CS-F620 Programming Software Manual
for
Icom IC-F620/F621TR

INTRODUCTION

QUICK START
If you're looking to get started quickly, we can help. Read this brief introduction first and we'll quickly move you on to the "Quick Start!" section on page 4.

THE RADIO
Congratulations on the purchase of the Icom IC-F620/F621TR series radio for yourself or your customer. The IC-F620/F621TR is a next generation, high performance multi-format Trunking/Conventional radio sure to fit the broad needs of analog radio consumers.

TYPEFACE CONVENTIONS
Throughout this manual certain typeface conventions are used for greater clarity, ease of reading and emphasis.

- Key (radio button) references are in bold.
- Programming screen references are in italics.
- Specified selections in programming screen fields are quote delimited.

THE SOFTWARE
When programming the IC-F620/F621TR series radio, ensure that you are using the software specifically designed for the LTR/PassPort version of the IC-600 series transceivers (the software generally included with this .pdf file) - Icom part number CS-F620TR. This cloning software is used to retrieve, edit and write radio configuration information to the IC-F620/F621TR. It is also used as well as to retrieve and save radio configuration information (from or to the programming computer) for archival purposes.

SOFTWARE COMPATIBILITY
This software is compatible with Microsoft Windows 98, 98SE, ME and XP.

TRADEMARK NOTICE

INSTALLATION
Insert the installation CD into the programming computer. Using Explorer, navigate to the root directory of the CD. There you will find two folders "CSF620TR" (the main programming software) and "CSF620TRADJ" (used for adjusting the radio's RF functionality). Select the CSF620TR folder, execute "Setup" inside of it and follow the on-screen directions. In the section titled "User Information" you must enter the software

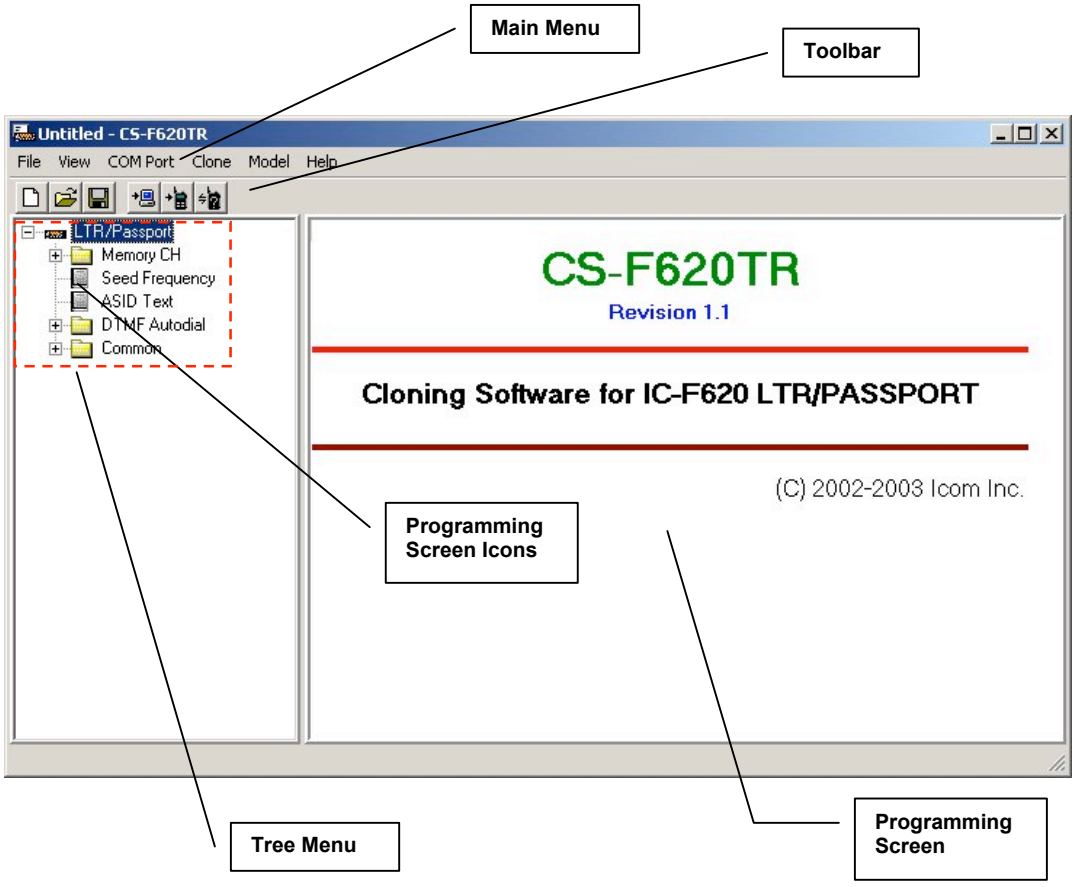
product ID (provided by Icom) before continuing. Once the software is installed, you can start it by double clicking the CS-F620TR shortcut provided on the desktop or through the start menu (navigate to "CS-F620TR"). At this point you can also install the adjustment software by navigating to the CSF620TRADJ folder and executing "Setup" there. This is only needed if you intend on performing radio alignment procedures and its functionality is not discussed in this manual.

CONNECTING RADIO

Connect the 25 pin side of the OPC-1122 Connector to the programming laptop with the 25 to 9 pin serial cable provided in the programming cable kit. Connect the microphone connector side of the OPC-1122 into the microphone jack of the radio. Power the radio on.

MAIN SCREEN

From this screen, you can access all the functions of the software. The screen contains five major components: the "Main Menu," the "Toolbar," the "Tree Menu" (with its "Programming Screen Icons" and folders) and the "Programming Screen".



- The Main Menu is used to provide access to all basic program functions not associated with radio configuration.

- The Toolbar provides quick access to commonly used functions.
- The Tree Menu contains various Programming Screen Icons and folders that provide access to Programming Screens where you can read and edit detailed configuration information.

QUICK START!

This section is useful if you need abbreviated information on how to read, edit and write programming information to a radio. This also serves as a useful overview of the programming software in general.

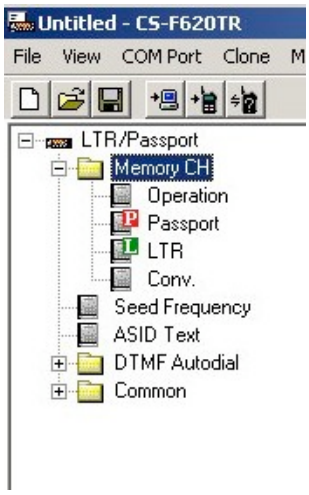
- To access information concerning a radio (like ESN, serial number, transceiver model, revision, comments and any installed option[s]) select (Clone Info.) from the Toolbar.

- To read a radio press the (Clone Read) button on the Toolbar.

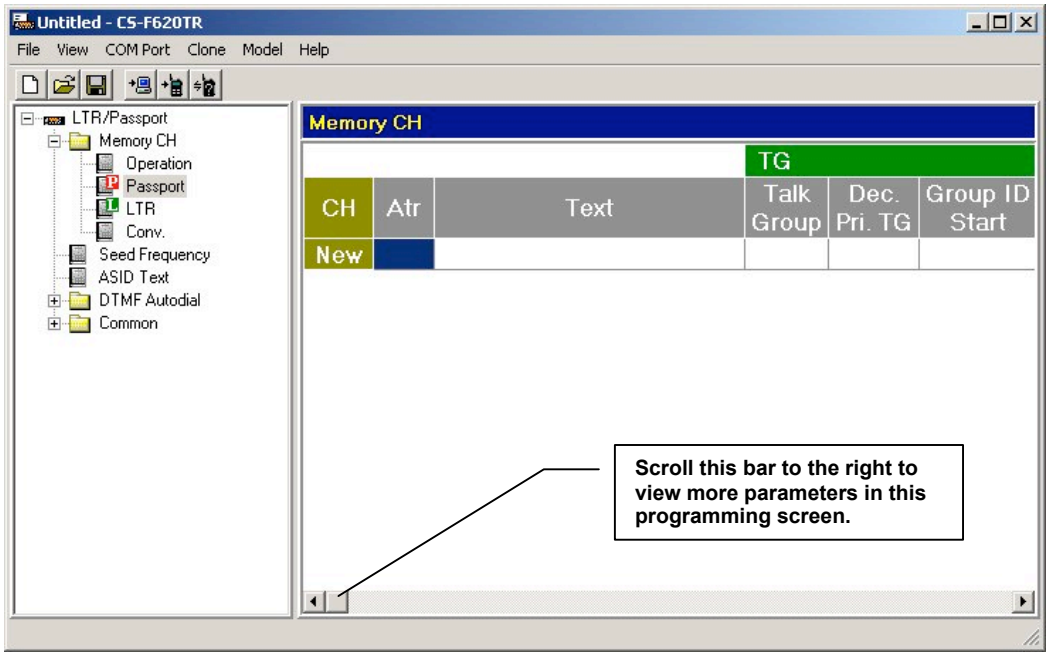
- To access configuration data stored in a file on the programming computers hard drive, select on the Toolbar and use the dialog box to navigate to the correct data file (usually with a ".icf" extension).

- To start a new programming instance, select "New" from the file menu.

- To select Programming Screens go to the Tree Menu. There you will see various Programming Screen Icons and folders (folders contain icons that are broadly related). Single clicking on an icon displays the programming screen associated with that icon. To open a folder either double click on it or select the "plus" sign next to it. If the sign is a "minus," that signifies that the selected folder is already displaying its contents. The LTR/PassPort icon is actually folder also. If it is collapsed, expand it to see its contents.



- Once the correct programming screen is displayed, you can view or edit parameters. On some programming screens, the parameters scroll horizontally off to the right, so use the horizontal scroll bar at the base of the programming screen to view and edit those parameters.



- To enter or view Conventional system information, select "Conv." from the Tree Menu (in the Memory CH folder). The *"Conv." (Conventional*) programming screen will then appear. Enter the information required.

- You must enter data in the Text field first for each line item you enter before you enter any other information. The program will force the cursor over to the Text field if you try and enter information anywhere else.

- As you enter information concerning the first system, note the word "New" appears on the next line. If you have another system you wish to enter after entering the first one, enter it there.

- *LTR* and *PassPort* programming screens follow the same pattern as the preceding.

- Explore the other programming screens to set features as desired.

- To write to a radio press the (Clone Write) button. Yes, the icon looks like a handheld and we're most definitely programming a mobile here but it'll work fine.

- To save configuration data to a file press the (Save) button. Use the dialog box that to name the file and store it in the folder of your choice.

This concludes the Quick Start section.

PROGRAMMING SOFTWARE IN DETAIL

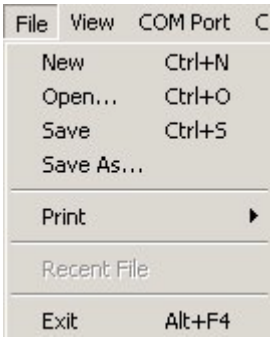
MAIN MENU

The Main Menu provides access to all basic program functions.

There are six Main Menu selections. Those selections and their sub-selections are described as follows:

FILE MENU

Contains menu selections for operations concerning radio files, printing and quitting the program.



File -> New: Create a new radio configuration file.

File -> Open…: Open an existing radio configuration file from the programming computers hard drive, floppy drive, etc.

File -> Save: Save a radio configuration file to the programming computers hard drive, floppy drive, etc.

File -> Save As…: Save a radio configuration file to the programming computers hard drive, floppy drive, etc. under a name different from the currently open file.

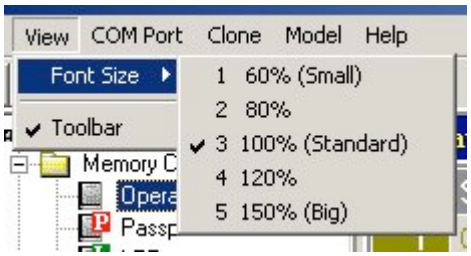
File -> Print Current Sheet: Print current contents of programming screen. When selected, a dialog box will appear. Select printer and other options from there.

File -> Print All: Print contents of all programming screens. When selected, a dialog box will appear. Select printer and other options from there.

File -> Recent File Section: Displays the last 4 configuration files saved or opened.

File -> Exit. Quit the program.

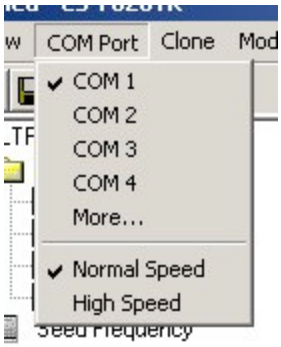
VIEW MENU
Contains selections for customizing aspects of the programs appearance and functionality.



View -> Font Size: Change the displayed font size in the programming screens. Goes from 60% to 150%. While it maybe tempting to make the font size bigger for greater legibility, doing so also has the side effect of making fewer columns visible in the programming screens requiring more scrolling. Find the font size for you that offers the best compromise between legibility and amount of displayed information.

View -> Toolbar: Select to display the toolbar or not. Not displaying it achieves a small amount more of screen real estate at the expense of ease-of-use.

COM PORT MENU
Contains selections pertaining to COM port utilization.



COM Port -> COM 1, COM 2, COM 3, COM 4: Select the one you wish to use. Selecting a port here will automatically deselect any other selected port including "More…"

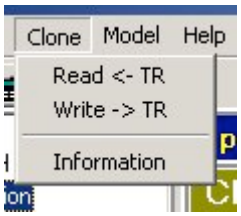
COM Port -> More…: Manually select a COM port number between 1 and 256. Selecting a port here will automatically deselect any other selected port.

COM Port -> Normal: Use when radio read/write errors occur. Normal Speed is 9600 bps. Selecting this speed will automatically deselect High Speed. This is the default selection.

COM Port -> High Speed: Use this selection unless you are having problems with radio read/write errors. High Speed is 38400 bps. Selecting this speed will automatically deselect Normal.

CLONE MENU

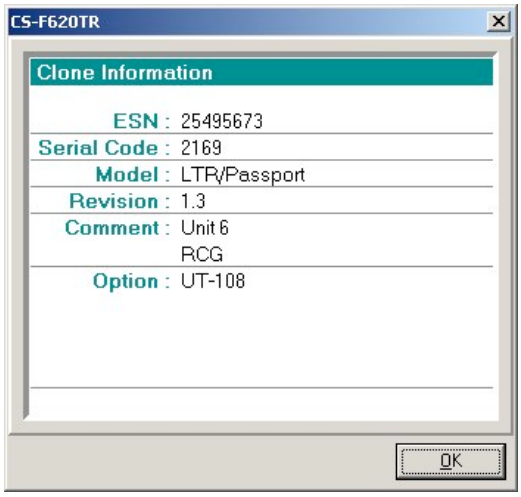
Contain selections for reading and writing to the IC-F620/F621TR series radio.



Clone -> Read <- TR: Read the configuration of a radio into the programming software.

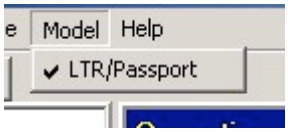
Clone -> Write -> TR: Write the configuration of a radio from the programming software to the radio.

Clone -> Information: Read basic information concerning the attached radio including ESN, serial number, transceiver model, revision, comments and any installed option(s).



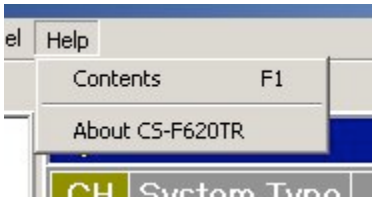
MODEL MENU

Allows selection amongst different radio models for the proper programming of the attached radio. Ensure this selection matches the radio you have connected to the program. Currently there is only one selection here.



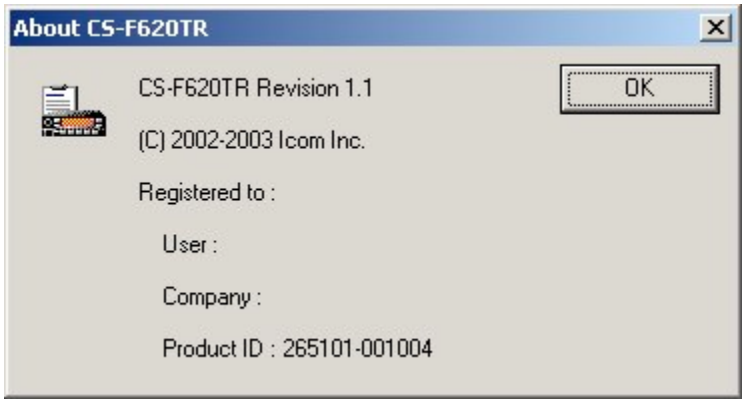
Model -> LTR/PassPort: Only selection.

HELP MENU
Allows selection of help (this) document and general version and registration information.



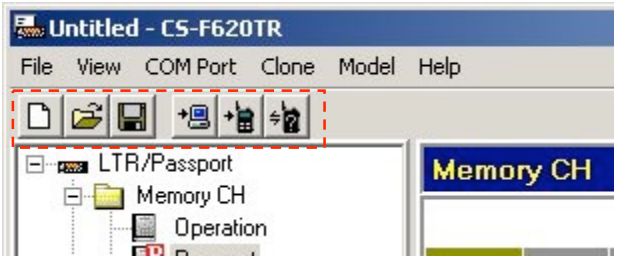
Help -> Contents: Select this help document.

Help -> About CS-F620TR: Displays information concerning current software version and registration information as shown.



TOOLBAR

The Toolbar provides quick access to commonly used functions. Note: if you let your mouse “hover” over a Toolbar button for about one second a tool tip will be displayed, briefly describing the function of that button.



New Button: Create new radio configuration file.

Open Button: Access configuration data stored in a file on the programming computer’s hard drive. When selected, use the dialog box to navigate to the correct data file (usually with a “.icf” extension).

Save Button: Used to save configuration data to a file. When selected, use the dialog box that opens to name the file and store it in the folder of your choice.

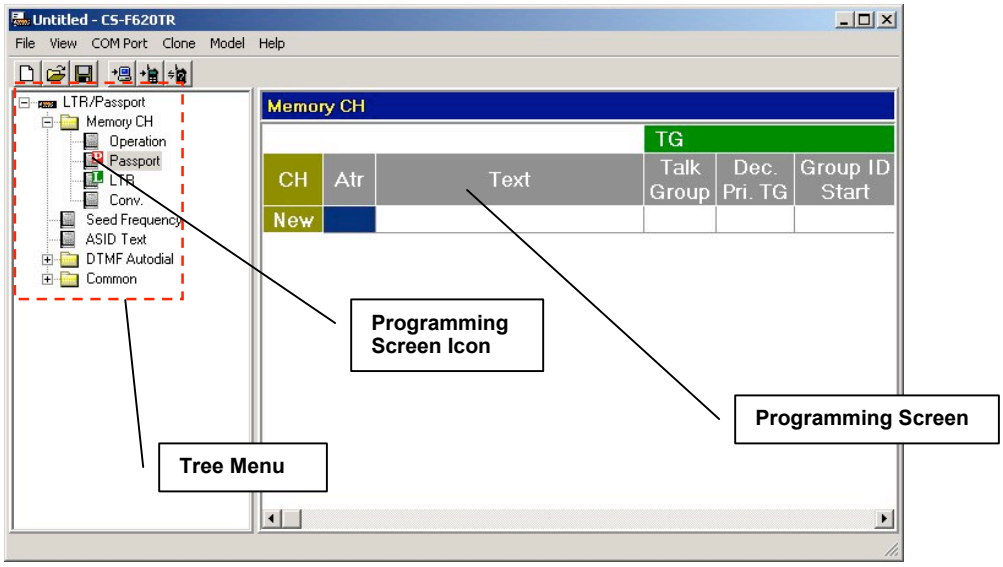
Clone Read: Used to read configuration information in an attached radio. If you get a “No answer from transceiver” dialog box follow the onscreen recommendations.

Clone Write: Used to write configuration information to an attached radio. If you get a “No answer from transceiver” dialog box follow the onscreen recommendations.

Clone Info: Read basic information concerning the attached radio including ESN, serial number, transceiver model, revision, comments and any installed option(s).

TREE MENU AND PROGRAMMING SCREENS

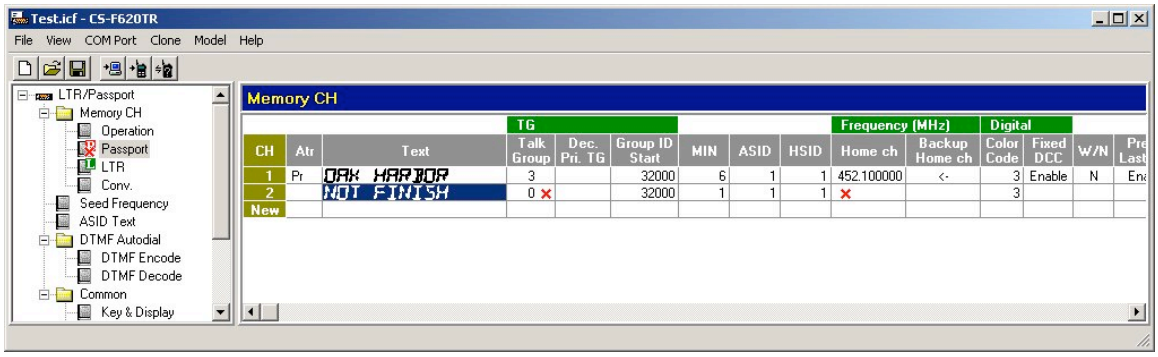
From the Tree Menu you can select a variety of icons and folders. Selecting the appropriate programming screen icon will display its associated programming screen to the right. To open a folder in the Tree Menu either double click on it or select the “plus” sign next to it. If the sign is a “minus” then that signifies that the selected folder is already displaying its contents. Folders serve the purpose of keeping similar programming screen icons grouped together. Collapsing a folder allows the user to de-clutter the screen.



SPECIAL NOTES ON ALL PROGRAMMING SCREENS

THE RED “X”

The IC-F620/F621TR programming software has a special feature that allows for fast diagnostics of configuration issues. If there is a configuration problem in any of the programming screens, a ✕ will be displayed over its associated programming screen icon. Additionally, if the programming screen that has an issue is selected, the program will show specifically which area in the programming screen is having a problem. Look for this when trying to diagnose configuration issues.

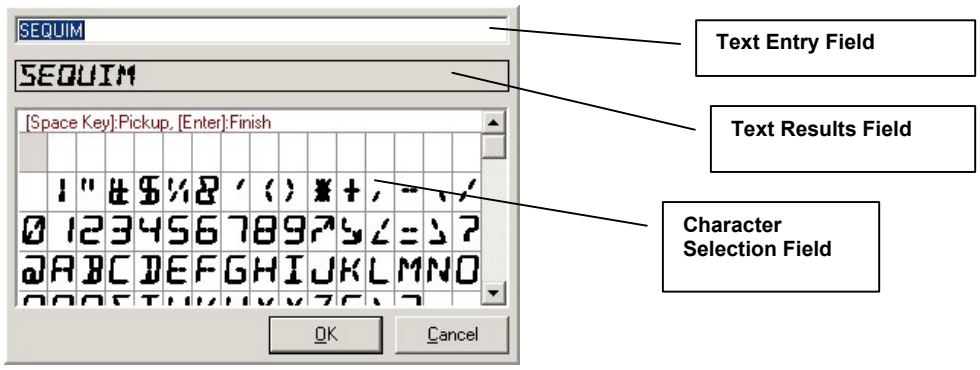


TEXT DIALOG BOX

Many programming screens use a common text entry dialog box. The purpose of this box is to help quickly and accurately enter text that the radio will display to the end user.

You can select the text you require by simply typing in the Text Entry field. You can also enter text by double clicking on the characters listed in the Character Selection field or by using your arrow keys to select a character and selecting the space bar to enter the character in the Character Selection field.

As characters are entered in the Text Entry field they are displayed in the Text Results field much as they would actually appear to the end user on the radio's display. Study the text you entered into the dialog box here to ensure that the results are satisfactory.



SPACE BAR

You can use the Space Bar of computer's keyboard to advance through data choices in programming screen fields that have drop down selections. This is a great way to speed up data entry.

RIGHT CLICK

You can "right click" with your mouse on all of the fields of the programming screens. Doing so usually brings up a small menu showing you the selections you have for that field or row.

THE WORD "SYSTEM"

The *PassPort*, *LTR* and *"Conv." (Conventional)* programming screens have a number of rows prefaced with a number from the CH column. The guide avoids the word "channel" in referring to these and will refer to every unique entry in each row as a "system" no matter if it is Conventional, LTR or PassPort. For example if the *"Conv."* programming screen has 5 rows filled in then there are 5 "systems" in that programming screen. If the *PassPort* programming screen has 3 rows filled in then there are 3 "systems" in that programming screen. In this case there would be a total of 8 unique "systems" in the radio. Of course, with the *Operation* programming screen, any of those systems can be assigned to a given "channel" sequence on the **Right Up/Down** front panel control keys.

DEFAULTS

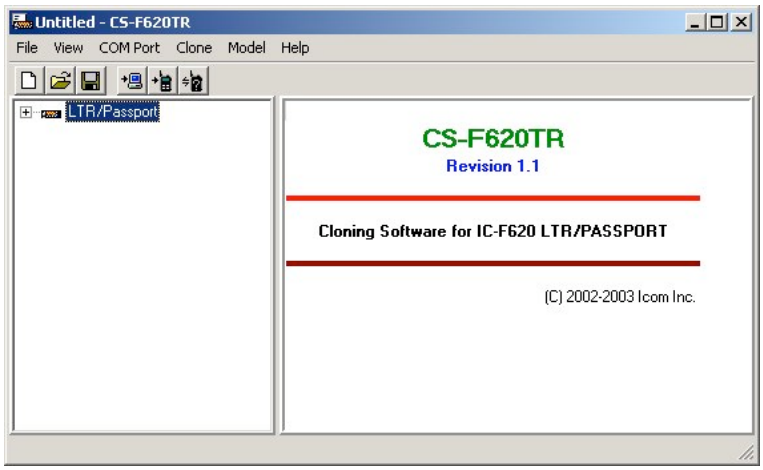
In many programming screens, you must generally make an entry in the Text field before filling in other information. The defaults listed in the programming screen tables are the defaults that you will see after this Text field has been entered.

KEY FUNCTIONS AND PROGRAMMABLE KEYS

The IC-F620/F621TR has a number of programmable keys on the radio and on the optional HM-100TN DTMF microphone. Key Functions can be assigned to any of those keys as described in the *Key and Display Assign* programming screen section starting on page 52. In this document it assumed that when discussing something like "pressing the **Priority** key" that a **Priority** key has been created by assigning the Priority key function to a programmable key. That programmable key then inherits the name of the key function.

TREE MENU AND PROGRAMMING SCREEN DETAIL

LTR/PassPort: Selecting this icon will display description and revision information in the programming screen. This icon is a folder also and opening it will display the next level of icons and folders. Don't let the LTR/PassPort description here confuse you, you can still add, edit and delete Conventional system information from the icons inside this folder.

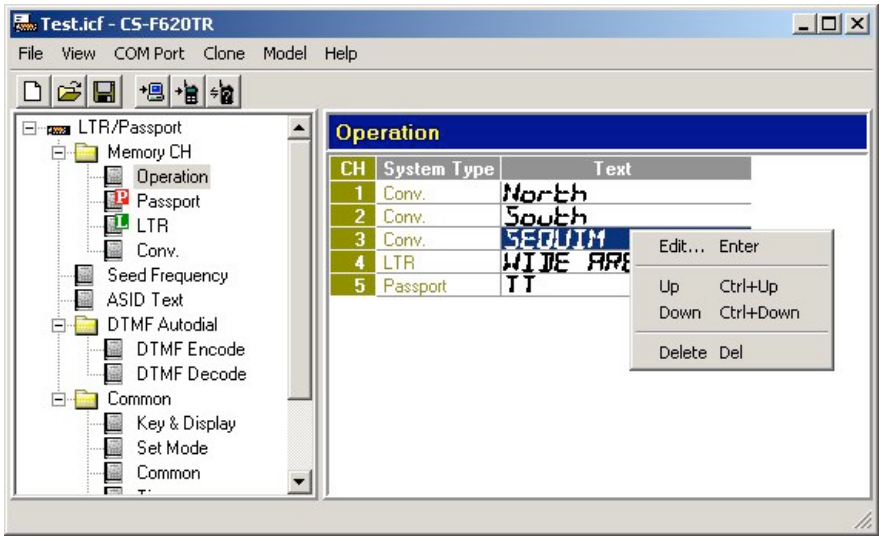


MEMORY CH FOLDER

 Located in the main branch of the Tree Menu. This folder is used to group all programming screen icons having to do with the configuration of each system in the IC-F620/621TR. Use this to access and edit detailed information concerning each system in the radio and setting system order on the channel selection buttons.

OPERATION PROGRAMMING SCREEN

Operation Programming Screen Icon: Icon is located in Memory CH folder. This programming screen allows the programmer to change the particular channel a system is programmed to, delete a system all together and also to change the text displayed on the radio for a particular system.



Note that to delete a system, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears. You can also reorder the channel a system is in by right clicking on either the System Type or Text field and selecting "Up" or "Down". Note, you cannot add a system from here. To add a system, use the programming screen icon of the mode you desire (also located in the Memory CH folder).

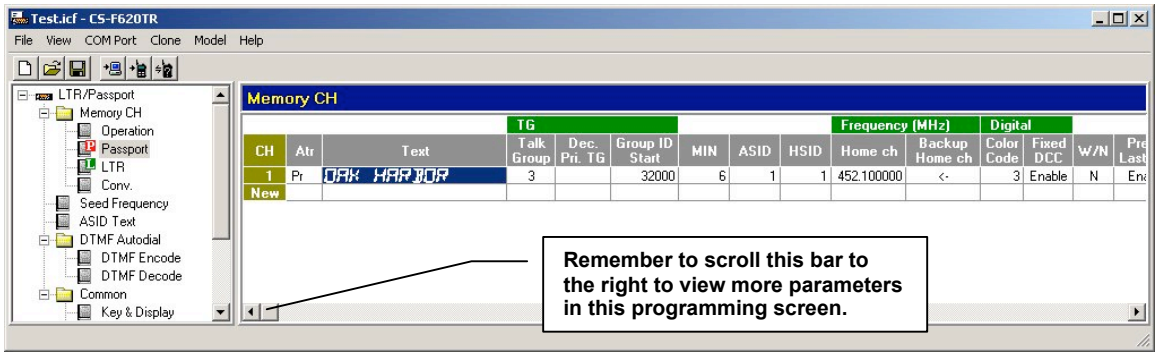
OPERATION PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Field	Description	Default	Suggested Settings
CH	The channel number and order of each system in the radio.	No user entry.	No user entry.
System Type	Type of system for the current channel number. Potential entries here would be "Conv.," "LTR" or "PassPort".	No user entry.	No user entry.
Text	Double click here to edit a text description for this field (as described on page 13). You can enter up to 10 characters for this field.	Whatever was entered in the Text field of the *PassPort*, *LTR* or *"Conv."* programming screen when the system was created.	Set as needed.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

PASSPORT PROGRAMMING SCREEN

PassPort Programming Screen Icon: Icon is located in Memory CH folder. This programming screen allows the programmer to create, read, edit and delete multiple PassPort systems.



This programming screen has a number of entries, though in many cases the default ones should suffice. Note a ✖ in the "Suggested Settings" column of the following table indicates that this is a mandatory field. Also, you should get in the habit of entering Text field data first. If you try and enter data into any other field besides the Text field, the program will re-direct the user back to the Text field automatically until data has been entered there. Finally note that to delete a system, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears.

PASSPORT PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Field	Description	Default	Suggested Settings
	CH	The total number of lines displayed will indicate the number of PassPort systems in the radio. You can have many systems here; the exact amount depends on memory available in the radio. You will get an overflow dialog box if you have reached the limit.	No user entry.	No user entry.

Group	Field	Description	Default	Suggested Settings
	Atr	Select “Priority,” “Phone” or “Phone Off” (or “Return” to exit without selecting a new setting). Selecting “Priority” sets this system as the one to be used if the **Priority** key is pressed. Note: changing this field to “Priority” will deselect any other system from being the priority system. Selecting “Phone” sets this system as the one to be used if the **Phone Request** key is pressed. Note: changing this to “Phone” will deselect any other system from being the phone request system. Select “Phone Off” to clear this setting.	✖ If no system has been set as a priority system. Otherwise: Phone OFF (Blank).	✖ Mandatory field. Amongst the programming screens for *PassPort*, *LTR* and *Conventional* at least one system needs to be set as a priority system even if no **Priority** key is programmed. Set as needed.
	Text	Double click here to enter a text description for this system (as described on page 13). You can enter up to 10 characters for this field.	✖	✖ Mandatory field - set as needed. You cannot enter any other information on this row until data for this field has been entered.
TG	Talk Group	This field indicates the current number of Talk Groups (and Select Call MINs) programmed into this system. Also, this field can be double clicked to open the PassPort *Talk Group Setting* programming sub-screen where Talk Group and MIN information can be edited. Before proceeding on with the sub-screen here, ensure that you set your Group ID Start field correctly. For information on the *Talk Group Setting* programming sub-screen, please see that table on page 27.	0 ✖	✖ Mandatory field - set as needed.
TG	Dec. Pri. TG	Select “Enable” or “Disable”. Select “Enable” if you wish to force monitor the Primary Group (the first group listed in the *Talk Group Setting* programming sub-screen). Selecting “Enable” here will also turn the “CH” field of the first row of the PassPort *Talk Group Setting* programming sub-screen red, indicating forced monitor. If this set to “Enable,” it does not matter if the radio is in scan mode or not, or whether CH 1 (primary group) is a Scan Member or not, the radio will always monitor this group, even while on roam sites.	Disabled (Blank)	Disabled

Group	Field	Description	Default	Suggested Settings
TG	Group ID Start	Enter from 1 to 65519. Sets the split point where all group/alias numbers at or above this number are considered groups and all numbers below this number are considered MINs. This should be set before entering the PassPort *Talk Group Setting* programming sub-screen.	32000	System operator provided.
	MIN	Enter from 1 to 65519. Enter the MIN you wish to use for this system here.	1	System operator provided.
	ASID	Enter from 1 to 127. Enter the ASID (Affiliated System ID) for the system you wish to use here.	1	System operator provided.
	HSID	Enter from 1 to 65535. Enter the HSID (Home System ID) for the system you wish to use here.	1	System operator provided.
Frequency (MHz)	Home ch	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the home channel of your home site and this is the channel the radio will look to for idle messages, go-to messages etc. (when registered to your home system).	✖	✖ Mandatory field - system operator provided.
Frequency (MHz)	Backup Home ch	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the backup home channel that your radio will search for and use in case of failure of the primary home channel. This is not supported in NTS Firmware from at least 2.4 earlier.	Blank	Currently not supported in PassPort – do not use.
Digital	Color Code	Select “0,” “1,” “2” or “3”. It is unimportant what this is set to if Fixed DCC is set disable.	3	System operator provided.
Digital	Fixed DCC	Select “Enable” or “Disable”. When this is enabled, the radio will only attempt to register to sites utilizing the color code entered in the Color Code column. This setting is primarily used to distinguish between different systems that utilize the same frequency (most commonly in geographically dissimilar areas).	Disabled (Blank)	System operator provided.
	W/N	Select “Wide” or “Narrow”. Specify if the PassPort system you are attempting to utilize is using wide or narrow band channels.	Wide (Blank)	System operator provided.
	Prefer Last-site	Select “Enable” or “Disable”. This sets the search behavior of the radio when it is first turned on or a new system has been selected. If this field is set to “Disable” the radio will always search for its home site first. If set to “Enable,” the radio will always search first for the site it was registered to when the radio was shut off or the system was changed. “Disable” may help the PassPort system operator reduce network traffic; “Enable” will probably ensure quicker end-user registrations.	Disabled (Blank)	System operator provided.

Group	Field	Description	Default	Suggested Settings
Roaming	INH	Select “Enable” or “Inhibit”. Selecting “INH” will force the radio to always remain on its home site, completely inhibiting it from roaming. Selecting “Enable” will ensure that the radio can roam normally.	Enable (Blank)	Set as needed. Generally this should be set to “Enable”.
Roaming	On Strongest Site	Select “Enable” or “Disable”. When the radio first goes into search mode (roam), selecting “Enable” will force the radio to search every frequency in its immediate neighbor list (frequencies collected from the site the radio is currently registered to). It will then register to the strongest site in the search (if that site meets search [roam] criteria). “Disable” will allow the radio, while searching, to register to the first site it finds that meets search (roam) criteria. Enabling this function may allow a radio to find the best site for a given area. Disabling this function allows the radio to discover a “good enough” site for an area. “Disable” usually provides quicker searches.	Disable (Blank)	Set as needed. Generally this should be set to “Enable”.
Home System	Look Back	Select “Enable” or “Disable”. Selecting “Enable” will force the radio to “look back” to its home system at an interval set by the Time field. This “look back” only occurs if the radio is idle. If the radio “sees” the home site and it meets search (roam) criteria, it will attempt to register back to its home site.	Enable (Blank)	Consult your system operator. Incorrectly setting this may cause unexpected service interruptions.
Home System	Time	Enter from 10 to 32,000 (in seconds). If the Look Back field is set to enable, this sets interval of time when the look back occurs. Note: Look Back Timer will not begin until all local neighbors are collected from the current registered site.	60	Consult your system operator. Incorrectly setting this may cause unexpected service interruptions. Suggested setting for this would be 1800. Do not use “0”.

Group	Field	Description	Default	Suggested Settings
Site Depth	Near Site	Select “Null” through “5”. As the radio remains on a PassPort site, it will collect a list of its immediate neighbors called its “Neighbor List”. As the IC-F620/F621TR searches, it will remember the neighbor lists from the sites it visits. This field sets the number of sites that the radio will reference back to when initiating a search. In other words, if this setting is set to “2” then the radio will search the neighbor list of the past two sites while in roam mode. If each list has 5 frequencies (the limit) in them, then the radio could potentially search 10 frequencies while roaming. These lists are usually searched a few times before the radio extends its search by going to “Far Sites” and Seed Frequencies.	Null (Blank)	Consult your system operator. Given no other guidance however, try setting this at “2” initially if using seeds and “5” if not.
Site Depth	Far Site	Select “Null” through “5”. As the radio remains on a PassPort site, it will collect a list of its immediate neighbors called its “Neighbor List”. As the IC-F620/F621TR searches, it will remember the neighbor lists from the sites it visits. This field sets the number of sites that the radio will reference back to when initiating a search AFTER SEARCHING NEAR SITES. In other words, if this setting is set to “3” then the radio will search the near sites a few times first. Then it will go to this list and search the neighbor list of the past three sites while in roam mode. If each list has 5 frequencies (the limit) in them, then the radio could potentially search 15 frequencies while roaming. As the radio searches “Far Sites” it also intersperses frequencies from the Seed List (if used) to improve the chances of finding a site.	Null (Blank)	Consult your system operator. It is recommend that this be set only if you don’t use seeds and PassPort Network the radio will be using is very large.
RSSI Condition	RSSI Enable	Select “Enable” or “Disable”. If enabled, the radio will use RSSI criteria when deciding to attempt to register to a system. If disabled, RSSI criteria are ignored by the radio.	Disable (Blank)	Set as needed. Generally should be enabled.
RSSI Condition	Min	Enter from 0 to 255. This number can only be set to the same value or less than the value in the Preferred field so to make it less frustrating, set the Preferred field first. This is the minimum field strength required to remain registered to a site. If the minimum field strength drops below the time set by the Los Time field, the radio will initiate looking for another site. To cross-reference this RSSI value to applied signal strength, please refer to the chart on page 71.	0	Set as needed. A good value to work with is 17.

Group	Field	Description	Default	Suggested Settings
RSSI Condition	Preferred	Enter from 0 to 255. If the number set here is below the Min field, the Min field will be adjusted to equal this. As a radio is looking for a site to register to, it must see an RSSI of this value or more before it attempts registration. To cross-reference this RSSI value to applied signal strength, please refer to the chart on page 71.	0	Set as needed. A good value to work with is 21. Setting this value somewhat higher than the Min field will help prevent the radio from repeatedly registering to, and then loosing, a marginal site (particularly the one it just left).
RSSI Condition	Look Back	Enter from 0 to 255. The Look Back field must be enabled for this field to matter. As the radio "looks back" at its home site, it must see an RSSI of this value or more before it attempts registration.	0	Set as needed. A good value to work with is 35. Setting this value even higher than "Preferred" will ensure that the "Look Back" function will work with less frustration for the user.
RSSI Condition	Los Time	Enter from 0 to 255 (seconds). This is a timer that starts as soon as received signal value has gone below the "RSSI Minimum". If the radio does not see a signal at or above the "RSSI Minimum" before the time on this timer expires, the radio will initiate searching for another site.	0	Set as needed. A good value to work with is 20 seconds.
RSSI Condition	Averaging	Select "Enable" or "Disable". Sets the radio to average the received RSSI signal over 2 samples to provide more reliable signal strength readings.	Disable (Blank)	Set as needed. Generally should be enabled.

Group	Field	Description	Default	Suggested Settings
RSSI Condition	Fringe Areas	Select “Enable” or “Disable”. The “RSSI Enable” field must be set to “Enable” for this function to work. If this field is set to “Enable” the radio works like this: if the radio initiates a search and no systems are found that meet the signal strength indicated in the Preferred field (after going through the neighbor list, near and far lists and seed lists) the radio will “switch off” RSSI searching. It will then attempt to register to the first site (or strongest site if the On Strongest Site field is set to “Enable”) it sees using low speed data only. Once it acquires a site in that mode, it will switch RSSI searching back on (for the next time the radio goes into search). If set to Disable, the radio will always use RSSI criteria when searching.	Enable (Blank)	Consult your system operator, though generally this should be disabled. Enabling this may cause unexpectedly poor transmission quality in certain situations.
ASID Black List	1 through 4	Enter from 0 to 255. Setting this prevents the radio from attempting to register to the site with the ASID listed here. 0 disables.	0	Consult your system operator though generally not needed.
	TOT	Set to “OFF” (manually type the word in) or enter from 0 to 255 seconds. Setting this prevents the radio from transmitting for a period longer than this timer.	OFF	Set as needed.
	Talk Around	Select to “None” or any of the Conventional or LTR systems that appear in this list. This is the system reverted to if the **Talk Around** key has been pressed. If “None” is selected here and the **Talk Around** key is pressed, be careful. No useful “Talk Around” function will be enabled and the radio may behave unexpectedly.	None (Blank)	Consult your system operator.
	ATB Ring Back	Select “Enable” or “Disable”. If a user attempts to transmit and the system is busy, enabling this will sound a ringing tone when the system is ready to accept traffic again.	Enable (Blank)	Set as needed.
Scan	Block Mode	Select “Enable” or “Disable”. When enabled, this will cause the radio to receive all groups in a range between the talk groups listed in the PassPort *Talk Group Setting* programming sub-screen (see page 27) under CH 2 and CH 3. Note: Ensure that the group listed under CH 2 is numerically lower than the group in CH 3 or this field will be marked with a ✖ and will not work. These groups will be scanned no matter the setting of the Scan Member field in the PassPort *Talk Group Setting* programming sub-screen. Note: Block Mode scan will only work when the radio is registered to its home site. If you do not intend to use Block Mode Scan do not assign a **Scan Type** key.	Disable (Blank)	Set as needed. Not generally used in PassPort.

Group	Field	Description	Default	Suggested Settings
Scan	Auto Group Select	Select “Enable” or “Disable”. Selecting “Enable” here puts the radio automatically into group scan as this system is selected. The groups scanned will be the groups set to “Yes” in the Scan Member field of the PassPort *Talk Group Setting* programming sub-screen (see page 27). Even if this field is enabled, Scan can be toggled between “Disable” and “Enable” if the **Scan** key is pressed (assuming “Edit TG List” is set to “Enabled”). Note: if Block Mode is “Enabled” then the type of scan used (if this field is enabled) will be “Block”. Otherwise, it will be “Individual”.	Disable (Blank)	Set as needed.
Scan	Edit TG List	Select “Enable” or “Disable”. Allows user to manually edit the groups being scanned. These edits are normally lost if the user changes systems or cycles power to the radio (though not when changing groups) unless the Save TG Scan field is enabled.	Disable (Blank)	Set as needed.
Scan	Save TG Scan	Select “Enable” or “Disable”. Allows user changes to the groups being scanned to be saved when the radio’s power is cycled or the system is changed.	Disable (Blank)	Set as needed.
DTMF	Decode ch	Select “None” or any of the “DTMF Decode Pri-Codes” listed. If a “DTMF Decode Pri-Code” has been selected, the radio will emit a ring tone and flash a “bell” icon if the proper DTMF sequence of digits is received. You must set up a DTMF decode entry to use this function (see the *DTMF Decode* programming screen - page 48). If the **Select Call** key is pressed, the radio will also mute to dispatch traffic until DTMF digits matching the Primary Code or Secondary Code digit string for the selected DTMF entry has been received.	None (Blank)	Set as needed.
Scrambler	ON/OFF	Select “OFF,” “ON” or “Inhibit”. Setting this to “OFF” sets the scrambler off as an initial setting. Setting this to “ON” turns the scrambler on as an initial setting. The **Scrambler** key can then be used to toggle this function on and off. Setting this field to “Inh” (Inhibit) will prevent the scrambler from being used while this system is selected. See the Scrambler Type field in the *Common* programming screen (page 60) for more information on setting up the scrambler.	OFF (Blank)	Set as needed.
Scrambler	Code	Set from 1 to 255. With the UT-109 (“Non-Rolling” type) only the value 1 through 32 will work. With the UT-110 (“Rolling” type) values from 1 to 255 will work.	1	Set the code number to match the code used by the customer in general.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

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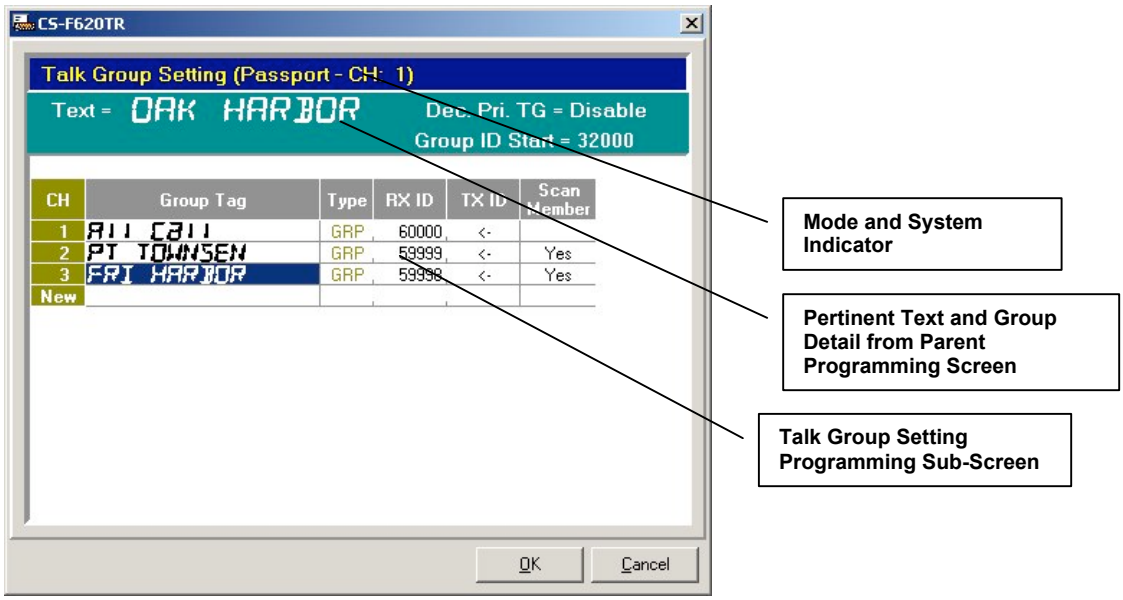
PASSPORT TALK GROUP SETTING PROGRAMMING SUB-SCREEN

After the Group ID Start field has been set correctly, double click on the Talk Group field in the *PassPort* programming screen to enter the *Talk Group Setting* programming sub-screen. Don't be confused, while this screen seems oriented around talk groups, this is also where MINs (and their MIN aliases) can be entered to use for selective call. The group tag you give to a MIN here will also act as a "MIN Alias" (meaning when a MIN from a calling party matches a MIN entered here, its group tag text, rather than the MIN number, will be displayed).



At the head of this screen is pertinent information concerning the current selected system. Each line in this screen can be used to enter group or MIN information. Note, to delete a row, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears.

PASSPORT TALK GROUP SETTING PROGRAMMING SUB-SCREEN FIELD DESCRIPTION TABLE

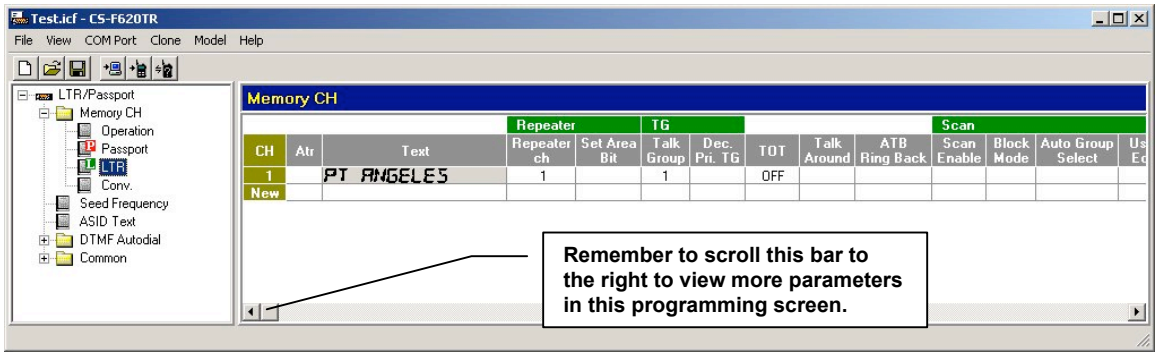
Field	Description	Default	Suggested Settings
CH	Each line can contain a new group. You can enter up to 250 groups per PassPort system. Don't let the "CH" designation of this column throw you off, each number in this column is just a reference number and have nothing to do with the "CH" column in the *PassPort* programming screen. If you are entering a primary group in the radio, it should be always be the first row here, particularly if you are enabling the Dec. Pri. TG field in the *PassPort* programming screen.	No user entry.	No user entry.
Group Tag	Double click here to enter a text description for this group if your Type field is going to be "GRP" (as described on page 13). If your Type field is going to by "MIN" (based on what you are about to enter in "RX ID" then this tag will become a MIN Alias tag. You can enter up to 10 characters for this field.	✖	✖ Mandatory field - set as needed. You cannot enter any other information on this row until data for this field has been entered.
Type	This field is for reference only. Depending on where the Group ID Start field is set and what information is entered into the RX ID field, this will appear as either "GRP" or "MIN". This field will display "GRP" when the number entered in the RX ID field is at or greater than the Group ID Start. When the number in the RX ID field is less than the Group ID Start, this field will appear as "MIN".	No user entry	No user entry
RX ID	Enter from 1 to 65519. Used to enter either group or MIN numbers. When entering groups, enter the PassPort group number you wish for this group entry. Your PassPort system operator usually provides this. MINs enter here can be used for selective call and can be selected like any group. Also, when a MIN from a calling party matches any of the MINs in this column, its associated Group Tag description, rather than the MIN number, will be displayed.	✖	✖ Mandatory field - set as needed.
TX ID	Enter from 1 to 65519. You must enter information into the RX ID field before attempting to change this field. If you attempt to enter this field first, the program will re-direct you to RX ID field. After you enter information in RX ID, this field will show a "<-" indicating that the contents of the TX ID field is the same as the RX ID field. This field should not be changed once its value is set to "<-".	✖ (<- After "RX ID" field has been entered)	✖ Mandatory field – leave as set by entry in "RX ID" field.

Field	Description	Default	Suggested Settings
Scan Member	Select “Yes” or “No”. When Type is “GRP,” select whether you wish the group to be scanned by default when the radio is doing group scan. You cannot edit this field if Type is “MIN”.	“Yes” if “RX ID” is a group number otherwise “No”.	Set as needed.

When finished editing here, select “OK” to save the information entered here. Select cancel to discard any edits.

LTR PROGRAMMING SCREEN

LTR Programming Screen Icon: Icon is located in “Memory CH” folder. This programming screen allows the programmer to create, read, edit and delete multiple LTR systems.



This programming screen has a number of entries, though in many cases the default ones should suffice. Note a ✕ in the “Suggested Settings” column of the following table indicates that this is a mandatory field. Also, you should get in the habit of entering Text field data first. If you try and enter data into any other field besides the Text field, the program will re-direct the user back to the Text field automatically until data has been entered there. Finally note that to delete a system, you can right click on almost any field in the programming screen and select “Delete” from the menu that appears.

LTR PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Field	Description	Default	Suggested Settings
	CH	The total number of lines displayed will indicate the number of LTR systems in the radio. You can have many systems here; the exact amount depends on memory available in the radio. You will get an overflow dialog box if you have reached the limit.	No user entry.	No user entry.

Group	Field	Description	Default	Suggested Settings
	Atr	Select “Priority,” “Phone” or “Phone Off” (or “Return” to exit without selecting a new setting). Selecting “Priority” sets this system as the one to be used if the **Priority** key is pressed. Note: changing this field to “Priority” will deselect any other system from being the priority system. Selecting “Phone” sets this system as the one to be used if the **Phone Request** key is pressed. Note: changing this to “Phone” will deselect any other system from being the phone request system. Select “Phone Off” to clear this setting.	✕ If no system has been set as a priority system. Otherwise: Phone OFF (Blank)	✕ Mandatory field. Amongst the programming screens for *PassPort*, *LTR* and *Conventional* at least one system needs to be set as a priority system even if no **Priority** key is programmed. Set as needed.
	Text	Double click here to enter a text description for this system (as described on page 13). You can enter up to 10 characters for this field.	✕	✕ Mandatory field - set as needed. You cannot enter any other information on this row until this field has been filled in.
Repeater	Repeater ch	The number in this field indicates the row the current home channel repeater is located on (in the *Repeater Setting* programming sub-screen. Double click here to enter the *Repeater Setting* programming sub-screen (see page 34).	✕	✕ Mandatory field - set as needed.
Repeater	Set Area Bit	Select “ON” or “OFF”. Selecting “ON” enables the area bit. This is used primarily to distinguish between to different systems that may share the same frequency.	OFF (Blank)	Set as needed.
TG	Talk Group	This field indicates the current number of talk groups programmed into this system. To set up talk groups, double click on this field. For information on the LTR *Talk Group Setting* programming sub-screen, please see that table on page 36.	0 ✕	✕ Mandatory field - set as needed.

Group	Field	Description	Default	Suggested Settings
TG	Dec. Pri. TG	Select “Enable” or “Disable”. Select “Enable” if you wish to force monitor the Primary Group (the first group listed in the LTR *Talk Group Setting* programming sub-screen). Note, selecting “Enable” here will also turn the “CH” field of the first row of the LTR *Talk Group Setting* programming sub-screen red, indicating forced monitor. If set to “Enable,” it does not matter if the radio is in scan mode or not, or whether CH 1 (primary group) is a scan member or not, the Primary Group will still be monitored.		
	TOT	Set to “OFF” (manually type the word in) or enter from 0 to 255 seconds. Setting this prevents the radio from transmitting for a period longer than this timer.	OFF	Set as needed.
	Talk Around	Select “None” or any of the Conventional or LTR systems that appear in this list. This is the system reverted to if the **Talk Around** key is pressed. When “None” is selected here and the **Talk Around** key is pressed, LTR simplex operation on the home channel is allowed.	None (Blank)	Consult your system operator.
	ATB Ring Back	Select “Enable” or “Disable”. If a user attempts to transmit and the system is busy, enabling this will sound a ringing tone when the system is ready to accept traffic again.	Enable (Blank)	Set as needed.
Scan	Scan Enable	Select “Enable” or “Disable”. Selecting “Enable” will allow this system to be scanned when performing system scan. Selecting “Disable” will prevent this system from being scanned. Even if the User Edit field is set to “Enable” the user will not be able to add this system to the list of systems scanned (if “Disable” is selected in this field).	Enable (Blank)	Set as needed.
Scan	Block Mode	Select “Enable” or “Disable”. When enabled, this will cause the radio to receive all groups in a range between the talk groups listed in the LTR *Talk Group Setting* programming sub-screen (see page 36) under CH 2 and CH 3. Note: Ensure that the group listed under CH 2 is numerically lower than the group in CH 3 or this field will be marked with a ✕ and will not work. These groups will be scanned no matter the setting of the Scan Member field in the LTR *Talk Group Setting* programming sub-screen. If you do not intend to use Block Mode do not assign a **Scan Type** key.	Disable (Blank)	Set as needed.

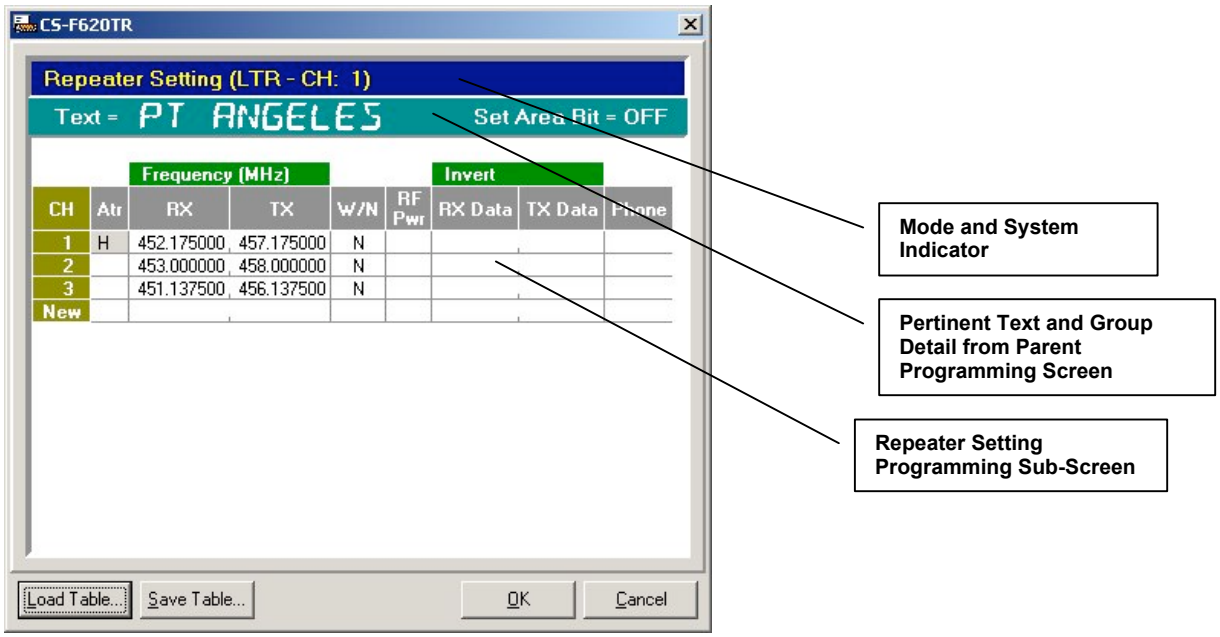
Group	Field	Description	Default	Suggested Settings
Scan	Auto Group Select	Select “Enable” or “Disable”. Selecting “Enable” here puts the radio automatically into group scan as this system is selected. The groups scanned will be the groups set to “Yes” in the Scan Member field of the LTR *Talk Group Setting* programming sub-screen (see page 36). Even if this field is enabled, Scan can be toggled between “Disable” and “Enable” if the **Scan** key is pressed (assuming the Edit TG List field is set to “Enabled”). Note: if Block Mode is “Enabled” then the type of scan used (if this field is enabled) will be “Block”. Otherwise, it will be “Individual”.	Disable (Blank)	Set as needed.
Scan	User Edit	Select “Enable” or “Disable”. Allows user to manually add or delete this system from the list of systems to be scanned. These edits are normally lost if the user changes groups or cycles power to the radio (though not when changing groups) unless the Save User Settings field is enabled.	Disable (Blank)	Set as needed.
Scan	Save User Settings	Select “Enable” or “Disable”. Allows user’s changes to the systems being scanned to be saved when the radio’s power is cycled or the system is changed.	Disable (Blank)	Set as needed.
Scan	Edit TG List	Select “Enable” or “Disable”. Allows user to manually edit the groups being scanned. These edits are normally lost if the user changes groups or cycles power to the radio (though not when changing groups) unless the Save TG Scan field is enabled.	Disable (Blank)	Set as needed.
Scan	Save TG Scan	Select “Enable” or “Disable”. Allows user’s changes to the groups being scanned to be saved when the radio’s power is cycled or the system is changed.	Disable (Blank)	Set as needed.
DTMF	Decode ch	Select “None” or any of the “DTMF Decode Pri-Codes” listed. If a “DTMF Decode Pri-Code” has been selected, the radio will emit a ring tone and flash a “bell” icon if the proper DTMF sequence of digits is received. You must set up a DTMF decode entry to use this function (see the *DTMF Decode* programming screen - page 48). If the **Select Call** key is pressed, the radio will also mute to dispatch traffic until DTMF digits matching the Primary Code or Secondary Code digit string for the selected DTMF entry has been received.	None (Blank)	Set as needed.

Group	Field	Description	Default	Suggested Settings
Scrambler	ON/OFF	Select “OFF,” “ON” or “Inhibit”. Setting this to “OFF” sets the scrambler off as an initial setting. Setting this to “ON” turns the scrambler on as an initial setting. The **Scrambler** key can then be used to toggle this function on and off. Setting this field to “Inh” (Inhibit) will prevent the scrambler from being used while this system is selected. See the Scrambler Type field in the *Common* programming screen (page 60) for more information on setting up the scrambler.	OFF (Blank)	Set as needed.
Scrambler	Code	Set from 1 to 255. With the UT-109 (“Non-Rolling” type) only the value 1 through 32 will work. With the UT-110 (“Rolling” type) values from 1 to 255 will work.	1	Set the code number to match the code used by the customer in general.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

REPEATER SETTING PROGRAMMING SUB-SCREEN

Double click on the “Repeater ch” field of the *LTR* programming screen to enter the *Repeater Setting* programming sub-screen.



At the head of this screen is pertinent information concerning the current selected system. Each line in this screen can be used to enter repeater channel information. Note that to delete a row, you can right click on almost any field in the programming screen and select “Delete” from the menu that appears.

REPEATER SETTING PROGRAMMING SUB-SCREEN FIELD DESCRIPTION TABLE

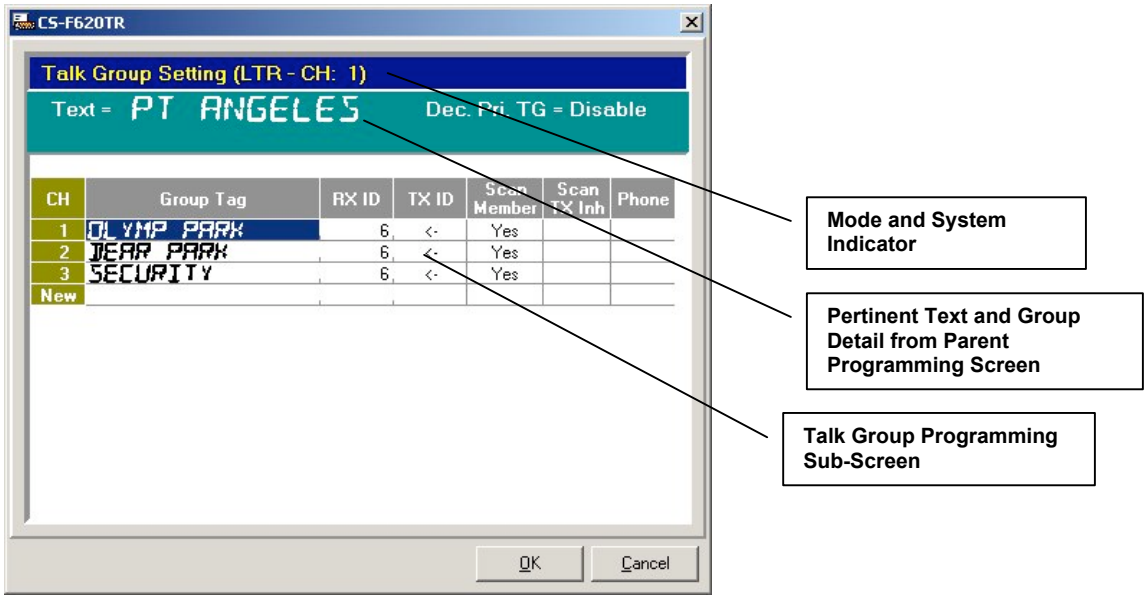
Group	Field	Description	Default	Suggested Settings
	CH	The total number of lines displayed will indicate the number of LTR repeater channels for the system being edited. You can enter up to 20 repeater channels before getting an “overflow” error.	No user entry.	No user entry.
	Atr	Select “Home Repeater” or “Return”. If you select “Home Repeater,” then this repeater channel will be the home repeater channel. You can only have one home repeater channel. If you have already selected one channel as a home repeater, selecting another for that status will automatically deselect the previous setting.	✕ Until one of the repeater channel rows is selected as a home repeater. For each row there after, this field will be blank.	✕ Mandatory field for one of the rows. You will get a ✕ in each Atr row until you select one of the rows as the home repeater. That will clear the ✕ in all rows. Consult your LTR system operator for information on which repeater channel is “home”.
Frequency	RX	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the radio receive frequency for this repeater channel.	Blank	System operator provided.
Frequency	TX	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the radio transmit frequency for this repeater channel.	Blank	System operator provided.
	W/N	Select “Wide” or “Narrow”. Specify if the repeater channel you are attempting to utilize is using wide or narrow band channels.	Wide (Blank)	System operator provided.
	RF Pwr	Set to “High” or “Low”. Specify if you wish to transmit to this repeater channel using high or low power.	High (Blank)	Set as needed.
Invert	RX Data	Select “On” or “Off”. Select whether or not the radio should expect inverted RX Data.	Off (Blank)	System operator provided.

Group	Field	Description	Default	Suggested Settings
Invert	TX Data	Select “On” or “Off”. Select whether or not the repeater is expecting to receive inverted TX Data.	Off (Blank)	System operator provided.
	Phone	Select “On” or “Off”. Select whether or not this repeater channel will be used for interconnect.	Off (Blank)	System operator provided.

When finished editing here, select “OK” to save the information entered here. Select cancel to discard any edits.

LTR Talk Group Setting Programming Sub-Screen

Double click on the Talk Group field of the *LTR* programming screen to enter the *Talk Group Setting* programming sub-screen.



At the head of this screen is pertinent information concerning the current selected system. Each line in this screen can be used to enter group information. Note that to delete a row, you can right click on almost any field in the programming screen and select “Delete” from the menu that appears.

LTR Talk Group Setting Programming Sub-Screen Field Description Table

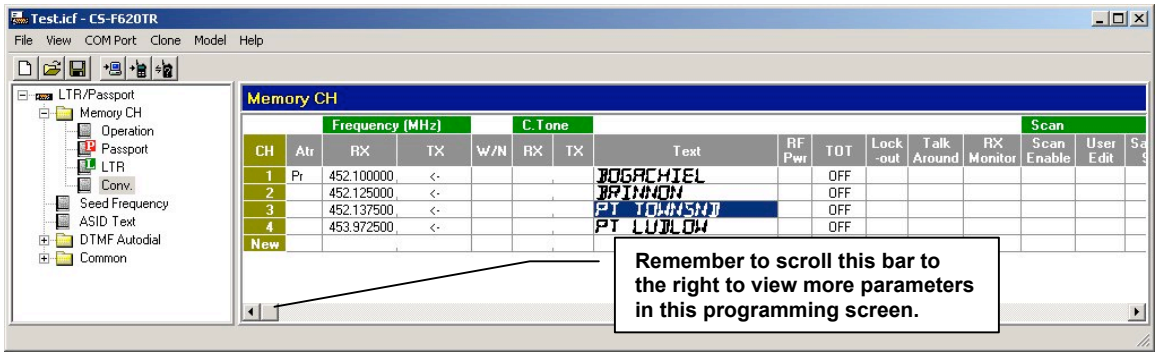
Field	Description	Default	Suggested Settings

Field	Description	Default	Suggested Settings
CH	Each line can contain a new group. You can enter up to 250 groups per LTR system. Don't let the "CH" designation of this column throw you off, each number in this column is just a reference number and have nothing to do with the "CH" column in the *LTR* programming screen.	No user entry.	No user entry.
Group Tag	Double click here to enter a text description for this group (as described on page 13). You can enter up to 10 characters for this field.	✖	✖ Mandatory field - set as needed. You cannot enter any other information on this row until this field has been entered.
RX ID	Enter from 1 to 250. Set RX Group ID.	✖ Until data is entered in this field.	✖ Mandatory field. System operator provided.
TX ID	Enter from 1 to 250. Set TX Group ID. You must enter information into the RX ID field before attempting to change this field. If you attempt to enter this field first, the program will re-direct you to RX ID field. After you enter information in RX ID, this field will show a "<-" indicating that the contents of the TX ID field is the same as the RX ID field. You can change this field to be different from the "RX ID" field for special purposes.	✖ Until data is entered in the "RX ID" field. This field then changes to "<-".	✖ Mandatory field – normally leave as set after data has been entered in the "RX ID" field. System operator provided.
Scan Member	Select "Yes" or "No". Determines if the group will be added to the group scan list.	Yes	Set as needed.
Scan TX Inh	Select "Yes," "No" and "Receive Only". When set to "Yes," the radio is prevented from transmitting on this group if this group is decoded while in group scan mode. Setting to "No" allows full transmit and receive on this group. Setting this to "Receive Only" makes this group a receive only group that cannot be transmitted on (regardless whether the user is in scan mode or not).	No (Blank)	Set as needed.
Phone	Select "Yes," "No" or "Primary Group". Selecting "Yes" allows this Talk Group to use interconnect on the LTR system if the **Phone Request** key is pressed. Selecting "No" disallows the use of the **Phone Request** key function. "Primary Group" selects primary phone group.	No (Blank)	Set as needed.

When finished editing here, select "OK" to save the information entered here. Select cancel to discard any edits.

CONV. PROGRAMMING SCREEN

Conventional Programming Screen Icon: Icon is located in Memory CH folder. This programming screen allows the programmer to create, read, edit and delete multiple Conventional systems.

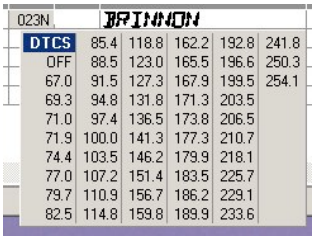


This programming screen has a number of entries, though in many cases the default ones should suffice. Note a ✕ in the "Suggested Settings" column of the following table indicates that this is a mandatory field. Also, you should get in the habit of entering Text field data first. If you try and enter data into any other field besides the Text field, the program will re-direct the user back to the Text field automatically until data has been entered there. Finally note that to delete a system, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears.

CONVENTIONAL PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Field	Description	Default	Suggested Settings
	CH	The total number of lines displayed will indicate the number of Conventional systems in the radio. You can have many systems here; the exact amount depends on memory available in the radio. You will get an overflow dialog box if you have reached the limit.	No user entry.	No user entry.

Group	Field	Description	Default	Suggested Settings
	Atr	Select “Priority,” “Phone” or “Phone Off” (or “Return” to exit without selecting a new setting). Selecting “Priority” sets this system as the one to be used if the **Priority** key is pressed. Note: changing this field to “Priority” will deselect any other system from being the priority system. Selecting “Phone” sets this system as the one to be used if the **Phone Request** key is pressed. Note: changing this to “Phone” will deselect any other system from being the phone request system. Select “Phone Off” to clear this setting.	✖ If no system has been set as a priority system. Otherwise: Phone OFF (Blank)	✖ Mandatory field. Amongst the programming screens for *PassPort*, *LTR* and *Conventional* at least one system needs to be set as a priority system even if no **Priority** key is programmed. Set as needed.
Frequency	RX	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the radio receive frequency for this channel.	✖	✖ Mandatory field - set as needed.
Frequency	TX	Enter from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for). This is the radio transmit frequency for this repeater channel.	Blank	Set as needed.
	W/N	Select “Wide” or “Narrow”. Specify if you wish to use wide or narrow channel width for this system.	Wide (Blank)	Set as needed. When working with conventional repeaters, consult the system operator.

Group	Field	Description	Default	Suggested Settings
C. Tone	RX, TX	Can be set to "DTCS" (Digital Tone Coded Squelch), "OFF" or any number of CTCSS selections from 67.0 to 254.1. If you select "DTCS," you must manually enter the Digital Code you wish to use. Also, when entering DTCS, enter "N" after the three digit number for normal polarity and "I" after the three digit number for inverse polarity (as in screen shot that follows). Note the "023N". See page 42 for recommended DTCS Tones.  This can be used to force the radio to un-mute only for radio traffic broadcasting the same codes squelch signal. Also needed sometimes to operate with Conventional repeaters.	Off (Blank)	Set as needed. When working with Conventional Repeaters, consult the system operator.
	Text	Double click here to enter a text description for this system (as described on page 13). You can enter up to 10 characters for this field.	✖	✖ Mandatory field - set as needed. You cannot enter any other information on this row until this field has been filled in.
	RF Pwr	Select "High" or "Low". Specify if you wish to transmit using high or low power by default on this system. Can be toggled with the **TX Power** key.	High (Blank)	Set as needed.
	TOT	Set to "OFF" (manually type the word in) or enter from 0 to 255 seconds. Setting this prevents the radio from transmitting for a period longer than this timer.	OFF	Set as needed.
	Lockout	Select "Busy Lockout" or "Off". When set to "Busy Lockout" the radio cannot transmit while there is activity on the receive frequency for this system.	OFF (Blank)	Set as needed.

Group	Field	Description	Default	Suggested Settings
	Talk Around	Set to “None” or any of the Conventional or LTR systems that appear in this list. This is the system reverted to if the **Talk Around** key is pressed. When “None” is selected here and the **Talk Around** key is pressed, simplex operation is enabled. In this regard, if the TX frequency is programmed different from the RX frequency, simplex operation takes place on the radios RX frequency. Also in this mode, the transmit coded squelch is what is entered in the “C. Tone TX” field and the coded squelch for RX is what is entered in the “C. Tone RX” field.	None (Blank)	Set as needed.
	RX Monitor	Select “Enable” or “Disable”. Setting this field to “Enable” allows the operator of the radio to disable any tone coded squelch and monitor the channel (if the **Monitor** key is pressed). Setting to “Disable” prevents the user from being able to monitor the channel, even if the **Monitor** key has been toggled on.	Enable (Blank)	Set as needed.
Scan	Scan Enable	Set to “Enable” or “Disable”. Selecting “Enable” will allow this system to be scanned when performing system scan. Selecting “Disable” will prevent this system from being scanned. Even if the User Edit field is set to “Enable” the user will not be able to add this system to the list of systems scanned (if “Disable” is selected in this field).	Enable (Blank)	Set as needed.
Scan	User Edit	Set to “Enable” or “Disable”. Allows user to manually add or delete this system from the list of systems to be scanned. These edits are normally lost if the user cycles power to the radio or changes systems unless the Save User Settings field is enabled.	Disable (Blank)	Set as needed.
Scan	Save User Settings	Set to “Enable” or “Disable”. Allows user’s changes to the systems being scanned to be saved when the radio’s power is cycled or the system is changed.	Disable (Blank)	Set as needed.
DTMF	Decode ch	Select “None” or any of the “DTMF Decode Pri-Codes” listed. If a “DTMF Decode Pri-Code” has been selected, the radio will emit a ring tone and flash a “bell” icon if the proper DTMF sequence of digits is received. You must set up a DTMF decode entry to use this function (see the *DTMF Decode* programming screen - page 48). If the **Select Call** key is pressed, the radio will also mute to dispatch traffic until DTMF digits matching the Primary Code or Secondary Code digit string for the selected DTMF entry has been received.	None (Blank)	Set as needed.

Group	Field	Description	Default	Suggested Settings
Scrambler	ON/OFF	Set to "OFF," "ON" or "Inhibit". Setting this to "OFF" sets the scrambler off as an initial setting. Setting this to "ON" sets the scramble on as an initial setting. The **Scrambler** key can then be used to toggle this function on and off. Setting it to "Inh" (Inhibit) will prevent the scrambler from being used while this system is selected. See the Scrambler Type and Scrambler Group Code fields in the *Common* programming screen (page 60) for more information on setting up the scrambler.	OFF (Blank)	Set as needed.
Scrambler	Code	Set from 1 to 255. With the UT-109 ("Non-Rolling" type) only the value 1 through 32 will work. With the UT-110 ("Rolling" type) values from 1 to 255 will work.	1	Set the code number to match the code used by the customer in general.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

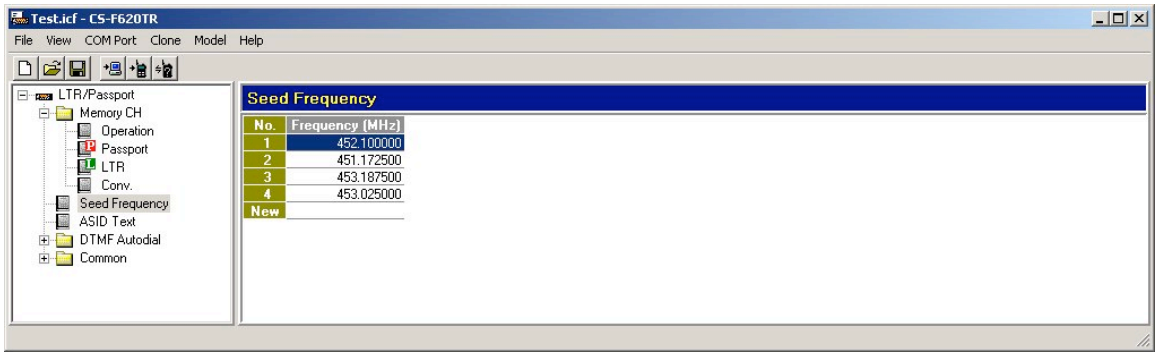
RECOMMENDED DTCS CODES

023	114	174	315	445	631
025	115	205	331	464	632
026	116	223	343	465	654
031	125	226	346	466	662
032	131	243	351	503	664
043	132	244	364	506	703
047	134	245	365	516	712
051	143	251	371	532	723
054	152	261	411	546	731
065	155	263	412	565	732
071	156	265	413	606	734
072	162	271	423	612	743
073	165	306	431	624	754
074	172	311	432	627	

SEED FREQUENCY PROGRAMMING SCREEN

Seed Frequency Programming Screen Icon: Located in the main branch of the Tree Menu. This programming screen allows the programmer to create, read, edit and delete seed frequencies required for any PassPort system entered. This is a global screen and all PassPort systems will refer to this list when in search mode.

Seed frequencies in PassPort are "hard coded" search frequencies (either collect or home channels – depending on whether the system uses redirect or not). When a radio in PassPort mode goes into search or "roam," normally it refers to its "neighbor list" frequencies (or "near" or "far" neighbor frequencies) while looking for a system. Sometimes it is more useful to hard code some frequencies in this seed list to make likelihood of finding a system more certain, particularly on large PassPort systems with many sites. Consult your system operator for more information on whether frequencies are required to be entered here. Be careful though, these frequencies are not "dynamic" like neighbor frequencies and any change in a PassPort system home or collect channels may require radios with those channels programmed in this list to be returned for reprogramming.



Note that to delete a seed frequency, you can right click on the Frequency field in the programming screen and select "Delete" from the menu that appears.

SEED FREQUENCY PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Field	Description	Default	Suggested Settings
No.	The total number of lines displayed will indicate the number of seed frequencies entered. You can have a maximum of 20 before getting an overflow error.	No user entry.	No user entry.

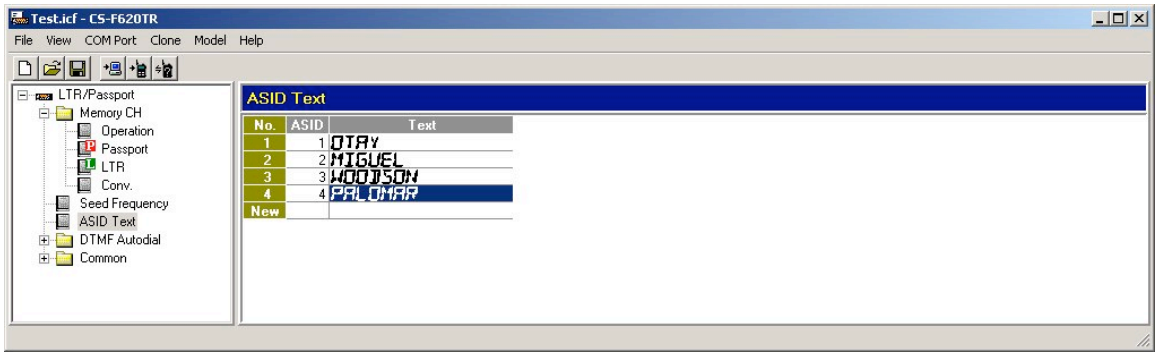
Field	Description	Default	Suggested Settings
Frequency (MHz)	Can be set from 1.000000 to 520.000000 (though, of course, the radio will only function for frequencies it is designed for).	Blank	Set as needed. Note: any frequencies programmed here should be “home” channels if the PassPort system is not setup for re-direct and should be collect channels if the PassPort system is setup for re-direct.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

ASID TEXT PROGRAMMING SCREEN

ASID Text Programming Screen Icon: Located in the main branch of the Tree Menu. This programming screen allows the programmer to create, read, edit and delete ASID text aliases required for any PassPort system entered. This is a global screen and all PassPort systems will refer to this list when they display ASID.

This programming screen is used to alias a text name to a given ASID (for PassPort systems). If an ASID number is to be displayed on the radio, and the received ASID number matches an ASID in this list, the radio will display the ASID Text alias instead of the ASID number.



Note that to delete an ASID Text alias, you can right click on almost any field in the programming screen and select “Delete” from the menu that appears.

ASID TEXT PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Field	Description	Default	Suggested Settings
No.	The total number of lines displayed will indicate the number of ASID Text Aliases entered. You can have a maximum of 10 before getting an overflow error.	No user entry.	No user entry.
ASID	Can be set from 1 to 127.	Blank	Set as needed.
Text	Double click here to enter a text description for this ASID (as described on page 13).	Blank	Set as needed.

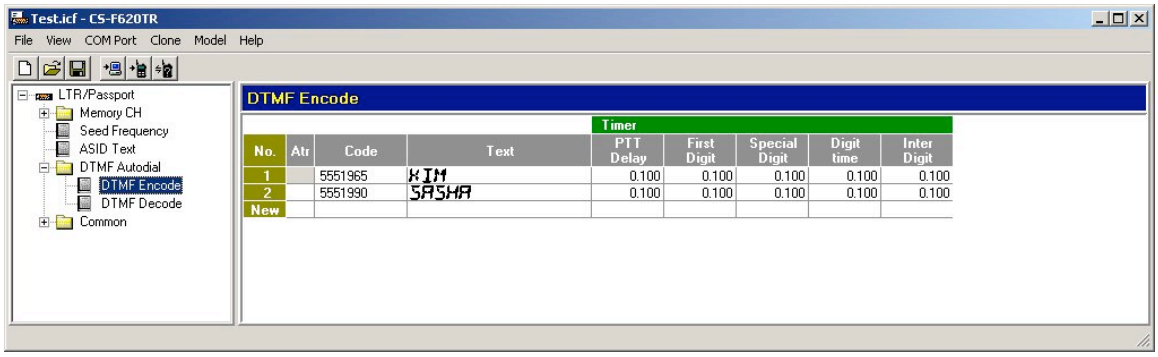
When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

DTMF AUTODIAL FOLDER

 Located in the main branch of the Tree Menu. Folder used to group all programming screen icons having to do with the DTMF encode and DTMF decode in the IC-F620/621TR.

DTMF ENCODE PROGRAMMING SCREEN

DTMF ENCODE PROGRAMMING SCREEN ICON: Located in DTMF Autodial folder. This programming screen allows the programmer to create, read, edit and delete all global DTMF encode entries. If a **Send DTMF** key has been pressed, the entries from this list appear for the operator to choose from to send the selected pre-programmed DTMF sequence for whatever interconnect or system needs. Also these entries can be used as auto-responses in the "Response" fields of the DTMF Decode programming screen.



Note that to delete a row, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears.

DTMF ENCODE PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

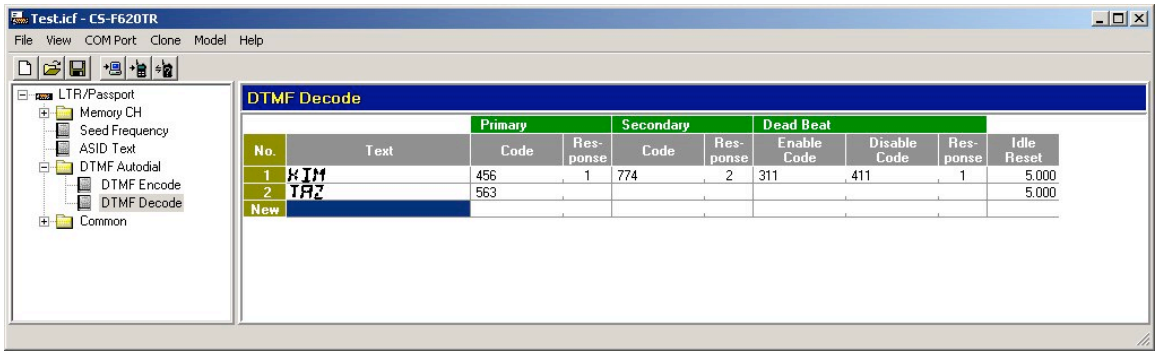
Group	Field	Description	Default	Suggested Settings
	No.	The line number of the DTMF Encode entry. You can have up to 10 entries here before getting an overflow error.	No user entry.	No user entry.
	Atr	Select "Emergency" or "Emergency OFF" (or "Return" to exit without selecting a new setting). Selecting "Emergency" sets this system as the one to be used if the **Emergency** key has been pressed. Note: changing this field to Emergency will deselect any other DTMF Encode row from being the Emergency entry. Select "Emergency OFF" to clear this setting.	Emergency Off (Blank)	Set as needed.
	Text	Double click here to enter a text description for this entry (as described on page 13). You can enter up to 10 characters for this field.	Blank	Set as needed.
Timer	PTT Delay	Enter from 0 to 32.767 (in seconds). Sets the period of time between when the radio initiates transmission of RF carrier and the sending the DTMF sequence. Used to ensure the radio and the receiving system are up and stable before sending out the DTMF sequence.	.1	Set as needed.

Group	Field	Description	Default	Suggested Settings
Timer	First Digit	Enter from 0 to 32.767 (in seconds). Sets period of time in which the first digit of the DTMF sequence will sound. Useful to provide extra “wakeup” time for various DTMF decode systems.	.1	Set as needed.
Timer	Special Digit	Enter from 0 to 32.767 (in seconds). Sets period of time in which special digits “*” (same as “E”) and “#” (same as “F”) will sound. These tones are often used as control codes and it is sometimes useful to have special control over their tone duration.	.1	Set as needed.
Timer	Digit time	Enter from 0 to 32.767 (in seconds). Sets period of time in which the each digit of the DTMF sequence will sound (other than Special Digit or First Digit).	.1	Set as needed.
Timer	Inter Digit	Enter from 0 to .255 (in seconds). Sets period of time between the sounding of each DTMF digit.	.1	Set as needed.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

DTMF DECODE PROGRAMMING SCREEN

DTMF DECODE PROGRAMMING SCREEN ICON: Located in DTMF Autodial Folder
This programming screen allows the programmer to create, read, edit and delete all global DTMF Decode entries. This is a global screen and all system programming screens will refer to this list in the "Decode ch" field.



Note that to delete a row, you can right click on almost any field in the programming screen and select "Delete" from the menu that appears.

DTMF DECODE PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Field	Description	Default	Suggested Settings
	No.	The line number of the DTMF Decode entry. You can have up to 10 entries here before getting an overflow error.	No user entry.	No user entry.
	Text	Double click here to enter a text description for this system (as described on page 13). You can enter up to 10 characters for this field.	Blank	Set as needed.
Primary	Code	Enter up to 10 numbers here. This is the sequence of DTMF digits that is the primary decode for this row.	Blank	Set as needed.
Primary	Response	Select "None" or any listed entry (you must have entries in the *DTMF Encode* programming screen to see a list of selections here). This is the DTMF response given upon the proper decode of the digits in the Primary Code field.	None	Set as needed.
Secondary	Code	Enter up to 10 numbers here. This is the sequence of DTMF digits that is the secondary decode for this row.	Blank	Set as needed.
Secondary	Response	Select "None" or any listed entry (you must have entries in the *DTMF Encode* programming screen to see a list of selections here). This is the DTMF response given upon the proper decode of the digits in the Secondary Code field.	None	Set as needed.
Dead Beat	Enable Code	Enter up to 10 numbers here. This is the sequence of DTMF digits that will restore the radio from DTMF "stun" mode.	Blank	Set as needed.

Group	Field	Description	Default	Suggested Settings
Dead Beat	Disable Code	Enter up to 10 numbers here. This is the sequence of DTMF digitals that will "stun" the radio, causing it to become mute and unable to transmit. Use the value in the Dead Beat Enable Code field to reactivate the radio to normal. Cycling the power or changing systems will not clear the radio from "stun" mode. The radio will display the text in the Stun Text field of the *Field Data* programming screen on power up if it is in "stun" mode.	Blank	Set as needed.
Dead Beat	Response	Select "None" or any listed entry (you must have entries in the *DTMF Encode* programming screen to see a list of selections here). This is the DTMF response given upon the proper decode of the digits in the Dead Beat Disable Code field.	None	Set as needed.
	Idle Reset	Enter from .1 to 32.767 (in seconds). Time receiver is un-muted after decode.	5.000	Set as needed.

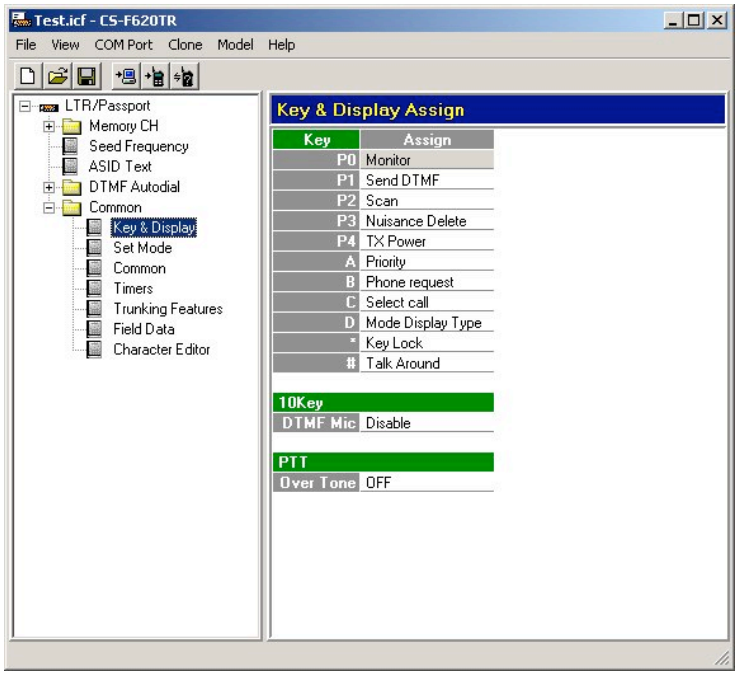
When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

COMMON FOLDER

 Located in the main branch of the Tree Menu. Folder used to group all programming screen icons having to do with common and miscellaneous configurations used by the radio in general.

KEY & DISPLAY ASSIGN PROGRAMMING SCREEN

KEY & DISPLAY ASSIGN PROGRAMMING SCREEN ICON: Located in Common folder. This programming screen allows the programmer to assign and re-assign key functions to programmable keys and edit miscellaneous DTMF parameters.



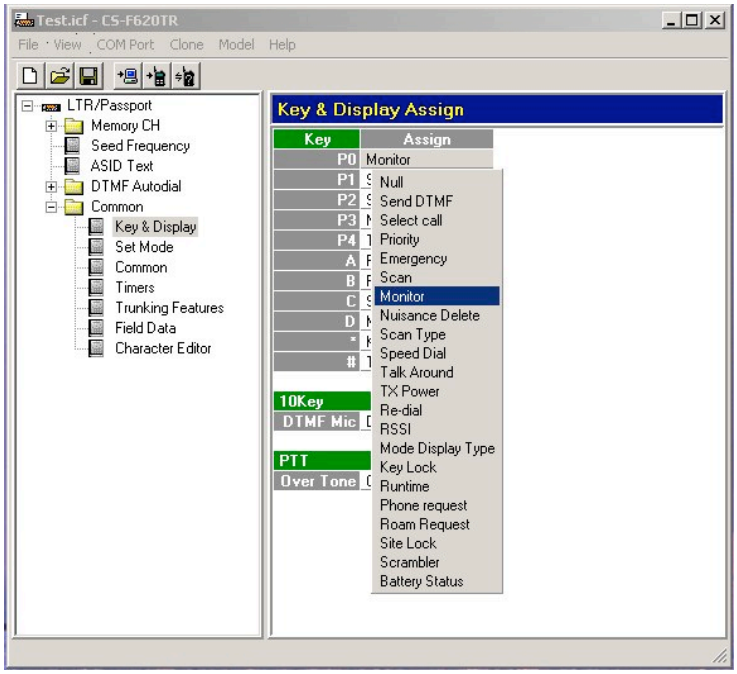
The preceding screen shot shows the programmable key defaults for the radio. Double click on the field you wish to edit. The next table is a description for each row in each group:

KEY & DISPLAY PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Row	Description	Default
Key	P0 –P4, A, B, C, D, *, #	A list of all programmable keys. To reassign a function to a given key, double click on the Assign field of the key you wish to re-assign and select from the menu that appears. Note all key functions can be assigned to any programmable key. Please refer to the screen and table on page 53 for a list of all key functions that can be assigned to programmable keys.	Refer to previous screen shot.
10 Key	DTMF Mic	Set to “Enable” or “Disable”. Selecting enable allows for DTMF operation of the optional HM-100TN DTMF microphone.	Disable
PTT	Over Tone	Set to “On” or “Off”. Selecting “On” will cause the radio to transmit a short tone as each transmission is de-keyed. This provides a more “affirmative” end of a transmission to the party receiving it. This is particularly useful for radios receiving transmissions in noisy environments or scenarios (like PassPort selective call) where the RF carrier from the repeater does not drop even though the transmitting party has de-keyed.	OFF

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

PROGRAMMABLE KEY FUNCTIONS



PROGRAMMABLE KEY FUNCTIONS DESCRIPTION TABLE

Key Function	Description	Fields and/or Programming Screens Related to
Null	Key assigned with this has no function.	NA
Send DTMF	Key assigned to this function will bring up a list of DTMF entries to select and send when activated. These entries are listed numerically by their order of entry in the *DTMF Encode* programming screen.	*DTMF Encode* programming screen
Select Call	This is a DTMF function only. Key assigned to this function will toggle Select Call "On" or "Off". When select call is "On" the radio is muted to dispatch traffic until a DTMF digit sequence that matches either the primary or secondary digit sequence of the DTMF entry selected in the "DTMF Decode ch" field for that system is received. You must create an entry in the *DTMF Decode* programming screen and select that entry in the "DTMF Decode ch" for the desired system for this to function properly. Note, once a DTMF selective call has been "de-coded" the key needs to be toggled back "On" to return to selective call mode.	See the *DTMF Decode* programming screen and the "Decode ch" field in the *PassPort*, *LTR* and *Conv*. programming screens.

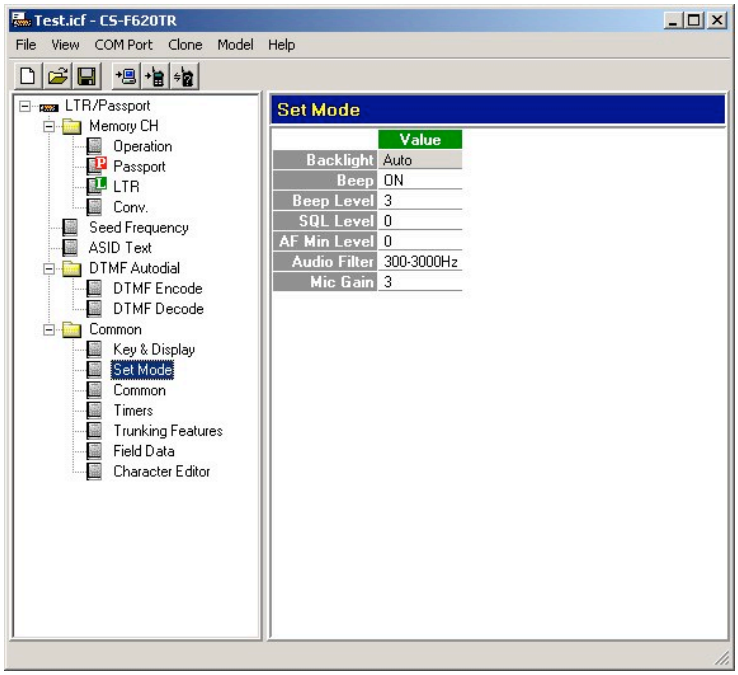
Key Function	Description	Fields and/or Programming Screens Related to
Priority	Key assigned to this function will cause the "Priority" system to be selected. The purpose of this is to give the user instant access to a critical or frequently used system.	The Atr field of the *PassPort*, *LTR* and "*Conv."* programming screens. Amongst those programming screens, at least one system needs to be set as a "Priority" even if no **Priority** key is programmed.
Emergency	Key assigned to this function will transmit digit sequence of the DTMF Encode entry marked "Emergency".	Atr field of the *DTMF Encode* programming screen.
Scan	Key assigned to this function will toggle scan between start and stop. Note, in PassPort, group scan will only work when registered to the home site. If the User Edit field and/or Edit TG List field has been enabled and scan is not active, you can select which groups or systems to scan or not scan with the **Scan** key. Select the targeted group or system, press and hold the **Scan** key down until you see "SCAN ADD" or "SCAN DEL". This will add or delete systems or groups from being scanned. A steady "S" icon indicates that the system or group is in the scan list. No "S" icon indicates that it has been removed. A blinking "S" indicates scan mode is active.	See the *PassPort*, *LTR* and "*Conv."* programming screens.
Monitor	Key assigned to this function will toggle the radio in and out of Monitor mode (a "Speaker Icon" will be displayed when mode is enabled). This disables CTCSS or DTCS tone code squelch. Useful for monitoring frequency activity in general without the filter of a coded squelch inhibiting some potential receive activity.	See the "C. Tone RX" and "C. Tone TX" fields in the *"Conv."* programming screen to see if the Conventional system has tone coded squelch.
Nuisance Delete	While the radio is in scan, the key assigned to this function will temporarily delete a system from being scanned. This will not work for groups. Cycling radio power or changing systems will clear this setting. Enabling the Save User Setting field in the *LTR* or *"Conv."* programming screens will not affect this function.	NA
Scan Type	Key assigned to this function toggles the scan type between "Individual" and "Block". If you're not using Block Scan, leave this unassigned.	*PassPort* and *LTR* programming screens.
Speed Dial	Key assigned to this function will bring up a list of DTMF entries to select and send when activated. These entries are listed numerically by their order of entry in the *DTMF Encode* programming screen.	*DTMF Encode* programming screen

Key Function	Description	Fields and/or Programming Screens Related to
Talk Around	Key assigned to this function will enable the "Talk Around" system programmed for the current system.	See Talk Around field in the *PassPort*, *LTR* and "*Conv.*" programming screens.
TX Power	Key assigned to this function will toggle between high and low power. Note: this setting will only work for systems and repeater channels whose settings are already not set to low in their programming screens.	See RF Pwr field in the *"Conv."* programming screen or the *Repeater Setting* programming sub-screen to set power for a system or channel high or low.
Re-dial	Key assigned to this function will resend the most recently transmitted DTMF digit sequence.	*DTMF Encode* programming screen
RSSI	Key assigned to this function will toggle between displaying the RSSI of a PassPort system "On" and "Off". Activating this sets up an alternating display showing both RSSI and the system or group tag. The RSSI display is in the following format: XX YY-ZZ, where XX is the ASID of the current system, YY is RSSI value of the current data message and ZZ is the average RSSI value of last two received data messages. The dash between YY and ZZ will turn to a "+" when there is activity on the channel the radio is monitoring.	NA
Mode Display Type	Key assigned to this function will toggle the display type between "Alpha" and "Scroll". Select "Alpha" and the display will show the current system or talk group. Select "Scroll" and the display will continuously scroll detailed information about the current PassPort, LTR or Conventional system you have selected.	NA
Key Lock	Key assigned to this function will lock the radio and prevent further key presses from having any function. Push and hold for 2 seconds to turn the lock function "On". Push and hold for 2 seconds again and enter the pass code "1234" to toggle the lock function "Off". The optional HM-100TN DTMF microphone is required for this function and the "DTMF Mic field" in the *Key & Display Assign* programming screen must be set to "Enable".	See the DTMF Mic field in the *Key & Display Assign* programming screen.
Runtime	Key assigned to this function displays radios total runtime.	NA
Phone request	Key assigned to this function will cause the "Phone" system to be selected. The purpose of this is give the user instant access to the system most frequently used for interconnect.	The Atr field of the *PassPort*, *LTR* and *"Conv."* programming screens. Only one system can be selected as the "Phone" system.

Key Function	Description	Fields and/or Programming Screens Related to
Roam Request	For PassPort systems only. Key assigned to this function will force the radio to go into search mode (roam). This is useful if the operator of the radio is having trouble with a system (for example: distant enough to be noisy but not weak enough to cause the radio to go into search mode) and wishes to attempt to find a system more suitable for his area.	NA
Site Lock	For PassPort systems only. Key assigned to this function will force the radio to remain on the current system it is registered to, no matter the condition of low speed data or RSSI from the system. This is useful if user will be using the radio in a localized area where, if the radio were to go into search mode, a better site would probably not be found. This prevents the radio from being unnecessarily out-of-service. Examples of where this could be handy would be at the fringe of the only site serving an area, a tunnel, or a localized area of blocking terrain. The radio should be removed from Site Lock mode as soon as possible to return to normal operation.	NA
Scrambler	Key assigned to this function toggles the scrambler "On" and "Off".	See the Scrambler ON/OFF and Code fields of the *PassPort*, *LTR* and *"Conv."* programming screens. Also the Scrambler group of fields in the *Common* programming screen.
Battery Status	Key assigned to this function toggles between display of battery voltage and normal display. Can be useful for troubleshooting or other special purposes, though not normally used.	NA

SET MODE PROGRAMMING SCREEN

SET MODE PROGRAMMING SCREEN ICON: Located in Common folder. This programming screen allows the programmer to edit general radio display and audio parameters.



The preceding screen shot shows the defaults for this programming screen. Double click on the field you wish to edit. The next table is a description for each row:

SET MODE PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

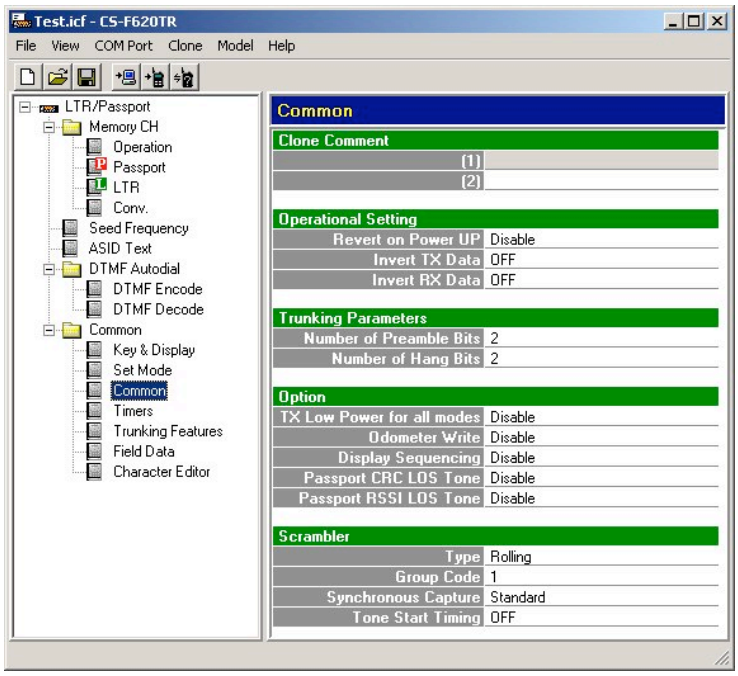
Row	Description	Default
Backlight	Select "OFF", "Dim", "Auto" and "ON". Selecting "Off" disables backlight completely. Selecting "Dim" sets backlight to be on constantly at a dim level. Selecting "On" sets the backlight to remain on continuously. Do not use "Auto".	Auto
Beep	Select "ON" or "OFF". Selecting "On" will activate a short "beep" when keys are pressed. Note: some beeps, such as the one for the lockout timer, cannot be turned off.	ON
Beep Level	Select "1" through "5" or "1 Linked" through "5 Linked". Selecting "1" through "5" (with "5" being the loudest) will cause the beeps to sound at a constant volume regardless of the setting of the volume knob. Selecting "1 Linked" through "5 Linked" (with "5 Linked" again being the loudest) "ties" the beeps to the volume control. Experiment with this setting to see what works best for the customer.	3
SQL Level	Enter a number from 0 to 255 (0 "the loosest"). Manually sets squelch levels.	0
AF Min Level	Enter from 0 to 255 (0 lowest). Sets the lowest level that speaker audio can be set to. This is useful to prevent the radio operator from turning the radio all the way down (and forgetting to turn it up) and potentially missing a call.	0

Row	Description	Default
Audio Filter	Select “300-3000Hz,” “0-3000Hz,” “300-3400Hz” or “0 –3400Hz”. Select different pass characteristics for the audio filter for special purpose applications.	300-3000Hz
Mic Gain	Select “1 Min” through “5 Max”. Increases or decreases microphone gain for special purpose applications.	3

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

COMMON PROGRAMMING SCREEN

COMMON PROGRAMMING SCREEN ICON: Located in Common folder. This programming screen allows the programmer to edit miscellaneous parameters.



The preceding screen shot shows the defaults for this programming screen. Double click on the field you wish to edit. The next table is a description for each row in each group:

COMMON PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

Group	Row	Description	Default
Clone Comment	(1) & (2)	These rows allow you to insert custom comments concerning the radio. You can enter up to 16 characters in each row. Note: You can read these comments quickly without reading the entire contents of the radio by hooking up the target radio to the programming computer and selecting Clone -> Information from the main menu.	Blank
Operational Setting	Revert on Power UP	Select “Enable” or “Disable”. Selecting “Enable” sets the radio to always power up to the first system in the channel list (see *Operation* programming screen). Selecting “Disable” sets the radio to always power up to the last system selected when the radio was powered down.	Disable
Operational Setting	Invert TX Data	Select “On” or “Off”. Selecting “On” inverts the polarity of TX Data for PassPort and LTR systems. The Invert TX Data field in the *Repeater Setting* programming sub-screen will over-ride this setting.	OFF
Operational Setting	Invert RX Data	Selecting “On” inverts the polarity of RX Data for PassPort and LTR systems. The Invert RX Data field in the *Repeater Setting* programming sub-screen will over-ride this setting.	OFF

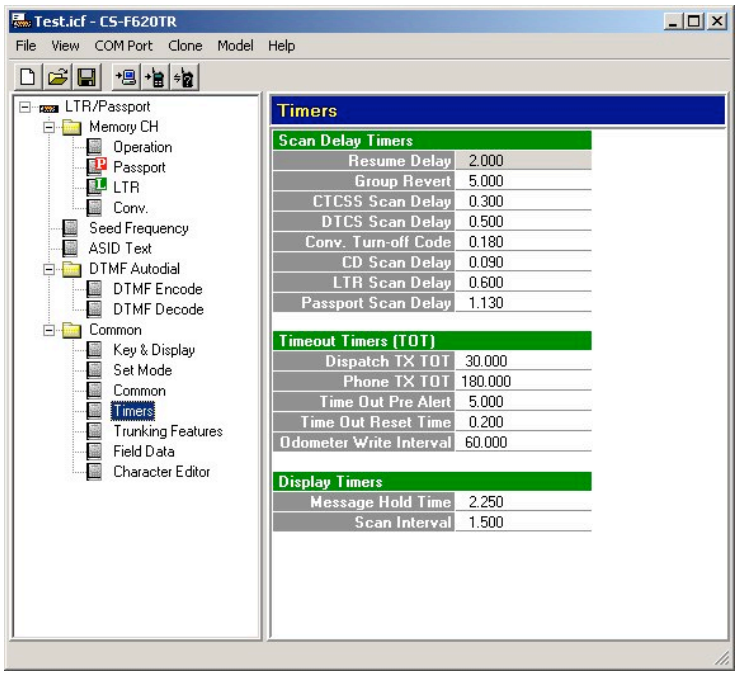
Group	Row	Description	Default
Trunking Parameters	Number of Preamble Bits	Select "0" through "7". Selects number of initial bits sent out with low speed data records to ready the decoder. Used for both PassPort and LTR systems.	2
Trunking Parameters	Number of Hang Bits	Select "0" through "7". Selects number of bits sent out at the end of the low speed data record to aid the decoder. Used for both PassPort and LTR systems.	2
Option	TX Low Power for all modes	Select "Enable" or "Disable". Selecting "Enable" forces to radio to start in low power. The "RF Pwr" field in the *"Conv."* programming screen or the *Repeater Setting* programming sub-screen over-rides this. Programming and activating a **TX Power** key will over-ride this also.	Disable
Option	Odometer Write	Select "Enable" or "Disable". Selecting "Enable" allows certain key radio "accounting" information (such as run time) to be periodically recorded to the radio's memory. To use the run time fields in the *Field Data* programming screen you must enable this. Enabling this also activates the Total Radio Runtime field in the *Field Data* programming screen.	Disable
Option	Display Sequencing	Select "Enable" or "Disable". Selecting "Enable" forces the radio on start up to continuously scroll detailed information about the current PassPort, LTR or Conventional system you have selected. This can be over-ridden by toggling the **Mode Display Type** key (though if power is cycled, the display will revert to "Scroll").	Disable
Option	PassPort CRC LOS Tone	Select "Enable" or "Disable". Selecting "Enable" causes the radio to emit a short tone whenever it goes into search mode (roam) because CRC is not sufficient.	Disable
Option	PassPort RSSI LOS Tone	Select "Enable" or "Disable". Selecting "Enable" causes the radio to emit a short tone whenever it goes into search mode (roam) because RSSI is not sufficient.	Disable
Scrambler	Type	Select "Rolling" or "Non-Rolling". The optional UT-109 (#02) or UT-110 (#02) voice scramble unit is required for this functionality (remove the UT-108 DTMF decoder unit to install). The UT-109 is a "Non-Rolling" type scrambler so select "Non-Rolling" in this field if installing a UT-109. The UT-109 will work with Conventional, LTR or PassPort. The UT-110 is a "Rolling" type scrambler so select "Rolling" in this field if installing a UT-110. The UT-110 can be used with LTR or PassPort, but only if the Synchronous Capture field is set to "Continuous". If the Synchronous Capture field is set to "Standard" the scrambler can only be used in Conventional mode.	Rolling
Scrambler	Group Code	Select 1 through 4. Selects group code. This setting is for the UT-110 only as the UT-109 does not utilize group codes.	1

Group	Row	Description	Default
Scrambler	Synchronous Capture	Select Standard or Continuous. This setting is for the UT-110 only. If this is set to “Standard”, sync starts when incoming signals are received (when squelch opens). If this is set to “Continuous” sync is continuous. For Conventional mode, “Standard” is recommended (though in “Standard” the scrambler may not sync up for as long as 4.4 seconds). For LTR or Passport, “Continuous” must be selected here (though with Continuous mode, the radio may experience occasional garble during voice transmissions).	Standard
Scrambler	Tone Start Timing	Select Off, 300ms, 600ms, 1100ms. This setting is for the UT-110 only and only if the Synchronous Capture field is set to “Standard”. Sets the sync tone delay.	OFF

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

TIMERS PROGRAMMING SCREEN

TIMERS PROGRAMMING SCREEN ICON: Located in Common folder. This programming screen allows the programmer to edit all global timing parameters.



The preceding screen shot shows the defaults for this programming screen. Double click on the field you wish to edit. The next table is a description for each row in each group:

TIMERS PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

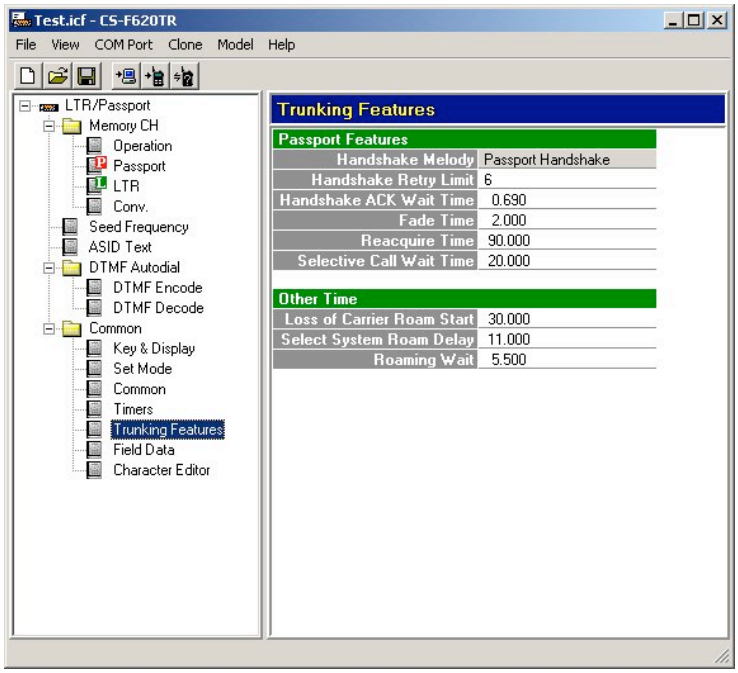
Group	Row	Description	Default
Scan Delay Timers	Resume Delay	Enter from .1 to 25.5 seconds. When scan stops on a busy channel and then the channel activity goes away, this is the interval of time between when the activity goes away and scan resumes.	2.000
Scan Delay Timers	Group Revert	Enter from 0 to 10 seconds. If the radio in group scan stops on an active group, this is the interval of time between when the activity goes away and the radio reverts back to the currently selected group (for transmit purposes). In other words this is the amount of time you have to reply back to a scanned group. If the user does not press the PTT in this interval of time after activity on the scanned group has ceased, the transmission will come up on the current group and not the scanned group.	5.000
Scan Delay Timers	CTCSS Scan Delay	Enter from .2 to 5 seconds. This is the interval of time that the radio will stay on the channel during scan to decode a CTCSS tone. If it cannot decode the proper tone in this interval of time, scan will continue.	0.300

Group	Row	Description	Default
Scan Delay Timers	DTCS Scan Delay	Enter from 0 to 5 seconds. This is the interval of time that the radio will stay on the channel during scan to decode a DTCS tone. If it cannot decode the proper tone in this interval of time, scan will continue.	0.500
Scan Delay Timers	Conv. Turn-off Code	Enter from 0 to .6 seconds. Sets the duration of reverse burst after a transmission is finished. Used to quiet squelch tails.	0.180
Scan Delay Timers	CD Scan Delay	Enter from 0 to 5 seconds. This is the interval of time the radio will spend on each system looking for activity.	.090
Scan Delay Timers	LTR Scan Delay	Enter from .5 to 5 seconds. This is the interval of time between when the LTR signal stops and the radio resumes scanning.	0.600
Scan Delay Timers	PassPort Scan Delay	Enter from 0 to 5 seconds. This is the interval of time between when the PassPort signal stops and the radio resumes scanning.	1.130
Timeout Timers (TOT)	Dispatch TX TOT	Set to "OFF" (manually type the word in) or enter from 0 to 255 seconds. Setting this prevents the radio from transmitting for a period longer than this timer.	30.000
Timeout Timers (TOT)	Phone TX TOT	Set to "OFF" (manually type the word in) or enter from 0 to 255 seconds. Setting this prevents the radio from transmitting on an interconnected system for a period longer than this timer.	180.000
Timeout Timers (TOT)	Time Out Pre Alert	Enter from .1 to 18 seconds. This sets the period of time, before the Time Out Timer expires, that the radio sounds a TOT warning beep.	5.000
Timeout Timers (TOT)	Time Out Reset Time	Enter from .1 to 18 seconds. This sets the period of time, after the Timeout Timer has expired, that the radio is disabled from transmitting.	0.200
Timeout Timers (TOT)	Odometer Write Interval	Enter from 10 to 180 seconds. This sets the time interval in which the radio writes "bookkeeping" (runtime etc.) information to its internal memory.	60.000
Display Timers	Message Hold Time	Enter from 0 to 5 seconds. Amount of time radio messages are displayed on screen.	2.250
Display Timers	Scan Interval	Enter from 0 to 5 seconds. Sets scrolling interval for radio messages.	1.500

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

TRUNKING FEATURES PROGRAMMING SCREEN

TRUNKING FEATURES PROGRAMMING SCREEN ICON: Located in Common Folder. This programming screen allows the programmer to edit additional trunking parameters used by the radio.



The preceding screen shot shows the defaults for this programming screen. Double click on the field you wish to edit. The next table is a description for each row in each group:

TRUNKING FEATURES PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

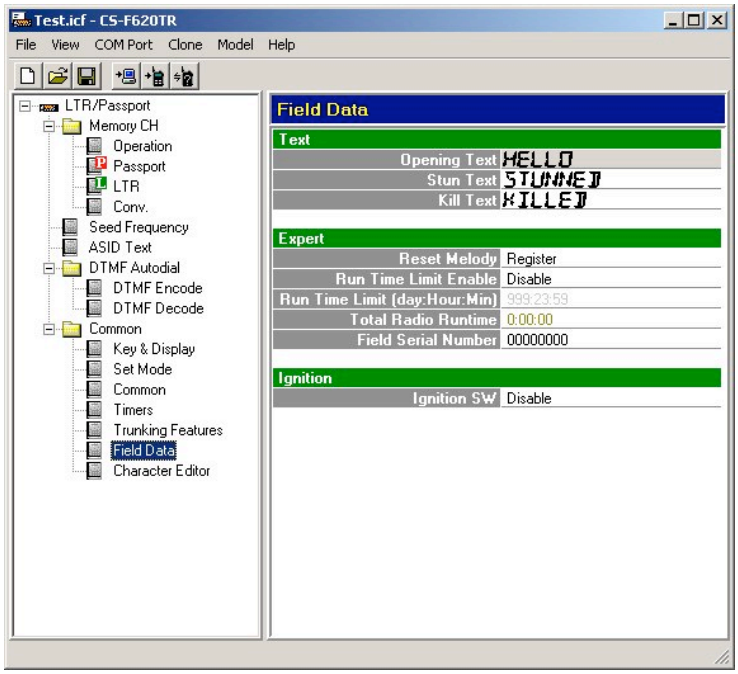
Group	Row	Description	Default	Suggested Settings
PassPort Features	Handshake Melody	Select from various radios tones in menu. This is the tone used for each transmission when handshaking with a PassPort system.	PassPort Handshake	PassPort Handshake
PassPort Features	Handshake Retry Limit	Enter from 0 to 255. This is the number of times a handshake will be attempted with a PassPort system until a “Busy” tone is emitted from the radio. The user at this point needs to release the **PTT** key and try again.	6	5
PassPort Features	Handshake ACK Wait Time	Enter from .25 to 65.535. This is the amount of time the radio will wait for a handshake acknowledge.	0.690	0.690
PassPort Features	Fade Time	Enter from 0 to 7.5. This is the amount of time the receiver will continue to monitor the current channel in the event the channel fades.	2.000	2.000

Group	Row	Description	Default	Suggested Settings
PassPort Features	Reacquire Time	Enter from 0 to 250. If a PassPort radio goes into search (roam) mode and it attempts to go back to the same site it left, it will not attempt to register to the site (because it probably does not need to) unless this period of time has elapsed.	90.000	90.000
PassPort Features	Selective Call Wait Time	Enter from 10 to 30. This is the amount of time the radio will wait for a successful selective call to be setup by the system after the radio initiates a selective call.	20.000	30
Other Time	Loss of Carrier Roam Start	Enter from 2 to 250. This is the amount of time between when radio has lost low speed data from the PassPort system that it is currently registered to and when it will go into search (roam) mode.	30.000	20
Other Time	Select System Roam Delay	Enter from 2 to 250. After a new system is selected, this is the amount of time the radio will wait until initiating search (roam) mode.	11.000	7
Other Time	Roaming Wait	Select from 2 to 65.535. If a radio is in search (roam) mode, this is the amount of time the radio will wait on each frequency for PassPort data activity before moving on to the next frequency in its neighbor lists or seed list.	5.500	This setting should be set to about 2.5 times the idle message interval of the PassPort system. For example, if the system is setup to send out an idle message every 2 seconds, then the suggested setting here would be “5”.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

FIELD DATA PROGRAMMING SCREEN

FIELD DATA PROGRAMMING SCREEN ICON: Located in Common Folder. This programming screen allows the programmer to edit miscellaneous expert and other parameters.



The preceding screen shot shows the defaults for this programming screen. Double click on the field you wish to edit. The next table is a description for each row in each group:

FIELD DATA PROGRAMMING SCREEN FIELD DESCRIPTION TABLE

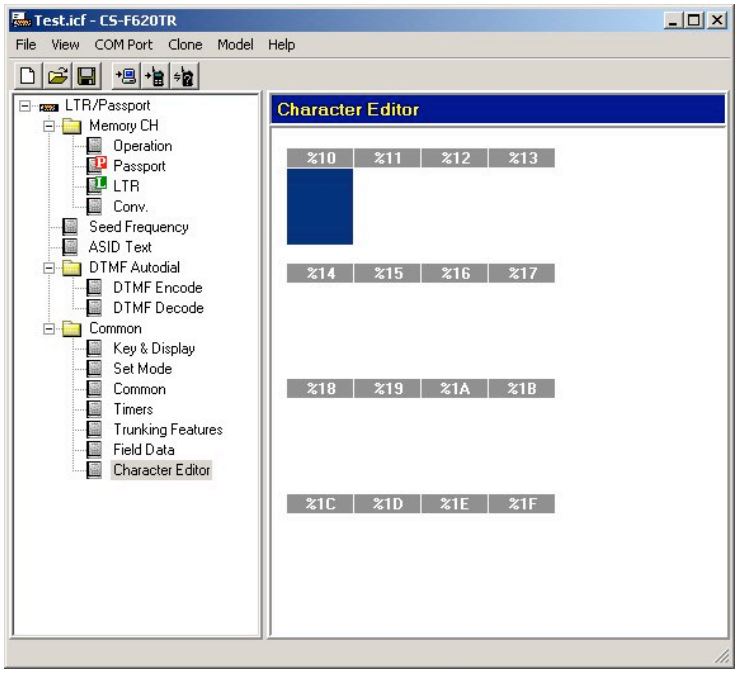
Group	Row	Description	Default
Text	Opening Text	Double click here (as described on page 13) and enter the text you wish to have displayed when the radio is first powered on. You can enter up to 10 characters here.	HELLO
Text	Stun Text	Double click here (as described on page 13) and enter the text you wish to have displayed if the radio has been stunned (PassPort or DTMF stun). You can enter up to 10 characters here.	STUNNED
Text	Kill Text	Double click here (as described on page 13) and enter the text you wish to have displayed if the radio has been killed (PassPort only). You can enter up to 10 characters here.	KILLED
Expert	Reset Melody	Select from various radios tones in the menu. This is the tone used when the radio is powered on or reset.	Register
Expert	Run Time Limit Enable	Select Enable or Disable. Selecting “Enable” here allows access to the “Run Time Limit (day:Hour:Min)” field and also ensures that the radio will not function beyond the time listed in the Run Time Limit field.	Disable

Group	Row	Description	Default
Expert	Run Time Limit (Day:Hour:Min)	Enter from 0:00:00 to 999:23:59. To access this field you must set the Run Time Limit Enable field to “Enable”. Enter the amount of days, hours and minutes you wish to have to radio function for.	99:23:59
Expert	Total Radio Runtime	Displays the cumulative runtime for the radio for the period of time that the Odometer Write field of the *Common* programming screen has been set to “Enable”.	0:00:00. No user entry.
Expert	Field Serial Number	Enter from 00000000 to 99999999. A user-defined serial number can be entered here.	00000000
Ignition SW	Disable	Select “Enable” or “Disable”. Selecting “Enable” here will set the radio to power on automatically when the ignition switch is turned on.	Disable

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

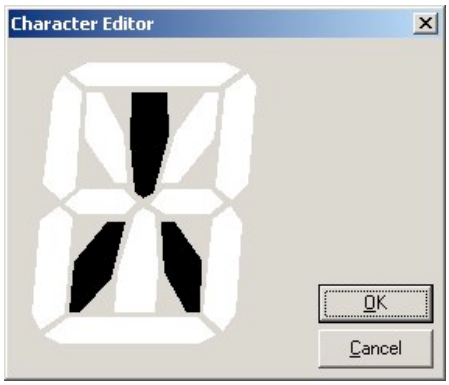
CHARACTER EDITOR PROGRAMMING SCREEN

CHARACTER EDITOR PROGRAMMING SCREEN ICON: Located in Common Folder. This programming screen allows the programmer to create custom display characters.



You can create and enter custom characters in the 16 fields here. These characters can be used, along with the default characters, as the text to enter in the Text Dialog Box (see page 13).

To create or edit a custom character, double click on one of the 16 new or existing fields in the *Character Editor* programming screen.

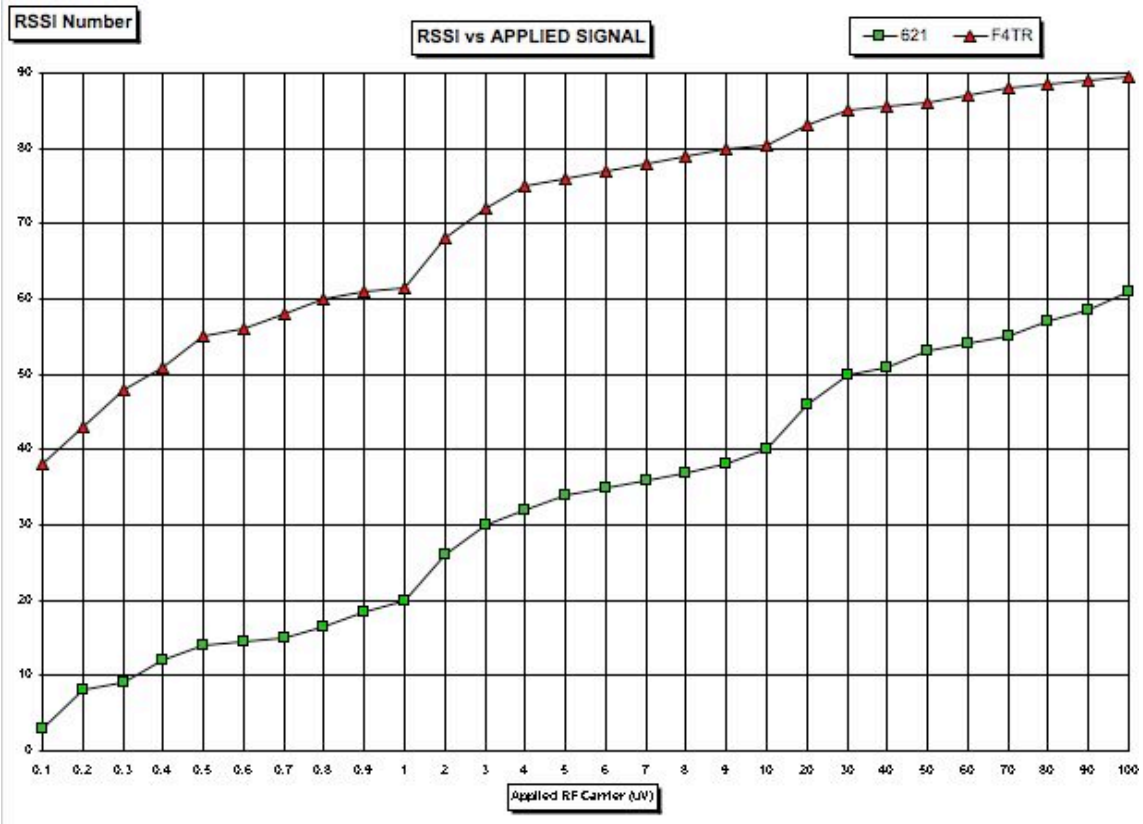


A dialog box will then be displayed that will allow you to edit segments. Click on the segments in this screen (to toggle the segment on or off) to create the character of your choice. Press OK when finished or Cancel to discard any edits.

When done editing in this programming screen you can proceed to other programming screens, save your programming parameters to a file or proceed to writing the information to the radio (assuming that editing has been finished for all other required programming screens also).

Appendix

APPENDIX A - RSSI Reference Chart (for “Min” and “Preferred” fields in the PassPort Programming Screen)



APPENDIX B - Suggested Radio Setups

The following are suggested setups for various system scenarios. The IC-F620/F621TR series radio is highly versatile and is capable of far more functions than indicated here. None-the-less, the demonstrated configurations are a good starting point for configuring the radio for a variety of system protocols. These can be a starting point for configuring a radio for each customer's or system operator's needs.

PASSPORT

This is a suggested setup and function description for a radio that will be primarily used on a PassPort system.

Refer to the next table for a description of what these keys do.

KEY ASSIGNMENTS AND FUNCTIONS

Keys	Key Assignment	Function
Group/MIN Up/Down	N/A	Use this to scroll through the group list. The group list may also contain a list of MINs for selective call. A double beep will sound as you reach the "limit" and cycle to the "top" or "bottom" of the list.
P0	Site Lock	This will force the radio to remain "Locked On" the current site, no matter the quality of signal from that site. This is useful if the radio is using a marginal site but if the radio were to go into search mode, a better site would probably not be found. This prevents the radio from being unnecessarily out-of-service. Examples of where this could be handy would be at the fringe of the only site serving an area, a tunnel, or a localized area of blocking terrain. The radio should be removed from Site Lock mode as soon as possible to return to normal operation.
P1	Roam Request	This will force the radio to go into search mode (roam). This is useful if the operator of the radio is having trouble with a system (for example: distant enough to be noisy but not weak enough to cause the radio to go into search mode) and wishes to attempt to find a system more suitable for his area.
P2	Talk Around	If the radio has a Conventional or LTR system programmed into it, this key would be used to quickly switch to that system for localized or other use.
P3	Mode Display Type	This mode provides useful information concerning the system and site the radio is currently registered to. Particularly useful when attempting to troubleshoot problems a user may be experiencing in the field with a PassPort system.

Keys	Key Assignment	Function
P4	RSSI	The Signal Strength Indicator on the Function Display usually shows sufficient information concerning the strength of the signal from the site the radio is currently registered to. There are times, often when attempting to troubleshoot system problems, that selecting this will provide more detailed information concerning the signal strength (and the ASID of the current system). Also, advanced users often appreciate the information displayed here. Activating this key sets up an alternating display between the RSSI and the system or group tag (depending on which rocker key, **System** or **Talk Group**, was last activated). The RSSI display is in the follow format: XX YY-ZZ, where XX is the ASID of the current system, YY is RSSI value of the current data message and ZZ is the average RSSI value of last two received data messages. The dash between YY and ZZ will turn to a "+" when there is activity on the channel the radio is monitoring.
System Up/Down	N/A	Use this to scroll through the system list. A double beep will sound as you reach the "limit" and cycle to the "top" or "bottom" of the list.

TYPICAL FUNCTIONS AND CONDITIONS

Function	How to Use
Power On	When the radio is first activated, it will briefly display the text entered in the Opening Text field of the *Field Data* programming screen. Then is will display the firmware version. It will then begin to look for a system to register to. Depending on the setting of the Preferred Last Registered field of the **PassPort** programming screen, the radio will first search for its "Home Site" or the site it was last registered to.
Searching (Roam)	The radio go into search mode when one of several criteria are met: • When the radio has just been turned on. • When a new PassPort system is selected. • When the signal from the current site the radio is registered to becomes unusable for communications. • When the **Roam Request** key is activated. Normally, a site should be found within about 20 seconds. On large systems or in marginal conditions this process could take up to 10 minutes or longer. While in search mode the radio will display "NO SVC" alternating with the current group or system tag. When a better site has been located the radio will attempt to register.
Registration	You will see the ASID (or ASID alias) of the site the radio is attempting to register to on the Function Display. When the radio has successfully registered, the registration tone will sound.
System Up/Down Keys and Group/MIN Up/Down Keys	The current System can be displayed by pressing either of the **System Up/Down** keys. Another press of either key will change the system (if there is more than one system in the radio). The current group can be displayed by pressing either of the **Group/MIN Up/Down** keys. Another press of either key will change the group (if there is more than one group in the system) or select MIN aliases for selective call (again – if so programmed). When changing groups, if the radio is registered to its "home site", the radio will NOT need to "re-register" into the site as a new group is selected. The user should not expect registration tones except when first registering to the site. If a user is on a "roam site" the user must wait for the radio to register to the site again (and get the registration tones) as a new group is selected (though not technically true if the group selected is a "primary group").

Function	How to Use
Group Dispatch	After the radio has registered, it is normally ready to perform "Group Dispatch". To call a base unit or other field units, simply press the **PTT** key. Wait until you get the PTT "handshake" tone and then start speaking. It is a common mistake for first time users to attempt to "over talk" this tone (particularly as there is a slightly longer delay to get this tone than in other protocols like LTR), but after a couple of minutes of practice the user should have no further difficulties. In Group Dispatch mode, all users registered to a particular group will hear any unit transmitting on that group.
Selective Call	Selective call can be accomplished by selecting a selective call "MIN alias" with the **Group/MIN Up/Down** keys. After selecting the MIN Alias, press the **PTT** key. If the other unit is available, you should receive a response in about 5 seconds though on very large system it could take up to 30 seconds. If the selective call does not go through, you will hear a low tone and the display will remain on the MIN Alias. If it does go through you will hear a tone and be connected. You can now have a private conversation with the person you are connected to without disturbing any dispatch group. To disconnect a selective call, press the **Group/MIN Up** key. You will hear a disconnect tone. Note, when using selective call, the site's repeater that was setup for the selective call will stay up for the duration of the call. This can be slightly disconcerting for users used to group dispatch as the radio does not behave as it does during a dispatch call (where the channel drops when the sending party quits transmitting). A way to help confirm when the other party has stopped transmitting is to enable the PTT Over Tone field of the *Key and Display Assign* programming screen (see page 52).
Scan	In the recommended settings, a **Scan** key is not setup. This is because, at this time, scan capabilities are limited in PassPort. You cannot scan across systems and group scan will only work if the radio is registered to its "home site" (unless "scanning" the "primary group"). Also, since the ability to roam is one of the primary advantages of PassPort, there may be some user confusion when attempting to understand when scanning will work and when it will not. If the radio will only be used on a "home site" this suggestion can be disregarded and the **P4** key would make a good candidate as a **Scan** key.

LTR TRUNKING

This is the recommended setup and function description for a radio that will be primarily used on a LTR system.

Refer to the next table for a description of what these keys do.

KEY ASSIGNMENTS AND FUNCTIONS

Keys	Key Assignment	Function
Group Up/Down	N/A	Use this to scroll through the group list. A double beep will sound as you reach the "limit" and cycle to the "top" or "bottom" of the list.
P0	Scan	Use this to key to enable scan mode and also to edit systems or groups to be scanned (if allowed for the system in use – see the User Edit or Edit TG List fields in the *LTR* programming screen). To enable group scan, press either of the **Group Up/Down** keys and then enable scan with this key. To enable system scan, press either of the **System Up/Down** keys and then enable scan with this key. The **Scan** key is also used to toggle whether a group or system is scanned. If User Edit and/or Edit TG List has been enabled for a system and the system is not in scan mode, you can select which groups or systems to scan or not scan. Select the targeted group or system, press and hold the **Scan** key down until you see "SCAN ADD" or "SCAN DEL". This adds or deletes the system or group from being scanned. A steady "S" icon indicates that the system or group is in the scan list. No "S" icon indicates that it has been removed. A blinking "S" indicates scan mode is active.
P1	Nuisance Delete	This is useful to temporarily remove non-essential systems from being scanned. This will not work for groups. Cycling radio power or changing systems will clear this setting.
P2	Talk Around	If the radio has a Conventional or another LTR system programmed into it, this key would be used to quickly switch to that system for localized or other use.
P3	Mode Display Type	This mode provides useful information concerning the system the radio is currently using. Particularly useful when attempting to troubleshoot problems a user may be experiencing in the field with an LTR system.
P4	Custom	Set aside for custom use such as for a **Phone** or **Priority** key.
System Up/Down	N/A	Use this to scroll through the system list. A double beep will sound as you reach the "limit" and cycle to the "top" or "bottom" of the list.

TYPICAL FUNCTIONS AND CONDITIONS

Function	How to Use
Power On	When the radio is first activated, it will briefly display the text entered in the Opening Text field of the *Field Data* programming screen. It will then show the firmware version.
System Up/Down Keys and Group/MIN Up/Down Keys	The current System can be displayed by pressing either of the **System Up/Down** keys. Another press of either key will change the system (if there is more than one system in the radio). The current group can be displayed by pressing either of the **Group Up/Down** keys. Another press of either key will change the group (if there is more than one group in the system).
Group Dispatch	After the radio has registered, it is normally ready to perform "Group Dispatch". To call a base unit or other field units, simply press the **PTT** key. Wait until you get the PTT "handshake" tone and then start speaking. It is a common mistake for first time users to attempt to "over talk" this tone, but after a couple of minutes of practice the user should have no further difficulties. In Group Dispatch mode, all users registered to a particular group will hear any unit transmitting on that group.
Scan	For a detailed description of how to use the scan function, refer to the **P0** key description in the previous table. Remember, many scan functions can be enabled or prohibited or set to a default on a system-by-system basis. Refer to the fields in the Scan group in the *LTR* programming screen.

CONVENTIONAL

This is the recommended setup and function description for a radio that will be primarily used in Conventional mode.

KEY ASSIGNMENTS AND FUNCTIONS

Keys	Key Assignment	Function
P0	Scan	Use this to key to enable scan mode and also to edit systems to be scanned (if allowed for the system in use – see the User Edit field in the *"Conv."* programming screen). Use this key to enable or disable the radio's system scan function. The **Scan** key is also used to toggle whether a system is scanned. If the User Edit field in the *"Conv."* programming screen has been enabled for a system and the system is not in scan mode, you can select which systems to scan or not scan. Select the targeted system, press and hold the **Scan** key down until you see "SCAN ADD" or "SCAN DEL". This adds or deletes the system from being scanned. A steady "S" icon indicates that the system is in the scan list. No "S" icon indicates that it has been removed. A blinking "S" indicates scan mode is active.
P1	Nuisance Delete	This is useful to temporarily remove non-essential systems from being scanned. Cycling radio power or changing systems will clear this setting.
P2	Talk Around	If the radio has another Conventional or LTR system programmed into it, this key would be used to quickly switch to that system for localized or other use.
P3	Custom	Set aside for custom use such as for a **Phone** or **Priority** key.
P4	Monitor	Use this to toggle the radio in and out of Monitor mode (a "Speaker Icon" will be displayed when mode is enabled). This disables CTCSS or DTCS tone code squelch. This is useful for monitoring frequency activity by bypassing any active coded squelch.
System Up/Down	N/A	Use this to scroll through the system list. A double beep will sound as you reach the "limit" and cycle to the "top" or "bottom" of the list.

TYPICAL FUNCTIONS AND CONDITIONS

Function	How to Use
Power On	When the radio is first activated, it will briefly display the text entered in the Opening Text field of the *Field Data* programming screen. It will then show the firmware version.
System Up/Down Keys	The current system can be displayed by pressing either of **System Up/Down** keys. Another press of either key will change the system (if there is more than one system in the radio).
Simplex Use	Press the **Push to Talk** key to broadcast to one or more radios on the same frequency and using the same tone coded squelch (if utilized).
Use with a Repeater	If coded squelch is used on a repeater, briefly press the **Monitor** key ensure that no one else is currently using the repeater (the **Monitor** key disables the "coded squelch" – enabling the user to hear all activity on the channel). Then press the **Push to Talk** key to broadcast to other users on the same repeater system utilizing the same coded squelch.
Scan	For a detailed description of how to use the scan function, refer to the **P0** key description in the previous table. Remember, many scan functions can be enabled or prohibited on a system-by-system basis. Refer to the fields in the Scan group in the *"Conv."* programming screen.