THD74 Programmer Help

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by RT Systems, Inc.

The Programmer is designed to give you the ease and convenience of programming the memories and options of the radio from your PC.

Using the Programmer, you can create separate files for unique applications such as travel, emergency activities, or special events. These files can contain different settings, such as memories, power management features, and DTMF numbers, for each purpose.

The Programmer also gives you the ability to read a configuration from the radio. The configuration would be stored in a file on your computer to be changed easily. Then, with minimal button pushing, you can send the altered file back to program the radio.

THD74 Programmer Help

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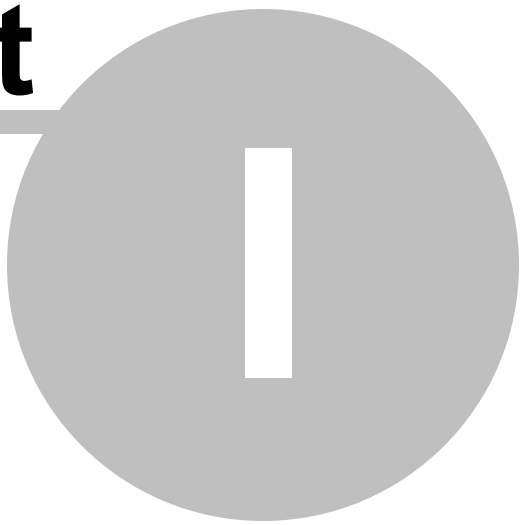
Foreword

These help files are offered as reference for the features of the programmer and with some added information about the features and functionality of the radio.

The final reference for a feature of the radio is the Users' Manual for that radio. Any error, omission or misrepresentation of a radio's ability is unintentional.

The Programmer cannot make the radio do anything that it cannot do from the face of the unit. It makes it easier to set options for the existing functions.

Part



1 What Is the Radio Programmer

The Programmer is designed to give you the ease and convenience of programming the memories and options of the radio from your PC.

Using the Programmer, you can create separate files for unique applications such as travel, emergency activities, or special events. These files can contain different settings, such as memories, power management features, and DTMF numbers, for each purpose.

These files are saved separately to be sent to the radio at any time. One file can be sent to the radio at any one time. Be sure to put everything you want into each file as you build it.

The Programmer also gives you the ability to read a configuration from the radio. The configuration would be stored in a file on your computer to be changed easily. Then, with minimal button pushing, you can send the altered file back to the radio.

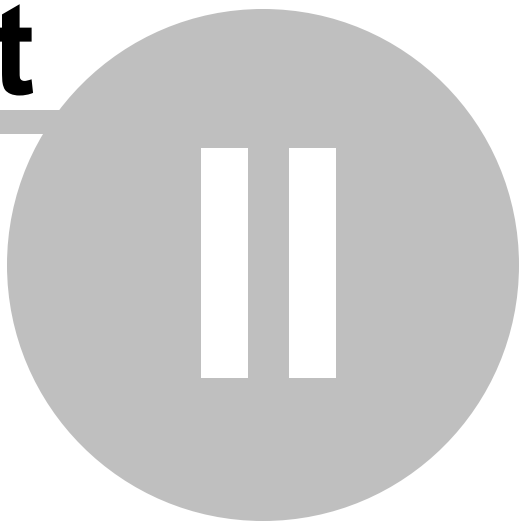
Hardware Requirements

Hardware requirements for the *RT Systems* Programmers include

- A PC running Microsoft Windows: XP (SP3), Windows 7 (32 or 64 bit), Windows 8/8.1 (full version) and Windows 10. The programmer will NOT work on Windows 98, ME, NT or 2000. Use of the programmers on Windows Vista is no longer supported although they will work on that platform.
- The correct RT Systems computer interface cable as shown in the ***Radio to Computer Cabling*** chapter under ***Radio / Computer Data Transfer*** section of this help.

Note: The RT Systems programmers (Version 4 or higher) will not recognize any other cable or USB adapter. They do not work through a serial port.

Part



2 Getting Started

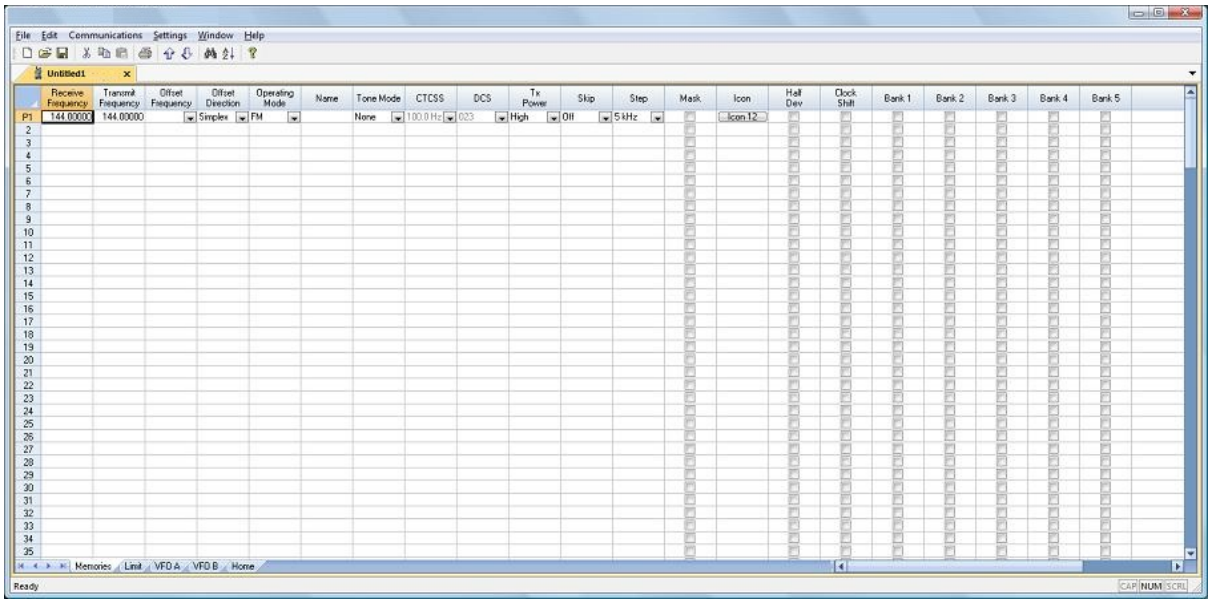
These are the basics for Gettings Started with the RT Systems radio programmer software. The details presented here are in generalities and while the programmer for your radio will work in a similar manner, the details may vary for your particular model as all radios are unique.

This section is presented as an overview for use of the programmer rather than specifics for one particular radio. Those details are covered in other parts of the help file.

Creating the file

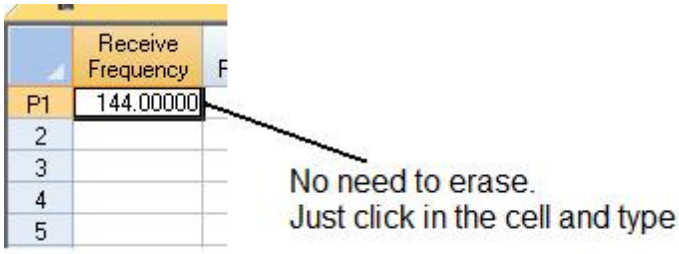
The Programmer gives you an easy way to access details for memory channels and other settings of the radio.

Open the programmer by clicking on the icon that was created during installation. The programmer opens to a default file.



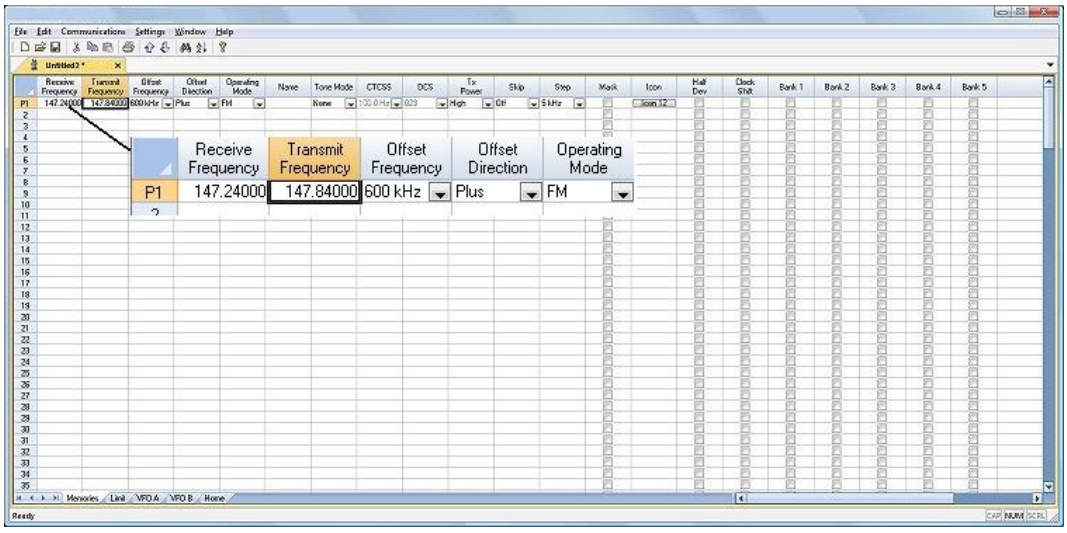
Note: The default file contains memory channel information on several of the screens. This information is needed by the radio to "fill spaces in its little brain". You can change the default entries that you see; but anything that is completed in the default file cannot be left blank. The Programmer will help you with this. If information is required, it will warn you when it is missing.

Enter a receive frequency



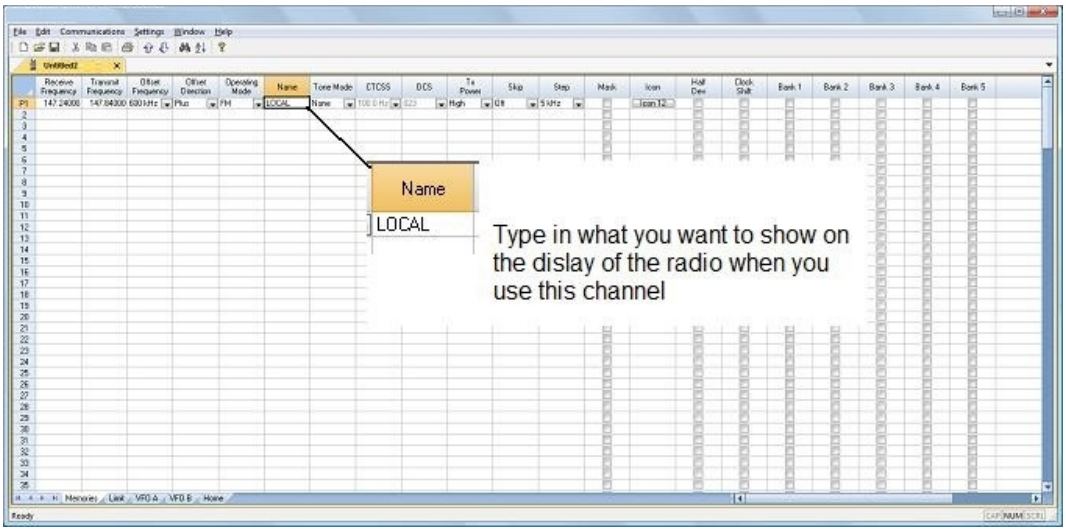
In this example we'll enter 147.240 MHz with standard offset, a Name of Local, and a tone of 100hz.

- Type one four seven period two four zero into the receive frequency column.
- Press Enter.
- The program completes much of the channel information with defaults. The Transmit frequency, Offset frequency, Offset Direction and Operating Mode are completed. This satisfies the "Standard offset" requirement from the original information.

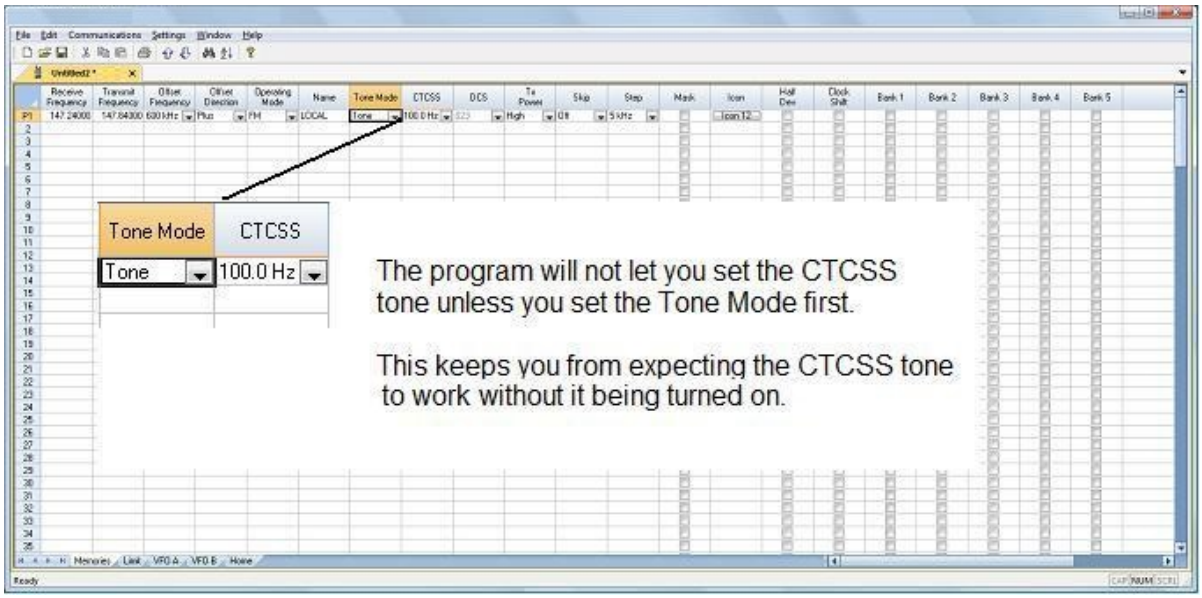


- Press tab or use your mouse to select the Name cell. Type LOCAL. You

choose upper or lower case on many radios. On others, only upper case letters are allowed. The programmer will help you. If a letter or symbol will not work on the radio, you will not be able to enter it here.

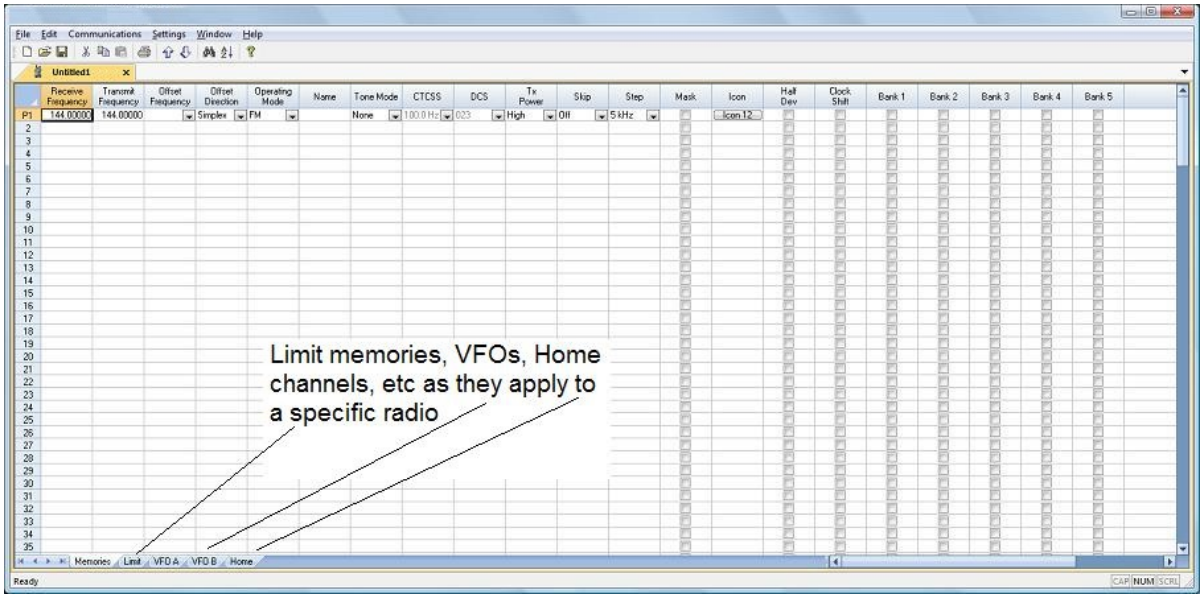


- Press tab to move to the Tone Mode cell. Setting up the tone of 100hz requires TW steps (just as it would if you were doing this from the face of the radio). Turn on Tone Mode AND then set the 100hz tone.



- This channel is ready to use.
- The other columns are set only if you need them for better radio performance. See Regular Memory Channels in this help and the User's Manual for the radio for details on what these features do and the settings for them.

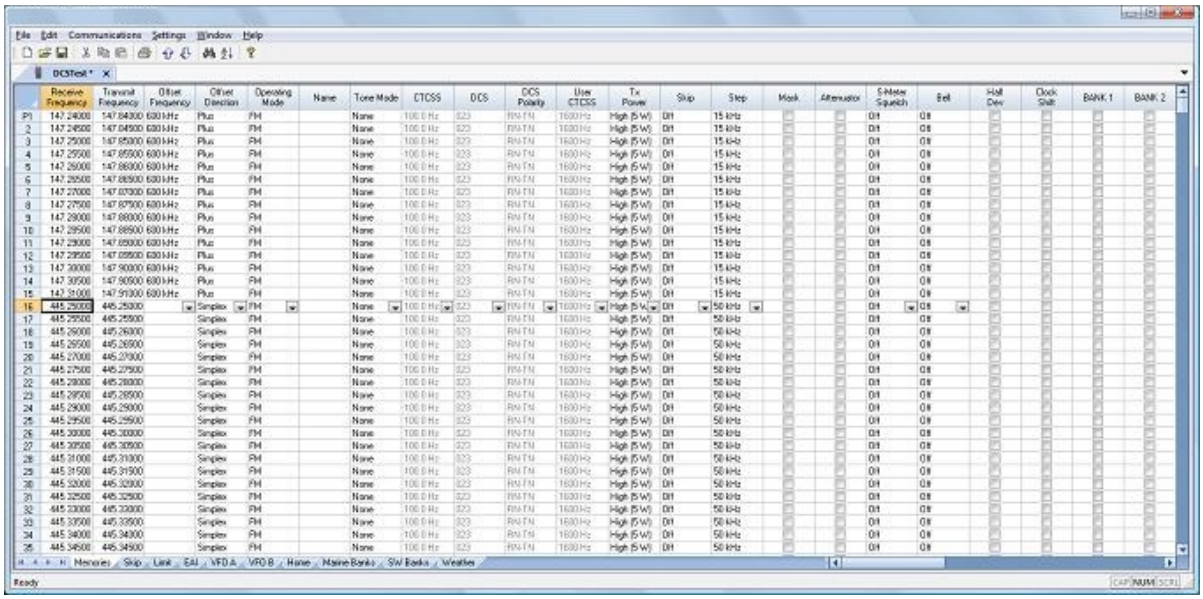
There is more to this radio than just memory channels. So, there is more to the programmer. Tabs at the bottom of the main screen give you access to Limit memories, Home channels, Hypermemories, VFO, Marine and Shortwave channels, that apply to your radio.



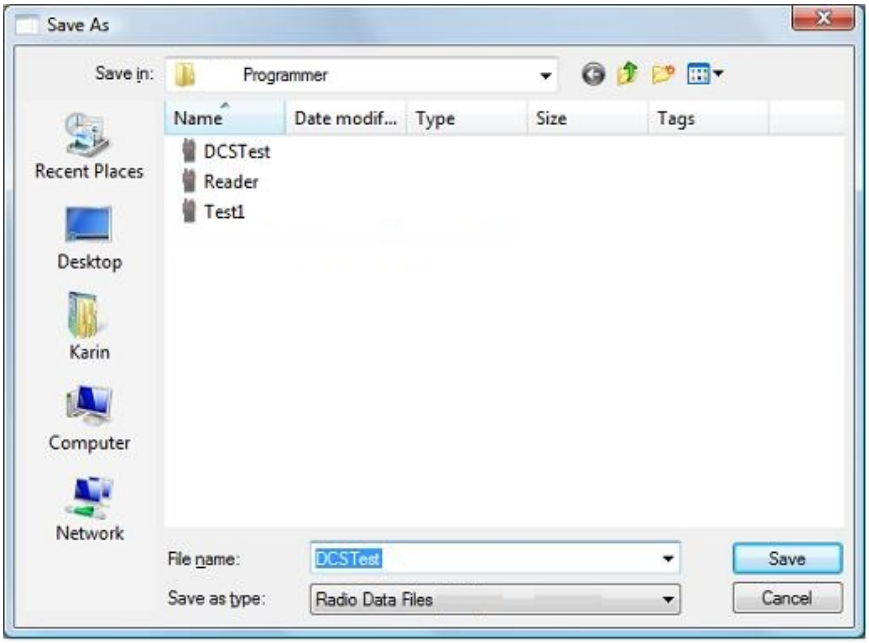
Click a tab. A screen opens with the details that can be entered for these radio functions. You can work with the radio without ever using these tabs. There are default values on these screens that never need to be changed. Make changes for your special activities when you plan to use one of these functions of the radio.

Save the file

Now that you have the frequencies entered into the memory channels, Save the file.



In the menu, click File | Save As



Enter a filename. You can be as descriptive as you want. 256 characters including spaces, upper and lower letters, and much more to describe this file. The programmer will enter the extension so it can find the file later.

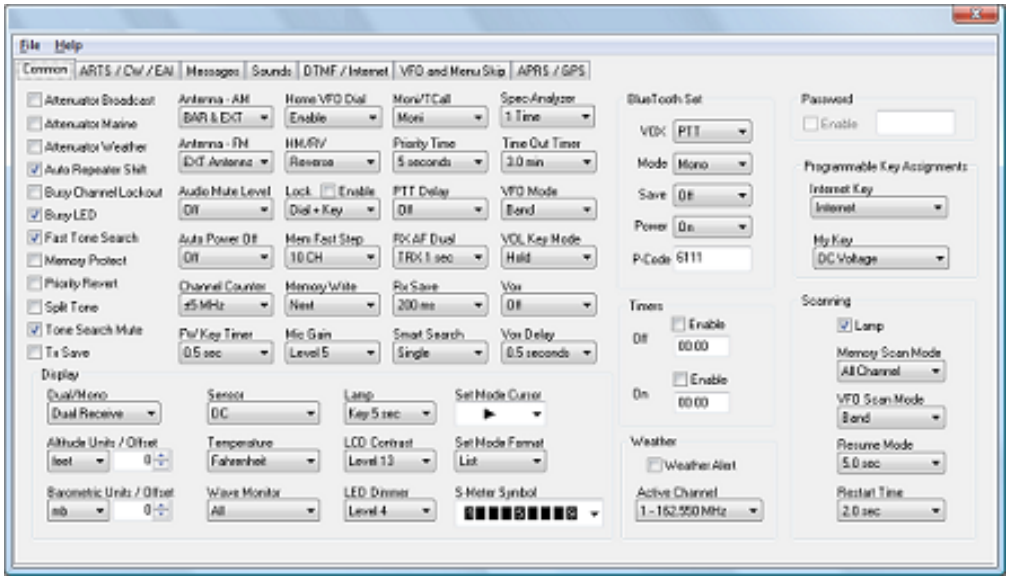
Once you complete this part of the process, the program will open the last file when it starts up.

Even More Radio Functions

Today's radios can do so much. Many of the features are not a part of the details for a memory channel. These other options are set once for the radio to use no matter what channel you're operating on: memory channel, limit memory, VFO or Home channel.

These options may include, but are not limited to, Lock mode, ARTS details, display brightness and color, DTMF memories, scan resume options, and many others.

Select Settings | Radio Menu settings from the menu at the top of the main screen to access these options. The Settings screen opens to a page with check boxes, list boxes and edit fields. A sample Settings screen would look like this.



Set the options as you need them to get the performance you want from your radio. The settings shown for your radio will correspond to your radio's features.

Once you have the options like you want it, save this file. Yes, this is saved separately from the frequencies in the memory channels.

To save the file, select File | Save from the menu on the Settings page. Enter a name when the window opens. You will not have to set these options again when you start a new file of memory channels.

Once the file is saved, select File | Exit to return to the main screen of the programmer.

Sending the file(s) to the radio (programming the radio)

The *RT Systems'* programmers (version 4 and higher) have no comport setup. Using the *RT Systems'* USB cable, you attach the cable, attach the radio, and get the programming done.

First: Communications | Get data from

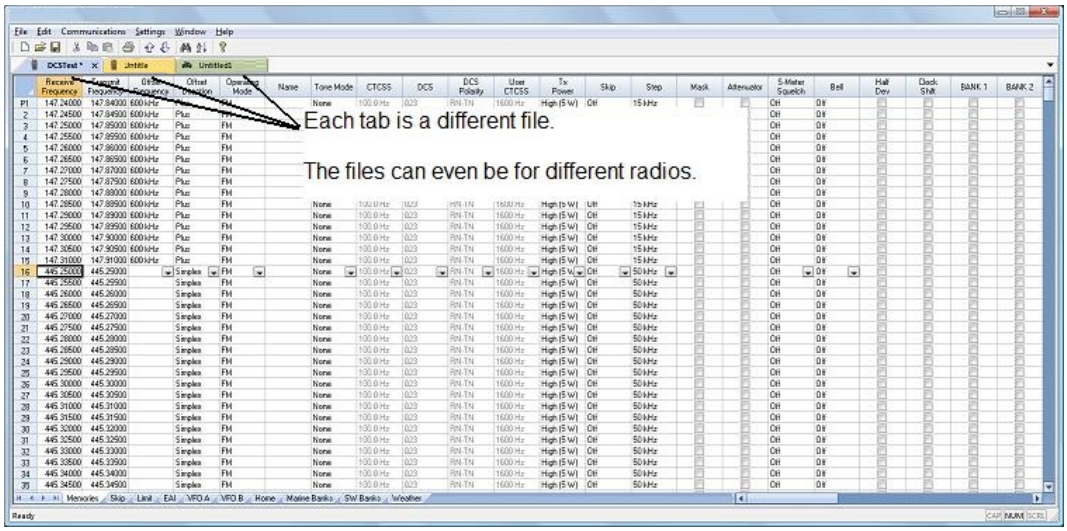
Although you really want to put the details of your file into your new radio so you can use it, doing Get data from with this new radio gets the process started and may help prevent problems sending the file to the radio.

This process is REQUIRED if your radio has been modified to transmit outside the ham band.

- From the menu at the top of the main window, select File | New. Open a new file to protect the file that you created.
- Connect the *RT Systems* USB cable to a port on your computer. Wait until the New Hardware Found process completes.
- With the radio off, connect the other end of the cable to the radio.
- From the menu at the top of the main window, select Communications | Get data from.

A screen will open with details about this process specific to your radio.

- Follow these steps carefully until this process is complete.
- Open the file that you created earlier. To open a file select File | Open from the menu at the top. Select your file from those in the list. Or your file may already be open in the other tab.



Second: Communications | Send data to

- When your file is ready, select Communications | Send data to from the menu at the top of the main screen.

A screen will open with details about this process specific to the radio.

- Follow the steps carefully to complete this process and program the radio. Read the screen carefully. The steps are often different from those used to get data from the radio.
- Turn off the power. Disconnect the programming cable from the radio.

Your radio may still be in VFO mode after it is programmed. This is a normal mode for the radio. Press the key on the face of the radio as described in the User's Manual for the radio to put the radio into Memory mode and see what you programmed.

Hardware Requirements

Hardware requirements for the RT Systems Programmers include:

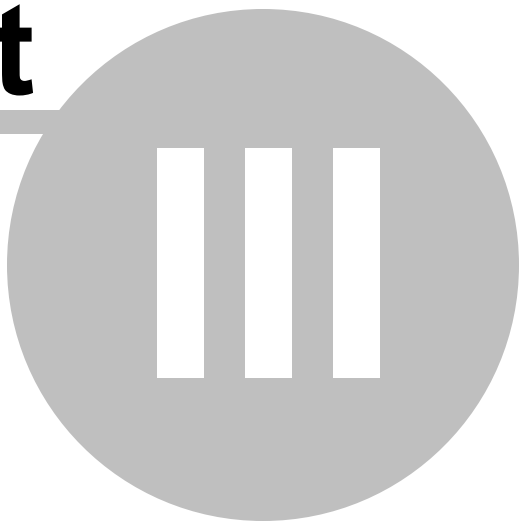
- A PC running Microsoft Windows: XP (SP3), Windows 7 (32 or 64 bit), Windows 8/8.1 (full version) and Windows 10. The programmer will NOT

work on Windows 98, ME, NT or 2000. Use of the programmers on Windows Vista is no longer supported although they will work on that platform.

- The correct RT Systems computer interface cable as shown in the ***Radio to Computer Cabling*** section of this help.

Note: The RT Systems programmers (Version 4 or higher) will not recognize any other cable or USB adapter. They will not work through a serial port.

Part



3 Using the Programmer - Overview

The Programmer is designed to be used in conjunction with the manual for the radio. The Programmer provides easy feature configuration while the written manual provides an explanation of a feature and its use.

Working with Programming Files

The radio Programmer has the ability to work on more than one file at a time. These can be files for the same radio or for different radios: even radios from different manufacturers.

You can copy and paste frequencies from one file to another. This added feature makes it even easier to create new files as you take pre-programmed memory information from other files.

The name of the file currently being edited is shown in the title bar at the top of the window. If the file has not yet been named, "Untitled #" appears. The "#" increments when multiple new files are being worked on. ***Note: Untitled #, the default filename, should not be used for permanent file storage. Even if you work in this file, be sure to enter a different filename when you save.*** The file being edited is referred to in this help as the current file.

Creating a New Programming File

Just like in any other editor, there are several ways to create a new cloning file.

- You can open an existing file, save it with a different filename.
- You can use the File | New command as a starting point for a new "blank" file. This file begins with default information for the radio. The "default' information you see in the file is the same as what was in your radio when you bought it new.
- Another way to create a data file is to upload the contents of the radio with the Communications | Get data from menu command. After executing this command, the current file will reflect the memory channels and feature settings of the radio. Changes are easily made to these settings and the new file saved.

Note: Not all the menu settings of the radio are associated with

memory channels. Many are "global" settings that affect the radio during memory or VFO operations. These settings are handled in the fields found on the screen accessed under Settings | Radio Menu Settings.

The global settings will be read from the radio; however, by default, these settings are not saved with the file. Select Settings | Radio Menu Settings to view, change and save these settings. Once saved, these global settings will be sent to the radio every time it is programmed. If they are not saved, default settings will be sent to the radio with the memory programming.

To save these Global settings

- Select Settings | Radio Menu Settings in the menu on the main screen. The Settings screen opens.
- Verify that your settings are as you want them or make changes.
- From the top of this screen, select File | Save. A Save dialog opens into which you enter a filename. Enter the name for this file and click Save.
- Exit the Settings screen by selecting File | Exit.

This settings file is now available for use by any saved file that you send to your radio.

Creating and using multiple Global settings files

There may be global settings of the radio that you want configured differently for different activities. You can make changes to your settings file and save it separately.

To select a settings file for use:

- Select Settings | Radio Menu Settings from the main page of the programmer.
- From the Radio Menu Settings screen, select File | Open. A list of settings files will be presented.
- Select the file you want to use and click Open.
- Verify that this is the settings file that you want to use. Check also that the proper filename appears in the bar at the top of the Menu Settings window.
- Select File | Exit to close this screen. These settings will be sent to the radio with each memory channel file until you change this file selection

again.

Having multiple memory channel files and multiple global setting files gives you the ability to mix and match the features of your radio to suit your needs. This makes it easy to customize the radio for a special event without disturbing the original programming files. Then once the event is over, simply reprogram the radio with the memory channel information and settings that you use everyday.

Tying Global Settings to a Memory Channel File

The RT Systems programmers have the option of saving the global settings with the memory channel information. This new feature is not the default for the programmer; but may be valuable under certain programming circumstances (i.e., programming many radios when you want to be absolutely certain that the settings and the frequencies are properly set for a given activity).

To contrast and compare the two Radio Menu Setting options:

- Use Separate file for menu settings (default)

  This is the default for the programmer.

  This option is based on a "Set and Forget" plan. Once the global settings are configured to your liking and saved, you do not have to repeat this process. This configuration does not change with a new memory channel file.

  The last settings file saved is the one that will be used when a memory file is sent to the radio.

  You can save several different settings files (i.e., one for your radio and a different one for your son’s radio). Then easily match the settings to the radio being programmed without having to make changes in the file repeatedly.

- Keep menu settings and frequencies in a single file. (option)

  This option is set on the Settings | Preferences screen.

  With this option selected, the Radio Menu Settings as assigned on the Settings | Radio Menu Settings screen are assigned ONLY in this file.

  With each new file created the Radio Menu Settings return to factory defaults.

  You have the ability to customize the global settings just as you

customize the memory channel file. This would be useful if you are programming each radio uniquely.

No guesswork about what the configuration of the global settings. Once they are set, they stay set in this file until you make a change to them.

Part

4 Viewing and Changing Programming Files

The Programmer begins in a screen displaying memory channel information for the radio. Default information found in a factory fresh radio is contained in the file. Anywhere this information is displayed it can be changed.

Memory information is easily entered in a spreadsheet style layout. You can view, rearrange, eliminate, or edit these entries. Memory channel 1 must be programmed in most radios. VFOs and Home channels must be programmed. Memory channel 1 and limit memory channels. VFO and Call channels must each contain a frequency appropriate for the band. The programmer checks for missing data when Send data to is executed.

Columns not regularly used are easily hidden with the selections under Settings | Preferences. Customize your screen for the information you use most often.

Radio Menu Settings

Global menu settings which in earlier programmers occupied the opening screen are now entered on a Settings screen accessed under Settings | Radio Menu Settings. Here options are set for menu settings of the radio that do not change with each memory channel. These settings affect the radio whether it is in memory mode or VFO mode.

The Radio Menu Settings screens contain check boxes for single click settings and easily filled blanks for personalized options. Once configured, these Settings are saved for use by new files. There is no longer a need to reset the options in each new file or to begin a file from an existing one.

Note: Radio Option Settings (including Lock, Beeps, etc) are read from the radio with the Get data from command. Be sure that settings you have customized are saved in the programmer. Access the Settings screen and use File | Save to make the options that were taken from the radio permanent for programming the radio later. Once saved, the settings will be repeated with each new file of memory channel details.

The programmer has two options for these Settings. Multiple Settings files can be created just as multiple frequency files. Then you can "mix and match" as needed to program a radio for a given situation. Alternately, you can opt to save the Settings as part of an individual file.

You can find more details on these two options under Using the Programmer - Overview and ***Radio Menu Settings - General Overview*** in this help. Using

individual and separate settings files is the default.

Part V

5 Easy Editing in the Grid

Many new data management commands are available in the programming software from *RT Systems*.

The commands listed here are available through a right click menu or from the list that opens when you select Edit from the menu at the top of the screen. These commands can be used on any of the spreadsheets in the program.

Right Click Menu

Select a row to be edited by clicking on the number to the left of that row. You will notice that the entire row is highlighted (not just the Receive Frequency cell). Release the left mouse button. You will notice that the row remains highlighted until you left click someplace else on the screen of the programmer.

Note: You can select several rows at once (to copy, delete, etc) by clicking on the number to the left of the first of the selection then while holding the left mouse button, drag the mouse across the number of each of the channels to be included. This must be a continuous group.

With the mouse pointing at the highlighted area (anyplace as long as the point of the mouse pointer is within the highlighted area), press the right mouse button. A menu opens with editing options. Release the right mouse button once that menu opens.

Use the mouse to point at the desired command. Left click the mouse to execute that command.

Edit Menu

Select a row to be edited by clicking on the number to the left of that row. You will notice that the entire row is highlighted (not just the Receive Frequency cell). Release the left mouse button. You will notice that the row remains highlighted until you left click someplace else on the screen of the programmer.

Note: You can select several rows at once (to copy, delete, etc) by clicking on the number to the left of the first of the selection then while holding the left mouse button, drag the mouse across the number of each of the channels to be included. This must be a

continuous group.

Holding neither of the mouse buttons, move the mouse pointer to Edit in the menu at the top of the screen. Press the left mouse button to select this menu option.

Holding neither of the mouse buttons, use the mouse pointer to select one of the editing options shown in the menu. Click the left mouse button to execute this command.

Editing Commands

The examples here will use the programmers for the Yaesu FT-60 (ADMS-1J) and the Icom IC-91 (WCS-91). You will see by the screen shots that you can copy and paste between files: even files for radios from different manufacturers. The programmer will take care of the similarities and differences.

Cut (Ctrl+X) - Removes the selected entry and leaves the memory channel blank. This feature is designed to work for deletion of all the data in a memory channel rather than data in a specific column.

Copy (Ctrl+C) - Copies the selected data.

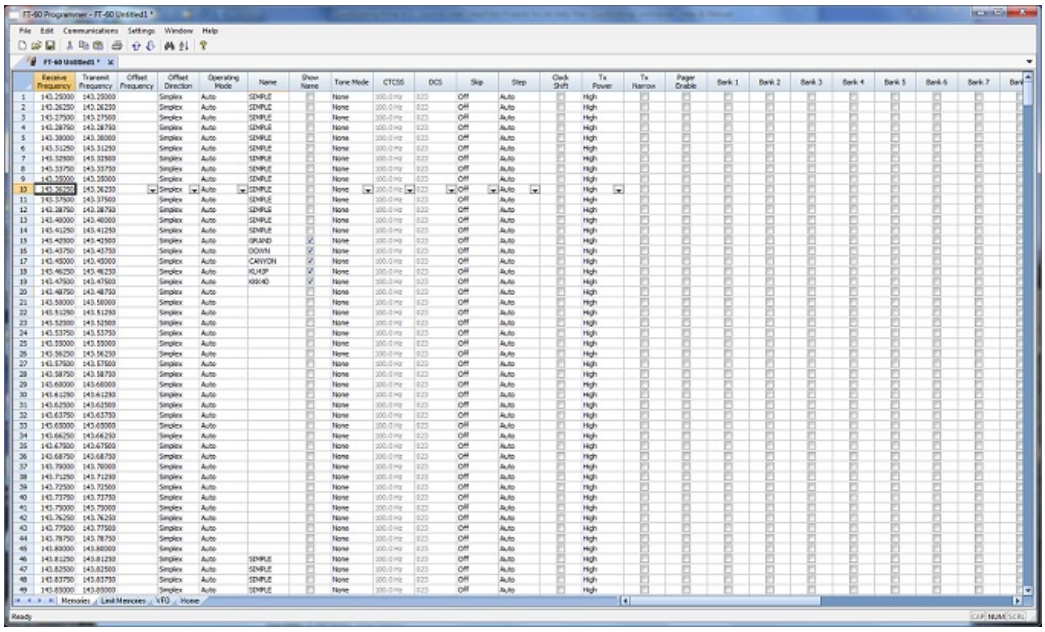
You can copy two different ways:
Copy ***all the details*** of a Memory Channel (one or several at once) or Copy ***details within one column*** (from one cell to one or many at one time)

- ***In most cases, data can be copied from one tab to another (as in left and right memories).***
- ***It can also be copied from one programmer to another (when both programs for different radios are installed).***
- ***Data that is not appropriate for where it is to be pasted (i.e., a VHF frequency into a UHF channel) will not be pasted.***

Copying an entire memory channel or group of channels

Shown here are details for copying within a file. The same actions apply to copy data to another tab of the file or to another programmer.

Open the file.

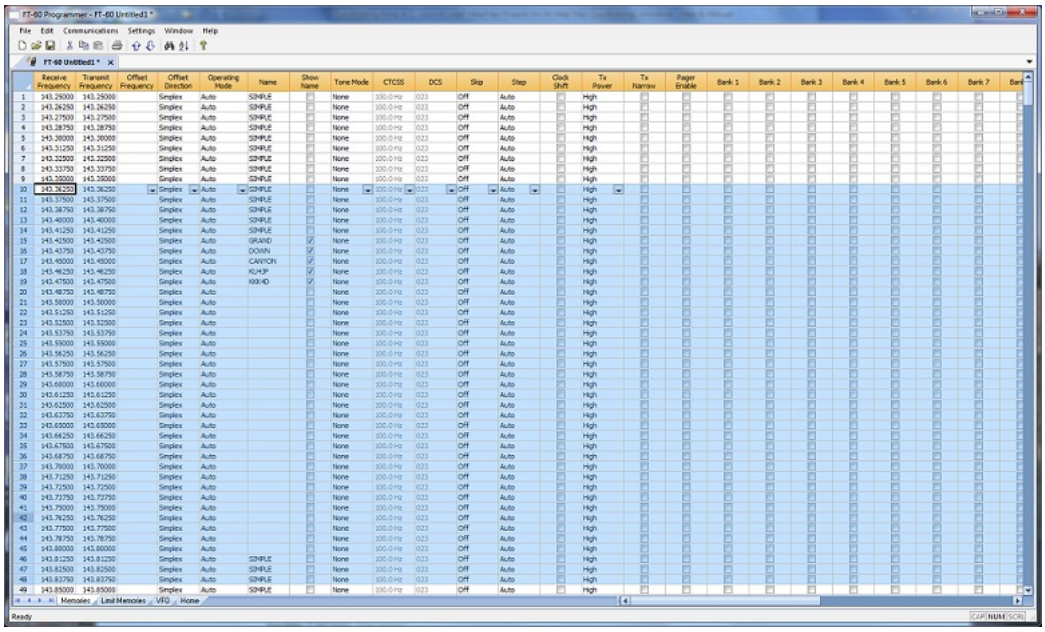


Select the data to be copied.

To select an **entire row**, point your mouse at the *number in the blue box at the left of the row*. Click and release the left mouse to select that row. The entire row will be highlighted when it is selected.

To select **multiple rows**, point your mouse at the number in the blue box at the left of the first row to be selected. Click and hold the left mouse button as you drag the pointer over the next several channels that you want to copy. The channels must be sequential for multi channel copying. All the selected channels will be highlighted.

To select **all rows**, point your mouse at the number in the blue box at the left of the first row. Left click the mouse. Release the mouse. Press Ctrl A to select all. The entire page will be highlighted. ***Note: If you have a lot of channels to select, rather than trying to select them with the mouse, simply select the first one and press Ctrl A. The copy and paste process does not care if blank channels are selected.***

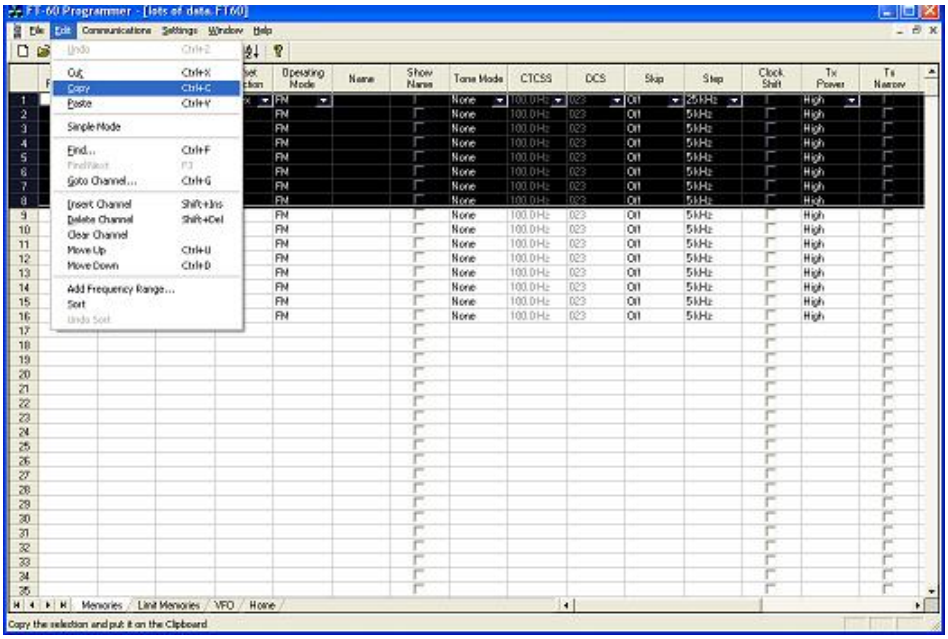


Copy Command

From the menu at the top of the screen, use your mouse to left click on Edit. From the menu that opens, use the mouse to left click on Copy.

You can also copy by pressing Ctrl C on the keyboard.

Or while pointing at the screen of the programmer, right click and select Copy from the menu that opens.



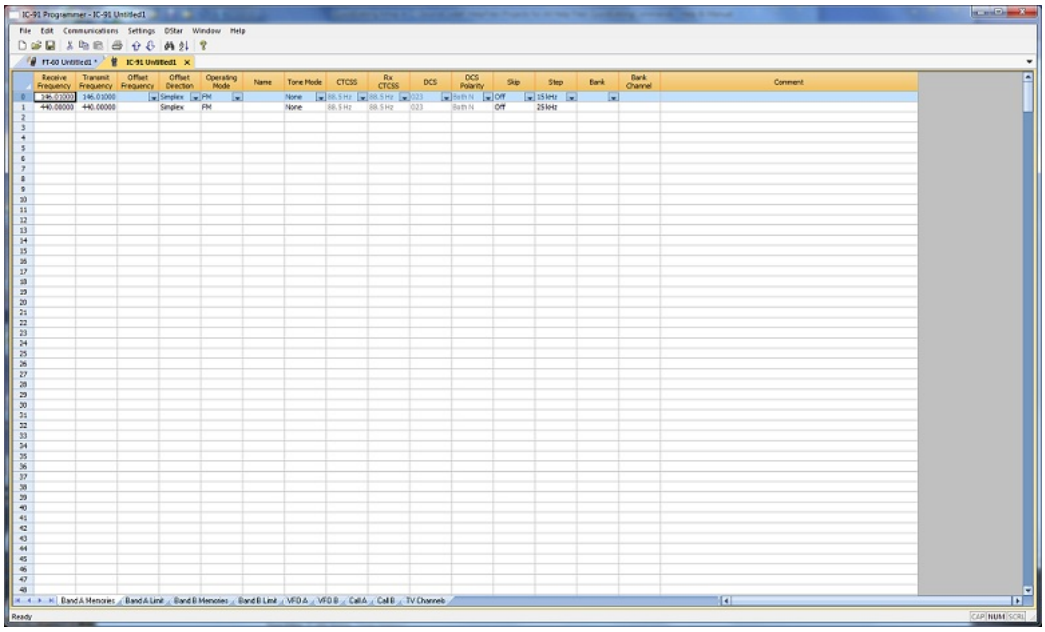
It will appear that nothing has happened. The program in conjunction with built in commands of the operating system of the computer has copied the data. It is waiting for you to Paste it where you want it.

Paste (Ctrl+V) - Writes the selected data to the current position of the cursor overwriting the data from that point.The programmers have the ability to copy and paste data in a single column as well as for an entire row.

Paste Complete Channels

Use the mouse to select the channel where you want the data to start. This can be in another file for the same radio or one for any radio for which you use an RT Systems programmer.

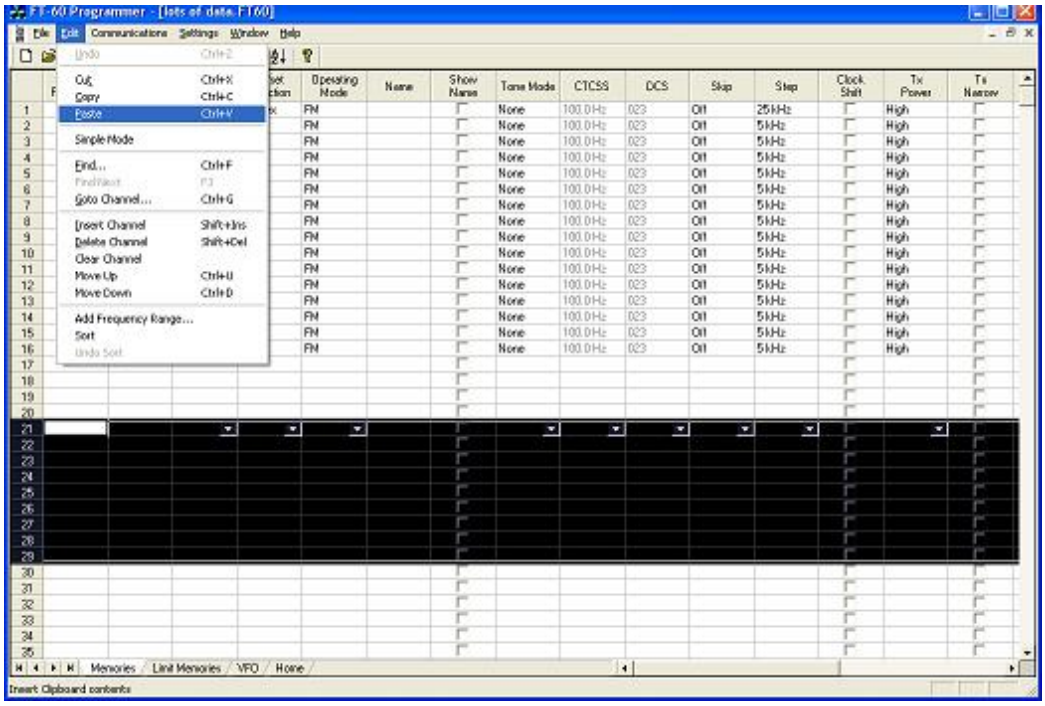
Select the row that is the **first** into which the data is to be pasted. The Paste process will begin in that location with the first copied channel and continue in each channel after that with the rest of the channels that were copied.



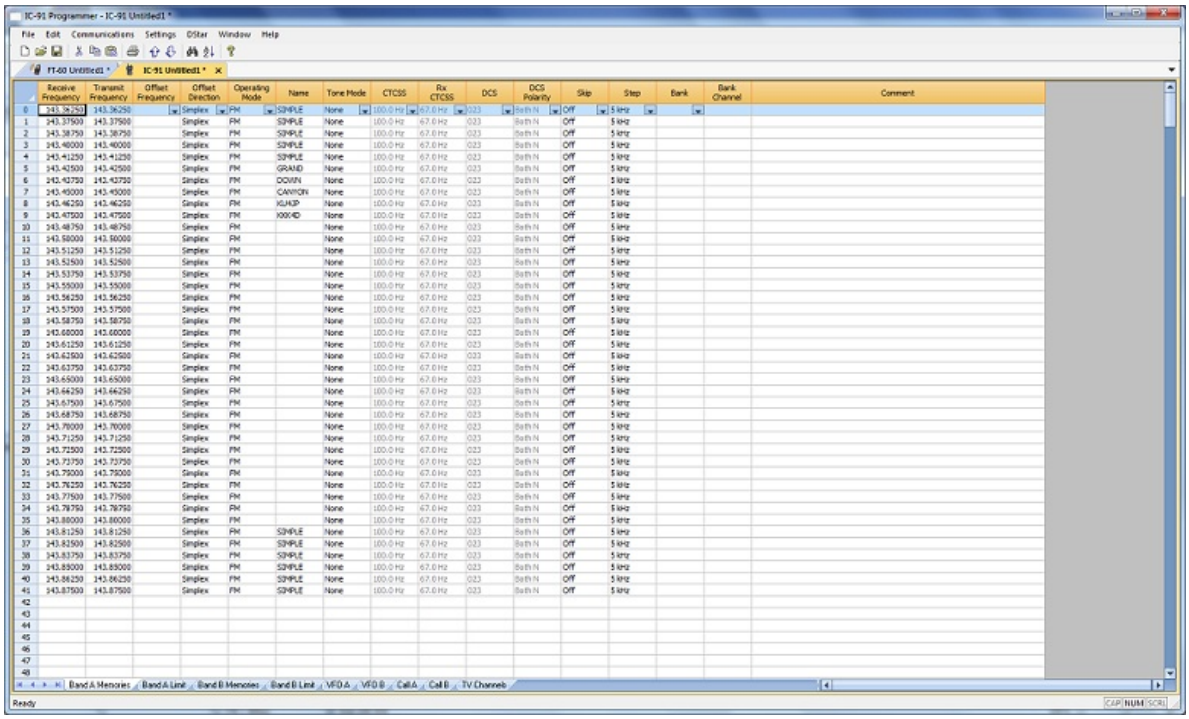
From the menu at the top of the screen, use your mouse to left click on Edit. From the menu that appears, use the mouse to left click on Paste.

You can also paste by pressing Ctrl V with the mouse pointing within the selected area (i.e., just look at where the mouse pointer is on the screen. It must by within the black area on the screen of the programmer for this keystroke to have any effect.).

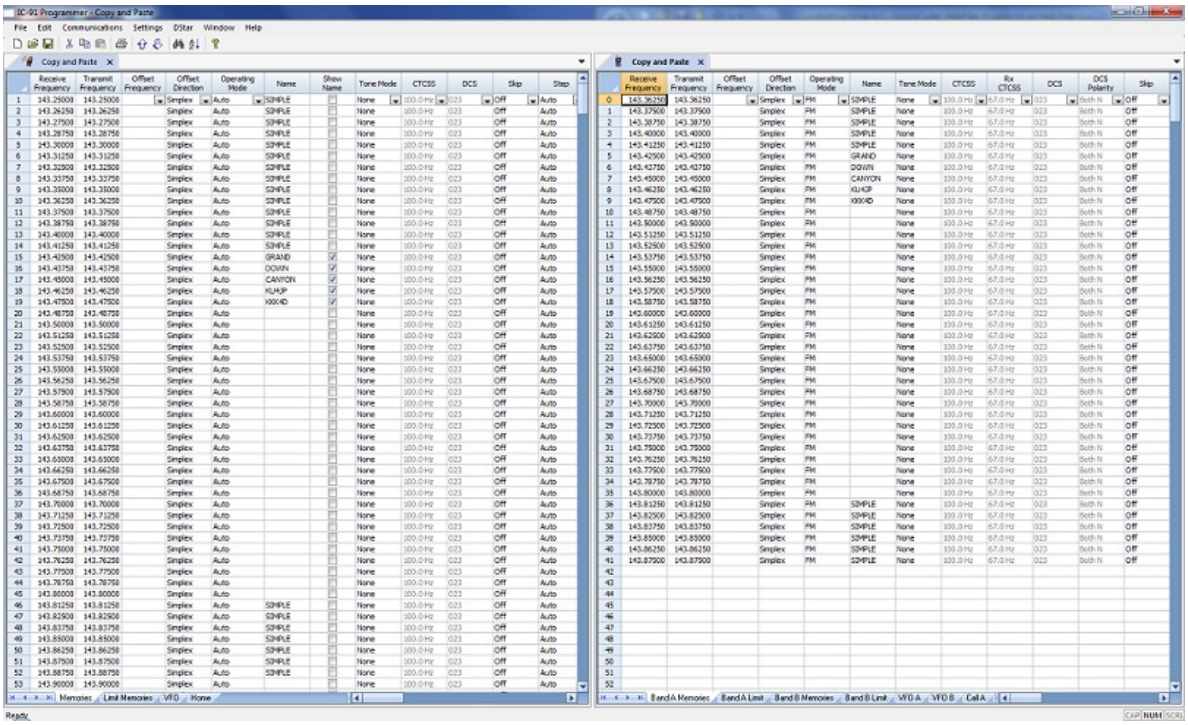
Or while pointing within the highlighted area, right click and select Paste from the menu that opens.



The information is pasted into the selected channels.



You can make this process even easier by splitting the screen into two parts. Select Window New Vertical Tab Group for this result.



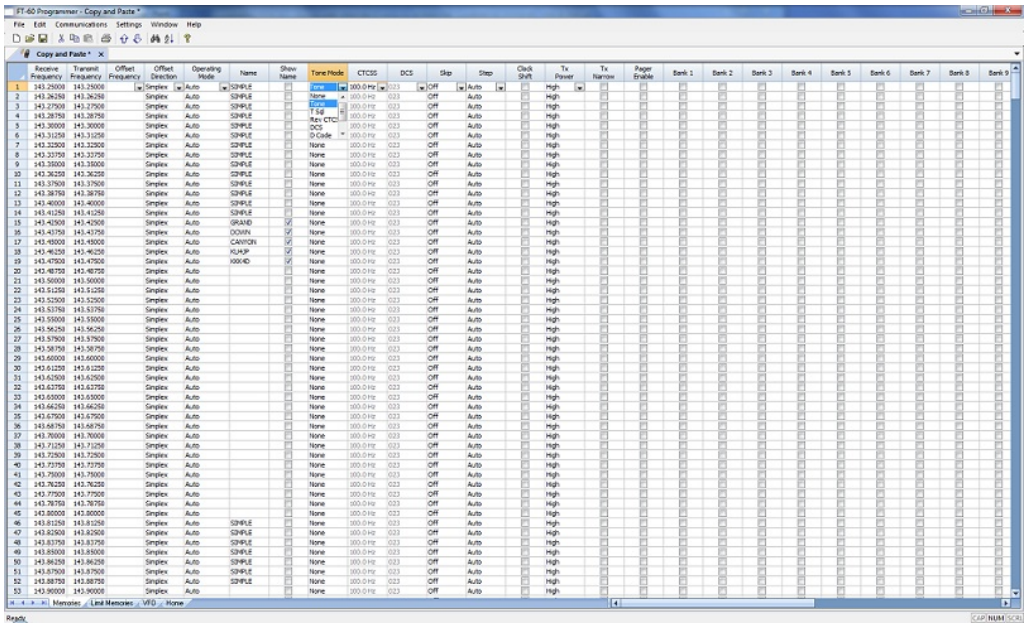
Copying details from one cell to change many rows at once.

- **Column editing:** This editing allows you to change the data in the same column of several rows at once. It works a little differently for columns with text (including those into which you enter text and those that you select text from a list) and check box fields. Each of these scenarios is presented here in an example.

  Text Cell Editing - To change Tone Mode to Tone for several channels.

  Select the Tone Mode field of the first of the channels to be changed.

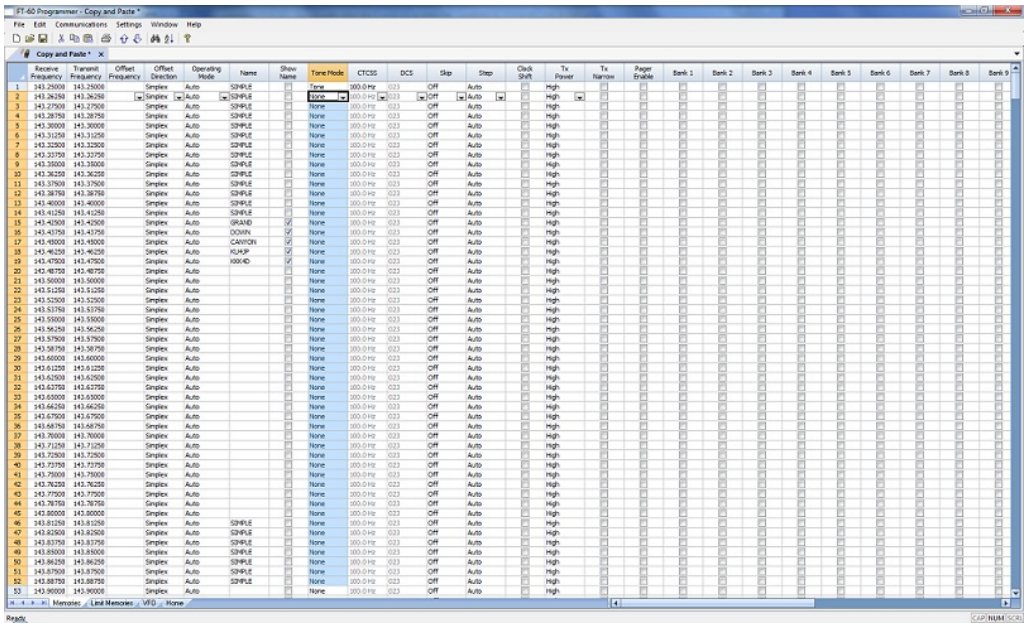
  Make the change by pulling the drop-down and selecting Tone from the list.



Once the selection is made, the focus will move to the next field. Click back into the Tone Mode field that displays the correct value. When you move back into the field you can copy the information if the field is highlighted with a ring around its border or if the text within is shaded (indicating that it is selected).

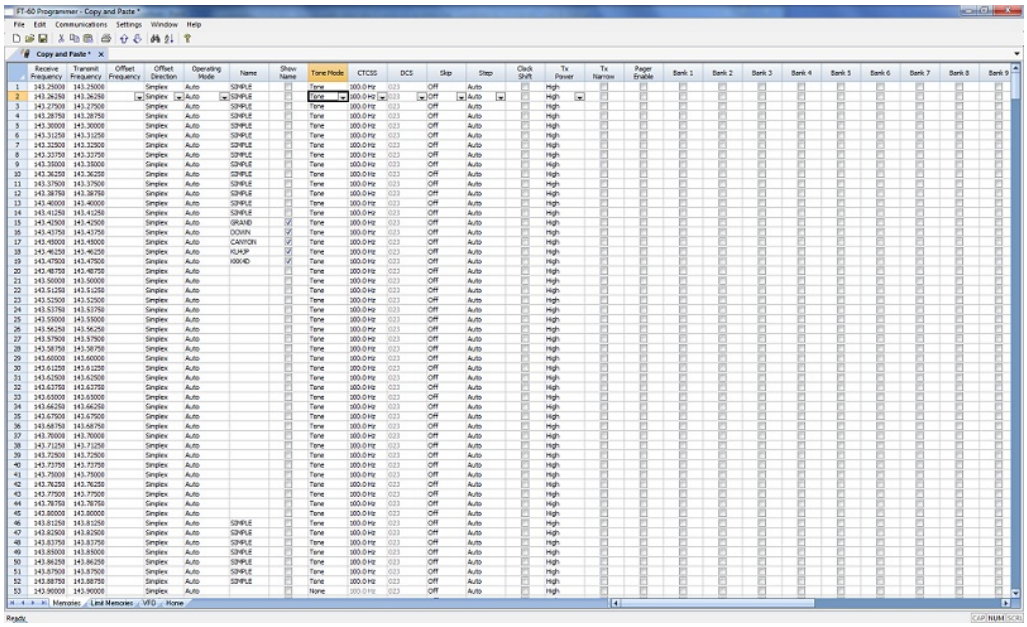
Press Ctrl + C, select Edit | Copy from the menu at the top of the screen, or right click and select Copy from the menu that appears. (Just as with row copying in the first example.)

Select the first cell to be changed by pressing Down arrow until that cell is highlighted (the cell will be in the same column so using the Down Arrow key will easily move you to another nearby cell). If you need to move quite a way in the file, move to the first cell to be changed and click the mouse to select that cell.



If several consecutive rows are to be changed, select them all by holding the Shift Key while you Down Arrow through them or hold the Left Mouse Key while you move your mouse over them (normal Windows selection processes). When they are selected, they will be highlighted in a color based on the scheme of your computer.

Press Ctrl + V, select Edit | Paste from the menu at the top of the screen, or Right Click and select Paste from the options in the menu that opens. The copied value will appear in each of the fields.



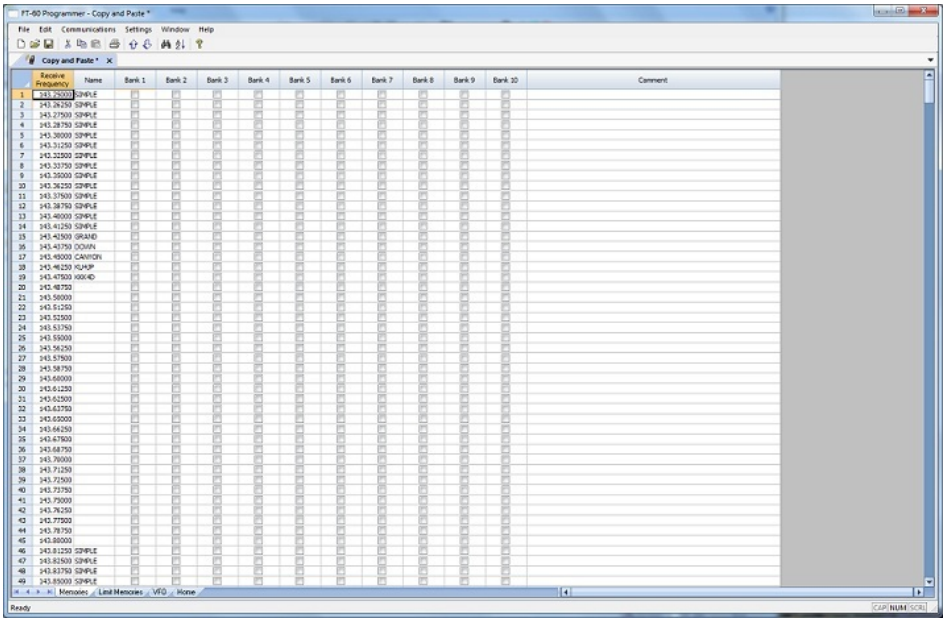
Column editing will address a selection of consecutive cells all at once or individual cells repeatedly. If the items to be changed are not consecutive, you can select and paste repeatedly until all the cells are addresses. You do not have to copy again. The programmer retains the copied value.

Check Box Cell Editing - If you want to put several channels into a Bank, there is no reason to do this one row at a time.

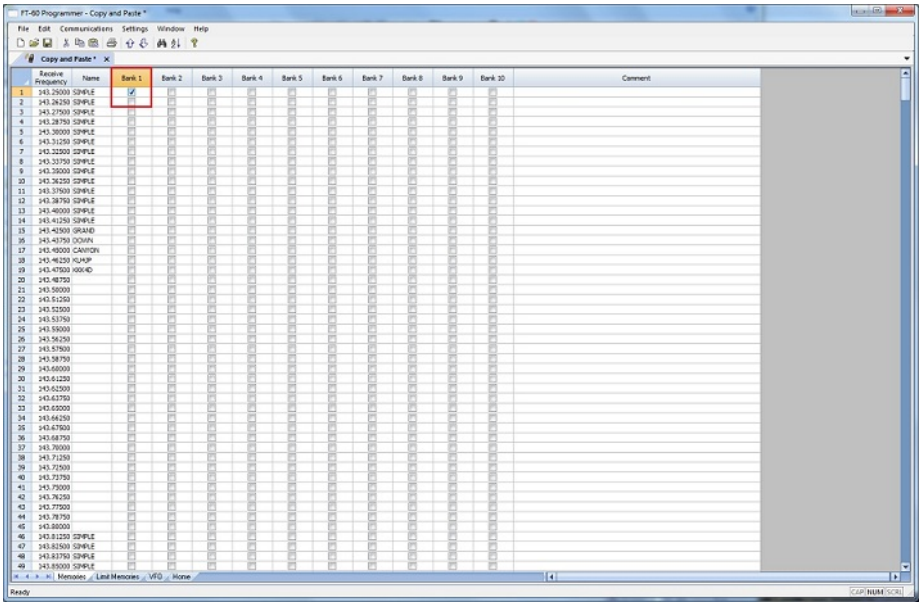
This process varies from the other by how the cells are selected. Check box cells act differently than those that contain text. You can copy from one check box column into another.

In this example, put channels several into Bank 1 without checking the Bank 1 box for each channel.

First, select Settings from the menu at the top of the page. From that menu, select Bank Settings. Several columns of the screen will be hidden leaving only Receive Frequency, Name and Banks. This makes working on the screen easier since you no longer must scroll through several columns that you are not using now.



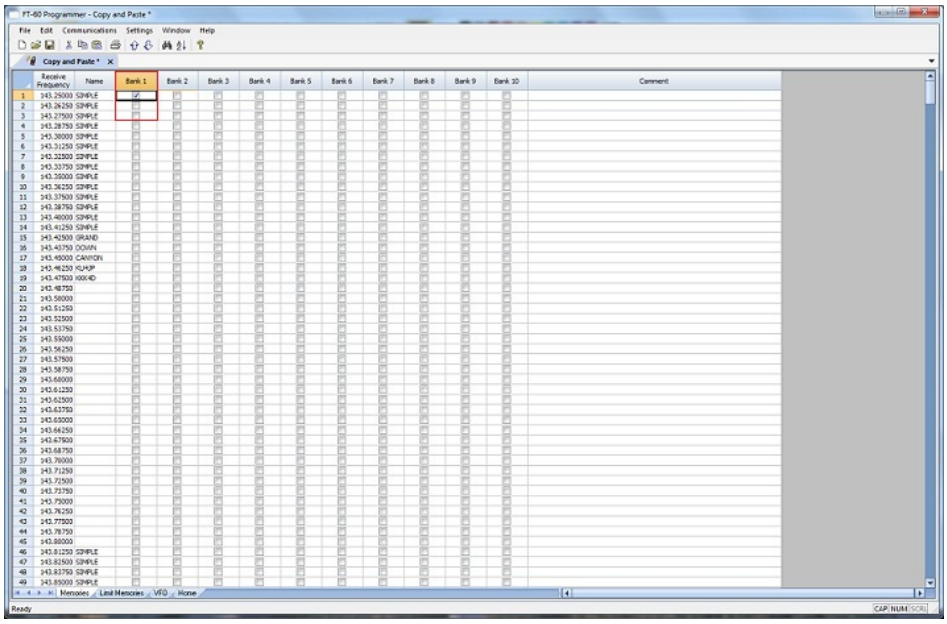
For Channel 1, put a check in the box under Bank 1.



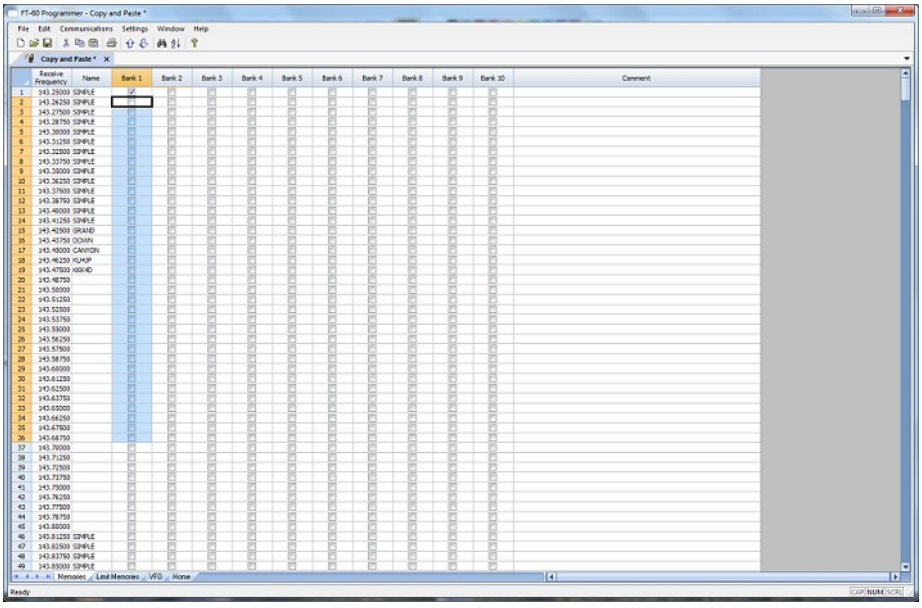
At this point you CANNOT copy this field. Press Tab or Enter to move out of the field.

The process is more easily done now with the keyboard rather than the mouse.

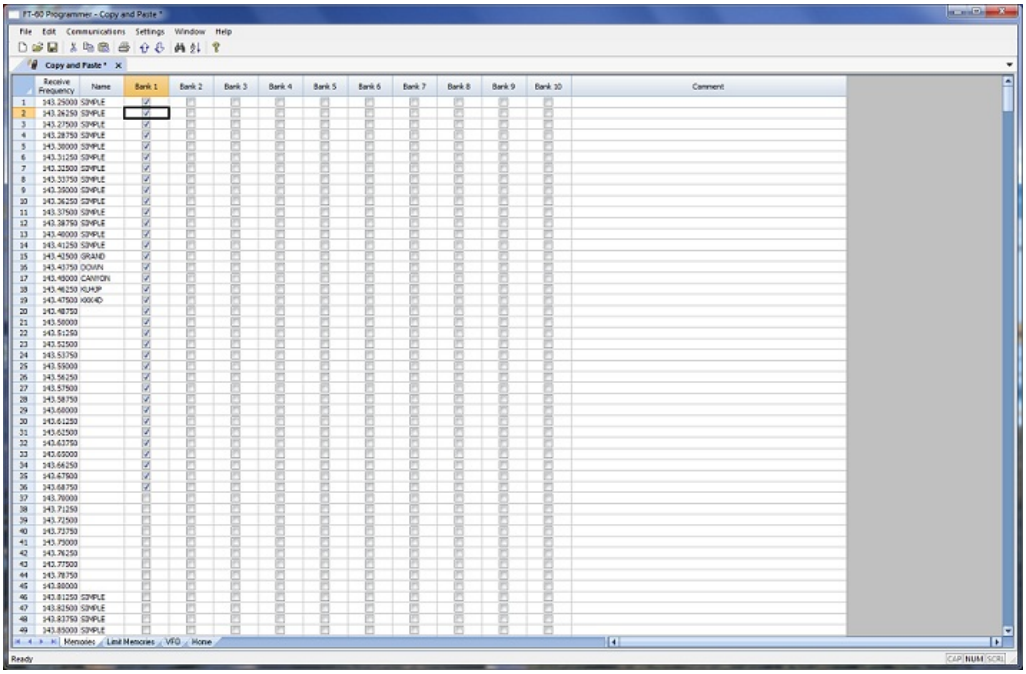
Press Right Arrow to move focus back into the Bank 1 column. Notice that there is now a black border on that cell. The cell is now ready to be copied. Press Ctrl C or select Edit from the menu then copy from the list that opens to copy the cell.



Press and Hold the Shift key while pressing the Down Arrow key to select the rows that will be set with this information.



Press Ctrl V to paste the selecting into the fields.



Simple Mode: Hides several of the columns for each memory channel. Those remaining are the ones that are most needed for any memory channel. Those remaining include:

Receive Frequency - A channel cannot be programmed without a receive frequency. This is the frequency you listen to.

Transmit Frequency - The programmer will complete this automatically. The column is included in case you need to enter the value other than the default for the receive frequency based on the band plan (i.e., an odd split pair).

Offset Direction - Again, the programmer will complete this automatically based on the band plan for the receive frequency. However, an occasional repeater will differ from the band plan. Including this column gives you the ability to address that difference.

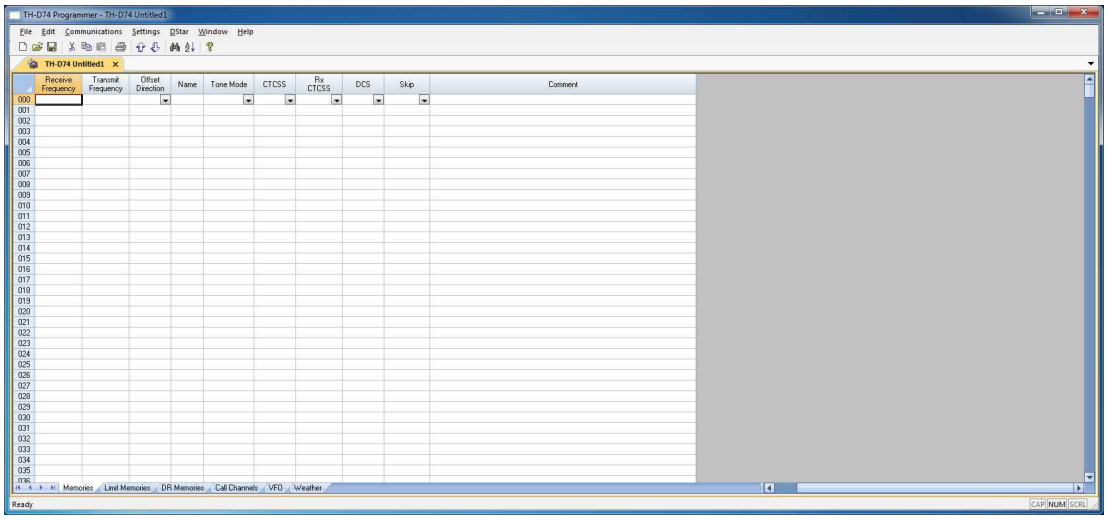
Name - This column is for personalized information to identify the channel.

Tone Mode - The repeater operator controls this detail for the repeater. There is nothing standard that can be completed automatically. You need

to select the Tone Mode then assign the CTCSS frequency or DCS code as needed for a particular repeater.

Skip - Use at your discretion to include or exclude a frequency during memory channel scanning.

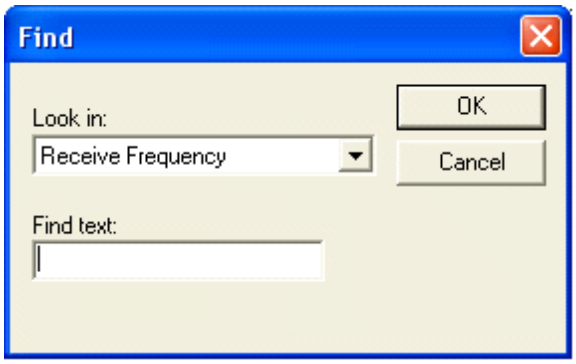
Comment - Personalized notes up to 80 characters. This information remains a part of the file and is not transferred to the radio.



Note: While in Simple Mode, you cannot access the Preferences screen (Settings | Preferences). The columns that are hidden in Simple mode are predetermined by the programmer.

All columns are visible on the screen when you are no longer in Simple Mode. If you want to hide other columns, you can do that through individual selection on the Settings | Preferences page.

Find (Ctrl+F) - Finds specific text in a specified column. Once you select this command or press Ctrl+F a screen opens into which you enter the text (or number) to be found.



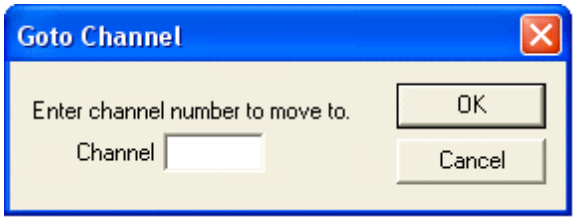
Select the field to be searched (i.e., Receive frequency, Transmit frequency, etc.)

Enter the text (or numbers) to be found.

Click OK to move to the first item found. The search always begins at the top of the list and stops at the end.

Find Next (F3) - Use the F3 function key to repeat the specified find and move to the next item. For example: You choose to search for 145 in the Receive Frequency column in a file with 5 channels beginning with 145. OK in the Find box takes you to the first one. F3 takes you to the second; then the third; then the fourth: and so on until you have stopped at each of those that match the criteria.

Goto Channel (Ctrl+G) - Moves to the indicated channel number. When this option is selected a screen opens into which you enter the channel number. Enter the number and click OK to move to that memory channel (programmed or not).



Insert Channel (Shift+Ins) - Inserts a blank row without deleting information present. The current information and all that follows is "pushed-down" to make room. The number of rows inserted will equal the number of rows selected. This is a great way to slip channel information into a list of channels.

Note: Insertion of rows can result in the loss of data from the bottom of the list. You will be warned if there is danger of data loss and given the opportunity to cancel the process to prevent this loss.

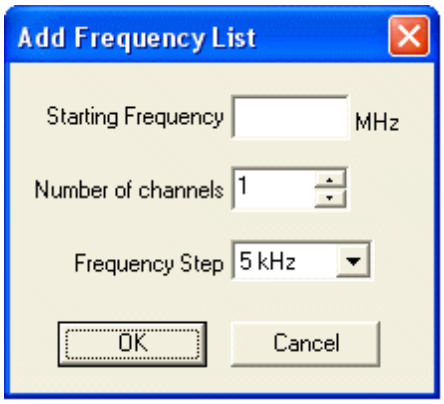
Delete Channel (Shift+Del) - Removes the selected row. All the data following the deleted row is "pulled-up" to eliminate the blank row. Beware!! Deleted data cannot be recovered. Neither the Insert nor the Paste commands write the data to the grid. If you accidentally delete data, exit the Programmer WITHOUT saving. The file will be restored to its condition when you last saved and the last deleted data will be restored. Multiple channels can be deleted by selecting them all at once and selecting delete.

Clear Channel - Removes the data from the selected channel without moving all those that follow up to fill this space. Leaves the channel blank.

Move Up (Ctrl+U) - The ability to select a channel and have it "change places" with the channel immediately preceding it. Repeat this command on a selected channel to "walk" it into place in your list. Sequential channels can be selected and moved at once. The group will move up one channel at a time. The displaced memory channel will move to the end of the group being moved.

Move Down (Ctrl+D) - The ability to select a channel and have it "change places" with the channel immediately following it. Repeat this command on a selected channel to "walk" it into place in your list. Sequential channels can be selected and moved at once. The group will move down one channel at a time. The displaced memory channel will move to the top of the group being moved.

Add Frequency Range - A convenient way to add lots of channels at once. This is great for setting up a radio for scanning a certain range of channels. When this option is selected you are presented with a window into which you enter the details of the channels to be entered.



Enter Starting Frequency: The value of the first frequency of the list to be entered. Any allowable frequency of the radio being programmed.

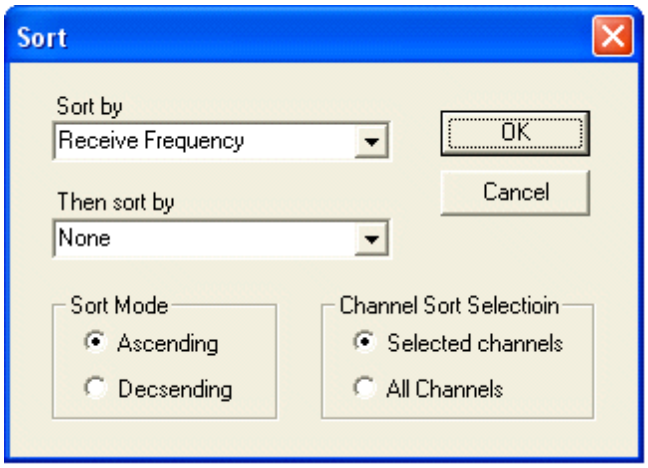
Number of channels - Enter the number of channels to be entered. You can insert as few as 1 to as many as 1000 channels at once. You are not warned if you select more than the number of memory channels. The process just inserts all that it can and ignores the rest.

Frequency Step - Enter the value that will separate each of the frequencies in these channels. Select 5kHz to 200 kHz.

Click OK and watch the screen fill. Or Cancel to exit the process without change to your file.

The channels are inserted beginning at the currently selected channel (i.e., if you have selected channel 40, the first channel will be added at channel 40). You are warned if a channel will be overwritten and given the ability to not overwrite or to cancel the process. If you choose No to prevent loss of the current channel information, the skipped frequency is entered into the next available space and not lost.

Sort - Great for data management or to arrange your channels permanently for a special use. The programmers have the ability to Undo a sort. You can now sort the list on a given parameter, touch-up a group of entries, then put the list back in its original order with the changes that you made. When this option is selected you are presented with a window for selection of the options.



Sort by - Select a column for the initial sort.

Then Sort By - Select a second column for a secondary sort.

Sort Mode - Ascending for lowest to highest. Descending for highest to lowest.

Channel Sort Selection - Selected Channels to sort only a group form the file. All Channels to sort all the channels in the file.

If the result is not quite what you expected, select the Undo Sort option to return the list to the point you left it last.

Always save your file before you sort. At the very worst you can exit the file without saving to return to the order of that last save.

Blank memory channels are always sorted to the top of bottom of the list based on the Ascending or Descending selection.

Different fields sort differently. If a field is a text field in one programmer and a drop down list in another, the sort results will be different. It has to do with how the computer interprets the values in these different types of fields. While this was present in the older programmers, it should not be a problem in the RT Systems programmers where the fields are consistent between the radio programmers.

Unsort - For use after sorting to return the list to the last saved order. Use Sort and Unsort to easily edit channels with the same info that needs to be changed. Sort to bring those channels together. Edit the details (see cell editing). Then unsort to return the list to the last saved order with the edits in place.

Quick File Access Commands

Ctrl 0 (Control zero) - Open existing file for same radio. Calls the Open dialog for the programmer being used allowing you to select a file to be opened without having to select the file type first. This is especially helpful when several programmers are loaded on one system. (i.e., Lets you select another FT-7800 file without having to select that file type first from the open box.)

Ctrl O (Control letter "O") - File | Open. Presents the box from which the file type is selected just as File | Open. Select the type of file to be opened. The programmer will look in the location of that last file for that particular file type. (i.e., you can open an FT-60 file while working with the FT-7800 programmer as long as you have the RT Systems program for both of these radios. With both open, you can copy and paste between the files or send each to the proper radio without having to close and reopen the programmers separately.)

Ctrl M - Automatically create a new file for the programmer being used. Eliminates having to select the file type first.

Ctrl N - File | New. Presents the box from which the file type is selected just as in File | New in the menu. Select the file type for the programmer to create a new file for that radio (the same as the one you're working with now or for a different radio for which you have the programmer.)

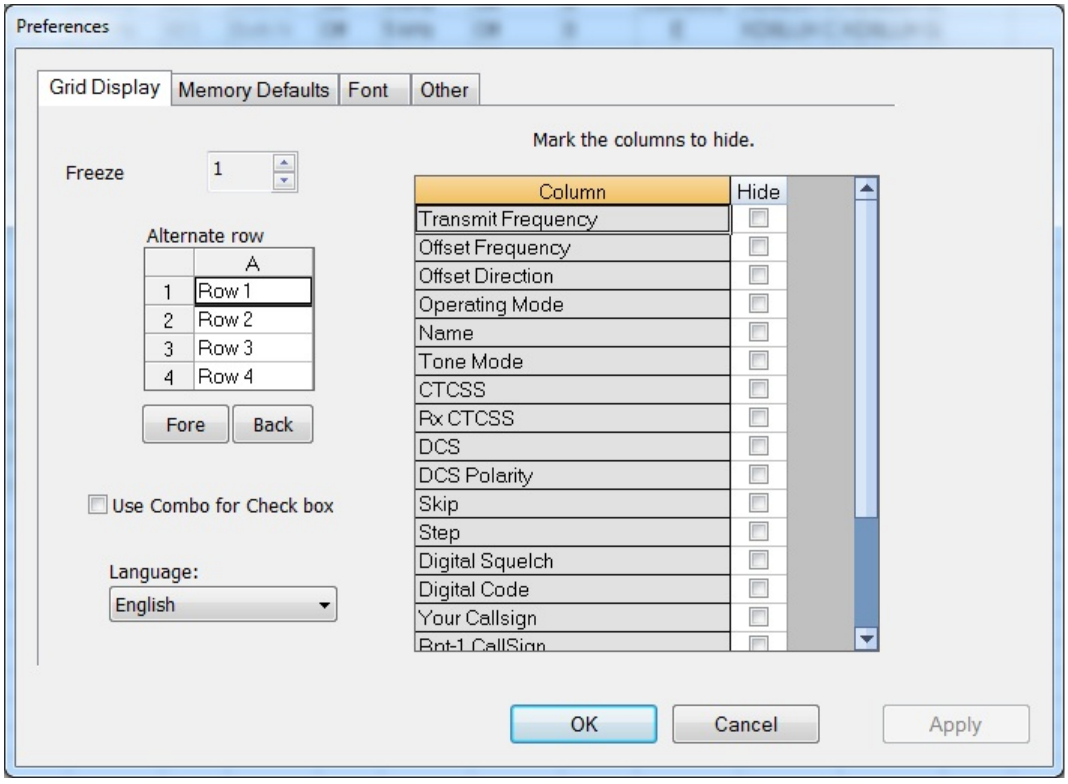
Part VI

6 Screen Appearance and Default Options

The screens of the programmer can be customized to make data entry that much easier. Many other controls for the program are found in the Preference section. The changes made here affect all the RT Systems programmers installed on this machine.

Options for screen appearance are accessed under Settings | Preferences from the menu on the main screen of the programmer. This screen appears when that option is selected:

Grid Display



Freeze Columns

The option to "freeze" can be applied to any or all columns. Select the number of columns to remain on the screen at all times as you scroll to the right of the spreadsheet.

Having these columns always available for reference can be a great help for identifying the memory channel being edited.

Hidden Columns (Mark the columns to hide)

Selected columns can be marked as hidden which removes them from the screen display. During editing, these fields are completed with default information for the radio. This option is a global setting and will affect every file, new or existing.

In an existing file the data in these columns is not lost: it is simply not displayed.

In a new file, a hidden column is filled with a default value.

Hidden column data is not printed. Columns can be marked as hidden to customize printed output and then restored for additional data management.

Note: Several columns are hidden and unhidden with the Simple Mode option found under Edit from the menu of the main screen. Simple mode hides all but the columns required for memory channel operations. When you leave Simple Mode, all columns will again be visible.

Alternate row colors

Select a color for the text (Fore) and/or background (Back) for rows 2, 4, 6, etc. This can help the readability of the spreadsheet.

Use Combo for Check box

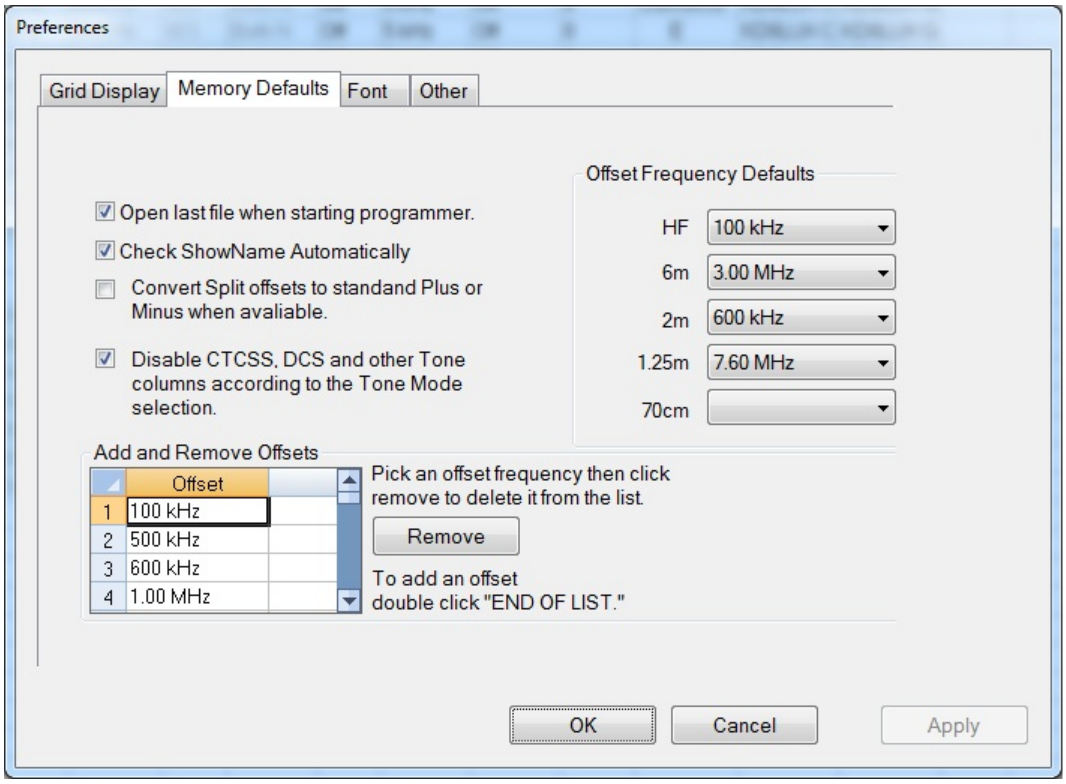
On some systems the checkbox option does not work and you are not able to make selections for banks, show name or other options with check boxes. The check boxes will be missing from the cell.

Select this option to change the cell to a Yes/No combo box rather than a check box. Make your selections by setting the option to Yes where desired. Just are with the checkbox option, the combo box selection can be copied and pasted to other cells in the column.

Language

Select from several languages for column headers, message boxes and other text in the programmer.

Memory Defaults



Memory Defaults let you set options that control the defaults of the memory channels. If you are having to change a certain cell repeatedly for the data you enter, you might want to make that change permanent here.

Open last file when starting programmer

By default, the programmer opens the last file saved. By choice, you can open to a default file for the radio by unchecking this box.

Check ShowName Automatically

By default, the programmer checks the ShowName column as soon as you enter the first letter of an alpha/numeric tag for the channel. By choice, you can have the programmer not check this box automatically. When

unchecked, the name will not be displayed on the radio. This options affects programmers that use a ShowName column. Not all do since many handle show name as a global setting rather than in each memory channel.

Convert Split offsets to standard Plus or Minus when available

By default, the programmer leaves a split pair as a "split" in a radio that can handle a "split" for Offset Direction (i.e., Yaesu radios, for one, handle odd splits this way). With this option engaged (checked), the programmer will always calculate the Offset Frequency and set the Offset Direction to Plus or Minus when possible (if the math comes out correctly for the design of the radio). The functionality of the radio is the same with either configuration for the frequency pair.

Disable CTCSS, DCS and other Tone columns according to the Tone Mode Selection

By default, the programmer turns the CTCSS, RX CTCSS, DCS and RX DCS columns on or off as needed for the selected Tone Mode (i.e., if you don't need to set a DCS code for Tone - encode - that column will be disabled and the value displayed in it ignored by the radio). With this option engaged, all the tone selection columns are active regardless of the Tone Mode selected. You will be able to change CTCSS frequencies and DCS codes although the radio may not use your selection for the Tone Mode engaged.

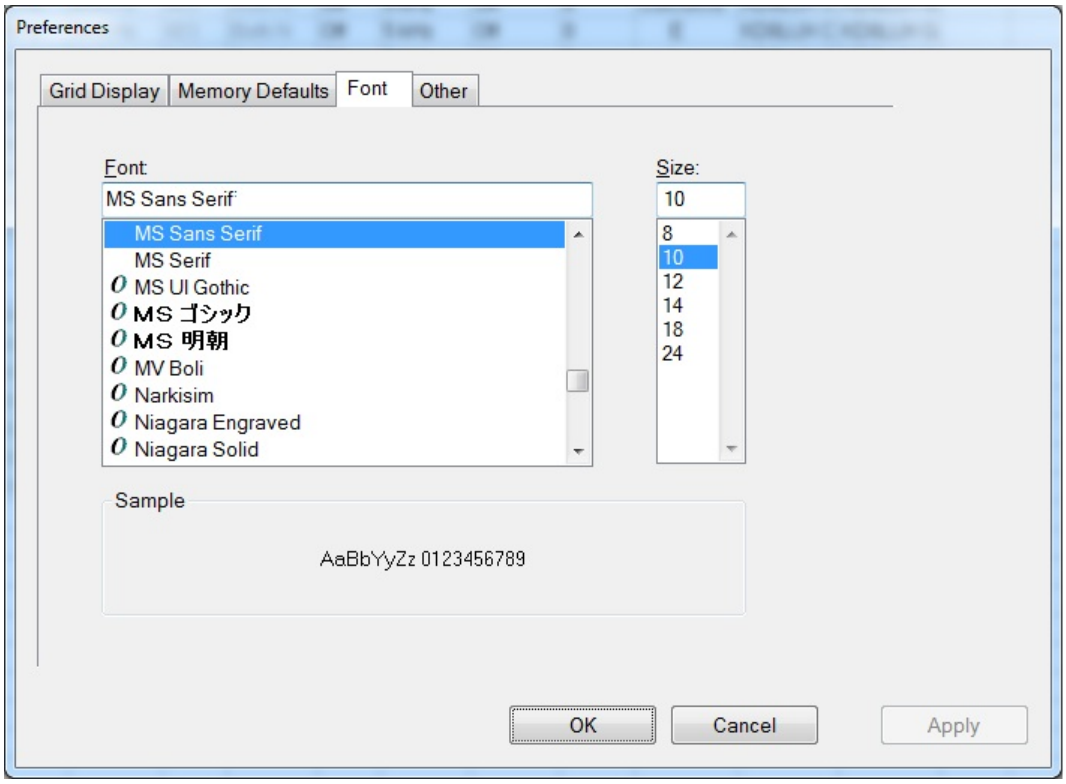
Add and Remove Offsets

A change to this section affects what you see in the Offset Frequency column when entering memory channels on the screens of the programmer. It also affects Offset Frequency Defaults found on this page.

Offset Frequency Defaults

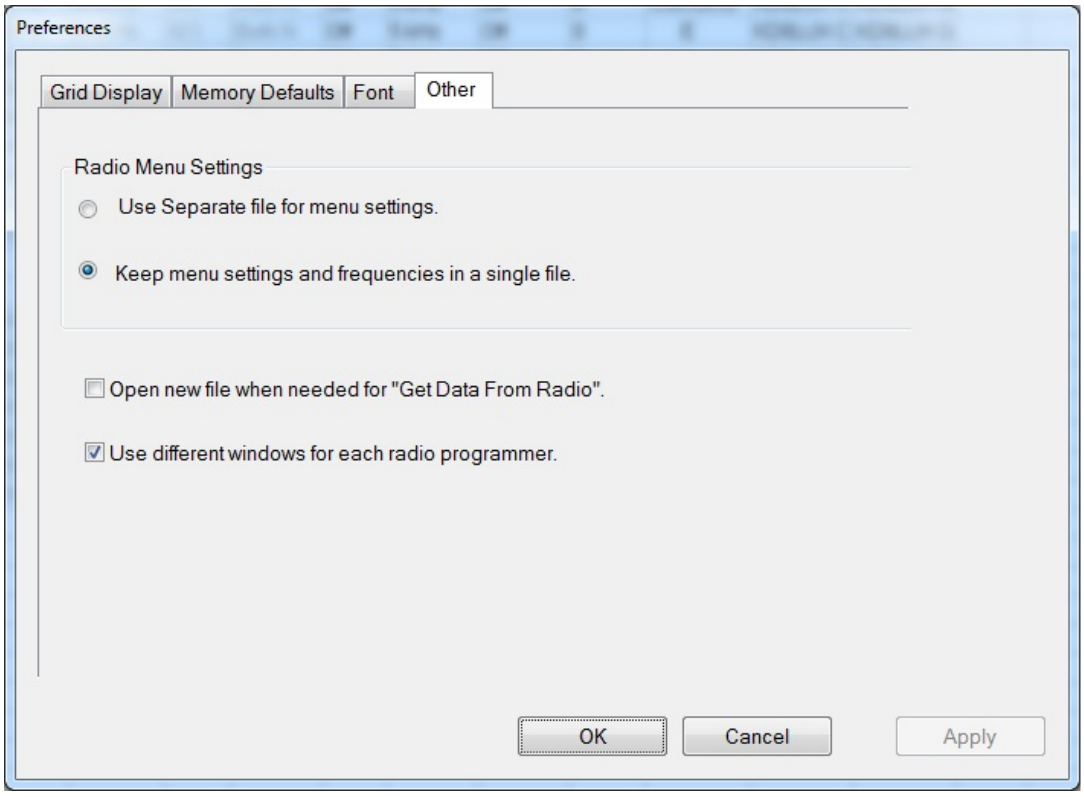
Select a value in each field for the programmer to use when you enter channel information. This value is used for channel information entered into any of the memory channel types (Memory, Limit memories, VFO, Home, etc).

Fonts



The RT Systems programmers include selection of font and size to control display of headers, messages and item identifiers in the programmer. Select any font and size available on your system to make the programmer easier to use.

Other



Radio Menu settings

By default (Use Separate file for menu settings), the programmer saves your global settings (Settings | Radio Menu Settings) to a separate file. In this arrangement, you must only set these options once. When the file is saved, it is used by the program even if you create a new file with memory channels. No need to touch up these setting just because you created a new list of memories.

The options, Keep menu settings and frequencies in a single file, eliminates this second file. You might want to exercise this option is you are creating files for completely different uses (Ham radio, fire department, etc), where you need the global settings to be different for the file. By engaging this option

Open new file when needed for "Get Data From Radio"

By default the programmer warns you when you select Communications | Get Data from Radio and the current file (the one you see on the screen right now)

is not a blank, default file. The programmer is warning you that if you continue you will lose all the work you have done by replacing the information on the screen with that currently in the radio.

By selecting this option (checking the box), the programmer will automatically open a blank, default file for you when Communications | Get data from Radio is selected. By completing the Get Data from Radio process into this default file, you will not lose the work you have been doing in the current file.

Use different windows for each radio programmer

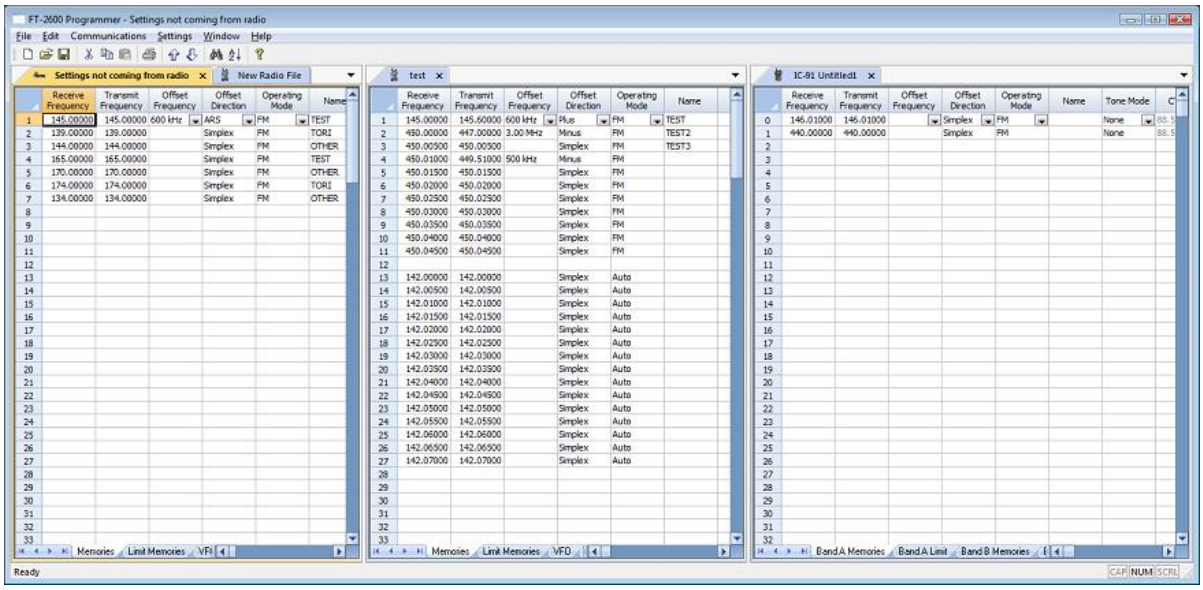
By default the programmer opens each of the programmers installed on this machine (Version 4 or 4.5) in the same master window. Each file occupies a separate tab. The titlebar of the main window identifies the programmer associated with the file in a particular tab. If you name your files as "the radio name" and then "any other identifying information... remember you have 256 characters... don't be cryptic" you can easily tell by the information on the tab which one is for which radio.

When this option is engaged (checking the box), each programmer will open in a separate "main window". Each tab that opens will be for that particular programmer. It will be as if the others don't exist unless you start them from the icon. Working between the files with copy and paste will still work even if the files are displayed in two separate windows. There is no loss of functionality. Only a change in how the files are displayed.

Part VII

7 Split Screen for Multiple Files

The RT Systems programmer can display more than one file simultaneously in the programmer's main window. Opening several files at once makes it even easier to copy and paste between them (even files for different radios from different manufacturers) or just to compare the frequency lists.



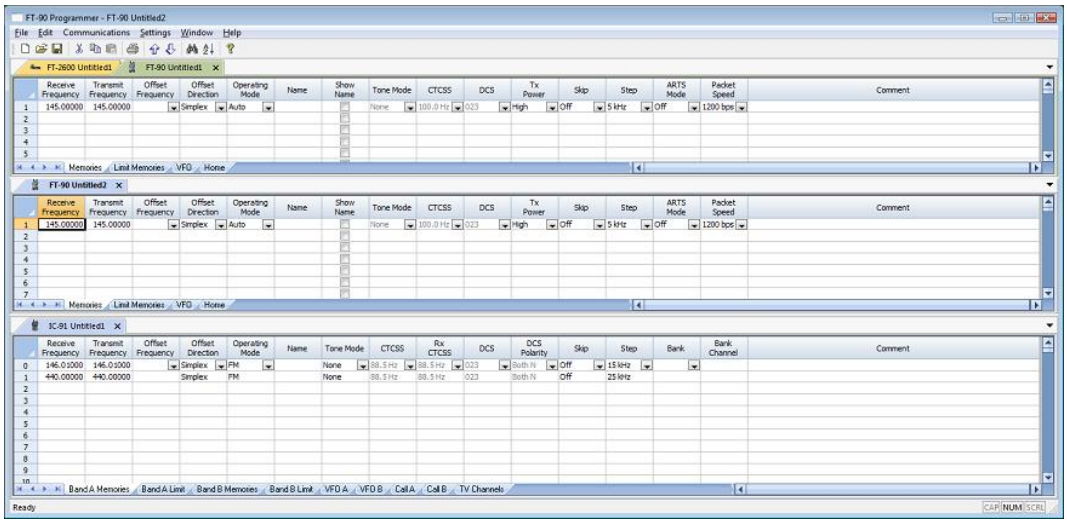
Open the files

From the menu at the top of the main screen, select Window | New Vertical tab group

The screen will separate into two parts taking the selected file to the new group.

To work with three as shown above, simple select another file and repeat the process.

A horizontal split is also possible.



Open the files

From the menu at the top of the main screen, select Window | New Horizontal tab group

The screen will separate into two parts taking the selected file to the new group.

To work with three as shown above, simple select another file and repeat the process.

Note: Once you divide the screen horizontally or vertically, the other separation is not available. Selections for vertical and horizontal groups will be enabled and disabled in the menu as necessary.

Part

8 Menu Item Cross Reference

The Programmer presents all the options for the radio in easy to use grid, check box, list and combo box formats. Most radios these days have so many options that organizing them in the Programmer can be a challenging task.

In the Programmer these settings are organized to make it easy for you to tell the difference as you customize the settings.

Presented here is a cross reference list that details the item as presented in the operating manual where you will find the setting for that item in the Programmer.

The location in the Programmer is described as a "path". For example.

Settings | Radio Menu Settings | Radio Menu Settings tab | Common 1 tab | Password

- Click on Settings in the menu at the top of the screen
- Select Radio Menu Settings from the menu that opens
- Select the Common 1 tab
- The option, Password, is on that screen

This section is presented in separate sections by menu item number to make the lists of menu items more manageable. Select the group from the contents at the left then look for the specific menu item you need to address.

8.1 Items 100- 799

The location in the Programmer is described as a "path". For example if you were looking for Item number 150 Scan Resume, you would find

Settings | Radio Menu Settings | Common 1 tab | Scan Resume

- Click on Settings in the menu at the top of the screen
- Select Radio Menu Settings from the menu that opens
- Select the Common 1 tab
- The option, Scan Resume, is on that screen

Set Mode		
Item No.	Radio Display	In the Programmer
TX/RX - RX		
100	Programmable VFO	
101	Beat Shift	Settings | Radio Menu Settings | Common tab | RX | Beat Shift
102	Detect Output Select	Settings | Radio Menu Settings | Common tab | RX | Detect Out Select
103	FM Narrow	Main Screen | Operating Mode (this item can be set for each memory channel)
104	MW/SW Antenna	Settings | Radio Menu Settings | Common tab | RX | MW/SW Antenna
105	Wx Alert	Settings | Radio Menu Settings | Common tab | RX | Wx Alert
TX/RX - TX		
110	TX Inhibit	Settings | Radio Menu Settings | Common tab | TX | Tx Inhibit
111	Time-Out	Settings | Radio Menu Settings | Common tab | TX | Time-Out Timer
112	Mic Sensitivity	Settings | Radio Menu Settings | Common tab | TX | Mic Sensitivity
TX/RX - RX Filter		
120	SSB High Cut	Settings | Radio Menu Settings | Common tab | Rx Filter | SSB High Cut
121	CW Width	Settings | Radio Menu Settings | Common tab | RX Filter

		| CW Width
122	AM High Cut	Settings | Radio Menu Settings | Common tab | Rx Filter | Am High Cut
TX/RX - Scan		
130	Resume	Settings | Radio Menu Settings | Common tab | Scan | Resume
131	Resume (digital)	Settings | Radio Menu Settings | Common tab | Scan | Resume (digital)
132	Time Restart	Settings | Radio Menu Settings | Common tab | Scan | Time Restart
133	Carrier Restart	Settings | Radio Menu Settings | Common tab | Scan | Carrier Restart
134	Priority Scan	Settings | Radio Menu Settings | Common tab | Scan | Priority Scan
135	Scan Auto Backlight	Settings | Radio Menu Settings | Common tab | Scan | Auto Backlight
136	Auto Weather Scan	Settings | Radio Menu Settings | Common tab | Scan | Auto Wx Scan
TX/RX - Repeater		
140	Offset Frequency	Main Screen | Offset Frequency (this item can be set for each memory channel)
141	Auto Offset	Settings | Radio Menu Settings | Common tab | Repeater | Auto Repeater Offset
142	CALL Key	Settings | Radio Menu Settings | Common tab | Repeater | Call Key
143	1750Hz TX Hold	Settings | Radio Menu Settings | Common tab | Repeater | 1750Hz Tx Hold
TX/RX - VOX		
150	VOX (on/off)	Settings | Radio Menu Settings | Common tab | VOX | VOX Enable
151	Vox Gain	Settings | Radio Menu Settings | Common tab | VOX | Gain
152	Vox Delay	Settings | Radio Menu Settings | Common tab | VOX | Delay
153	Vox TX on Busy	Settings | Radio Menu Settings | Common tab | VOX | Tx On Busy
TX/RX - DTMF		
160	Encode Speed	Settings | Radio Menu Settings | Common tab | DTMF | DTMF Speed
161	Pause Time	Settings | Radio Menu Settings | Common tab | DTMF | Pause Time
162	Tx Hold	Settings | Radio Menu Settings | Common tab | DTMF | Tx Hold
163	DTMF Memory name (16 characters)	Settings | Radio Menu Settings | Common tab | DTMF | Name and DTMS Code

	code (16 digits)	
164	Echo Link Memory name (8 characters) code (8 digits)	Settings | Radio Menu Settings | Common tab | Echolink Memories | Name or Callsign and Memory Code
TX/RX - CW		
170	Pitch Frequency	Settings | Radio Menu Settings | Common tab | CW | Pitch Frequency
171	Reverse	Settings | Radio Menu Settings | Common tab | CW | Reverse
TX/RX - Others		
180	QSO Log	Settings | Radio Menu Settings | Common tab | Others | QSO Log
181	LED Control	Settings | Radio Menu Settings | Common tab | Others | LED Control
Memory - Memory Channel		
200	View List (Memory Channel List)	Main screen | Memories tab. Each row in the spread sheet is a memory channel.
201	Group Name	Bank Naming and Linking
202	Recall Method	Settings | Radio Menu Settings | Common tab | Memory | Recall Method
203	Group Link	Bank Naming and Linking
204	CALL Channel list	Main screen | Call/Home tab (see tabs at the bottom of the screen)
Memory - Repeater List		
210	Repeater List	Dstar | Digital DStar Settings | Your Callsign
Memory - Callsign List		
220	Callsign List	
Audio File - Recording File		
300	Recording File List	
301	Recording	
302	Recording Band	Settings | Radio Menu Settings | Common tab | Audio | Recording Band
Audio File - Voice Message		
310	Voice Message List	
311	Tx Monitor	Settings | Radio Menu Settings | Common tab | Audio | Tx Monitor
312	Digital auto reply	Settings | Radio Menu Settings | Common tab | Audio | Digital Auto Reply
GPS - Basic Settings		
400	Built-In GPS (on/ off)	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | Builtin GPS

401	My Position	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | Positions table
402	Position Ambiguity	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | Position Ambiguity
403	Operating Mode	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | Operating Mode
404	Battery Saver	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | Battery Saver
405	PC Output	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | PC Output
406	Sentence	Settings | Radio Menu Settings | GPS tab | GPS Basic Settings | GPS Sentence
GPS - Track Log		
410	Track Log Recording	Settings | Radio Menu Settings | GPS tab | GPS Track | Track Log
411	Clear Track Log	Not addressed in the programmer.
412	Record Method	Settings | Radio Menu Settings | GPS tab | GPS Track | Record Method
413	Interval	Settings | Radio Menu Settings | GPS tab | GPS Track | Interval
414	Distance	Settings | Radio Menu Settings | GPS tab | GPS Track | Distance
APRS - Basic Settings		
500	My Callsign	Settings | Radio Menu Settings | APRS1 tab | My Callsign (this callsign is for APRS only)
501	Icon	Settings | Radio Menu Settings | APRS1 tab | Station Icon
502	Position Comment	Settings | Radio Menu Settings | APRS1 tab | Position Comment
503	Status Text	Settings | Radio Menu Settings | APRS1 tab | Status Text (Selection, Name, and Tx Rate)
504	Packet Path	Settings | Radio Menu Settings | APRS1 tab | Packet Path
505	Data Speed	Settings | Radio Menu Settings | APRS1 tab | Internal TNC | Data Speed
506	Data Band	Settings | Radio Menu Settings | APRS1 tab | Internal TNC | Data Band
507	DCD Sense	Settings | Radio Menu Settings | APRS1 tab | Internal TNC | DCD Sense
508	TX Delay	Settings | Radio Menu Settings | APRS1 tab | Internal TNC | TX Delay
509	APRS Lock	Settings | Radio Menu Settings | APRS1 tab | APRS Lock (Frequency, PTT, APRS Key)
APRS - Beacon TX Control		
510	Method	Settings | Radio Menu Settings | APRS1 tab | Beacon Tx Algorithm | Method

511	Initial Interval	Settings | Radio Menu Settings | APRS1 tab | Beacon Tx Algorithm | Internal Interval
512	Decay Algorithm	Settings | Radio Menu Settings | APRS1 tab | Decay Algorithm
513	Prop Pathing	Settings | Radio Menu Settings | APRS1 tab | Proportional Pathing
514	Speed	Settings | Radio Menu Settings | APRS1 tab | Beacon Information | Speed
515	Altitude	Settings | Radio Menu Settings | APRS1 tab | Beacon Information | Altitude
516	Object	
APRS - QSY Information		
520	QSY Info in Status (on/off)	Settings | Radio Menu Settings | APRS2 tab | QSY in Status
521	Tone/Narrow	Settings | Radio Menu Settings | APRS2 tab | Tone/ Narrow
522	Shift/Offset	Settings | Radio Menu Settings | APRS2 tab | Shift/ Offset
523	QSY Limit Distance	Settings | Radio Menu Settings | APRS2 tab | QSY Limit (miles)
APRS - Smart Beaconing		
530	Low/High Speed	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Low / High Speed
531	Slow Rate	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Slow Rate
532	Fast Rate	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Fast Rate
533	Turn Angle (minimum for turn detection)	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Turn Angle
534	Turn Slope	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Turn Slope
535	Turn Time	Settings | Radio Menu Settings | APRS2 tab | Smart Beaconing | Turn Time
APRS - Waypoint		
540	Format	Settings | Radio Menu Settings | APRS1 tab | Waypoint | Format
541	Length	Settings | Radio Menu Settings | APRS1 tab | Waypoint | Length
542	Output	Settings | Radio Menu Settings | APRS1 tab | Waypoint | Output
APRS - Packet Filter		
550	Position Limit	Settings | Radio Menu Settings | APRS1 tab | Packet Filter Type | Position Limit
551	Filter Type	Settings | Radio Menu Settings | APRS1 tab | Packet Filter Type

APRS - Message		
560	User Phrase	Settings | Radio Menu Settings | APRS2 tab | User Phrases
561	Auto Message	Settings | Radio Menu Settings | APRS2 tab | Auto Message Reply | Reply
562	Reply To	Settings | Radio Menu Settings | APRS2 tab | Auto Message Reply | Reply to
563	Reply Delay Time	Settings | Radio Menu Settings | APRS2 tab | Auto Message Reply | Delay Time
564	Reply Message Text	Settings | Radio Menu Settings | APRS2 tab | Auto Message Reply | Text
APRS - Notification		
570	RX Beep	Settings | Radio Menu Settings | APRS2 tab | Sound | Rx Beep
571	TX Beep	Settings | Radio Menu Settings | APRS2 tab | Sound | Tx Beep
572	Special Call	Settings | Radio Menu Settings | APRS2 tab | Sound | Special Call
573	Display Area	Settings | Radio Menu Settings | APRS2 tab | Interrupt Display | Display Area
574	Interrupt Time	Settings | Radio Menu Settings | APRS2 tab | Interrupt Display | Time
575	APRS Voice	Settings | Radio Menu Settings | APRS2 tab | Interrupt Display | APRS Voice
APRS - Others		
580	PC Output	Settings | Radio Menu Settings | APRS2 tab | PC Port | PC Output
581	Network type	Settings | Radio Menu Settings | APRS1 tab | Network
582	Voice Alert	Settings | Radio Menu Settings | APRS2 tab | Voice Alert
583	VA frequency	Settings | Radio Menu Settings | APRS2 tab | CTCSS Frequency
584	Message Group Code (up to 9 characters x 6 codes)	Settings | Radio Menu Settings | APRS2 tab | Group Filtering | MEssage Group Code
585	Bulletin Group Code (up to 5 characters x 6 codes)	Settings | Radio Menu Settings | APRS2 tab | Group Filtering | Bulletin Group Code
Digital - RX History		
600	View History	
Digital - TX/RX		
610	My Callsign	DStar | Digital Dstar Settings | My Callsign
611	Tx Message	DStar | Digital Dstar Settings | Tx Message
612	Direct Reply	Settings | Radio Menu Settings | GPS tab | Digital | TX/

		RX | Direct Reply
613	Auto Reply Timing	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | Auto Reply Timing
614	Data TX End Timing	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | Data Tx End Timing
615	EMR Volume Level	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | Enhanced Monitor Volume Level
616	RX AFC	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | Rx AFC
617	FM Auto Detector on DV	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | FM Auto Detection on DV
618	Data Frame Output	Settings | Radio Menu Settings | GPS tab | Digital | TX/ RX | Data Frame Output
619	Break Call	
Digital - Digital Squelch		
630	GPS Information in frame	Settings | Radio Menu Settings | GPS tab | GPS Data Tx | GPS Information in Frame
631	Sentence	Settings | Radio Menu Settings | GPS tab | GPS Data Tx | GPS Sentence
632	Auto TX	Settings | Radio Menu Settings | GPS tab | GPS Data Tx | Auto Tx
Digital - RX Notification		
640	Display Method	Settings | Radio Menu Settings | GPS tab | Rx Notification | Display Method
641	Single Display Size	Settings | Radio Menu Settings | GPS tab | Rx Notification | Single Display Size
642	Dual Display Size	Settings | Radio Menu Settings | GPS tab | Rx Notification | Dual Display Size
643	Display Hold Time	Settings | Radio Menu Settings | GPS tab | Rx Notification | Display Hold Time
644	Callsign Announce	Settings | Radio Menu Settings | GPS tab | Rx Notification | Callsign Announce
645	Standby Beep	Settings | Radio Menu Settings | GPS tab | Rx Notification | Standby Beep
FM Broadcasting - Basic Settings		
700	FM Radio Mode	Settings | Radio Menu Settings | Configuration tab | FM Radio | Fm Radio Mode
701	Auto mute return time	Settings | Radio Menu Settings | Configuration tab | FM Radio | Auto Mute Return Time
FM Broadcasting - Memory		
710	FM Radio List	Settings | Radio Menu Settings | Configuration tab | FM Radio | List box (Name and RX Frequency)

[1] Available only for the TH-D72A

8.2 Items 800 - 999

The location in the Programmer is described as a "path". For example if you were looking for Item number 340 APO Waypoint Format, you would find

Settings | Radio Menu Settings | APRS 1 tab | Waypoint section | Format

- Click on Settings in the menu at the top of the screen
- Select Radio Menu Settings from the menu that opens
- Select the APRS 1 tab
- The option, Format, is in the Waypoint section on that screen

Set Mode		
Item No.	Radio Display	In the Programmer
SD Card - Export		
800	Config Data	Not addressed in the program. This is a function of the radio that allows it to transfer information to an SD card.
801	Config data + V.Msg	Not addressed in the program. This is a function of the radio that allows it to transfer information to an SD card.
802	Repeater List Only	Not addressed in the program. This is a function of the radio that allows it to transfer information to an SD card.
803	Callsign List Only	Not addressed in the program. This is a function of the radio that allows it to transfer information to an SD card.
SD Card - Import		
810	Config Data	Not addressed in the program. This is a function of the radio that allows it to transfer information from an SD card.
811	Config data + V. Msg	Not addressed in the program. This is a function of the radio that allows it to transfer information from an SD card.
812	Repeater List Only	Not addressed in the program. This is a function of the radio that allows it to transfer information from an SD card.
813	Callsign List Only	Not addressed in the program. This is a function of the radio that allows it to transfer information from an SD card.
SD Card - Unmount		
820	Unmount Execute	Not addressed in the program. This is a function of the radio that allows the SD card to be removed safely.
SD Card - Format		
830	Format execute	Not addressed in the program. This is a function of the radio

		that formats an SD card.
SD Card - Memory Size		
840	View Free Capacity	Not addressed in the program. This is a function of the radio that displays the available free space of an SD card.
Configuration - Display		
900	Backlight Control	Settings | Radio Menu Settings | Configuration | Display | Backlight Control
901	Backlight Timer	Settings | Radio Menu Settings | Configuration | Display | Backlight Color
902	LCD Brightness	Settings | Radio Menu Settings | Configuration | Display | Backlight Timer
903	Power on Message	Settings | Radio Menu Settings | Configuration | Display | Power On Message
904	Single Band Display	Settings | Radio Menu Settings | Configuration | Display | Single Band Display
905	Meter Type	Settings | Radio Menu Settings | Configuration | Display | Meter Type
906	Background Color	Settings | Radio Menu Settings | Configuration | Display | LCD Brightness
Configuration - Audio		
910	Audio Balance	Settings | Radio Menu Settings | Configuration | Audio | Balance
911	TX/RX EQ	Settings | Radio Menu Settings | Configuration | Audio | TX Equalizer (FM/NFM), TX Equalizer (DV), Receive Equalizer
912	TX EQ Level	Settings | Radio Menu Settings | Configuration | Audio | TX Equalizer Level
913	RX EQ Level	Settings | Radio Menu Settings | Configuration | Audio | RX Equalizer Level
914	Beep	Settings | Radio Menu Settings | Configuration | Audio | Beep (A)
915	Beep Volume	Settings | Radio Menu Settings | Configuration | Audio | Beep Volume
916	Voice Guidance	Settings | Radio Menu Settings | Configuration | Audio | Voice Guidance
917	Voice Guidance Volume	Settings | Radio Menu Settings | Configuration | Audio | Voice Guidance Volume
918	USB Audio Output Level	Settings | Radio Menu Settings | Configuration | Audio | USB Audio Level
Configuration - Battery		
920	Battery Saver	Settings | Radio Menu Settings | Configuration | Battery | Battery Saver
921	Auto Power Off	Settings | Radio Menu Settings | Configuration | Battery | Auto Power Off
922	Battery Level	Not addressed in the programmer.

Configuration - Bluetooth		
930	Bluetooth (on/ off)	Settings | Radio Menu Settings | Configuration | Bluetooth | Bluetooth Enable
931	Connect	Not addressed in the programmer
932	Device Search	Not addressed in the programmer
933	Disconnect	Not addressed in the programmer
934	Paring Mode	Not addressed in the programmer
935	Device Information	Settings | Radio Menu Settings | Configuration | Bluetooth | Device Name
936	Auto Connect (on/off)	Settings | Radio Menu Settings | Configuration | Bluetooth | Auto Connect
Configuration - Auxiliary		
940	PFI Key	Settings | Radio Menu Settings | Configuration | Auxiliary | PF1 Key
941	PF2 Key	Settings | Radio Menu Settings | Configuration | Auxiliary | PF2 Key
942	PF1 (Mic)	Settings | Radio Menu Settings | Configuration | Auxiliary | PF1 Key (Mic)
943	PF2 (Mic)	Settings | Radio Menu Settings | Configuration | Auxiliary | PF2 Key (Mic)
944	PF3 (Mic)	Settings | Radio Menu Settings | Configuration | Auxiliary | PF3 Key (Mic)
945	Cursor Shift	
946*	Secret Access Code	
Configuration - Date & Time		
950	Date and Time Setting	Not addressed in the programmer
Configuration - Lock		
960	Key Lock Type	Settings | Radio Menu Settings | Configuration | Lock | Keys Lock Type
961	DTMF Key Lock (On/Off)	Settings | Radio Menu Settings | Configuration | Lock | DTMF Keys Locki
962	Mic Key Lock (On/Off)	Settings | Radio Menu Settings | Configuration | Lock | Mic Keys Lock
963	Volume Lock (On/off)	Settings | Radio Menu Settings | Configuration | Lock | Volume Lock
Configuration - Units		
970	Speed, Distance	Settings | Radio Menu Settings | Configuration | Units | Speed, Distance
971	Altitude, Rain	Settings | Radio Menu Settings | Configuration | Units | Altitude, Rain
972	Temperature	Settings | Radio Menu Settings | Configuration | Units |

		Temperature
973	Latitude, Longitude	Settings | Radio Menu Settings | Configuration | Units | Latitude, Longitude
974	Grid Square Format	Settings | Radio Menu Settings | Configuration | Units | Grid Square
Configuration - Interface		
980	USB Function	Settings | Radio Menu Settings | Configuration | Interface | USB Function
981	PC Output (GPS)	Settings | Radio Menu Settings | Configuration | Interface | PC Output (GPS)
982	PC Output (APRS)	Settings | Radio Menu Settings | Configuration | Interface | PC Output APRS
983	KISS (PC Input/ Output-KISS)	Settings | Radio Menu Settings | Configuration | Interface | KISS
984	DV/DR (PC Input/ Output - DV/ DR)	Settings | Radio Menu Settings | Configuration | Interface | DV/DR
Configuration - System		
990	Language	Settings | Radio Menu Settings | Configuration | System | Language
991	Version	Not addressed in the programmer
999	Reset	Not addressed in the programmer

* Only in TH-D74A model

Part

9 D-Star Settings

D-Star technology is the next step for advanced use of amateur radio. Using a system of repeaters, this system enables long distance communication as easily as communicating with a local repeater.

Use of the D-Star system involves detailed setup of identifying information. Fields are provided in the Programmer to address these details.

Channel-specific information is entered with each memory channel.

File-specific information is entered on the screen that opens when you select D-Star | Digital (D-Star Settings) from the menu at the top of the main screen. This information is then available when you are entering memory channel details. (i.e., Enter Your Callsigns and Rpt Callsigns here then choose the one that you want from the list when you are entering the frequency information. Saves repeated entry.)

The global settings for D-Star are entered into the Settings file of the Programmer. These settings can be used in any file that you create or kept specific to this file depending on how you use your settings file

Channel-Specific D-Star Settings

The fields in the Programmer for the D-Star settings are included with those for each memory channel. The D-Star fields become active and ready for data once a receive frequency is entered and the Operating Mode is set to DV (simplex) or DR (repeater). Further, with DV or DR selected as the operating mode, the columns for Tone are disabled. Any value that appears in a disabled column is not used by the radio.

If you must program a D-Star channel manually, you will need the following information. Remember, all of this can be done using the D-Star calculator bult right into the program.

Enter the Receive and Transmit frequency for the repeater.

Select DV (simplex) or DR (repeater) as the Operating Mode.

The columns specific to D-Star become active. These include Digital DSQL, Digital Code, Your Callsign, Rpt-1 (repeater) Callsign, and Rpt-2 (repeater) Callsign. Enter the D-Star settings for this particular repeater.

Digital Squelch - Set to DSQL for digital call sign squelch or CSQL for Digital code squelch.

DSQL uses My Callsign and CSQL uses the Digital Code set for this memory channel.

Digital Code - Select a digital code to be used with CSQL.

Your Callsign - Enter the call sign to be used for Your Callsign. This is the callsign or command to the repeater or dongle. Your Call entries include things such as CQCQCQ, REF030CL (link to Refelector 30 2M module where the L is in the 8th space), U (Unlink with the U in the 8th space), I (for Status - or Info where I is in the 8th space). For ease of entry, try the D-Star Calculator built right into the programmer.

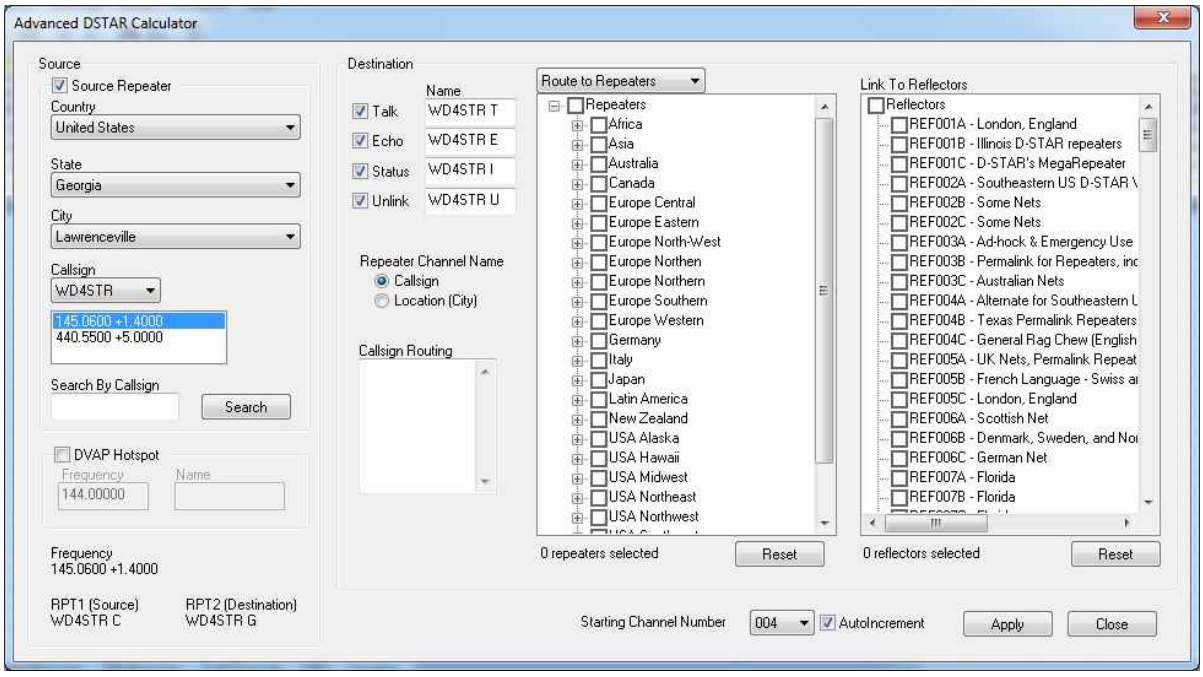
Rpt-1 / Rpt-2 Callsign - Enter the callsign to be used for Repeater 1 and Repeater 2 along with spaces and needed designation for that repeater. This is the callsign of the repeater with the letter designation of the frequency (A = 1.2 G, B = 440 Mhz, and C = 144 Mhz) for Rpt 1 and generally the callsign of the repeater with G in the 8th position for Rpt2 (this puts your signal onto the internet - the gateway). Again, for ease of entry, try the D-Star calculator built right into the programmer.

Using the D-Star Calculator

A channel for D-Star can be programmed manually and may need to be especially if it is a new repeater in your area. The RT Systems programmer has the D-Star calculator built right in to make D-Star programming even easier. Maintained by RT Systems and updated often, the calculator should have most of the information you need for any place in the world. Hot spots and X-Reflectors are not a part of the database maintained for the programmers. New repeaters are added as soon as we know about them and can verify the information through the Trust server.

To use the D-Star calculator:

Select DStar | DStar Calc from the menu at the top of the screen. The calculator opens.



Source

Starting at the left of the screen, notice the section marked "Source". This is the repeater you will go into. Just as in analog transmissions, you must be able to "hit" the repeater. Select the Country, Start, and City nearest to you.

We select Country : United States
State: Georgia
City: Lawrenceville

The callsign WD4STR appears indicating that this is the only callsign in this location. If Callsign remains blank, the selection includes more than one. Select from those in the list.

Notice that this callsign has two frequencies associated with it. These are two modules of this repeater. They are located in the same place.

You can do the same things through each of them. There are times you can hit a 440Mhz machine easier than a 2M machine so you probably want to set up them both.

Search by Callsign is used if that is the information you have available. Sometimes a location for a callsign is not in the exact city you expect it to be. You may be surprised where a repeater is located.

DVAP Hotspot lets you enter the frequency and a name for your DVAP hotspot. The programmer will use that information to set up the channels you want to your selected destinations.

Destination

Moving to the right, we encounter Destination. This is the "Out" side of the transmission.

Notice that the first column in Destination includes Talk, Echo, Status and Unlink with a check mark next to each. These channels will be set up automatically for you. You will use them for:

Talk - This is your CQCQCQ channel. This is the one you will use most often to do just what it says... talk

Echo - This channel is VERY IMPORTANT when you are getting set up or you travel to a new area. This channel lets you send a transmission to the repeater and hear it back... in your voice. This is your test channel. To use it... Turn to this channel and listen to be sure the repeater is not in use. If it is quiet, key up, give your callsign and say "Testing". If you hear back clearly "*Your callsign... Testing".* you are making a good connection into that machine. If you hear nothing... you did not make the trip. If you hear talking that sounds like Donald Duck, your transmission made the trip but not very well. You cannot count on this repeater in your current location with this radio on this antenna to communicate via DStar.

Status - Why Status is I and not S, I don't know.... I think it stands for Information. That is what the repeater will give you when you send it this command. Turn to this channel and key up. The repeater will respond with information about its being connected to other machines on the system.

Unlink - Probably the most important of these commands. Once you use a repeater to link to a reflector or another machine, it is nice if you "unlink" before you leave. It's always nice to hang up the phone after the call. You will use this command a lot. Simply turn to this channel and press the PTT. You might want to give your callsign and say that you are unlinking.

Name - This is the name that will be displayed for your use. This is not a working part of the DStar setup. You can change the Name here or after the channels are created in memory. You need the name to know which channel is doing what. Without it all you have is frequency and the frequency will be the same for several memory channels in a DStar setup.

Repeater Channel Name - Select Callsign or Location (City) for the programmer to use as the Name for the memory channel. Again, this is information for you to use to identify the channel. Choose what works best for you.

Callsign Routing - Enter specific callsign you want to route to. This is a more advanced function of DStar. The programmer will set up the channel for this function; however, this is not your best option for your first attempts.

Repeaters - Notice at the top of that window there is a drop down that includes two options -

> **Route to Repeaters** - This is a function of the Trust Server to "route" your call to a designated repeater. This function "ties up" only your local machine. The machine on the other end is not "hard coded" to the originating machine. People at the other end will capture your information and "route" back to you. This process is required in places where linking is not allowed.
>
> **Link to Repeaters** - This function "hard codes" the two repeaters. This option has the advantage that anyone at the other end can join in the conversation once the repeaters are linked without having to capture routing information. Many repeaters will not allow themselves to be linked. This is by choice of the repeater owner.

Use the tree to find the repeater you want your signal to come out on. The programmer will automatically set up the channels for each that you select.

> ***Note: The beginner should skip this part of the process. Come back to it once you have some experience, know that everything is working with the system, and have someone to experiment with on the other end. While this is a very useful part of the DStar system, it is not the place to start.***

Link to Reflectors - This is the place for the beginner. These are like party lines. Once the repeater is linked, people from any place else in the world may also be linked. It's like jumping into a pool with LOTS of people to talk to. Some reflectors are busier than others. I would suggest REF001C and REF030C as they usually have traffic. Others though may be just as popular. Check others, especially if you speak the language. You may meet many new friends from around the world.

Once you make your selections... and believe me you do NOT want to select all the repeaters or reflectors: that's just too many to work with... check the options at the bottom of the screen

Starting Channel Number - Use the dropdown to start the list any where you want in the file. ***Remember, this is an OVERWRITE function not one that inserts. If you tell it to start at channel 101 and you have information in channels 102 - 105, it will replace what you have in those channels with what comes from the Calculator.***

AutoIncement - Check to have the Starting Channel Number reflect the next channel number after those you insert.

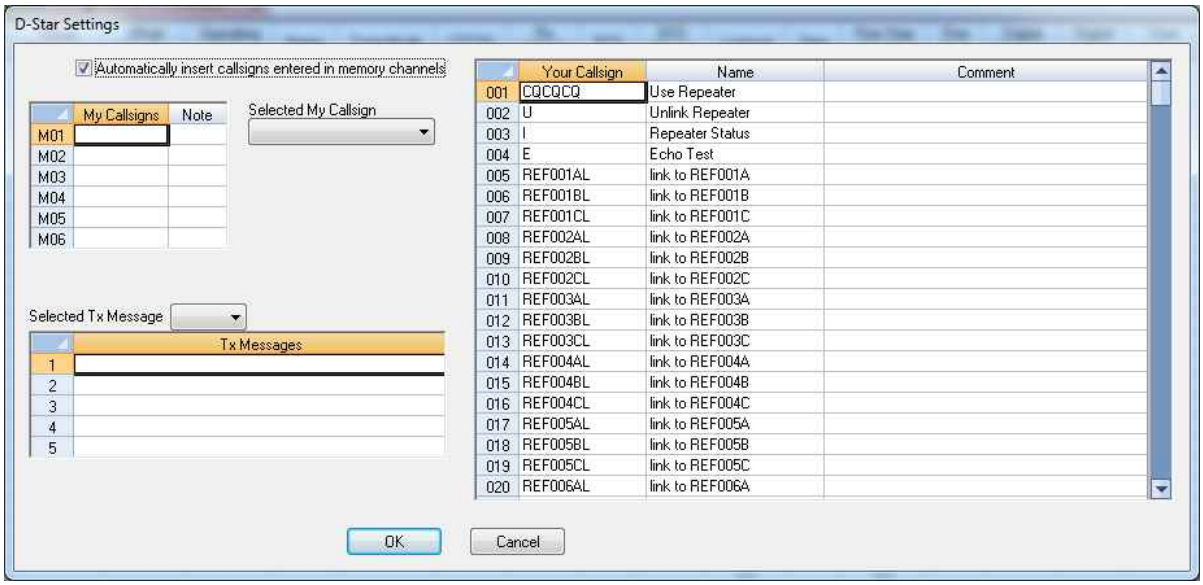
Apply - Click and watch the channels appear in the grid. These are complete DStar channels ready for you to use to make your first contact... that is if you have registered your callsign. If not, go to www.KD0LUX.org and complete the registration. This is RT Systems' repeater. Registration is a two part process that requires we respond to you. If we don't get back to you in a few days, call us. We'll take care of you immediately.

File-Specific D-Star Settings

DStar | Digital (D-Star) Settings

From the menu at the top of the screen, select **DStar | Digital (D-Star) Settings**. The options entered into the fields of this screen are saved as part of the file into which you are entering memory channel details. The options of this screen are ***NOT SAVED*** until you save the file with the memory channel information. It is recommended that as soon as you finish working with the options on this screen, click OK on this screen to close it, then File | Save to save EVERYTHING in the file.

You are NOT just saving the Digital Settings with this move. You are saving the complete programming file AND the D-Star settings. It is recommended that you do this now to prevent loss of the information that you entered for these settings.



My Callsign - Enter you, personal callsign just as you registered it in the Trust Server. ***This is the minimum information required on this screen and it is REQUIRED***. This process will not work if this field is not completed.

Note - Four characters of your choice. Many people put their name (if short enough) or a radio ID. (D74 would be a good entry here).

Selected Tx Message - Select the number of the message to be transmitted. You can save up to 5 messages using them one at a time.

Tx Messages - Enter text for up to five messages to be used one at a time during DStar transmissions.

Your Callsign - This is a list of commands used in the Your Callsign field when working in DR Memories.

Name - An identifying name for the Your Callsign entries.

Other Digital Settings for D-Star operations

These are found in the programmer under Settings | Radio Menu Settings | GPS tab | Digital section

TX/RX

The radios has the ability to reply to a received call by simply pressing [PTT] while the radio displays the interrupt screen in DV or DR mode. The default setting is On.

A special icon appears at the bottom right of the screen indicating that a direct reply is possible. When the [PTT] is pressed when this icon appears, the settings of the radio are automatically changed to reply settings and transmission becomes possible to the calling station.

Direct Reply - Check to engage functionality that sets automatically the Callsign of the other station and replies when a signal to your callsign is received.

The change to transmission settings is temporary. Once the display hold time elapses, the radio returns to the previous transmission settings.

When a repeater frequency is received in DV mode, you cannot reply be pressing [PTT].

Auto Reply Timing - Set the time delay before the Auto Reply is sent.

Data Tx End Timing - Set the delay time that the radio waits to return to RX after high speed digital Tx in accordance with the requirements of the software in use for this activity.

Rx AFC - Engage this function to correct a slight frequency offset of the received signal to achieve frequency stability.

FM Auto Detection on DV - Check to engage reception of an FM signal when operating in DV mode.

Note: An FM signal cannot be received when in DR mode.

Data Frame Output - Set the parameter to control output of digital data received by D-Star via the Micro-USB connector.

All - Transfers all received data to the micro-USB connector.

Related to DSQ - Transfers data based on the Callsign squelch/Code squelch settings. The digital data is not output when the sound is muted by the squelch.

DATA Mode - Data is transferred only when the radio is in Data mode.

Enhance Monitor Volume Level - The Enhanced Monitor Requeest mode is a function used for emergency communications while in DV/DR mode. This function forces the squelch of all radios that hear this signal to open. This option allows you to set the volume for reception of an EMR signal on your

radio (i.e., this signal could be heard at a greater volume than you normally use so you are less likely to miss an emergency call).

Note: If the volkume level set via the [VOL] knob is higher than that set here, the higher volume will be used when an EMR signal is received.

GPS Data Tx

While working in DR or DV mode, location information can be sent with your signal. These option configure what is sent and the format of that transmission.

GPS Information In Frame - Check to engage transmission of location information using GPS when operating in DV/DR mode.

Auto Tx - Set the interval at which location information is transmitted automatically.

- This function is for use in DV mode. It should be off in DR mode.

- When My Position is not set using GPS, this function will not operate.

GPS Sentence - Select up to four of the GPS sentences to transmit location information when operating in DV mode. These include:

[GGA] - Global Positioning System Fix Data

[GLL] - Geographic position, latitude/longitude

[GSA] - GPS DOP and active satellites.

[GSV] - GPS Satellite in view

[RMC] - Recommended minimum specific GPS/Transit data

[VTG] - Track made good and ground speed

Note: These each appears in the radio with $GP appended to the beginning.

When My Position is not set using GPS, GSA, GSV and VTG sentences are not sent.

Rx Notification

The RX break-in function displays information received for the other station in a break-in screen. These options configure what information is received.

Display Method - Control when the data from the break-in station is

displayed. Select from:

Off - Displays a one-line information (D-Star icon and Callsign) for all received calls.

All - Displays a break-in for all received signals.

Related to DSQ - Dispalys a break-in screen when the callsign or coded squelch matches that set in your radio.

My Station Only - Displays a break-in screen only when a call to your station (callsign) is received.

Single Display Size - Select Half or Entire display when operating in a single band configuration.

Dual Display Size - Select Half or Entire display when operating in a dual band configuration.

Display Hold Time - Set how long the break-in screen is displayed.

- When 0 is selected, the break-in screen remains until the signal is lost.

- When there are multiple RX break-in station, only the most recent is displayed.

Callsign Announce - Set this option to engage verbal announcement of the callsign of a received station.

- Only the callsign is announced. The TX message is not included in the announcement.

Sandby Beep - Check to engage an audible sound that is heard when a D-Star transmission has ended.

9.1 Setting up the Radio for DStar

So now your head is spinning and you're thinking, "What did I get myself into?!?!?" I'll never get DStar to work!

This is easier than you think... even though there are pages of text at DStar Settings explaining what all these options do.

Let me give you a brief overview of what you do next.

Note: This is all done with two presumptions

- That you have done Communications | Get data from Radio or Read from SD Card already. If not, do that now then return to this page. See details at Communications | Get Data from Radio

- That you have registered your callsign into the Trust Server. If not, use the registration at www.KD0LUX.org and complete the registration. This is RT Systems' repeater. Registration is a two part process that requires we respond to you. If we don't get back to you in a few days, call us. We'll take care of you immediately.

1) Open the file into which you want to put DStar memory channels. This could be a new file if all you want in your radio is DStar channels or it could be a file that you have already put some analog channels into.

2) From the menu at the top of the screen, select DStar | Digital (D-Star) Settings

Enter callsign information

Enter Text Message information if desired (it is recommended). Be sure to set a text message to use.

3) Click OK to close this screen once the entries are complete. Save the file using File | Save as from the menu at the top of the screen.

4) Access DStar | DStar Calc from the menu at the top of the screen.

Set up the DStar repeater in your area with a connection to Reflector 01C or 30C.

5) Click Apply to create these channels. Then Close to close the calculator.

6) Do Communications | Send data to Radio or Write to SD Card to program the radio with the new channel information.

7) Use the Echo command to check that you can hit this repeater.

8) Presuming that you can, use the Link command (REF030CL) to connect to 30C reflector. The repeater will tell you if it is successful with this command.

9) Turn back to the TALK channel. Key up. Give your callsign and say you are new to DStar. Can anyone let you know how you're doing. i would be surprised if someone does not answer.

10) Enjoy your visit. When you are finished, turn to the UNLINK channel. Key up to break the connection to the reflector.

Part

10 Programming Memory Channels

The radio has lots of different types of memory channels. In the Programmer, these all program in a spreadsheet dedicated to that "type" of memory.

Use the links to access details for any one of these.

Regular Memory Channels - The several hundred all radios have these days. The ones you will use most often.

Home (Call) Channels - These are special memory channels that have one button access from the face of the radio. See the operating manual for the radio for details of how to access these memories from the face of the radio.

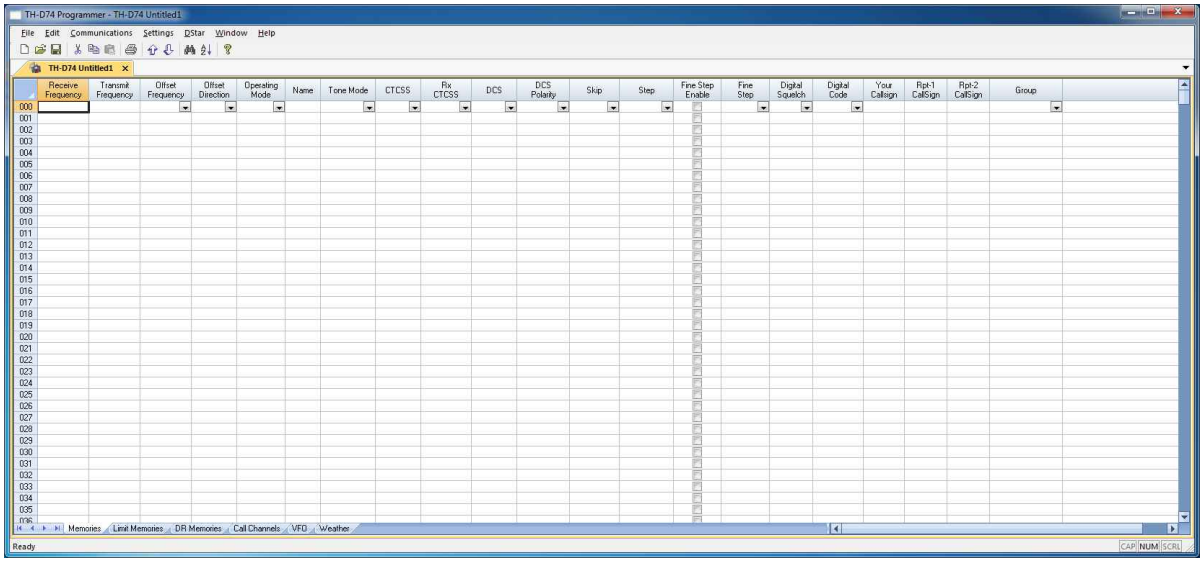
Limit Memories - These memory channels can be used as "regular" memories giving you that many more memory channels for individual use; however, these also control the top and bottom range of scanning when you begin scanning on one of these.

VFO Memories - Settings for VFO operations when the file is first sent to the radio. This channel has no one button recall on the radio and will change when the tuning knob is used. To be able to recall settings at any time, use the Regular Memory Channels.

Details on the special editing abilities of the Programmer are included in the ***Easy Editing in the Grid*** section of this Help. Review these details to make data entry even easier.

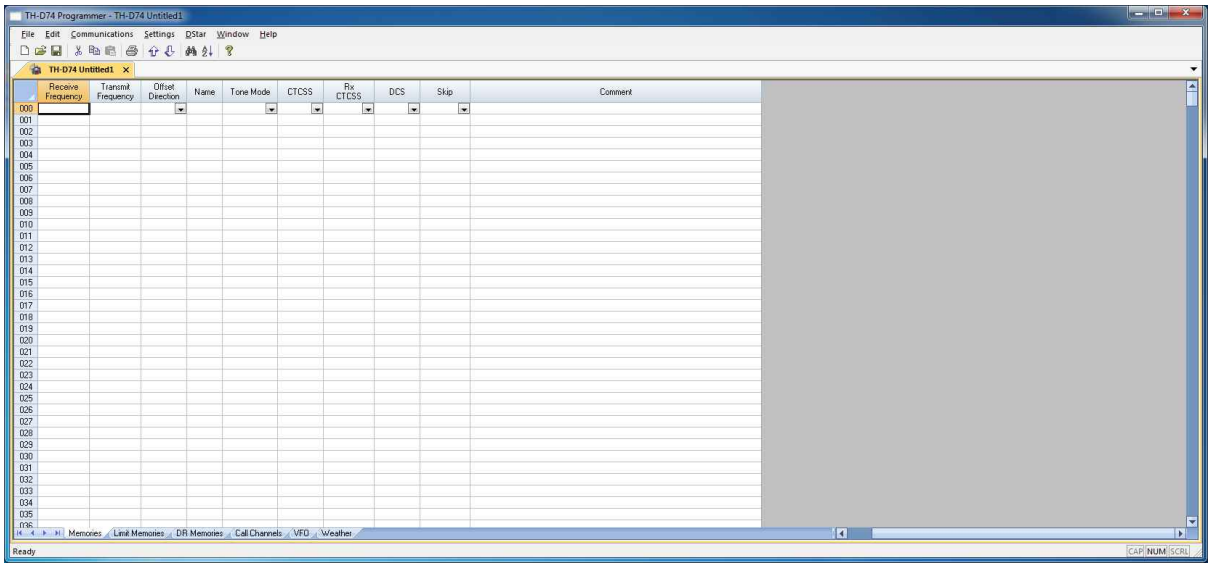
10.1 Regular Memory Channels

Enter the details for the memory channels on the screen of the program that first opens.



- All details associated with the memory channels are programmed from this screen.
- These are not all the functions of the radio. Other features are set once for the radio to use no matter which memory channel you're on. These other items are set on the Settings screen accessed through Settings | Radio Menu Settings from the menu at the top of the screen.
- Columns continue off the right side of the window. Use the bar at the bottom of the screen to move to these columns or press ENTER to step through each column.

Make programming extra easy. Try Simple Mode in the software for even less to enter. .



- In Simple Mode the columns needed for the minimum information to set up the channel are shown on the screen. Extra columns are hidden and filled with default information.
- To put the screen into Simple Mode, select Edit | Simple Mode from the menu. While in Simple Mode, you cannot access the Preferences screen. The Programmer controls what columns are hidden while in this mode

Details to be entered for Memory Channels

Receive Frequency: Enter a receive frequency for the memory channel. Acceptable frequencies are detailed in the operating manual for the radio.

- Unacceptable frequencies for the radio cannot be entered into the Programmer.
- The first memory channel must be programmed.

Note: When working in a default file you will find several channels (Call, VFO, etc) preprogrammed. While you can change the information in these channels, they cannot be blank. The radio must have acceptable data in these memory locations.

Transmit Frequency: Enter a specific transmit frequency or let the Programmer calculate this frequency based on the offset. This field is always available; however the transmit frequency for an "odd split" is the only value that must be entered manually.

Note: In the Programmer you can enter details for frequencies

outside the transmission abilities of the radio. The software will not enable transmission on these frequencies. Transmission will be possible only if the radio has been properly modified.

Entering a "Split" pair - When you are given information to program your radio, you may be given a "pair" of frequencies (one for receive and a different one for transmit).

If the difference between the two frequencies (in hertz) is *not divisible by 50,000 (hertz)*, this pair is referred to as a split.

If the difference in hertz is *divisible by 50,000 (hertz)*, the Programmer will automatically calculate the Offset frequency and set the Offset direction properly for working this repeater.

To enter the details for a "split pair":

- First, enter the Receive Frequency into that column of the Programmer. This will be the frequency that you monitor when awaiting a call. This will be the frequency of the repeater.
- Press Enter. The Programmer will fill the remaining columns with default information which may or may not be right for your particular situation.
- The Transmit field will be active as indicated by the dark border. Enter the Transmit Frequency from the information you have. (Note: Simply type the first number of that frequency. The field will change without having to erase what is there.)
- Press Enter. Notice that the Offset Direction is set to Plus or Minus. Note:The Programmer may set the Offset Direction to Plus or Minus. If it does and the Receive and Transmit frequencies are what you entered, leave it as it is shown. This combination will give you the same performance on the repeater with more efficient workings of the radio.

You are finished with this entry unless you need to enter Name, Tone, or other details for this memory channel.

Offset Frequency: Standard offsets are included in the programmer. You do not have to do the calculations. Remember, the /. most common standards are 600 kHz for the 2M band and 5.0 MHz for the 440 MHz band.

Kenwood radios can use an Offset Frequency of 3-digits (x 10 kHz) in 50 kHz steps (i.e., any value ending in .x00 or .x50 where x is any digit from 0 to 9) with a Plus or Minus Offset Direction.

This gives you the ability to use the Reverse function of the radio although your frequency pair is not separated by a standard offset value.

A ***non-standard Offset Frequency*** value is entered by typing it into the Offset Frequency field after the Receive Frequency has been entered. Values are entered as an exact value including the decimal to denote kHz. Then select Plus or Minus in the Offset Direction column and watch the Programmer calculate the Transmit Frequency.

For example, given the pair **146.650** and **147.300**, the **Offset Frequency** entered would be **.650** (decimal - six - five - zero) with a **Plus** Offset Direction. Without the decimal, an error is raised in the Programmer that a valid Offset Frequency should be entered.

As another example, given the pair **147.255** and **145.940** . This pair can not be entered with an Offset Frequency and an Offset Direction. The resulting offset for this pair us 1.315 MHz, which is not on a 50 kHz step. This pair requires entry of both the Receive and Transmit frequency with the Offset Direction set to Split.

Some European DStar repeaters require a 0.00 MHz offset with a Plus or Minus direction. This can be done in the program by setting Offset Frequency to 0.00 (or blank) and Offset Direction to Plus or Minus.

Offset Direction

Simplex - Transmit and receive frequencies are the same. Remember, when you use Simplex, the radio does not use any value that appears in the Offset Frequency column. It will transmit and receive on the SAME frequency.

Minus -The Offset Frequency is subtracted from the receive frequency yielding the frequency on which you will be transmitting.

Plus - The Offset Frequency is added to the receive frequency yielding the frequency on which you will be transmitting.

Split - Used when a non-standard offset is required. The user enters both the receive and transmit frequencies.

Operating Mode: Assign the operating mode as appropriate for the frequency. This value can be set and stored independently for each memory channel.

Note: AM, LSB, USB, and CW are for receive only and are used by channels on Band B only.

Name: Enter an Alpha/Numeric tag (up to 16 characters) for a memory channel to provide an easy reminder of the function of a particular channel. The name is shown along with the frequency on the display of the radio.

Tone Mode: The tone systems of the radio has two functions.

It sends the sub-audible signal needed to gain access to a "toned" repeater (Tone).

It uses a sub-audible tone to block signals into your radio and sends a signal to the repeater to open it for use. Your radio remains silent until a signal with the assigned tone is heard. This makes you like the "toned" repeater. (T Sql (Tone Squelch) = CT (Kenwood term)

Use of either of any of the tone systems requires two steps: Turning on the Tone Mode and Setting the CTCSS tone frequency or DCS code. The Programmer makes sure that you complete both by blocking access to the tones until a Tone Mode is selected.

The Tone Modes include:

None - No tone system activated. Even if the CTCSS Tone or DCS Code columns are set to a value, transmissions will not get through unless this column is set to the proper function.

Tone (T) - Tone generator is activated for ***transmission only*** using analog CTCSS tones. This mode is used for many if not most repeater operations.When this option is selected, the CTCSS column becomes available.

Select the tone frequency from those in the list. The value must be in the list.

The values that appear in the RX CTCSS and DCS columns are ignored by the radio when this option is being used for Tone Mode.

T Sql (CT and T/C cross tone) - Tone squelch is activated for ***both transmission and reception using the same or different CTCSS tones for both.*** In this mode only signals set up with the same tone will open the squelch. Your radio will remain silent otherwise.

Select the tone frequency from those in the CTCSS and Rx CTCSS columns. The values must be in the lists.

The values that appear in the DCS and RX DCS columns are ignored by the radio when this option is being used for Tone Mode.

Note: If you set a different value for CTCSS and Rx CTCSS this function will NOT work radio to radio. Split tones (T/C in cross tone) is for use only with a repeater. When you are working a simplex frequency between two radios, you must be transmitting the same tone that the other radio is listening for.

DCS (DCS) - Digital Coded Squelch mode is activated for ***transmission***

and reception using one DCS code for both. This mode is used in many commercial systems.

When this option is selected, the DCS column becomes available. Select the code from those in the list. The value must be in the list.

The radio uses the DCS Code for both transmissions and reception.

The values that appear in the CTCSS and Rx CTCSS columns are ignored by the radio.

TDCS (T/D cross tone) - ***CTCSS*** mode is activated for ***transmission*** and ***DCS*** is activated for ***reception***. This mode is good to use for private communications in a busy setting.

When this option is selected, the CTCSS and RX DCS columns become available. Select the values to use from those two lists. That in CTCSS is used to transmit and that in RX DCS is used to block incoming signals. The values must be in the list.

DCode (D/O cross tone) - ***DCS*** mode is activated for ***transmission only***.

When this option is selected, the DCS column becomes available. Select the value to use. The values must be in the list. With this mode, your radio does not block incoming signals.

DTone (D/C cross tone) - ***DCS*** mode is activated for ***transmission*** and ***tone squelch*** using a CTCSS analog tone is activated for ***reception***.

When this option is selected, the DCS and RX CTCSS columns become available. Select the values to use. This mode would be for use on a special repeater system. It will not work radio to radio since if the radio is generating DCS, the other radio is blocking that signal. If you want to work radio to radio, use TSql or DCS.

DCode (T/C cross tone) - ***CTCSS*** mode is activated for ***transmission and reception*** with the ability to use ***DIFFERENT tones for each***.

When this option is selected, the CTSS and RX CTCSS columns become available. Select the values to use. The values must be in the list. This system is for use on a repeater system. It will not work for radio to radio, simplex, communications.

CTCSS: Select one of 50 tone frequencies to be used with Tone mode of "Tone". This field is active only if Tone Mode is set to Tone. A value that appears in this field is ignored if Tone Mode is set to TSql or DCS.

Rx CTCSS: Select one of 50 tone frequencies to be used with Tone mode of "TSql". This field is active only if Tone Mode is set to TSql. The tone squelch function uses a

tone to access the repeater AND block signals from being received by your radio. The Kenwood radio uses the value in this field to block the incoming signal. This value can be the same or different from that in the CTCSS column when doing tone squelch (TSql). A value that appears in this field is ignored if Tone Mode is set to Tone or DCS.

DCS Code: Select one of the 104 codes available for use when the radio is in DCS mode. This value is set independently for each memory channel. This field is active only when a Tone Mode for DCS is selected. A value that appears in this field is ignored if one of the tone modes that uses DCS is not activated.

Step: The frequency that the radio is on changes by the value of the step when tuning manually (in VFO or Memory tune). In VFO, this value could keep you from returning to your original frequency. The Programmer will help you with this value. An incorrect value will be corrected before the file is sent to the radio thus making the radio operate properly.

Fine Step - Set tuning to 20, 100, 500 or 1000Hz steps. Setting this option will allow you to set the frequency of the channel to a greater fineness.

Fine Mode - Check to engage fine mode tuning for this channel. This fineness is often useful when scanning the HF bands and is available only if the Operating Mode is set to AM, LSB, USB or CW.

Tx Step: When saving a split pair, the Kenwood radio requires a step value for both the receive frequency (step) and the transmit frequency (Tx step). The Programmer will help you with this value. An incorrect value will be corrected before the file is sent to the radio thus making the radio operate properly.

Digital

These option can be set only if the channel is set to DV or DR mode (the digital operating modes)

Digital Squelch - Select DSQL or CSQL as instructed for the repeater. This information will be specified in that available for the repeater. If nothing is specified, there is no Digital squelch for this system.

Digital Code - Select the Digital Code used with Digital Squelch

Your Call - Enter the appropriate Your Callsign for this channel. This is the command for the repeater (i.e., CQCQCQ is the talk command while E in the 8th position is the echo command and REF030CL is the link to Reflector 30 2M side command). Use the built in DStar calculator to help you with these commands and proper letter position. Access the DStar calculator through DStar | Dstar Calc at the top of the page. See the section in this help on use of that tool.

RPT1 - Enter Repeater 1 designation for use into this repeater (i.e., callsign of the repeater then A-1.2G, B-2M, or C-440MHz in the 8th space)

RPS2 - Enter Repeater 2 designation for use out of this repeater (i.e., callsign of the repeater, then G in the 8th space for gateway)

Use the Dstar calculator built into the program to help eliminate the guesswork with these entries. Access the calculator via Dstar | DStar Calc in the menu. On-line videos at www.rtsystems.com help with even more information on how to use the DStar calculator.

Lockout - Check to engage. A channel that is locked out is not scanned.

Memory Group - Select a Group into which this channel will be sorted for Group Link Scanning. You can link the maximum 30 memory groups randomly. Every channel will be in a group. Group 0 is the default. If you are not using this function, leave this set to Group 0.

Note: The Memory Groups in this radio are for SCANNING only. This is not a separation for selected use.

At least 2 memory channels must be programmed into a selected group and Lockout must not be engaged for the group to be included in scanning.

Memory groups not included in the group link are not included during scanning. (This is a good way to omit busy channels or channels from another area you don't want to include all the time when scanning.... put them in a separate group then do not link that group.)

If Memory Recall Method is set to Current Band, the memory channels in the group of the same frequency band as the current memory channel will be scanned while other memory channels within the group will be skipped.

Comments: An identifying comment up to 80 characters. This information is not transferred to the radio.

10.2 Limit Memories for Program Scan

This feature allows you to set sub-band limits for VFO scanning.

For example, you might wish to set up a limit (in North America) of 144.300 MHz to 148.000 MHz so as to prevent encroachment into the SSB/CW "Weak Signal" portion of the band below 144.300 MHz. Then when you scan using this limit pair, you will begin scanning at 144.300 and continue to scan up to 148.000 before returning to 144.300 to begin the cycle again.

The Limit Memory channels are entered on the Limit Memories page accessed through the tab of the same name at the bottom of the screen. The same information as that entered for any memory channel is entered for these. See the Regular Memory Channels section of this Help for the details about the information to be entered.

In the Limit Memory channels, **Step** becomes much more important since you plan to begin scanning from one of these channels. Remember that scanning will increment the frequency by the value in the Step field. Choose your value to be sure you do not miss channels in your range.

Note: If the start frequency lies within two different frequency ranges, the range in the lesser memory scan number will be used (i.e., if you have from 144 to 146 in U1/L1 and 145 to 147 in U3/L3 and you start scanning on 145.35, the radio will scan the L1/L3 limits, 144 to 146 since this is the first group in which 145.35 lies.)

The option for Scan Resume can be set from the Programmer. This item is found in the Setting file which is accessed by selecting Settings | Radio Menu Settings from the menu at the top of the screen. Scan Resume is found on the Common 1 tab.

To use Program scan once the limits are set, saved and sent to the radio,

Select the desired band

Press the [VFO] button

Rotate the Tuning control knob to select a frequency within your desired range.

Note: If the frequency is within more than one Program Scan range, the range stored in the lower channel number will be used. Consider this carefully when setting up the ranges. If range 1 and range 2 overlap, be sure to begin scanning range 2 on a frequency that is within range 2 but outside of range 1.

Press the [VFO] button to start scanning at the current frequency.

To halt the scan, press [VFO] again

10.3 VFO Memories

The VFO memory provides "temporary" frequency storage for quick access. The VFO memory is temporary since it is lost when the radio is tuned while in VFO mode.

> ***Note: Remember, the VFO memory is temporary. The programmed frequencies appear immediately after the file is sent to the radio. When the radio is manually tuned in VFO mode, the programmed frequency cannot be recalled as a memory channel frequency will be.***

Programming the VFO memory from the Programmer can be particularly helpful for reoccurring events for which the details of this channel are needed along with other memory channels.

Memories do not have to be programmed into VFO before being programmed into the memory channels when entering details in the Programmer. Memory channels are programmed directly into the spreadsheet that appears when the Programmer opens.

To program the VFO memory, select the VFO tab at the bottom of the screen. Enter a frequency that is appropriate for the band. The details that you enter will replace the default of the radio. Simply type over the information shown to make the changes. These channels must contain a frequency appropriate for the band. They cannot be blank.

The information to be entered is the same as that for regular Memories except that the VFO memories do not have an alpha label available to be programmed. See the Regular Memory Channel in this Help for details of the fields.

In VFO mode, **Step** is important to ensure that you can tune manually to a certain frequency. Pay careful attention to this column when programming the VFO memories.

10.4 Call Channel

The Call channel memory provides convenient, one-touch access to your most often used frequency in the 2M, 220MHz and 440MHz analog and digital bands.

Call channel memories are programmed on the Call Channels tab of the Programmer. The information to be programmed for the Call Channels is the same as that for the regular Memories. See Regular Memory Channels for the details of each item to be programmed.

Call Channels... Analog and DV. DV gives you Your callsign only. DR gives you access to RPT1 and RPT2 are not available. DV mode is is designed for Simplex communications from radio to radio or radio to dongle.

10.5 DR Memories

While using DR Memories gives you wonderful functionality for accessing DStar repeaters in new areas in which you might be traveling, there are a few things about DR Memories that you need to know to make your adventures into DStar easier.

1) DR Memories are not a complete DStar channel.

They hold 2/3s of the information needed to make a contact.

Until you understand the workings of DStar, we recommend that you program your DStar channels into memory where they can be complete and ready to use when selected.

As you learn more about DStar operations, you will be able to use DR Memories in the future.

2) You do NOT have to put your DStar channels into DR Memories to operate on DStar.

DStar channels can be set up in regular memory.

In regular memory, the channel will have all the information to make a contact.

You can program more than one repeater into regular memory.

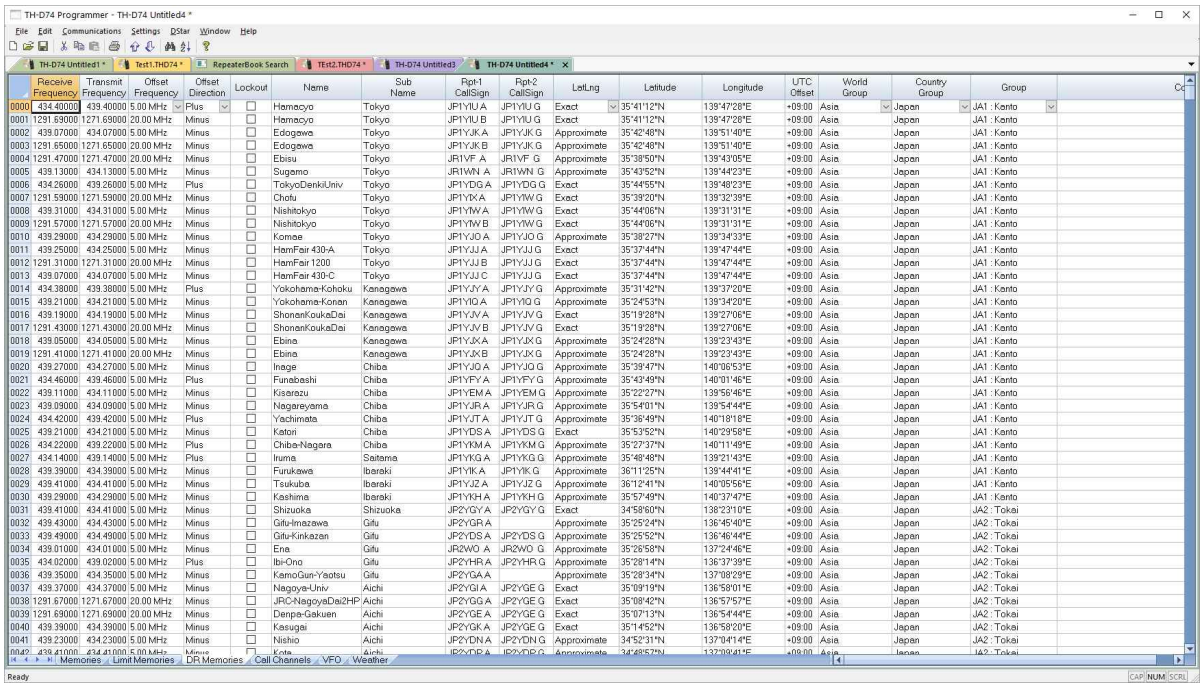
Regular memories are great to use for your "home" DStar repeater(s). Those you use most often.

3) You have to do as much "knob turning" using DR Memories as you do using regular memory channels.

The DR Memories are great for scanning, near repeater identification, and general QSOs. However, in DR Memories, you have to turn the know between the Your Callsign selection is you are going to do talk (CQCQCQ), Echo (E), Link (REF030CL) or Unlink (U) functions.

In regular memories, you change between memory channels to access the commands.

DR Memories



The radio comes programmed with 1465 DStar repeaters. This list may or may not contain the repeaters you want to use. The programmer makes it easy to edit this data to create a list you need for your travels.

Information can be added one at a time or use the DStar calculator to fill in many entries at once. Be sure to update the programmer (Help | Check for updates) to keep the DStar Calculator updated on your system.

The information for each DR memory includes:

Receive Frequency: Enter a receive frequency for the memory channel. Acceptable frequencies are detailed in the operating manual for the radio.

- Unacceptable frequencies for the radio cannot be entered into the Programmer.
- The first memory channel must be programmed.

Note: When working in a default file you will find several channels (Call, VFO, etc) preprogrammed. While you can change the information in these channels, they cannot be blank. The radio must have acceptable data in these memory locations.

Transmit Frequency: Enter a specific transmit frequency or let the Programmer calculate this frequency based on the offset. This field is always available; however the transmit frequency for an "odd split" is the only value that must be entered manually.

Note: In the Programmer you can enter details for frequencies outside the transmission abilities of the radio. The software will not enable transmission on these frequencies. Transmission will be possible only if the radio has been properly modified.

Entering a "Split" pair - When you are given information to program your radio, you may be given a "pair" of frequencies (one for receive and a different one for transmit).

If the difference between the two frequencies (in hertz) is not divisible by 50,000 (hertz), this pair is referred to as a split.

If the difference in hertz is divisible by 50,000 (hertz), the Programmer will automatically calculate the Offset frequency and set the Offset direction properly for working this repeater.

To enter the details for a "split pair":

- First, enter the Receive Frequency into that column of the Programmer. This will be the frequency that you monitor when awaiting a call. This will be the frequency of the repeater.
- Press Enter. The Programmer will fill the remaining columns with default information which may or may not be right for your particular situation.
- The Transmit field will be active as indicated by the dark border. Enter the Transmit Frequency from the information you have. (Note: Simply type the first number of that frequency. The field will change without having to erase what is there.)
- Press Enter. Notice that the Offset Direction is set to Plus or Minus. Note:The Programmer may set the Offset Direction to Plus or Minus. If it does and the Receive and Transmit frequencies are what you entered, leave it as it is shown. This combination will give you the same performance on the repeater with more efficient workings of the radio.

You are finished with this entry unless you need to enter Name, Tone, or other details for this memory channel.

Offset Frequency: Standard offsets are included in the programmer. You do not have to do the calculations. Remember, the most common standards are 600 kHz for the 2M band and 5.0 MHz for the 440 MHz band.

Kenwood radios can use an Offset Frequency of 3-digits (x 10 kHz) in 50 kHz steps (i.e., any value ending in .x00 or .x50 where x is any digit from 0 to 9) with a Plus or Minus Offset Direction.

This gives you the ability to use the Reverse function of the radio although your frequency pair is not separated by a standard offset value.

A ***non-standard Offset Frequency*** value is entered by typing it into the Offset Frequency field after the Receive Frequency has been entered. Values are entered as an exact value including the decimal to denote kHz. Then select Plus or Minus in the Offset Direction column and watch the Programmer calculate the Transmit Frequency.

For example, given the pair **146.650** and **147.300**, the **Offset Frequency** entered would be **.650** (decimal - six - five - zero) with a **Plus** Offset Direction. Without the decimal, an error is raised in the Programmer that a valid Offset Frequency should be entered.

As another example, given the pair **147.255** and **145.940** . This pair can not be entered with an Offset Frequency and an Offset Direction. The resulting offset for this pair us 1.315 MHz, which is not on a 50 kHz step. This pair requires entry of both the Receive and Transmit frequency with the Offset Direction set to Split.

Some European repeaters require a 0.00 MHz offset with a Plus or Minus direction. This can be done in the program by setting Offset Frequency to 0.00 (or blank) and Offset Direction to Plus or Minus.

Offset Direction

Simplex - Transmit and receive frequencies are the same. Remember, when you use Simplex, the radio does not use any value that appears in the Offset Frequency column. It will transmit and receive on the SAME frequency.

Minus -The Offset Frequency is subtracted from the receive frequency yielding the frequency on which you will be transmitting.

Plus - The Offset Frequency is added to the receive frequency yielding the frequency on which you will be transmitting.

Split - Used when a non-standard offset is required. The user enters both the receive and transmit frequencies.

Lockout: Check to omit the channel when scanning.

Name: Enter an Alpha/Numeric tag (up to 16 characters) for a channel to provide an easy reminder of the function of that particular channel. The name is shown

along with the frequency on the display of the radio.

Sub Name - Enter and Alpha/Numeric tag (up to 16 characters) for a channel to provide an additional level of organization when searching for a particular channel.

Rpt-1 / Rpt-2 Callsign - Enter the callsign to be used for Repeater 1 and Repeater 2 along with spaces and needed designation for that repeater. This is the callsign of the repeater with the letter designation of the frequency (A = 1.2 G, B = 440 Mhz, and C = 144 Mhz) for Rpt 1 and generally the callsign of the repeater with G in the 8th position for Rpt2 (this puts your signal onto the internet - the gateway). Again, for ease of entry, try the D-Star calculator built right into the programmer.

LatLng - Specify if the Latitude and Longitude entries are Exact or Approximate.

Note: There must be a value in this field for the near repeater search function to work.

Latitude and Longitude - Enter the specification for the location of the repeater.

UTC Offset - Enter this specification for the location of this repeater in UTC time.

World Group - There are 6 World Groups into which the repeaters are separated. The names of the World Groups can be edited in the Bank Names and Linking section of the programmer accessed under the Settings menu item.

Country Group - There are 36 Country Groups into which the default repeater list is separated. The names of the Country Groups can be edited in the Bank Names and Linking section of the programmer accessed under the Settings menu item.

Group - The Country Groups break down into local groups for the final step in the organizational structure of the DR memories list.

Part

11 Programming Other Set Menu Items

There is a lot more to this radio than just the memory channel.

Your radio has other menu items that are not associated with each memory channel. These menu items are "global" to the radio's functionality. The radio uses these settings no matter what memory channel you're on, what frequency of operation you're in, if you're in VFO or memory.

If you radio "acts funny" once it is programmed with a file of memory channels, check the settings file to be sure things are set correctly. Then be sure to save the settings file so your personal touches will go to the radio with every file. (File | Save from the menu on the Settings screen). The settings file then works in conjunction with the memory channel file to program your radio.

Things like Beep, Squelch, Programmable keys and Locks, just to name a few, are set for the radio to use whenever it is being operated...no matter the channel or mode (VFO or memory).

Radio Menu Settings are set from the Radio Menu Settings screens in the Programmer. These screens are accessed by selecting **Settings | Radio Menu Settings** from the menu on the main screen.

The Programmer offers three options for managing the global settings:

- Set and forget - The Radio Menu Settings screens are there for you to use to easily customize your radio to suit your use. Once you make your selections and save them, you don't have to do it again, even it you start a new frequency file.
- Create and use multiple global settings files - This might be the best option if you program the frequencies for several different people. You can customize the global functions for the individual without having to recreate the frequency file.
- Save the settings as part of the file with the memory information - This might be best if you are programming different frequencies AND different global settings for different groups. You might even want to use this option if you travel. How you use your radio at home may differ from how it should function on the same frequency in another city. Then each time you travel, simply load the corresponding file into the radio to have frequency and global settings as you need them for where you're going.

The three options are discussed in detail below. Once you decide, set the Programmer

for the option that you want on the Preferences screen (Settings | Preferences) in the Programmer.

Set and Forget

This is the default of the Programmer.

Not using the Radio Menu Settings (Settings | Radio Menu Settings) settings can result in your radio "acting funny" every time you program it. That's because something is getting reset in the radio by a setting in this file.

From the main screen of the Programmer, select Settings | Radio Menu Settings. Explore these screens. If you fear you have made changes you don't want, click the "X" at the upper right of the Settings screen. Answer No to the prompt to save. Then click the "X" again to close. The screen will close without saving anything you have done.

Details for the options on this page are found on several pages of this Help. Each page contains the details for the options on that page. The information there can help you decide how best to customize a setting.

Once you complete your selections:

- Click File | Save
- If you are working in a default file (Untitled.rsf), you will be prompted for a filename.
- Enter a name for this file. This can be the same as the name you're using for the memory channel information or it can be a name unique to these settings. If you're at a loss, use "Settings".
- Click Save to close the Save dialog
- Click File | Exit to close the Settings screen.

The Programmer will take it from here making sure these customized settings go to the radio along with the memory channel information.

Creating and using multiple global settings files

There may be global settings of the radio that you want configured differently for different activities. You can make changes to your settings file and save it separately.

Having multiple memory channel files (."radio name") and multiple global setting files

(.rsf) gives you the ability to mix and match the features of your radio to suit your needs. This makes it easy to customize the radio for a special event without disturbing the original programming files. Then once the event is over, simply reprogram the radio with the memory channel information and settings that you use everyday.

When a new file is begun, the ***same settings used in the last settings file saved*** will be used automatically. You need not re-enter the settings each time, nor are you forced to always begin a new file by renaming an existing file. You need only enter memory channel details.

To select a settings file for use:

- Select Settings | Radio Menu Settings from the main page of the Programmer.
- From the Radio Menu Settings screen, select File | Open. A list of settings files will be presented. - Do not change the Files of Type selection at the bottom. The Programmer presents appropriate files to choose from.
- Select the file you want to use and click Open.
- Verify that this is the settings file that you want to use. Check also that the proper filename appears in the titlebar at the top of the Menu Settings window.
- Click File | Save to reset the Programmer to use this file.
- Select File | Exit to close this screen. These settings will be sent to the radio with the memory channel file until you change this file selection again.

Save the settings as part of the file with the memory information

Beginning with the Version 3 Programmers, and continuing into the current version, is the option of saving the global settings with the memory channel information.

This feature is good two ways. First, if you think that you'll always use only one file for programming and you are more comfortable knowing that EVERYTHING that is going to the radio is in this one file, select this option. Second, if you are programming similar, but not identical, memory channel information for people who use their radios very differently, keeping global menu settings in the file with the memory channel information would reduce the chance of programming a radio incorrectly.

Keep menu settings and frequencies in a single file. (option)

- From the main screen of the Programmer, select Settings | Preferences

- Click OK to close this screen.
- From the main screen of the Programmer, select Settings | Radio Menu Settings.
- Make changes as needed.
- Click Close | Apply changes and close (if you want to save) or Discard all changes and close (if you think you're made mistakes and need to return to the last time you saved this file).

Remember, with each new file created the Radio Menu Settings return to factory defaults. You must set these option for EACH memory channel file created.

Another feature of this option is the ability to use the settings from a settings file that you already created.

- From the Menu Settings screen, select External Setting Files
- From that menu select Open
- Select a settings file from the list presented. The settings file must be for the same radio.
- To set these to be used in this file, select Close | Apply changes and close.

The settings from the other file will be saved to this file and sent to the radio with this memory channel programming.

11.1 Radio Menu Settings - Common

Your radio has other menu items that are not associated with each memory channel. These menu items are "global" to the radio's functionality. The radio uses these settings no matter what memory channel you're on, what frequency of operation you're in, if you're in VFO or memory.

If your radio "acts funny" once it is programmed with a file of memory channels, check the settings file to be sure things are set correctly. Then be sure to save the settings file so your personal touches will go to the radio with every file. (File | Save from the menu on the Settings screen). The settings file then works in conjunction with the memory channel file to program your radio.

RX

Beat Shift - Prevents interference when the radio's microprocessor and the CPU's clock's signals appear on the same spots of the reception frequencies. Select a setting from Type 1 to Type 8 which does not cause interference.

From face of radio, enter menu mode and access menu item 138 to select the setting.

Detect Output Select - For use with functions involving the PC.

AF - The received sound is output

IF (Single Band) The received IF signal of Band B is output to the PC.

Detect - The decoded signal of Band B is output to the PC

When set to IF or Detect, Band A is hidden and receiving sound output of Band A stops

This option does not work in conjunction with KISS

IF and Detect work only with Band B.

Detect cannot be used with DV mode

The detected signal is output from the internal speaker when IF or Detect is engaged.

Use of IF or Detect will turn off beeps and voice guidance.

Special PC software is needed to process IF or detection signal. Neither Kenwood no RT Systems handles this software.

MW / SW Antenna - ANT Connector / Bar Antenna - The radio uses a built-in bar antenna when receiving frequencies from 0.1 to 10.1 MHz. Change this option to ANT Connector to use an external antenna when listening in this range.

Weather Alert - (TH-D74A only) Available only in the USA and Canada. When activated, this function will seek a received NOAA 1050 Hz tone. When tone is received, the weather alert tone will sound. Select the band for activating the weather alert.

Note: Whether or not the Weather Alert is activated, you can still access the weather channels. The Weather Alert simply notifies you of activity on the weather channels.

TX

TX Inhibit - Check to stop radio transmissions.

Note: While Inhibit is ON, [TX Inhibit] appears on the screen and an error beep sounds if the transceiver tries to transmit.

Access Menu item 139 to engage or disengage this feature from the face of the radio.

Time-out Timer - Set the time limit for continual transmission. After this time, the radio will automatically cease to transmit.

Mic Sensitivity - Change the microphone input sensitivity. The microphone input sensitivity setting applies to both the internal and external microphones.

Rx Filter

SSB High Cut - Reduce interference and noise in SSB mode to make the receiver sound easier to hear. Low cut is set to 200 Hz. Select 2.2, 2.4, 2.6, 2.8 or 3.0 kHz for the high cut range. This option affects SSB signals received in Band B only.

CW Bandwidth - Reduce interference and noise in CW mode to make the receiver

sound easier to hear. Select 0.3, 0.3, 1.0, 1.5, or 2.0 kHz range. The center of the filter is the pitch frequency. This option affects CW signals received in Band B only.

AM High Cut - Reduce interference and noise in AM mode to make the receiver sound easier to hear. Low cut is set to 200 Hz. Select 3.0,4.5,6.0,or 7.5 kHz for the high cut range. This option affects AM signals received in Band B only.

Scan

Resume - Select the resume mode for the scanner after detecting a signal. Default is Time with 5 seconds for hold time.

> Time - resumes after approximately 5 seconds, even if the signal is still present
>
> Carrier - remains on a busy frequency or Memory channel until signal drops, then resumes scanning 2 seconds after signal drop.
>
> Seek - remains on a busy frequency or Memory channel after signal drops and does not automatically resume scanning.

Resume (Digital) - select the resume mode for the scanner after detecting a digital signal. Default is Seek with 2 seconds for hold time.

> Time - resumes after approximately 5 seconds, even if the signal is still present
>
> Carrier - remains on a busy frequency or Memory channel until signal drops, then resumes scanning 2 seconds after signal drop.
>
> Seek - remains on a busy frequency or Memory channel after signal drops and does not automatically resume scanning.

Time Restart - Set the time after which scanning will resume when Scan Resume (Analog or Digital) is set to the Time option. This one setting will affect the Time option for either Scan Resume (Analog) or Scan Resume Digital.

Carrier Restart - Set the time after which scanning will resume when Scan Resume (Analog or Digital) is set to the Carrier option. This one setting will affect the Carrier option for either Scan Resume (Analog) or Scan Resume Digital.

Priority Scan - Check to engage Priority Scanning. This function check the priority channel once every three seconds for activity. If activity is found, the radio changes to that frequency for communications. When activity ceases, scanning resumes no key was used continuously for 3 seconds during the period of activity on that channel.

Note: Be sure to enter the details for the Priority Channel (frequency, tone, name, etc.) in the space provided on the Call/Priority tab accessed from the main page of the programmer. Priority Scanning will not function if this channel is left blank. This channel can be left blank if this function is not in use.

Auto Backlight - Check to turn on the backlight for approximately 2 seconds when scanning is paused. This function works with all scans.

Auto Wx Scan - Set the amount of time that will pass before weather alert scan begins.

Repeater

Auto Repeater Offset - Check to have the radio function in VFO with a repeater offset for a given frequency based on a band plan shown on page 7-1 in the User Manual for the radio.

Call Key - Set the function of the CALL key to access the call channel or to transmission of the 1750 Hz tone needed by many European repeaters.

1750 Hz Tx Hold - Check to engage. When engaged, the radio remains in transmit mode for 2 seconds after transmitting the 1750 Hz tone. The radio does not continuously transmit the 1750 Hz tone during that 2 seconds.

Memory

Recall Method - Set to All Bands or Current Band as needed.

Note: When set to Current Band you will seem to lose memory channels. You will see only those that match the current operating band. If you suddenly have fewer memory channels that you expect, check the setting in Menu Item 202 and be sure to reset this option to All Bands in your programming file.

CW

Pitch Frequency - Set the pitch for CW reception.

Reverse - You can select Normal (USB) or Reverse (LSB) for receiving the CW signal.

Others

QSO Log - Check to engage communication history recording. This recording is to a microSD card only.

LED Control - Check to control illumination of the BUSY LED to save battery consumption.

RX - Check to light the LED when receiving on Bands A and B including FM broadcast. Uncheck to turn off the LED at all times.

FM Radio - Check to light the LED when receiving an Fm radio broadcast. Uncheck to turn off the LED at all times.

Audio

Recording Band - Engage audio recording on Band A or Band B. This option in the software makes the selection: engage the option from the face of the radio through Menu Item #301 when you are ready to use it and an SD card is in place.

TX Monitor - Check to engage this function for monitoring the voice message that is being played or sent.

Digital Auto Reply - Select the message to be sent when Auto Reply is engaged in the Digital Function Menu of the radio.

VOX

Enable - Check to engage VOX functionality. VOX functionality eliminates the necessity of manually pressing the PTT to switch to transmit mode.

Note: VOX operations cannot be done with the internal microphone on the radio or with a speaker mic (see page 12-5 of the manual for the radio). The internal mic and speaker are located too close to one another for proper operations. An optional Headset is required for this functionally (I suspect this is the Bluetooth Headset since the instructions specifically that a speaker/mic cannot be used).

The 1750 Hz tone must be accessed manually even when VOX is engaged.

When VOX is on, the ASC function turn off.

Gain - Set the gain level for best performance. The level controls the ability of the VOX circuit to detect the presence or absence of your voice.

Delay - Set the delay option to control the length of time between the end of your spoken word and the radio's return to transmit mode. If set too short, the end our your transmission may not be sent; however, you do not want to set it overly long and tie up the airwaves with an empty carrier.

TX on Busy - Check to force VOX transmissions even if the radio is receiving a signal.

Note: You can use [PTT] or [CALL] (if 1750 Hz is programmed) to transmit regardless of this setting.

DTMF Memories

Name and DTMF Code - Enter a name and up to 16 characters for each DTMF memory. DTMF memories are useful for Echolink access, autodial, and other activities that you do regularly that require a DTMF string to access.

DTMF Speed - Adjust the sending speed of the DTMF tones as needed by the repeater you use. The best is found through trial and error and may vary based on transmit conditions. A little slower without being too slow usually yields better results.

Pause Time - Set the lag time that transpires between when you key the DTMF memory and when it is transmitted.

TX Hold - Check to have the radio remain in transmit mode after the DTMF memory is sent.

Selected DTMF Channel - Select the active DTMF memory channel.

EchoLink Memories

Echolink allows you to communicate with other amateur radio stations over the Internet using voice over IP technology. The Echolink software progra allows worldwide communications to be made between stations or computer computer to station, greatly enhancing your comunications capabilities. The official Echolink website is www.echolink.org

The radio has 10 special memories for Echolink DTMF information. Those memories store the following information:

Name or Callsign - Up to 8 characters for Echolink memory name

Memory Code - Up to 8 digits for one channel code

11.2 Radio Menu Settings - Configuration

Included here are brief descriptions of the features to be controlled and how to set them in the Programmer. The operating manual of the radio should be used to provide any other explanation of the feature and its use after programming.

Audio

Balance - Set the sound output for band A and band B. This is a good feature to use when using APRS along with a voice channel. You can set the APRS sounds to a minimum to reduce interference with your conversation.

TX Equalizer (FM, NFM) - This function changes the transmission voice frequency characteristic for FM (analog) transmissions.

TX Equalizer (DV) - This function changes the transmission voice frequency characteristics for DV (digital) transmissions.

Receive Equalizer - This function changes the received voice frequency characteristics.

TX/RX Equalizer Levels - Set the level to adjust the received and transmitted sounds.

Beep - Check to enable an audible sound heard when a button is pressed on the radio.

Even with the beep function off, the radio will beep 1 minute before power turns off when Auto Power is activated.

Even with the beep function off, the radio will beep when the Time-Out-Timer causes it to cease to transmit.

Beep Volume - Set the loudness of the tone heard.

USB Audio Level - The radio "talks" to the PC via USB Audio. use this option to adjust the volume of that communication.

Voice Guidance - Turn on functionality that announces frequency, memory channel information and other operating status shown on the display of the radio. Set to:

Off - No voice is heard.

Manual - The current status is announced when the power button is pressed.

Auto 1 - The announcement includes only the changed information when a change is made.

Auto 2 - The announcement includes status or displayed information and the memory channel name is announced rather than the frequency for the memory channel.

- Voice Guidance is available in English only

- Pressing the [PF2] while powering on the radio will engage voice guidance in the Auto 1 option.

Voice Guidance Volume - Set the volume of the announcement.

Battery

Battery Saver - This function saves your battery by causing the radio to sleep over a given interval of time when no signal is received and not buttons re pressed for more than 5 seconds. Select from 0.2 to 5.0 seconds of sleep time after which the radio wakes for 1 second to listen for a signal. Off disengages this option.

Auto Power Off - Set a time of non-use after which the radio will power off.

Bluetooth

Bluetooth Enabled - Check to engage use of a Bluetooth device with the radio.

Auto Connect - Check to have the radio automatically connect with this device when it is in range.

Device Name - Enter the name of the device in use for Bluetooth pairing.

Auxilary

PF1 and PF2 Keys (radio) - Set functions for these keys on the radio to suite your activities.

PF1, PF2 and PF3 (mic) - Set functions for keys on the Kenwood SMC-33 microphone.

Units

Set options for display of Speed/Distance, Altitude / Rain, Temperature, Latitude / Longitude, and Grid Square format to suit your usage.

Lock

Key Lock Type - The Key Lock function ensures that your transceiver settings remain unchanged if you accidentally press a key. Select from:

Key Lock - Locks all the front panel keys. (press [F] for 1 second to unlock the keys.)

Frequency Lock - Locks the radio on the VFO frequency or onto the current memory channel. It also locks the [MHz], [ENT], [MR], [BAND], scan function, [PF] (Group Up and WX) keys/functions.

Key Lock and Frequency Lock - Locks all the front panel keys along with the ENC control. (Press [F] for 1 second to unlock the keys.

Note: The [MONI], [PTT], [power] and [VOL] keys and control knobs cannot be locked.

DTMF Key Lock - Prevent transmission of DTMF tones by using this lock feature. Check to engage.

Mic Key Lock - Lock the microphone PF (programmable function) keys.

Volume Lock - Lock the volume so that it cannot be changed inadvertently.

With this function engaged, you can still change the volume on the radio... it's just harder. Press and hold the [MONI] key while turing the VOL control knob. The volume will lock at the new setting after releasing the [MONI] key.

Interface

USB Function - Connecting the radio to a PC enables you to interface to programming, GPS, APRS, KISS (Packet) and digital operations using appropriate software and in some cases other hardware. Kenwood advises that you never connect through a USB hub. Use a good USB-A to Mini USB-B cable. Watch the connection carefully. Do not force the wrong connector into the slot on the side of the radio (there are many that seem to be the same, but are not!)

You can select whether the radio operates as a USB port and audio device or operates as a mass storage class device when it is connected to the PC. Set that option here selecting from:

COM + AF - The radio operates as a virtual COM port for serial data communication (yes, this is how USB works), ans outputs one of the AF, IF or detection signals by USB.

Mass Storage - The radio enters mass storage mode. You can access the microSD card of the radio directly from the PC (just in case you don't have an SD card reader in your computer... or you forgot your SD card adapter and need to get to the SD card to download logs or other information from it.). The radio will appear as a removable disk on the PC.

Note: Once the radio is configured as a mass storage device, the radio can no longer talk to the SD card. Log recording will be halted until this option is returned to Com+AF which can be done via Menu Item 102 in the radio.

All functions of the radio cease other than power on/off.

The radio will not transmit and receive while configured as mass storage.

Mass storage works directly with the SD card of the radio. Be sure the SD card is present and properly configured for this function to yield results on the PC.

In other words... your radio becomes a big MicroSD card adapter. All other functions cease to work.

Output - Output for GPS, APRS, KISS (Packet) and digital operations (DV/DR) can be configured for USB or Bluetooth.

System

Language - Set to English or Japanese for display prompts.

Remember, voice assist is available only in English.

Display

Backlight Control - Backlighting brightness of the LCD can be set to any of four levels. These include:

Auto - The backlight turns on when operating any key or when rotating the knob on the top.

Auto (DC-In) - On battery, the operation is the same as Auto. When on DC, the light is On.

MANUAL - The backlight turns on and off then the power key is pressed.

On - The backlight is always on while the power is on.

Backlight Color - Set the background color to Black or While

Backlight Timer - Set the timer from 3 to 60 seconds after which the backlight ceases.

LCD Brightness - Set the backlight brightness to High, Medium or Low.

Power On Message - Change the message that is displayed each time the radio is powered on. This message will replace the default HELLO!! that appears in a new radio.

Single Band Display - Change the radio to work in a single band operating on one frequency with GPS information or the current date occupying the remainder of the screen.

Meter Type - Set the design of the S/RF meter that is displayed on the face of the radio when a signal is received.

FM Radio

The radio can receive FM radio broadcasts while simultaneously monitorying two signals as well as waiting for a CW or a call from an acquaintance or from an APRS call. When a signal is received on Band A or Band B, the FM radio is muted until communications are completed.

FM mode cannot be engaged when selecting LF/MF/(AMBC), HF, 50, FMBC on Band B.

FM mode cannot be engaged when Priority Scan or Weather Alert is On or when Detect Out Select is set to IF or Detect.

FM Radio Mode - Check to engage FM radio operations. You cannot override the limitations by engaging this feature here. Although you can check the box, the radio will ignore the setting when the other parameters are engaged.

Auto Mute Return Time - Set the time after which the radio will return to FM mode after ham band activities cease.

FM Memories - Enter the Name and Receive Frequency for your favorite FM listening channels.

11.3 Radio Menu Settings - GPS

Use the settings on this page to control the functionality of the built-in GPS of the TH-D74 radio.

My Position

The radio has 5 memory channels for storing position data. Program Name, Latitude, Longitude, and Altitude for each of these channels as suits your activities. Mark the one to be used immediately after programming with this file to In-Use.

GPS Sentence

Select the format for the NMEA sentence to be added to the Internal GPS receiver data output from the PC.

GPS Basic Settings

Position Ambiguity - For times that you do not know or want to disclose your exact location, select the number of digits that will NOT be included in your packets. When set to Off, the complete location data (degrees, minutes and seconds) is sent and displayed. The digits are removed from the right of the string until at 4 digits, only the degree of your location is sent.

Operating Mode - Set to Normal for the display of the radio to continue to show your frequency. Performance is that of a normal transceiver. Set to GPS Receiver for GPS information display. The transmit and receive functions of the radio are turned off while the radio is in GPS operation only.

> ***Note: With this function set to GPS Receiver, key operations are limited as explained on page 13-2 of the User Manual for the radio. Be sure you are familiar with what will and will not function on the radio before engaging this mode.***

Battery Saver - This function turns off the GPS when the timer expires if position data has not been determined during the maximum "catching" time (about 5 minutes). Options include:

Built-in GPS - Check to engage the built in GPS functionality.

PC Output - Check to engage GPS data output to a PC. This output can be via Bluetooth or USB cable.

GPS Tracking

Track Log - With this option engaged (checked), all movement is saved in the GPS LOGGER on the SD card.

- Turning on Track Log will automatically turn on GPS.

- A Track Log entry is not saved when GPS function is not pinpointing.

- If Track Log overwritting is off, "Log Full" appears when the SD card is full and the Track Log function is paused.

- When APRS is on, Track Log will function only is APRS COM terminal input is OFF.

Record Method - Set the recording method for tracking. Select from Time, Distance or Beacon.

Interval - Set the interval time from 2 to 1800 seconds in steps of 1 second.

Distance - Set the distance from 0.01 to 0.99 in steps of 0.01.

Digital

TX/RX

The radios has the ability to reply to a received call by simply pressing [PTT] while the radio displays the interrupt screen in DV or DR mode. The default setting is On.

A special icon appears at the bottom right of the screen indicating that a direct reply is possible. When the [PTT] is pressed when this icon appears, the settings of the radio are automatically changed to reply settings and transmission becomes possible to the calling station.

Direct Reply - Check to engage functionality that sets automatically the Callsign of the other station and replies when a signal to your callsign is

received.

The change to transmission settings is temporary. Once the display hold time elapses, the radio returns to the previous transmission settings.

When a repeater frequency is received in DV mode, you cannot reply be pressing [PTT].

Auto Reply Timing - Set the time delay before the Auto Reply is sent.

Data Tx End Timing - Set the delay time that the radio waits to return to RX after high speed digital Tx in accordance with the requirements of the software in use for this activity.

Rx AFC - Engage this function to correct a slight frequency offset of the received signal to achieve frequency stability.

FM Auto Detection on DV - Check to engage reception of an FM signal when operating in DV mode.

Note: An FM signal cannot be received when in DR mode.

Data Frame Output - Set the parameter to control output of digital data received by D-Star via the Micro-USB connector.

All - Transfers all received data to the micro-USB connector.

Related to DSQ - Transfers data based on the Callsign squelch/Code squelch settings. The digital data is not output when the sound is muted by the squelch.

DATA Mode - Data is transferred only when the radio is in Data mode.

Enhance Monitor Volume Level - The Enhanced Monitor Requeest mode is a function used for emergency communications while in DV/DR mode. This function forces the squelch of all radios that hear this signal to open. This option allows you to set the volume for reception of an EMR signal on your radio (i.e., this signal could be heard at a greater volume than you normally use so you are less likely to miss an emergency call).

Note: If the volkume level set via the [VOL] knob is higher than that set here, the higher volume will be used when an EMR signal is received.

GPS Data Tx

While working in DR or DV mode, location information can be sent with your signal. These option configure what is sent and the format of that transmission.

GPS Information In Frame - Check to engage transmission of location information using GPS when operating in DV/DR mode.

Auto Tx - Set the interval at which location information is transmitted automatically.

- This function is for use in DV mode. It should be off in DR mode.

- When My Position is not set using GPS, this function will not operate.

GPS Sentence - Select up to four of the GPS sentences to transmit location information when operating in DV mode. These include:

[GGA] - Global Positioning System Fix Data

[GLL] - Geographic position, latitude/longitude

[GSA] - GPS DOP and active satellites.

[GSV] - GPS Satellite in view

[RMC] - Recommended minimum specific GPS/Transit data

[VTG] - Track made good and ground speed

Note: These each appears in the radio with $GP appended to the beginning.

When My Position is not set using GPS, GSA, GSV and VTG sentences are not sent.

Rx Notification

The RX break-in function displays information received for the other station in a break-in screen. These options configure what information is received.

Display Method - Control when the data from the break-in station is displayed. Select from:

Off - Displays a one-line information (D-Star icon and Callsign) for all received calls.

All - Displays a break-in for all received signals.

Related to DSQ - Dispalys a break-in screen when the callsign or coded squelch matches that set in your radio.

My Station Only - Displays a break-in screen only when a call to your station (callsign) is received.

Single Display Size - Select Half or Entire display when operating in a single band configuration.

Dual Display Size - Select Half or Entire display when operating in a dual band configuration.

Display Hold Time - Set how long the break-in screen is displayed.

- When 0 is selected, the break-in screen remains until the signal is lost.

- When there are multiple RX break-in station, only the most recent is displayed.

Callsign Announce - Set this option to engage verbal announcement of the callsign of a received station.

- Only the callsign is announced. The TX message is not included in the announcement.

Sandby Beep - Check to engage an audible sound that is heard when a D-Star transmission has ended.

11.4 Radio Menu Settings - APRS 1

The Automatic Packet Reporting Systems was designed to support rapid, reliable exchange of information for local, tactical real-time information, events or nets. All relevant information is transmitted immediately to everyone in the net and every station captures that information for consistent and standard display by all participants. Since the primary objective is consistent exchange of information between everyone, APRS established standard formats not only for the transmission of POSITION, STATUS, MESSAGES, and QUERIES, but also for display so that users of different systems will still see the same consistent information displayed in a consistent manner (independent of the particular display or mapping system in use).

Included here are brief descriptions of the features to be controlled and how to set them in the Programmer. The operating manual of the radio should be used to provide any other explanation of the feature and its use after programming.

My Callsign - Program your callsign using a maximum of 9 alphanumeric characters. You cannot send any data using NOCALL.

This callsign entry is for APRS not for Dstar. The callsign for Dstar is set in the programmer under DStar | Digital Dstar Settings accessed from the menu at the top of the screen.

Station Icon - Set an icon to accompany the other information sent in your APRS identifier.

Position Comment - select one of the 15 predetermined position comments.

Note: Never select EMERGENCY unless it is necessary. This causes the Emergency Alarm on all stations to sound. If you select EMERGENCY, a confirmation message appears.

Packet Path Settings - a packet path is the digipeat route of the packet data sent from My station.

Type - select the packet path type. Options are:

New-N - digipeat type commonly used in North America, but is also now used worldwide.

RELAY - digipeat type commonly used in Europe.

Region - this method is used when packet is relayed within a limited area. Packet paths are specified by using abbreviations (for example, in American, CA represents California, AZ represents Arizona, etc.)

Others - this method is used when the path is directly to a specific individual. A character string is needed for the data to be relayed.

WIDE 1-1 - Check to enable this option for packet operations.

Total Hops - Select the relay step number.

Path is VIA - Confirm the settings contents.

Status Text - a desired comment, using a maximum of 42 alphanumeric characters, to transmit with your position data. There are 5 memory channels to preprogram.

Status Tx Rate - number of times on which to transmit. 1/**X** means the status text will be transmitted **X** number of times. Options include OFF and 1/1 ~ 1/8. (APRS only).

APRS Lock - Prevents accidental frequency changes and/or transmissions when enabled. Check to enable lock for Frequency, PTT and APRS Key.

Waypoint Settings

Format - select the type of sending format. On the radio, manual section is done by entering Menu mode and accessing menu item 340.Format options are: NMEA, MAGELLAN, and KENWOOD.

Length - select the length of the waypoint name (6, 7, 8, or 9 characters). Using radio controls, selection is made under menu item 341 in Menu mode.

Output - select the extent of waypoint data you want to send. Set selection from face of radio by enter Menu mode and accessing menu item 342.

All - all information is sent.

Local - If the position limit is ON, all data within the position limit is sent. If it is OFF, then all waypoint data is sent.

Filtered - permitted information using the packet filter is sent.

Packet Filter Type - check the type(s) you want to receive. Options include Weather, Mobile, NAVITRA, 1-Way, DIGI, Object, and Others. If all types are checked, you will receive all types of data.

Position Limit (Miles) - Specify a distance from your location to prevent receiving APRS packets from others located outside the specified distance. This is especially useful when too many APRS packets in the area disturbs your APRS activities.

Note: The mile unit can be changed to kilometer. To change using the Programmer: go to Settings | Radio Menu Settings | Configuration tab | Units section | Speed, Distance.

Decay Algorithm - if there is no change of information over a period of elapsed time, the data is transmitted based on timed intervals of a Decay Algorithm (1 minute, 2 minutes, 4 minutes, 8 minutes, 16 minutes, 32 minutes, 32 minutes, 32 minutes, etc.).

Note: Should the position data change, the data transmission interval reverts back to the settings selected in the Initial Interval or Proportional Pathing.

Proportional Pathing - after a period of elapsed time, the transmit packet path changes with each transmission.

Note: When jointly used with the Decay Algorithm function, and the speed is 1 knots or slower, the Decay Algorithm pattern is used; however if the speed is 3 knots or faster, the pattern changes to Proportional Pathing.

Beacon Tx Algorithm Settings

Method - select the operation method for transmitting packets.

Manual - each press of the [BCON] key transmits your packet.

PTT - your packet transmits upon releasing the switch after you press/hold and speak into the microphone. To operate, press [BCON] to turn ON, then press and hold [PTT] and speak into microphone. Release [PTT] to transmit APRS packet. To turn function off, press [BCON] again.

Note: You cannot retransmit packet until selected Initial Interval time expires. Wait until "BCON" is blinking on display panel to transmit.

Auto - packets are automatically transmitted at selected intervals periods. Press [BCON] to turn ON function; press [BCON] key again to turn OFF.

SmartBeaconing - after manually transmitting position one time, your position data is automatically transmitted using the time interval set under "SmartBeaconing" (Settings | Radio Menu Settings | APRS 3 tab | Smart Beaconing, or menu items 3F0~3G2). Press [BCON] to turn ON function; press [BCON] key again to turn OFF.

Note: After setting Smart Beaconing, the Tx Interval Time, Decay Algorithm, and Proportional pathing features will no longer operate.

Initial Interval - set the interval time for automatically transmitting APRS packets. From the face of the radio, select interval time by entering Mode menu and accessing menu item 3D1.

Note: While signals are present, an APRS packet does not transmit after the set interval. Once the signals drop, then the transmitting is executed.

Decay Algorithm and Proprotional Pathing - Check to engage these options that control beacon transmissions.

Beacon Information

Speed - select whether or not to transmit speed information. To manually turn on or off using the radio controls, access menu item 370 in Menu mode.

Altitude - select whether or not to transmit altitude information. To manually turn on or off using the radio controls, access menu item 371 in Menu mode.

Note: When the beacon type is NAVITRA, this information will not appear on the display.

Internal TNC Settings

- The TH-D72 has a built-in TNC (Terminal Node Controller) modem in the transceiver for packet communication. The embedded microcomputer supports not only the radio functions, but also data communication application programs such as APRS.

Note: Close distance between the radio antenna and personal computer may cause interferences.

Data Band - Select how data will be transmitted and received.

A-Band - A band receives and transmits

B-Band - B band receives and transmits

Data Speed - Select 1200 or 9600 bps for the data transfer rate, depending on TNC. The default setting of 1200 bps is standard among current APRS networks.

DCD Sense - select the method for inhibiting the built-in TNC from transmitting.

D or RxD Band - when the data band is no longer busy, the packet is transmitted.

Both Bands - when the bands are no longer busy, the packet is transmitted.

Ignore DCD - Transmission is not inhibited and the packet is transmitted immediately.

Tx Delay - Set the transmission delay time between transmitting the APRS data and transmitting a flag code prior to the APRS data.

Network - set the method in which packet data is transmitted without other stations or making a connection.

APRS - commonly set for normal use (default setting). When messages or meteorological data is transmitted, "APK102" is added to the packet, following your callsign. There are no restrictions on received packets. To select manually, enter Menu mode and access menu item 3I0 (number 3 - letter I - number 0).

ALTNET - select for restrictions on received packets. When messages or meteorological data is transmitted, your character string is added to the packet, following your callsign. To select manually, enter Menu mode and access menu item 3I1. Select Altnet and press [MHz], then enter desired character string.

11.5 Radio Menu Settings - APRS 2

The Automatic Packet Reporting Systems was designed to support rapid, reliable exchange of information for local, tactical real-time information, events or nets. All relevant information is transmitted immediately to everyone in the net and every station captures that information for consistent and standard display to all participants. Since the primary objective is consistent exchange of information between everyone, APRS established standard formats not only for the transmission of POSITION, STATUS, MESSAGES, and QUERIES, it also establishes guidelines for display so that users of different systems will still see the same consistent information displayed in a consistent manner (independent of the particular display or mapping system in use).

Included here are brief descriptions of the features to be controlled and how to set them in the Programmer. The operating manual of the radio should be used to provide any other explanation of the feature and its use after programming.

QSY (Frequency) Settings

The QSY function uses AFRS (Automatic Frequency Reporting System) to report a frequency on which voice communication is set. A receiving station will receive the embedded frequency information from a station using the QSY function. The receiver can change the frequency (or QSY) over to the embedded frequency of the sender to begin voice communication by the select of [TUNE].

A properly configured TH-D74 QSY station can automatically embed the voice frequency from a non-data band to the beginning of a status text. There is other information besides just a frequency that can be sent. Refer to your operating manual for further details.

QSY In Status - Check to embed the frequency information at the beginning of the status text.

Tone/ Narrow - Check to embed the frequency then followed by the tone/FM narrow information in the status text.

Shift/Offset - Check to embed the shift direction and offset width with the status text.

Smart Beaconing Settings - Optimize beacon transmission based on driving direction and speed.

Low Speed - 2 ~ 30 mi/h, km/h, or knots. If lower than this, beacons are transmitted at the time interval specified under SLOW RATE.

High Speed - 2 ~ 90 mi/h, km/h, or knots. If faster than this, beacons are transmitted at the time interval specified under FAST RATE.

Slow Rate - 1 ~ 100 minutes.

Fast Rate - 10 ~ 180 seconds.

Turn Angle - driving direction change, minimum value setting (5 ~ 90 degrees).

Turn Slope - driving direction change, additional value setting (1 ~ 255 (10 degrees/speed)).

Turn Time - minimum time delay between each beacon transmission by change of direction (5 ~ 80 seconds).

PC Port

PC Output - Select APRS data to be outputted to the PC. Options include Off, raw packets or Waypoints.

Voice Alert - This function will notify another station as to whether or not they are within communications range by emitting beacon tones.

CTCSS Frequency - The CTCSS tone that must be matched by other stations for voice alert to be heard. Only stations with a matching CTCSS tone will hear the beacon.

Sound

Rx Beep - sounds a beep each time an APRS packet is received. Select an option:

All - beep sounds for all received messages, including duplicate and/or invalid data.

All New - beep sounds when message and new packet data are received at your station address.

Mine - beep sounds when a message is received at your station address and your transmitted data is received by a digipeater.

Message Only - beep sounds only when message is received at your station address.

Off - no beep sound.

Tx Beep (Beacon) - sounds a beep each time your position information is transmitted. Beep options are:

Off - No sound

On - sounds when beacon is automatically transmitted or when using the PTT switch.

Note: Depending on the congestion level of the channel, the beep sound may be delayed when using the internal TNC DCD sense function.

Special Call - set callsigns of stations from which you want to receive a special call sound notification.

Interrupt Display Settings

Display Area - select the display area. To manually select using the radio controls, access menu item 3U0 in the Menu mode.

Entire Always - the received new data, duplicate data, and station data appear on the full display, while other data appears only at the top of the display.

Entire - the received new data appears on full display, while other data appears only at the top of the display.

One Line - the received new data appears only at the top of the display.

Note: When an emergency message or a message designated for your station is received, the received data appears on the full display, even if the display method is set to ONE LINE.

When a status message is received, it is displayed on half of the screen.

Time - set the display duration of newly received data. Options are 2, 5, or 10 seconds, and FOREVER (which cannot be canceled). From the face of the radio, enter Menu mode and access menu item 3U1 to set this feature.

Auto Message Reply

Enable or disable programmed message that automatically responds to a received message when you are unable to answer. To manually enable this feature from face of the radio, access Menu 3Q0 in Menu mode.

Text - Enter your reply message of alphanumberic characters, including special ASCII characters.

Reply To - enter the specific callsign you would like your message to automatically reply to.

Note: A reply will be sent to all matching stations when using a wildcard mark (*). For example, if you enter JA1*, a response is sent to all callsigns beginning with JA1.

Group Filtering

Message Group Codes - Use a message group coe to exchange mesages only among your group members. With one or more message group code programmed, you will receive messages that include the same group code(s) in additional to messages addressed to you.

Bulletin Group Codes - If you program one or more bulletin group codes, you will not receive bulletins addressed to other specific groups. you can program any desired code using alphanumeric characters (up to 5 characters for bulletin or 6 for groups). .

Part

12 Radio / Computer Data Transfer

Data flow two ways: from the computer to the radio or from the radio to the computer. Even when you are sending a file to the radio, some data must be sent from the radio to the computer to ensure that the two are "talking" before transfer of the file ever gets started.

In either case, ***be sure to follow the directions presented on the screen carefully***. The wrong button press can result in a communications failure that could reset your radio to factory defaults.

Details for this process are contained in these sections:

Communications | Get Data From - Always the best place to start. Even if there is nothing in your radio. It gets the data "flowing" between the two.

Communications | Send Data To - This process programs the radio with the details of the file that is on the screen. If the file is blank, you will have a blank radio. Be sure you see your frequencies on the screen before you start this part of the process.

Radio to Computer Cabling - Check the photos to be sure you are using the correct cabling for your radio.

Comport Setup - There is no comport setup in Version 4. The Programmer automatically finds the *RT Systems* USB cable for you.

12.1 Communications | Get Data From Radio

Transfers the contents of the radio memory to the computer. This function is often referred to as "reading" the radio since memory information is "read" from the radio.

Note: This step is required before the first file can be sent to the radio.

Files with frequency information can be created in the Programmer without executing this step. Be sure to do File | New before you do Communication | Get Data From Radio to protect any information you have entered into the program.

The Get Data From process (reading the radio)

The TH-D74 radio can transfer programming data to and from the computer via cable or Micro SD card. Each of the processes will be covered here.

Using a cable

The radio connects to the computer using a USB A to Micro B cable. This cable is used by many phones today and the cables are interchangeable. The electronics for the process are in the radio. A cable from another deceive may not work if the wiring is different that what is needed by the radio. If one does not work, try another or use the RT Systems RT-49 cable that you know will work.

When you first connect the radio to the computer and turn it on, drivers must load so your computer knows what it is talking to. Windows will raise the message that new hardware is found and that it's loading drivers. On most systems driver installation will be automatic since the device uses standard Windows system drivers.

If the process fails on CDC-ACM, there is a correction for it that can be loaded from the RT Systems site. Access it here D74 Driver Repair

In the KRS-D74 Programmer, access Communications | Get data from Radio

A window opens with instructions for the process. Follow the steps to complete the process.

Note: When you click OK, a window will open indicating that the process is "Attempting Communications" . After a very short time, that screen will change to "Reading" and a progress bar will begin to fill. This happens almost immediately... but it may be slightly delayed depending on your system.

Once the progress bar begins, do not disturb the radio. Interrupting this process could result in loss of data in the radio.

Using the SD Card

There are lots of advantages to using the Micro SD Card for radio programming. Foremost, you can save different files and configurations for the radio to the one card. Then use the one that you want for a given activity. How great for a vacation! Save your home configuration as file "Home" then save Location 1, Location 2, Parade, Race, etc separately. As you engage in a separate activity in a different place, just import the frequencies and settings needed without the need of a computer. The radio does all the work on its own!!

This all starts at the radio.

1. Carefully insert SD card into slot on side of radio. The gold "teeth" of the card will be positioned towards the front of the radio.
2. Turn the radio on.
3. Press Menu

4. User the multi-scroll key to move to the SD Card options. Press ENT at the center of that key to enter that menu option.
5. Press ENT to select EXPORT.
6. Press ENT to select Config Data
7. Press ENT to have the information sent to the card. The radio will indicate "Saving" and then display a complete message when the process is finished.

Note: You have no control over the file name at this point. That will come later. The default filename is a combination of the date and time ensuring a unique name each time the process is done.

8. Press the [DUAL A/B] key for OK to exit the menu. Remove the SD card and prepare it for use by your computer (i.e., put it in an adapter or directly in a slot on your machine.)
9. Open the KRS-D74 Programmer.
10. Do File | New if you have data in the displayed file that you don't want to lose.
11. Do Communications | Read data from SDCard
12. The program will find the SD card automatically. If not, which happens on some systems, use the options in the Look-In box at the top to drill out to the SD Card.
13. Select the file you want to load. There can be several files on the card at one time. You have the choice of which one to use. The filename is date and time so it is easy to identify the one you created last.
14. The information from the radio appears on the main screens of the programmer as well as in the Settings file (Settings | Radio Menu Settings.

You are ready to edit this file or create a new file with the details you want.

When the Get Data From process is complete (either via the cable or via the SD card), the Programmer will return to the spreadsheet of the main window where the information taken from the radio is displayed. This information is ready to be edited and saved.

The radio can remain connected to the computer while changes are being made in the Programmer. These changes are not reflected in the radio until you complete the Send Data To process in the Programmer.

If you are doing major editing, turn the radio off and remove the cable. Then return to

the Programmer for editing the file. Once your editing is complete, connect the radio to the computer and complete the Communications | Send Data To Radio process to transfer the changes to the radio.

Troubleshooting

- "Nothing" happens when I press the button indicated on the second screen of the Get Data From process.

  If this is "nothing on the radio", check that your keys are not locked. Turn the radio off. Unlock the keys. Then turn the radio back on in CLONE mode and try again.

  If this is "nothing on the computer" (i.e., the transfer status bar does not appear and begin to fill), check the cable connections between the radio and the computer.

- Other details for general troubleshooting can be found in the ***Troubleshooting*** section of this Help.

- Should the problem persist, contact ***RT Systems*** for personal assistance.

12.2 Communications | Send Data To Radio

Sends the contents of the current file and the settings file to the radio.

Note: In the RT Systems' Programmers, you can have files open for several different radios at one time. The Programmer can send a file only to the radio it is for. The title bar at the top of the Programmer tells you which radio the file is for.

Current File

The Programmer can work with several radio files at one time. There is no need to close extra files before executing the Communications | Send Data To Radio process. The current file will be sent to the radio during the Send DataTo process.

The current file is the one that appears in the main window of the Programmer. Basically, what you see on the screen is what is sent to the radio.

Settings File

Check your global menu settings under Settings | Radio Menu Settings to be sure the right information is being sent. The items on this screen are the radio settings that are not associated with a specific memory channel.

These settings are set once to be sent to the radio with any frequency file that you create. Details on these settings can be found in the Programming Other Set Menu Items section of this Help.

If the radio "acts funny" after it is programmed,

- Check the Radio Menu Settings found under Settings | Radio Menu Settings. These are global settings that are not tied to any one memory channel. When you program your radio with a file from the computer, these settings go with the memory channel details.
- Make changes to the settings as needed.
- Save the settings file.
- Do Communications | Send Data To Radio with the same memory channel file. The menu settings will be sent with the memory channel information.

Now that you have the two files lined up and all the details in them that you want, you are ready to connect the radio and get it programmed.

Connect the radio to the computer

The TH-D74 radio can transfer programming data to and from the computer via cable or Micro SD card. Each of the processes will be covered here.

The radio connects to the computer using a USB A to Micro B cable. This cable is used by many phones today and the cables are interchangeable. The electronics for the process are in the radio. A cable from another deceive may not work if the wiring is different that what is needed by the radio. If one does not work, try another or use the RT Systems RT-49 cable that you know will work.

If the drivers don't load for the radio and you are attempting the Communications | Send data to Radio process, you have not completed Communications | Get data from Radio. There are details about driver installation in that section of this help.

Completing the "Send Data To" Process

Using the cable

When you execute the Communications | Send Data To command, you are presented with instruction for putting the radio into clone mode.

Read the screen carefully. The steps differ with each model. Pressing the wrong button will result in no response or the wrong response for the process.

Follow the steps on this screen. When you click OK a progress bar appears immediately letting you know that the process is working. The transfer status window disappears and the Programmer returns to the Main Window when the process is complete.

With the radio off, remove the cloning cable. The radio is ready to power-up and use with the newly programmed settings.

Note: The radio may be in VFO mode even after it is programmed. This is a normal mode of the radio and the one you found it in the first time you turned it on. Press the [2/M.IN/ABC/MR]] key to put the radio into memory mode.

Using the SD Card

This process may seem more complicated but think of the abilities you have with it. You have control to create different files that you can use in the radio without having your computer available to make changes.

Be sure the same SD card that you used originally with the radio is in the computer. That will be the one that you used to do the "Export" function from the radio.

In the program, select Communications | Write Data to SD Card.

The program will find the card automatically. You will be prompted for a filename. Since the name can be anything you want it to be, you can create files for several different events or locations by naming them differently.

Once the process is complete on the computer, remove the SD card.

Load the SD card into the radio and when you are ready, access the SD Card options in the Menu.

Select Import.

When presented with a list of files, select the one you want to load.

Press ENT to load that configuration data to the radio. When the Import process is complete, the radio will reflect the details of the file you just loaded (memory channels and other option settings).

You can leave the SD card in the radio to have other files available later.

Troubleshooting

Program does not automatically find the SD Card

There are lots of things that can cause this problem. Two most common are:

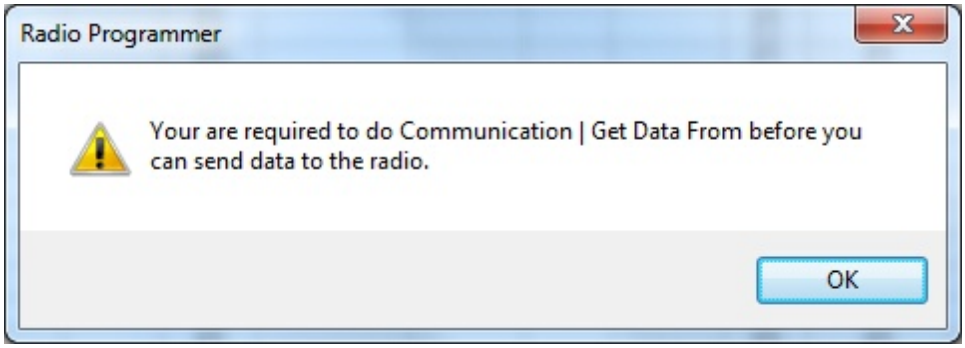
1) The SD card is not in the computer when you access Communications | Write to SD Card

2) The SD card is not the one you used originally when you first exported the configuration of the radio.

Simply use the options of Look-In to drill to the SD Card. Remember, the radio will be looking for the specific directory KENWOOD / TH-D74 / SETTINGS / DATA / {filename}

Yes, you can create that directory yourself; but if you get it wrong, the radio may not be able to find the file to Import. It's best to do an Export from the radio onto the card you're using before writing the file back to the card from the programmer. Then you know the structure is as the radio expects it.

Communications | Get Data From Radio required first



The first time you attempt to send your file to the radio, this message may appear.

This indicates that you have not read the configuration of the radio into the Programmer.

There are details that the Programmer can get only from the radio. Even if the radio is not yet programmed, these "background" details are necessary for the Programmer to send a file to your radio successfully.

To complete this process:

1) Select File | New from the menu at the top of the screen.

2) Turn off the radio.

3) Select Communication | Get Data From Radio from the menu at the top of the screen.

4) Complete the process detailed on the screen.

5) Once the process is complete, click the tab at the top of the screen showing your filename. The file that you want to send to the radio will be displayed on the screen.

6) Select Communications | Send Data To Radio from the menu at the top of the screen.

7) Complete the process following each step carefully to program these channels into the radio.

Modified Radio

If your radio has been modified, you need to read from the radio (Get Data From) into a new file before you attempt to write data to the radio. When the Get Data From process is used, even if the radio is not yet programmed, the Programmer gets the data it needs to know that the radio is modified.

When you use Get Data From for the sake of establishing communications, you need to save the file ONLY if you want to save the memory data that is currently in the radio. The Programmer already has what it needs. The option to save is available should you want to save the pre-programmed data.

The radio is not programmed after the process is complete

This could indicate several things. Most of those are specific to the radio. The most general error is not an error in programming; but the need to put the radio into Memory mode once programming is complete. Many of the radios return to VFO when they are programmed. Press the appropriate key on the radio (see the operating manual for your specific model to identify the key press that changes the radio from VFO to memory mode. It will be detailed there.) Once in memory mode the information programmed will be available for use.

Several of the radios are not programmed when the download process is complete. These radios have encountered an error during the programming process. Try the process again. If it continues to fail, first, be sure you are using the latest version of the

Programmer by updating from the Check for Update link under Help in the menu of the main screen of the Programmer. If the problem persists, send the file that you are attempting to send to the radio. We will examine it for any problem that might exist in the data.

Check the cabling between the radio and the computer by disconnecting and reconnecting at all connections. Try the process again.

If you have problems sending a certain file to the radio

Cancel the Send Data To process and execute Get Data From. Be sure to open a New file (File | New) into which the data will be read from the radio. This prevents loss of data in the file that you are sending to the radio. Getting data from the radio is a less critical process that can help get communications established.

The radio must be connected to the computer with the proper cables for that radio. See Radio to Computer Cabling in this Help for details and pictures.

If necessary, contact ***RT Systems'*** tech support for assistance.

12.3 Radio to Computer Cabling

The TH-D74 connects to the computer via a USB A to Micro USB B cable. These are very common as many phones use them today.

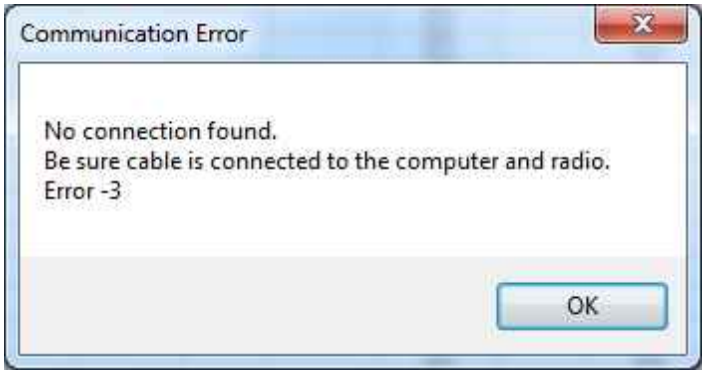
The one available from RT Systems is the RT-49.

12.4 Comport Setup

In the *RT Systems'* Programmers there is ***NO*** com port setup. The software finds the USB cable automatically.

That's not to say that some of these radios do not use com ports. The TH-D74 uses a com port set up by the drivers of the radio.

The following error may happen when you click OK on the Get Data from Radio or Send Data to Radio screens.



There are two common causes for this.

1) The drivers for the USB electronics of the radio did not install properly. See details about that in the Knowledge Base at www.rtsystems.com. Use this link to access that article.

2) Be sure to give the computer enough time to do its internal setup once the cable is attached. On some machines this can take up to a minute (a long time in computer time). Once the cable is ready for use, the program will continue into the steps for transferring data between the radio and the computer.

Part XIII

13 File Maintenance

Just as in a word process or other Windows based program, you will create files in the programmer for use in the radio. You can create as many files as the space on your hard drive will allow.

Remember, erase everything and replace it with the details of the file sent from the programmer. Be sure everything you want in the radio is in the file that is sent. This is an "all or nothing" process.

From the File menu at the top of the main window, select:

New - Create a new file in any Version 3 programmer you have installed.

Open - Open an existing file in any of the Version 3 programmers you have installed.

Open Travel Plus Link - Active only if a list is open in Travel Plus. Accesses that Travel Plus list. Details on this functionality are available in the ARRL Travel Plus section of the help.

Close - Closes the current file.

Save - Saves the current file.

Save As - Saves the current file giving you the opportunity to enter a new name. This creates a copy of the file and saves it with the new name you entered.

Import - Advanced functionality that addresses data from a "flat" ASCII file. Details on this process are found in the Import and Export section of the help.

Export - Extracts data from the programmer file to a "flat" ASCII file. Details on this process are found in the Import and Export section of the help.

Print Preview - Lets you see the formatted information on the screen before it prints.

Print - Prints the current file

Send File as E-mail - Sends the current file to *RT Systems'* tech support. This functionality is dependant on the e-mail program of your computer.

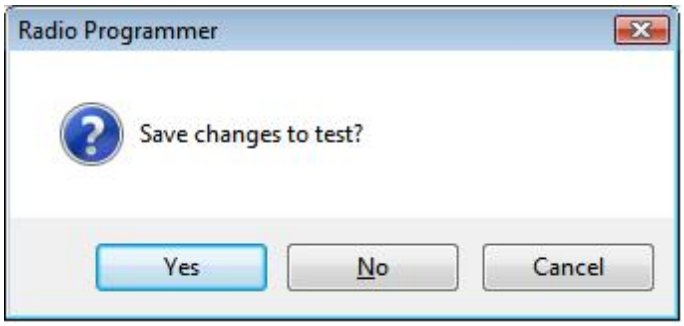
Files 1-4 - Up to four files that you last worked in and saved.

Exit - Closes the programmer.

13.1 File | Exit

Exits the Programmer.

If files have been changed, you will be prompted to save or cancel the Exit command to avoid data loss in that file.



Yes - Exits the program saving the file.

No - Exits the program without saving any work done in the file since the last time you saved.

Cancel - Halts the Exit option. The program returns to the open file.

13.2 File | New

Use this command for setting up a "clean slate" into which you enter memory frequencies. A "clean slate" or default file will often have at least one channel programmed on the memory channel screen. This is a factory default that is in your radio when it is new. The information for this channel can be changed; however, in most radios, channel 1 must be programmed.

Use the quick key command of Ctrl M for easy access to a new file.

If you have been working to create a file with memory channels, use File | New before using Communications | Get data from to prevent losing all the work you have done in this file. The Get data from process will replace the information in the open file with what is in the radio.

Other Radio Menu Settings and a New File

The radio is more than just memory channels. There are features that are controlled once for the radio. They cannot be customized for each memory channel. These features are address in the programmer under Settings | Radio Menu Settings.

The settings for these features that were last saved are use whenever a New file is created. There is no need to reset these features for each new file. If you have not saved a settings file, factory these radio menu items are set to factory defaults(as if you reset your radio).

Note: If you radio "acts funny" after you download to it (i.e., keypad beeps are different, squelch is open, Scan resume settings are changed, etc.,) you have not yet set these options in the Settings portion of the programmer. To make these option settings permanent:

- ***Select Settings | Radio Menu Settings from the menu at the top of the screen.***
- ***Personalize your options just as you did on the radio.***
- ***Select File | Save from the menu on the Settings screen.***
- ***Enter a filename when prompted and click Save.***
- ***Select File | Exit from the menu on the Settings screen.***
- ***You will not have to change these again unless you want them to function differently.***

The settings file will change only if you read from the radio (Communications | Get data from) and send that file back to the radio (Communications | Send data to) without saving the memory information that you retrieved. This is helpful if you are programming a friend's radio in which he has all these options set up as he wants them.

The File|New command can be used to open several new files at once. Memory channel information can be copied between these files (even from V3 to V4), regardless of which radio they are for.

13.3 File | Open

Just as in a word processor or other Windows programs, the command opens a previously saved file.

You are not limited to one programming file for your radio. Make as many as you want. Then choose the one you want when you open the programmer.

13.4 File | Print

Prints the Memory channel information of the displayed page of the current file (i.e., if you are on the memories tab, the memory channel information is printed. Similarly, if you are on the VFO tab, the VFO channel information is printed.)

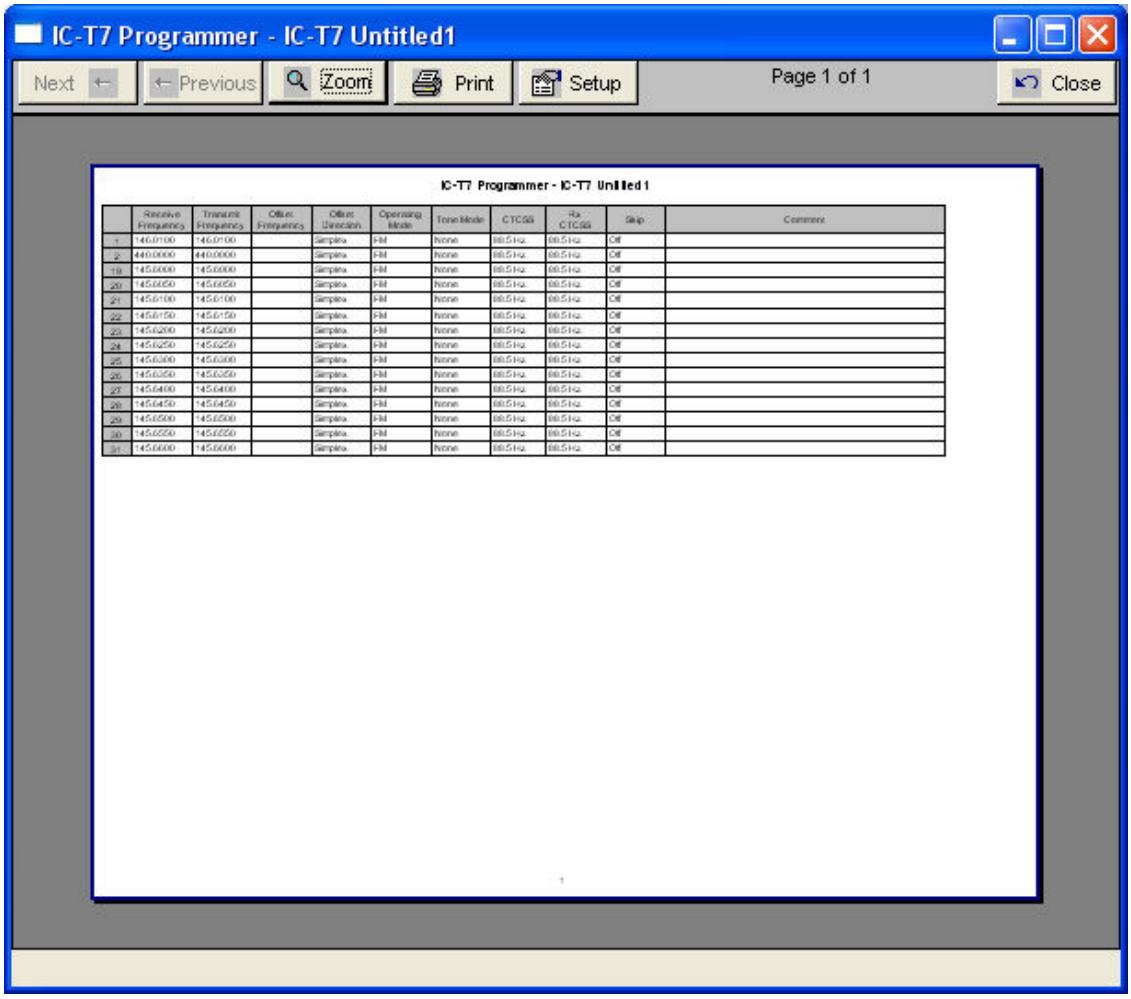
- When this command is selected, a print dialog will give you the opportunity to setup your printer.
- Hidden columns are not printed. A printout can be customized (including increasing type size) by deliberately hiding columns before printing. To hide column, select Settings | Preferences from the menu of the programmer.
- Only memory channels that are programmed are printed. Your printout will not include the blank channels in the file.
- Use Print Preview to see what your printout will look like and how many pages will be included before you send it to the printer. This new option will help save lots of wasted paper.

13.5 File | Print Preview

This feature of the programmers lets you preview the data to be printed before you waste paper sending it to the printer.
With the file open that you want to print, select File | Print Preview.

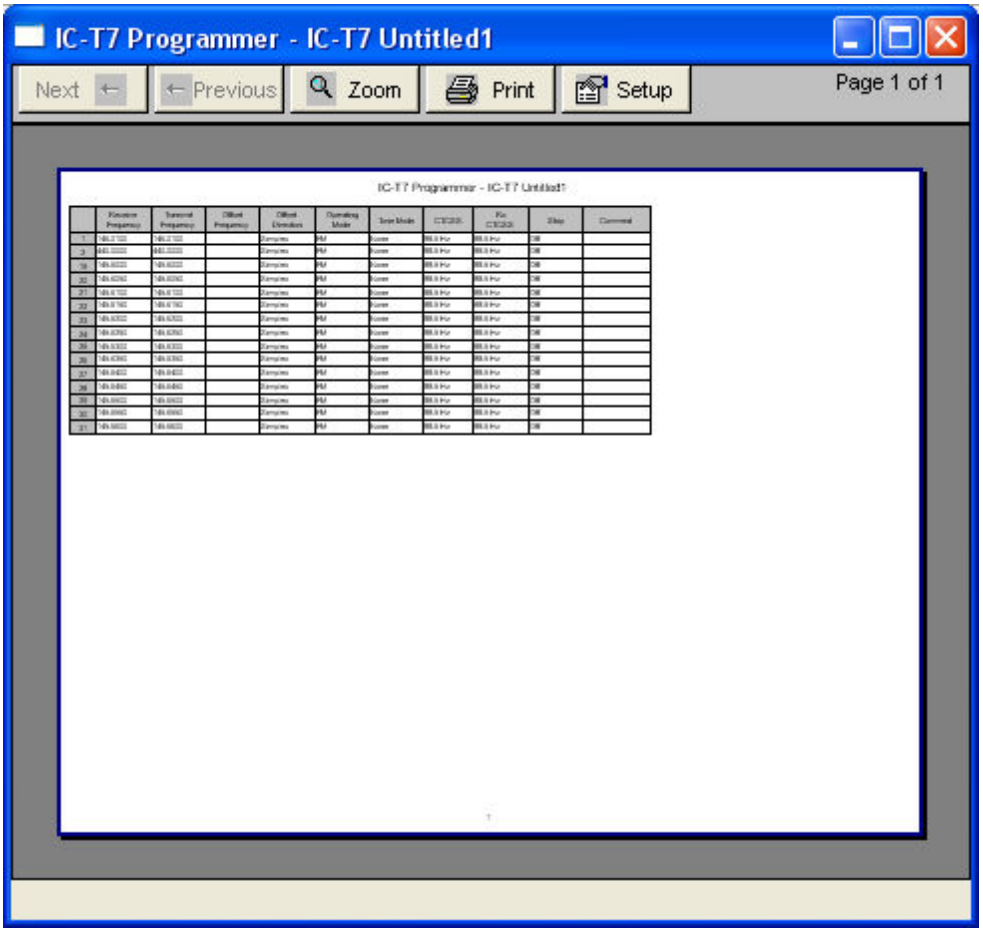
You will notice first that the screen changes. It is filled with the data that will be printed. This is just a temporary change. The order of your channels has not been changed in the file.

Then the screen opens to display the printed output you can expect.



Notice at the top of the page you can see that your have "X of X pages". Making small changes can help reduce this number if it is not as you expect.

For example, reduce the size of the comment column since it is not being used (or hide it completely). This move could save an additional page (or pages) by getting all the columns to fit on one page.



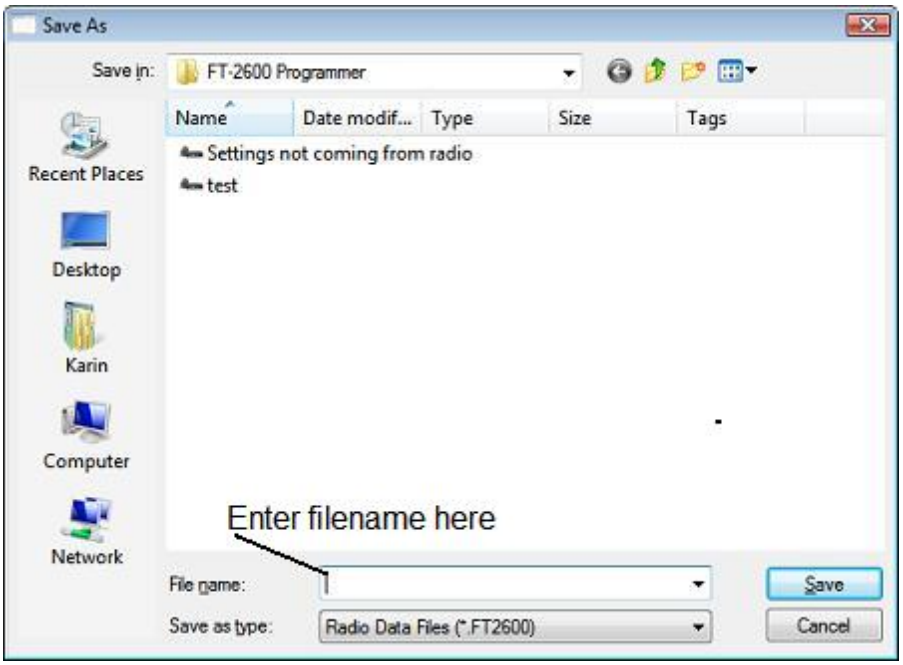
Under Printer setup, change the margins to print on as much of each page of paper as possible. Again, this can make it possible for all the columns to fit on one (or half the number of) page.

Use Zoom to read the data in the preview more easily. Click Zoom again to return to this view.

13.6 Saving Programming Files

Many different files can be saved to your hard drive for permanent storage giving you the ability to reprogram your radio quickly and easily to suit your current use.

- Files are saved using the File | Save or File | Save As command.
- When the window opens for the filename, enter any name up to 256 characters (including spaces) but without a period at the end or an extension. The Programmer will enter that information for you automatically.



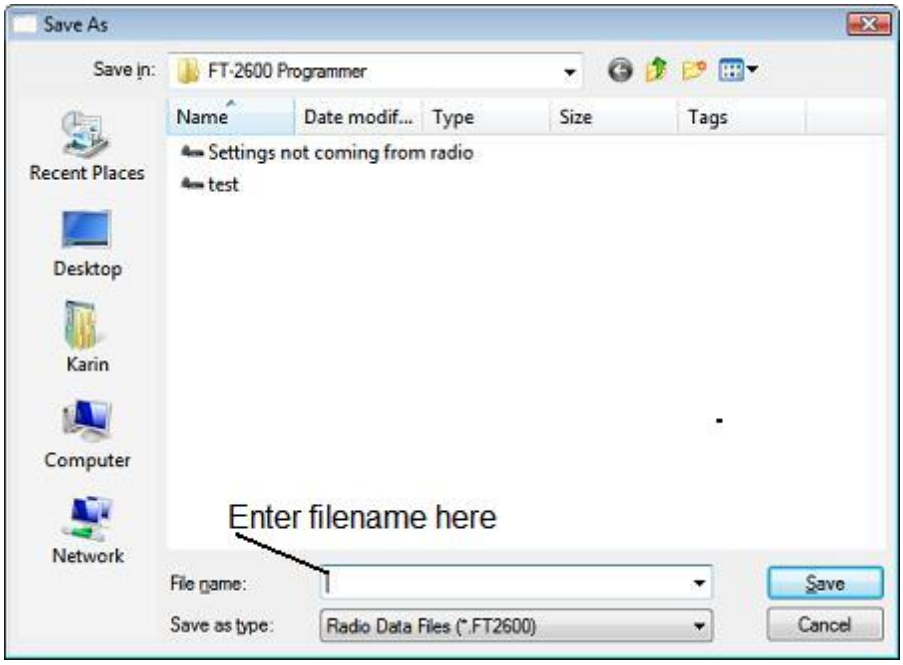
13.6.1 File | Save

Saves the current file to your computer hard drive.

If several files are open, the current file (the one on top: the one you are working in) is the one that will be saved. Be sure to save the changes to each of the open files before closing the Programmer.

It is recommended that you save the current file during data input and before sending it to the radio. Just as with a word processor, it's an awful shame to lose everything if something happens to the computer during either of these processes.

If the name of the current file is Untitled (in the main window title bar), you will be presented with a save file dialog and should enter a new filename.



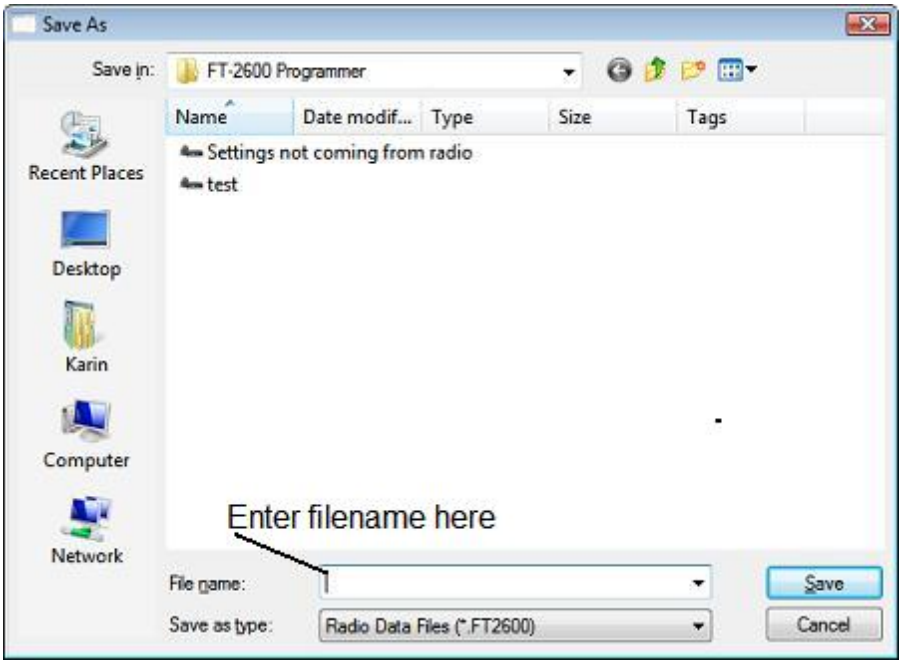
The filename can be any combination of characters and spaces including numbers and letters.

When saving a file, let the Programmer do the work. All you need to enter is the name you want for the file.

13.6.2 File | Save As

Saves the current file under a new name. Used if you want to make a copy of the file that you're working in to maintain the original without the changes you're making now.

- If several files are open, the one that is active is the current file. This file will be saved with the Save As command.
- This is a good way to start another file for editing. Changes made to this file do not affect the data in the original file.
- When this command is selected, a save file dialog containing a list of existing files is presented. You can either select one of these to be overwritten or enter a new filename. The Programmer will add the extension so you should not enter an extension or a period at the end of the filename.



- The title bar of the window changes to reflect the new filename.
- When saving a file, let the Programmer do the work. All you need to enter is the name you want for the file.

Part

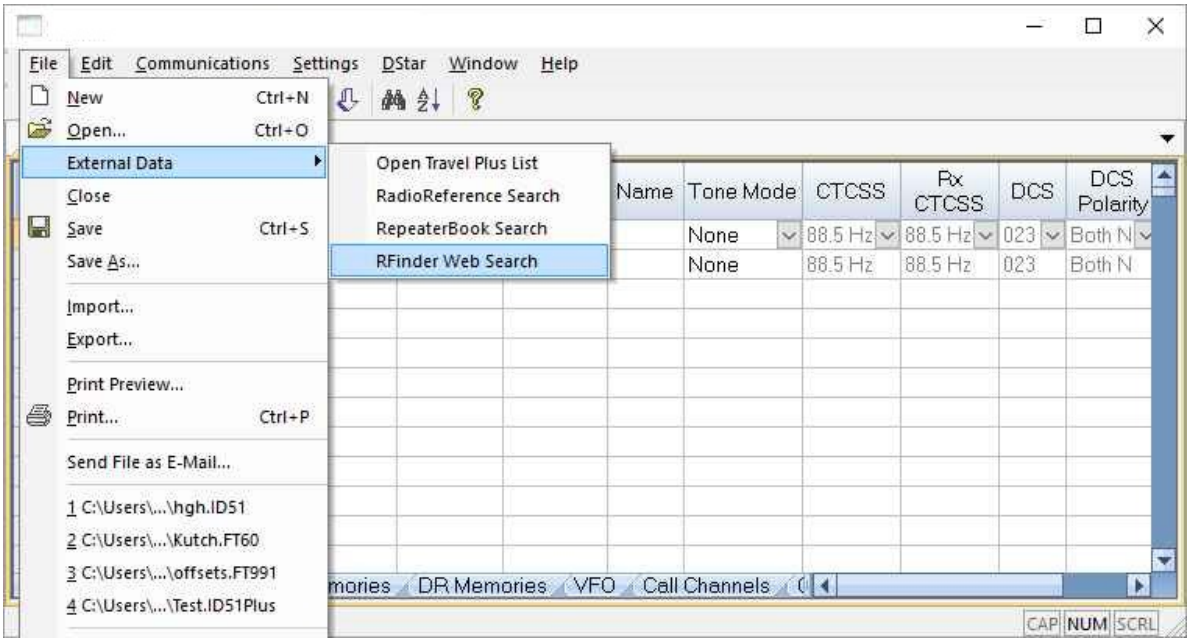
14 RFinder Web Service

The RFinder (RepeaterFinder) Worldwide Repeater Directory is a steadily growing worldwide repeater database including IRLP and Echolink information. The RT Systems programmers have an easy to use interface to the RFinder directory right in the programmer.

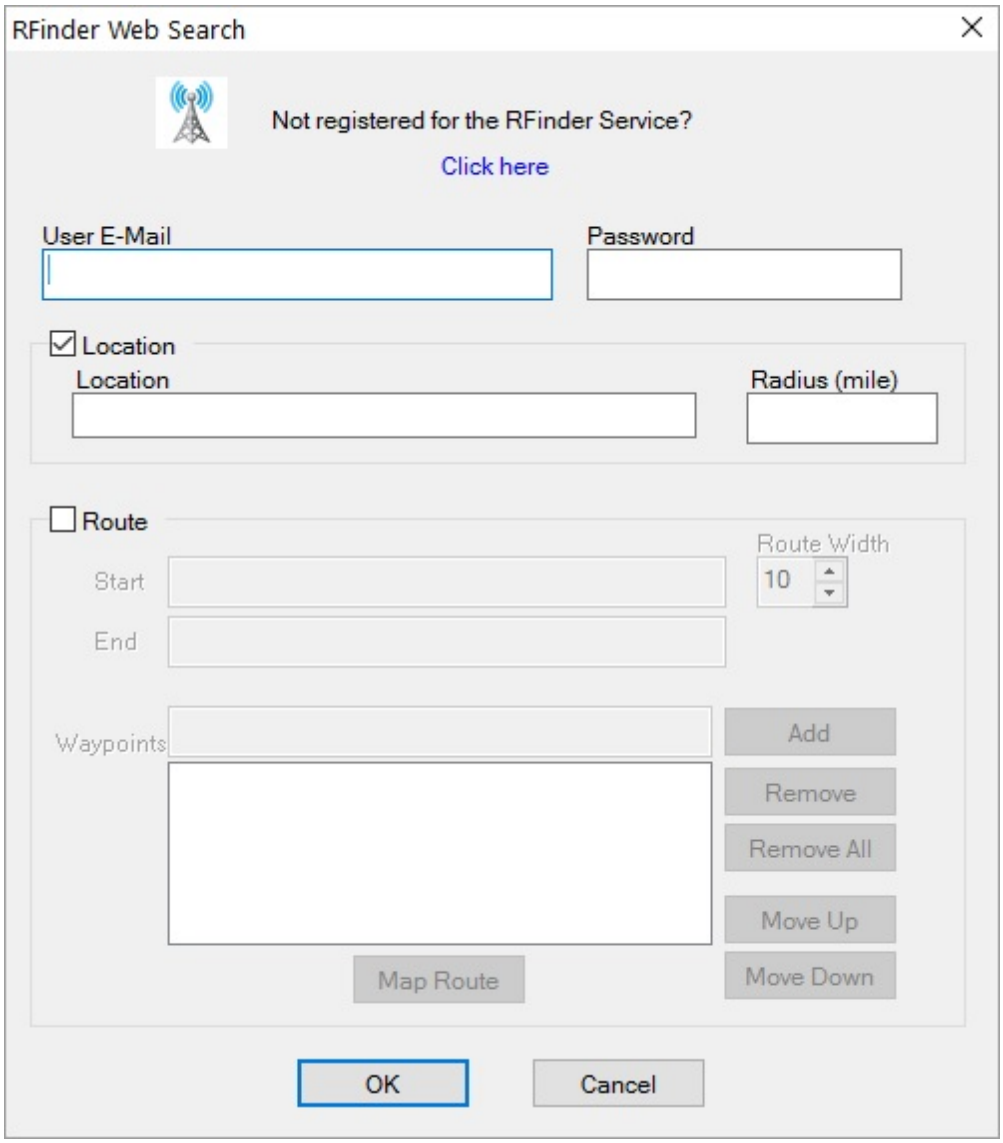
Access to the RFinder Worldwide Repeater Directory is available by subscription and can be accessed by licensed users via any version of the RFinder android app, our new browser interface (web.rfinder.net), or through third-party applications. A license subscription is required to access the RFinder database through the programmer. You can purchase that license from the link on the RFinder page in the programmer.

Using the RFinder Interface

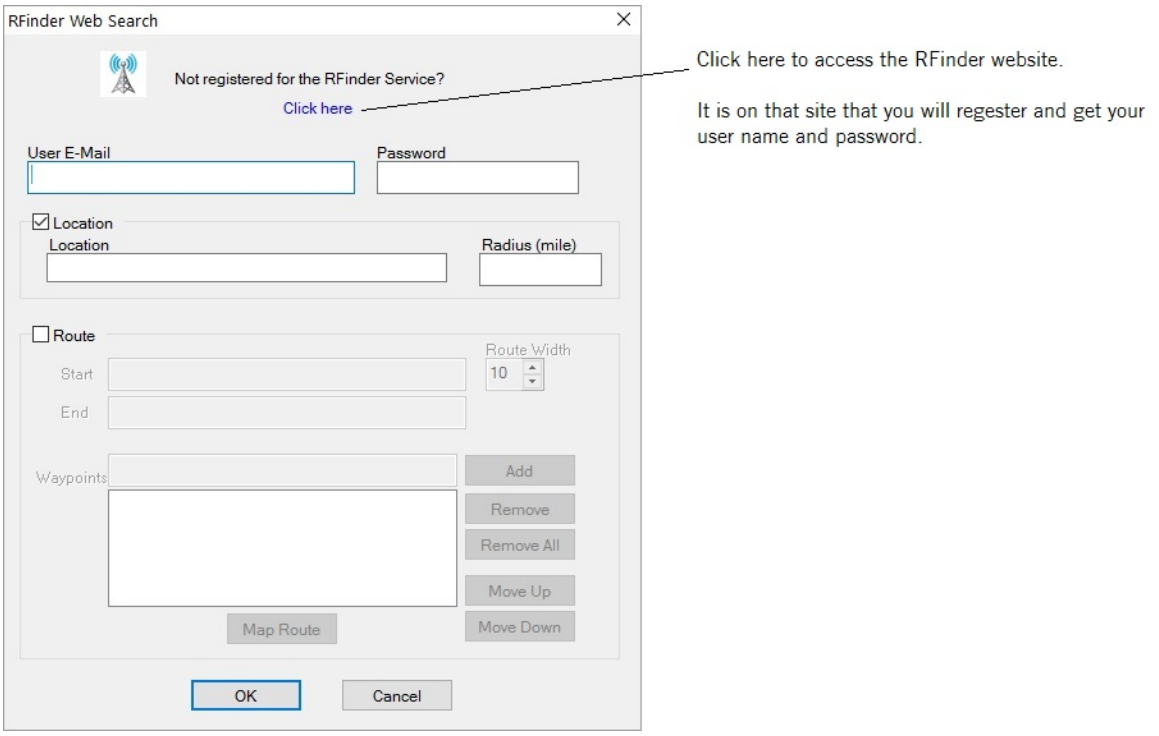
From the main screen in the programmer, select File | External Data | RFinder Web Service



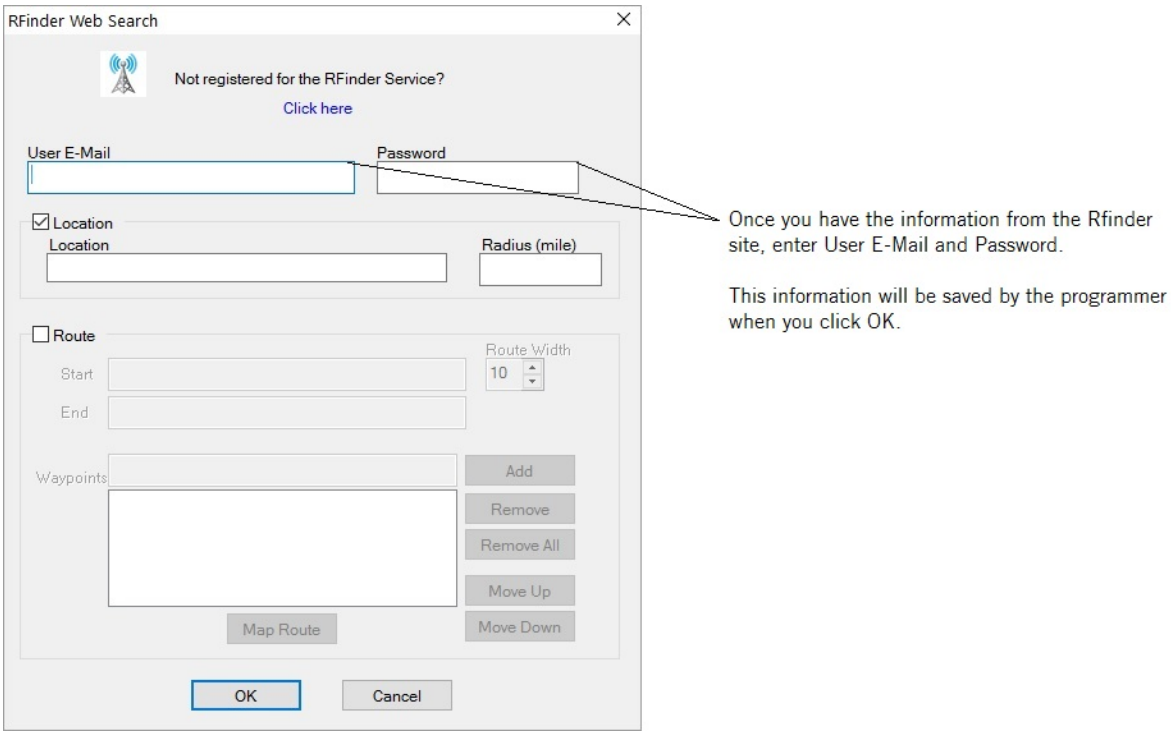
A window opens with options for this service



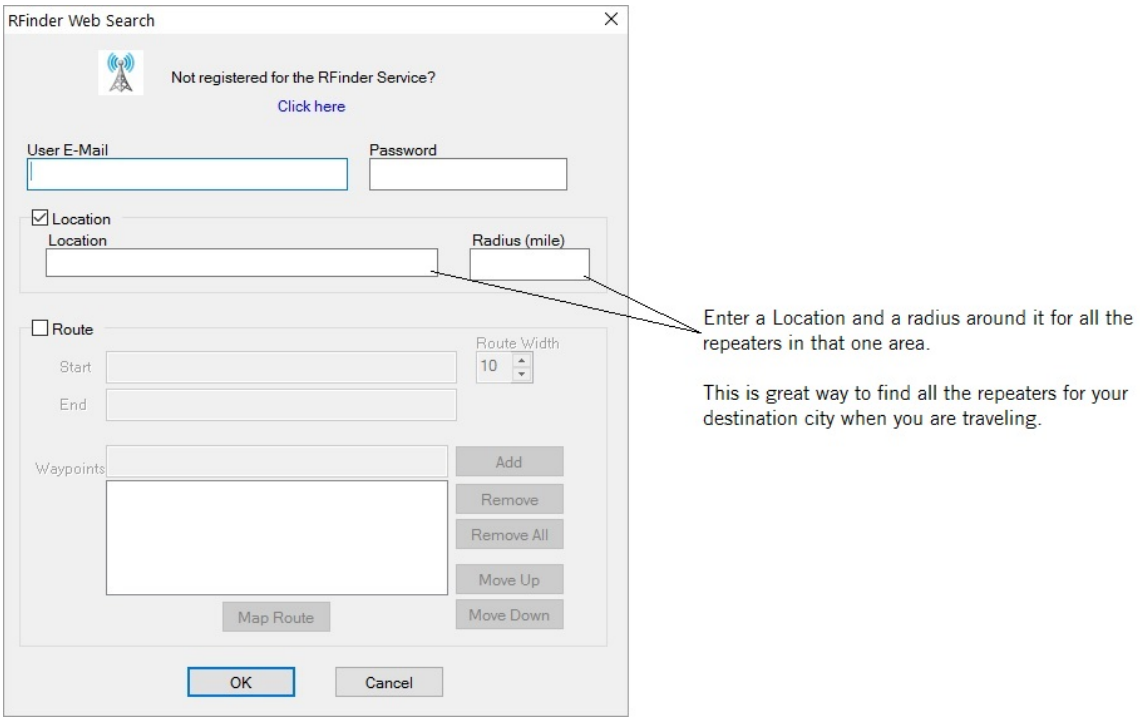
If you are not yet a subscriber to the RFinder service, you can set those details from here.



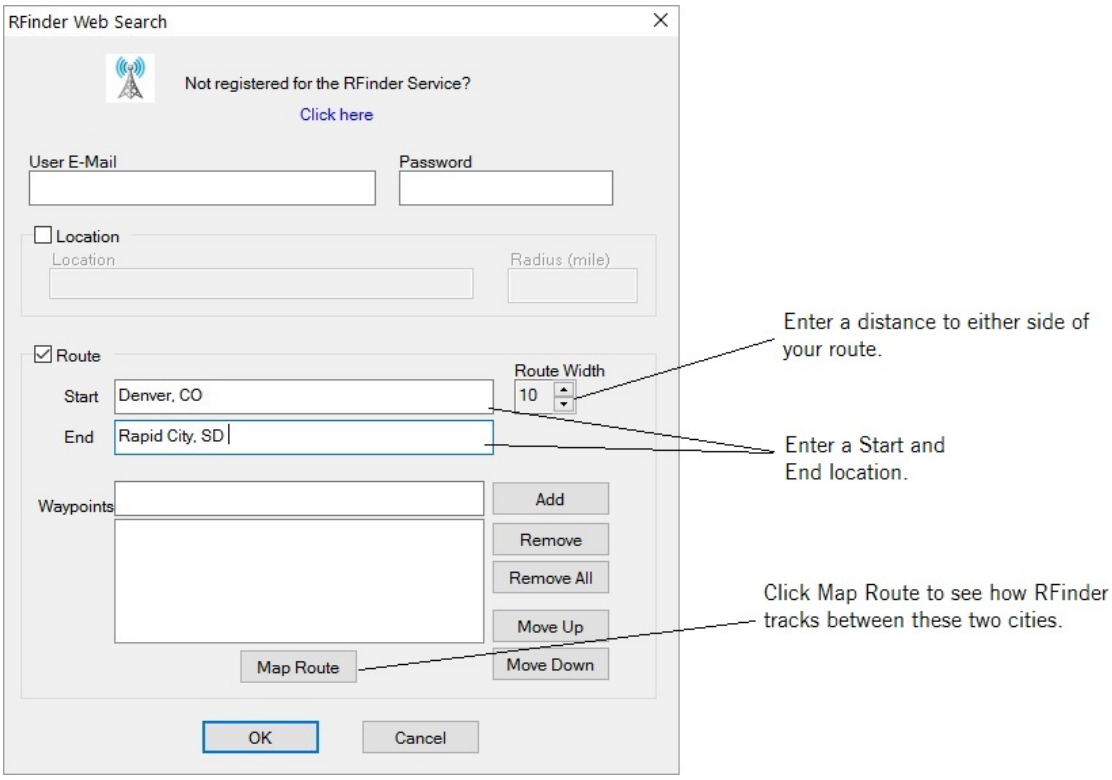
Once that process is complete, return to the programmer and complete the User and Password information. This information will be saved when you click OK. You complete these fields only once.

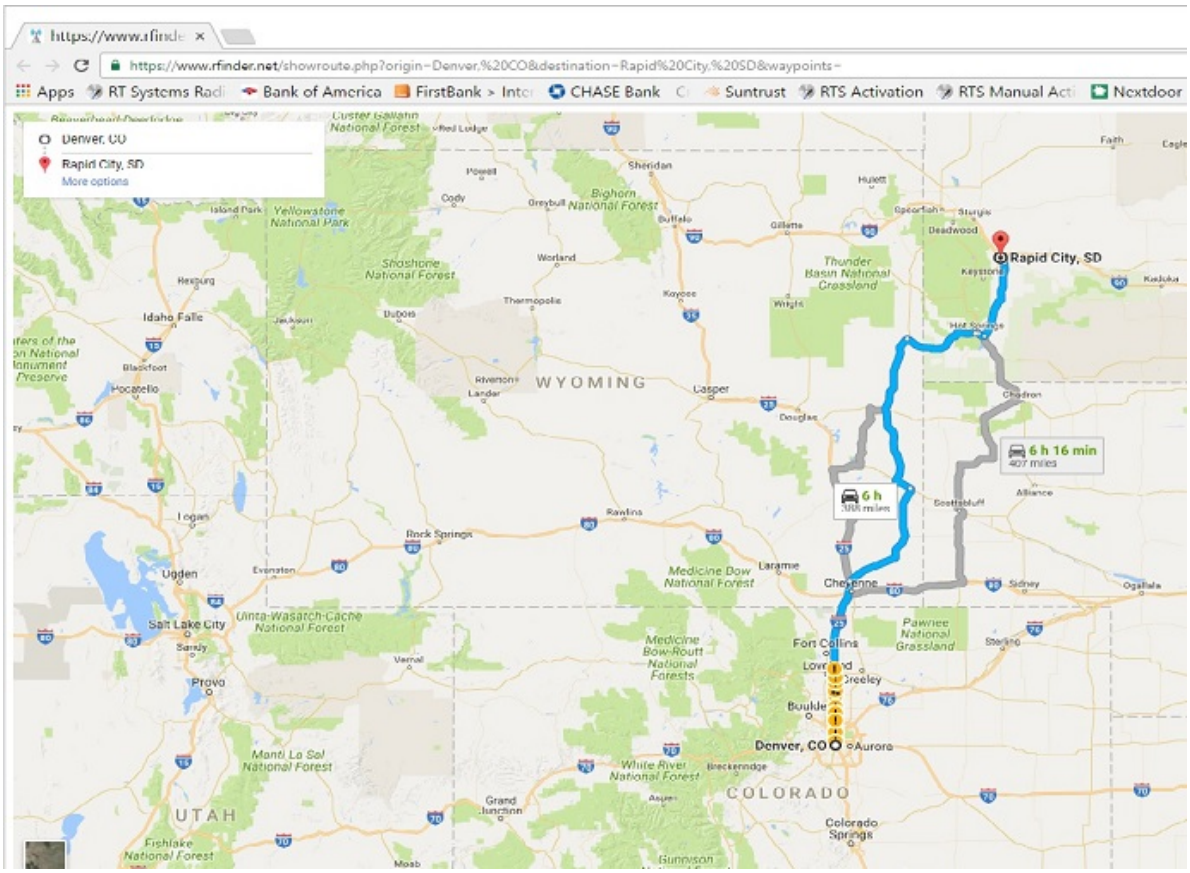


Now the fun begins... Complete your location

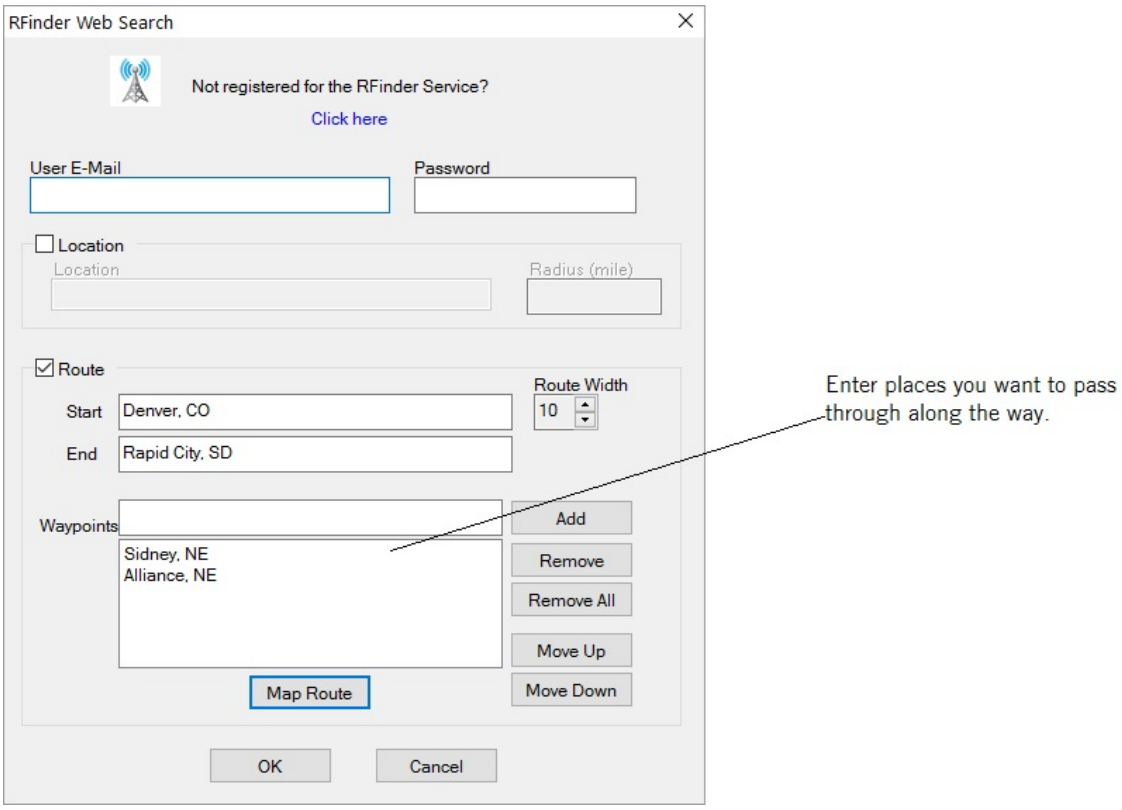


Alternately, you can work with a route to create a list of repeaters that lie along your travels.

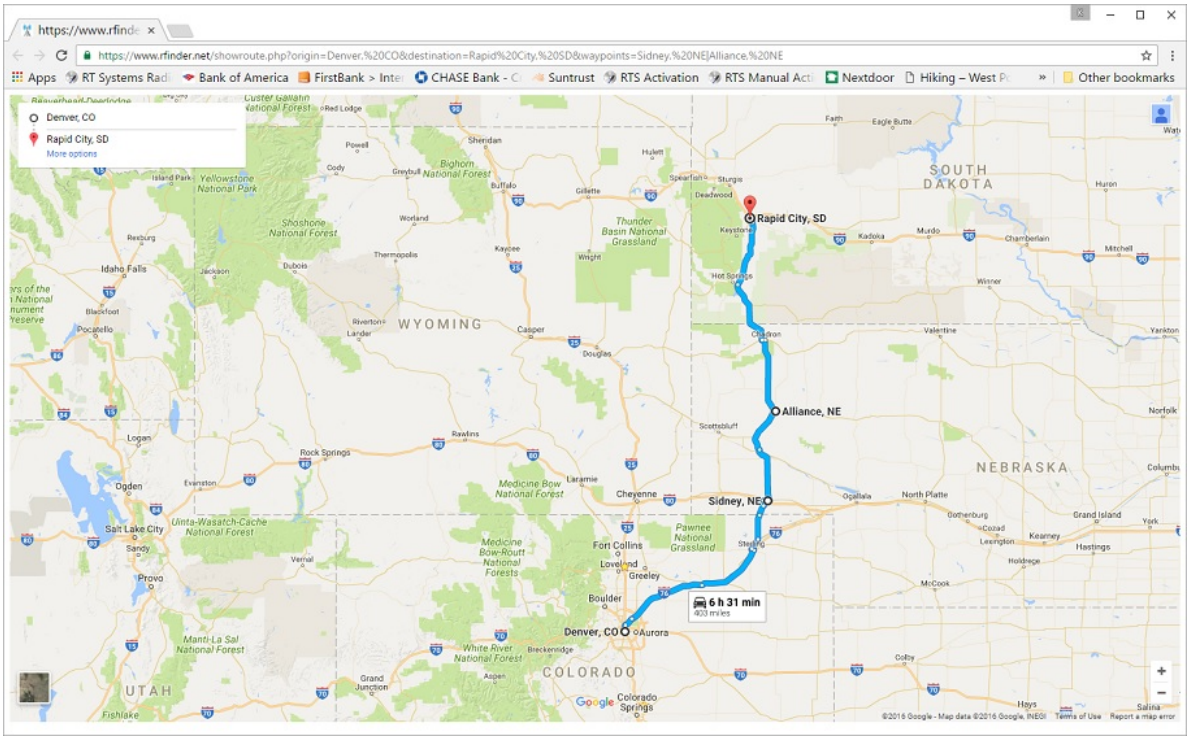




If this is not your desired route, enter waypoints along the route you want to take. RFinder will then track through those cities on the way between the start and end locations.



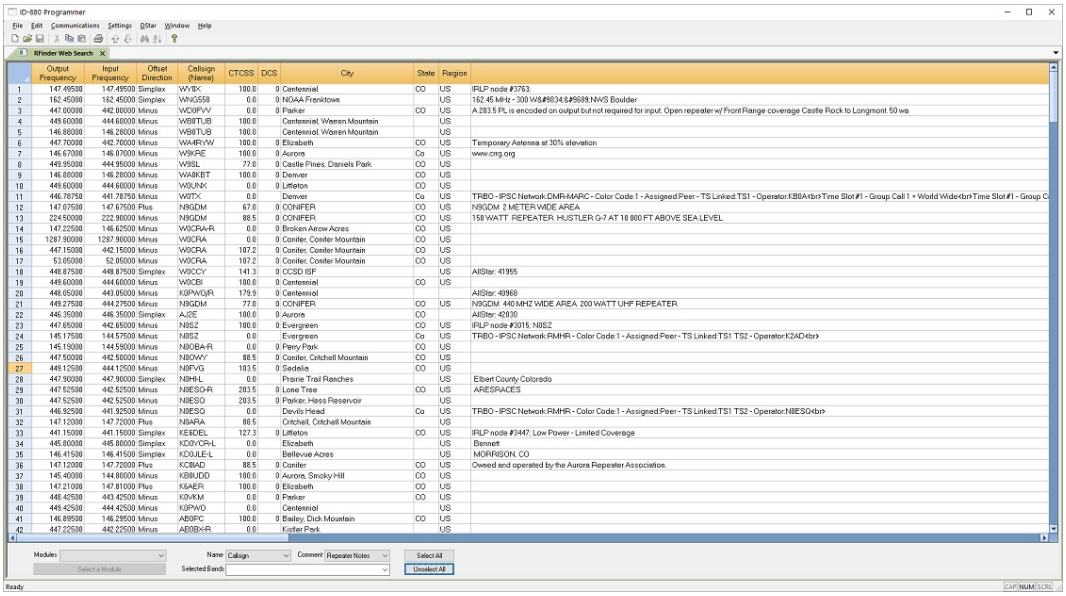
And your route becomes this.



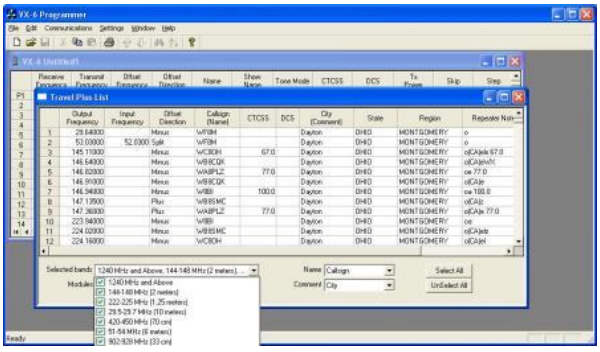
Click OK

A screen is returned on which you will

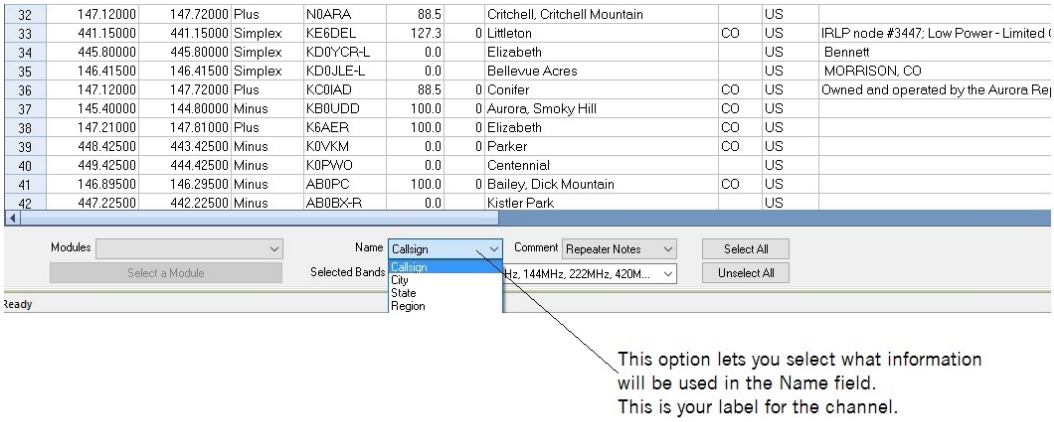
- Check the data returned: maybe you spelled something wrong and did not get the list you expected.



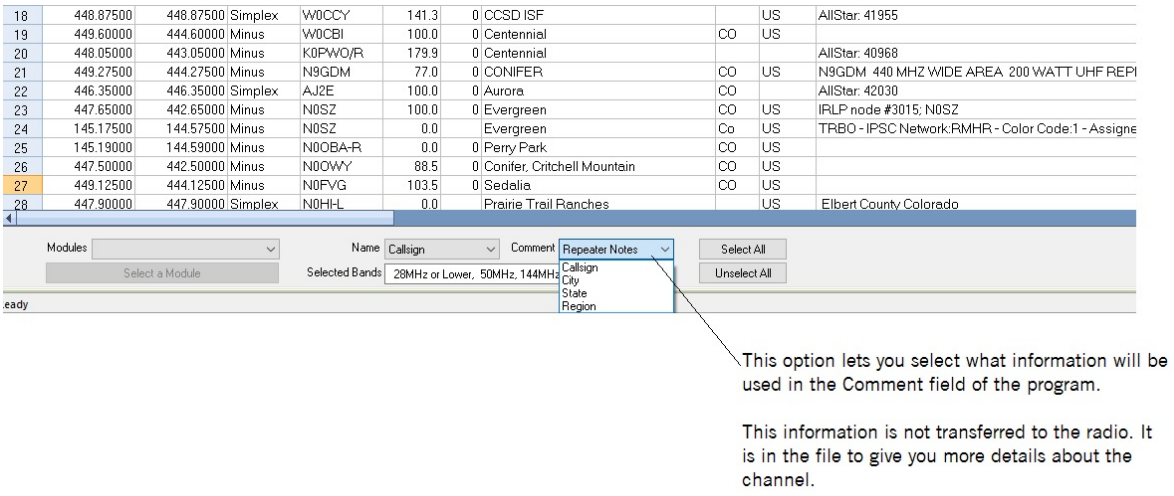
- Use the tools at the bottom of this screen to further refine the list (you may have DMR or Dstar or P25 repeaters in the list that you don't want).



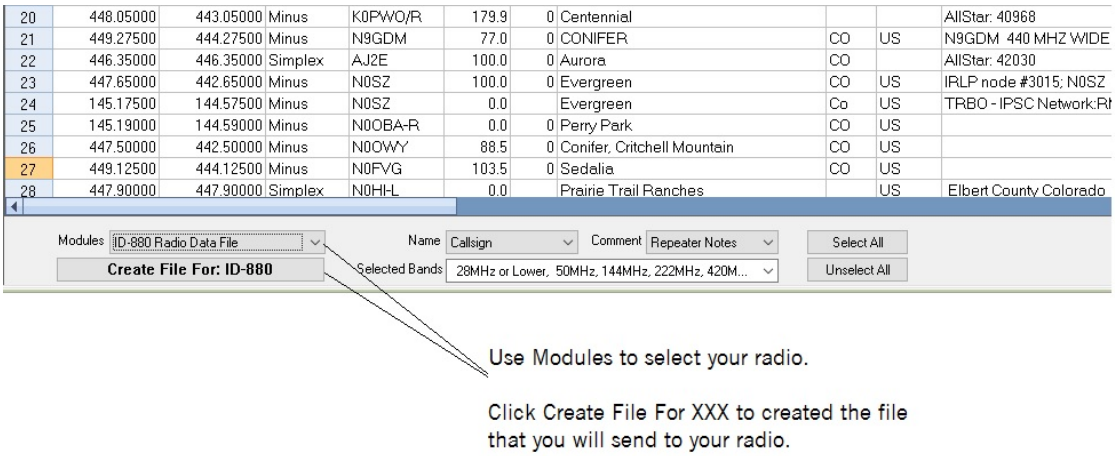
- Assign information for the Name field: this can be Callsign, City, State, Region, Repeater Notes or Sponsor. Remember, the radio will truncate your selection to the number of characters it can hold. So in some of the older radios, DENVER would become DENVE.



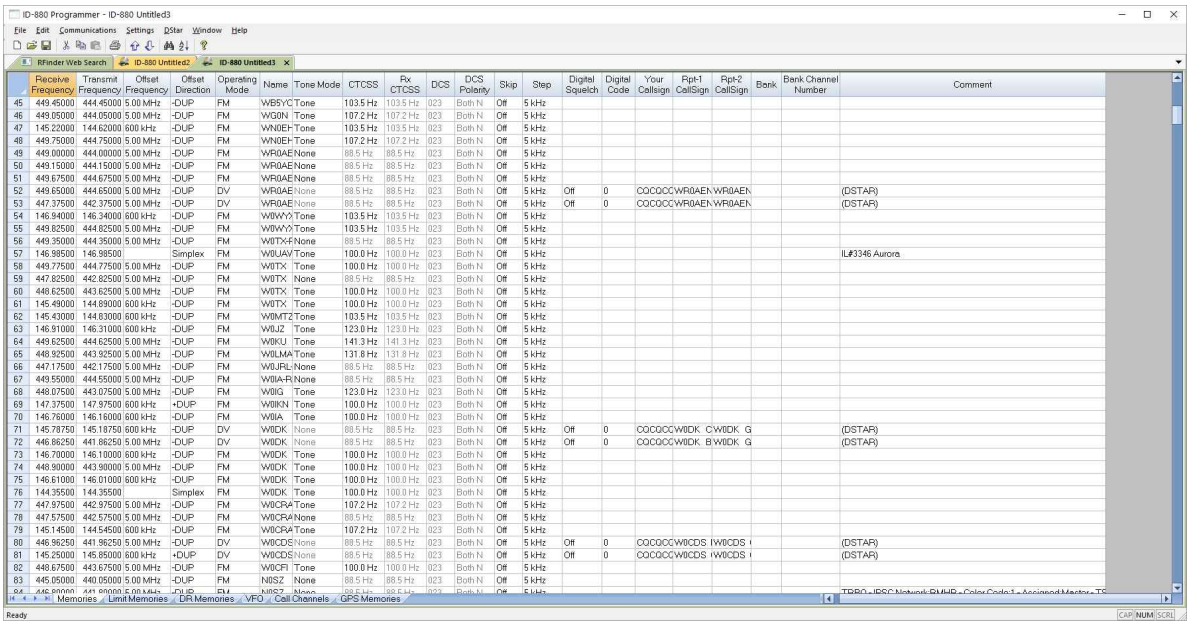
- Assign information for the Comment field: this is information that will not be transferred to the radio. It provides more details about a certain channel. You can select Callsign, City, State, Region, Repeater Notes or Sponsor for this field.



Once you finish refining the list, click Modules. Then click Create File for: xxx radio



The programming file for your radio is created.



A complete programming file with having to type only the location you want!

Part

15 ARRL TravelPlus*

RT Systems' programmers have a feature that opens a TravelPlus list in the radio programmer. This makes the data available for creating files for programming your radio without the need to import the data from a file.

This Help file contains sections on creating the list in TravelPlus* and on getting that list ready to program your radio. Takes only a few mouse clicks to have your radio programmed for that trip or other special event.

Creating a list in TravelPlus* - Brief details on this process. For more details, see the help file in TravelPlus*.

Opening the list in the radio Programmer - Details on opening the list in the radio programmer and the controls on that list.

Using the TravelPlus* list with an existing radio programming file - Sometimes you don't want all the repeaters found for an area by TravelPlus*... or you want to put what you found into a certain group of memory channels in the radio programming file. This section details how to use the list selectively in the radio file.

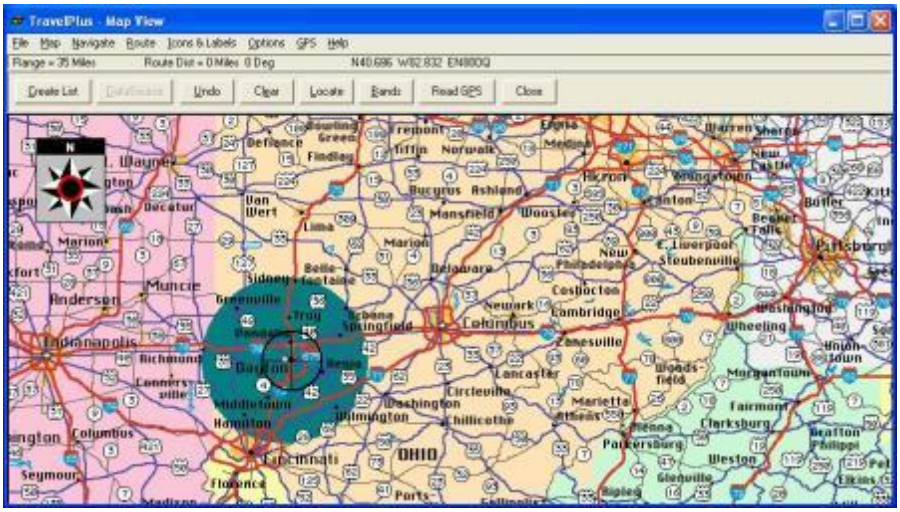
*TravelPlus is a product of the American Amateur Radio League.
Any images from TravelPlus included in this help are copyrighted to DHF Systems, LLC.

15.1 Creating a list in TravelPlus*

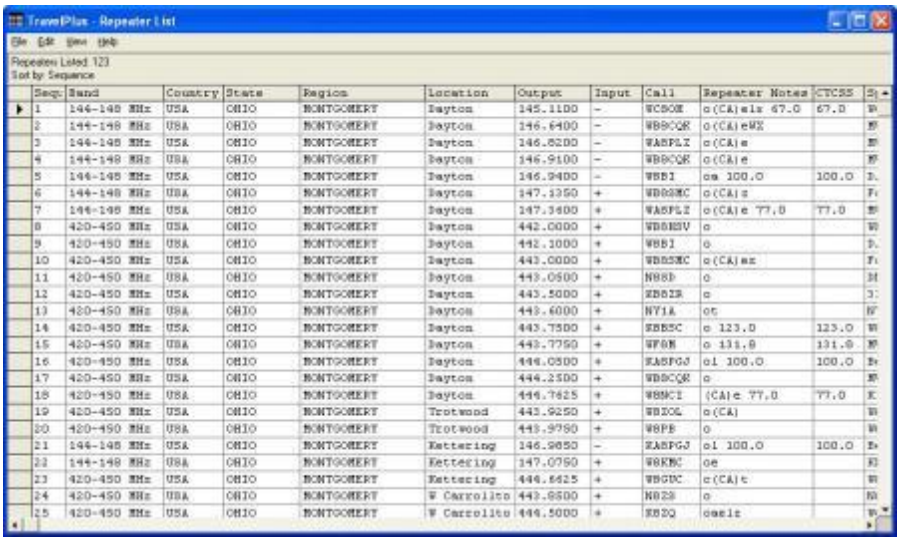
RT Systems' programmers have a feature that opens a TravelPlus* list in the radio programmer. This makes the data available for creating files for programming your radio without the need to import the data from a file.

These instructions very briefly cover creation of the list from TravelPlus*. It is not intended to teach you to use that program. Detailed instructions are included in this help for using the information from that list in a file for programming your radio.

Open TravelPlus* from the link provided when that program was installed. Select a location or create a route.



Once you have the area defined on the map, click the Create List button from the top of the screen. TravelPlus* displays the list of repeater frequencies found within your search area.



Seq.	Band	Country	State	Region	Location	Output	Input	Call	Repeater Notes	CTCSS	D
1	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	145.1100	-	WC8OH	o(CA)e1z 67.0	67.0	W
2	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	146.6400	-	WB8CQR	o(CA)eWX		W
3	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	146.8200	-	WA8PLZ	o(CA)e		W
4	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	146.9100	-	WB8CQR	o(CA)e		W
5	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	146.9400	-	WB8I	oa 100.0	100.0	D.
6	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	147.1350	+	WD8GMC	o(CA)s		F
7	144-148 MHz	USA	OHIO	MONTGOMERY	Dayton	147.3600	+	WA8PLZ	o(CA)e 77.0	77.0	W
8	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	442.0000	+	WD8HSV	o		W
9	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	442.1000	+	WB8I	o		D.
10	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.0000	+	WB8SMC	o(CA)ez		F
11	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.0500	+	N8SD	o		M
12	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.5000	+	WB8ZR	o		D
13	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.6000	+	NY1A	os		W
14	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.7500	+	WB8SC	o 123.0	123.0	W
15	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	443.7750	+	WF8M	o 131.0	131.0	W
16	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	444.0500	+	KA8PGJ	o1 100.0	100.0	D
17	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	444.2500	+	WB8CQR	o		W
18	420-450 MHz	USA	OHIO	MONTGOMERY	Dayton	444.7625	+	WB8CI	(CA)e 77.0	77.0	K
19	420-450 MHz	USA	OHIO	MONTGOMERY	Trotwood	443.9250	+	WB2OOL	o(CA)		W
20	420-450 MHz	USA	OHIO	MONTGOMERY	Trotwood	443.9750	+	W8PE	o		W
21	144-148 MHz	USA	OHIO	MONTGOMERY	Kettering	146.9650	-	KA8PGJ	o1 100.0	100.0	D
23	144-148 MHz	USA	OHIO	MONTGOMERY	Kettering	147.0750	+	W8KBC	oe		K
23	420-450 MHz	USA	OHIO	MONTGOMERY	Kettering	444.6625	+	WB8UC	o(CA)c		W
24	420-450 MHz	USA	OHIO	MONTGOMERY	W Carrollto	443.8500	+	N8ZS	o		N
25	420-450 MHz	USA	OHIO	MONTGOMERY	W Carrollto	444.5000	+	K8ZQ	oaelz		W

Check the list. If you don't like the results, try again. Once you are satisfied with the list, you are finished with TravelPlus*. You can exit that program or leave it running while you access the *RT Systems'* radio programmer.

Run the *RT Systems* programmer. If the programmer is already running, switch to it now to create a file from this list for programming the radio.

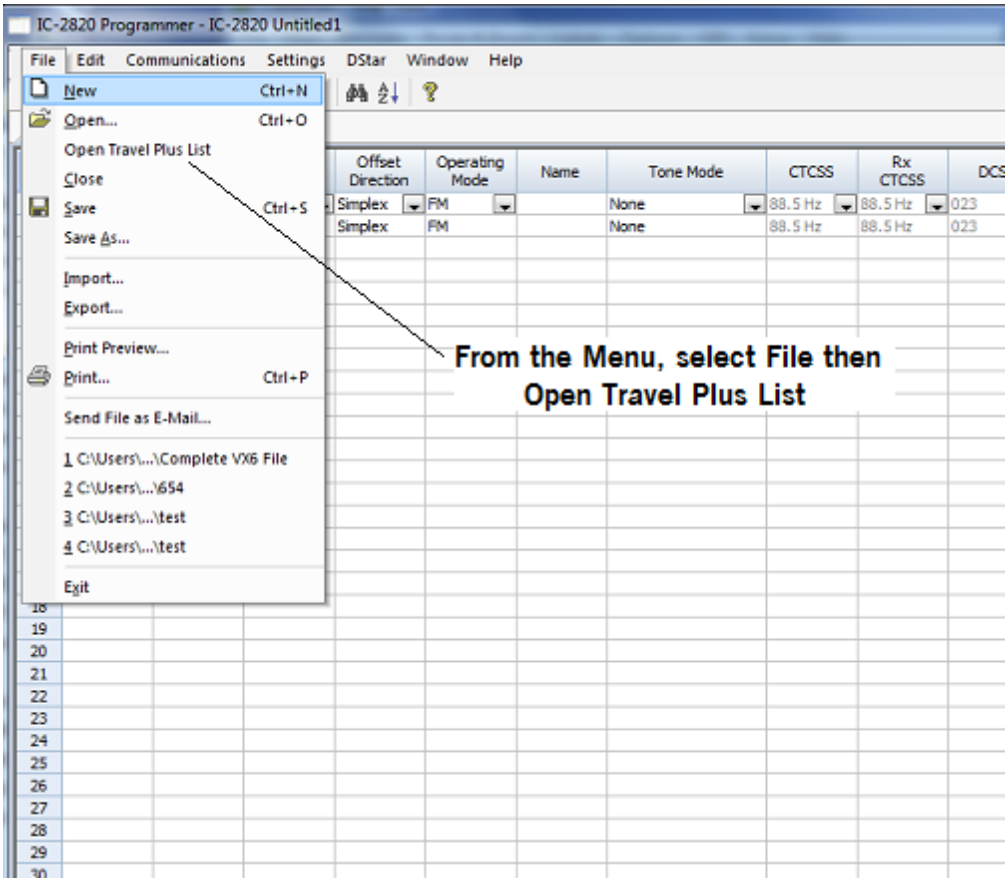
*TravelPlus is a product of the American Amateur Radio League.
Any images from TravelPlus included in this help are copyrighted to DHF Systems, LLC.

15.2 Opening the list in the Programmer

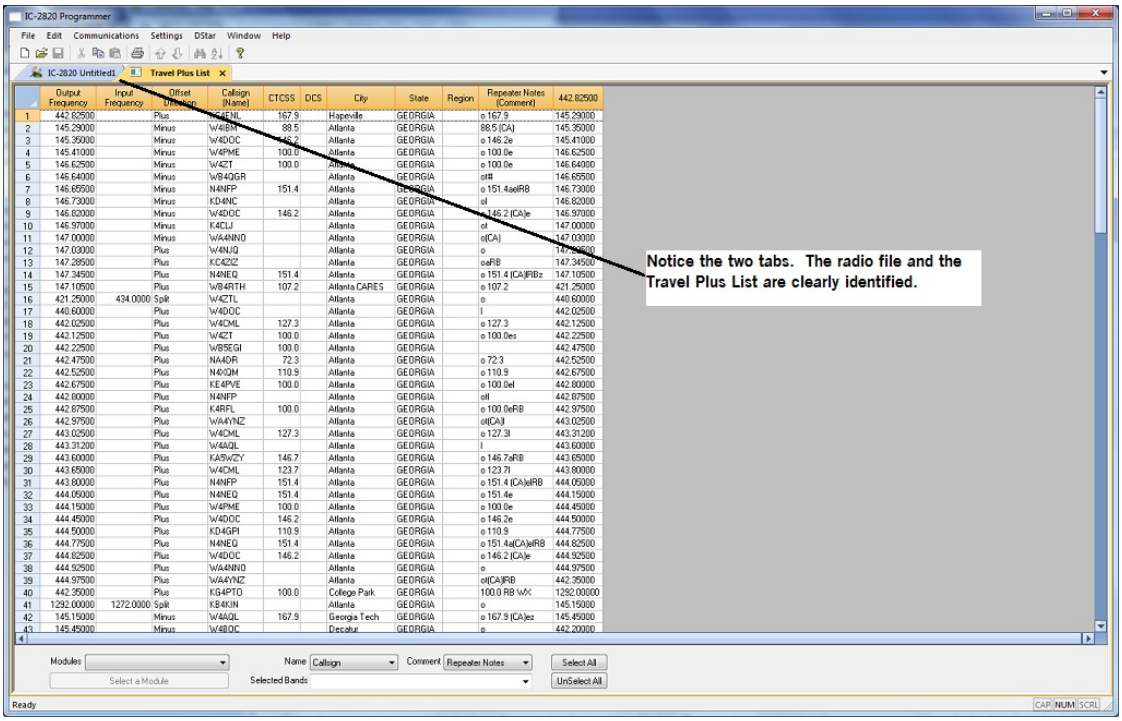
Once you have created a list in TravelPlus* (Version 10.0 or higher), open any one of the programmers installed on your machine.

To access the list:

- Select File from the menu at the top of the screen.
- Select Open TravelPlus* list (this option was disabled until you created the list)



- The list appears in the window of the programmer



Customizing the list for the radio file:

Several selections appear at the bottom of the window that contains the list. These options control how the programmer will handle the data from the list in creating the radio programming file. These fields and their options are described below.

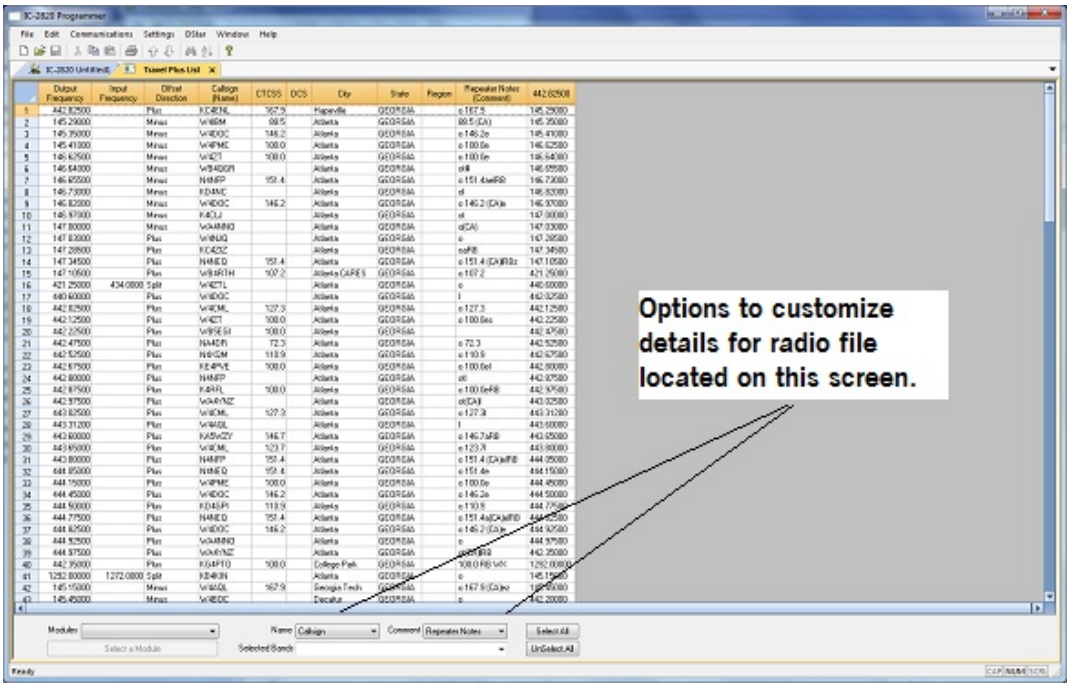
- Selected Bands: Lists the bands of the frequencies in the list. All the bands are selected by default. Uncheck those that you don't want as part of the file for the radio.

  If you are programming a 2 Meter radio with a file that contains 6 Meter repeaters, you can choose to eliminate those frequencies in this step to better understand what will be contained in your resulting file. If you skip this step, the programmer will omit these frequencies in the resulting radio file since the radio does not operate on these frequencies.

  If you do not eliminate the bands that cannot be used by your radio, the resulting radio file will contain blanks for each frequency the programmer removes during file creation. Although the radio does not care, you may not want all those blanks in your radio file.

  If the TravelPlus* list contains too many frequencies for the radio, using the Selected Bands option would remove unused frequencies thus

lowering the number in the file and making it possible to create a radio file with all those frequencies that you want. (i.e., Your TravelPlus* file has 512 frequencies in the selected area. Your radio has 450 channels. You Select Bands and eliminate 6M, 10M and 220 Mhz Bands. The resulting list now has 432 frequencies... few enough that they all will fit into the radio file.)



- Name: The TravelPlus* list contains information that does not "match" directly to a column in the radio programmer. One of the columns in the programmer accept data from these columns is the Name field.

  Name in the programmer is the field that sets the alpha display on the radio. Generally, this display is limited to 5-8 characters depending on the radio (other than the VX-8 that allows 16 characters).

  By default, the programmer associates Callsign from the TravelPlus* list to Name in the programmer.

  You can change that association by selecting another column from those listed.

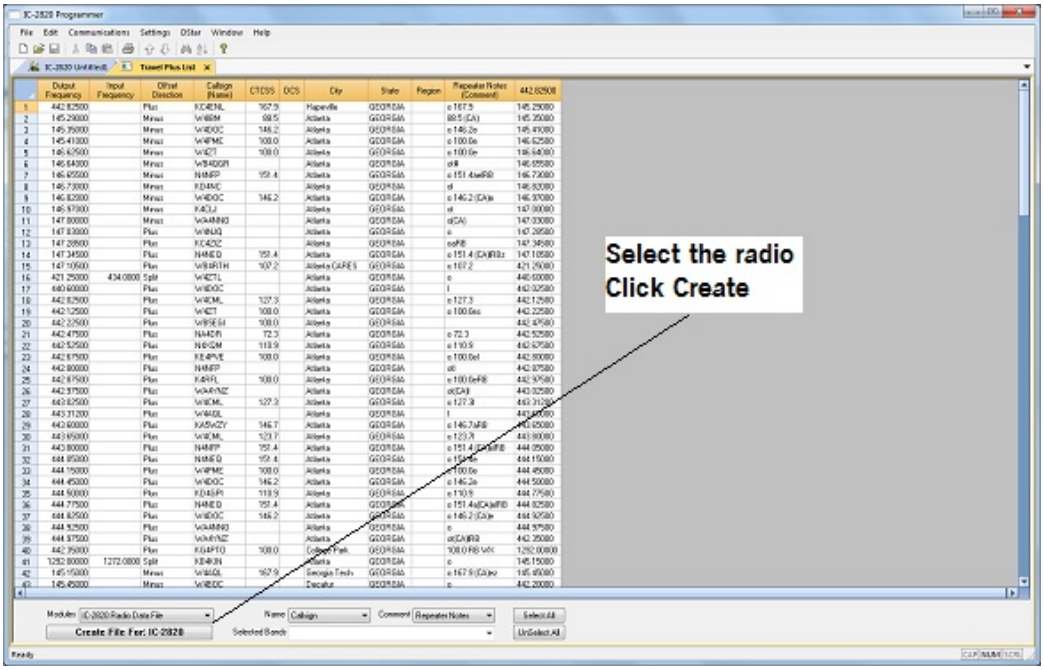
- Comment: The TravelPlus* list contains information that does not "match" directly to a column in the radio programmer.One of the columns in the programmer accept data from these columns is the Comment field.

Comment in the programmer is a field of information that helps you while you work with the programmer. This information does not transfer to the radio.

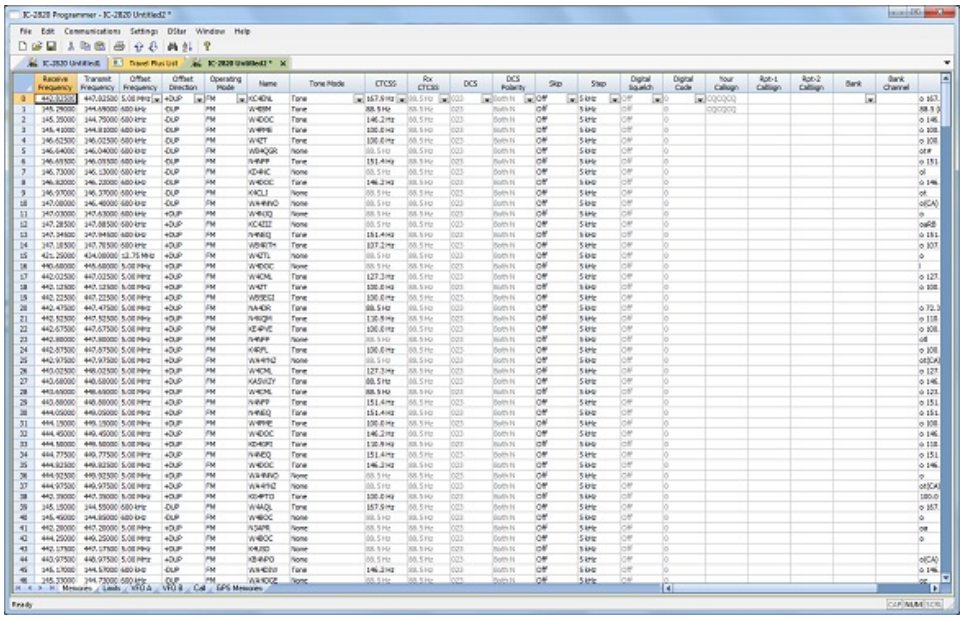
By default, the programmer associates City from the TravelPlus* list to Comment in the programmer.

You can change that association by selecting another column from those listed.

- Module: Select the radio for which you want to create a file.



The resulting file appears in its own tab.



The file is ready to be sent to the radio.

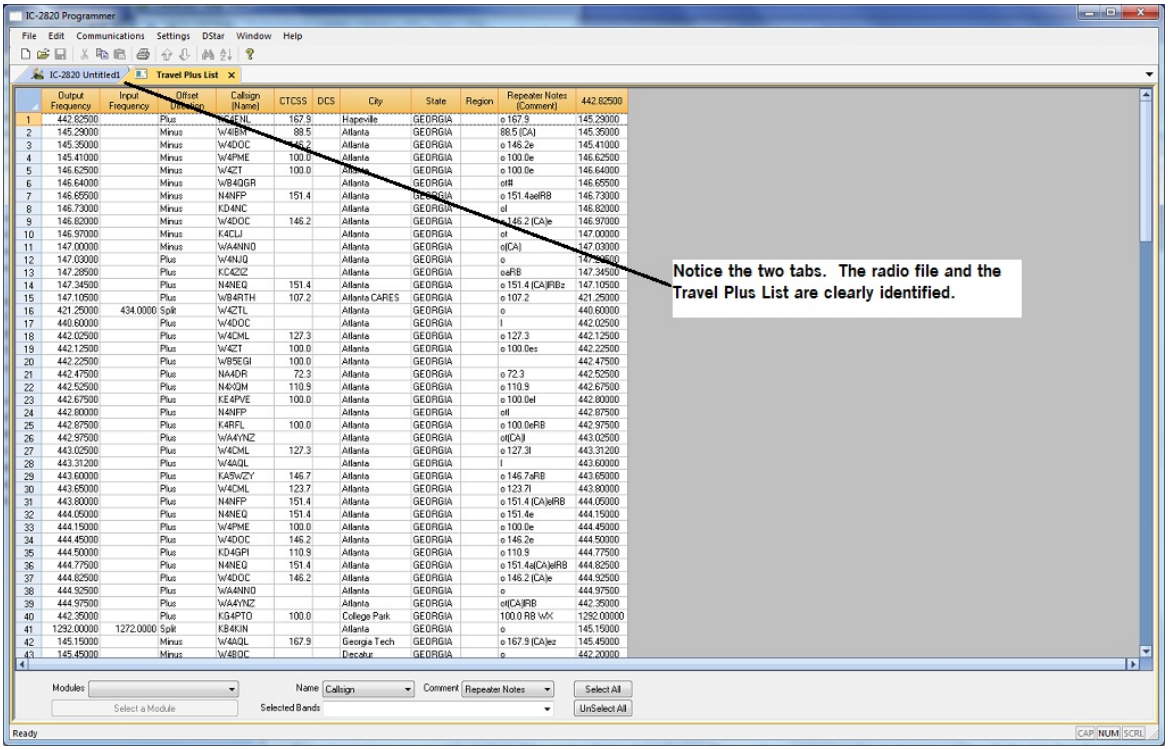
*TravelPlus is a product of the American Amateur Radio League.
Any images from TravelPlus included in this help are copyrighted to DHF Systems, LLC.

15.3 Using the TravelPlus* List with existing programmer file

You may not want to use all the information from the TravelPlus* list in a separate file for your radio. You may already have a file to which you want to add only some of the information from the List.

Using the list from TravelPlus* along with an RT Systems radio programmer (Version 4 or higher), you can copy and paste selected channels from the list to a file for your radio.

- Begin by creating your list in TravelPlus* as detailed in Creating a List in TravelPlus* in this help.
- Open the programmer.
- Open the file into which the frequencies are to be inserted.
- Access the TravelPlus* list through the link in the file menu. Both the list and the file are now open in the programmer. Working in reduced screen mode is helpful with this process to let you see both files at one time.

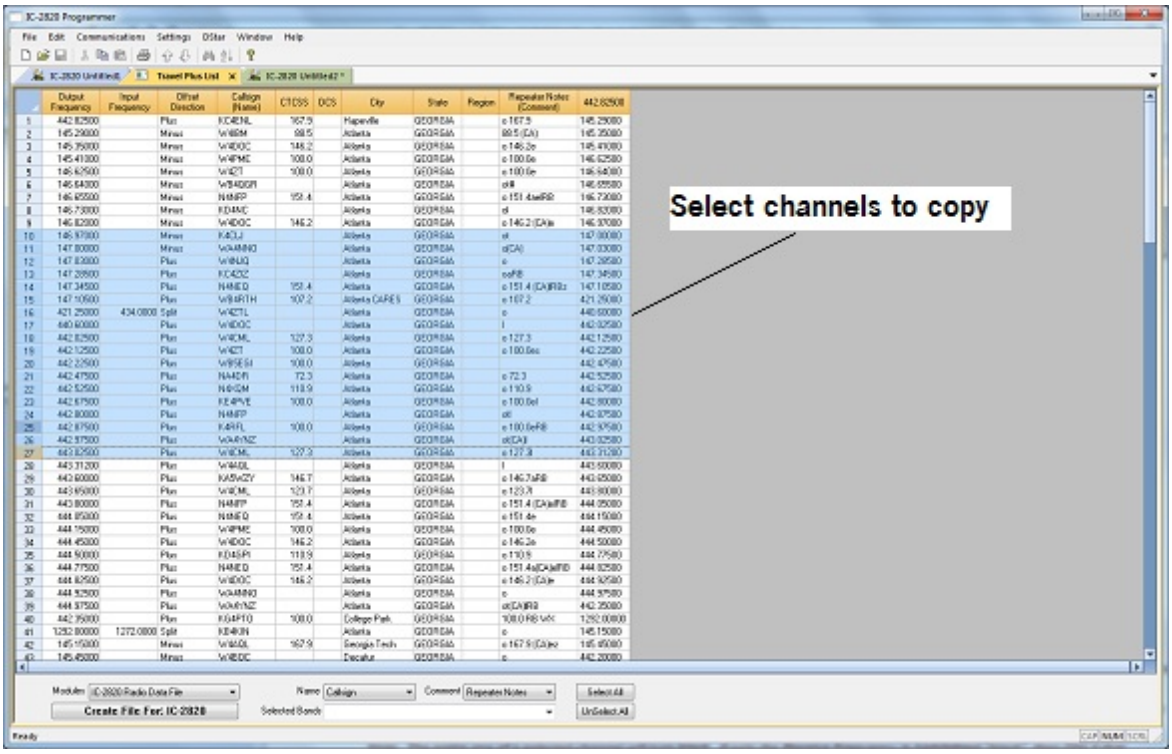


- Select a group of channels.

  Point your mouse at the CHANNEL NUMBER (the grey shaded column on the left) and left click. Don't let go of the left click button if you want more than one.

  While holding the left mouse button, drag the mouse over the CHANNEL NUMBER of all the channels you want. If there are more than those on the screen, just keep going at the bottom. The screen will scroll to let you continue your selection.

  Note: The entire row of a selected channel will turn be highlighted. If only the Receive Frequency is highlighted, then ONLY that information will be copied.



- Copy the channels

  With the mouse pointing at the highlighted channels right click and select Copy from the menu that opens.

  OR... with your mouse, left click to select Edit from the menu at the top

of the screen. From the menu that opens, select Copy.

It will appear that nothing has happened; however, Windows has copied the information.

- Use the mouse to click into the programmer file.

Note: If you are using the programmer in full screen mode, select Window from the menu then the programmer file name from the bottom of that list to switch between the two screens.

Alternately, you can select Window | Tile to have the programmer display the two windows equally in the main window.

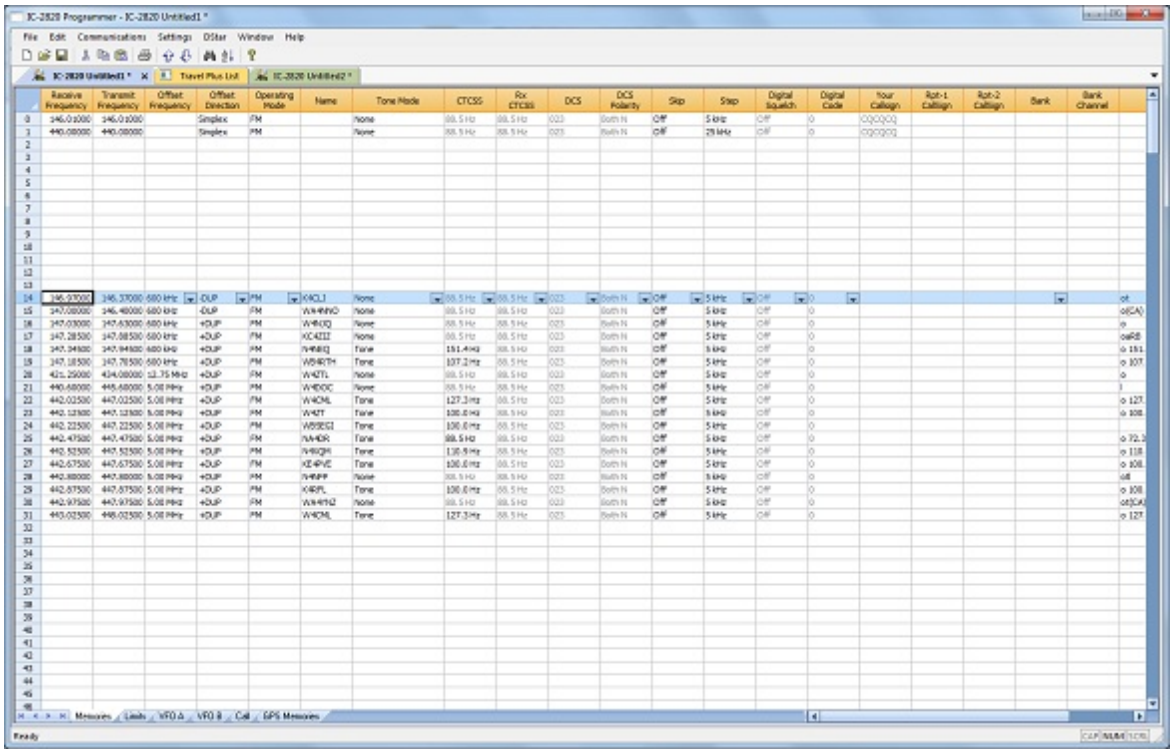
- Select the first channel in the file into which the information is to be pasted.
- Paste the information into the radio file

With the mouse pointing at the highlighted channels right click and select Paste from the menu that opens.

OR... with your mouse, left click to select Edit from the menu at the top of the screen. From the menu that opens, select Paste.

- View the results

The resulting file now contains only those selected pieces of information from the TravelPlus* list along with all the original information of that file.



- Save the programmer file to make this change permanent.

  Press Ctrl S or select File then Save from the menu that opens

  With either process it will appear that nothing happens; however, Windows has made the change to the radio file permanent.
- Send the file to your radio.

*TravelPlus is a product of the American Amateur Radio League.
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Part XVI

16 Copying From an Excel Spreadsheet

The Programmer can handle information copied from an Excel spreadsheet.

Although this process is valid for transferring data between these programs, it is not recommended for original file creation. It can be tedious getting all the information into the original Excel file that you are copying from. For example, why struggle to find information for the offset frequency and offset direction for your Excel list when the programmer will complete this information automatically when frequencies are entered there.

Limitations for use of another commercial spreadsheet program include:

- The spreadsheet program will know none of the limitations of the radio. It will allow you to enter any value in any space. You will have to enter transmit and receive frequencies, CTCSS tones, and DCS codes carefully to be sure they are imported correctly to the radio.
- You will need to organize your data carefully. The Programmer will import all the items from a single column as the same thing. This can cause an odd split to be entered as Simplex or a non-standard offset to be ignored if non-similar data is listed in the same column.

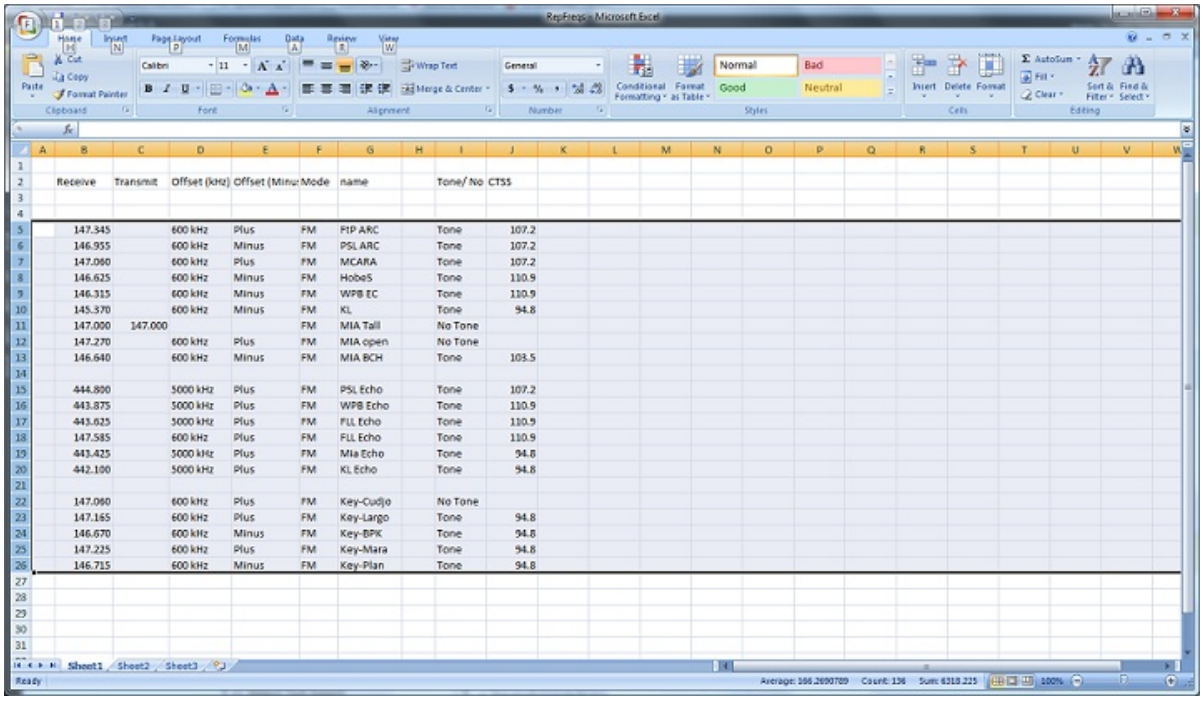
Let the Programmer help you as you create your original file with its defaults and automatic settings. Once the file is created you could export the data for other uses.

16.1 Step 1

The Programmer makes no assumptions about the information being handed to it from the Excel file. You need to be familiar with the data in the file to the point you can identify that data to the programmer during the copy process.

Step 1

Open the Excel file. Select and copy the information you want to put into the programmer.



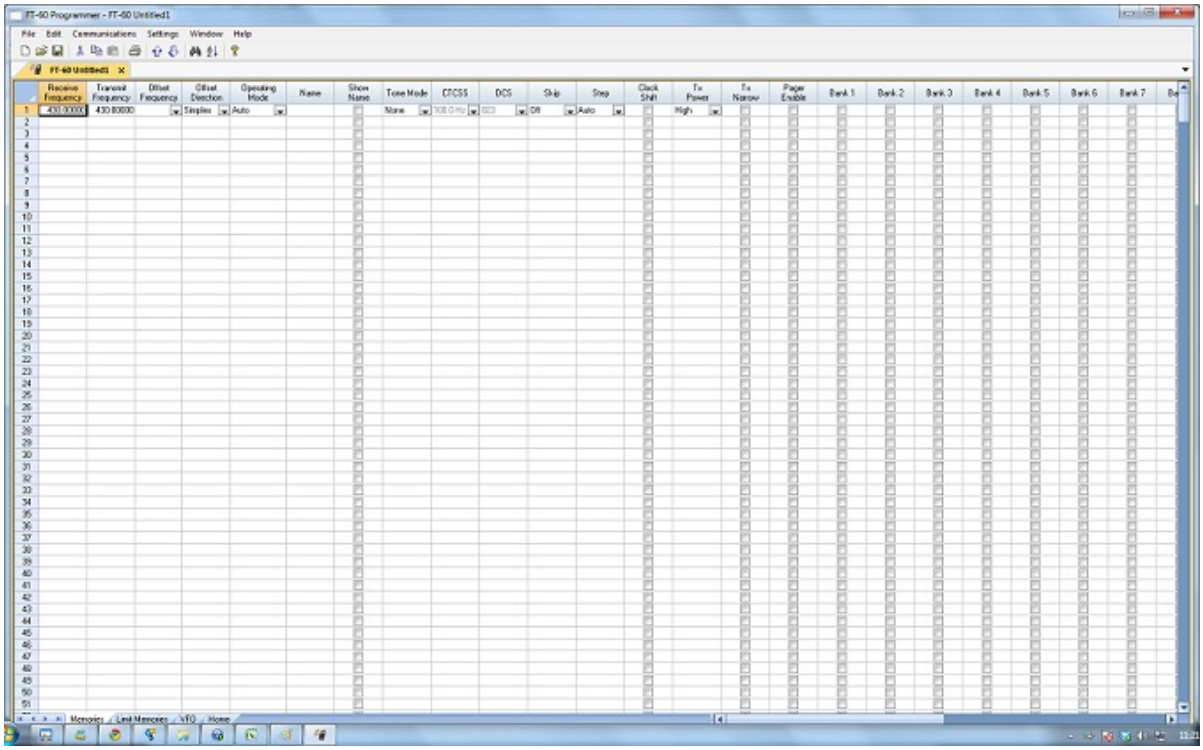
Receive	Transmit	Offset (kHz)	Offset (Minus	Mode	name	Tone/ No	CTSS
147.345		600 kHz	Plus	FM	PIP ARC	Tone	107.2
146.955		600 kHz	Minus	FM	PSL ARC	Tone	107.2
147.060		600 kHz	Plus	FM	MCARA	Tone	107.2
146.625		600 kHz	Minus	FM	HobeS	Tone	110.9
146.315		600 kHz	Minus	FM	WPB EC	Tone	110.9
145.370		600 kHz	Minus	FM	KL	Tone	94.8
147.000	147.000			FM	MIA Tall	No Tone	
147.270		600 kHz	Plus	FM	MIA open	No Tone	
146.640		600 kHz	Minus	FM	MIA BCH	Tone	103.5
444.800		5000 kHz	Plus	FM	PSL Echo	Tone	107.2
443.875		5000 kHz	Plus	FM	WPB Echo	Tone	110.9
443.625		5000 kHz	Plus	FM	FLL Echo	Tone	110.9
147.585		600 kHz	Plus	FM	FLL Echo	Tone	110.9
443.425		5000 kHz	Plus	FM	Mia Echo	Tone	94.8
442.100		5000 kHz	Plus	FM	KL Echo	Tone	94.8
147.060		600 kHz	Plus	FM	Key-Cudjo	No Tone	
147.165		600 kHz	Plus	FM	Key-Largo	Tone	94.8
146.670		600 kHz	Minus	FM	Key-BPK	Tone	94.8
147.225		600 kHz	Plus	FM	Key-Mara	Tone	94.8
146.715		600 kHz	Minus	FM	Key-Plan	Tone	94.8

16.2 Step 2

Open the Programmer to which the data is to be pasted.

It is recommend that you import into a new file to prevent loss of data from an existing file. Channel information can be copied to an existing file, and put exactly where you want it, after the process of copying from Excel is complete.

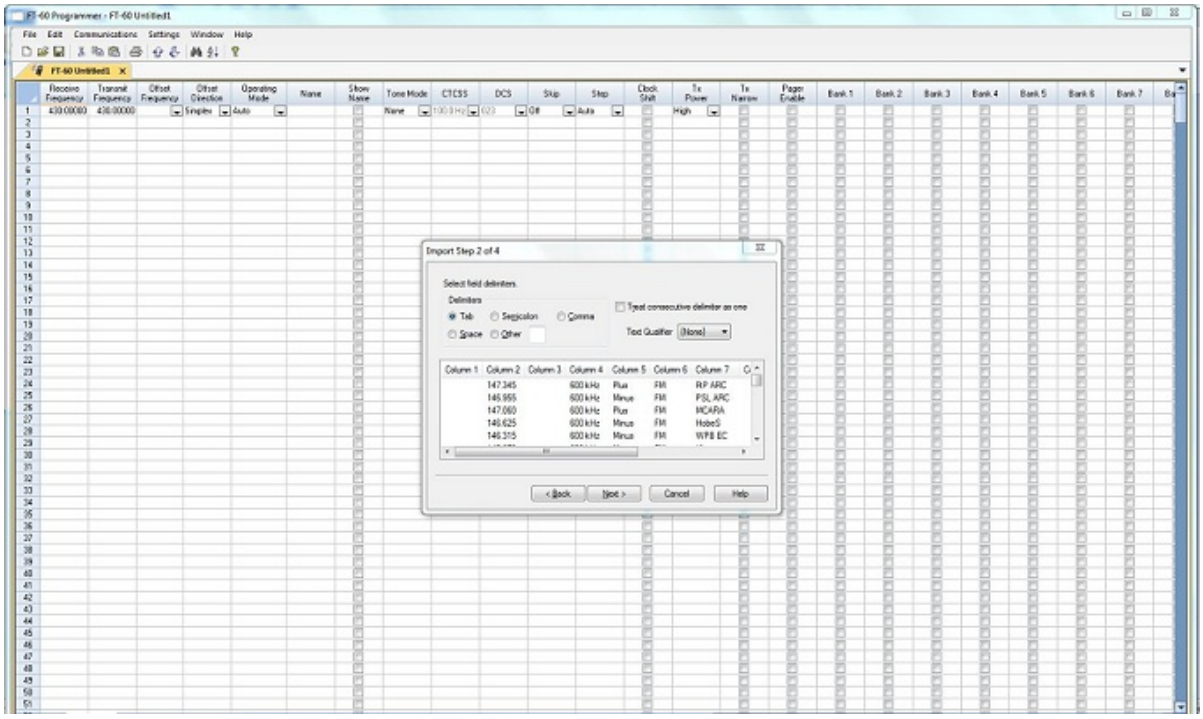
Note: The FT-60 is used here as an example. The process works the same for any RT Systems programmer (Version 4 or higher). Column names shown in the screen shots of this example may differ or not be available for your particular radio.



16.3 Step 3

Paste: Press Ctrl V or right click and select Paste or select Edit then Paste from the menu at the top of the screen.

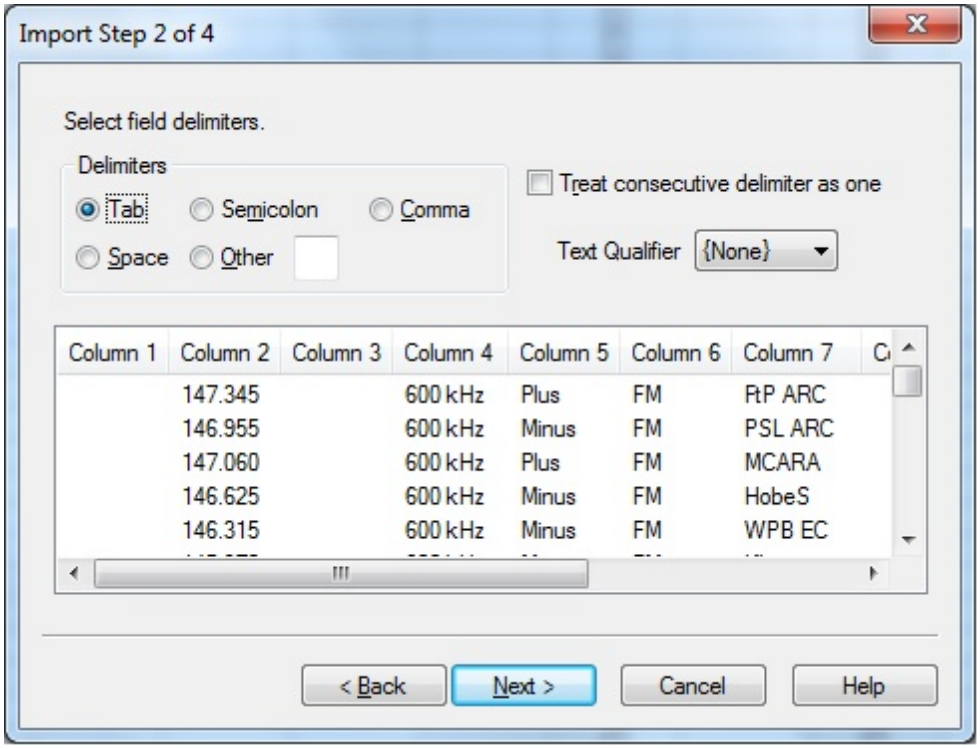
A window opens to complete the process.



16.4 Step 4

On this screen, you may need to use the Text Qualifier to remove quotes from your data.

The data should be appear as it does in this image: without quotes and separated into columns.

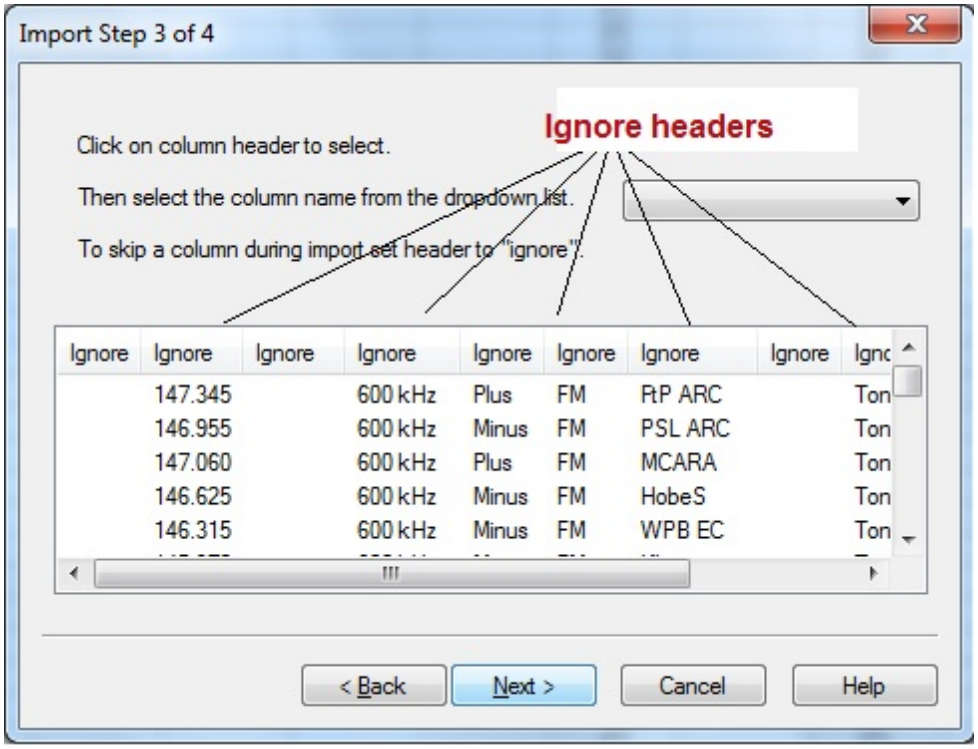


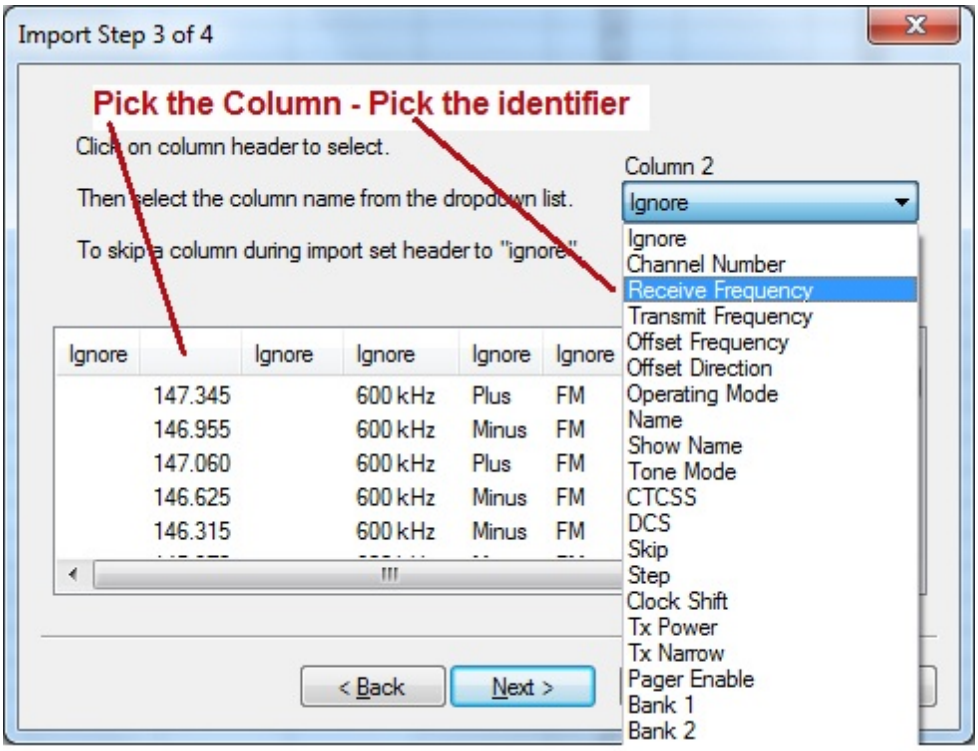
Click Next to continue.

16.5 Step 5

In this step of the process, you identify the information in your spreadsheet for the programmer. The programmer attempts to identify the columns based on the headers that you have for the columns in your original file.

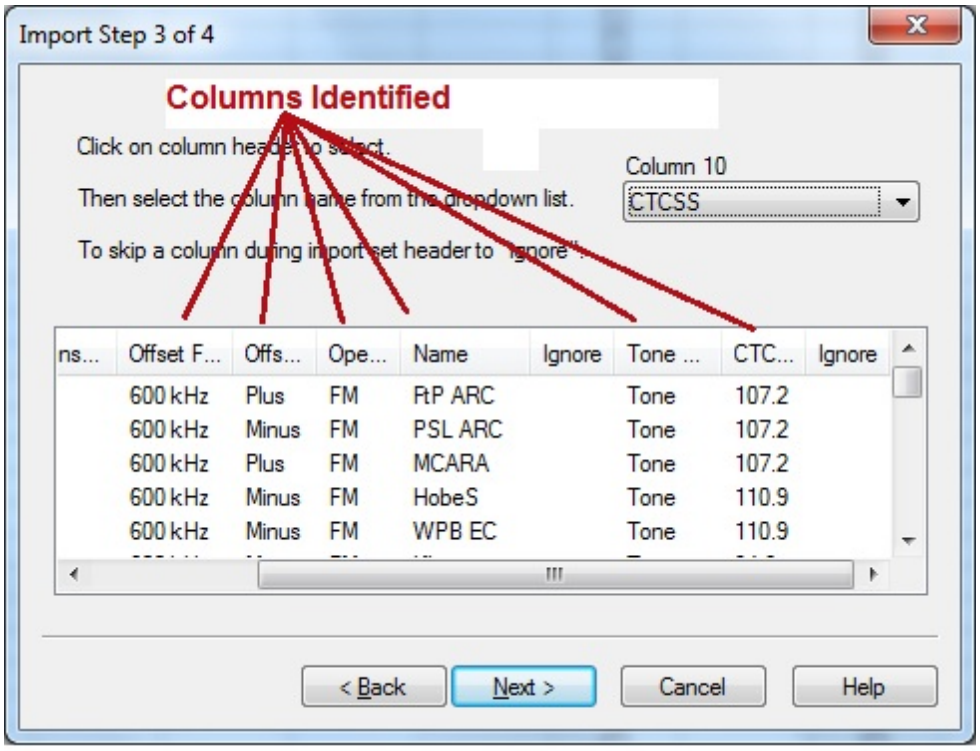
The programmer makes no assumptions and will set any non-matched column to "Ignore". The data in an ignored column will not be used in this process.





The column header changes to show your selection. Be sure to identify each of the columns you want used. The data in an "ignored" column will be set to defaults in the resulting file. Your specifics will not be used (the information will be ignored).

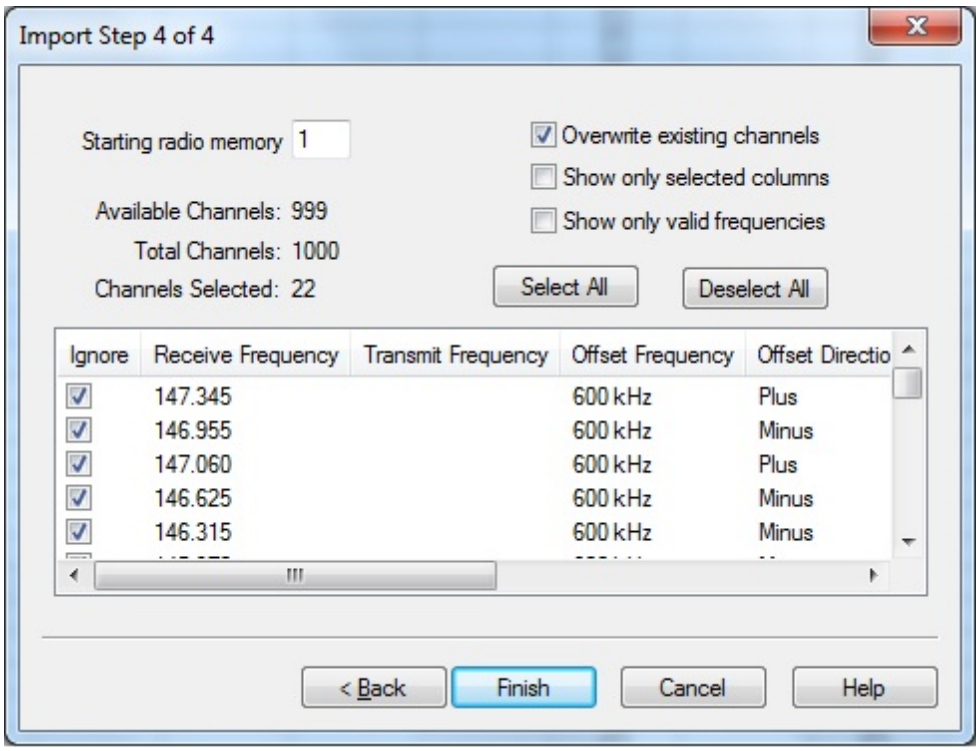
You ONLY need Receive frequency to import. The programmer will set everything else for the channel to defaults which means you will lose other important information (names, tones, etc.) if you don't take the time to tell the programmer that this information is available in the file.



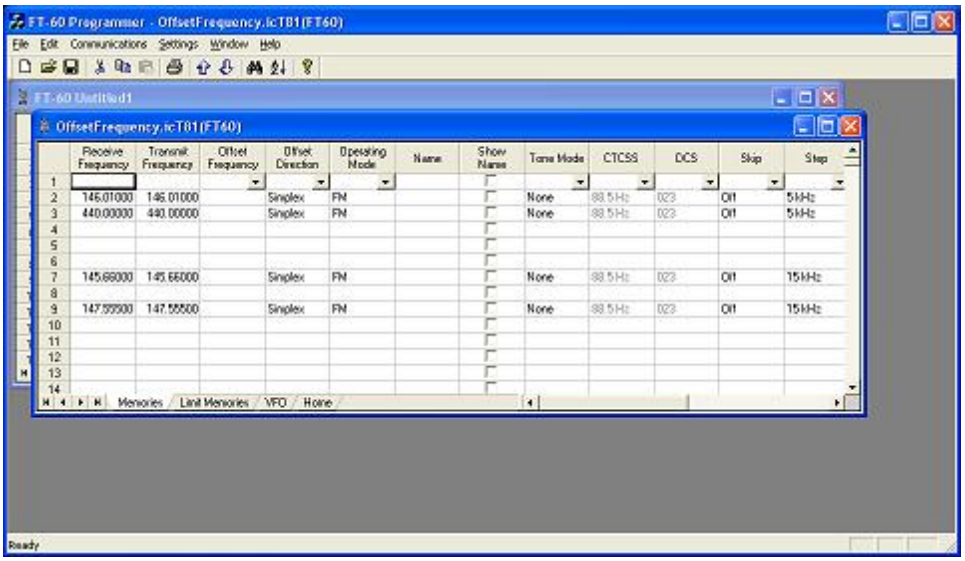
Click Next to continue.

16.6 Step 6

Complete the options on the final screen and click Finish.



The resulting file contains the data just as it was in the Excel spreadsheet.



Part XVI

17 Importing a file

The Programmer can Import data from delimited text files. These files can be created using the Export feature of the Programmer for another radio, Travel Plus for Repeaters by ARRL, commercial spreadsheet programs, or text editors.

Limitations for use of another commercial spreadsheet program include:

- The spreadsheet program will know none of the limitations of the radio. It will allow you to enter any value in any space. You will have to enter transmit and receive frequencies, CTCSS tones, and DCS codes carefully to be sure they are imported correctly to the radio.
- You will need to organize your data carefully. The Programmer will import all the items from a single column as the same thing. This can cause an odd split to be entered as Simplex or a non-standard offset to be ignored.

The easiest way to begin a text file for your Programmer is to Export a file from the Programmer first. In that exported file, you will see column headers for the details that the Programmer expects to import. You will also see the format of the information. You can edit or add to this file with any commercial spreadsheet program or text editor.

Note: The new features off the programmer include the ability to enter a series of channels by entering just a beginning frequency and the number to be entered, column editing, copy and paste of one or multiple rows of data, rearrangement of columns, hiding columns that need not be edited, and automatic completion of data based on band defaults for a frequency entered. Given that the programmer is designed for the data of the radio, you might find editing in the programmer easier than using another spreadsheet program.

The file to be imported must contain at a minimum Receive frequency to define a valid memory channel. The programmer will fill the rest of the details for that channel with defaults just as if that frequency had been entered.

The Programmer makes no assumptions about the information available. If a piece of information is omitted, the Programmer imports the memory as a simplex channel and fills other fields with defaults.

Although this process is very valid for transferring data from one radio Programmer to another and for using the data from other sources such as ARRL Travel Plus, it is not recommended for original file creation. It can be tedious getting all the information into the file to be imported just like the Programmer wants it. Let the Programmer help you as you create your original file with its defaults and automatic settings. Once the file is

created you could export the data for other uses.

17.1 Creating a file for Import

Checking a file to use with the Programmer

If you are given a file that you want to import into a programmer for use by your radio and are not sure if it is a "flat file", test the file by opening it with Windows notepad.

If the Notepad display is full of strange characters with very little legible text, this file is not ready to be imported by the programmer. The file may or may not be able to be used for import depending how it was created and saved.

Try opening the file in Microsoft Excel or other commercial spreadsheet program. If everything looks good there carefully save the file in as delimited text (this could be called several different things in the program that you are using. If the first one you try does not produce the file format that you want, try selecting a different File Type during the save process. The details for this process are included below for Microsoft Excel.

Open the file that you created during the save process in Notepad. As before, if the display is legible data separated by commas you are well on your way. If, however, the data appears in one very long line, you should return to the original source to extract the data with line feed breaks at the end of each record.

If the Notepad display has orderly lines of legible data separated by commas, it is ready for use by the programmer. It is fine if you see two commas right together. The process can handle a blank field.

Saving an Excel file for import

If you work on a file in Excel for import to the programmer, that file must be saved as a comma delimited file before you leave Excel. The Programmer cannot import an Excel file with all its formatting codes. What it can work with is the "flat file" output of that file.

- In Excel, select File|Save as
- In the Save As window change the Save as Type to CSV (comma delimited) *.csv
- Enter a file name for the output file. Pay attention to the drive and directory to which the file is being saved. You will need to be able to find the file later for use during import.

- Excel will raise a warning(s) about worksheets and formatting that will be lost if the file is saved in this format. Answer to the affirmative (OK or Yes) to the message(s);eliminating the formatting is exactly what you want.
- When you exit Excel, you will be asked again if you want to save the *.csv file. If you have made no changes since you lost saved, answer No. If you have made changes, answer Yes and proceed through the warnings again to save the file again.

Limitations for use of another commercial spreadsheet program include:

- The spreadsheet program will know none of the limitations of the radio. It will allow you to enter any value in any space. You will have to enter transmit and receive frequencies, CTCSS tones, and DCS codes carefully to be sure they are imported correctly to the radio.
- You will need to organize your data carefully. The Programmer will import all the items from a single column as the same thing. This can cause an odd split to be entered as Simplex or a non-standard offset to be ignored if the data is not in a column labeled correctly or is mixed in with dissimilar data.

The Import File

The Import function is designed to assimilate some if not all of the following pieces of information for use by the Programmer. As radio features vary, so will the information to be imported (i.e., frequency ranges, the way offsets are handled, special options such as mask, clock shift, etc.)

The very best way to begin an Import file is to export a file from the programmer. That will give you the headers for the columns that the programmer expects and formatting for the data in each.

Remember, you need only Receive frequency to import a file. All other details will be set to defaults for the field during the import process. As with all computer functions, the more information you can give it and the more accurate that information, the easier the process and the more accurate the results.

Channel Number: If your file has channel numbers and you opt to use this column

during import, your resulting file might not be what you expect.

- If the "Overwrite existing channels" option is checked: The information will be inserted into the specific channel no matter what is in the file at that location now . While the channel numbers can help to organize the information being imported, it can result in data being overwritten in the process
- If the "Overwrite existing channels" option is unchecked: The information from the file being imported will be skipped if there is already information in the channel. The data in the existing radio file will not be overwritten.

It is always recommended that you import into a new file to prevent data loss in an existing radio file. Once the information is in the programmer file, it can be copied into an existing file. With the copy process, you have more control of where the data is inserted into the file.

Receive Frequency: The very least a file must have to be imported is the receive frequency. This may be called the "output frequency" depending on whether you're referring to the radio or the repeater. If the column header is "Receive Frequency", the import process will recognize this label and identify the information automatically.

- Acceptable receive frequencies are detailed in the User's Manual for the radio. In the text file, the frequency should be entered in the format "MHz decimal kHz" (i.e., 146.450) with up to five digits following the decimal.
- Although, unacceptable frequencies can be entered into the text file, they will not be imported into the Programmer. They will result in a blank memory channel when import is completed.

Transmit Frequency: Enter a specific transmit frequency in the format "MHz decimal kHz" (i.e., 146.450) with up to five digits following the decimal.

This information can be omitted from the file.

- If you are importing repeater information where all the repeaters have standard offsets (none operates on an "odd" split) the import process will calculate the Transmit Frequency from other information in the file.

This information must be included in a separate column for an "odd split".

- The column cab be empty other than the specific information for those few "odd split" repeaters. The import process will calculate the Transmit Frequency from other information in the file for the other channels.
- Acceptable transmit frequencies are detailed in the manual for your radio.

Note: In the Programmer you can enter details for frequencies outside the transmission abilities of the radio; however, the software will not enable transmission on these frequencies. Transmission will be possible only if the radio has been properly modified.

Offset Frequency: This is the amount that the Receive Frequency changes to produce the Transmit Frequency. Standard offsets in the programmer include 100, 500, and 600 kHz (0.1, 0.5 and 0.6 MHz) and 1.0, 1.6, 3.0, 5.0, and 7.6 MHz.

- In Yaesu radios any value in 50 kHz increments can be used as an offset (i.e., .650, .550, .050)
- In an Icom radio, there are no Splits. Everything must be entered with an exact Offset Frequency.
- The Offset Frequency is used by the radio along with the Offset Direction to calculate the Transmit Frequency. The Programmer does the same.
- This is one place that the import process will make an assumption for you. It uses 600 kHz for the offset for VHF and 5 MHz for the offset for UHF if no other offset is specified.

Non-Standard Offsets

The Offset Frequency can be used in conjunction with Offset Direction for a value in 5 kHz steps (i.e., any value ending in .xx5 where x is any digit from 0 to 9). This gives you the ability to use the Reverse function of the radio although your frequency pair is not separated by a standard offset value. This is considered a non-standard offset.

To use a non-standard offset in your text file enter the Receive Frequency. Then the Offset Frequency as an exact value including the decimal to denote kHz. For example, given the pair 146.650 and 147.300, the Offset Frequency entered would be .650 (decimal six five zero). And the Offset Direction as Plus or Minus. With these three pieces of information, the import process will setup this memory channel correctly for use by the radio with the most functionality.

Note: You may see this import with one of the standard Offset Frequencies; however, once the file is saved, closed and reopened, the Plus or Minus and the Offset Frequency value as entered will appear.

Offset Direction: The Offset Direction lets the Import process know whether to add (plus) or subtract (minus) the Offset Frequency from the Receive Frequency when calculating the Transmit Frequency for the memory channel.

Enter Plus, Minus, + or - for the process to recognize the command.

NOTE: Be sure to use Offset Direction if your file contains + and &endash; in this column. Using Offset Frequency for this column will result in all channels being imported as simplex.

Operating Mode: Enter FM, AM, or WFM as appropriate for the frequency.

Name: Enter an Alpha/Numeric tag (up to 8 characters) for the memory channel to provide an easy reminder of the function of a particular frequency. Not all radios have this available for each memory channel. Consult your Users' Manual for details.

Tone Mode: Use of the tone systems of the radio allows for silent monitoring until a call is received with a corresponding tone. Tone mode also allows access to repeaters that are made private with a PL tone. Most radios offer CTCSS (Continuous Tone Coded Squelch System) or DCS (Digital Coded Squelch) to be tailored to your particular needs. Consult your Users' Manual for details specific to your model.

Use of either of the tone systems requires two steps. Your import file will handle these steps in THREE (3) columns.

- Step 1: Turning on Tone Mode
  There are now so many different tone modes and combinations of them, we recommend that you use the designation just as it appears in the Programmer for your radio to identify the Tone Mode to be used. Examples would include but not be limited to:
  - None - Tone mode off
  - Tone - Encode
  - T Sql - Encode/Decode
  - DCS - DCS Tone
  - Others specific to your radio as detailed in the Tone Mode column of the programmer.

- Step 2: Setting the tone frequency (CTCSS) or selecting the code for the tone (DCS).

Note: The CTCSS tone frequencies and the DCS tone codes should be stored in TWO separate columns in your file to be imported. The import process does not separate. It will ignore incorrect values leaving the tone set incorrectly for the channel.

- **CTCSS Tone**: Enter one of the 50 tone frequencies in the format MHz

decimal kHz with only one digit to the right of the decimal.

This value must be entered exactly as shown in the chart in the Users Manual. A value that is not in the table will result in an incorrect tone value setting in the resulting Programming file.

This value is set independently for each memory channel.

- **DCS Code**: Enter one of the 104 codes in a three digit format (This will appear as two digits if you editor does not show leading zeroes. Two digits are acceptable when the third is a leading zero).

  This value must be entered exactly as shown in the chart in the Users Manual.

  A value that is not in the table will result in an incorrect tone value setting.

  This value can be set independently for each memory channel that uses a DCS tone.

Skip: Marks selected memory channel to be *skipped during scanning* This field should contain one of the following:

Scan, 0, or Stop to include the channel to be scanned

Skip or 1 to mark the channel to be skipped.

PScan or 2 to mark the channel as Preferential Scan

Step: The frequency being used by the radio changes by the value of the step when tuning manually. This value is used by the radio in Memory Tune mode. This value is not critical in memory mode since the original memory channel frequency can be retrieved by exiting Memory Tune mode.

Enter 5/10/12.5/15/20/25/50 or 100 as needed.

Clock Shift: Shifts the internal reference frequency slightly to eliminate "birdies" that interfere on other channels.

Enter On or 1 / Off or 0

Tx Power: The output power can be set individually set for each memory channel to address the exact needs of each operation.

Enter High / Med / Low

Half Deviation: Enter On or Off as needed for the channel

Comments: Enter an identifying comment up to 80 characters.

You can see by the details here that creating a file for import can be a tedious process. Although this process is very valid for transferring data from one radio Programmer to another and for using the data from other sources such as ARRL Travel Plus, it is not recommended for original file creation.

Let the Programmer help you as you create your original file with its defaults and automatic settings. Once the file is created you could export the data for other uses.

The comma-delimited file can contain this information in any order. It must contain only the Receive frequency to be a valid memory channel. The Programmer makes no assumptions about the information available. If a piece of information is omitted, the Programmer imports the memory as a simplex channel and fills other fields with defaults.

This data can be entered in any order. You will identify the specifics to the Programmer during the Import process. If you find after several entries that you need another column for additional information, simply add it at the end. The Programmer will correct the order when it imports.

Save the data in your file often to prevent loss. Be sure to save the file as text with delimiters (separators) rather than as a worksheet of the program in which you are working. The Programmer cannot use a worksheet created by the other program.

To save as a text file, select File | Save (in the spreadsheet program). In the Save file window, select a different file type from the selection at the bottom of the screen. Acceptable formats are those that specify Text (i.e., .cvs, or .txt file extension).

Exit the spreadsheet program. Your file is ready to be imported into the Programmer. Changes can be made within the Programmer after you import the data.

17.2 Import - Step 1

In the Programmer, select File | New.

It is always best to import to an "Untitled" or new file. The new file is used as a temporary stopping point for the data. This way, if the results as not quite as you expected, you simply close the file without saving and begin again... in another new file.

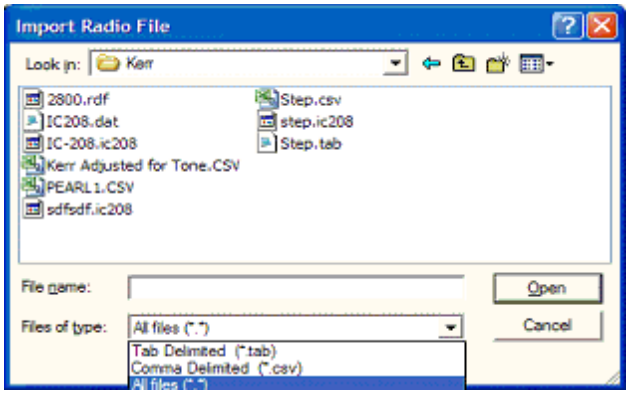
Working in a new file eliminates the possibility that existing data will be overwritten and lost during the import process. From there use the tools available in the programmer (copy and pate, column editing, sort and unsort, etc) to get the data just as you want it.

If you want the data to be a part of an existing file, use copy and paste to move it from the new file to exactly where you want it in the existing file.

Importing

In the Programmer select File | Import.

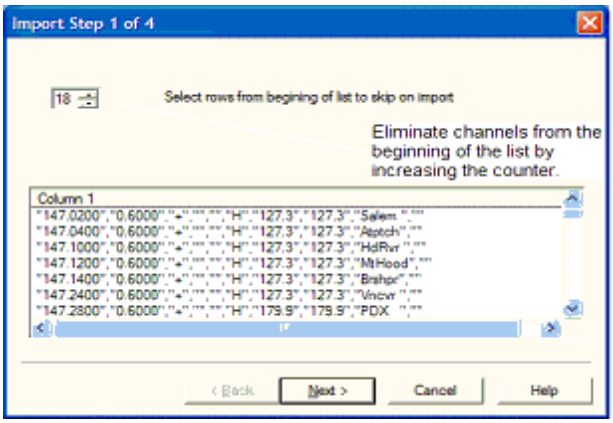
From the Import Radio File dialog that opens, select the file to be opened.



This screen gives you the ability to find and open the file to be imported.

- Use "Look in:" at the top to change directories as needed
- Use "File of type:" at the bottom to show other files in the directory you selected. Since the most common file types are *.csv and *.tab you may need to change types for your file to appear.
- Once your file is highlighted, select Open to proceed.

Import Step 1 of 4: Identify one or more of the first rows of data to be omitted



This screen was used originally to omit headers, columns without data, from the import. This is no longer necessary.

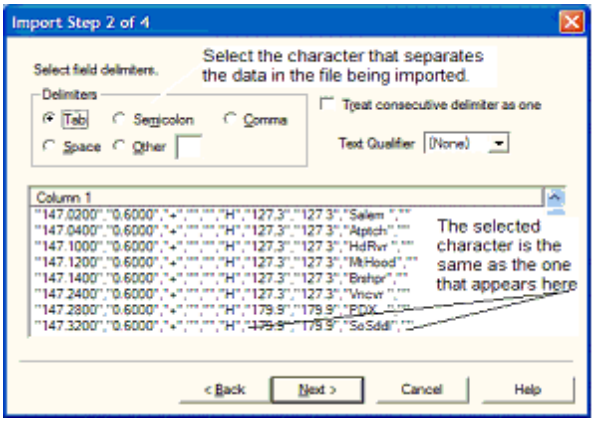
> ***Actually, it is recommended that you leave the headers to help you more easily identify the information in a later step.***

This step remains useful for eliminating a number of memory channels from the import process. For example if your file contains more channels than are allowed by the radio. You could eliminate multiple channels here rather than later in the import process.

Click Next to continue.

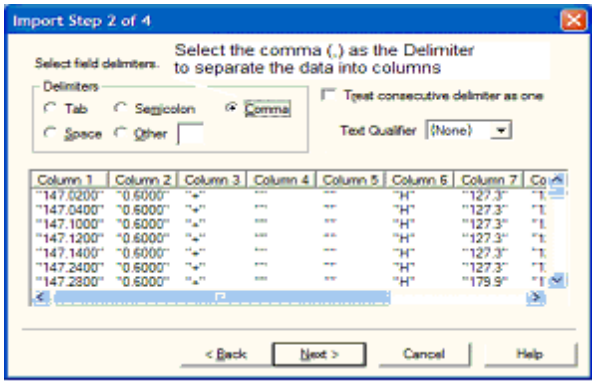
17.3 Import - Step 2

Import Step 2 of 4: Identify the delimiters (separators) used in your file.



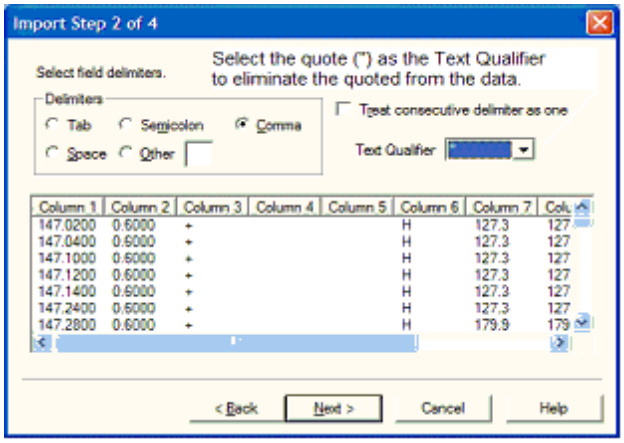
The data in the file to be imported is separated by tabs, semicolons, commas, space or other non-text characters. Select from the list at the top of the screen or enter the one you used.

Once you select the correct delimiter, the data will properly separate into columns.



Examine the data to be sure that it is ready for the Programmer to process. Look at the data in the window. Select the proper Text Qualifier if you have single or double quotes within a data field. With quotes present, the import process will handle all the data

incorrectly resulting in a blank file. Once selected, the quotes are removed and the data appears as shown.

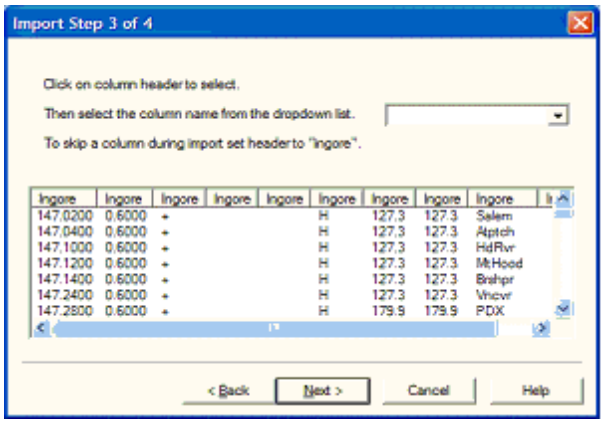


Click Next to continue.

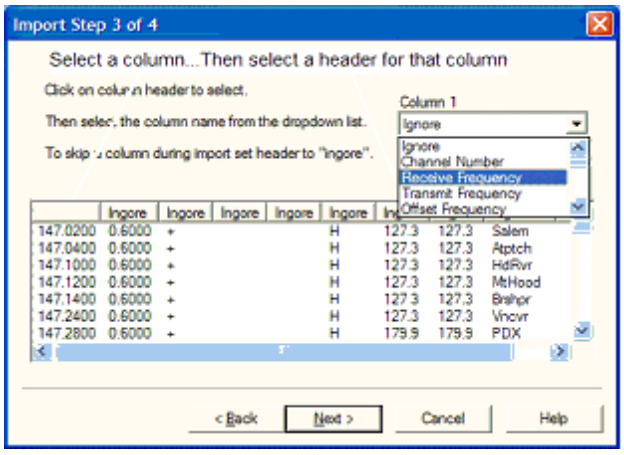
17.4 Import - Step 3

Import Step 3 of 4: Identify the data to the Programmer

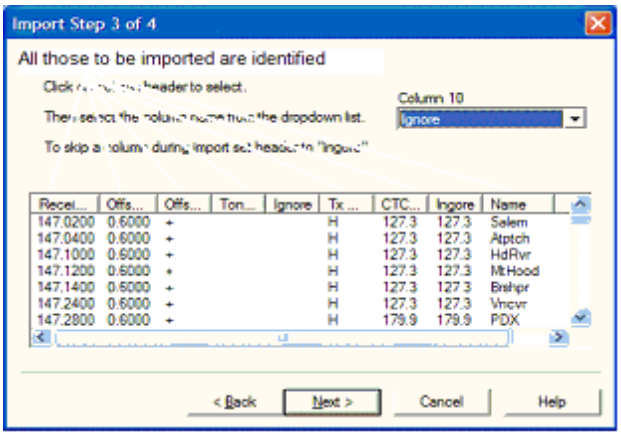
The Programmer will make an attempt to identify the information in your file. In this step of the process, you can make corrections to the assignments the Programmer has made and identify other columns that you want imported.



For the columns to be imported, select the header of the column (the little grey box just above the column) then select the proper identifier from the drop down list at the top of the screen



You need to identify only those columns to be imported.

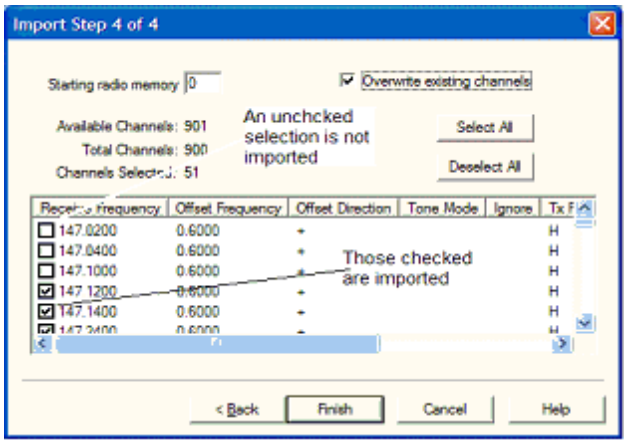


Click Next to continue.

17.5 Import - Step 4

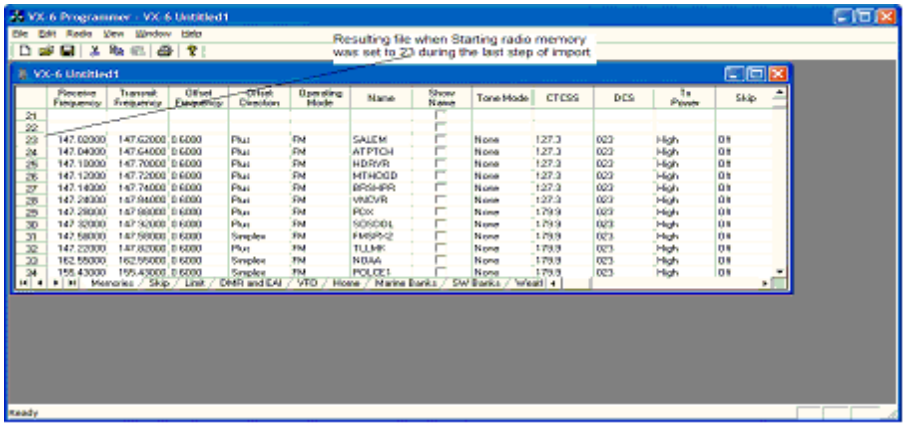
Import Step 4 of 4: Limit the channels that are imported by the Programmer

Again, you can make adjustments to the data to be imported without having to edit the original file. Select all or any part of the list by checking the box at the left of the screen.



Since the data can be imported into an existing file, use the boxes at the top of the screen to place the data in the file where you want it to appear.

- Starting radio memory - Insert the channels into the file somewhere other than at the beginning (i.e., At the end of a list that has the last channel of 21. Enter 22 in this box to begin with the next memory channel of that file).
- Overwrite existing channels - Tells the process to replace data it finds in the existing file or to skip that data and write in the next available channel. For example:
- Unchecked - If you import into a file with memories in channel numbers 1-10, 12, 15 and 16 the process would write the imported channels in order to 11, 13, 14, then 17 on to the end of the imported list.
- Checked - If you import to a file with memories in channel numbers 1-10, 12, 15 and 16 the process would write the imported channels in order beginning at channel 1and continue in order to the end of the imported list. The existing channel data of the file would be lost in the process as it is replaced with that of the imported file.
- Finish - Click to compete the process. The resulting file in this example would look like this:



Part XVI

18 Export

The programmer can export, "convert" , the data of a radio programming file to a flat file for use in other programs. This will create the file that you need is someone asks you for a "csv" or Excel file.

You control two parts of export

What is exported from the file

Where the exported file is saved on your hard drive.

What is exported from the file

The file created through export contains the data on the screen that is open when the process is begun.

If a radio has Right Memories and Left Memories, it will export the data of the Right Memories when you are viewing that screen when the process is begun and the data from the Left memories if you are viewing that screen.

Each export should be directed to a separate file. If you use the same filename, you will replace the data from the first export with that of the next.

Where the exported file is saved on your hard drive

Select the section of the file to be exported.

Click File | Export

A Save dialog box opens. You have complete control of the filename and location of the file on your hard drive in the options in that Save dialog box.

Pay close attention to the filename and directory designation of the resulting file. You want to be able to find it easily later.

Part

19 Troubleshooting

Technical support is available from *RT Systems* at the times and number shown in the *Contacting RT Systems* of this help.

As issues are addressed by Techsupport personnel, the issue and the result are often detailed on the FAQ page of www.rtsystemsinc.com Check there for additional information that might pertain to the exact issue you're seeing with your radio.

Detailed here are several of the more common problems that you may want to check before you contact technical support.

"The data from the radio will overwrite this file. Continue?"

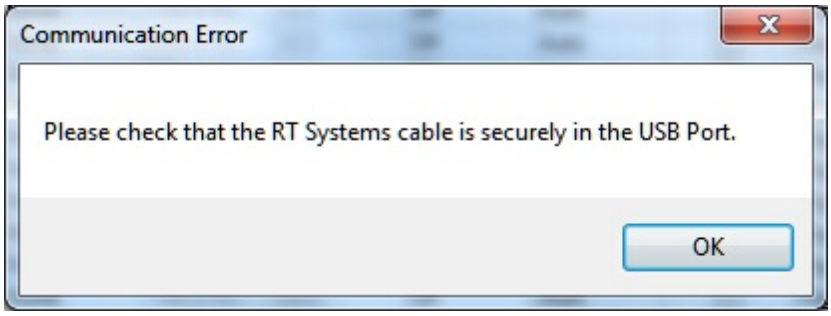
This message will be raised by the programmer when you select Communications | Get data from radio with a file open that is not a new (default) file into which no entries have been made.

This message is warning you that you will replace any information you have entered with whatever is in the radio. The "whatever" could be all blank channels.

Answer "yes" if you want to lose all the information that appears on the screen. Answer "no" if you don't want to lose several hours of work spent creating the file on the screen. To prevent loss of information, first do File | New to open a new (default) file. Then while looking at that file, do Communications | Get data from radio and complete that process. Your file will drop to the background and be protected from during this part of the process.

Once you complete Communications | Get data from radio, return to your file a) select the tab at the top of the page; or b) select File | Open and open the file from the list presented (if you closed it some time during the process.)

Program cannot find cable



This message can appear when you are attempting to get data from the radio or send data to the radio. There can be several causes. The most common are:

The cable is not attached to the computer or you have the wrong programming cable attached. The cable for this radio is pictured in the ***Computer to radio cabling*** section of this help.

The communications process was accessed too quickly after the cable was attached. It can take some computers a minute or more to recognize the cable properly. Give the computer a little more time and try again.

The problem may lie in the electronics of the cable. If this is the first time you have attempted this process, contact RT Systems for assistance. This can be corrected easily in just a few minutes with the computer and an Internet connection.

Note: This can be corrected using a machine that has an Internet connection that you don't plan to use for the programming software. The software for the radio does not have to be installed to complete the correction.

HotSync, the program for the Palm Pilot, is running on this computer. Hotsync immediately takes control of an available comport. Since the RT Systems programming cable establishes a comport, Hotsync takes control before you have a chance to use it. Look for the icon, red and blue arrows chasing each other, in the tray at the right of the task bar. If found, right click and exit. That program will load again when you re-boot your computer. You will need to disable this software any time you program your radio.

Interference from other cables attached

The Programmer is designed to find the cable to be used by this radio for programming. This process is done through special identifying numbers programmed into the electronics of the USB connector.

The process looks at each USB device attached. Other items attached, especially

other programming cables, may cause the programmer to wrongly identify the RT Systems cable it must use for a specific radio.

Two different errors can occur in this configuration. Either the programmer will report that the RT Systems cable is not attached to the USB port or the Communications process will not respond since the data being transferred from the radio (you did press all the right buttons) is traveling along a cable other than that the programmer is connected to.

Interference from other applications

Your radio is not the only device you attach to your computer for programming or data interchange. I-Pads, I-Pods, Palm Pilots and other PDA devices, printers, cameras and others all install programs for their use. Unfortunately, many of these programs run constantly looking to be used any time a cable is attached.

These programs take control of the cable even if it is not for their device. This renders the cable useless for its intended purpose.

You may not even be aware that these programs are running. You may have sold the device months ago; but unless you took steps to permanently disable the software for it, the problem remains. These programs run start whenever the computer is started or brought back from hibernation then run in the background with little indication that they are there.

Begin checking by hovering over each icon at the lower right of your screen. Those in the taskbar. A name will appear as you pass over each. You may recognize the one that needs to be disabled. Usually an option to Exit or Close will be available from a right click menu. Don't worry about exiting something you might need. The application will begin again when you restart your computer.

After addressing a program, check in the programmer. You should be able to click OK on the Communications | Get Data from screen and have the process continue instead of raising the error message.

Tech support at RT Systems will be glad to help you with this; but we are limited given this is an issue specific to the applications running on your machine. You are welcome to contact us for help with this issue.

Defective Cable

Cables from RT Systems are 100% tested prior to packaging. Even with this level of control, occasionally a cable fails in the field. Contact RT Systems tech support if to

determine if the cable is at fault and a replacement is needed.

A replacement can be initiated when you send a copy of your receipt as proof of purchase and the issue has been diagnosed with a tech support representative at RT Systems. In this case, a replacement will be sent immediately with a prepaid label for return of the defective item. The replacement will be sent to the address on the receipt.

If the receipt is not available, return the original cable for replacement. A replacement cable will be sent immediately when the defective item is received at our location.

USB Driver Installation

On some systems running Windows 2000 or early versions of XP, the drivers for the cable will need to be installed manually. This is a normal thing in the USB world and is easily done.
We are *RT Systems* will be happy to help you through this process.

With the USB cable detached from the computer, start the New Hardware Wizard from the indication for the device in the Device Manager.

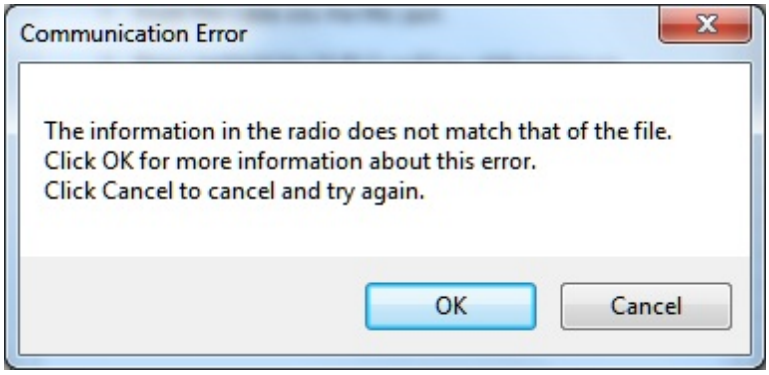
The drivers have been installed on your machine in the following directory.

C:\Program Files\Common Files\RT SystemsV4\RTDrivers\USBComDrivers\Drivers

Run the New Hardware Wizard twice. The first time use ftdibus.ini in that directory. The second time use ftdiport.ini in that same directory.

Then attach the cable again. Check in Device Manager to be sure it is now listed under Ports (Com and Lpt) with a comport designation assigned.

Modified Radio



This error is raised when you attempt to send a file to a radio that is modified before the programmer is given that information.

If your radio has been modified, you must complete Communications | Get data from radio into a new file before you attempt to write data to the radio. When the Get data from radio process is used, even if the radio is not yet programmed, the Programmer gets the data it needs to know that the radio is modified.

When you use Communications | Get data from for the sake of establishing communications, you need to save the file ONLY if you want to save the memory data that is currently in the radio. The Programmer already has what it needs. The option to save is available should you want to save the pre-programmed data.

Cabling to properly address the radio

The RT Systems Programmers work only with the RT Systems' USB cables
No other USB cable will be recognized by the programmer.

RT Systems' programmers address over 100 different radios. Of those, some program through the speaker jack, some through the mic jack, some through the data jack and some through the CAT port. These ports must be addressed by the correct RT Systems cable for communications to be successful.

Be sure to use the correct RT Systems cabling to address the radio being programmed. Check the User's Manual for the radio if you are not sure where the port is on the radio that is specified in the programmer. The cables for this particular radio are pictured in the *Radio to Computer Cabling* section of this help.

Specific to the FT-857/D and FT-897D: The cable used for programming is the USB-62 cable with the 8-pin mini din plug. This plug is attached to the CAT jack on the back of the radio. Forcing this connector into the data port will ruin the plug and could damage the radio. There have been cases where the power pin and the PTT were

connected (since you never know which pin will go which way when you force them out of place) causing several hundred dollars in damage. Check to be sure you are connecting the cable to the matching jack before forcing the pins into the holes.

At the time of this writing (2009), none of the Yaesu VHF/UHF mobile radios used the USB-62 cable with its 8-pin plug. We have seen this tried. It will not work. The mobile radios that program through the data jack require a 6-pin mini din connection on the cable. Check the cabling specified in the help for the radio that you're programming to be sure that you're using the right one to address the radio.

Icom specific issue for Clone mode

Other than the Icom IC-R10, at the time of this writing, Icom radios are NOT put into CLONE mode for programming. CLONE mode is used only when you transfer data from one radio to another.
The process for programming the radio from the computer is simple. When the instructions say to "Turn the radio on", do just that, press the power button to turn it on. If pressing a key is needed as a part of this step, it will be included with the instructions on the Get data from screen.

Yaesu Radio does not go into Clone mode after initial menu selection

Many Yaesu radios, handheld and mobiles, access Clone mode from a startup menu. When you turn the radio on holding the specified key, you are in that menu with several options of radio functions. Clone is only one of these options.

Once the Clone option is found in that menu, another key on the radio is pressed to activate that mode. You know the options has been activated when the radio cycles off and back on. Only then is it in Clone mode and ready to program.

If the radio does not cycle off and back on when that next button is pressed, one of the following may address the issue:

The keys on the face of the radio are locked. Turn the radio off and back on in normal mode to check for the Lock symbol on the screen. Unlock the keys and try again.

You have pressed the designated key too long or not long enough. Try again until you get the feel for the process.

Yaesu Radio does not change to Tx or Clone Out when button is pressed

Many Yaesu radios have a key sequence that starts Clone mode without having to select that option from a startup menu: the radio simply comes on in Clone mode.

With CLONE displayed on the face of the radio, a button is pressed to begin communications.

If the radio comes on displaying CLONE; but then is unresponsive when the button is pressed to begin (i.e., the screen does not change from Clone) check these two common causes:

First, be sure you are using the correct cabling for the radio being programmed. If an adapter was included with the kit, use it.

Check that the keys are not locked. To check, turn the radio off. Turn it back on in normal mode and check for the Lock symbol on the screen. Unlock the keys from the face of the radio and try again.

Windows Version Compatibility

The RT Systems Programmers (version 4 or higher) is designed to work with Windows XP (SP3), VISTA (32 or 64 bit) or Windows 7 (32 or 64 bit) and Windows 8 and 8.1 (full version).

RT Systems no longer supports use of the programmers on Windows 98, Windows 98SE, Windows 2000, or Windows ME.

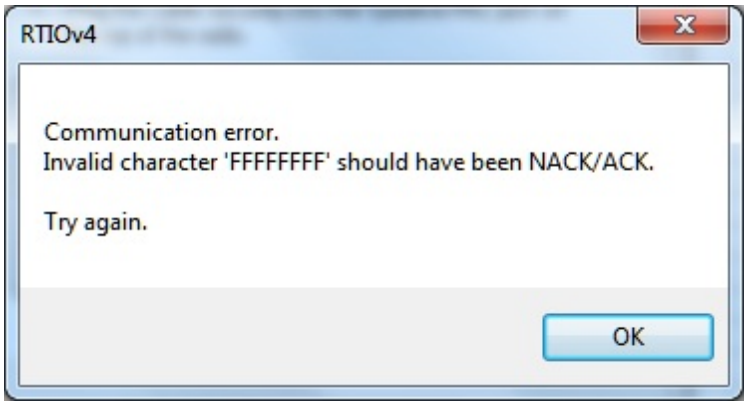
Note: If you plan to use an older computer for programming your radio, you may experience problems with the program resulting from files that are missing from the operating system. These files would have been delivered through normal Windows updates to the operating system.

If the machine has been out of service for several years, set it up with an Internet connection and Automatic Updates activated. Let it sit for several days while it finds what it needs.

Once the updates are installed, you will have no other problems

related to the operating system relative to the programmer.

NACK/ACK Error



As ugly as this error appears. it actually is only a generic message saying the Communication process failed. Try again after reading the hints here.

Do NOT turn the radio off. It may display Error. It is not terrible unhappy and is still in Clone Mode.

Cancel all Communications screens that are open in the programmer.

Open a new file (File | Open form the menu at the top of the screen).

Select Communications | Get data from radio. Doing Get Data from often gets the process going.

Skip the steps for putting the radio into Clone mode. It is already there.

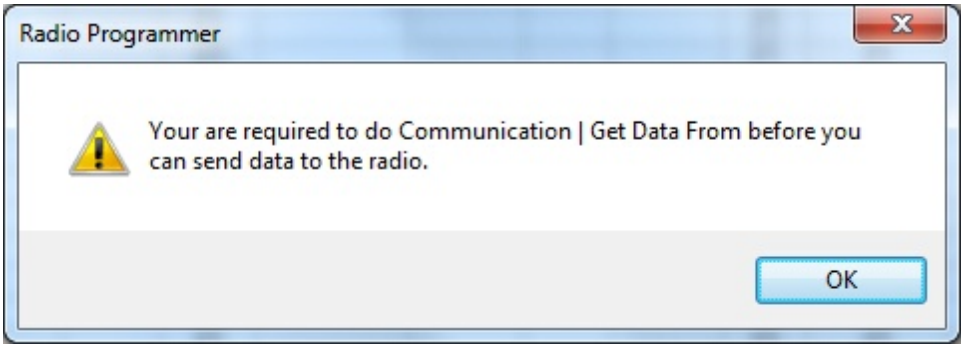
Click OK

Press the key as instructed to begin the process (sometimes you need to press it twice... once to return to Clone mode... then again to begin the process.)

Once Get data from is successful, attempt Send data to. In this scenario, you can skip the steps to put the radio into Clone mode since it usually remains in Clone mode after Get data from is completed.

19.1 Get Data from Radio Required

The first time you attempt to send your file to the radio, this message may appear.



This indicates that you have not read the configuration of the radio into the programmer.

There are details that the programmer can get only from the radio. Even if the radio is not yet programmed, these "background" details are necessary for the programmer to send a file to your radio successfully.

Part

20 Invalid Frequencies

This information is meant to address radio operators in the US. While many of these details are true in other countries, some are not. Band plans, allowable frequencies, and other details differ around the world; but many of the functions of the radio remain the same making this information useful to everyone.

This section is offered to help users understand why a frequency is rejected by an amateur radio. The Programmer will not allow you to enter a frequency that your particular radio cannot use.

Your radio is designed to work on all frequencies in the amateur bands. Problems arise when frequencies from commercial operations are used on this amateur equipment. This explanation is offered to help you understand where the radios differ.

How Radios Work

A little here about how radios work. As for an allowable frequency, three factors are important: Reference Frequency, Reference Step and Step.

Reference Frequency - Based on its internal electronics, the radio uses a value based off the frequency you enter along with the Reference Frequency Oscillator to generate the desired frequency.

Reference Step - The difference between any two Reference Frequencies. This value is set as a part of the internal workings of the radio. It cannot be changed.

Step - The difference between two frequencies displayed on the face of the radio when the tuning knob is turned while operating in VFO mode.

Reference step and Step work in conjunction with each other allowing or prohibiting you from tuning to a given frequency.

Commercial radios have a Reference Step of 2.5 kHz.

Amateur radios are generally designed with Reference Steps of 5, 6.25, 12.5, 9 (only AM) and 8.333333 (air band only) kHz. While a few models have all these Reference Steps, many more remain with only Reference Steps of 5 and 12.5 kHz. These two are sufficient for accessing any repeater in the Amateur Bands.

While in the mathematics of things there will be frequencies in the commercial bands that match the available Reference Steps of Amateur radios, the Step of the Amateur radio will not allow you to tune to the desired frequency.

It takes both working together to achieve a valid frequency.

Testing the validity of a frequency

The question of validity is seen with frequencies with four digits following the decimal (i.e., 154.03125 may be your local volunteer fire department frequency and while their commercial radios can do this frequency, your amateur radio cannot... and it cannot be made to do it with any software.)

Let's take 154.03125 and put it to the test.

Step 1:

The first and easiest test for the validity of a frequency is to attempt to dial to that frequency in VFO mode on the face of the radio. Remember in your attempts that it may be necessary to adjust the Step (see your Operator's Manual for details) to get to a certain frequency.

Turn on your radio.

Access VFO mode

Turn the tuning knob.

Wlth the frequency changing by 5kHz steps, the frequency changes from 154.030 to 154.035 to 154.040 (oops... lost the 3 in the second position... let's try something else).

Change Step to 12.5 kHz (see Operator's Manual for your radio. This is generally done in the Set menu; however a shortcut key on the face of the radio may give you easier access to this menu item.)

With the frequency changing by 12.5kHz steps, the frequency changes from 154.025, to 154.0375 (hey, at least I have the fourth digit now), to 154.050... oops, missed the 154.03125 completely. Again, can't get there tuning on the face of the radio.

Try other Step values until you're satisfied that the radio just cannot be made to do that frequency.

Step 2:

Compare your frequency to this list. If you find it here, it will work. Note: "x' represents any number.

1. xxx.xx500 - Generally only 5 or 0 allowed in the third position with all 0s after that. A few exceptions are shown below.
2. xxx.x12500 - Allowable for four digits after the decimal. The first digit after the decimal can be any from 0 to 9.
3. xxx.x375 - Allowable for four digits after the decimal. The first digit after the decimal can be any from 0 to 9.
4. xxx.x625 - Allowable for four digits after the decimal. The first digit after the decimal can be any from 0 to 9.
5. xxx.x875 - Allowable for four digits after the decimal. The first digit after the decimal can be any from 0 to 9.

Comparing 154.03125:

There is a 1 in the third position after the decimal. By Rule 1, this is not allowed for an amateur radio.

The frequency does not fit into any of the others that allow 4 digits after the decimal.

Step 3: Do the math.

Allowable frequencies (in Hz) must be evenly divisible by 5000 or 12500 or 6250 Hz.

Convert your frequency to Hz:

154.03125 x 1,000,000 = 154031250

Divide that number by 5000

154031250 / 5000 = 30806.25

154031250 / 12500 = 12322.5

154031250 / 6250 = 24645

The 6250 Hz division was successful. There is a possibility that this frequency can be used by an amateur radio.

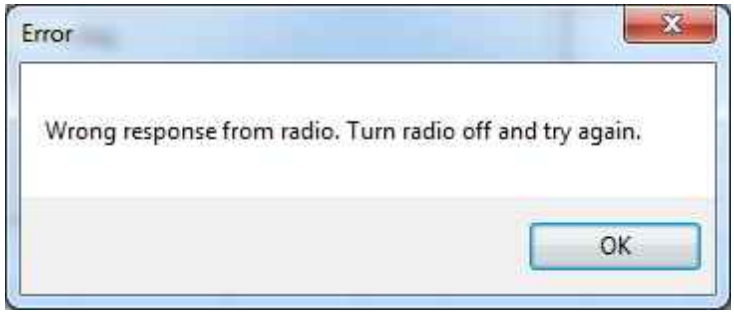
As discussed earlier, both the Reference Step and the Step of the radio are used to determine a valid frequency. Models vary. While this frequency passed

the validity test for certain amateur radios, that in no way implies that it will work on your particular radio.

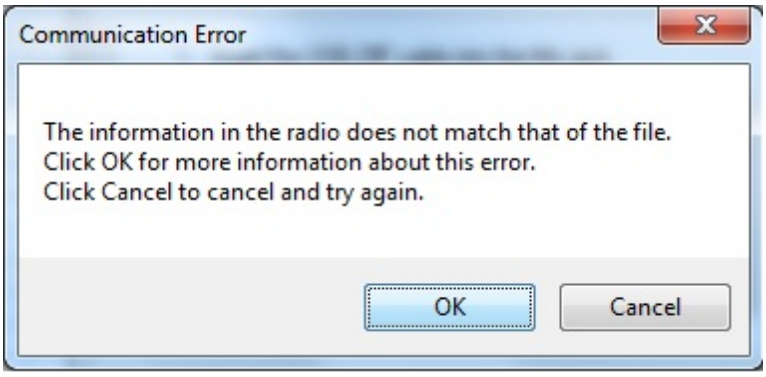
For this particular frequency to work in your particular radio, it is necessary that the radio have a 6.25 kHz step available in the Step option of the Set menu.

Part XXI

21 Hardware Error Troubleshooting



This error is VERY common in the radios that use the 2-pin plug into the mic jack. It is resolved by pushing the cable again... a little harder so that it seats completely into the mic jack.



"Well of course the information in the radio and the file do not match. I just made changes to the file and I want the different information in the radio!!"

This is a common first reaction to this error. However, that is not the file information involved in this error. There are several causes for this error. They include incorrect key strokes on the radio, interference on the computer by another application or device, a faulty cable or the presence of a radio that has been modified for out of band use.

Below are various steps offered as corrections. At the end of each section try again to transfer data to the radio again.

Try this First

The error most likely indicates that "behind the scenes" information about the radio does not match that of a factory radio. This is most common when a radio has been modified for our of band transmission.

1. Create a new file (press Ctrl M on the keyboard or select File | New from the menu at the top of the screen). This protects the file that you are trying to send to the radio.
2. Select Communications | Get data from Radio from the menu at the top of the screen. Complete the steps of the process.
3. When this is completed successfully, return to your file (click to tab at the top of the screen that displays the filename or select File | Open to reopen your file.)
4. Select Communications | Send data to Radio. Be careful to follow these steps shown on this screen. Generally, they are different from the Get Data from radio steps.

Radio Issues

"Error" is displayed on the radio.

"Behind the scenes" information about the radio does not match that of a factory radio. This is most common when a radio has been modified.

1. Create a new file (Ctrl M or File|New)
2. Execute Communications | Get data from Radio. This is the only way this "behind the scenes" information can be obtained for your radio.
3. When this is completed successfully, return to your file.
4. Execute Communications | Send data to Radio begin careful to follow these steps since they are different from the Get Data from radio steps.

The radio does not change when "OK" clicked on the screen in the programmer (never indicates receive).

There is no communication between the radio and the computer. Check through

the Cable issues to be sure you are using the right cable and that it is connected properly to the radio and to the computer.

The radio never goes to CLONE.

On many radios you hold buttons during power on to access a startup menu. Once you select the clone option of the menu (the radio is ***NOT YET IN CLONE MODE***). You press a key to accept the CLONE option. When you press the button to access the startup menu option, the radio does not change.

1. The keys on the radio may be locked. Turn the radio off then back on in normal mode to check for a lock symbol on the screen. If the keys are locked, unlock them. Once unlocked, power off the radio and begin the Communications process again.

2. The key specified is "touchy" and responds if it is touched just the right way. This has been the case on several of the mobile radios. Try again with a shorter or longer touch on the button. When you get that touch just right, the radio will respond.

3. The wrong cable is being used. This is true for several of the hand held radios that use the 4-pin plug. If you attempt this process with a stereo plug, the radio will not respond when you attempt the cloning process.

The radio never went into send (TX) mode (Get data from radio process).

Now that the radio is in Clone mode, one more button press is required to start the data transfer (Get data from) or to make the radio ready to receive the data (Send data to).

1. The wrong cable is being used. This is true for several of the hand held radios that use the 4-pin plug. If you attempt this process with a stereo plug, the radio will not respond when you attempt to access the Clone option of the startup menu.

2. The keys on the radio are locked. Turn the radio off then back on in normal mode to check for a lock symbol on the screen. Once the keys have been unlocked, power off the radio and begin the Communications process again

Radio is not on at the time of data transfer.

This can get the process "out of sync". Cancel the Communications screen on the computer. Then access that screen again and start over with turning the radio on in Clone mode. Be sure the battery is charged on your handheld radio or that you are

connected to external power to prevent an unexpected shutdown during this process.

General Issue

Followed the Steps Incorrectly or executed the wrong process.

Get data from the radio:

1. Go to “Communications” in the top menu.
2. Click “Get Data from Radio”.
3. Read and follow each step. (Remember, the keystrokes are different for each radio. They are detailed for a particular radio on the Get Data from radio screen. The trick is to follow each step... one at a time.)

Send data to the radio:

1. Go to “Communications” in the top menu.
2. Click “Send Data to Radio”.
3. Read and follow each step. (Remember, the keystrokes are different for each radio. They are even different for this process than they were for the Get Data from Radio process. They are detailed for a particular radio on the Get send data to radio screen. The trick is to follow each step... one at a time.)

Cable Issues

Check that you are using the correct cable for this radio.

Many radios have jacks that will accommodate the programming cable from a different radio. Although the cable fits in the jack, the radio does not accept programming through the wrong jack.

You can see the cables for each radio by clicking on Programming Cable Chart

Check that the cable is securely in the USB Port.

Be sure it has not pulled loose (this is easy to do with a USB). Also, the cable should be plugged into a USB port on the computer rather than on a USB hub.

Check that the cable is plugged into the radio securely.

On cables with 6- or 8-pin round din plugs, you may want to check that the pins are not bent in such a way that they are making a bad connection. Unplug the cable from the radio and check by looking at the pins in the plug.

On cables with 4, 6, or 8 pin modular plugs that address the mic jack, push the cable toward the connector to be sure the modular plug is plugged into the mic jack completely. There can be a good bit of play between the mic jack and the plug. Hold the cable securely until the process is complete.

Part

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E-mail	techsupport@rtsystemsinc.com Should you choose to send a message via e-mail, be sure to include at the very least the following details: • The radio with which you use the Programmer • The version number of the Programming software

(found in the Programmer under Help | About)

Based on the information given, we will respond as quickly as possible.

Be sure that rtsystemsinc.com is set as an acceptable address for your e-mail program. Or watch for your response in your spam or junk mail folder.