

# CODEPLUG CONVERSION PROCEDURE FOR NARROWBAND TDFM SERIES RADIOS

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## INTRODUCTION

TDFM series (TDFM 6/7/7300) radios manufactured after January 1 2013 must comply with the FCC Narrow band mandate for VHF and UHF radios. These radios will not allow programming of analog wide deviation or 25 KHz deviation on VHF and UHF frequencies. This restriction affects the software options in radios with the same project numbers that have VHF and UHF RF modules. 700/800 MHz modules are NOT affected. As a result, this makes cloning codeplugs more difficult using the Motorola CPS software. The CPS software will not allow simple cloning and will give a “Feature Set Mismatch” error.

There is a way to program the new radios to be compatible with the old “Wide Band” radios. This procedure is called a Drag and Drop procedure in the CPS software. It involves converting the old codeplug from the Wide Band radio for use with the Narrow Band radio. Once this is done, then this new codeplug can be cloned in to all newer Narrow Band radios as before.

This document describes the procedure for converting the older conventional codeplugs to the new configuration. In addition, this method can also be used to convert similar codeplugs for use in different project radios.

### RADIOS AFFECTED:

The following radios are affected by the narrow band mandate:

- TDFM 600 Series II
- TDFM 6000 Series II
- TDFM 636
- TDFM 7000
- TDFM 7300

### HOW TO DETERMINE IF THE RADIO IS NARROW BAND ONLY:

Turn on the radio and watch the display. It will display the TIL software version before it completes the boot up process.

The software version will indicate if the radio is narrow band or wide band:

TDFM 600/6000	TR22N
TDFM 636	TV6N
TDFM 7000	TS28N
TDFM 7300	TL13N

TABLE 1: Technisonc Software Versions for Narrowband Radios

Software versions with the “N” designation are narrow band only radios. If the software does not have the “N” then it is an older legacy radio. These are capable of analog wide band (25 KHz) and analog narrow (12.5KHz). Narrow Band radios are only capable of analog narrow (12.5khz).

All radios are also capable of P25 digital which is 12.5 KHz by default. Narrow banding does not affect the Digital side of the radios.

***NOTE: As of January 1 2013 all VHF and UHF analog FM licenses are required to operate in Narrow mode (12.5KHz). Even if the radios are capable of operating in 25 KHz mode, they must be reprogrammed to FM narrow. It is the responsibility of the end user to ensure that the radios are programmed to narrow band operation in accordance with their FCC license rules.***

**NOTE: This process requires Motorola Astro 25 Portable CPS Version R17.01.02 or higher to perform the codeplug conversion. If the existing CPS is older, then it must be upgraded. Refer to Technisonic TIBFM 12-01 Rev. F for details on acquiring the latest Motorola CPS software from the Motorola On line website (MOL).**

The TIB can be found on the Technisonic website: [www.til.ca](http://www.til.ca)

Navigate to the “Programming Software” link, then click on ‘Read More’. Under the “CPS programming” then click on the link for “CPS Programming Software/Cables Ordering Guide”.

### GETTING STARTED:

It is highly recommended that the codeplugs from the new narrow band radios be read and saved to disk before converting the existing codeplugs. It is always good practice to have back copies of the codeplugs since the CPS cannot create new codeplugs.

1) Start CPS and open a copy of the existing codeplug file to be converted. Minimize the CPS window so that it covers half the left screen. Then start a second instance of CPS. Use the second instance of CPS to read the codeplug from the target narrow band radio. Minimize the second CPS so that both tree views can be seen of the computer monitor side by side with the second CPS on the right side. See Figure 1.

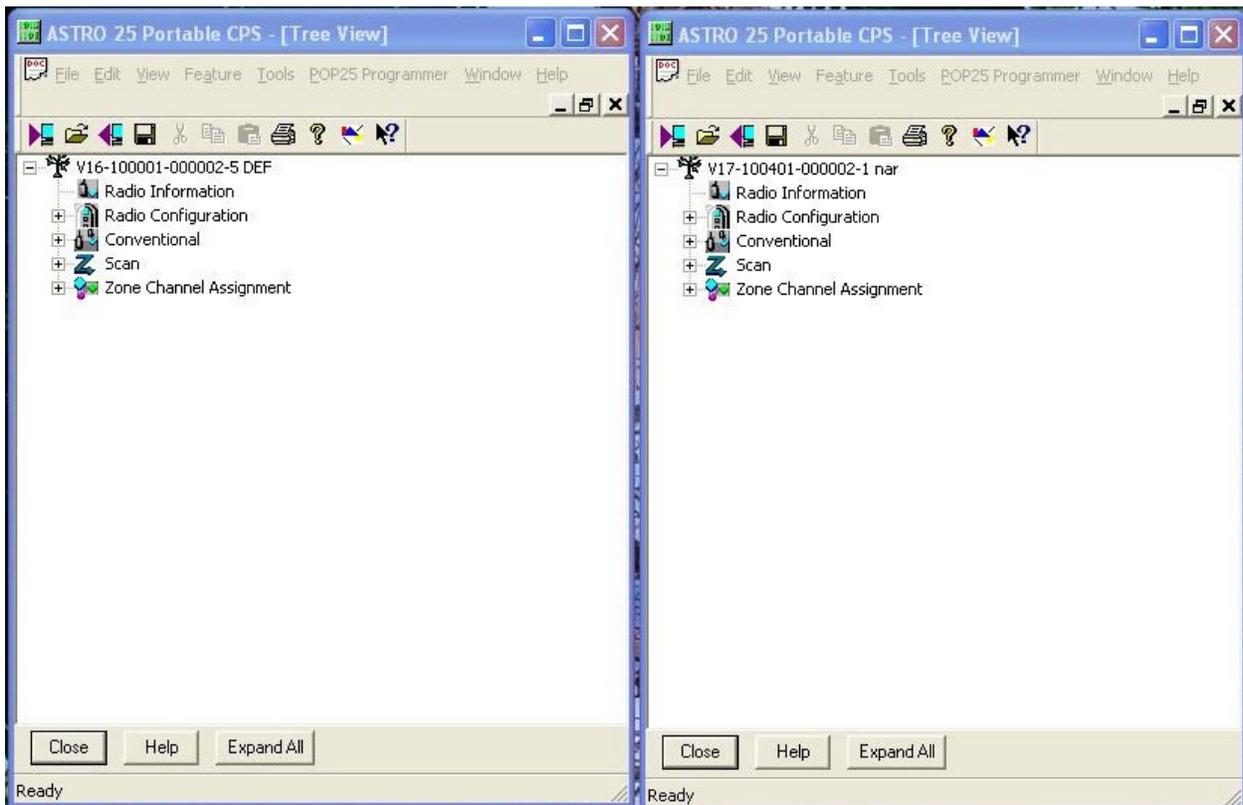


FIGURE 1: Original codeplug “Tree View” on left and new “Narrow Band” on the right

2) Verify the options between the two codeplugs. This information can be viewed by clicking on RADIO INFORMATION, and then the FEATURE SET Tab.

The new Narrow band radios will have the “Q507 12.5 KHz FCC Mandate” Option. CPS will not allow these codeplugs to be simply “cloned” because the options are not the same. A DRAG AND DROP operation must be done to get the CPS to copy most of the existing programming information to the new codeplug where the info is applicable.

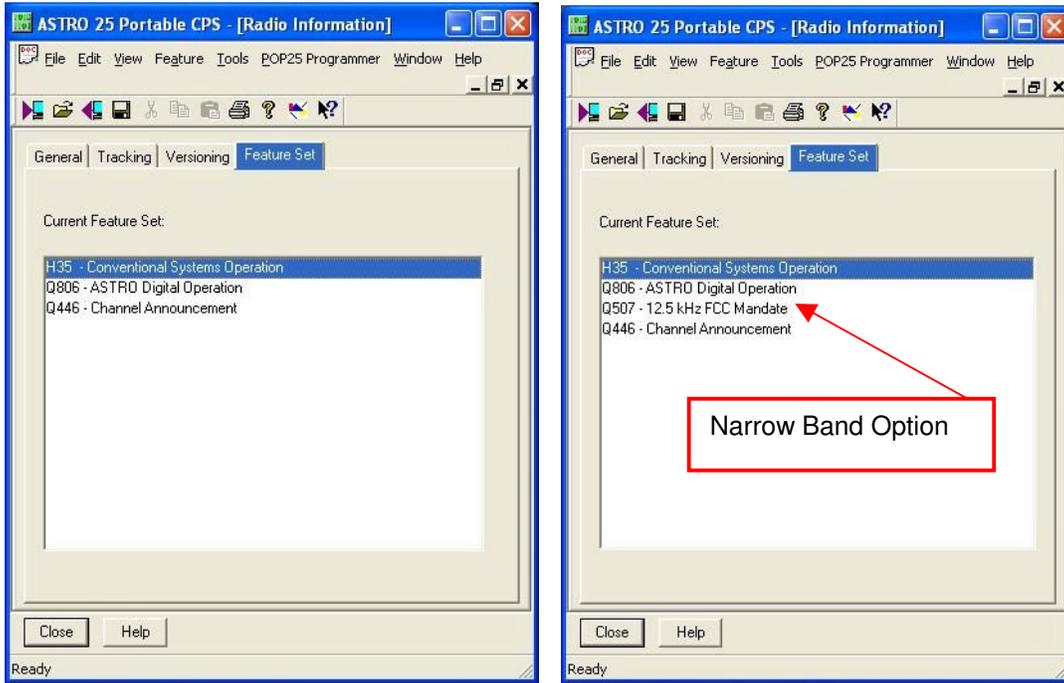


FIGURE 2: Feature Set comparison

3) Return back to the "Tree View" as before for both codeplugs.

To do the drag and drop, left click the mouse on the "Tree Icon" at the top of the left codeplug to highlight it. Then left click the Tree and hold the left key on the mouse while dragging the icon over to the other Tree symbol on the top of the right codeplug. Release the mouse.

The CPS will begin copying the programming information over to the new codeplug. This could take a few minutes depending on how many channels are programmed in the old codeplug.

Figure 3 shows the "Top node Drag and Drop complete" window.

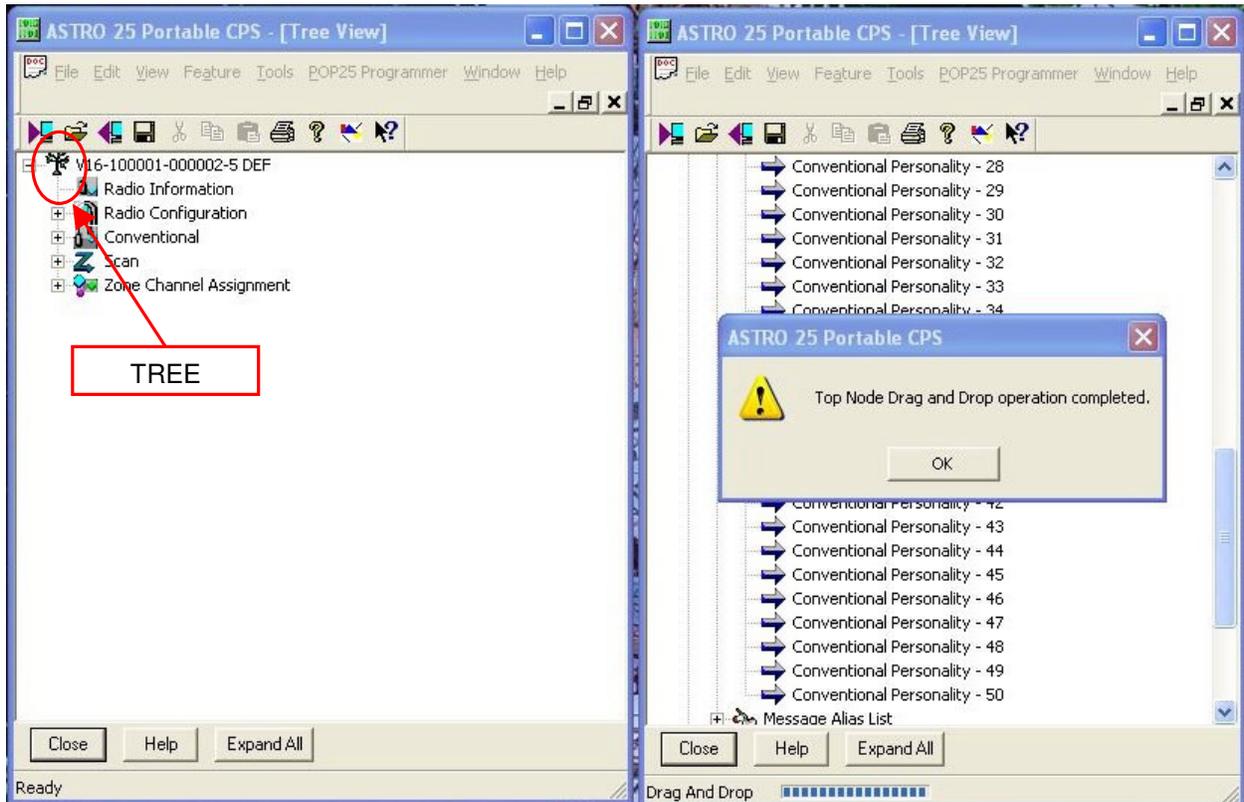


FIGURE 3: Drag And Drop completed

4) The “Invalid Fields” screen will pop up after clicking Ok on the completion of the drag and drop operation. All the invalid fields in the box must be fixed in order to save or program the codeplug to a radio. Clicking on each Invalid field will take you to the place in the new codeplug where the information must be supplied or changed to satisfy the squawks. The areas in the codeplug are usually highlighted in Red.

Usually most of the Invalid fields will be as a result of the existing channels copied that have Wide band deviation (25 KHz). These channels must be changed to Narrow or 12.5 KHz deviation in the Zone Channel Assignment for the new codeplug.

The example, Figure 4 shows several channels with wide band deviation “TX Option Transmit Deviation” that must be corrected. It also indicates what channels that need to be corrected.

Navigate to the Zone and Channels as indicated and change the TX deviation to 12.5 KHz in the pull down column. Refer to Figures 5 and 6

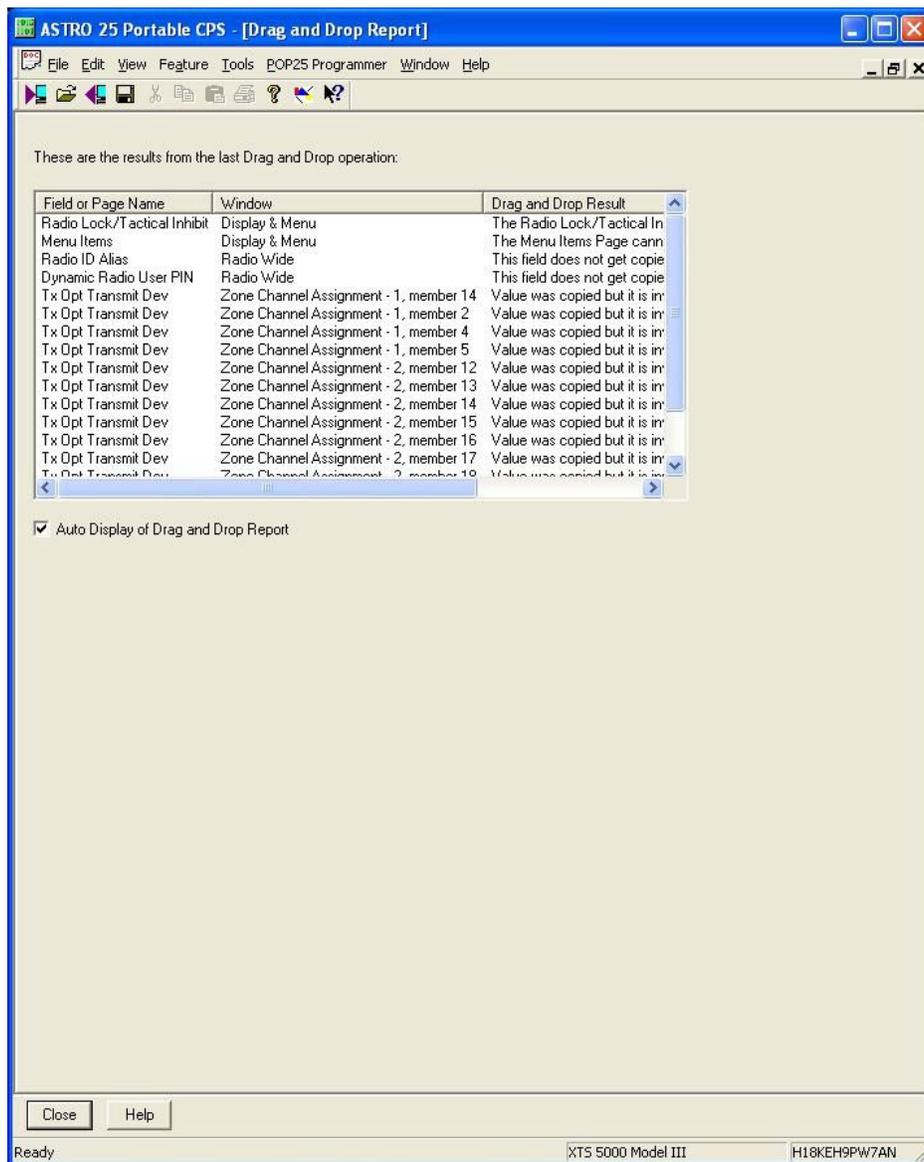


FIGURE 4: Invalid Fields Report after a drag and drop operation.

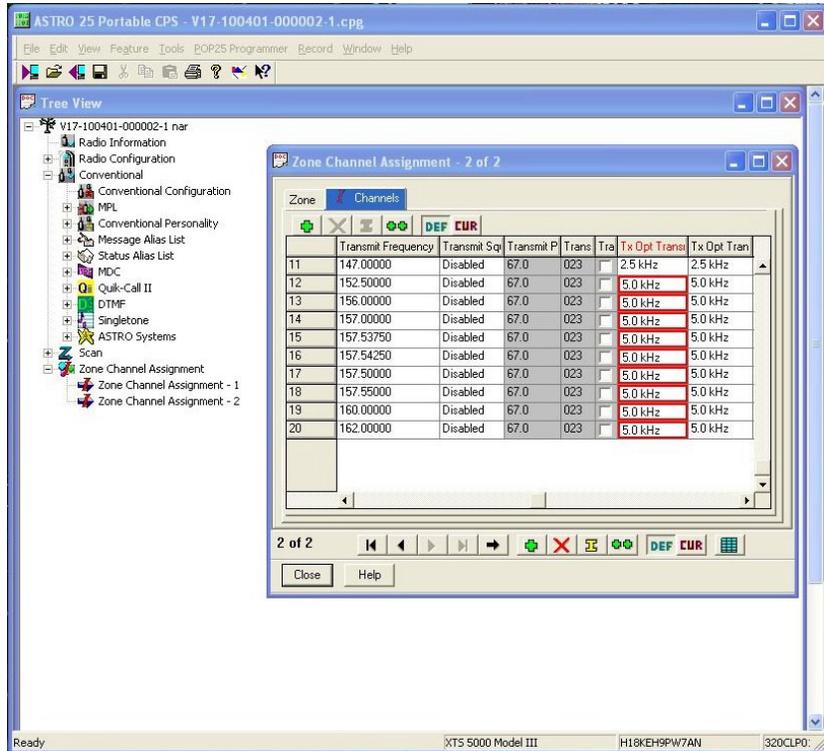


FIGURE 5: TX Deviation errors highlighted

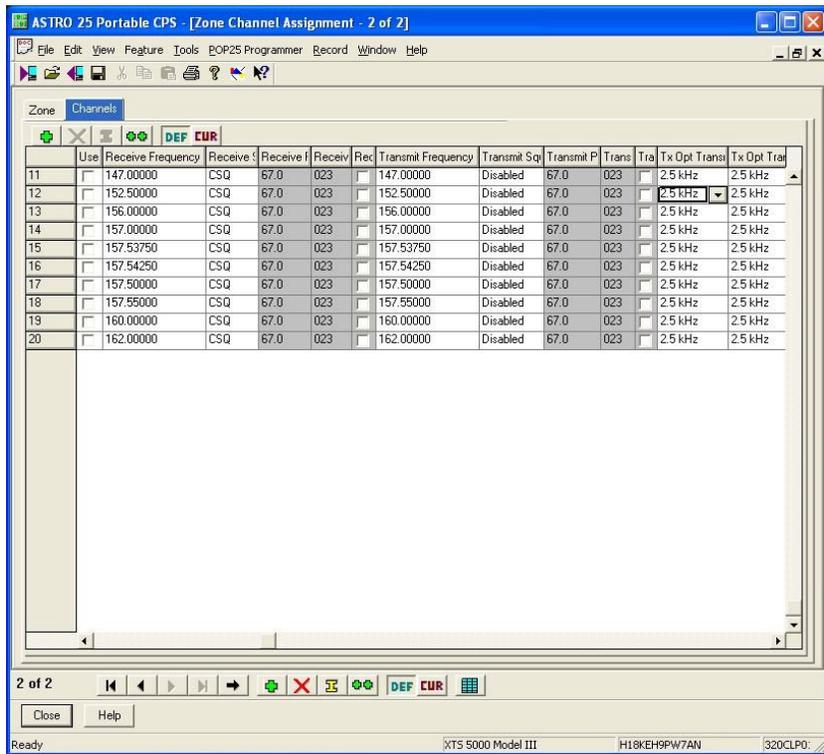


FIGURE 6: TX Deviation set to Narrow (12.5 KHz) – Errors Cleared.

5) Check the Invalid Fields on the new codeplug for any other errors. At the top of the tool bar, click on VIEW and select "INVALID FIELDS". If the box is empty then, you can now save the new codeplug. See Figure 7.

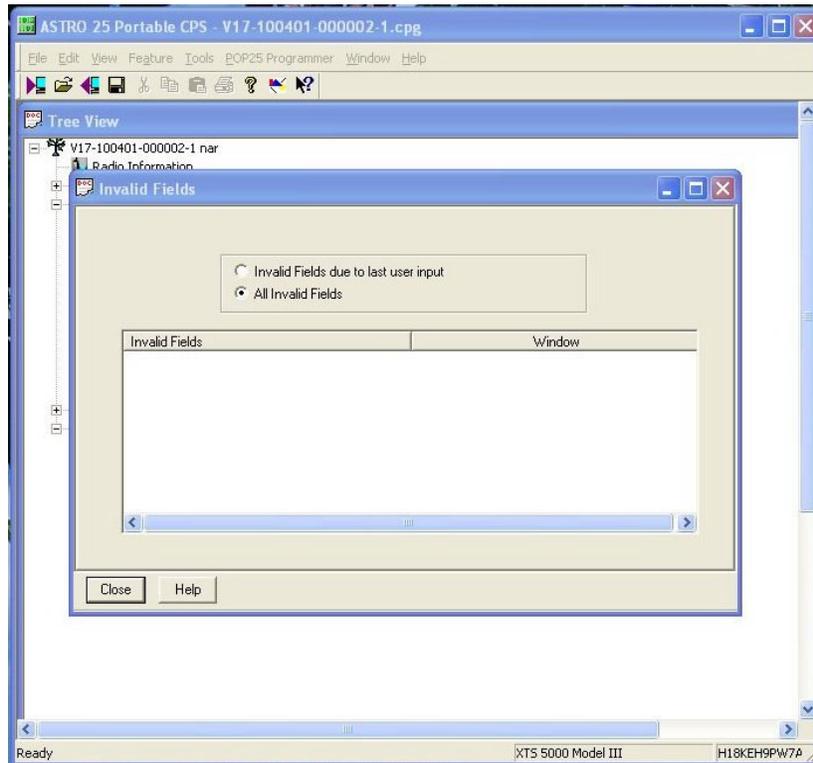


FIGURE 7: All Invalid Fields cleared

6) Check the Menu Items between the two codeplugs. During a drag and drop operation, most of the information is copied. **In all cases the Menu Items in the codeplug do not get copied.** The Menu Items in the new codeplug must be manually changed to match the old codeplug.

Reset both codeplugs to display the Tree views. On both codeplugs select RADIO CONFIGURATION and then DISPLAY and MENU.

Click on the MENU ITEMS tab to display the menu Items. Check the "Selected Items column.

Figure 8 shows the two Menu Item settings. Add or delete the menu Items in the new codeplug using the ADD and REMOVE Buttons. Then arrange the items in the same order as the original codeplug by using the MOVE UP /DN buttons. Save the codeplug. Figure 9 shows the correct list in the new codeplug.

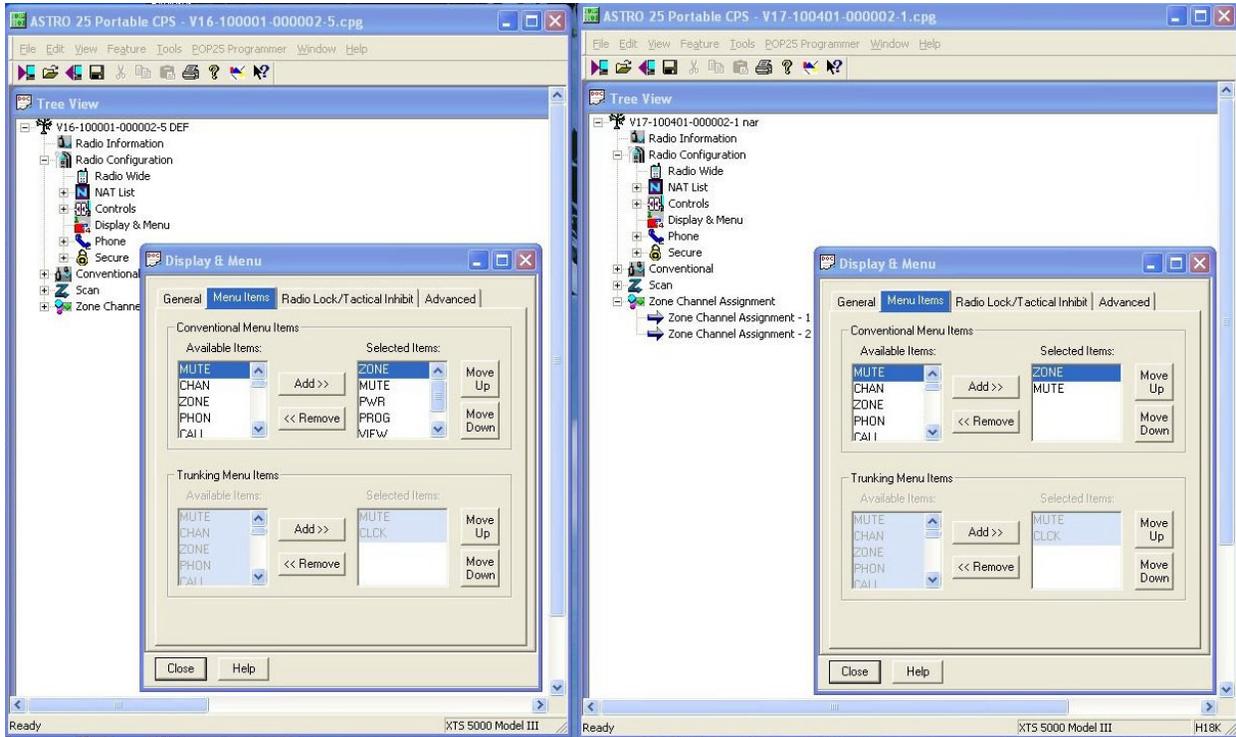


FIGURE 8: Menu Items Comparison

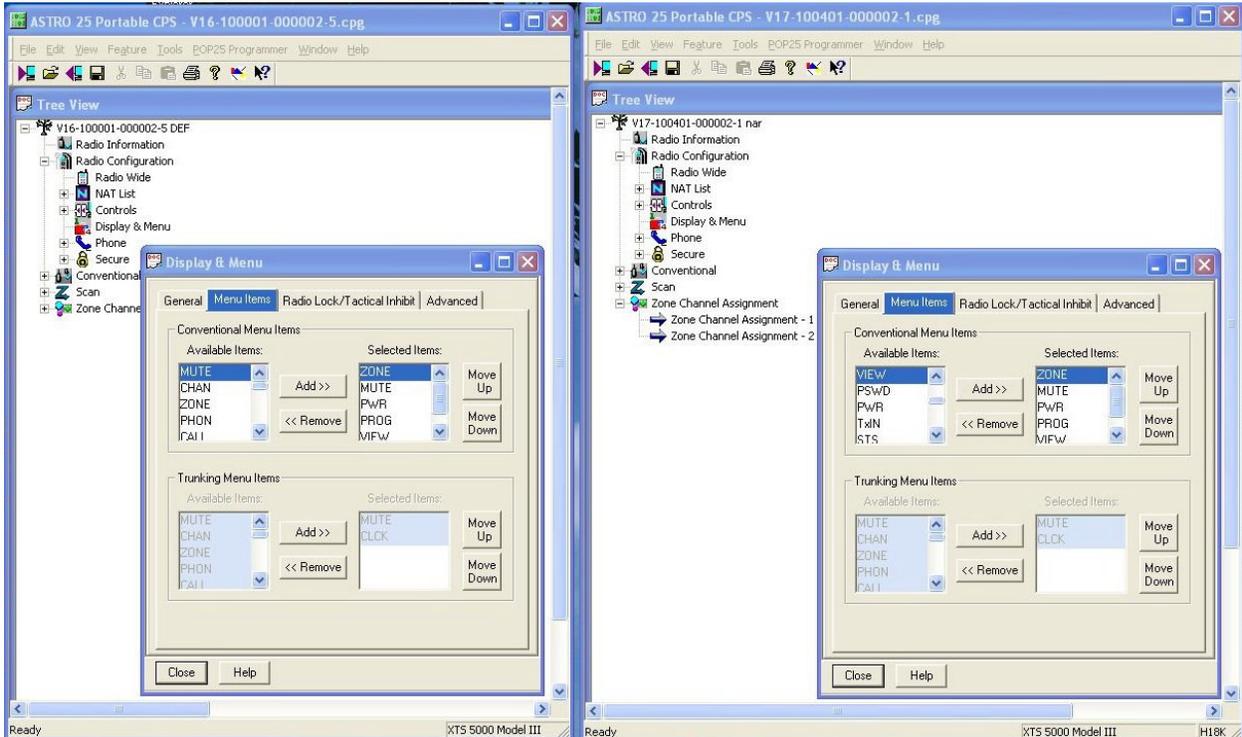


FIGURE 9: Menu Items matched in new codeplug

7) Minimize the old codeplug on the left. Program the new narrow band codeplug to the new radio by selecting the FILE – WRITE DEVICE or clicking the Write device icon on the tool bar.

The conversion is now complete. The saved new codeplug can now be used to clone other Narrow Band radios with the same bands and options. The old codeplug can still be used to clone the older Wide Band radios. It is best to keep both codeplugs in different directories so they are not confused during reprogramming.

This means that two sets of codeplugs must now be maintained for each VHF and UHF module that are in the wide band radios and the narrow band radios.

#### CONVERTING TRUNKED RADIOS:

Most radios use trunking on 700/800 MHz but some radios have trunking options on VHF and UHF. The above procedure can be used to convert trunked codeplugs but requires one or more Trunking System Keys loaded into the CPS prior to the conversion. The Trunking system keys are owned by the radios system administrators and most likely will not be given out.

As with all trunked radios, it is highly recommended that the operators of the radios contact the administrators of the trunked systems and have their programming staff assist in converting these codeplugs.