



TECHNICAL INFORMATION BULLETIN

T/B No.: TIBFM 16-02
Issue Date: DEC15/09
Rev. Date:

TiL Model: TDFM-7300

Affected S/No: ALL

Purpose: This document is a brief overview on the programming procedures pertaining to the CPS software used to program our TDFM-7300 series of FM Transceivers.

INTRODUCTION

All bands/modules except the Lowband (Band 5) must be programmed individually through the CPS software. Refer to Technical Bulletin (TIBFM 16-01) for the applicable software and cables required.

Keep in mind through the programming process that the settings for the band modules are done in four stages.

1. The **Menus** are defined
2. The **Features** are assigned to the function buttons
3. The **Personalities** are set up
4. The **Zones** have the personalities assigned to them

1.0 SETUP

If this is the first attempt to program this radio, then the following must be performed:

- Connect the computer interface cable up between the radio and computer's com-port
- Start the Motorola Astro 25 Portable CPS Software on your computer
- Select the band you wish to program by pushing the band button on the front of the radio
- Read the radio band frequency file "Code Plug" and save this file



The CODEPLUG can then be modified and then programmed back into the band module. The Band module only needs to be read once. After the CODEPLUG has been saved on the computer, then it will not need to read again to make any future changes. Simply load the file in the CPS, edit any changes and then program them to the module.

1.1 READING THE CODEPLUG FROM BAND MODULE

To read the codeplug from the band module click on "FILE" then click on "READ DEVICE".

This can take a minute or so. After this is done a window will open in the programming environment. The window will show a tree listing of different areas that can be expanded to edit the radios features.

1.2 EDITING THE CODEPLUG FILE MENUS, BUTTONS AND SWITCHES

The first thing that should be done is to decide what MENU items are required on the front of the radio. Menu items are configured in the "DISPLAY & MENU" pull down box in the "RADIO CONFIGURATION" part of the codeplug tree.

Click on "MENU ITEMS" tab. There are 4 lists. The top two lists are for conventional modes and the bottom two lists are for trunking modes. To configure the menus for the radio's display, you must select the items from the left box and add them to the right box. The order in which the items are added will determine what items are displayed from left to right. Only 3 of the items can be displayed at any time. The same holds true for the trunking menus. If more than three menus are selected the UP and DN buttons on the front of the radio are used to scroll through the additional menus.

The next item that should be programmed is to define what the function buttons and switches are to do. Function buttons are defined in the "BUTTONS" box under the "CONTROLS" directory of "RADIO CONFIGURATION".

There are four buttons to define. The "TOP BUTTON" in the software maps to the "F4" key on the front of the TDFM-7300 radio and the "F1, F2 & F3 keys are programmed from "SIDE BUTTONS " 1, 2 & 3 respectively in the software. To define each button click onto the pull down menu and select the desired option.



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Notes:

- The **F1** button is usually programmed for manual squelch override for conventional channels. A brief press of the **F1** button will cause the squelch to open for ¼ of a second. The squelch can be forced open by pressing and holding the **F1** key for 2 seconds. To close the squelch briefly push **F1** again.
- The **F3** button is usually assigned for the DIRECT TALK AROUND feature used on channels that are programmed for repeaters. This feature allows the radio to transmit on the same frequency as the repeater output when in close proximity but does not use the repeater, therefore the radio “Talks around” the repeater. To enable, press the **F3** button. A “↑” indicator will be displayed in the right hand portion of the radio band display. To switch back to normal, press **F3** again.

Switches are defined similarly by going to the “SWITCHES” box also under the “CONTROLS” tree.

The rotary control should **always** be set to “CHANNEL SELECT”. This ensures that the rotary knob will change channels when the radio is in “CHAN” mode.

The **ESW** switch located on the right side of the radio’s keypad is configured by setting the “TWO POSITION CONCENTRIC” pull-down menus. The zero with slash position is programmed with the feature or function set to position A in the software. The “O” is programmed by position B in the software.

The **ESW** button is usually used for selecting SECURE or CLEAR mode for radios equipped with encryption. To enable SECURE for the current channel press the **ESW** button. The **ESW** indicator will change to “O” from “Ø” and an “S” will also appear if the radio has encryption. To switch to CLEAR mode press **ESW** again and the “S” symbol will disappear and the **ESW** indicator will change to “O”.

The **TSW** switch has three positions that are represented by A, B or C. These positions are designated for a function determined by the pulldown boxes found in the programming software.

The C position is sometimes programmed as the SCAN function. However the SCAN feature should not be mapped to any button or switch position unless scan lists are created in the radios personalities.



1.3 CONFIGURING PERSONALITIES

The radio's personalities define various common settings that can be assigned to individual channels.

To program the personalities:

- Click on "CONVENTIONAL" in the tree
- Click on "CONVENTIONAL PERSONALITY" There may be one or more personalities listed
- Double-click on the first personality. A dialog box will appear for the receive parameters

1.4 SETTING RECEIVE PERSONALITY PARAMETERS

Click on the RECEIVE OPTIONS tab to set up the parameters for modulation and squelch settings these settings are:

- UNMUTE/MUTE TYPE: Set to "UNMUTE" or "MUTE"
- RX VOICE/SIGNAL TYPE: Set to "NON ASTRO" for analog FM or "ASTRO" for P25 CAI modulation
- Set to "MIXED MODE" to make the receiver automatically decode P25 modulation or analog FM
- RX UNMUTE DELAY: This governs how fast the receiver opens the squelch when a signal is received. Factory default is 1 for NO DELAY. It is not recommended to alter this setting
- SQUELCH (FINE TUNE): This is the carrier squelch setting for this channel. The default setting is "6" but it can be tightened up as desired
- RX EMPHASIS: Should always be checked
- BUSY LED: Should always be checked.
- RX check box designated for RX only channels if desired

1.5 SETTING TRANSMIT PERSONALITY PARAMETERS

Click on "TX OPTIONS" tab and observe the options:

- TIME OUT TIMER: set to 3 (Factory default) for maximum of 60 seconds of continuous transmit time. If no Timer is desired set this to 1 for "infinite" or no time limitation on transmit. It is recommended that a timer is programmed.



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- TX VOICE/SIGNAL TYPE: This sets the type of transmit modulation. If the receive options has been set to “NON ASTRO” then, this box will show the same. If the RX options have been set to “ASTRO”, then this box will show this too. This is normally not modifiable. If the receive options have been set to “MIXED MODE” then this box can be modified to select either “NON ASTRO” for analog FM or “ASTRO” for P25 CAI modulation.
- TRANSMIT EMPHASIS: Should be checked.
- REVERSE BUSRST: Checked
- HOT KEYPAD: Checked if you want DTMF dialing on front panel when transmitting.
- TRANSMIT POWER LEVEL: This is the default power setting for this channel. This can be later modified with the “PWR” setting in the menus on the front of the radio.
- Click on the SCAN tab for each personality to tag channel to a specific scan list if desired

Note: Personalities are preprogrammed and assigned a personality identification number which can be later attached to individual channels

1.6 ASSIGNING PERSONALITIES TO CHANNELS AND ZONES

After the personalities are defined the channels and zones can be defined.

- Click onto the ZONE CHANNEL ASSIGNMENT to expand the channels and zones then double click on the first ZONE to open. The ZONE tab will show you the current zone and its assigned name at this stage you can rename it. **Note:** The characters are limited to 3 as set by the display menu settings.
- Click onto CHANNELS to bring up the channel table in the current zone which may contain other channels. Each channel can be defined by several parameters that need to be programmed.
- To program a channel select the channel first by typing in the channel’s name (up to nine characters) then click onto channel’s PERSONALITY.
- Select either **Cnv** (conventional channel) or **Trk** (trunked). Then click onto PERSONALITY # and select from the pull down menu of personalities previously created.
- Type in the RX frequency then select the RX SQUELCH TYPE. Select CSQ for Carrier Squelch, PL for CTCSS or DPL for Digital Code Squelch.
- Select TX OPT TRANSMIT DEV and from the pull down menu select 5Khz for FM wide or 2.5Khz for narrow.



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- If the channel selected has a personality set for Astro or P25 digital then all of the RX squelch and TX squelch settings are shaded out however the RX NAC (network access code) and TX NAC need to be assigned. These are the equivalent to CTCSS or DCS codes for P25 channels
- Type in the TX NETWORK ID and RX NETWORK ID at the far right hand side.
- If the TX and RX frequencies are different TALKAROUND/DIRECT function needs to be enabled then click onto TA DIRECT/TALKAROUND check box. This will enable the F3 button to toggle the T/A option on duplex channels. This will have no effect on simplex channels where the TX and RX are the same frequency.
- To add extra channels click on the last channel in the table and click onto “+” at the top of the screen or select “X” to delete a channel.
- To add zones click onto the ZONE tab then click “+” the bottom of the screen. To delete zones use the arrows at the bottom to navigate to the zone then click onto “X” at the bottom.
- Once the channels and zones are defined save the codeplug to a new file name.

This software must be configured such that some or all of the personalities are grouped into ZONES.

1.7 PROGRAMMING THE CODEPLUG INTO THE BAND MODULE

To program the current codeplug into the band module, click on “FILE” then “WRITE DEVICE”. This may take a minute or two. The radio will show “PROGRAM MODE” while its being programmed or read. When the programming is complete the CPS will display a message “WRITE SUCCESSFUL”.

If programming a different radio with the same options then use the CLONE feature by following the procedure below:

- With the codeplug open click on TOOLS then CLONING then CLONE RADIO
- Click on READ SERIAL NUMBER tab and wait for serial number to change
- Click on PROGRAM RADIO tab and wait for WRITE SUCCESSFULL popup
- The module is now programmed. To return to normal operation cycle the power to the radio.



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This entire process will have to be repeated for each band module except band 5 in the TDFM -7300 series radios. After you have completed programming the radio verify that the radio is working on the channels as expected.

Notes:

- Type II modules have 1000 memory positions and can be programmed in zones with varying numbers of channels (up to 255 channels per zone).
- However modules with FPP (front panel programming) option are restricted to a total of 240 memory positions.
- Memory locations in modules with FPP are organized in 15 zones of 16 channels. It is not possible to deviate from this template. Channels and zones cannot be added or deleted in FPP modules.
- At this time the FPP option is only available on the VHF, UHF LO and UHF HI Type II modules.

Note: FPP not available for the 800MHZ module