

# **Icom IC-F4TR Programming Guide**

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## About this Software Package

Use this software to program the IC-F4TR transceiver or radio. The programmer can enter data on computer, transfer it to a radio, or print it for a permanent record. Data that is already programmed in a transceiver can be retrieved and edited. Your programming software package includes a disk and manual.

### ***Hardware/Software Requirements***

Equipment	Type
Transceiver	IC-F4TR
Computer	IBM PC
Operating System	Windows 95, 98, NT, Windows 2000, Windows Millennium Edition
Communication Port	Use COM1, COM2, COM3 or COM4 port.
Communication Interface	Use an OPC-478 cable to connect the computer with the transceiver when transferring data.

## About this Manual

This manual describes how to program specific functions which affect radio operation and performance. If you are already familiar with the radio and with programming, follow this route to get started quickly:

- go to Setup menu to identify the communications port
- go to Options menu to identify yourself [optional]
- go to Radio menu, choose Read Radio to retrieve and display the information already programmed to the radio (or go to the File Menu to Open an existing Radio File)
  - a short form of this information appears on the Main menu
- press the Edit Systems button to edit the selected system or to add a new system to the radio
- go to Edit menu, select Radio Wide Data to program the keys
- go to File menu to open and/or save the program information to a file
- go to Radio menu, choose Program Radio to write the program to the radio.

If you are not familiar with programming the radio, read through this section before making any entries. See the Programming Overview for a diagram of the process before getting started.

# Familiarizing Yourself with the Radio

## *Radio controls explained*

1	volume control (VOL)	Turns power ON and adjusts the audio level
2	push-to-talk switch (PTT)	Push and hold to transmit; release to receive
3	up and down arrow keys	Push to select the operating channel  Up arrow increases and down arrow decreases the channel number or programmed mode
4	dealer-programmable keys	Each key can be programmed for one of several functions
5	keypad	Use it to enter DTMF codes, channel numbers, phone numbers
6	antenna connector	Connects the antenna to the radio
7	SP/MIC jack	Connects the optional speaker microphone
8	activity LED	Display: Lights red while transmitting
9	function display	Displays messages, channel numbers and indicators

## Connecting the Equipment

To connect the radio and the computer, attach the programming cable.

2. Switch OFF the power to the radio.
3. Connect the 9-pin connector on the cable to a COM port on the computer.
  - If the computer has a 25-pin connector, use an adapter.
4. Connect the other end of the cable to the speaker jack on the radio.
5. Switch ON the power to the computer.

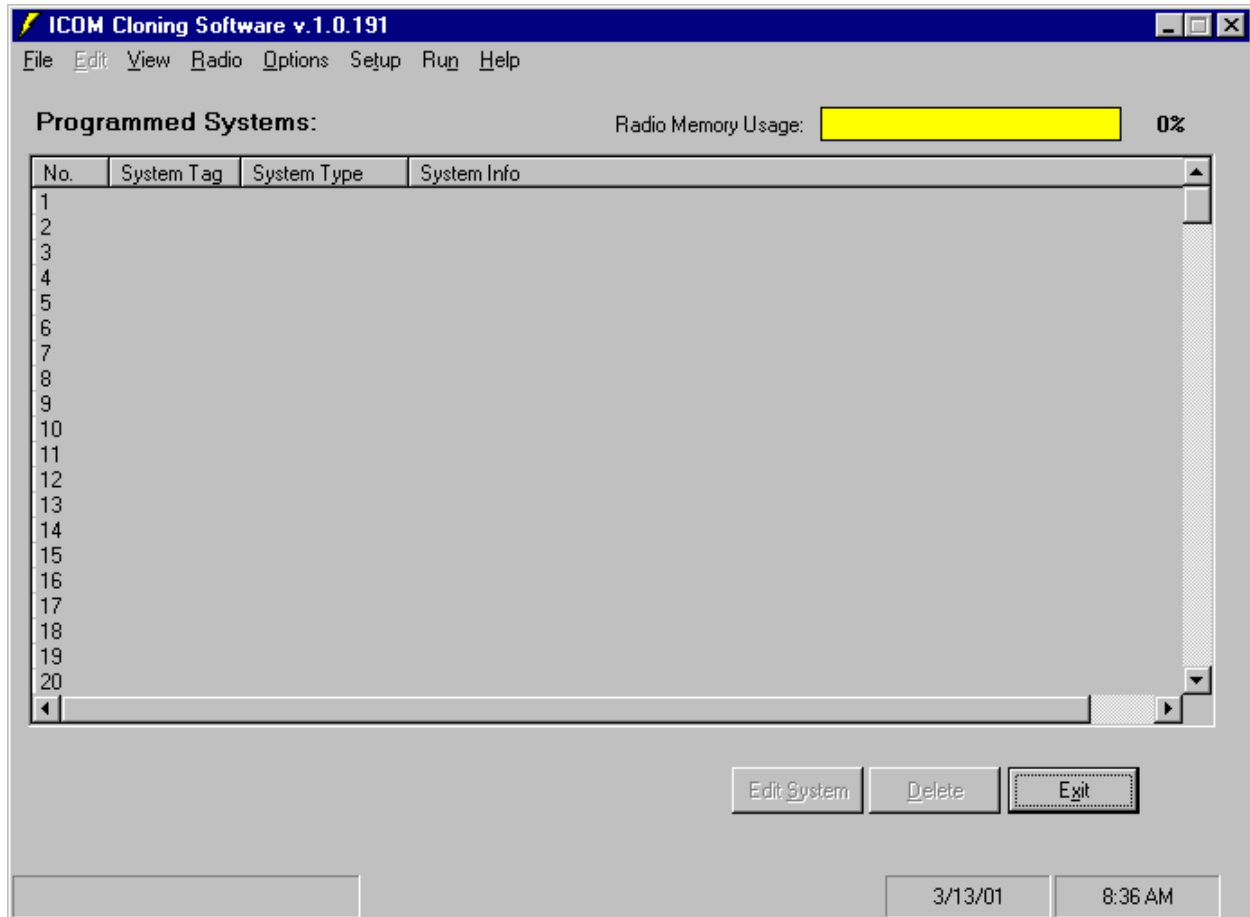
## Installing the Program

After completing all the physical connections, you can install the programming software.

1. Insert the Icom software CD or floppy disk in your disk drive.
2. From the Start menu, select Run. The Run window appears.
3. Type “D:\Setup” where “D:” is the letter of the CD ROM Drive
4. Follow the instructions on the screen for setting up the program.
  - Close all applications
  - Choose the directory where you want to install the program.

## Starting the Program

From the Start Menu select Programs, ICOM Cloning Software for the personal computer programming software. The Main screen appears in its “unloaded” state.

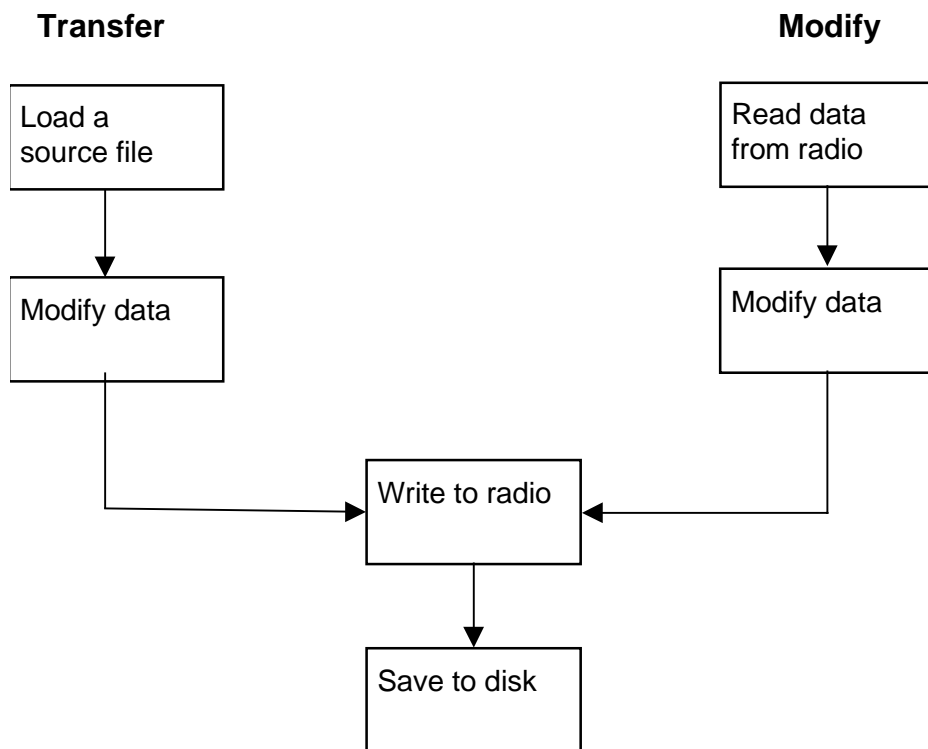


Data must be loaded into the program before continuing. This is accomplished either by reading the radio’s memory contents or by opening an existing radio file. This is the first step in programming the radio.

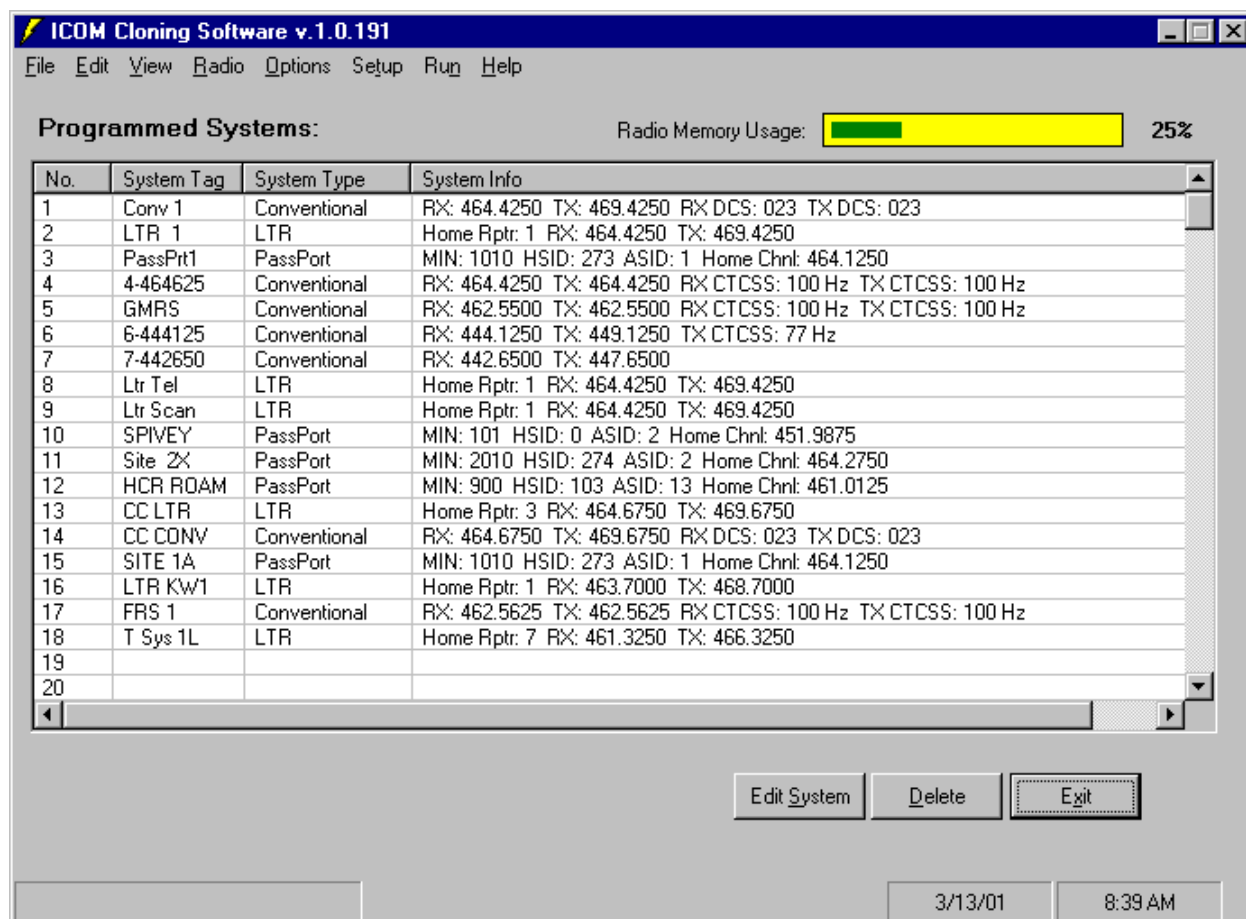


## ***Programming Overview***

When you are ready to begin programming, decide how to proceed. You can modify existing data or transfer data from a source file.



After Data has been loaded, the Main Screen will appear in its active or “loaded” state. It contains the menu bar, the programmed system window, the three screen buttons and a memory gauge indicator.



**Menu Bar.** The menu bar at the top of the screen lists seven menus. Click to view menu options and make a selection.

**Programmed System Window.** The window in the center of the screen lets you quickly identify and edit the systems you want to program.

**Screen Buttons.** Use the Edit Systems button under the window to program the selected system. Other buttons allow you to delete a system or exit the Cloning software.

**Memory Gauge.** This control indicates the percentage of the radio’s memory which is used by the current programming.

**Using Windows.** As with most Windows applications, you can make selections on screen to program data. Use the mouse to move through the menu options and make choices.

## Main Screen

The Main Screen shows the menu bar, a window with the summary of the programmed systems and the screen buttons you can use to change them.

**Menu bar.** From left to right, the Menu bar gives you access to these menus:

- File
- Edit
- View
- Radio
- Options
- Setup
- Run
- Help

**Programmed Systems window.** The programmed systems are identified by:

- Number
- System tag
- System type
- System info

**Screen buttons.** The main screen contains buttons that let you move to more detailed selection screens or complete an action.

- Press the screen buttons to Delete systems or Exit the program
- Press the screen button to Cancel your entry and move back to the previous screen.

## Menu Overview

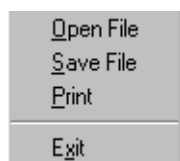
The menu bar at the top of the screen lists these menu titles:

Menu	Function
File	Use the File menu to open, save and print data files and to exit the program.
Edit	Use the Edit menu to define radio-wide functionality.
View	Advanced technicians can view operational data. Restricted.
Radio	Use the Radio menu to read data from and write data to the radio's memory.
Options	Use the Options menu to identify yourself as a Factory Technician or an Advanced Dealer or to change passwords.
Setup	Use the Setup menu to select the communication port on the computer that connects with the transceiver.

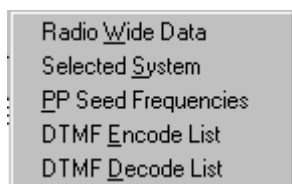
Run	Technicians use this menu for setting advanced features. Restricted
Help	Use the Help menu to view the Online User's Guide or find out information about the release of the software.

## ***Menu Options***

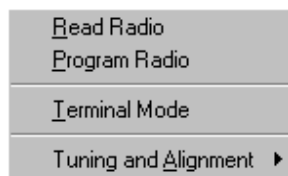
### File Menu



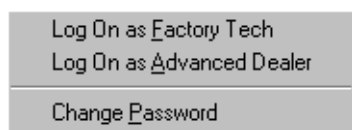
### Edit Menu



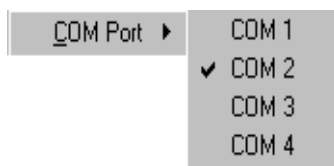
### Radio Menu



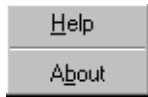
### Options Menu



### Setup Menu



## Help Menu



## ***The Menu Route***

In the following sections, we discuss the menus in reverse order, from right to left.

Help is available from the Help menu. The Run menu may be used to upgrade the radio's firmware.

To start, enter basic identifying information on the Setup and Options menus. Once you complete these entries, you won't need to use these menus again. Then go to the Radio menu and select Read Radio (or go to the File menu and choose Open File) to pick up pre-programmed data and read it into the Cloning Software. Highlight desired system by clicking on it with the left mouse button and use the Edit System key to display and edit the Selected System. Go to File menu to save your changes to a file.

## ***Help***

The Help menu contains these selections:

- Help
- About

You can make a selection from the menu to get help.

## ***Run***

The Run menu contains these selections:

- Firmware Upgrade
- Factory Tuning

Advanced technicians use these functions.

## ***Setup***

Use the Setup menu to identify the communications port on the computer you select to connect with the radio. Setup contains 4 selections:

- COM 1
- COM 2
- COM 3
- COM 4

Make your choice and a check mark appears beside the selected item.

## ***Options***

Use the Options menu to identify yourself. Options contains these selections:

- Log on as a Factory Technician
- Log on as an Advanced Dealer
- Change Password

Select an option and enter or change a password. Press OK.

## ***Radio***

Use the Radio menu to read and program information in the radio. The menu contains these selections:

- Read Radio
- Program Radio
- Terminal Mode
- Tuning and Alignment

**Read Radio** allows you to read the data already programmed to the radio. Each radio is programmed with a unique identifying number – its electronic serial number or ESN – and with radio frequency or RF alignment information. When you select Read Radio, this identifying information is displayed on the Radio Wide Data screen.

**Program Radio.** The ESN of each radio is programmed into the radio at the factory and cannot be changed. All other features can be reprogrammed with updated information. Do **not** use Program Radio until you have programmed all the key functions specific to this radio. When you have made all the selections, go to Program Radio to incorporate them.

**Note:** If the radio loses its power or the PC fails during programming, the radio will not work. The radio must be reprogrammed from the data previously saved to a file. In the event that the data was not saved and the radio memory cannot be recovered, the radio may be restored back to its original defaults.

## ***Copying default information***

Non-volatile memory or NVM contains default information. If something goes wrong, you can copy this programmed information again.

### ***To copy defaults from memory:***

- turn off the radio
- press and hold PTT and P1
- turn the radio on
- wait for the error message

For Engineering Defaults: Release the PTT and P1 keys and press the Down Arrow and then P0 keys.

For F1 Factory Defaults: Release the PTT and P1 keys and press the Down Arrow and then P1.

For F2 Factory Defaults: Release the PTT and P1 keys and press the Down Arrow and then P2.

For F3 Factory Defaults: Release the PTT and P1 keys and press the Down Arrow and then P3.

The radio restarts automatically and reinitializes memory with the factory defaults.

**Terminal Mode** shows a darkened screen and may be used to directly read radio memory locations or to write discreet values to the radio.

**Tuning and Alignment.** When you select Tuning and Alignment, a submenu appears with these choices: (these choices are restricted and only available to those with advanced dealer privilege or higher.)

- TX Deviation
- LowSpeed Data Discriminator
- Transmitter Alignment
- Receiver Alignment

When you select Deviation or Low Speed Discriminator, these choices appear:

- wide
- narrow

You can select wide or narrow to bring up screens and change settings for the appropriate band. Make the adjustment needed to rectify the radio's deviations.

When you are satisfied with your entries, press Done.

## ***View***

You need special access to get to the View menu. The options on the View menu are restricted to advanced technicians. The information they provide about the radio is available for viewing only. The View screen contains these options:

- Maker Reserved Data
- Factory Data
- Odometer Readings
- Calibration Data
- Diagnostic Data

Each of the View screens contains data about settings, timers, tuning, and default readings that are available for viewing only. The diagnostic screen allows special flags to be set which may be used to help diagnose problems in the Cloning Software.

## ***Edit***

Use the Edit menu to enter specific programming information about the radio. The menu contains these selections:

- Radio Wide Data
- Selected System
- PP Seed Frequencies
- DTMF Encode List
- DTMF Decode List



## Radio Wide Data

**Radio Wide Data** contains the Key Map screen button. This button takes you to the Radio Key Map screen to program keys. Before you program the keys, you can work through a series of settings for the radio.

When you select Radio Wide Data, a screen appears with these selection tabs:

- Operational Settings
- Timers
- Trunking Features
- Field Data

**Operational Settings.** Select Operational Settings to bring up this screen:

The screenshot shows a software window titled "Radio Wide Data" with a close button (X) in the top right corner. Below the title bar are four tabs: "Operational Settings" (selected), "Timers", "Trunking Features", and "Field Data". The "Operational Settings" tab contains the following controls:

- Group Revert Time: 5000 ms.
- ☐ Revert on Power Up
- Priority Mode: LTR 1 (dropdown)
- Phone Mode: Ltr Tel (dropdown)
- Emergency Code: DTMF T0 (dropdown)
- ☐ Invert Rx Data    ☐ Invert Tx Data
- Trunking Parameters:
  - Number of Preamble Bits: 2
  - Number of Hang Bits: 2
- Options:
  - ☐ TX Low Power for all modes
  - ☐ TX Micro Power for all modes
  - ☒ Enable Odometer Write
  - ☐ Enable Display Sequencing
  - ☐ Disable Radio Sounds
  - ☒ Enable Battery Beeps
  - ☒ Disable Radio Menu
  - ☐ Enable PassPort CRC LOS Tone
  - ☐ Enable PassPort RSSI LOS Tone

At the bottom of the window are three buttons: "Key Map", "Done", and "Cancel".

The itemised list to the right lets you turn operational settings off and on. The items to the left let you decide when some of the settings go into operation, and under what conditions.

The radio Operational Settings are described below:

Field	Description	Default
Group Revert Time	Amount of time to revert to selected system. While scanning groups, radio transmits on last received group until this time expires, then radio transmits on Group 1 of this system	5000 ms
Revert on Power Up	At power on radio will revert to first system	Disabled
Priority Mode	Radio access priority. Assign a button to go directly to preferred system.	1
Phone Mode	The system number (Conventional, LTR, PassPort) used for phone interconnect.	1
Emergency Code	Which DTMF Encode List item to use as the Emergency number (dialed automatically when programmed Emergency button is pressed)	
Invert Rx Data	Invert the polarity of the Receive Data (if required by the NTS).	Enabled
Invert Tx Data	Invert the polarity of the Transmit Data(if required by the NTS).	Disabled
Trunking Parameters - Number of Preamble Bits - Number of Hang Bits	Number of initial bits sent out with low speed data records to ready the decoder. Number of bits sent out at the end of the low speed data record to aid the decoder.	2 2
Tx Low Power for all modes	The radio will always transmit in low power (1 watt).	Disabled
Tx Micro Power for all modes	The radio will transmit in test power mode.	Disabled
Display TG On Select	Display selected talk group name.	Enabled
Enable Odometer Write	Allow accounting information to be recorded such as number of times radio has registered.	Enabled
Enable Display Sequencing	Allows display of more than one screen of information by showing one at a time. See Display Timers	Enabled
Disable Radio Sounds	Turn off all radio tones.	Disabled
Enable Battery Beeps	Tone sounds when low battery.	Enabled
Disable Radio Menu	Turn off all radio menus.	Enabled
Enable PassPort CRC LOS Tones	Enables Tones to sound when PassPort system is lost under normal roaming.	Disabled
Enable PassPort RSSI LOS Tones	Enables Tones to sound when PassPort system is lost under RSSI roaming.	Disabled

- You can press the screen button Key Map to program the keys or review your choices.

**Timers.** Select **Timers** to bring up this screen:

**Radio Wide Data**

**Timers**

**Scan Delay Timers**

- CTCSS Scan DelayTimer: 300 ms.
- DCS Scan DelayTimer: 500 ms.
- Conv Turn-Off Code Timer: 180 ms.
- CD Scan Delay: 90 ms.
- LTR Scan DelayTimer: 600 ms.
- PassPort Scan DelayTimer: 1130 ms.

**Timeout Timers**

- Dispatch TX Time Out Timer: 30 sec.
- Phone TX Time Out Timer: 180 sec.
- Time Out Pre Alert: 50 x100 ms
- Time Out Reset Time: 2 x100 ms
- Odometer Write Interval: 60 sec.
- Backlight Time: 5 sec.

**Display Timers**

- Message Hold Time: 2250 ms.
- Scan Interval: 1500 ms.

**Buttons:** Key Map, Done, Cancel

Enter the scan delay times, timeout times and display times in milliseconds on this screen.

The radio Timers Settings are described below:

Field	Description	Default
Scan Delay Timers	Time interval to delay scan.	
- CTCSS Scan Delay Timer	If signal detected, stay on channel this long to decode CTCSS	300 ms
- DCS Scan Delay Timer	If signal detected, stays on channel this long to decode DCS.	500 ms
- Conv Turn-Off Code Timer	Allows CTCS to send reverse phase burst.	180 ms
- CD Scan Delay	Scan resume after signal gone time.	90 ms
- LTR Scan Delay Timer	If signal detected, stays on channel this long to decode LTR.	600 ms
- PassPort Scan Delay Timer	If signal detected, stays on channel this long to decode	1130 ms

Field	Description	Default
	Passport.	
Timeout Timers - Dispatch TX Timeout Timer - Interconnect Time Out Timer - Time Out Pre Alert - Time Out Reset Time - Odometer Write Interval - Backlight Time	- Time interval for PTT event time out in dispatch call. - Time interval for Interconnect transmission time out. - Pre-alert is warning tone for impending timeout. - Timeout reset time is time interval before function resumes. - Time between odometer writing radio information. - Amount of time radio display back light remains on when an event occurs to turn it on.	30 sec 180 sec 50 x 100 ms 2 x 100ms 60 sec 5 sec
Display Timers - Message Hold Time - Scan Interval	- Time interval for keeping a message displayed on the screen. - Time interval between each scan event.	2250 ms 1500 ms

- You can press the screen button Key Map to program the keys or review your choices.

**Trunking Features.** Select Trunking Features tab to bring up this screen:

Enter the settings for the PassPort features.

The radio Trunking Features are described below:

Field	Description	Default
PassPort Handshake Melody	Tone sounded for PassPort Clear-to-talk. Selections include None, Register, LTR clear to Tx, Invalid, Dead Beat, Primary Ring, Secondary Ring, Low Battery, Dead Battery, Busy	PassPort Handshake
PassPort Handshake Retry Limit	Number of times the radio will attempt system handshake.	3 tries
PassPort Handshake ACK Wait Time	Time interval for acknowledgement of low speed data by NTS.	690 ms
PassPort Fade Time	Don't disconnect at loss of signal. Wait this long.	2000 ms
PassPort Reacquire Time	After losing system and beginning to search for a roamer site, if originally registered system is seen, stay registered on that system (no re-registration required)	90 sec
Loss of Carrier Roam Start Time	Wait time before roaming is initiated.	30 sec
Select System Roam	After a new system is selected, the time period delay before	10 sec

Delay Time	roaming is initiated.	
Roaming Wait Time	When roaming, the wait time at each channel to listen for signal.	5500 ms

- You can press the screen button Key Map to program the keys or review your choices.

**Field Data.** Select Field Data tab to bring up this screen:

**Radio Wide Data**

Operational Settings   Timers   Trunking Features   **Field Data**

HelloText: HELLO   Radio Reset Melody: Register

Stun Text: -STUNNED   Run Time Limit: 21474836 sec.

Kill Text: -KILLED-   Lockout Code: 1234

Customer Info:   Field Date: 99101400

LOST RADIO PLS CALL  
1-317-845-841   Programming Password: 87654321

Field Serial Number: 12345678

Key Map   Done   Cancel

Enter the identifying information on this screen.

The radio Field Data Features are described below:

Field	Description	Default
Hello Text	Text displayed when radio powers up	HELLO
Stun Text	Text displayed when radio is in stunned state	STUNNED
Kill Text	Text displayed when radio is in killed state	KILLED
Customer Info	Customer specific information	
Radio Reset Melody	Tone sound during radio reset. Selections include None, Register, LTR clear to Tx, Invalid, Dead Beat, Primary Ring, Secondary Ring, Low Battery, Dead Battery, Busy	None
Run Time Limit	Radio will operate for specified seconds (prepaid time)	
Lockout Code	Code to unlock the radio when locked by programmable button	1234
Field Date	Date of last radio programming.	
Programming Password	Password to view programmed data in the Cloning Software (no password required if blank)	87654321
Field Serial Number	Open field for dealer tracking.	

- You can press the screen button Key Map to program the keys or review your choices.

**Radio Key Map.** Press the Key Map button to bring up the screen where you record the programming choices you make. Look up Key Mapping and Default Settings in the Appendix for information about standard default settings for keys. Refer to Key Functions in the Appendix for a description of the functions you may be asked to program.

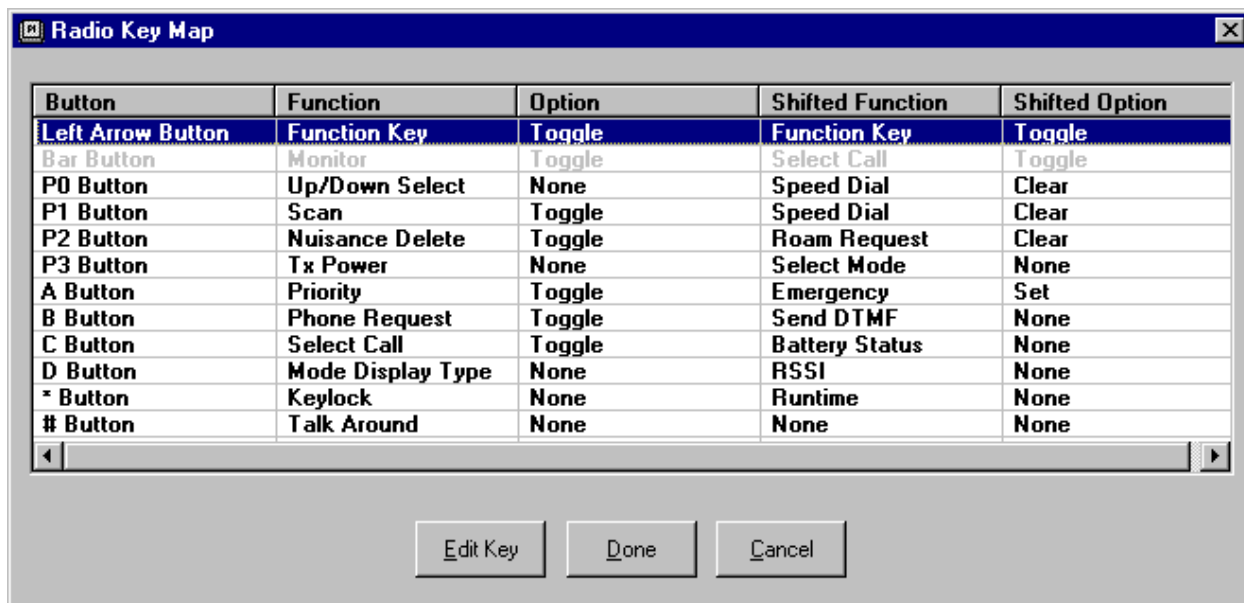
## Programming the Keys

### Radio Key Mapping

Each key can handle two functions: a normal function and a shift function. These functions are programmed on the Radio-Wide Data screen, accessible through the Edit menu on the Main screen.

- To select Normal, users press the key to access the function.
- To select Shift, users press the < left arrow function key. When the delta icon appears, users press the programmed key to access the function.

Almost any function can be assigned to any key. Certain functions can be programmed as defaults for specific keys. See the **Appendix** for a list of typical Default Settings.



The screenshot shows a window titled "Radio Key Map" with a table containing five columns: Button, Function, Option, Shifted Function, and Shifted Option. The table lists various buttons and their corresponding functions and options. At the bottom of the window, there are three buttons: "Edit Key", "Done", and "Cancel".

Button	Function	Option	Shifted Function	Shifted Option
Left Arrow Button	Function Key	Toggle	Function Key	Toggle
Bar Button	Monitor	Toggle	Select Call	Toggle
P0 Button	Up/Down Select	None	Speed Dial	Clear
P1 Button	Scan	Toggle	Speed Dial	Clear
P2 Button	Nuisance Delete	Toggle	Roam Request	Clear
P3 Button	Tx Power	None	Select Mode	None
A Button	Priority	Toggle	Emergency	Set
B Button	Phone Request	Toggle	Send DTMF	None
C Button	Select Call	Toggle	Battery Status	None
D Button	Mode Display Type	None	RSSI	None
* Button	Keylock	None	Runtime	None
# Button	Talk Around	None	None	None

The Radio Key Map shows how each radio button is programmed. A Button can be assigned a Function and Shifted Function (button used with the < left arrow key) with Options. The button can also have a Menu Function assigned. Select a key to be programmed by clicking on it with the mouse then press the Edit Key at the bottom of the Radio Key Map menu to program the Button (note, the left arrow key and the bar/speaker key are not programmable).

- Press the Edit Key button to bring up the Edit Programmable Key screen for a selected key.
- When you are satisfied with the entries on the Key Map, press Done.
- Press Cancel to cancel your entry and return to the previous screen.



**Edit Programmable Key (example).** You can edit the “P0” Key functions and options on this screen:



***Make these entries:***

1. Identify the button and enter its basic function.
2. The option, such as toggle, or null if there is no option, will be set automatically.
3. Identify the function for the button when it is used with the < left arrow shift key.
4. The option for the shifted function, which is usually, toggle, clear, set or null, will be set automatically to its proper value.

The drop down boxes for the Function and Function Shifted key choices are:

None	Emergency	Phone Request
Monitor	Tx Power	Select Call
Up/Down Select	Redial	Battery Status
Key Lock	RSSI	Runtime
Scan Type	Mode Display Type	Send DTMF
Speed Dial	Scan	Roam Request
Select Mode	Nuisance Delete	Search Frequency
Talk Around	Priority	

Use the drop down boxes to scroll through the options. Make your choices and when you are satisfied with them, press the screen button Done.

## ***Selected System***

The second selection on the Edit menu is Selected System. This allows the programmers to edit a system, which they select on the main screen. There are 2 types of systems: Conventional and trunking, and 2 types of trunking systems: LTR and PassPort.

The F4TR is primarily a trunking radio. Its use as a conventional radio is secondary. When you began with Read Radio, the program identified the type of system(s) programmed and entered the appropriate tags on the Main Screen. From the Main Screen, the Edit System button takes you to the selected system – Conventional, LTR or PassPort – to make specific settings and selections for this radio by system type. While LTR and PassPort are trunking systems, they also contain some conventional functions.

## Conventional Data

The System Number and System Tag identifies the Conventional System.

The other data entry fields for the Conventional Data menu include:

Field	Description	Default
Rx Frequency	Receive Frequency in MHz	0
Tx Frequency	Transmit Frequency in MHz	0
Narrow Mode	Operate in narrow band	Disabled
Tx Low Power	Transmit at a lower power	Disabled

Coded Squelch - None/Carrier Squelch - CTCSS - DCS	- No coded squelch  - Use CTCSS – must also specify the Receive and Transmit Code  - Use DCS – must also specify the Receive and Transmit Codes and whether the DCS Code Polarity should be inverted	Default
Receive Code	Default code appears. Use drop down box to change it	Default
Transmit Code	Default code appears. Use drop down box to change it	Default
DCS Code Polarity Invert	Select to invert polarity	

- Press the screen button to bring up Mode Options
- When you are satisfied with your entries, press Done.

**Mode Options.** When you press Mode Options, the Mode Settings screen appears. It contains these tabs:

- TX/RX
- DTMF
- Scan
- System Overrides

**TX/RX.** TX/RX for transmit/receive lets you choose a mode to use for talkaround functionality and select timing and emergency codes for specified Conventional System Number with System Tag.

- When you are satisfied with your entries, press Done.

The Transmit/Receive parameters for a Conventional system are:

Field	Description	Default
Talk Around Mode	Choose a mode to use when not using repeater	None
Tx Timeout Time	Maximum transmission time	0
Emergency Code	If in emergency mode, this DTMF sequence is sent over air.	0
Enable Mode Timeout Timer	Turn on the timeout timer.	Enabled
Enable Tx Busy Inhibit	Turn on the Transmit Busy Inhibit to prevent transmission on a busy channel. Conventional mode flag only.	Disabled
Enable Rx Monitor Inhibit	Turn on the Receive Monitor Inhibit. Conventional mode flag only. Not allowed to monitor any other channels.	Disabled

**DTMF.** DTMF lets you choose previously programmed encode and decode indexes and turn coding features on and off for specified Conventional System Number with System Tag.

- When you are satisfied with your entries, press Done.

The screenshot shows the 'Mode Settings' dialog box with the 'DTMF' tab selected. At the top, 'System Number' is set to '1' and 'System Tag' is 'Conv 1'. Below the tabs (TX/RX, DTMF, Scan, System Overrides), there are two dropdown menus: 'DTMF Decode Index' set to '1: TTDEC 0' and 'DTMF ANI Index' set to '1: DTMF T0'. There are three checkboxes: 'Disable DTMF Encode' (unchecked), 'Disable DTMF Dead Beat' (unchecked), and 'Enable DTMF Encode ABCD' (unchecked). At the bottom are 'Done' and 'Cancel' buttons.

The DTMF parameters for a Conventional system are:

Field	Description	Default
DTMF Decode Index	Number of which DTMF decode object is used. The decode objects are created in the DTMF Encode List menu.	None
DTMF ANI Index	DTMF ANI number	255
Disable DTMF Encode	Prevent transmission of DTMF	Disabled
Enable DTMF ABCD	Turn on ABCD key tones	Disabled
Disable DTMF Dead Beat	Do not allow radio to be disabled through a DTMF sequence	Disabled
Enable DTMF Side Tone	Turn on DTMF side tones to hear the tones being sent.	Disabled

**Scan.** Scan lets you turn scanning features on and off and allows radio users to edit scan lists using the radio keypad for specified Conventional System Number with System Tag.

- When you are satisfied with your entries, press Done.

The screenshot shows the 'Mode Settings' dialog box with the 'Scan' tab selected. At the top, 'System Number' is set to '1' and 'System Tag' is 'Conv 1'. Below the tabs, there are two sections: 'Scan Features' and 'User Scan Edit'. In 'Scan Features', both 'Disable System Scan' and 'Enable Scan Resume Delay' are unchecked. In 'User Scan Edit', both 'Allow User to Edit System Scan List' and 'Save User System Scan Edit' are checked. At the bottom are 'Done' and 'Cancel' buttons.

The Scan parameters for a Conventional system are:

Field	Description	Default
Disable System Scan	Do not scan this system when in system scan	Disabled
Enable Scan Resume Delay	If signal is heard, wait before continuing scan	Disabled
Allow User to Edit System Scan List	Allow user to add/remove system from the scan list	Enabled
Save User System Scan Edit	Save user preferred scan settings at power off.	Enabled

**System Overrides.** System overrides lets you force changes to some basic system settings.

- When you are satisfied with your entries, press Done.

The screenshot shows a 'Mode Settings' dialog box with a blue title bar. At the top, there are two input fields: 'System Number:' with the value '1' and 'System Tag:' with the value 'Conv 1'. Below these are four tabs: 'TX / RX', 'DTMF', 'Scan', and 'System Overrides'. The 'System Overrides' tab is selected and highlighted. Inside this tab, there is a section titled 'System Overrides (All Groups)' containing three unchecked checkboxes: 'Force Narrow Band', 'Force TX Low Power', and 'Force TX Test Power'. At the bottom of the dialog are two buttons: 'Done' and 'Cancel'.

The System Override parameters for a Conventional system are:

Field	Description	Default
System Overrides	Provide overrides that Force Narrow Band, Force Tx at Low Power, Force Tx at Test Power	Disabled

## LTR Data

### LTR Talk Groups

Enter basic number and tag identifications for this system; then, fill in the table with more specific identifying information for each talk group. The column headings are:

- Group No
- Group Tag
- TxID
- RxID
- Scan Mmbr
- Tx Inhibit
- Phone

System Number:  System Tag:

Talk Group Data  
Priority Talk Group Decode Active (Grp 1 is Priority)

Grp No.	Group Tag	Tx ID	Rx ID	Scan Mmbr	Scan Tx Inhbt	Phone
1	TG P	2	2	Yes	No	No
2	TG A	1	1	Yes	No	No
3	TG B	10	10	Yes	No	No
4	TG 20	20	20	Yes	No	No
5	TG 21	21	21	Yes	No	No
6	TG 22	22	22	Yes	No	No
7	TG 23	23	23	Yes	No	No
8	TG 50 L	50	50	Yes	No	No
9	R55 T54	54	55	Yes	No	No
10	R54 T55	55	54	Yes	No	No

Always Decode Priority TG ☒

Primary Phone Group:

Add TalkGroup Edit TalkGroup Delete TalkGroup

Mode Options Repeaters Done Cancel

Below the table, you can identify the primary phone group. Use the screen buttons to add or edit a talk group or delete a talk group.

- Press the Mode Options button to enter the Mode Options for this LTR system
- Press the Repeaters button to bring up the LTR Repeater screen and register frequencies



- When you are satisfied with your entries, press Done

**Add a Talk Group.** When you press the screen buttons to add or edit a talk group, this screen appears:

The Add Talk Group parameters for a LTR system are:

Field	Description	Default
Talk Group Tag	Specify the name of the LTR Talk Group	
Encode ID	Transmit Group ID	
Decode ID	Receive Group ID	
Scan List Member	Add this Talk Group part to the group scan list	Enabled
Scanned Tx Inhibit	Prevent the radio from transmitting on this group when it is heard during group scanning	Disabled
Group Tx Inhibit	Talk Group is a receive only group.	Disabled
Enable Phone Privilege	Allow this Talk Group to use the Phone option	Disabled

**Mode Options.** When you press Mode Options, the Mode Settings screen appears. It contains these tabs:

- TX/RX
- DTMF
- Scan
- System Overrides

**TX/RX.** TX/RX for transmit/receive lets you turn on modes and select timing and emergency codes for specified LTR System.

- When you are satisfied with your entries, press Done.

The Transmit/Receive parameters for a LTR system are:

Field	Description	Default
Talk Around Mode	Indicates system to use if unable to use repeater. If "None" is selected, operates as LTR simplex on home channel output frequency	None
Tx Timeout Time	Stop Transmitting after specified seconds	0
Emergency Code	If in emergency mode, this DTMF sequence is sent over air.	0
Enable Mode Timeout Timer	Turn on the timeout timer	Enabled
Disable ATB Ringback	Prevent automatic handshake retry when all chnnels are busy	Disabled

**DTMF.** DTMF lets you set encode and decode indexes and turn coding features on and off for specified Conventional System Number with System Tag.

- When you are satisfied with your entries, press Done.

The screenshot shows a 'Mode Settings' window with a title bar and a close button. Inside, there are two text fields: 'System Number:' with the value '2' and 'System Tag:' with the value 'LTR 1'. Below these are four tabs: 'TX / RX', 'DTMF' (which is selected and highlighted), 'Scan', and 'System Overrides'. The 'DTMF' tab contains two dropdown menus: 'DTMF Decode Index:' set to '1: TTDEC 0' and 'DTMF ANI Index:' set to '1: DTMF T0'. Below the dropdowns are three checkboxes: 'Disable DTMF Encode' (unchecked), 'Disable DTMF Dead Beat' (unchecked), and 'Enable DTMF Encode ABCD' (unchecked). At the bottom of the dialog are two buttons: 'Done' and 'Cancel'.

The DTMF parameters for a LTR system are:

Field	Description	Default
DTMF Decode Index	Which DTMF decode list is used to allow calls to this unit. The decode objects are created in the DTMF Decode List menu.	None
DTMF ANI Index	DTMF ANI number	255
Disable DTMF Encode	Prevent DTMF transmissions	Disabled
Enable DTMF ABCD	Allow use of 4 <sup>th</sup> column DTMF tones	Disabled
Disable DTMF Dead Beat	Do not allow this radio to be disabled via DTMF tones	Disabled
Enable DTMF Side Tone	Turn on DTMF side tones in order to hear tones as they are being dialed.	Disabled

**Scan.** Scan lets you turn scanning features on and off and lets users edit some scan lists.

- When you are satisfied with your entries, press Done.

The screenshot shows the 'Mode Settings' dialog box with the 'Scan' tab selected. At the top, 'System Number' is set to 2 and 'System Tag' is set to LTR 1. The 'Scan' tab is active, showing two sections: 'Scan Features' and 'User Scan Edit'. In 'Scan Features', all four options are unchecked: 'Disable System Scan', 'Enable Scan Resume Delay', 'Enable Block Mode Scan', and 'Auto Group Scan on System Select'. In 'User Scan Edit', all four options are checked: 'Allow User to Edit System Scan List', 'Save User System Scan Edit', 'Enable User to Edit TG Scan List', and 'Save User TG Scan Edit'. At the bottom are 'Done' and 'Cancel' buttons.

The Scan parameters for a LTR system are:

Field	Description	Default
Disable System Scan	Do not scan this system when in system scan	Disabled
Enable Scan Resume Delay	If signal is heard, wait before continuing scan	Disabled
Enable Block Mode Scan	Receive all LTR groups ID's between the ID listed for Group 2 and Group 3	Disabled
Auto Group Scan On System Select	Always scan all groups when on this group	Disabled
Allow User to Edit System Scan List	Allow user to add/remove system from the scan list	Enabled
Save User System Scan Edit	Save user preferred system scan settings at power off.	Enabled
Enable User to Edit TG Scan List	Allow user to add/remove system from the scan list	Enabled
Save User TG Scan Edit	Save user preferred group scan settings at power off.	Enabled

**System Overrides.** System overrides lets you force changes to some basic system settings.

- When you are satisfied with your entries, press Done.

The screenshot shows a 'Mode Settings' dialog box with a blue title bar. At the top, there are two input fields: 'System Number' with the value '2' and 'System Tag' with the value 'LTR 1'. Below these are four tabs: 'TX / RX', 'DTMF', 'Scan', and 'System Overrides'. The 'System Overrides' tab is selected and highlighted. Inside this tab, there is a section titled 'System Overrides (All Groups)' containing three checkboxes: 'Force Narrow Band' (unchecked), 'Force TX Low Power' (checked), and 'Force TX Test Power' (unchecked). At the bottom of the dialog are two buttons: 'Done' and 'Cancel'.

The System Override parameters for a LTR system are:

Field	Description	Default
System Overrides	Provide overrides that Force Narrow Band, Force Tx at Low Power, Force Tx at Test Power	Disabled

**Repeaters.** Enter the LTR Repeater Table. Information for a total of 20 Repeaters can be specified. Data must include the Receive/Transmit frequencies and whether the repeater supports narrow band, low power, inverted Rx, Tx data, and Phone.

Home Repeater:  Set Area Bit: ☒ System Number:  System Tag:

**1-10**      11-20

Repeater	Receive Frequency	Transmit Frequency	Narrow Band	Low Power	Invert Rx Data	Invert Tx Data	Phone
1	464.4250	469.4250	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	464.1250	469.1250	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	464.3250	469.3250	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	464.5250	469.5250	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	462.5500	467.5500	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The LTR Repeaters screen also provides the option of saving the repeater table to a file or loading the table with data saved to a file.

## PassPort Data

Here is the PassPort data screen:

The image shows a software window titled "PassPort Data". At the top, there are two fields: "System Number:" with the value "15" and "System Tag:" with the value "SITE 1A". Below these are four tabs: "Channel Info", "System ID", "System Features", and "Group Info". The "Channel Info" tab is selected. Inside this tab, there are two sections. The first section has "Home Channel:" and "Frequency:" with the value "464.1250". The second section has "Backup Home Channel:" and "Frequency:" with the value "464.1250". Below these are two dropdown menus: "Initial DFA Sub Band:" with the value "5" and "Digital Color Code:" with the value "0". To the right of the "Digital Color Code:" dropdown is a checkbox labeled "Fixed DCC". Below these are two more checkboxes: "Narrow Mode" and "Force Home Freq./ASID Agreement for registration". At the bottom of the window are three buttons: "Mode Options", "Done", and "Cancel".

The system number and tag appear at the top of the screen. You can enter information under the following tabs:

- Channel Info
  - System ID
  - System Features
  - Group Info
- 
- Use the screen button to enter the Mode Options for this PassPort system
  - When you are satisfied with your entries, press Done

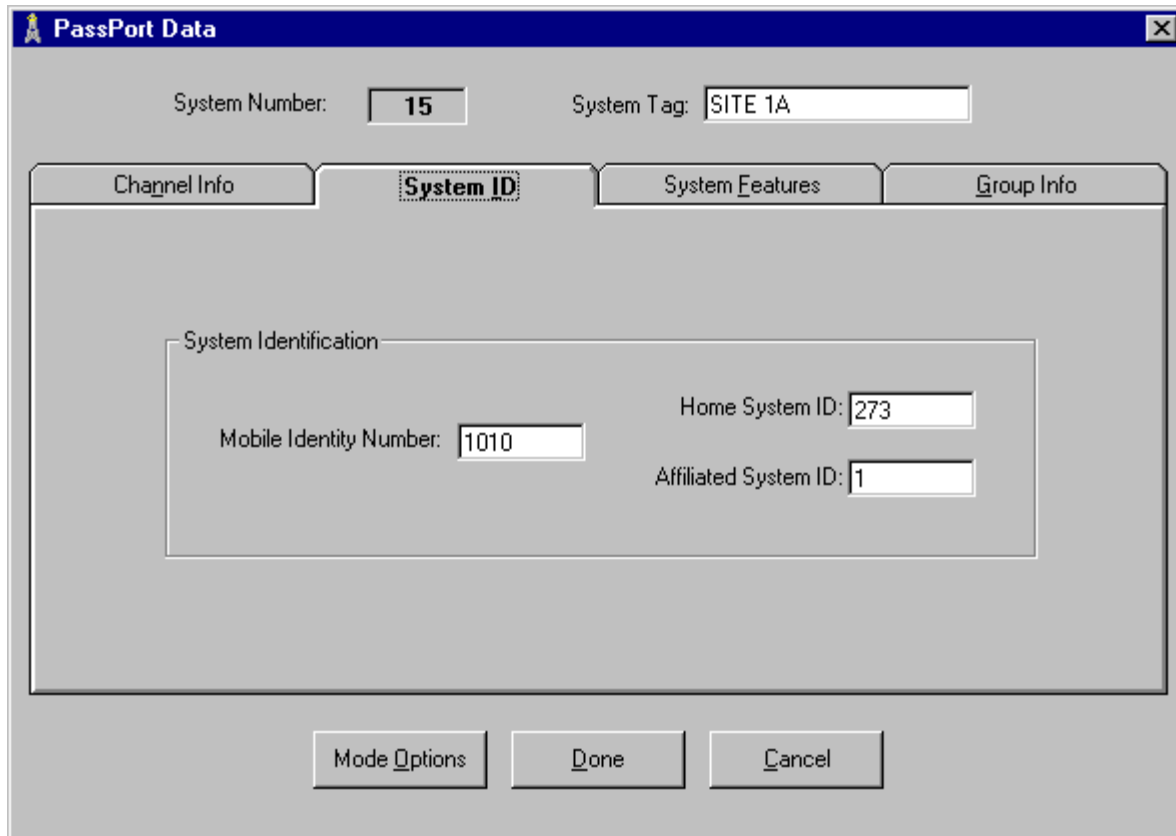
**Channel Info.** Enter frequencies for the Home Channel and Backup Home Channel and complete the identifying information.

The Channel parameters for a PassPort System are:

Field	Description	Default
Home Channel Frequency	Specify the home channel frequency for this system in MHz	
Backup Home Channel Frequency	Specify the backup home channel frequency for this system in MHz	Same as Home channel
Initial DFA Sub Band	Specify the initial DFA sub band (see NTS Chart)	5
Digital Color Code	Specify the Digital Color Code to distinguish this system from others which share same frequency.	0
Fixed DCC	Force radio to match Digital Color Code of the system in order to register.	Disabled
Narrow Mode	Operate in narrow band – will be wide band if not enabled	Disabled
Force Home Freq. / ASID Agreement for Registration	Do not allow the radio to register on similar systems.	Disabled



**System ID.** Enter the system identification information under this tab.

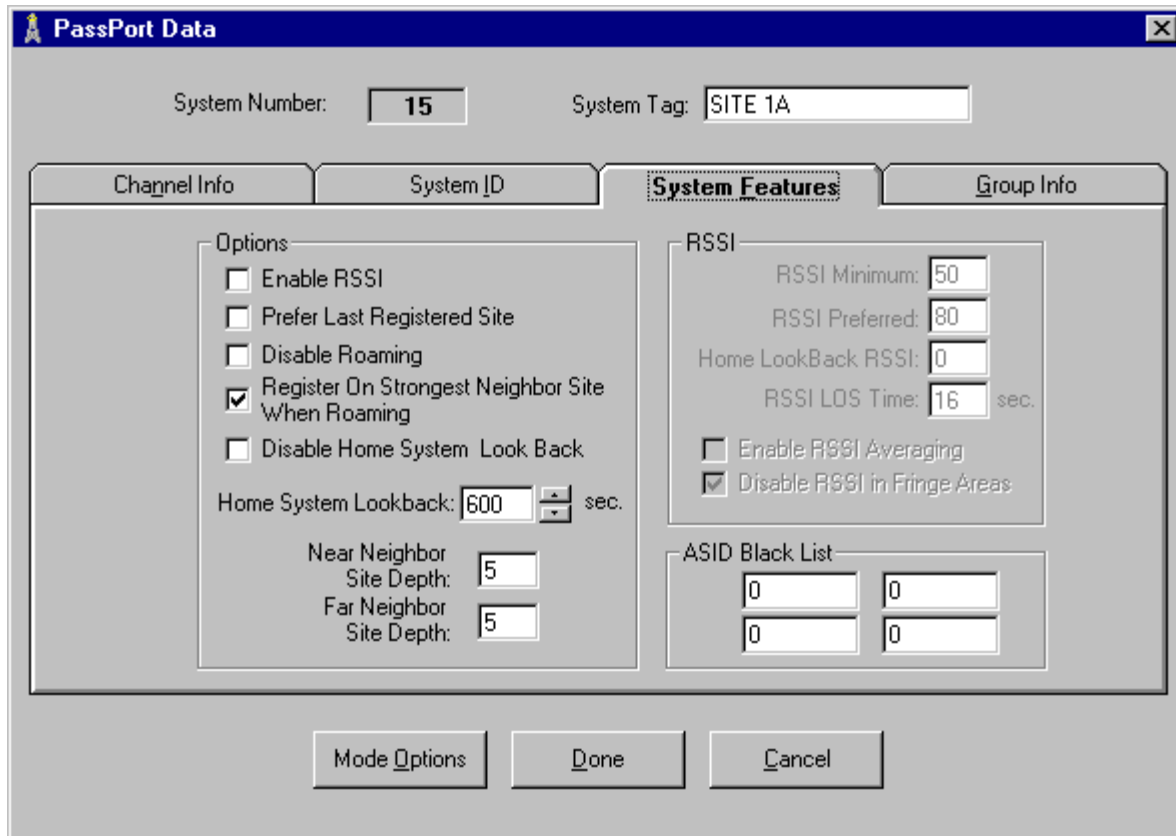


The image shows a software window titled "PassPort Data" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there are four tabs: "Channel Info", "System ID" (which is selected and highlighted with a dashed border), "System Features", and "Group Info". Above the tabs, there are two input fields: "System Number:" with the value "15" and "System Tag:" with the value "SITE 1A". Below the tabs, there is a large rectangular area containing a "System Identification" section. This section has three input fields: "Mobile Identity Number:" with the value "1010", "Home System ID:" with the value "273", and "Affiliated System ID:" with the value "1". At the bottom of the window, there are three buttons: "Mode Options", "Done", and "Cancel".

The System ID parameters for a PassPort System Number and Tag are:

Field	Description	Default
System Identification	Specify NTS parameters to identify Radio MIN, Home System ID and the Affiliated System ID	None

**System Features.** Configure system specific information to improve roaming behavior.



The image shows a software window titled "PassPort Data" with a close button (X) in the top right corner. Inside the window, there are two input fields at the top: "System Number:" with the value "15" and "System Tag:" with the value "SITE 1A". Below these are four tabs: "Channel Info", "System ID", "System Features" (which is selected and highlighted with a dashed border), and "Group Info". The "System Features" tab contains two main sections. The "Options" section on the left has five checkboxes: "Enable RSSI" (unchecked), "Prefer Last Registered Site" (unchecked), "Disable Roaming" (unchecked), "Register On Strongest Neighbor Site When Roaming" (checked), and "Disable Home System Look Back" (unchecked). Below these is a "Home System Lookback:" field with a value of "600" and a unit of "sec.". Further down are "Near Neighbor Site Depth:" and "Far Neighbor Site Depth:" fields, both with a value of "5". The "RSSI" section on the right has four input fields: "RSSI Minimum:" (50), "RSSI Preferred:" (80), "Home LookBack RSSI:" (0), and "RSSI LOS Time:" (16) with a unit of "sec.". Below these are two checkboxes: "Enable RSSI Averaging" (unchecked) and "Disable RSSI in Fringe Areas" (checked). At the bottom of the "RSSI" section is an "ASID Black List" with two rows of input fields, each containing the value "0". At the very bottom of the dialog are three buttons: "Mode Options", "Done", and "Cancel".

The System Feature parameters for a PassPort System Number and Tag are:

Field	Description	Default
Enable RSSI	Cause the radio to use RSSI for system acquire and roaming determination	Disabled
Prefer Last Registered Site	On Power up, attempt registration on last registered site rather than beginning with Home site	Disabled
Disable Roaming	Force radio to always remain on its home site	Disabled
Register on Strongest Neighbor Site When Roaming	Search ALL neighbor list frequencies when roaming and attempt registration on the one with the strongest signal	Disabled
Disable Home System LookBack	Turn off option to periodically look back to home system to see if available for registration.	Disabled
Home System Lookback	Time interval for checking Home system availability	45 sec
Near Neighbor Site Depth	How many entries to hold in near neighbor almanac -- The radio will search frequencies collected from this number of most recently registered sites several times before searching the Far Neighbor and Seed Frequencies.	1

Far Neighbor Site Depth	How many entries to hold in far neighbor almanac -- The radio will search frequencies collected from this number of most recently registered sites only after searching the Near Neighbor Frequencies several times.	5
RSSI <ul style="list-style-type: none"> <li>- RSSI Minimum</li> <li>- RSSI Preferred</li> <li>- Home Lookback RSSI</li> <li>- RSSI LOS Time</li> <li>- Enable RSSI Averaging</li> <li>- Disable RSSI in Fringe Areas</li> </ul>	<ul style="list-style-type: none"> <li>- Minimum signal strength to remain registered on a site</li> <li>- Minimum signal strength necessary to attempt to acquire a site</li> <li>- Minimum signal strength to re-register on Home Site.</li> <li>- Amount of time to wait after losing signal before roaming begins</li> <li>- Permit radio to average multiple RSSI samples for more intelligent roaming</li> <li>- Disregard RSSI when no systems are found above RSSI preferred</li> </ul>	
ASID Black List	List of ASIDs which the radio is prohibited from accessing.	Disabled

**Group Info.** Enter Talk Group data under these headings:

- Group No
- Group Tag
- Tx ID
- Rx ID
- Scan Member
- Use the screen buttons to add or edit a talk group or delete a talk group.

PassPort Data

System Number: **15**      System Tag: **SITE 1A**

Channel Info    System ID    System Features    **Group Info**

Talk Group Data

Group No.	Group Tag	Tx ID	Rx ID	Scan Member
1	TG 43001	43001	43001	Yes
2	TG 43002	43002	43002	Yes
3	TG 43003	43003	43003	Yes
4	TG 49999	49999	49999	Yes

Add TG  
Edit TG  
Delete TG

☐ Allow User to Edit Scan List

Mode Options    Done    Cancel

The Add Talk Group parameters for a PassPort system are:

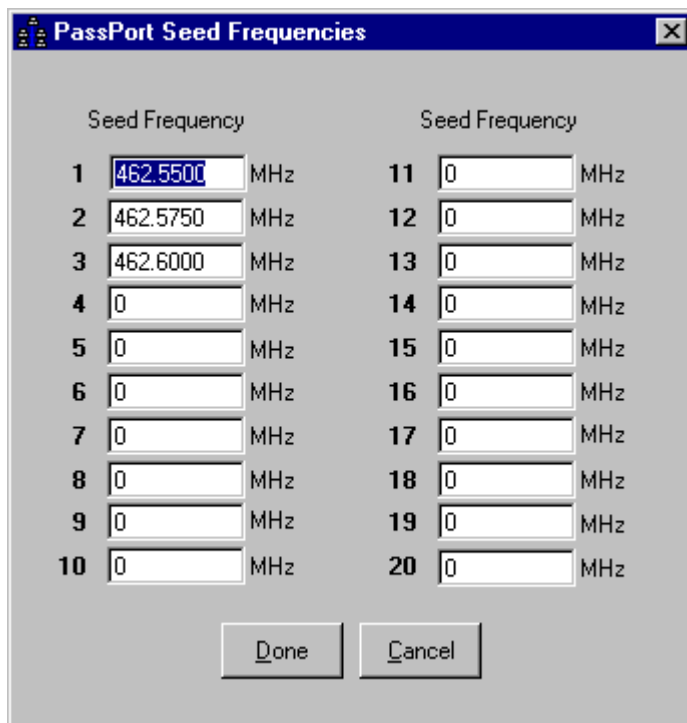
Field	Description	Default
Talk Group Tag	Specify the name of the PassPort Talk Group	
Encode ID	Transmit Group ID	
Decode ID	Receive Group ID	Same as Encode ID
Scan List Member	Add this Talk Group to the scan list	Enabled
Allow User to Edit Scan List	Enable Scan List Edit	Disabled

**Mode Options.** When you press Mode Options, the Mode Settings screen appears. The PassPort Mode Option settings are the same as LTR. The screen contains these tabs:

- TX/RX
- DTMF
- Scan
- System Overrides

## ***Seed Frequencies***

**PassPort Seed Frequencies.** The Seed Frequencies Screen is accessed via the Edit Menu. When you select this screen, you can assign up to 20 seed frequencies for the PassPort System.



The image shows a software dialog box titled "PassPort Seed Frequencies". It contains two columns of input fields, each labeled "Seed Frequency". The first column has 10 fields, numbered 1 to 10. The second column has 10 fields, numbered 11 to 20. Each field is a text box followed by "MHz". Field 1 contains the value "462.5500", while fields 2 through 10 contain "462.5750", "462.6000", and "0" respectively. Fields 11 through 20 all contain "0". At the bottom of the dialog are two buttons: "Done" and "Cancel".

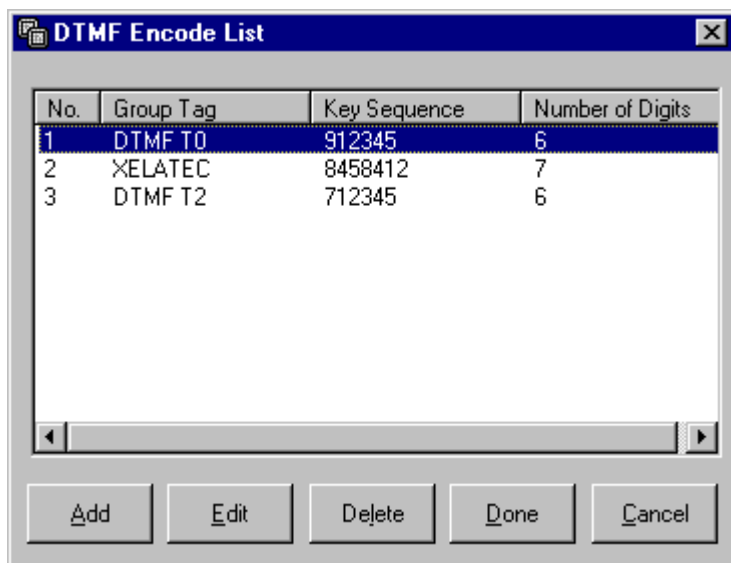
Seed Frequency	Seed Frequency
1 462.5500 MHz	11 0 MHz
2 462.5750 MHz	12 0 MHz
3 462.6000 MHz	13 0 MHz
4 0 MHz	14 0 MHz
5 0 MHz	15 0 MHz
6 0 MHz	16 0 MHz
7 0 MHz	17 0 MHz
8 0 MHz	18 0 MHz
9 0 MHz	19 0 MHz
10 0 MHz	20 0 MHz

Done Cancel

## DTMF Lists

**DTMF Encode List.** You can program several auto-dial or ANI sequences into memory. The radio user cannot change these numbers but can access the list in order to perform speed dial, etc. When you select this screen from the Edit Menu, you may make entries under the following headings:

- No.
  - Group Tag
  - Key Sequence
  - Number of Digits
- 
- Use the screen buttons to bring up an add or edit screen
  - Delete this entry with the Delete button or complete it by pressing Done.



**DTMF Encode Data.** Use this screen to add or edit an entry that will be transferred to the encode list. You can enter more detailed information about the number and timers attached to this entry.

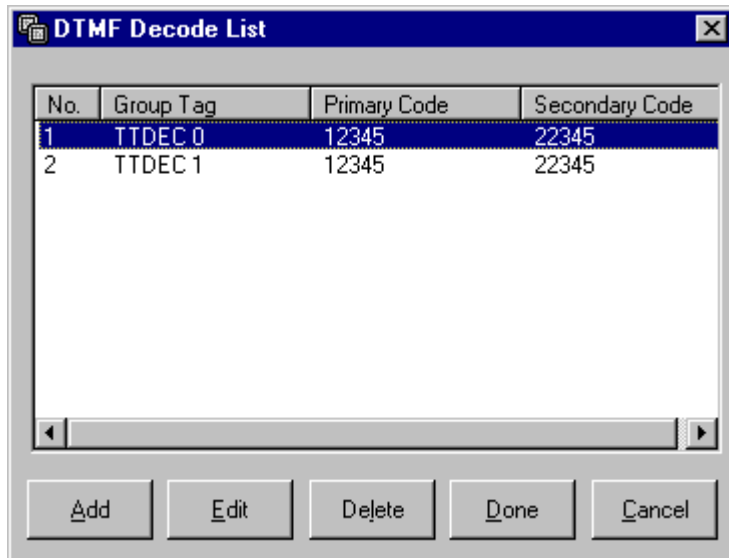
The DTMF Encode Data parameters for an Encode List Item are:

Field	Description	Default
DTMF Encode Tag	Name of DTMF code sequence.	
DTMF Sequence	Digits automatically entered in DTMF {0-9, A-D , #,*)	
Number of Digits	Number of digits in the DTMF sequence.	
DTMF Encode Timers		
- PTT Delay	- PTT Delay how long wait before transmit	
- First Digit Time	- First Digit Time is how long does first digit sound	
- Special Digit Time	- Special Digit (#,*) sounding time	
- Digit Time	- Digit Time is time for sound of other digits other than special	
- Inter Digit Time	- Inter Digit Time is time between digits	

**DTMF Decode List.** Each mode can be assigned a DTMF decoding structure. The structure has sequences for a primary code, secondary code, kill code and revive code, as well as response sequences for each. In trunking modes, acknowledgements or responses wait for a handshake on the talk group.

When you select the DTMF Decode List screen from the Edit menu, make entries under the following headings:

- No
  - Group Tag
  - Primary Code
  - Secondary Code
- 
- Use the screen buttons to bring up an add or edit screen
  - Delete this entry with the Delete button or complete it by pressing Done.





**DTMF Decode Data.** Use this screen to add or edit an entry that will be transferred to the decode list. You can enter more detailed information about the types of codes and decode timing attached to this entry.

The DTMF Decode Data parameters for a PassPort system are:

Field	Description	Default
DTMF Decode Tag	Name of DTMF Decode list entry	
Primary Code	Primary sequence of digits decoded for this decode personality.	
Primary Response	Match to one of the DTMF encode list members	
Secondary Code	Secondary sequence of digits decoded for this decode personality.	
Secondary Response	Match to one of the DTMF encode list members	
Dead Beat Enable Code	Enter code sequence to stun the radio.	
Dead Beat Disable Code	Enter code sequence to un-stun the radio.	
Dead Beat Response	Sequence that is returned to acknowledge radio stun. Code is an index of the encode list.	
Decode Timing		
- Idle Reset Time	- Time Receiver is un-muted after decode.	- 5000
- Decode Auto Reset Time	- Not Used	- 10

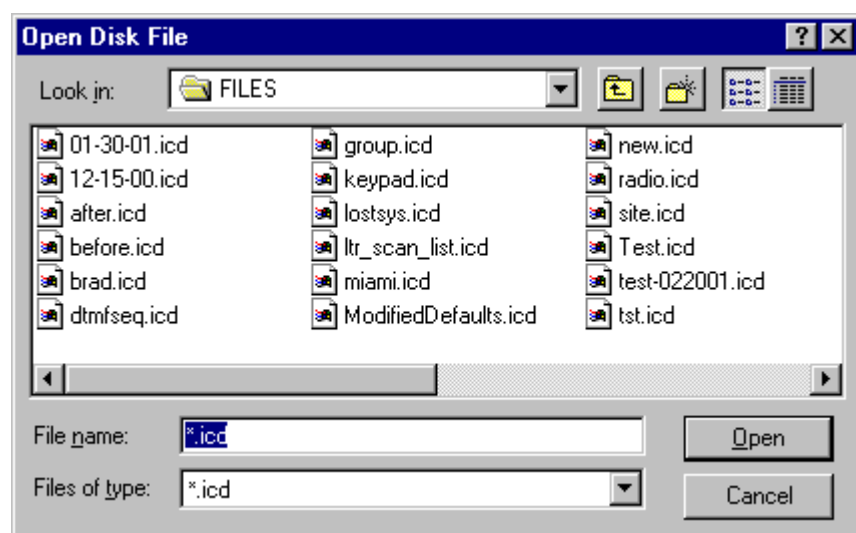
- Decode Auto Response Time	- Not Used	- 30
-----------------------------	------------	------

## File

Use the File menu to open, save and print data files and to exit the program. File contains these selections:

- Open File
- Save File
- Print
- Exit

**Open File.** Open a file and name it to hold the data you program for this radio.



**Save File.** Save the data in this file you have identified. You can use the file data as a source file for future programming or as a record of the program you developed for this radio.

**Print.** You can print a summary of the data entered into the Cloning Software to keep a physical record.

**Exit.** When you are through programming and want to quit the program, select Exit from the File menu.

# Appendix

The Appendix contains the following reference information for programmers:

## **Quick Reference: Tones, Icons and Messages**

- This section describes the alerts that users respond to

## **Key Mapping**

- This section describes how normal and shift functions are assigned to keys

## **Default Settings**

- This section contains typical default settings for functions that can be programmed to specific keys

## **Key Functions**

- This section contains a description of the functions programmers may be asked to assign to specific keys

## **Quick Reference**

### **Tones, Icons and Messages**

<b>Tones</b>	<b>Meaning</b>
power-up alert	the transceiver is working
busy signal	the channel or trunk line is busy
call signal	you have an incoming call
clear to talk beep	you are connected with your party
dial tone	you can enter a phone number
intercept tone	your call is out of range
lockout tone	contact is not available
low battery tone	your battery needs recharging
number tone	terminates connection
time out timer	your calling time is expired

<b>Icon</b>	<b>Meaning</b>
Battery	Flashes when battery voltage is low
Busy	The channel or trunk line you are trying to contact is busy
C	Carrier detected
Delta	Indicates that keys are using their Shift functions
[G]	Flashes when a Primary Group call comes in Or - missed a call from a Primary Group
Lock	Indicates keypad is locked
Low	Indicates low transmission power
P	PassPort registered. Flashes if this is not Home
[S]	Indicates DTMF selective call mute -- squelch -- is on Flashes when DTMF selective call comes in
Scan	Indicates transceiver is scanning for systems or groups
SlashCircle	Indicates this mode and system or talk group will not be scanned
Speaker	Indicates you are in Monitor mode
Telephone	Indicates you selected Interconnect mode

*To clear the icon, press PTT or any key.*

Messages	Meaning
Scan Add	This group or system is added to Scan
Scan Del	This group or system is deleted from Scan
Scan All	All systems, groups and modes are being scanned

## Key Mapping

Each key can handle two functions: a normal function and a shift function.

- To select Normal, users press the key to choose the function.
- To select Shift, users press the < left arrow function key. When the delta icon appears, users press the programmed key to choose the function.

Almost any function can be assigned to any key. Certain functions can be programmed as defaults for specific keys.

## Default Settings

P0	Normal	Toggle up and down arrows between system and group select
P0	Shift	speed dial
P0	Menu	use P0 as Cancel or Exit key
P1	Normal	Toggles the Scan start and stop
P1	Shift	speed dial
P2	Normal	scan Nuisance to delete system or talk group
P2	Shift	speed dial
P3	Normal	turn Talk Around mode On and Off
P3	Shift	speed dial
A	Normal	Goto Priority mode
A	Shift	Goto Priority mode and send Emergency DTMF sequence [message]
B	Normal	Goto Select Phone mode
B	Shift	Select and send pre-programmed DTMF sequence [message]
C	Normal	turn DTMF selective call On and Off
C	Shift	display Battery voltage
D	Normal	Toggle LCD display between Alpha Only and Scroll
D	Shift	Enter PassPort Group ID [testing only]
*	Normal	turn Keylock On and Off. Press and hold for 2 seconds
*	Shift	Enter PassPort Group A ID [testing only]
#	Normal	Used to end the connection. set transmitter power.

## Key Functions

Here is a description of the functions you may be asked to program:

Functions	Meaning
Scan start/stop	Toggle turns scanning on and off. Starts either conventional or trunking scan.
- In conventional:	Press button to select Preferred Scan and scan list of conventional modes.
- In [LTR] trunk:	Press button to turn on Group scan. The Scan icon appears when scanning is in progress.
- Scan Add or Scan Delete	<p>You can add or delete modes from scanning:</p> <p>With scanning off, select the targeted mode. Press and hold the scan key. After 2 seconds, the display shows this message: Scan Add or Scan Delete. Note: Any changes users make to the modes, systems or groups to be scanned may be lost when changing modes or when the radio is powered off.</p>
- In PassPort:	You can scan Groups in Passport but you cannot scan Systems
- Scan All	If you hold the Scan button a few seconds longer, all modes, systems and talk groups are turned on. This message appears: Scan All
- Nuisance delete	If you stop on a talk group when scanning and press nuisance delete, this talk group is deleted from the Scan list until the mode is changed, or the radio is next turned on.
Priority mode	Radio goes to programmed Priority mode for Emergency sequence.
Phone mode	Radio goes to programmed Interconnect mode. If you select PassPort and it allows Interconnect, you can place the phone call.
- Selective call	<p>You can turn the selective call squelch On or Off. The radio only supports DTMF based selective calling.</p> <p>- If selective call is active, the [S] icon appears.</p> <p>- If it is not allowed in that mode, the error tone sounds and the [S] icon does not appear.</p>
Speed dial	DTMF sequence is pre-programmed by dealer.
Redial	To redial the last number, hold down the PTT switch and press the Up arrow key. The last number dialed is displayed. Press the Up arrow key again to call that number.



<b>Functions</b>	<b>Meaning</b>
Talk around - In Conventional or LTR modes:	Talk around works on the repeater output frequency. Talk around may be programmed to goto a specific mode for talk around. When selected again, the radio reverts to the previously selected mode unless you change the mode manually.
In PassPort:	PassPort users are able to move easily between PassPort and Talk around programmed in a conventional mode, even though Talk around is generally prohibited in PassPort.
Emergency	Radio reverts to programmed Emergency mode and sends DTMF/Emergency sequence. This action can be assigned to a shift function key to reduce the chance of activating it inadvertently.
Monitor - speaker key	In Conventional mode, use the speaker key to turn the squelch on and off. Does not work with trunking.
Lock	Press and hold for 2 second to Lock or Unlock keypad and controls. Displays Lock icon. If an unlock code is programmed in, you must enter the code to unlock.
Tx Power	Select High or Low power. The Low icon indicates low power operation. If low power is programmed in, you cannot select High power.
Time-out Timer	Amount of time is pre-programmed by dealer.
End call	Normally, the # tone is used to terminate a connection and end the call.