CSQ, ESW and TSW functions clutter the screen.


- CSQ Indicator Disabled Toggles CSQ indicator.
- H/L Power Indicator Enabled Toggles Hi/Lo indicator.
- ESW Indicator Disabled Toggles ESW indicator (not used).
- TSW Indicator Disabled Toggles TSW indicator (not used).
- **Sidetone (x)** 29 (default) for all installed modules
- Squelch Blinking (x) Enabled for all installed modules
- Num Lock Tmr Revert 03 Disabled when above *Num Lock Mode* is disabled. Time when Num Lock reverts back to where the *Knob Default* setting is set to.
- ADM Tmr 00 Automatic Daylight Mode. Brightens the display in direct sunlight when the  6/BRT key is pressed. Seconds on:
 - 00 = Momentary
 - 11 = 1 second
 - 21 = 2 seconds and so on until
 - 101 = 10 seconds
- RFM (x) Text Color White Changes the color of the radio modules display color.




 Mode Key


- Disabled




 1/F1 Key


- Non-trunked radios (typical):
 - Opens squelch on the highlighted module.
 - Pressing  (1/F1) for 2 seconds (beep heard) keeps squelch open until  (1/F1) pressed again.
- Trunked radios:
 - Site Disp/Search




 2/F2 Key

- Saved channels can be recalled no matter which Zone you are on (by module).
- 1. Press Module Select  Softkey to place a box around the desired module.
- 2. Change to desired Zone and channel you want saved.
- 3. Press & hold  (2/F2) key to load selected Zone & channel into  (2/F2) quick access.

 3/F3 Key

- Saved channels can be recalled no matter which Zone you are on (by module).
- 1. Press Module Select  Softkey to place a box around the desired module.
- 2. Change to desired Zone and channel you want saved.
- 3. Press & hold  3/F3 key to load selected Zone & channel into  3/F3 quick access.

 #/F4 Key

- Saved channels can be recalled no matter which Zone you are on (by module).
- 1. Press Module Select  Softkey to place a box around the desired module.
- 2. Change to desired Zone and channel you want saved.
- 3. Press & hold  (#/F4) key to load selected Zone & channel into  (#/F4) quick access.



4/MUP Key

- Preset channel up

5/UP Key

- Toggles up through next grouping of Menu Softkeys. Three Menu Softkeys per group maximum.

6/BRT Key

- Display brightness up
- When the display dimmer is at its highest level (31) and you press and hold the  (6/BRT) key the display will become fully bright. This helps when glare is making the screen difficult to read. See the  (FUNC) key ADM Tmr setting.

7/MDN Key

- Preset channel down

8/DN Key

- Toggles down through next group of Menu Softkeys. Three Menu Softkeys per group maximum.

9/DIM Key

- Display brightness down

0/ESW Key

- Disabled except in programming mode

*/TSW Key

- Disabled except in programming mode

Abbreviations & Definitions

Analog	Old school radio signals. These are the first type of voice signals used.
Band	Used interchangeably with Module. A module can be capable of two or three frequency bands: VHF-FM (136 to 174 MHz), UHF Lo (380 to 470 MHz), UHF Hi (450 to 520 MHz) and 700/800 (764 to 870 MHz). Bands may or may not be active.
Codeplug	A file used on Motorola radios. Technisonic uses Motorola radio modules in their TDFM-9000 series radios. This file literally determines how a radio will operate and is very complex. Codeplugs determine which keys do what, in what order, frequencies, how they are used, how they are organized, etc.
Combined Mode	A radio installation function. Where a radio has a single set of wires for receive, transmit PTT and microphone combining all radio module signals together. See Individual Band.
CPS	Motorola's Customer Programming Software. The APX CPS software is used to program the TDFM-9000 series radios. APX CPS is a highly complex program available only by subscription.
CTCSS	Continuous Tone Controlled Squelch System (i.e. analog tones).

Decimal	Commonly used numbers. The term is typically used when discussing NAC and Talkgroup codes.
Direct	Similar to Talkaround. Using one frequency for both receive and transmit.
DPL	Digital Private Line. Analog digital tones. Motorola calls them DPL while most others call them DCS. These are not P25 digital tones. DPL/DCS tones are seldom used.
Dual User	The radio can be configured where two users (i.e. pilot and co-pilot) can separately control the radio.
ESW	Two position ergo switch. A Motorola feature not enabled in the NIICD Codeplug.
F Keys	Special function keys. NIICD has configured the codeplug where F1 is open squelch and F2, F3 and F4 are user selectable channel presets.
FPP	Front Panel Programmability. The ability to edit channel information.
FUNC	Function. Activates radio configuration options.
Hex	Sixteen possible characters in a single space. Normally 10 characters can use a single space but when the letters A, B, C, D, E and F are used more information can be packed into a smaller area. The term is used when discussing NAC and Talkgroup codes.
HOME	Resets radio to the "Home" screen.
Individual Band	A radio installation function. Where a radio has multiple sets of wires for receive, transmit PTT and microphone. Each radio module's signals are an individual set. See Combined Mode.
Module	A radio "module" inside the TDFM-9000. Up to six radio modules can be installed. Each module can receive, transmit and store up to 3,000 channels while being independent of all other modules.
Monitor	Open squelch on analog channels and listen to traffic on that receiver. Typically this generates noise used to set the module's volume level.
MPL	Multiple Private Line (i.e. multiple tones). The ability to use several tones on the same channel.
NAC	Network Access Code. A function of P25 digital with 4,096 combinations. Similar to analog CTCSS tones but in a digital format.
P25	Project 25 digital. Our VHF-FM radio signals are either P25 or analog.
PTT	Push-to-talk. Transmitting on a radio.
PWR	Power. A softkey selection that toggles a modules transmitter power from "H" (6 watts) to "L" (1 watt).
Softkey	A key with multiple functions depending on the radio's current settings
Talkaround	Bypassing the settings in a duplex (two) frequency channel so it becomes simplex (one frequency). Typically the tone assigned to the receiver is used on the transmitter.
Talkgroup	Talkgroup code. A function of P25 digital and a sub-function of NAC with 65,536 combinations. There is no analog equivalent.
Tlkgrp	See Talkgroup.

TPL	Tone Private Line. Analog tones. Motorola calls them TPL while most others call them CTCSS or simply Tones.
TSW	Three position toggle switch. A Motorola feature not enabled in the NIICD Codeplug.
Zone	A group of channels. Zones can have from one to hundreds of channels in them. Zones are a convenient way to organize channels into similar groups.