MOTOROLA

VISAR™ Privacy Plus® Radios
Radio Service Software
User's Guide
Software Part Number: RVN-4123

RSS Technical Support: (Domestic): 800-367-4803 (Menu #5)
(International): 305-475-3778

68-81073C90-C

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RADIO SERVICE SOFTWARE
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With reference to Manual No. **68-81073C90-C**
VISAR Privacy Plus

Use the following scale to answer each question listed below. If you have a specific comment about any section, please write it in the space below the appropriate question.

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

1. The list of required equipment and the setup procedure are clear and complete.	1	2	3	4
2. The procedure for backing up and installing the software is clear and complete.	1	2	3	4
3. The explanations of keyboard commands and screen arrangement are clear.	1	2	3	4
4. The explanation of the Get/Save procedures is clear and complete.	1	2	3	4
5. The explanation of the Change/View procedures is clear and complete.	1	2	3	4
6.The explanation of the Programming procedures is clear and complete.	1	2	3	4
7. The explanation of the Service/Alignment procedures is clear and complete.	1	2	3	4
8. The explanation of how to Print the codeplug is clear and complete.	1	2	3	4
9. The Table of Contents and Index are complete and accurate.	1	2	3	4
10. The illustrations and tables added to the understanding of the explanations.	1	2	3	4
11. The Glossary and List of Abbreviations are helpful.	1	2	3	4
12. The User's Guide is well organized and helpful.	1	2	3	4

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1 Introduction

Welcome to the VISAR Privacy Plus Radio Service Software Program!

This Radio Service Software (RSS) manual is your guide to customizing and programming a variety of features into a VISAR radio. Modern microprocessor chip technology used to manufacture this radio and the VISAR RSS (a computer program, which when interfaced with a radio, electronically programs a radio) make it possible for you to personalize a radio with a unique set of features for each individual customer. No tools are needed.

The RSS computer program resides on the diskettes you received in the package with this manual. The radio's customization and servicing is accomplished using an IBM® Personal System/2® Model 30 or higher computer.

The alignment and troubleshooting sections of this manual are intended for use by qualified communications technicians and maintenance personnel only.

This series of portable radios has a unique set of features combined with the convenience of maintenance-free tuning, due to its wide-band capability. Listed below are some of major features and functions of the VISAR Privacy Plus RSS:

VISAR RSS Programmable Features	VISAR RSS Service Functions
Trunking system parameters	Reference oscillator alignment
Trunking talkgroups	Transmit deviation alignment
Ergonomic features	Transmit power alignment
Zone/Channel assignments	Replaced power amplifier calibration
	Replaced logic board calibration
	Replaced RF board calibration

Prerequisites

To program radios using the RSS, we recommend a basic working knowledge of the following:

- Microcomputers
- The radio's available features (Refer to the appropriate Radio Operator's Manual.)
- Your customers' needs
- MS-DOS operating system, version 5.0 or later

This RSS requires a minimum of 510 kilobytes of free RAM to run. (The DOS CHKDSK command can be used to determine the amount of free RAM available on your computer.) DOS 5.0 is required. It is also strongly recommended that this RSS be run on a computer with the following minimum configuration:

- 80286 CPU or higher
- DOS 5.0 (with DOS running in high memory)
- 4 Megabytes of RAM or greater

The powerful features and extensive flexibility of these new radio families require much more codeplug data validation than in the past. For complex configurations, it is recommended that the RSS be executed from a RAM disk. This will reduce execution time significantly.

To configure your computer with a RAM disk, you need to modify your CONFIG.SYS file with a statement. The sample statement below is required to run the RSS in DOS 5.0:

DEVICE=C:\DOS\RAMDRIVE.SYS 4096 512 1024 /E

which stands for:

C:\DOS\RAM DRIVE.SYS	The name of the path where the DOS RAM drive program resides.
4096	The size of the RAM disk in kilobytes (4096 would configure a four-Megabyte RAM disk).
512	The size of the sectors required in the RAM drive (in bytes).
1024	The number of files and directories you can create in the RAM disk's root directory.
/E	Command extension required to create the RAM disk in extended memory instead of in expanded or conventional memory. If your computer is configured to use expanded memory, replace the /E switch with /A.

In order to run the RSS from the RAM disk, a .BAT (batch) file should be used to copy the necessary files from the hard drive to the RAM disk. Archive files are not affected and must be saved on the hard drive or

floppy drive as usual. (If you are a computer beginner, refer to the DOS manual that came with your computer for DOS procedures and commands).

Using This Manual

The VISAR Privacy Plus RSS Manual is designed to teach basic radio feature programming and to speed up access to technical reference information. It is intended for both beginners and advanced users of the RSS. This manual contains information on all of the following:

- How to hook up the radio and other required hardware to your computer
- How to install the RSS
- How the RSS operates and how the screens are organized
- How to navigate through the menus and screens from the MAIN MENU and use special keyboard commands
- What the purpose of each menu and screen is, along with detailed descriptions of the functions and data fields relevant to each menu/screen
- How to program a radio using the GET/SAVE and CHANGE/VIEW screens as well as how to service the radio using the SERVICE screens
- How to organize your file directories and specify directory paths for codeplug files
- How to print out radio programming information
- How to clone (or program identical information into several) radios

To locate the information you need, use the Table of Contents and/or the Index. Explanations of major terms used in this manual can be found in the Glossary.

Watch for WARNINGS, CAUTIONS and NOTES which are used throughout this manual, the definitions of which are provided below:

WARNING

An operational procedure, practice, or condition, etc., which may result in injury or death if not carefully observed.

Caution

An operational procedure, practice, or condition, etc., which may result in damage to the equipment if not carefully observed.

Note: An operational procedure, practice, or condition, etc., which is important to emphasize.

Assembling The Hardware

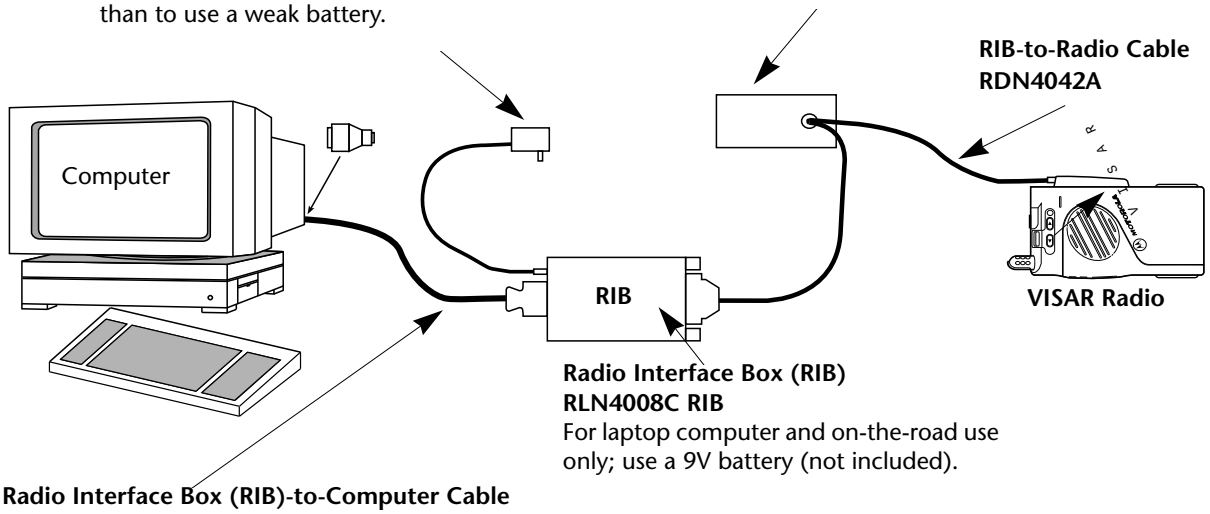
The figure below shows how to assemble the required (and optional) equipment used to program a VISAR radio.

RIB Power Supply

01-80357A57 (110 Vac) Power Supply
or **01-80358A56** (220 Vac) Power Supply.
or **60-82728J01** (9 V) Power Supply.
It is more reliable to use the power supply than to use a weak battery.

Portable Products Test Set - P/N RTX4005B or RTX-4005A Test Set (with rework kit RPX-4665A)

Provides the capability for testing many transmitter and receiver functions. Transmitter modulation and keying can be simulated and receiver parameters can be tested without opening up the radio. The Test Set is used in conjunction with the programming/test cable.



Radio Interface Box (RIB)
RLN4008C RIB
For laptop computer and on-the-road use only; use a 9V battery (not included).

Radio Interface Box (RIB)-to-Computer Cable

30-80369B72 Cable for IBM Personal Computer AT or compatible computer (9-pin end and a 15-pin end).

or **30-80369B71** Cable for IBM Personal Computer XT or compatible computer (25-pin end and a 15-pin end)
See Appendix A for connection details.

⚠ Caution	Use a fresh, 9V battery. The LED will remains lit with a weak battery and this may cause certain errors on screen.

Steps to Connect the Hardware

1. Connect the RIB-to-computer cable to the communications port of the computer (9/25-pin end).
2. Connect the other end (15-pin end) to the RIB Box.
3. Connect the 25-pin end of the RIB-to-radio cable to the RIB box, and the 9-pin end to the side connector of the radio.
4. Plug one end of the power supply into the RIB box and the other end into a wall outlet.

After you connect the hardware, turn on the radio by turning the volume control clockwise. You will hear one of the following types of tones.

High-pitched, short tone	Hardware is connected correctly and the radio's internal firmware is operating correctly. **Note:** This tone may be disabled in the codeplug and may not be heard.
Continuous low tone	Critical failure or radio's internal software malfunction.

You can install, start or explore the RSS using just the diskettes and your computer if you do not have all the necessary hardware. You can even update existing radio archive files stored on disk. What you cannot do without the required hardware is read from or save codeplug data to an actual radio and perform service functions.

Caution

When programming or calibrating a radio, DO NOT disconnect the radio from the RIB when the computer is communicating with the radio. If you do so, the radio may become inoperable. The only recommended time to disconnect the radio is while you are at the MAIN MENU or at any of the GET/SAVE/PROGRAM screens.

Note: If you are using a laptop computer and you plan to use the RSS while the computer is in battery mode, you may need to set the serial/parallel adapter to run on battery power. This can be accomplished using the application diskette supplied by the computer manufacturer. If this action is not performed, you are likely to receive serial bus errors.

Note: If your RIB has a switch and LED, be sure to turn on the switch before each programming session.

What's On The RSS Diskettes

Below are the files located on the diskettes you received with this manual.

File Name	File Type	Description
INSTALL.EXE	Installation file	Used to install the RSS.
VISARPP.001	Executable files	Compressed version of the file that the installation program uncompresses when it installs the RSS on your hard disk.
INSTALL.DAT	Installation file	Contains installation data.
DISK.ID	Installation file	Floppy Disk ID.

The RSS creates a file named VISARPP.BAT. This file is generated by the hardware installation command (INSTALL) and is located under the root directory of the hard drive, enabling the RSS to start up from the root directory.

A file can be a program (i.e., a set of commands to tell the computer what to do) or a collection of data or information. A DOS file should have two parts to its name: a file name followed by a file extension which is optional. The extension provides an easy way to identify or tag files at a glance for easy grouping or categorizing.

The "A" in the file name "A9999999.999" refers to the fact that the file being saved is a radio "archive" file. The "9999999.999" in the above file name refers to the radio's 10-digit serial number. As a DOS file name is limited to 8 characters in the prefix and three characters in the extension, this RSS default radio archive file-naming system conforms to the DOS file-naming convention. For example, the sample file name "A1234567.890" could be a valid radio archive file name.

Frequent RSS users and computer pros can skip the "Organizing Your Hard Disk" section and proceed to the "Starting The RSS" section. New RSS users should read all sections.

It is important to spend some time early on deciding which types or groups of files should be located together in the same file directory. File directories can be created using the DOS **MD** or **MKDIR** command.

You may want to organize your directories first by customer area, then by customer name, and finally by radio model type, or perhaps in the reverse order. Consider the different ways in which you operate your business: do you separate radio files by customer location, by sales revenue, by fiscal year, or perhaps by date of purchase? When deciding how to organize your files and directories, we suggest the following:

- Put as few directories as possible near the top, or root, of your directory tree. The next level of directories would be the *customer names* within each of those areas.

- Keep the RSS diskette contents in one directory and your archive files in a different directory.
- Keep archive files in separate directories according to the model of the radio being programmed. It is not possible to know a file's model type by simply looking at the file name. Have a separate directory name for each radio model, and then store the archive files for that specific model within the appropriate model directory. This way, archive files for multiple model types will not located in the same directory. Storing archive files for different radio models in the same directory can cause a lot of confusion.

Organizing Your Hard Disk

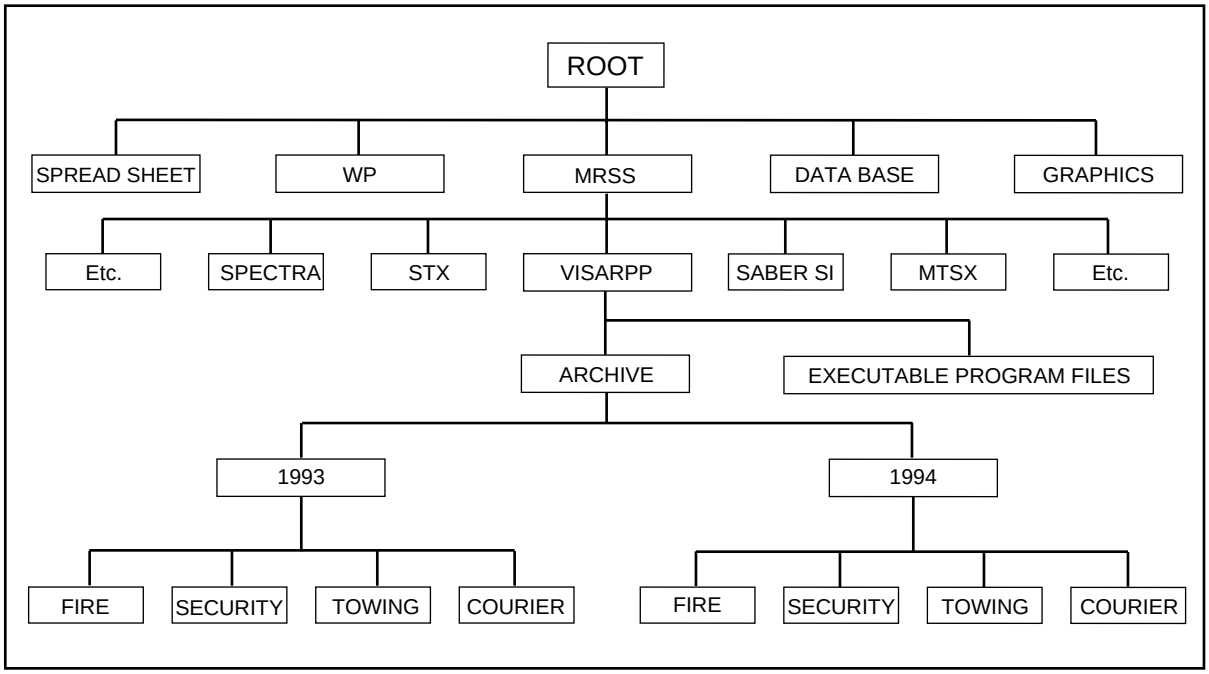
Below is a sample directory tree for storing your radio archive files on your computer's hard disk. Though your hard disk directory tree may vary depending on your way of doing business, this setup may be a starting point for you. The installation program will automatically create the MRSS and VISARPP directories for you if they do not already exist.

We suggest that you execute the following command before starting out to program a radio:

PROMPT PG

If you place the above command in your autoexec.bat file, it will be executed every time the computer boots up. The prompt will the show your current location in the directory tree. Note how the prompt changes when the following commands are typed to change directories. The prompt is shown in bold face.

C>PROMPT PG
C:\> CD\MRSS
C:\MRSS\>



Starting The RSS

The RSS is not a Windows program. If you have Windows loaded, the RSS program will not operate correctly.

Create a Back-up Copy of RSS Diskette(s)

We recommend that you make a back-up copy of the RSS. To make a back-up copy, follow the steps below.

1. Insert the RSS diskette you received with this manual into drive A.
2. Type DISKCOPY A: A:

Caution

Accidentally reversing the insertion order of the diskettes will erase the contents of the RSS diskette. DOS will tell you when to insert the source diskette (the original RSS diskette) and when to insert the target diskette (a newly formatted one). When the disk copy command has been executed, use the target diskette as the new working copy.

3. Keep the original RSS diskettes in a safe place away from magnets, moisture and heat.

What To Do with Previous Versions of RSS Diskettes

We recommend discarding previous versions of the RSS so you always have the most current version available and do not mistakenly program a radio with outdated data. In addition, the latest RSS version has updated codeplug structures which will be unreadable with old versions of RSS.

Installing the RSS on your Hard Disk

Install the latest RSS version as soon as you receive it. This ensures that you have the latest version of the RSS installed at all times. This action also stores important files in a consistent place for cross-referencing and future use. The software installation will take approximately three minutes.

The INSTALL program will:

- Create the MRSS, VISARPP and ARCHIVE directories if they do not already exist.
- Write over the old version's program files with the same name, if present.

Note that the install program will NOT write over your archive files.

You may install the RSS on several personal computers and laptop computers at a single site depending on the terms of your license. If you have additional sites (i.e. a second shop, etc.) you should purchase additional subscriptions.

RSS Hard Disk Installation & Start-Up Procedure

1. Insert the RSS diskette in drive A.
2. Type **A:** (press Return).
3. At the **A:** prompt**,** type **INSTALL**.

Follow directions and answer questions on the display as and when they appear.

You will be instructed to switch diskettes in the diskette drive (ex. “INSERT DISK CONTAINING FILE...”).

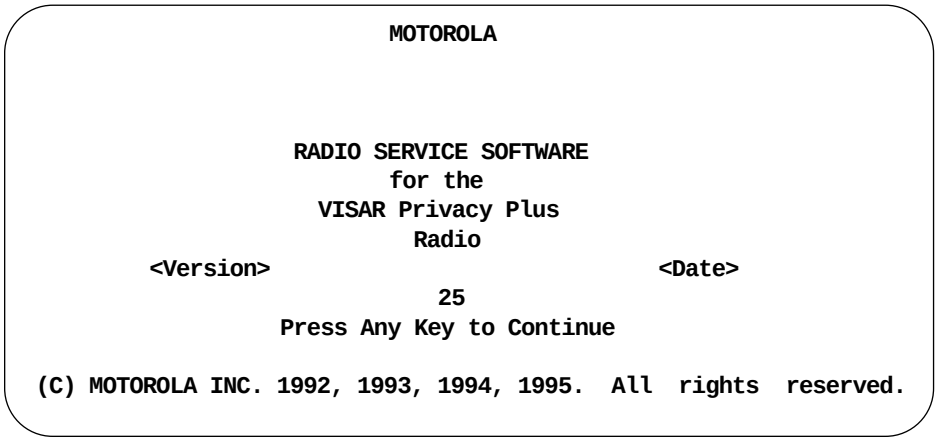
After installing the RSS on your hard disk, follow the start-up procedure below:

1. At the **C:** type **cd C:**
1. Type **C:** and press Return to log on to the hard drive.
2. At the **C:** prompt type **VISARPP**.

This command starts up the RSS. If the software does not start up correctly, you may hear a tone or see an error message or error code printed on the display. If this happens, verify that the file VISARPP.BAT appears under the root directory of Drive C.

The Banner Screen

When the program has been successfully loaded in your computer, you will see a Banner screen similar to the one below.

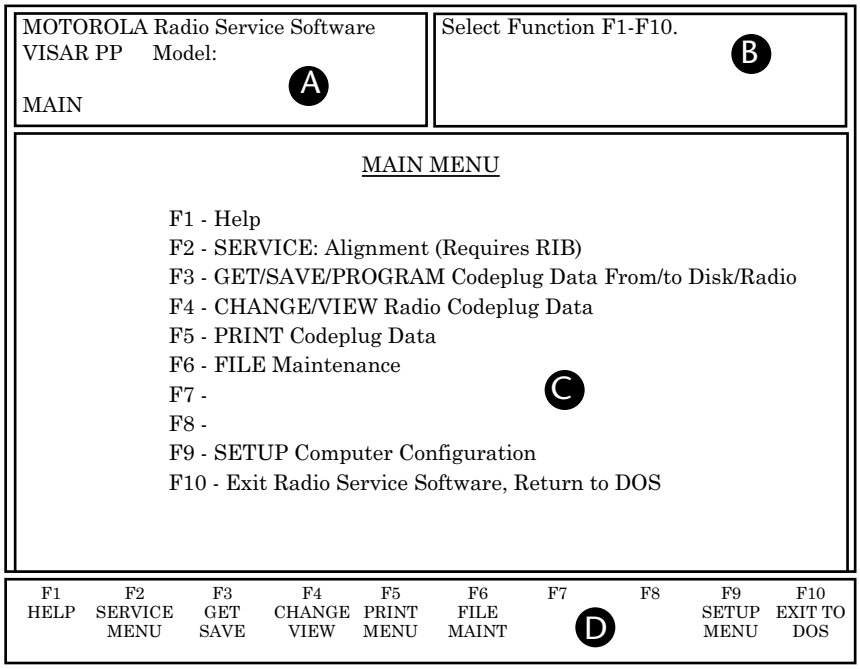


The *Version* and *Date* on the Banner screen above are not shown here. However, your RSS will show the actual version and date on the screen.

Press any key at the BANNER screen to access the MAIN MENU.

Anatomy of a Menu

Within the RSS, there are menus that will take you to other menus and/or to screens where you can change the choice or value of a field. The only difference between a menu and a screen is the information which appears in the *working area*, marked by the letter C in the figure below. A menu or screen has four areas, labelled below as A, B, C and D.



A RSS Location ID Area

In this area you will find the words "MOTOROLA Radio Service Software" and a menu or screen pathname for the current menu or screen shown on the display.

B Instruction Area

As the name indicates, this area asks you to perform specific actions such as "Select Function, F1-F10", "Use UP/DOWN arrows to scroll value," and so on.

C Working Area

This area of a menu (not a screen) displays a list of functions (menu choices) you can execute from the current menu. Each menu item is preceded by an F-key (function key). Pressing an F-key from among the available choices advances you to another menu or screen as the case may be.

D F-Key (Function Key) ID Area

This area displays the F-keys and function names for the current menu or screen.

> **Note:** All functions (supported and unsupported) will be displayed in the menu's working area. The unsupported functions (based on the radio's model or options) will, however, NOT be displayed in the F-key area.

Navigating Through The RSS Menus

Every action of the RSS is controlled by you through the use of formatted displays and function keys.

Under each menu or screen title, you will find a sequence of F-keys (or Function keys) such as 

. This sequence represents the path from the MAIN MENU to that specific menu or screen. To access the desired menu or screen, simply press these keys one by one from the MAIN MENU.

The F-keys and other special keys that you can use to communicate with the RSS are listed below along with their various functions.

F1

Used to display on-help information on *every* RSS screen and menu. On-line help provides information on how to use the currently displayed menu, screen, line or field. You may also find system setup information in a HELP screen. In many cases, the help information provided is for the specific line of the screen that is currently highlighted.

F2 through **F9**

The **F2** through **F9** keys perform special functions and actions which can vary from menu to menu and from screen to screen. For instance, *on some screens*, **F5** will print out the current screen to your printer, **F8** will save the data and options currently displayed, and so on.

F10

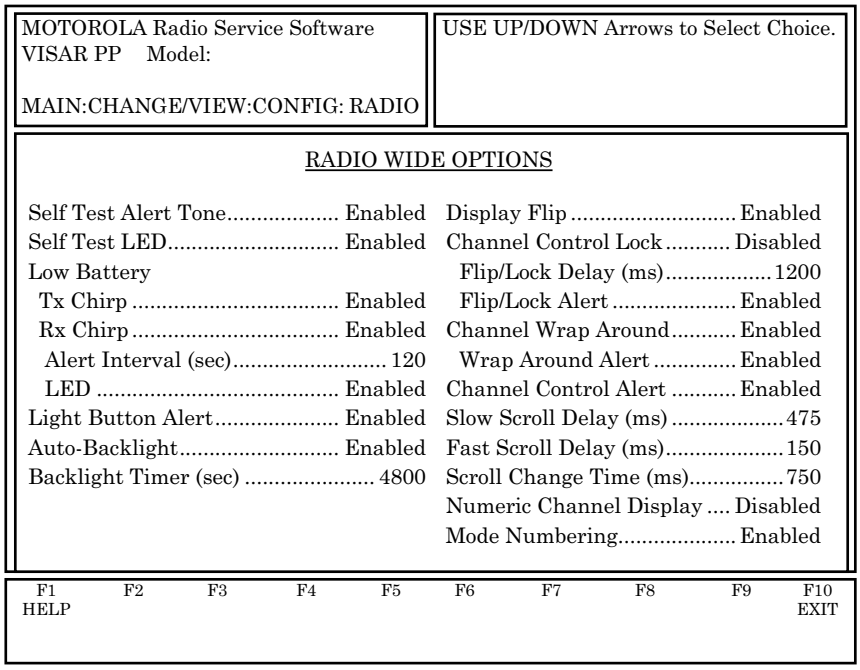
Used to exit to previous menu or screen. The **F10** key performs this function on *every* menu and screen. At the MAIN MENU, the **F10** key is used to exit the RSS.

Esc

Used to exit to the MAIN MENU. The **Esc** key performs this function on *every* menu and screen.

Anatomy of a Screen

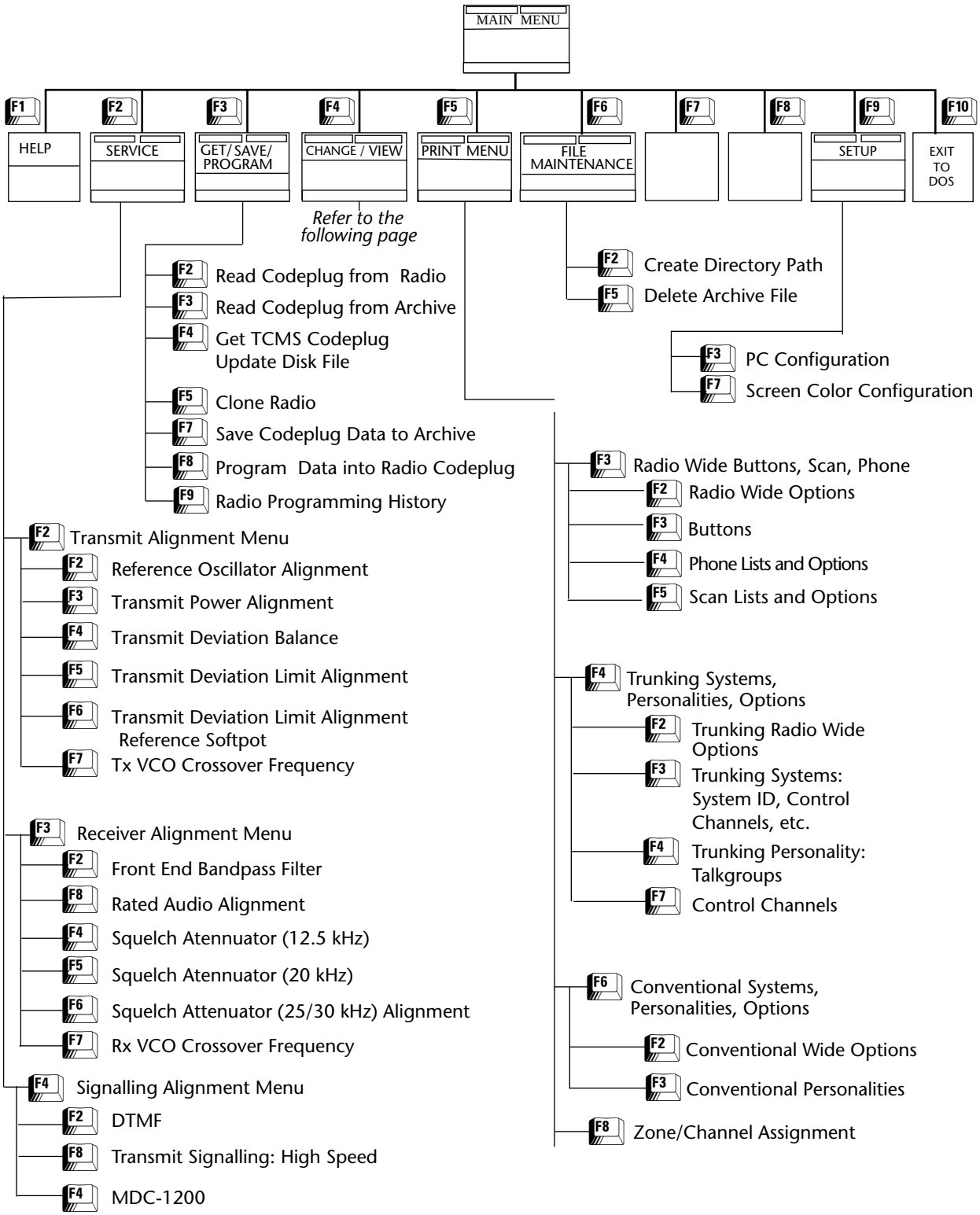
The only difference between a menu and a screen lies in the contents of the working area.

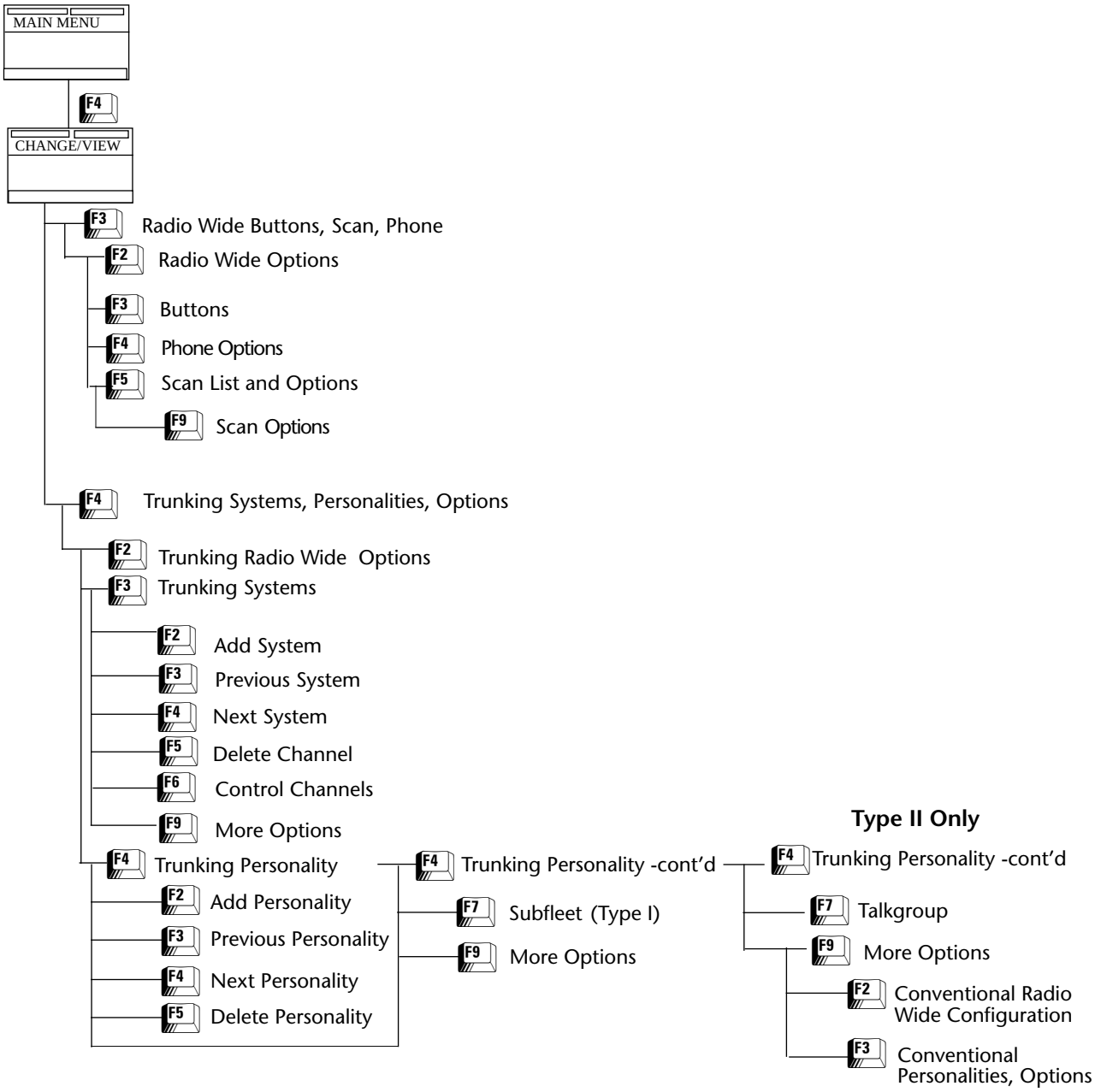


The working area of a screen contains a list of programmable features called “fields” that can be selected or changed using the arrow, tab or return keys described earlier. On some screens, there are features that can be selected for each *individual* channel or mode; these features are selected on a mode-by-mode basis. On other screens, there are features that can be selected for *all* modes of the radio (referred to as “radio-wide” features). And still other screens list those features that perform specific RSS functions, such as servicing the radio or printing the personality data.

Complete Menu Mapping at a Glance

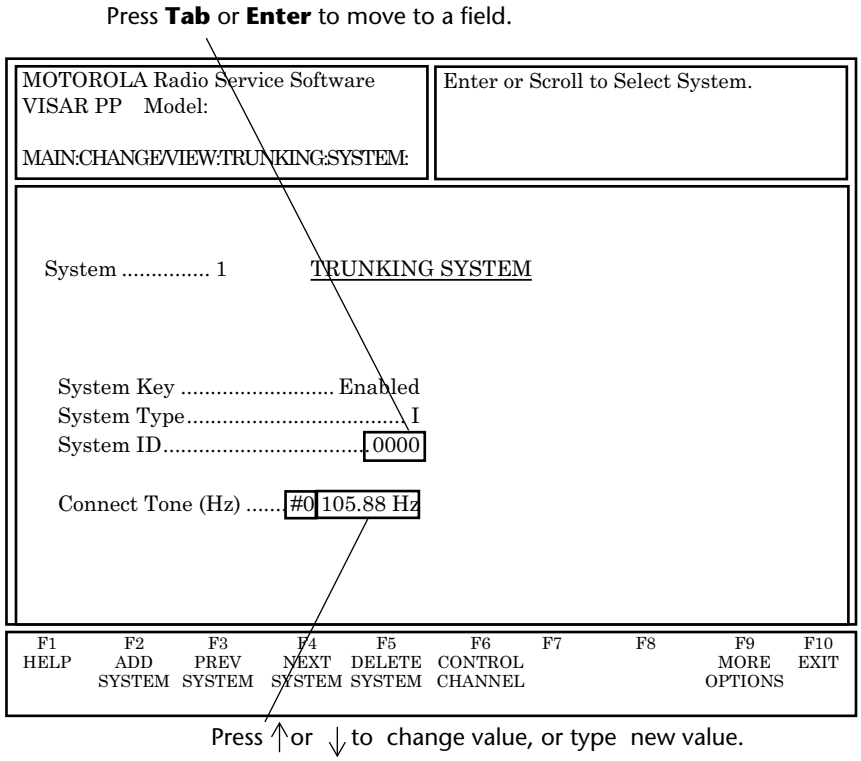
The following Menu Map is a guide through the entire RSS.




MAIN MENU
F4
CHANGE/VIEW
F3 Radio Wide Buttons, Scan, Phone
F2 Radio Wide Options
F3 Buttons
F4 Phone Options
F5 Scan List and Options
F9 Scan Options
F4 Trunking Systems, Personalities, Options
F2 Trunking Radio Wide Options
F3 Trunking Systems
F2 Add System
F3 Previous System
F4 Next System
F5 Delete Channel
F6 Control Channels
F9 More Options
F4 Trunking Personality
F2 Add Personality
F3 Previous Personality
F4 Next Personality
F5 Delete Personality
F4 Trunking Personality -cont'd
F7 Subfleet (Type I)
F9 More Options
Type II Only
F4 Trunking Personality -cont'd
F7 Talkgroup
F9 More Options
F2 Conventional Radio Wide Configuration
F3 Conventional Personalities, Options

Changing A Field Value

Some screens contain fields that require, or take values from, other screens and features and thus are dependent upon each other. For example, the System ID number specified in the CHANGE/ VIEW:TRUNKING:PERS screen are assigned in the CHANGE/ VIEW:TRUNKING:SYSTEM screen.



Tab or Enter

Accepts data currently in the field and then moves the prompt forward one field. If the entry is not accepted (probably not a valid value), an error beep will sound. Functions like the **Enter** or **Return** key.

Del

Used to erase the current character in a field.

PgUp

Used to displays the previous page of information on the screen.

PgDn

Used to display the next page of information on the screen. The **Num Lock** key must be off.

Screen fields come in three basic types:

Information fields

Non-editable fields which cannot be altered or changed.

Scrollable fields

Contain a range of values, or several options, from which you can select the desired value/option. To edit or change a choice, press the arrow key(s).

Direct-entry fields

The desired value must be typed in using the keyboard. To edit or change a choice, type in an acceptable value.

Changing a field's value is typically done either by scrolling through a list of options (in scrollable fields) or by typing in a correct value (in direct-entry fields). Scrolling is accomplished using the arrow keys.

Setting (Configuring) RSS Computer Defaults

Setting computer defaults eliminates the need to specify them every time you enter the RSS or program a radio.

Read this section if you wish to do any of the following:

- Set a default file path name,
- Set or change the default port used to interface with the radio and RIB
- Set the default colors you see on your RSS screen.

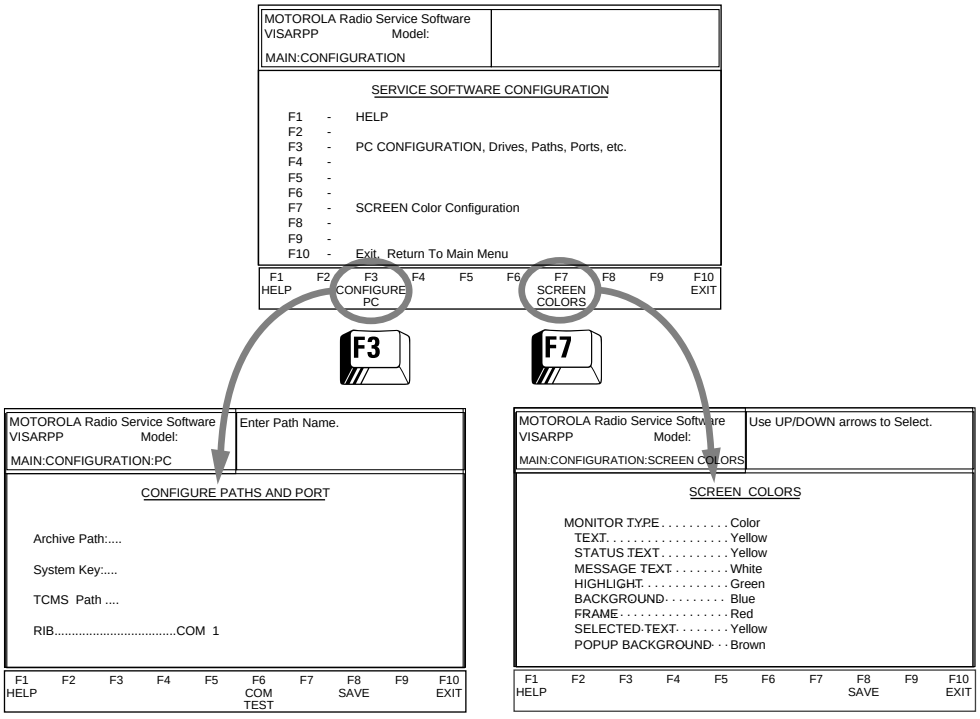
To begin configuring RSS defaults, return to the MAIN MENU by pressing the **Esc** button.

From the MAIN MENU, press **F9** to get to the SERVICE SOFTWARE CONFIGURATION MENU.

From the SERVICE SOFTWARE CONFIGURATION MENU, you can either read the on-line help (**F1**), set some default computer values or exit (**F10**).

Pressing **F3** on the SERVICE SOFTWARE CONFIGURATION MENU will bring up the CONFIGURE PATHS AND PORT screen, where you can specify the default drive and path names for future archive, system key, and TCMS files, as well as selecting which COM Port to use to communicate with the Rado.

Pressing **F7** on the SERVICE SOFTWARE CONFIGURATION MENU will display the SCREEN COLORS. In this screen, you can specify the colors for your screen's text, lines, background, and highlighted fields.



Setting Default Archive and Back-up Paths

You can set the drive name and path names for archive files you will create later. Specifying a default path name here will save much typing time later every time you want to save an archive file. Here's how to set the default archive and back-up file paths:

1. Press **F3** at the SERVICE SOFTWARE COMPUTER CONFIGURATION MENU to get to the CONFIGURE PATHS AND PORT screen.
2. At the CONFIGURE PATHS AND PORT screen, type **C:\MRSS\VISARPP\ARCHIVE** (i.e., the archive file path name).
3. Type **F8** to save the field options displayed on the screen.

The following paragraph is a work-around for the problem of the SERVICE SOFTWARE CONFIGURATION MENU appearing every time you start the RSS using the 3-1/2" diskettes. Our goal is to have this screen appear once (i.e., the first time you use this RSS, so that you can set your defaults) and then eliminate it from the display at subsequent times by storing the information in a file on the diskette.

Setting a Default Port

Use the following steps to specify the serial port to interface with the radio and RIB. The default port is COM 1.

1. Press **F3** at the SERVICE SOFTWARE CONFIGURATION MENU to go to the CONFIGURE PATHS AND PORT screen.
2. Go to the serial port RIB field by Pressing **Tab** three times.
3. Select a port using the arrow keys to scroll through the available field options. Options are COM 1, COM 2, COM 3, or COM 4.
4. Test the port by pressing **F6**, COMTEST - if OK, you will hear a beep and the words "Communications With The Radio Was Successful" will appear in the instruction area.
5. Press **F8** to save this configuration. The message "Configuration File Written Successfully" will appear in instruction area of the screen.
6. Press **F10** to exit this screen and go to previous menu.

Exiting The RSS

Before you exit the RSS, always ask yourself these questions:

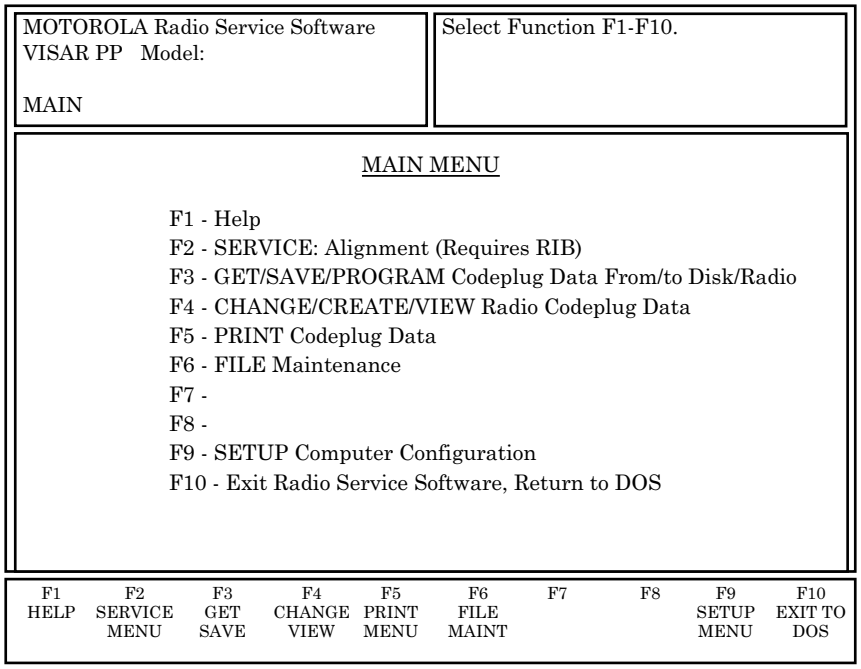
1. Did you apply the changes to the radio (save to the radio)?
2. Did you apply the changes to a computer file (save archive file)?

Press the **Esc** key to return to the MAIN MENU, and then press **F10** followed by **F2** to exit to the DOS prompt.

Main Menu

The MAIN MENU is the top level of the program from which all function selections start. All selections are made via the function keys, labeled **F1** through **F10** on the keyboard. All other menus contain an **Esc** key, and by pressing it the operator may at any time return to the MAIN MENU.

The user must initially load data from a radio (or disk) using the GET/SAVE function before being allowed to CHANGE/VIEW any codeplug data. For any problems not covered by the Radio Service Software User's Manual or the Radio Service Manual, contact your local Motorola field technical representative.



Function Key Descriptions

F1 - HELP

Provides additional information on this screen. Generic help is available within any help screen in the form of the MORE HELP function.

F2 - SERVICE

A multi-level menu that permits access to all radio service alignments through the service screens. A radio must be connected to the computer via the RIB before access will be permitted to the service screens. All service screens access the codeplug directly. Therefore, it is **NOT** necessary to read the codeplug data before using the service screens.

F3 - GET/SAVE

Used to read codeplug data from a radio and/or retrieve-archived codeplug data from a diskette or hard disk for editing purposes using the CHANGE/VIEW function. The GET/SAVE function is also used to program edited codeplug data back into the radio or to create an archive file on a diskette or hard disk.

F4 - CHANGE/VIEW

A multi-level menu that is used to change, view, or modify codeplug features and option configurations. All radio codeplug parameters are classified as either RADIO-WIDE, CONVENTIONAL, TRUNKED, or

PERSONALITY related. The CHANGE/VIEW menu permits access to each of these categories. Unlike the SERVICE function, a codeplug must be loaded into the computer's memory using GET/SAVE functions before CHANGE/VIEW functions can be accessed. An archive file can be accessed without a radio being connected.

F5 - PRINT MENU

Prints selected codeplug data.

F6 - FILE MAINTENANCE

Allow access to archives so that you can retrieve codeplug data or find/create paths to enter or store archive files.

F9 - SETUP

Used to configure the Radio Service Software according to specific user requirements. Default disk drives, communication ports, and even screen colors may be customized to the customer's specific needs.

F10 - EXIT

Used to quit the program and return to DOS. Ensure that all desired codeplug changes have been programmed back to the radio and that an archive copy has been made. If this is not done, all changes will be lost as returning to DOS erases this data from the computer's memory.

How to Read the Codeplug

1. Start up the RSS If you are not already at the MAIN MENU, press "2" at the start-up screen and any key at the BANNER screen to access the MIAN MENU.
2. From the MAIN MENU press F3; the GET/SAVE/PROGRAM MENU will be displayed.

Reading the Codeplug

You may read the codeplug from the radio or from the archive disk. After reading, the codeplug will be checked for valid serial number, model number, checksums, etc.

Reading Codeplug Data from the Radio

Turn the radio on and press **F2**. A series of status messages will appear in the upper right corner of the screen. If a communication error occurs, a pop-up window will be displayed. If no errors occur, the center of the screen will display the progress of the codeplug read. The read process will take approximately one minute. After the codeplug is read, the GET/SAVE/PROGRAM MENU will be displayed.

Reading Disk Codeplug Files

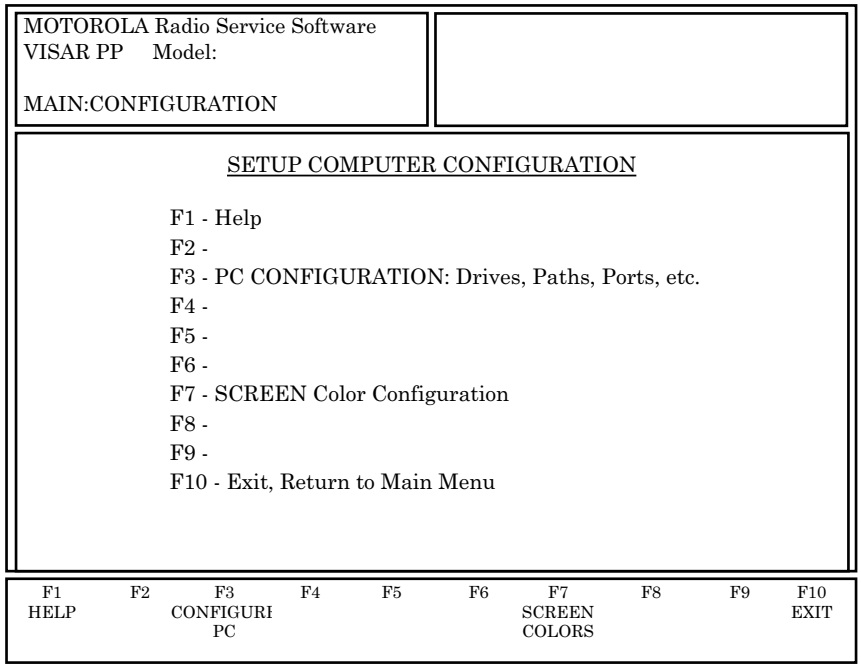
Press **F3** at the GET/SAVE/PROGRAM MENU. The ARCHIVE FILE screen will be displayed. An archive path and the list of files in that path will be displayed. By default, the path will be the corresponding archive path specified on the CONFIGURE PATHS AND PORT screen. If you want to retrieve a file from another path, press **F2**, type in the path name, and then press **Enter**. The names of the files in the new path will be displayed.

To retrieve a selected file, press **F8**. The selected file will be retrieved, validated, and placed in computer memory. The progress of the read process will be displayed on the screen.

To delete a file, select it and press **F5**.

Set Up Computer Configuration

The SETUP COMPUTER CONFIGURATION screen can be accessed by pressing **F9** at the MAIN MENU.



From this screen, you may set up the paths for archive. You may also set up the serial port (COM 1 or COM 2) that will be used to communicate with the radio.

Function Key Descriptions

F1 - HELP

Provides useful information about the currently displayed menu, screen, or field.

F3 - CONFIGURE PC

Used to set default disk drive paths for archive files and back-up files. It is also used to select which asynchronous communications port (COM 1 or COM 2) the RIB will be connected to. The RSS will automatically determine at what clock speed the computer is operating. No user-selectable parameters are required. (Refer to the owner's manual that came with your computer for a complete description of path names and asynchronous communication ports.)

F7 - SCREEN COLORS

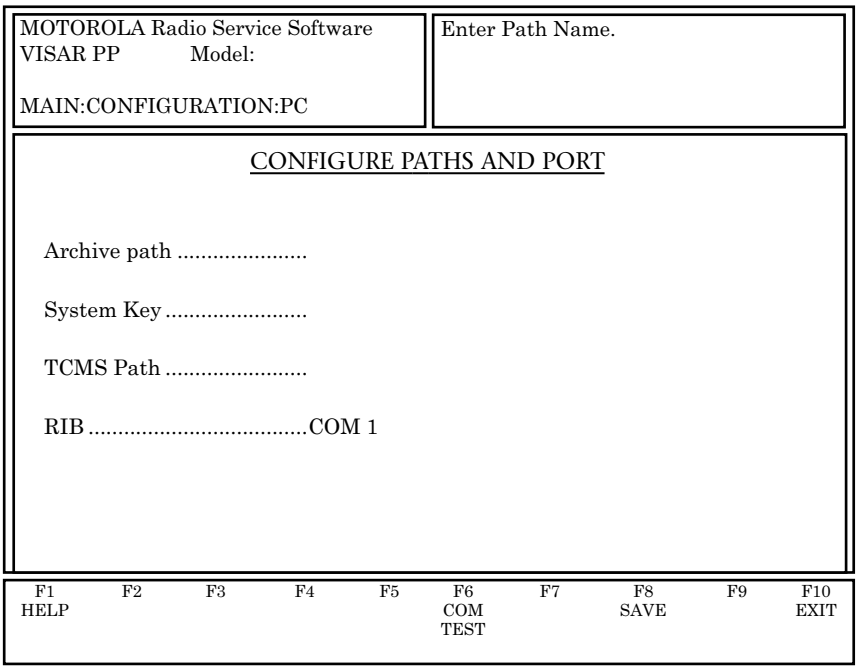
Used to enable the monochrome display option. If the computer is capable of color display, viewing quality is greatly enhanced. The standard default configuration for the RSS is for a monochrome display.

F10 - EXIT

Moves the display backward in the RSS tree, one screen or menu at time.

Configuring Paths and Port

From the MAIN MENU, press **F9** and then **F3** to access this screen.



This screen is used to set default disk drive paths for archive files, back-up files, and TCMS authorization files. It is also used to select which asynchronous communications port (COM 1 thru COM 4) the RIB (radio interface box) will be connected to.

Refer to the owner's manual that came with your computer for a complete description of directory path names and asynchronous communications ports.

Function Key Descriptions

F6 - COM TEST (Communications Test)

Used to verify if your computer is set up correctly and is able to READ and PROGRAM a radio codeplug properly.

After your computer and RIB are connected according to instructions in your Radio Service Software manual and you have selected the appropriate communication port, turn on your radio and execute the COM TEST function by pressing **F6.**

COM TEST will verify if your system is functioning properly by sending commands to the radio and checking for the proper response. No codeplug changes will result from these commands. An OK response will be displayed in the Status Window if the system checks OK. Otherwise, error messages will be displayed and you should consult your manual for proper corrective action.

F8 - SAVE

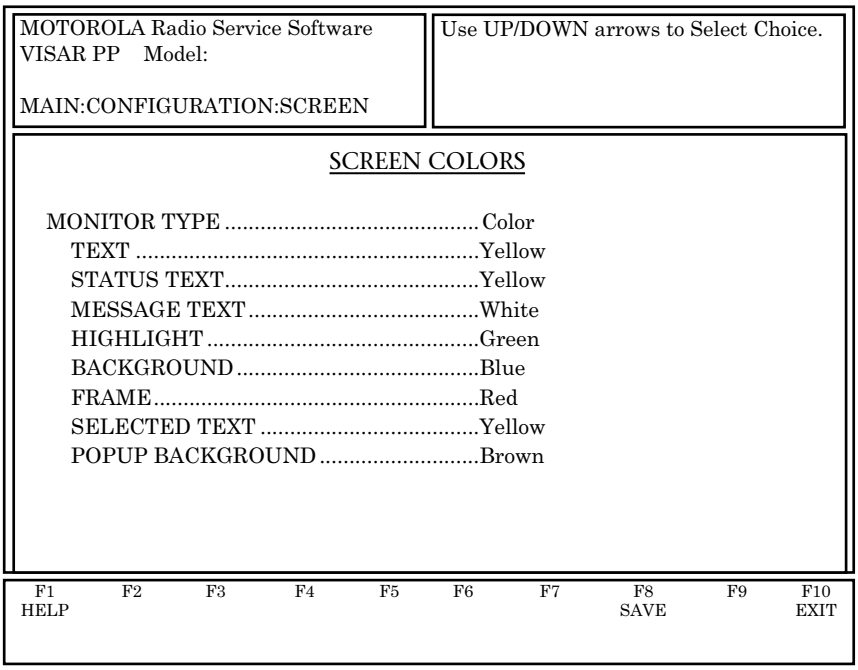
Used to save configuration information to a file on your program disk. Every time you use the RSS, the configuration that you saved LAST will be used. The configuration may be changed and saved at any time.

Field Definitions

Archive Path	Enter the default directory path where archive files are to be located. The GET FILE and SAVE FILE functions will default to this path. Refer to the owner's manual that came with your computer for a complete description of directories and path names.
System Key	Enter the default DOS directory path where Trunking System Keys are to be located. The load System Key function will default to this path. Refer to the owner's manual that came with your computer for a complete description of directories and path names.
TCMS Path	Enter the default directory path where TCMS download files are to be located. The TCMS MERGE screen will default to this path.
RIB	Use the UP/DOWN arrow keys to select which asynchronous communications port (COM 1 or COM 2) your RIB (radio interface box) is connected to. If you are not sure how your computer is configured or if you have two asynchronous communications ports, first select COM 1 and use the COM TEST (**F6**) function to communicate with a radio. If the test fails, select COM 2 and repeat COM TEST. Ensure all cables and power supplies are connected according to instructions provided in your RSS user's guide. **Note:** Refer to the owner's manual that came with your computer for a complete description of asynchronous communications ports and instructions on how to configure them.

Setting Screen Colors

From the MAIN MENU, press **F9** and then **F7** to access this screen.



This screen is used to select the type of display monitor that you are using with your computer, i.e., Monochrome or Color.

For proper color operation, you must have a color monitor and the appropriate color display interface card must be installed in your computer. Please refer tothe owner's manual that came with your computer and/or contact your computer dealer if you have questions regarding the color capability of your system.

You may also further customize your screen by selecting colors for the screen's text, status line, message line, highlighted text, background, frame, selected text and pop-up background.

> **Note:** Screen configuration changes must be SAVED (**F8**) before you EXIT (**F10**) this screen.

Function Key Description

F8 - SAVE

Used to save the configuration information to a file on your program disk. Every time you use the RSS, the configuration that you saved last will be used. The configuration may be changed and saved at any time.

Field Definitions

Monitor Type

Use the UP/DOWN arrow keys to select either a monochrome or color display monitor. The factory default is Monochrome.

Text

Use the UP/DOWN arrow keys to select the desired color for screen text. The factory default is Light Gray.

Status Text	Use the UP/DOWN arrow keys to select the desired color for the status text located in the lower portion of the top right-side window. The factory default is Light Gray.
Message Text	Use the UP/DOWN arrow keys to select the desired color for the message text located in the upper portion of the top right-side window. The factory default is Light Gray.
Highlight	Use the UP/DOWN arrow keys to select the desired color for the highlighted screen text. The factory default is Yellow.
Background	Use the UP/DOWN arrow keys to select the desired color for the screen. The factory default is Black.
Frame	Use the UP/DOWN arrow keys to select the desired color of the screen outline. The factory default is Light Gray.
Selected Text	Use the UP/DOWN arrow keys to select the desired color of the selected text. The factory default is Light Gray.
Pop-up Background	Use the UP/DOWN arrow keys to select the desired color of the pop-up background. The factory default is Black.

Basic Radio Programming Tutorial

2

Now that the hardware and software installation is complete, the RSS is up and running, and you are familiar with the RSS user-interface, you are ready to personalize a radio. The tutorials that follow will walk you through the procedure of programming specific features into a radio.

The first tutorial deals with how to program a VISAR basic trunked radio and the steps used to save the radio's personality to codeplug and archive files. The desired features that must be programmed, the major steps involved in programming the radio, and the specific steps required to program features into the radio are all listed in the following pages.

Programming a Basic VISAR Privacy Plus Radio

The tutorial assumes that the RSS is up and running and that you are at the MAIN MENU. (Refer to Section 1 for the RSS installation procedure.) Remember that **F1** displays help information about the currently highlighted field or the current screen. Press **F10** to back out of the RSS one menu level at a time.

Desired Features

Assume that two systems with two subfleets/talkgroups each are desired and that factory defaults are suitable for most parameter values.

Major Decisions Involved

To program the above features into the radio, follow this approach:

1. Determine the desired number of systems, subfleets and their configuration.
2. Determine the desired features to program for each system and for each personality, etc.

High-Level Programming Flow

The overview of the flow of programming in this example is as follows:

1. Read the radio.
2. Merge the TCMS download file with the radio's codeplug.
3. Assign personalities to switch positions on ZONE/CHANNEL screen.
4. Program the radio.

This programming flow was chosen because it minimizes navigation between screens.

Step-by-Step Programming Instructions

The directions below are designed to give you an overview of the radio programming procedure. Use the sample chart for a conventional radio on the following page to record the features that you wish to program into your radio.

Read Current Radio's Personality (Codeplug)

Before you can program the VISAR radio, you must first read and access the current radio's personality (codeplug data). Follow these steps to read the codeplug:

1. At the MAIN MENU, press **F3** to get to the GET/SAVE MENU.
2. Press **F2** to get the current radio's codeplug data. A status bar will keep you updated as to how much of the codeplug has been read.

Merge/Download TCMS

For this tutorial, we will assume that the TCMS file is in the appropriate directory. Before you can begin programming, you must merge the TCMS file into the VISAR radio as follows:

1. At the GET/SAVE MENU, press **F4** to get to the TCMS codeplug update disk file.
2. Press **F8** to update data. The TCMS Path will be highlighted. We assumed the TCMS file was in the appropriate directory. If this path is absent, type in the appropriate path name, press **F10** to return to the GET/SAVE MENU, then press **F8** to update the data.
3. Press **Esc** to exit to the MAIN MENU.

Program Zone/Channel Features

Now that the personalities are programmed, we will assign them to rotary channel positions using functions in the ZONE/CHANNEL screen.

1. At the CHANGE/VIEW MENU, press **F8** to bring up the ZONE/CHANNEL ASSIGNMENT screen.
2. Press **F2** to add a zone.
3. Press **F3** to go to the previous zone (in this case, Zone 1).
4. Press **F6** to add a channel. The desired number of channels can be added in this manner.
5. Press **Tab** or **Enter** to advance the prompt to the next Personality Type field.
6. Use the UP/DOWN arrow keys to select the desired Personality number or type in the number directly. To move to the Talkgroup/Subfleet field, press **Enter** or **Tab**. Repeat this step for additional Channel numbers.
7. Press **F4** to move to the next Zone.
8. Repeat steps 4 to 7 above for each Zone to be programmed.
9. When finished, press **Esc** to return to the MAIN MENU.

Table 1 Trunked Radio Personality Chart

Feature Name	Per1	Per2	Per3	Per4	Per5	Per6	Per7							
System														
Talkgroups														
Individual ID														
Connect Tone														
Talk Permit														
Zone														
Channel														

Program Data Into Radio Codeplug

Now that you have set values for all the features you want, it is time to actually program them into the radio. *Programming the personality into the radio's codeplug must be done **after** creating or editing the personality of a radio or else the changes will be lost.*

1. Press **F3** at the MAIN MENU to bring up GET/SAVE MENU
2. Press **F8** at the GET/SAVE MENU to bring up the PROGRAM RADIO screen. Make sure that the radio is connected to the RIB and that both the RIB and the radio are powered up before pressing **F8**.

Caution

When programming or tuning a radio DO NOT disconnect the radio from the RIB when the computer is communicating with the radio. This action may leave the radio in an inoperable state. Disconnect the radio **only** when you are in the MAIN MENU or GET/SAVE screens.

Cloning Radios

Cloning is a process by which codeplug information is copied from one radio to another or to multiple others. Follow the procedure below to clone a radio:

1. Press **F3** at the MAIN MENU to bring up the GET/SAVE MENU.
2. Press **F3** again to go to the GET ARCHIVE FILE screen. A list of filenames will be displayed. These filenames reflect the serial numbers that the RSS found in the archive pathname specified. The name of the file that you saved in the first tutorial should appear in this list.
3. Press **Tab** until the xxxxxxxx.xxx file is highlighted.
4. Press **F8** to retrieve the selected (highlighted) file.
5. Press **F10** to return to the GET/SAVE MENU.
6. Assemble the hardware and connect the radio that you wish to clone (i.e. the "target" radio).
7. Press **F5** at the GET/SAVE MENU to bring up the CLONE MENU.
8. Press **F2** to read the serial number from the target radio.
9. Press **F8** to program the current codeplug data into the target radio.
10. You may now disconnect the radio, but make sure that you are at the MAIN MENU or GET/SAVE MENU when performing this action. Otherwise, the radio may become inoperable.

Repeat steps 6 through 10 to clone additional radios as necessary.

Exit the RSS

Press **Esc** to back up to the MAIN MENU. At the MAIN MENU, press **F10** and then **F2** to exit to DOS.

3

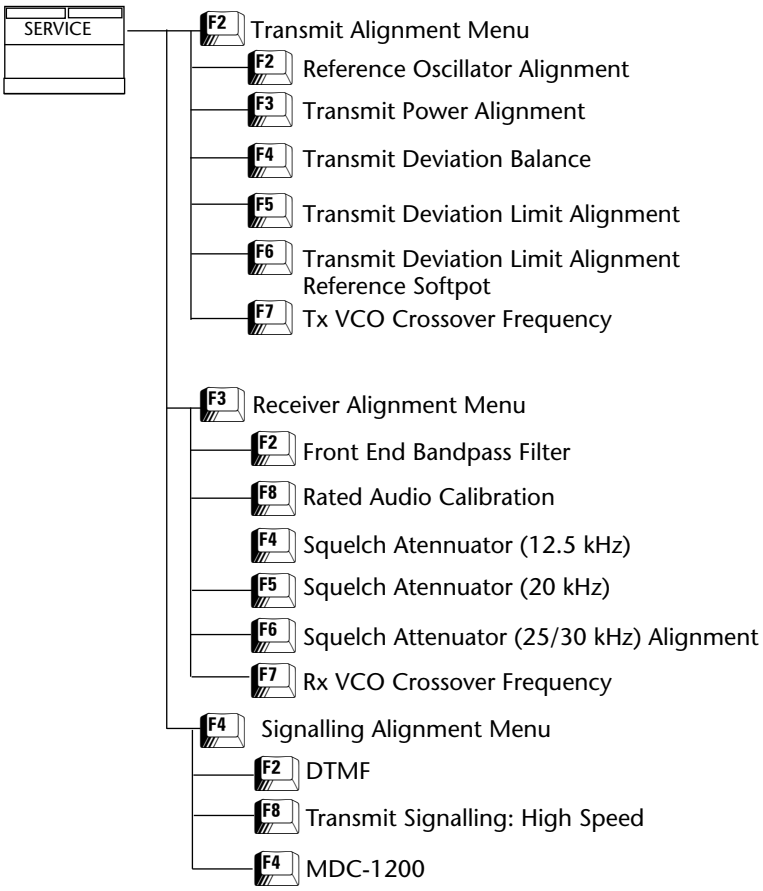
Service Menu Functions

Servicing the Radio Using the RSS

Now that the hardware and software installation is complete and the RSS is up and running, you are ready to personalize the radio(s). The following pages are constructed in such a manner that a qualified service technician can keep a radio at full capability throughout its design life by means of correct alignments and configurations. This section describes how to utilize the RSS manual and enable particular radio functions and capabilities desired by the user.

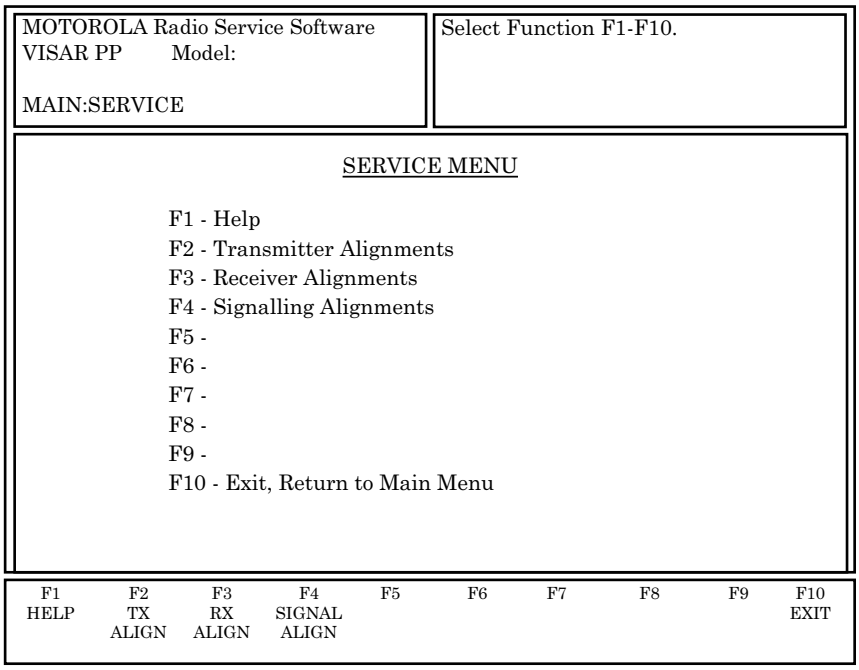
Note: All functions (supported and unsupported) will be displayed in the menu's working area. The unsupported functions (based on the radio's model or options) will NOT be displayed in the F-key ID area.

Menu Map



Service Menu

Press **F2** at the MAIN MENU to access the SERVICE MENU.



All radio alignment and board replacement procedures are accessed from the SERVICE MENU. A radio must be connected to your computer via a RIB and cables and the radio turned on before you will be permitted to access the service screens.

Caution

Do NOT switch radios in the middle of any SERVICE procedure. Always use the EXIT function key (**F10**) to return to the MAIN MENU before disconnecting the radio. Improper exits from service screens may leave the radio in an improperly configured state, resulting in seriously degraded radio or system performance. Refer to your Radio Service Manual for detailed service procedures.

All service screens read and program the radio codeplug directly; you do NOT have to use GET/SAVE/PROGRAM MENU functions unless you are changing or printing data.

Note: You must save the new values before exiting the screen or the new value will be discarded.

Function Key Descriptions

F2 - TX ALIGN
(Transmitter Alignment)

Used to perform standard radio transmit alignment procedures. Standard periodic alignment procedures are performed from this menu. Refer to your Radio Service Manual for Transmit Alignment procedures.

F3 - RX ALIGN
(Receiver Alignment)

Used to perform standard radio receive alignment procedures. Refer to your Radio Service Manual for Receive Alignment procedures.

F4 - SIGNAL ALIGN
(Signalling Alignment)

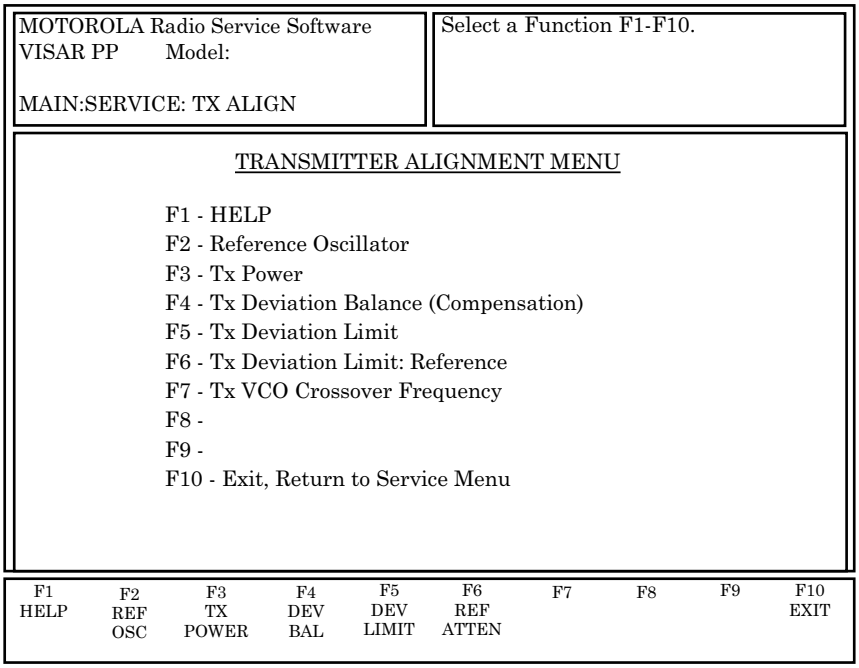
Refer to your Radio Service Manual for Signalling Alignment procedures.

Caution

Transmitter, Receiver and Signalling Alignment procedures should only be attempted by qualified service personnel. Failure to perform alignment procedures properly may result in a seriously degraded radio or system performance. Refer to your Radio Service Manual for detailed service procedures.

Transmitter Alignment Menu

From the MAIN MENU, press **F2** twice to access the TRANSMITTER ALIGNMENT MENU.



Standard periodic alignment procedures are performed from this menu. Refer to your Radio Service Manual for alignment procedures.

Caution

These procedures should only be attempted by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

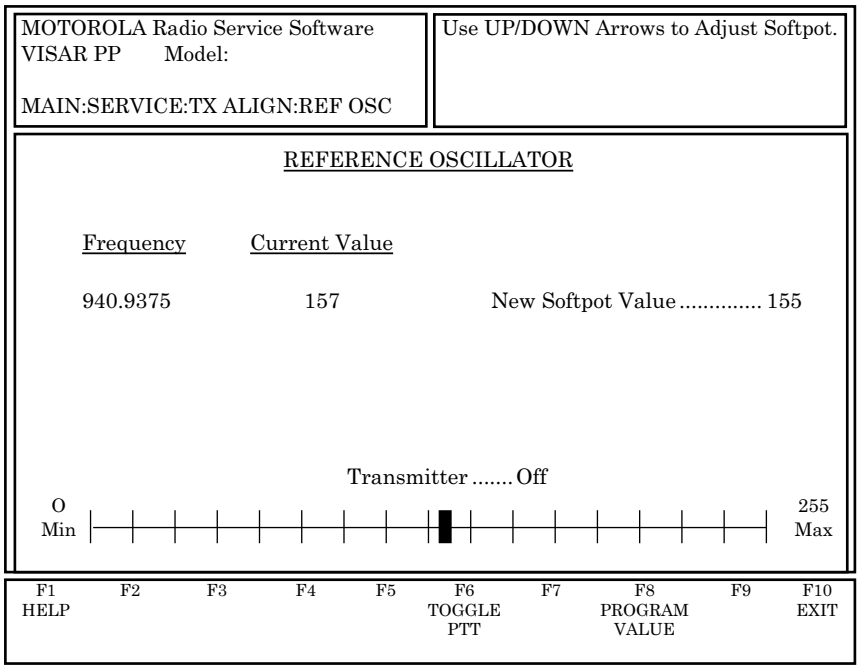
Signalling deviation for DTMF and high-speed trunking data should be checked any time the radio is serviced and must be adjusted whenever any of the modulation circuitry has been replaced. Before adjusting signalling deviation, radio compensation/deviation adjustments must be made. No adjustments are required for DPL, PL, or trunking connect time deviation.

Function Key Descriptions

F2 - REF OSC (Reference Oscillator Alignment)	This is the working value of the Reference Frequency (Reference Oscillator).
F3 - TX PWR (Transmit Power Alignment)	Refer to your Radio Service Manual for the Transmitter Power Alignment procedure. This procedure should only be attempted by qualified service personnel.
F4 - DEV BAL (Transmit Deviation Balance [Compensation] Alignment)	Refer to your Radio Service Manual for the Transmit Deviation Balance (Compensation) Alignment procedure. This procedure should only be attempted by qualified service personnel.
F5 - DEV LIMIT (Transmit Deviation Limit Alignment)	This is the reference softpot value for this frequency. Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment Reference Attenuator procedure. This procedure should only be attempted by qualified service personnel.
F6 - REF ATTEN (Transmit Deviation Limit Alignment: Reference Softpot)	Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment Reference Attenuator procedure. This procedure should only be attempted by qualified service personnel.
F7 - VCO (TX VCO Crossover Frequency)	This is only available on UHF and VHF radio models. Refer to your Radio Service Manual for the Transmitter Power Alignment procedure. This procedure should only be attempted by qualified service personnel.

Reference Oscillator Alignment

From the MAIN MENU, press **F2** three times to bring up the REFERENCE OSCILLATOR ALIGNMENT screen.



The New Softpot Value is the working value of the reference oscillator (reference frequency). Refer to your Radio Service Manual for the Reference Frequency Alignment procedure.

The reference oscillator is adjusted by first keying the radio by pressing **F6**, and then by pressing the UP/DOWN arrow keys to increase or decrease the frequency respectively. (A three-minute time-out timer is enabled when the radio is keyed by pressing **F6**.) The radio will transmit on the Test Mode 1 frequency. A relative adjusted value will be displayed on the status bar, but the actual transmitter frequency must be determined from the frequency counter or the service monitor.

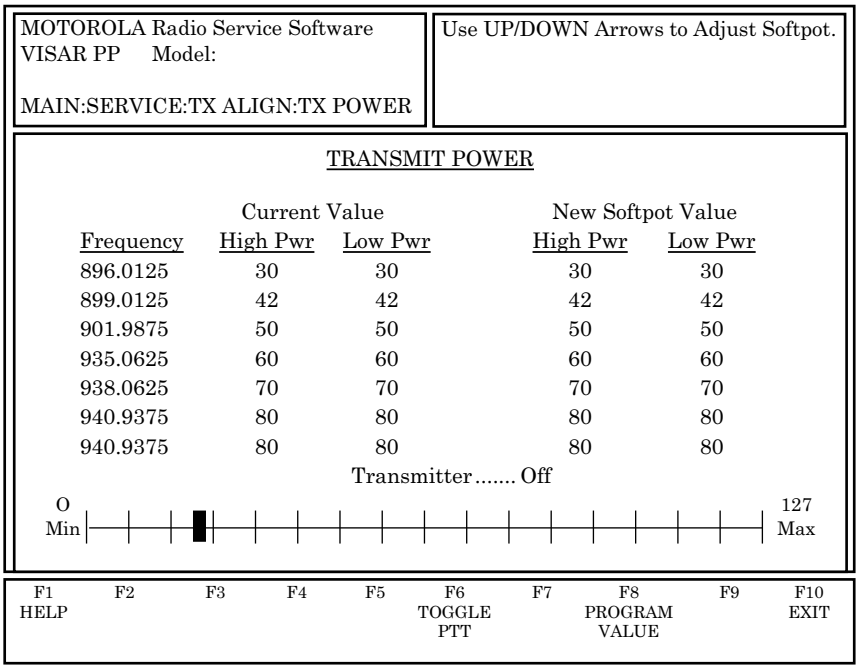
Function Key Descriptions

F6 - TOGGLE PTT — Alternately keys and de-keys the radio being serviced.

F8 - PROGRAM VALUE — Programs the selected value into the radio.

Transmit Power Alignment

From the MAIN MENU, press **F2** twice and then **F3** to access the TRANSMIT POWER ALIGNMENT screen.



Refer to your Radio Service Manual for the Transmitter Power Alignment procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

The adaptive splatter control feature uses the transmitter power settings for reduced transmit power under strong received signal conditions to reduce adjacent-channel interference.

Transmitter power is adjusted by first keying the radio using **F6**, and then by pressing the UP/DOWN arrow keys to increase/decrease power respectively. A relative TX power value will be displayed, but the actual transmitter power output must be determined from the service monitor.

Programming Procedure

1. Press **F6** at the TRANSMIT POWER screen to key up the radio. (The radio's RF output must be terminated into a 50 ohm load).
2. While transmitting, modify the TX power softpot setting with the UP/DOWN arrow keys.
3. Measure the actual RF power with a service monitor.
4. Press **F6** to de-key the radio and **Tab** to move between frequency points.
5. Press **F8** to save the new value.

Function Key Descriptions

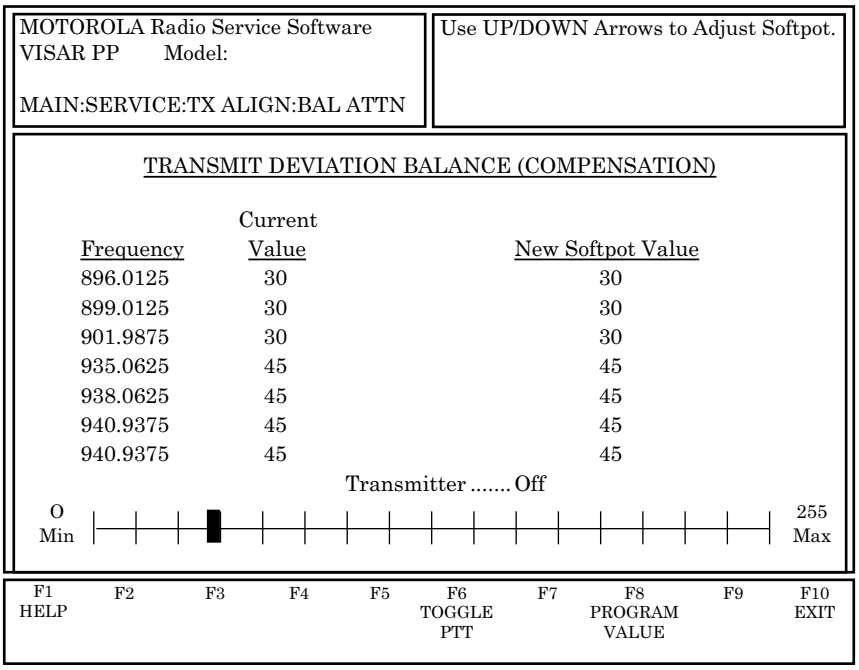
F6 - TOGGLE PTT	Alternately keys and de-keys the radio being serviced.
F8 - PROGRAM VALUE	Programs the selected value into the radio.

Field Definitions

New Softpot Value High Pwr	This is the power High for this frequency. The status bar shows the setting in relation to the minimum and maximum settings.
New Softpot Value Low Pwr	This is the power Low for this frequency. The status bar shows the setting in relation to the minimum and maximum settings.

Transmit Deviation Balance (Compensation) Alignment

From the MAIN MENU, press **F2** twice and then **F4** to access this screen.



Refer to your Radio Service Manual for the Transmit Deviation Balance Alignment (Compensation) procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

This alignment procedure balances the modulation contributions of the low and high frequency portions of a baseband signal. Power alignment is critical to the operation of signalling schemes that have very low frequency components (i.e., DPL) and could result in distorted waveforms if improperly adjusted.

This procedure needs to be performed at multiple frequencies to allow for proper alignment across the entire RF band. The RF band is divided into frequency zones with a calibration point (value) in each zone.

Balanced attenuator alignment balances the modulation sensitivity of the VCO and reference modulation (synthesizer low-frequency port) lines. It is a way of correcting for deviation sensitivity versus RF frequency variations in the VCO. The transmit and receive bands are divided into frequency zones with a calibration point in each zone.

Balanced attenuator alignment is required after replacing (or servicing) the controller board or the RF board. Using the UP/DOWN arrow keys, adjust compensations according to instructions provided in your Radio Service Manual. Performing this procedure automatically calculates compensation alignment.

Function Key Descriptions

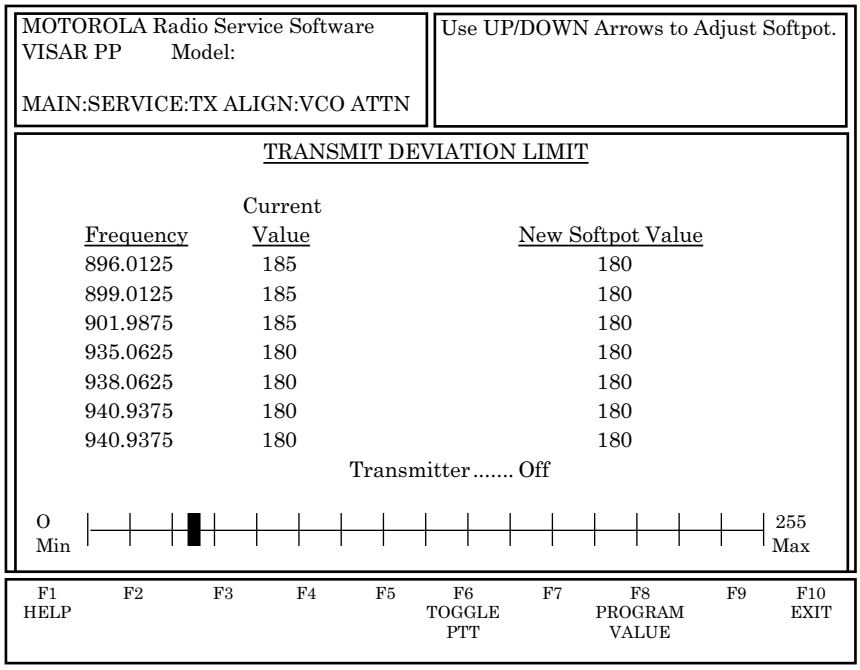
F6 - TOGGLE PTT	Alternately keys and de-keys the radio being serviced.
F8 - PROGRAM VALUE	Programs the selected value into the radio.

Field Definition

New Softpot Value	This is the balance value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Transmit Deviation Limit Alignment

From the MAIN MENU, press **F2** twice and then **F5** to access the TRANSMIT DEVIATION LIMIT screen.



Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

This is the VCO attenuator value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings. The alignment procedure limits the modulation of a baseband signal. It is used primarily for modulation limiting.

This procedure needs to be performed at multiple frequencies to allow for proper alignment across the entire RF band. The RF band is divided into frequency zones and a calibration point (value) for each zone. VCO Attenuator Alignment is required after replacing (or servicing) the controller board or the RF board.

Programming Procedure

1. Press **F6** to key up the radio. (The radio's RF output must be terminated into a 50 ohm load.)
2. Apply the appropriate signal according to instructions provided in your Radio Service Manual. While transmitting, modify the VCO Attenuator setting with the UP/DOWN arrow keys.
3. Measure the actual RF power with a service monitor.
4. Press **F6** to de-key the radio and **Tab** to move between frequency points. Press **F8** to save the new value.

Function Key Descriptions

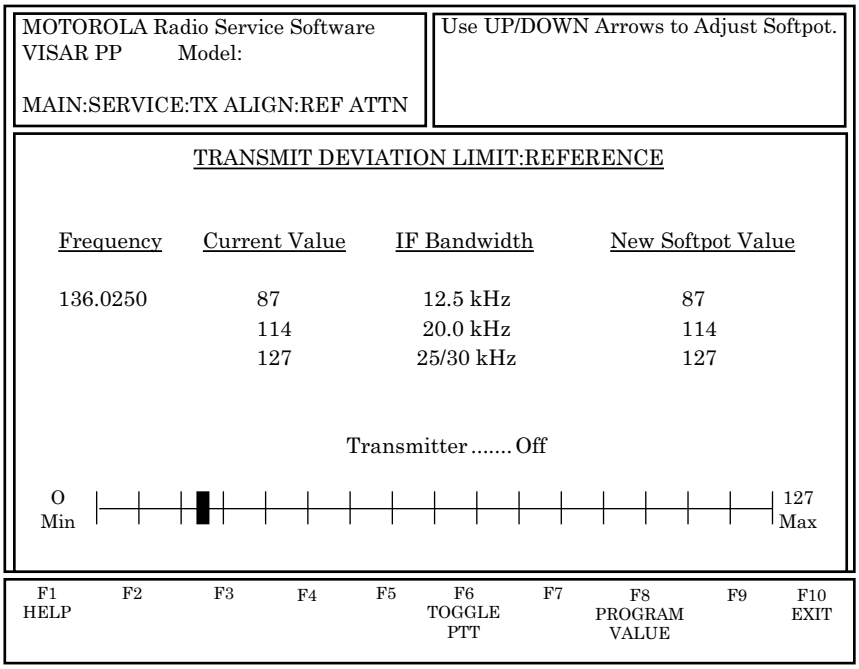
F6 - TOGGLE PTT	Alternately keys and de-keys the radio being serviced.
F8 - PROGRAM VALUE	Programs the selected value into the radio.

Field Definitions

New Softpot Value	This is the VCO softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Transmit Deviation Limit Alignment: Reference

From the MAIN MENU, press **F2** and then **F6** to bring up the TRANSMIT DEVIATION LIMIT ALIGNMENT: REFERENCE SOFTPOT screen.



Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment: Reference Softpot procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

Press **Tab** to select the desired field, or press the desired function key (**F1 - F10**). If a desired field is selected, press the UP/DOWN arrow keys to select the desired choice or value.

Function Key Descriptions

F6 -TOGGLE PTT — Alternately keys and de-keys the radio being serviced.

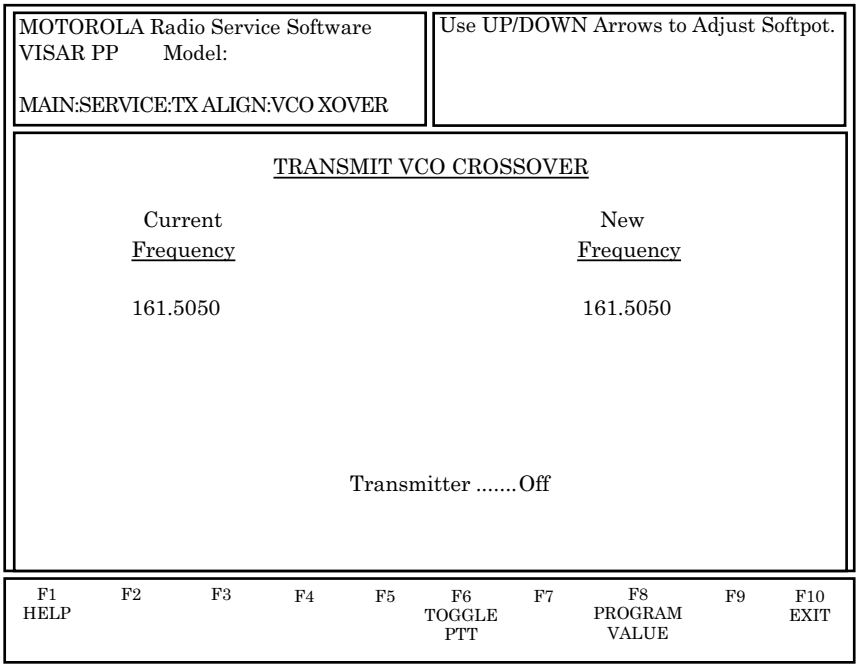
F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the VCO softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Transmit VCO Crossover

From the MAIN MENU, press **F2** twice and then **F7** to access this screen.



Refer to your Radio Service Manual for the VCO Crossover Limit Alignment: Reference Softpot procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

Programming Procedure

1. Press **F6** to key up the radio. (The radio's RF output must be terminated into a 50 ohm load).
2. Measure voltage reading per according to instructions provided in your Radio Service Manual.
3. Adjust softpot until the voltage reading is 3 volts, +/- 0.1 volts.
4. Press **F6** to de-key the radio.
5. Press **F8** to save the new value.

Function Key Descriptions

F6 - TOGGLE PTT — Alternately key and de-key the radio being serviced.

F8 - PROGRAM VALUE — Program the selected value into the radio.

Field Definition

New Softpot Value — This is the VCO softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Receive Alignment Menu

From the MAIN MENU, press **F2** and then **F3** to access this screen.

MOTOROLA Radio Service Software VISAR PP Model: MAIN:SERVICE: RX ALIGN	Select Function F1-F10.

RECEIVER ALIGNMENT MENU

F1 - HELP
F2 - Front End Bandpass Filter
F3 - Rated Audio Calibration
F4 - Squelch Attenuator (12.5 kHz)
F5 - Squelch Attenuator (20 kHz)
F6 - Squelch Attenuator (25/30 kHz)
F7 - Rx VCO Crossover Frequency
F8 -
F9 -
F10 - Exit, Return to Service Menu

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
HELP	FRONT END FILT ALGN	AUDIO	SQUELCH 12.5 KHZ	SQUELCH 20 KHZ	SQUELCH 25/30 KHZ				EXIT

Standard periodic receiver alignment procedures are performed from this menu. Refer to your Radio Service Manual for Receive Alignment procedures.

This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

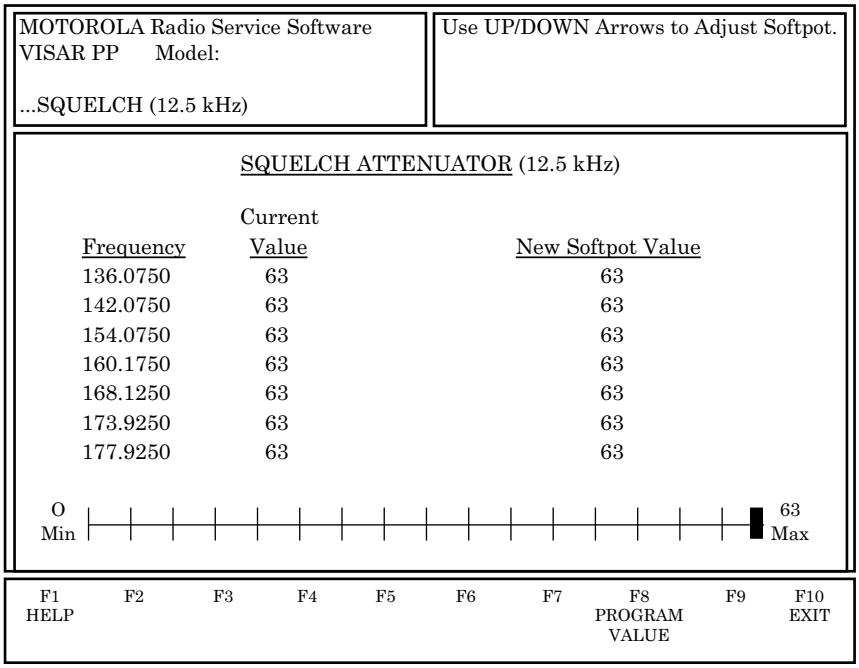
Function Key Descriptions

F2 - F7

Refer to your Radio Service Manual for the Alignment procedures. These procedures should only be attempted by qualified service personnel.

Squelch Attenuator (12.5 kHz) Alignment

From the MAIN MENU, press **F2**, **F3** and then **F4** to access this screen.



This screen allows you to adjust the squelch level for each test mode frequency. Use the UP/DOWN arrows to change the value of the squelch. Use the **Tab** key to move between frequency points.

Programming Procedure

1. Apply the appropriate RF signal to the radio.
2. Modify the Squelch Attenuator setting with the UP/DOWN arrow keys.
3. Press **Tab** to move between frequency points.
4. Press **F8** to save the new value.

Function Key Descriptions

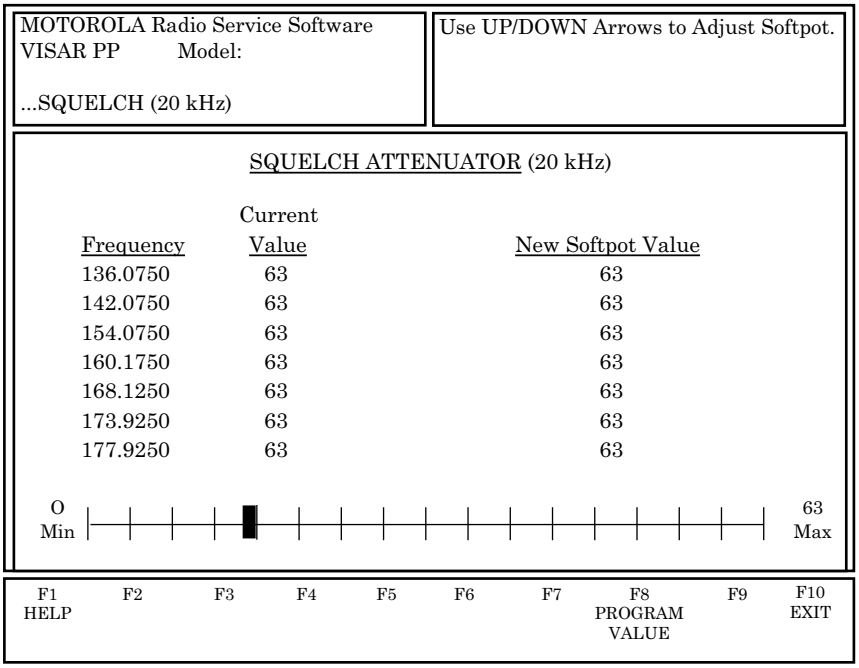
F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the squelch attenuator softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Squelch Attenuator (20 kHz) Alignment

From the MAIN MENU, press **F2**, **F3** and then **F5** to access this screen.



Refer to your Radio Service Manual for the Squelch Alignment procedure.

> **Caution** This procedure should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

The squelch attenuator setting is increased or decreased by pressing the UP/DOWN arrow keys respectively. A relative value between 0 and 63 will be displayed on the screen. Adjust the squelch setting to the desired value.

This screen allows you to adjust the squelch level for each test mode frequency. Use the UP/DOWN arrows to change the value of the squelch. Use the **Tab** key to move between frequency points.

Function Key Description

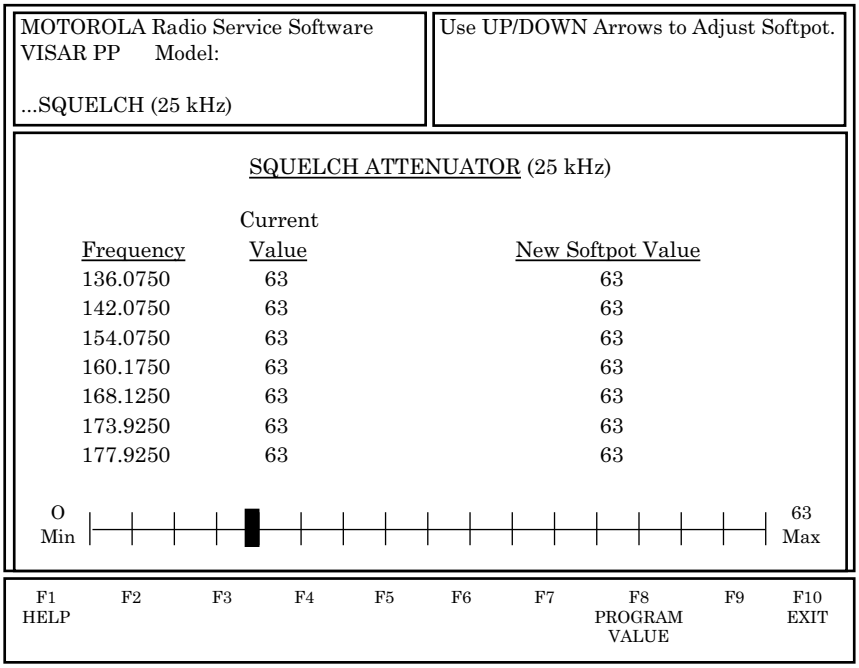
F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the squelch attenuator softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Squelch Attenuator (25/30 kHz) Alignment

From the MAIN MENU, press **F2**, **F3** and then **F6** to access this screen.



Refer to your Radio Service Manual for the Squelch Alignment procedure. This procedure should only be attempted by qualified service personnel.

The squelch attenuator setting is increased or decreased by pressing the UP/DOWN arrow keys respectively. A relative value between 0 and 63 will be displayed on the screen. Adjust the squelch setting to the desired value.

This screen allows you to adjust the squelch level for each test mode frequency. Use the UP/DOWN arrows to change the value of the squelch. Use the **Tab** key to move between frequency points.

Function Key Description

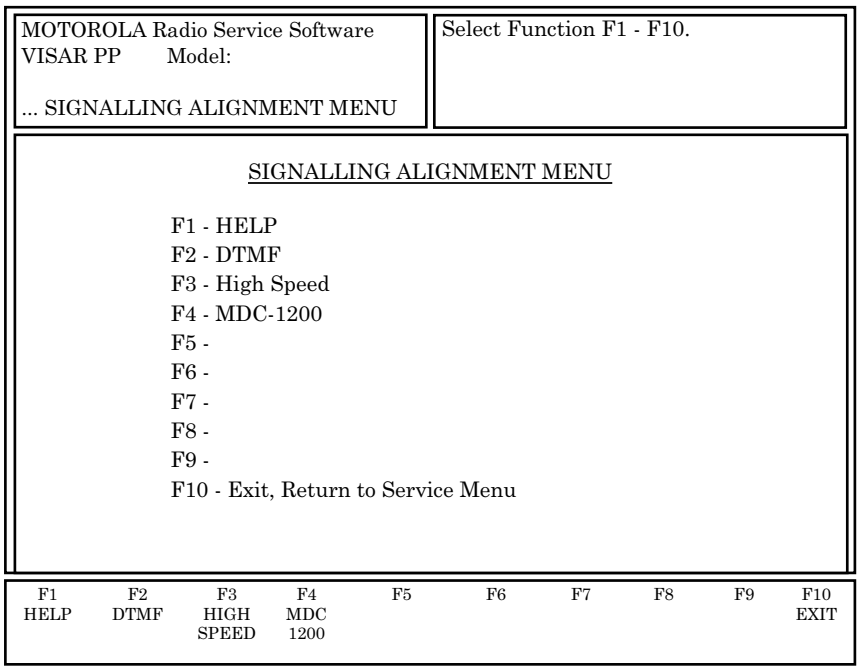
F8 - PROGRAM VALUE — Program the selected value into the radio.

Field Definition

New Softpot Value — This is the squelch attenuator softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Signalling Alignment Menu

From the MAIN MENU, press **F2** and then **F4** to access this screen.



Refer to your Radio Service Manual for the signalling alignment procedure. Signalling deviation should be checked any time the radio is serviced and must be adjusted whenever any of the modulation circuitry has been replaced. All radio compensation/deviation adjustments must be made before adjusting signalling deviation.

Caution

These procedures should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

Function Key Descriptions

F2 - DTMF (DTMF Transmit Deviation Alignment)

Refer to your Radio Service Manual for the DTMF signalling deviation alignment procedure.

F3 - HIGH SPEED (Transmit Deviation Limit Alignment: High-Speed)

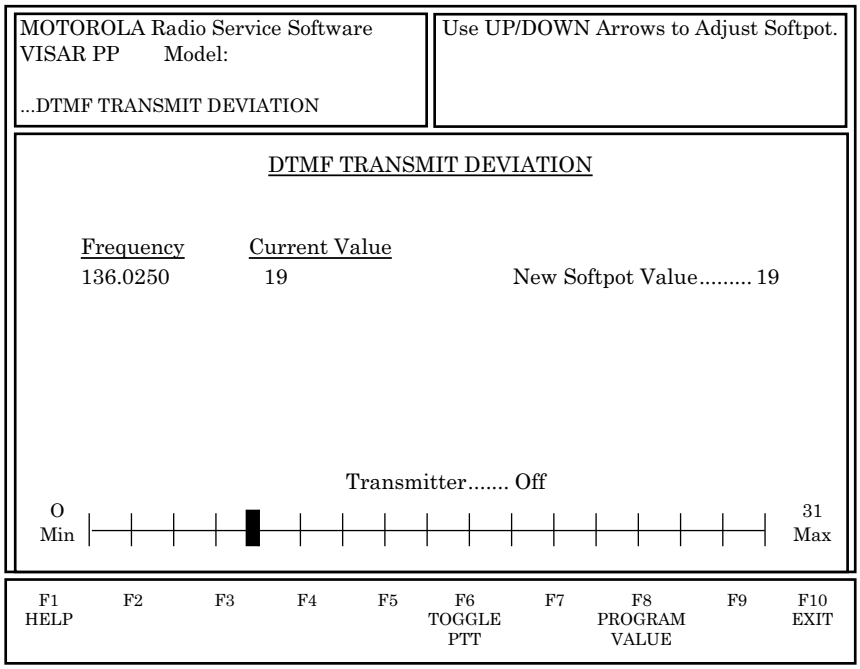
Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment: High Speed procedure.

F4 - MDC-1200 (MDC Signalling Deviation Alignment)

Refer to your Radio Service Manual for the MDC Signalling Deviation Alignment procedure.

DTMF Transmit Deviation

From the MAIN MENU, press **F2**, **F4** and then **F2** to access this screen.



Refer to your Radio Service Manual for the DTMF Signalling Deviation Alignment procedure.

> **Caution** These procedures should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

DTMF deviation should be checked any time the radio is serviced and must be adjusted whenever any of the modulation circuitry has been replaced. All radio compensation/deviation adjustments must be made before adjusting DTMF deviation.

DTMF deviation is increased or decreased by first keying the radio by pressing **F6**, and then by pressing the UP/DOWN arrow keys respectively. A relative deviation value is displayed, but the actual transmitter deviation must be determined from your service monitor. Set your modulation analyzer to read peak deviation.

Function Key Descriptions

F6 - TOGGLE PTT — Alternately keys and de-keys the radio being serviced.

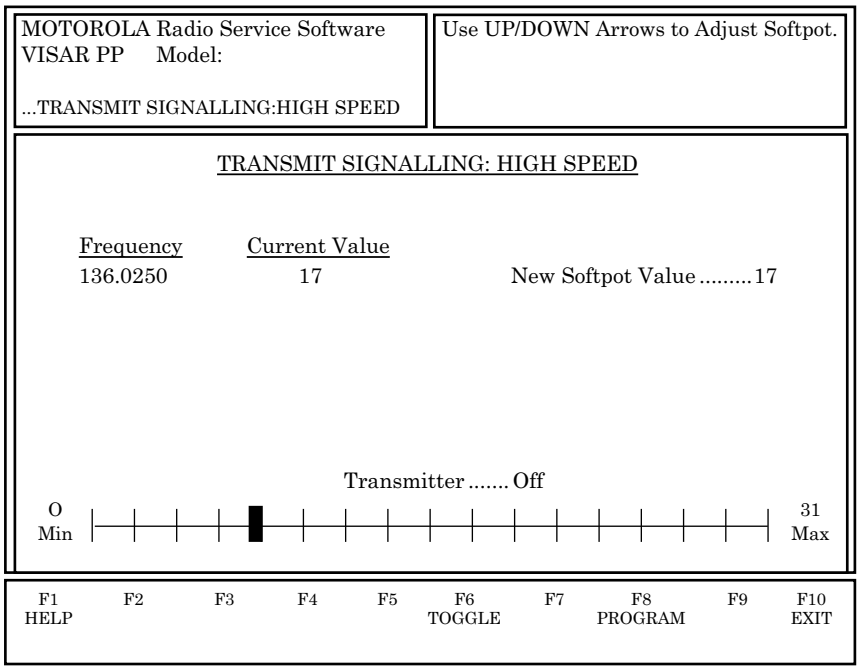
F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the DTMF softpot value. The status bar shows the relationship between this setting and the minimum and maximum settings.

Transmit Signalling: High Speed

From the MAIN MENU, press **F2**, **F4** and then **F3** to access this screen.



Refer to your Radio Service Manual for the Transmit Deviation Limit Alignment: High Speed procedure.

> **Caution** These procedures should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

Function Key Descriptions

F6 - TOGGLE PTT — Alternately keys and de-keys the radio being serviced.

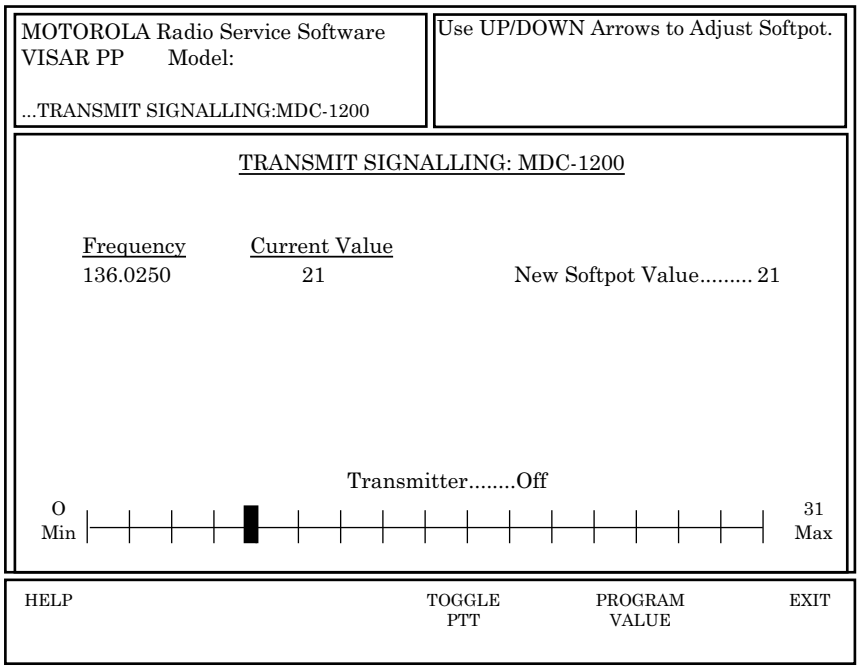
F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the high-speed softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

Transmit Signalling: MDC-1200

From the MAIN MENU, press **F2**, and **F4** twice, to access this screen.



Refer to your Radio Service Manual for the MDC Signalling Deviation Alignment procedure.

> **Caution** These procedures should be attempted only by qualified service personnel. Failure to perform alignment procedures properly may result in seriously degraded radio or system performance.

MDC deviation should be checked any time the radio is serviced and must be adjusted whenever any of the modulation circuitry has been replaced. All radio compensation/deviation adjustments must be made before adjusting MDC deviation.

MDC deviation is increased or decreased by first keying the radio by pressing **F6**, and then by pressing the UP/DOWN arrow keys respectively. A relative deviation value is displayed, but the actual transmitter deviation must be determined from your service monitor. Set your modulation analyzer to read peak deviation.

Function Key Descriptions

F6 - TOGGLE PTT — Alternately keys and de-keys the radio being serviced.

F8 - PROGRAM VALUE — Programs the selected value into the radio.

Field Definition

New Softpot Value — This is the MDC softpot value for this frequency. The status bar shows the relationship between this setting and the minimum and maximum settings.

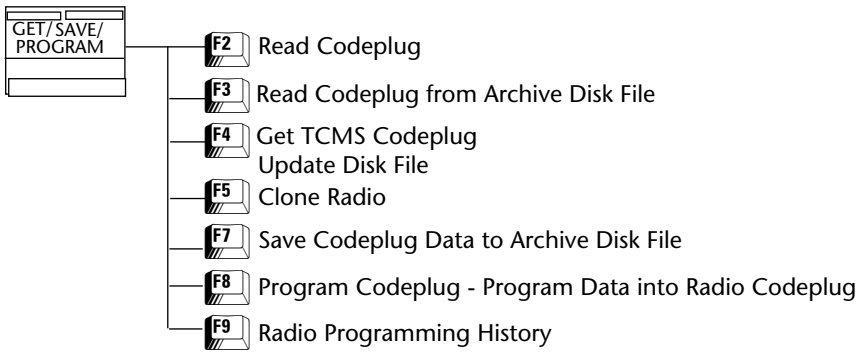
Get/Save/Program Menu Functions

4

This section describes all the functions available from the GET/SAVE/PROGRAM MENU. To guide you through these functions, GET/SAVE/PROGRAM-related menus and screens are shown with their respective programming procedures from the MAIN MENU, function key descriptions and field definitions.

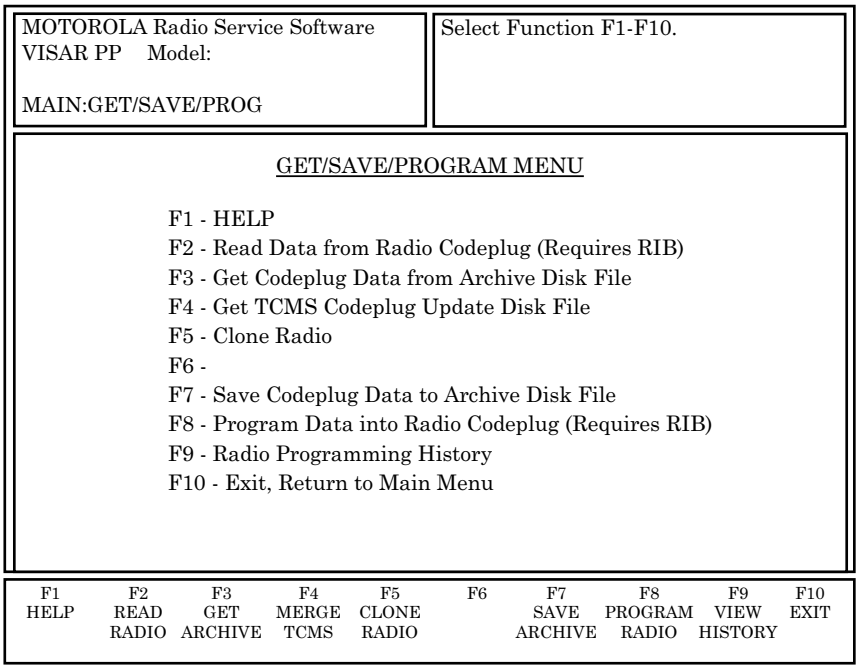
Note: All functions (supported and unsupported) will be displayed in the menu's working area. The unsupported functions (based on the radio's model or options) will NOT be displayed in the F-key ID area.

Menu Map



Get/Save/Program Menu

At the MAIN MENU, press **F3** to bring up this screen.



The GET/SAVE functions are used to transfer codeplug data from your radio or an archive file into your computer so that you can change, view, or print the data. GET/SAVE functions also permit you to PROGRAM modified data back into your radio or to SAVE a copy of the codeplug data in an archive file.

Caution

Do NOT turn off the radio or disconnect it from the computer while attempting to program the codeplug. Interrupting the programming process will destroy the codeplug contents and completely DISABLE the radio!

Function Key Descriptions

F2 - READ RADIO (Read Radio Codeplug)

Reads the information (data) stored in the radio codeplug (EEPROM) and transfers it to the computer's memory. The time required to read a codeplug will depend directly on your computer type and the size of the codeplug you are reading. The status of the READ operation will be displayed at the bottom of the screen. A radio and RIB must be properly connected to the computer and power turned on before you attempt the READ function.

F3 - GET ARCHIVE

Retrieves an archive file from a diskette or hard disk and loads the data into the computer's memory. Once retrieved, the file may be modified using the CHANGE/VIEW functions or programmed into a radio just as codeplug information read from the radio using the **F2** READ RADIO function.

F4 - MERGE TCMS

Updates codeplug information with trunking information from the Trunking Code Management System (TCMS). The required changes must first be entered into the TCMS database through a TCMS terminal and then downloaded using a modem and the TCMS On-Line Filed Programming (OFP) software package.

F5 - CLONE RADIO

Copies codeplug information from one radio to another. Only radios with the same model number may be cloned. The CLONE RADIO screen summarizes the individual ID information for Trunking so that it can be changed conveniently from one screen. Trunked radios may not be cloned unless System Keys have been loaded for each trunking system ID.

F7 - SAVE ARCHIVE

Creates (or updates) an archive copy of the codeplug information onto a diskette or a hard disk. An archive copy of every radio installed or serviced is STRONGLY recommended in order to be able to quickly restore customer information is case of a codeplug failure.

F8 - PROGRAM RADIO

Transfers codeplug information from the computer to the radio codeplug. A radio and RIB must be properly connected to the computer and power turned on before you attempt this function.

The time required to program a codeplug will depend directly on your computer type and the size of the codeplug you are programming. The status of the programming operation is displayed at the bottom of the screen.

F9 - VIEW HISTORY

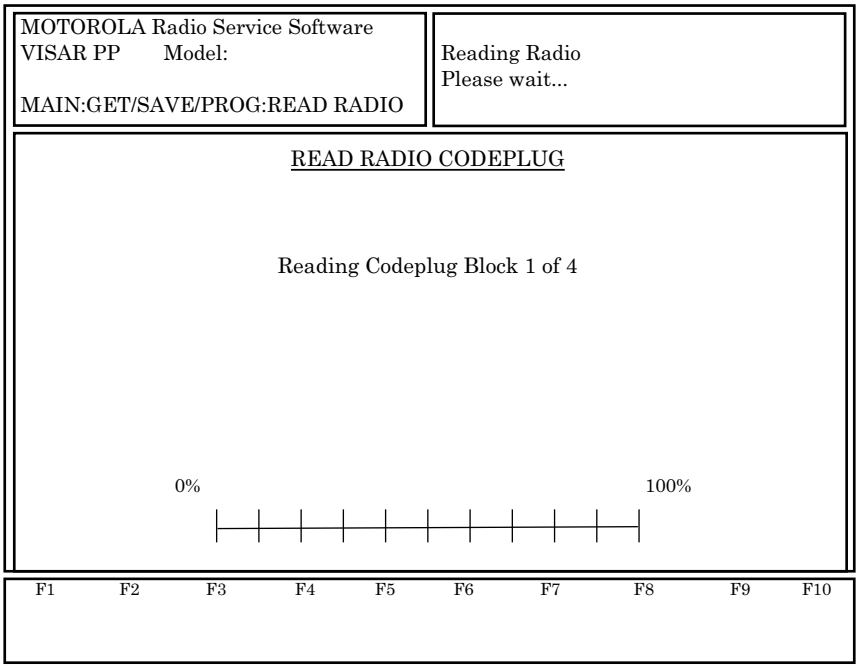
Provides all the information about the last time the radio was programmed. This includes where and when the radio was programmed and if the programming was authorized.

Caution

If software versions of the radio and the current data are not compatible, read the radio codeplug and enter the data again. Trunked data must be downloaded from the Trunking Code Management System (TCMS) by means of a TCMS codeplug update.

Reading Codeplug Data From Radio (Requires RIB)

From the MAIN MENU, press **F3** and then **F2** to access this screen.



Note: You may read the codeplug from the radio or from the archive disk. Refer to the following page for instructions on reading codeplug data from an archive disk. After the codeplug is read, it will be checked for valid serial number, model number, checksums, etc.

Once in the READ RADIO CODEPLUG screen, a series of status messages will appear in the upper right corner of the screen. If a communication error occurs, a pop-up window will be displayed. If no errors occur, the center of the screen will display the progress of the codeplug reading activity. The read process will take approximately one minute. After the codeplug is read, you will automatically be returned to the GET/SAVE/PROGRAM MENU.

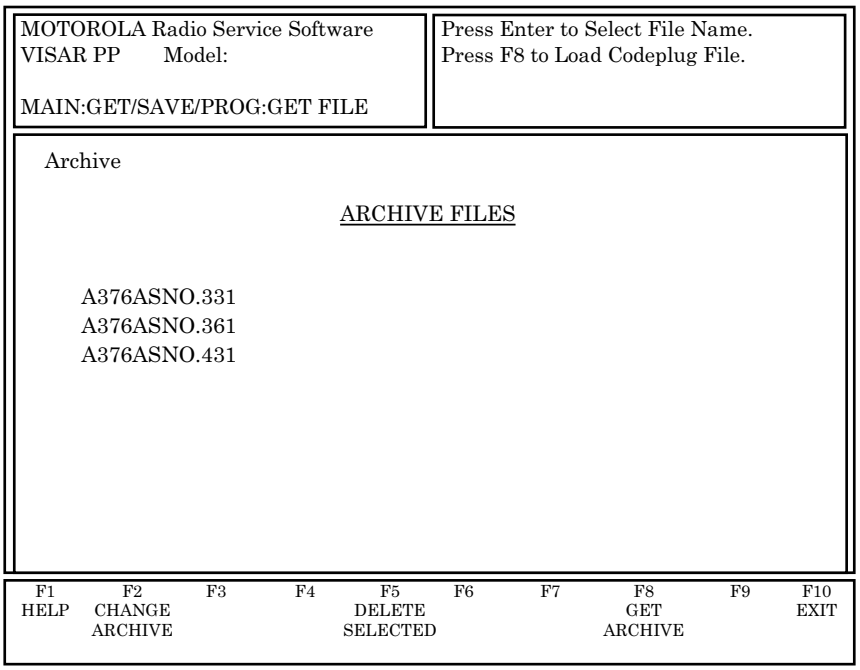
Field Definition

Reading Codeplug Blocks

This is the number of blocks that have been read. The status bar shows the relative value of the number of blocks read so far compared to the total number of blocks to be read.

Get Codeplug Data From Archive File (Requires RIB)

From the MAIN MENU, press **F3** twice to access this screen.



The GET ARCHIVE function is used to retrieve an archive file from a diskette or hard disk. Once retrieved, the file may be modified using the CHANGE/VIEW functions or programmed into a radio.

Press **Tab** to select the serial number of the radio to be retrieved. The **F8** function key is used to retrieve the selected file as described below.

Function Key Descriptions

F2 - CHANGE ARCHIVE

Used to specify the directory path where the archive file is to be located. The default archive path will always be the specified default path from the SETUP CONFIGURATION MENU (**F9** from the MAIN MENU).

F5 - DELETE SELECTED

Allows you to delete the selected archive file.

F8 - GET ARCHIVE

Used to get the archive file highlighted on the screen.

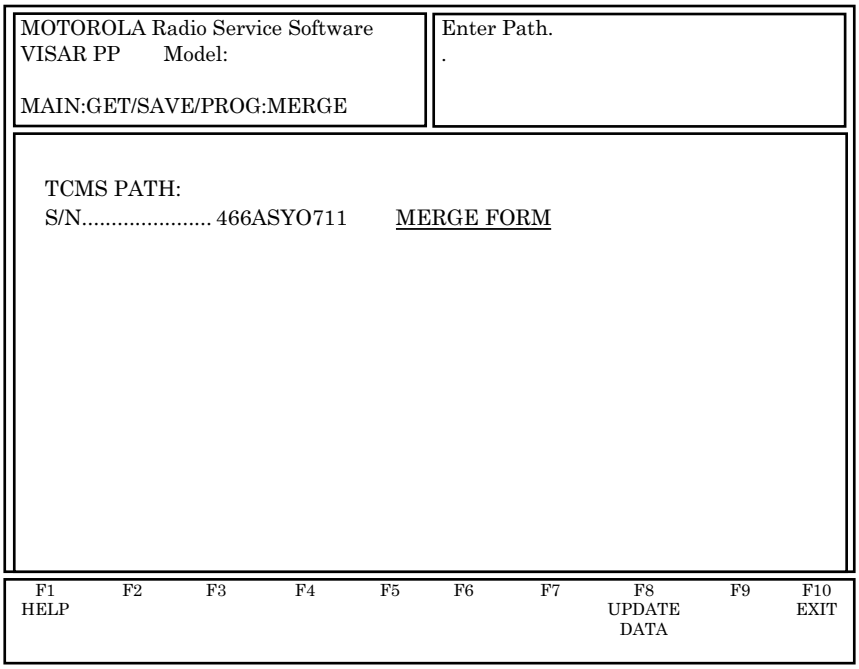
Field Definition

Archive File Name

This is the DOS name of the file which contains the data for the codeplug. Refer to your the owner's manual that came with your computer for a complete description of DOS file names.

Get TCMS Codeplug Data From Archive Disk File

From the MAIN MENU, press **F3** and then **F4** to bring up this screen.



This function is used to update codeplug information with trunking information from the TCMS (Trunking Code Management System).

The required changes must first be entered into the TCMS database through a TCMS terminal, and then downloaded using a modem and the TCMS On-Line Field Programming (OFP) software package.

Function Key Descriptions

F8 - UPDATE DATA

Updates codeplug information with trunking information from the TCMS (merges the TCMS data for the selected serial number).

Field Definition

TCMS Path

Enter the directory path for the directory which contains the TCMS Merge files. The default archive path will always be the specified default from the SETUP CONFIGURATION MENU (**F9** from the MAIN MENU).

TCMS Merge Procedure

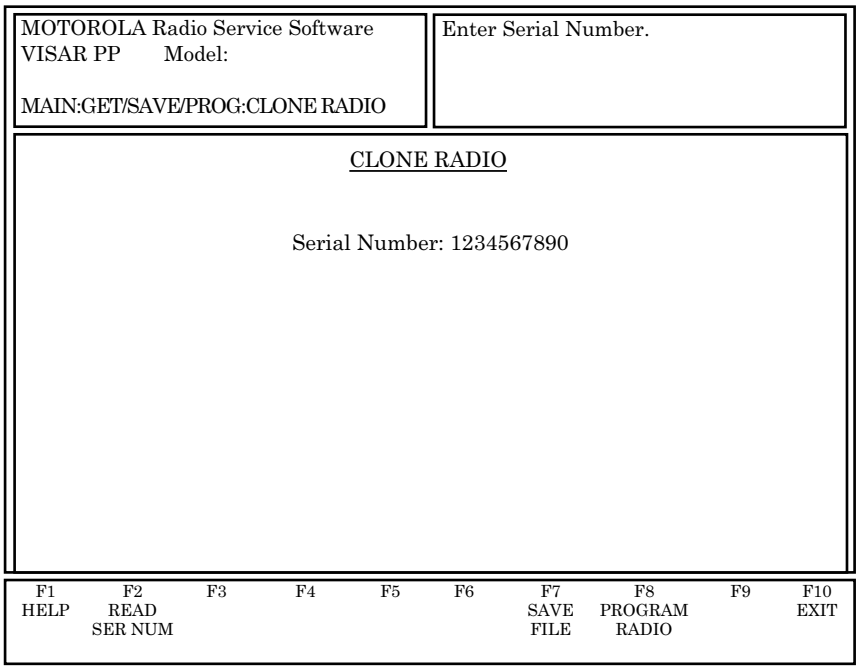
1. Enter the change in the TCMS database.
2. Download a DOS file with this new trunking information. (Refer to the TCMS On-Line Field Programming or OFP software package).
3. Use the GET/SAVE functions to read the radio codeplug or get the archive file for the radio to be updated.
4. Access the MERGE TCMS screen and press **F8** to update the codeplug information.

If an “Overload of Maximum Systems/Personalities” error is observed during the merge process, follow this procedure:

1. READ & ARCHIVE existing radio personality.
2. DELETE all systems and personalities until only one system/ personality exists in the radio.
3. Press **F4** to GET TCMS data.
4. Press **F8** UPDATE DATA. If you attempt to overload systems at this time, an “additional insert not allowed” error message will appear on the screen. In such a case, ignore the warning and continue.
5. Press **F10** twice to exit.
6. Press **F4** to enter the CHANGE/VIEW screen.
7. Press **F4** to enter the TRUNKING SYSTEMS screen and press **F3**. Only the systems are merged.
8. Scroll to SYSTEM #1 and delete by pressing **F5**.
9. Confirm that the system is deleted by pressing **F2**. Press **F10** three times to exit.
10. Press **F3** to enter the GET/SAVE MENU and press **F4** to get TCMS data.
11. Find the correct serial number and press **F8** to UPDATE DATA. Press **F10** twice to exit.
12. Press **F4** to bring up the CHANGE/VIEW screen. Press **F4** again to enter the TRUNKING MENU and press **F4** once more to enter the TRUNKING PERSONALITY screen.
13. Scroll to PERSONALITY #1 and press **F5** to delete that personality.
14. Press **F2** to confirm that the personality has been deleted and press **F10** twice.
15. Press **F8** to bring up the ZONE/CHANNEL screen. Verify that all channels point to their proper places.
16. Press **F10** twice to exit.
17. Press **F3** to enter the GET/SAVE MENU and press **F7** to save archive data and confirm the correct Archive Path.
18. Press **F8** to save archive and **F10** to exit.
19. Press **F8** to program data into the target radio. This will complete the over-writing process.

Clone Radio

From the MAIN MENU, press **F3** and then **F5** to access this screen.



The CLONE radio function is used to copy codeplug information from one radio to another. Only radios with the same serial number may be cloned. Trunked radios may not be cloned unless a System Key has been loaded for each trunking system ID.

Programming Procedure

1. Press **F2** to read the radio codeplug to be cloned, i.e., the "source" codeplug. An archive file may be used as the "source" codeplug.
2. If required, enter the trunking IDs for the new radio. Trunking System keys (or FTR Key) are required to clone trunked radios.
3. Connect the "target" radio to the computer. Press **F8** to program the source codeplug into the target radio. An archive file for the target radio may also be created using the **F7** key.

Function Key Descriptions

F2 - READ SER NUM (Read serial number)

Allows you to read the serial number/codeplug data of the "source" radio or an archive file being used as a "source".

F7 - SAVE FILE

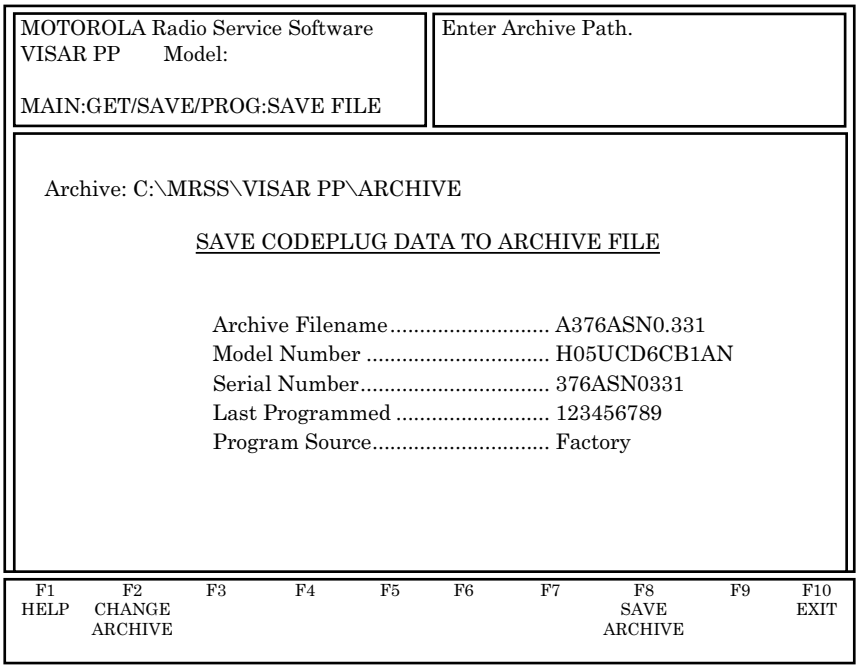
Saves the codeplug data.

F8 - PROGRAM RADIO

Programs the "source" radio using saved codeplug data.

Saving Codeplug Data to an Archive File

From the MAIN MENU, press **F3** and then **F7** to access this screen.



The SAVE ARCHIVE function is used to create (or update) an archive copy of the codeplug information onto a diskette or hard disk.

> **Note:** You are STRONGLY encouraged to make an archive copy of every radio installed or serviced in order to be able to quickly restore customer information in case of a codeplug failure.

Function Key Descriptions

F2 - CHANGE ARCHIVE

Used to specify the directory path where the archive file is to be located. The default archive path will always be the specified default path from the SERVICE SOFTWARE CONFIGURATION screen (**F9** from the MAIN MENU).

F8 - SAVE ARCHIVE

Saves the archive file to the path specified (or to the default path if no path is specified). Do NOT press **F8** until you have entered the customer identification information.

Field Definitions

Archive File Name

This is the DOS name of the archive file. The standard DOS file naming convention must be used, i.e., one- to eight- character alphanumeric name appended with a one- to three-character alphanumeric extension (xxxxxxxx.yyy). This must be no more than eight characters with a three-character extension. The archive file name may be changed if an alternative radio tracking method is to be used.

Model Number

This is the radio model number stored in the codeplug.

Serial Number

This is the radio serial number stored in the codeplug.

Last Programmed

This is the time and date the radio was last programmed.

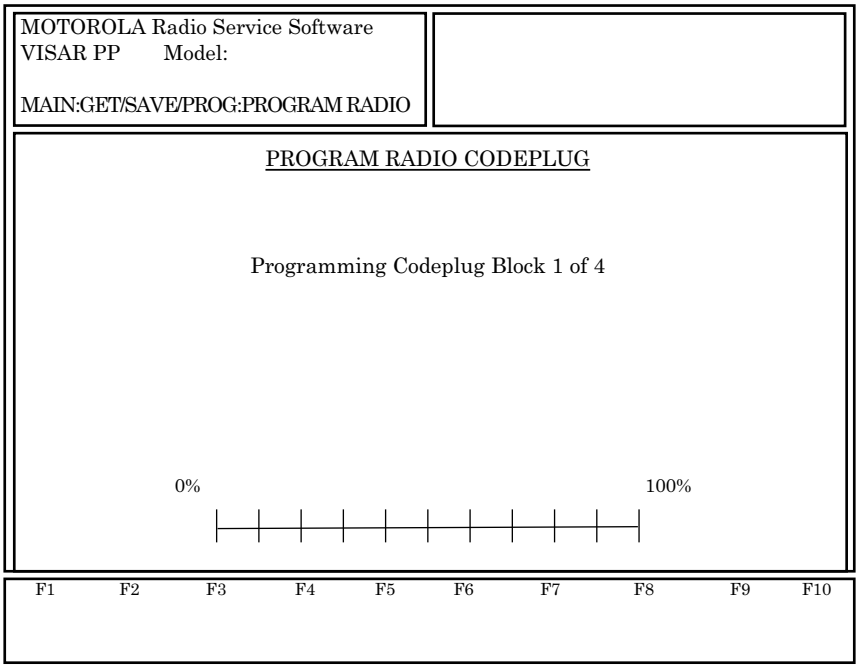
Program Source

This field describes the source of the most recent codeplug programming:

RSS	Programmed by a standard RSS.
Factory	Programmed in the factory.
Lab	Programmed using a special development RSS.
FTR Key	Programmed using a FTR System key.

Programming the Radio's Codeplug (Requires RIB)

From the MAIN MENU, press **F3** and then **F8** to bring up this screen.



This screen allows you to program the radio. A radio interface box (RIB) is required to perform this operation.

General Programming Steps

Trunking Radios

If you do not have the necessary System Key files and are programming a radio, the serial number of the attached radio must be identical to the one in the serial number field on the RSS and the PROGRAMMING HISTORY screen. If the serial numbers are different, programming will be aborted. To program this radio, you must first read the radio using the **F2** READ RADIO function.

A radio and RIB must be properly connected to the computer and the power turned on, before any attempt is made to program the radio's codeplug.

Perform the following steps if TCMS is used:

1. Press **F2** to read radio codeplug on GET/SAVE/PROGRAM screen.
2. Press **F4** to view the GET TCMS CODEPLUG UPDATE screen.
3. Press **F8** to merge data.
4. Press **Esc** to return to the MAIN MENU.
5. Press **F4** to bring up the CHANGE/VIEW MENU.
6. Press **F3** on the CHANGE/VIEW MENU to access the RADIO WIDE CONFIGURATION MENU and press the desired function key.
7. When the desired selections in each field have been made, press **F10** to return to the CHANGE/VIEW MENU.

8. Press **F8** to access the ZONE/CHANNEL ASSIGNMENT screen and make the desired selections.
9. Press **Esc** to return to the MAIN MENU. Press **F3** to access the GET/SAVE MENU.
10. Press **F8** to program the radio codeplug.

Perform the following steps if TCMS is NOT used:

1. Press **F2** to read radio codeplug on GET/SAVE/PROGRAM screen.
2. Press **F10** to enter the MAIN MENU.
3. Press **F4** to enter the CHANGE/VIEW MENU.
4. Press **F4/F3** to bring up the TRUNKING SYSTEM screen. Press the UP/DOWN arrow keys to select the desired system.
5. Press **F10** to return to the TRUNKING MENU.
6. Press **F4** to enter the TRUNKING PERSONALITY screen. Press **Enter** or **Scroll** to select the desired system.
7. Press **F10** twice to return to the CHANGE/VIEW MENU.
8. Press **F8** to enter the ZONE/CHANNEL ASSIGNMENT screen and make desired selections.
9. Press **Esc** to return to the MAIN MENU.
10. Press **F3** to view the GET/SAVE MENU.
11. Press **F8** to program the radio codeplug.

The time required to PROGRAM a codeplug will depend directly on your computer type and the size of the codeplug being programmed. The status of the programming operation will be displayed on the screen.

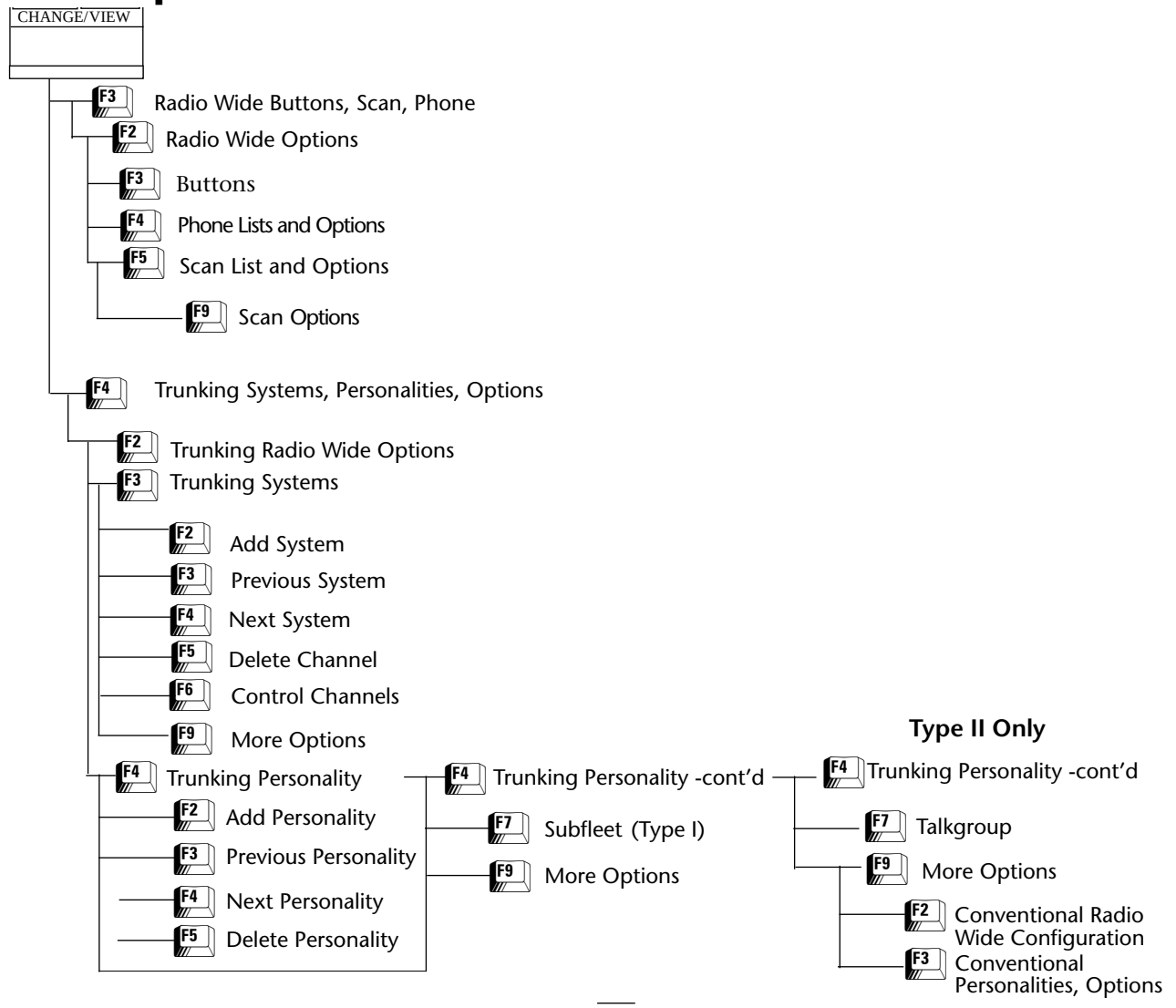
Change/View Menu Functions

5

This section describes all the functions available from the CHANGE/VIEW MENU. To guide you through these functions, CHANGE/VIEW-related menus and screens are shown with their respective RSS locations from the MAIN MENU, function key descriptions, and field definitions.

Note: All functions (supported and unsupported) will be displayed in the menu's working area. The unsupported functions (based on the radio's model or options) will NOT be displayed in the F-key ID area.

Menu Map



Change/View Menu

Press **F4** at the MAIN MENU to access the CHANGE/VIEW MENU.

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW

Select Function F1 - F10.

CHANGE/VIEW MENU

F1 - HELP
F2 -
F3 - Radio Wide Buttons, Scan, Phone
F4 - Trunking Systems, Personalities, Options
F5 -
F6 - Conventional Systems, Personalities, Options
F7 -
F8 - Zone/Channel Assignment
F9 -
F10 - Exit, Return to Main Menu

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
HELP		RADIO CONFIG	TRUNK DATA		CONV DATA		ZONE/CHN ASSIGN		EXIT

The CHANGE/VIEW MENU is a multi-level menu that is used to change, view, or modify codeplug features and option configurations. The CHANGE/VIEW MENU functions permit access to each category. Unlike the SERVICE MENU functions, a codeplug must be loaded into your computer's memory (using GET/SAVE/PROGRAM MENU functions) before you can access the CHANGE/VIEW screens. You may change or view an archive file without having a radio connected.

> **Note:** If your radio model does not contain a specific feature, you will not be permitted to access the corresponding data field or screen for that feature. Refer to your radio catalog sheets or Radio Service Manual for radio model descriptions and features.

After all change/view modifications are completed, you MUST return to the GET/SAVE/PROGRAM MENU and program the changes back into the radio or save them to a new archive file. Otherwise, the modifications will be lost when you turn off your computer or load another codeplug into memory.

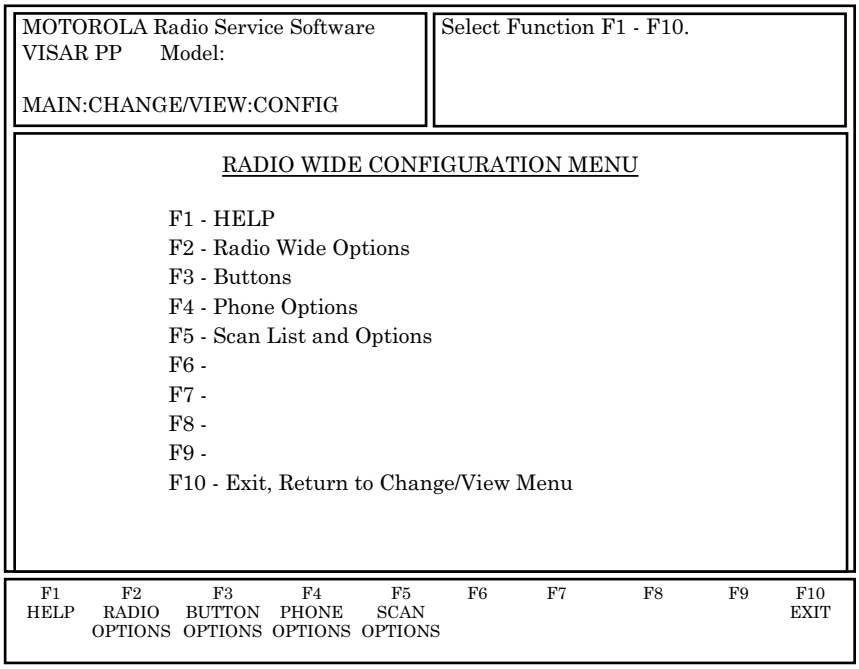
> **Note:** The CHANGE VIEW MENU does NOT actually modify the radio's codeplug data. Instead, it modifies a copy of the data retrieved from the codeplug or archive file via the GET/SAVE/PROGRAM MENU functions.

Function Key Descriptions

F3 - RADIO CONFIG (Radio Configuration)	Used to change or view radio parameters and options that affect overall radio operation such as button settings.
F4 - TRUNK DATA (Trunking Data Configuration)	A multi-level menu used to change or view trunking-only personalities, systems, etc. Most personality and system data must be changed via the TCMS (trunking code management system) and can only be viewed.
F6 - CONV DATA (Conventional Data Configuration)	Used to change/view Conventional-only personalities and Conventional Wide Options. This function key will not be valid for Trunked-only models.
F8 - ZONE/CHN ASSIGN (Zone/Channel Assignment)	Used to assign a group of channels (or talkgroups) to a particular zone based on some common characteristic such as geographic location, job function, signalling type, etc.

Radio Wide Configuration Menu

From the MAIN MENU, press **F4** and then **F3** to access this menu.



The RADIO WIDE CONFIGURATION MENU may be used to further customize your radio for specific applications. Parameters and options that affect both trunking and conventional operations are adjusted using functions available in this screen. Typically, when you start editing a codeplug, you should access this menu and configure the radio wide options first by working your way through the sub-menus of this menu. This will allow the options on other screens to reflect radio-wide options. Fields for unsupported options will not be visible.

Function Key Descriptions

F2 - RADIO OPTIONS — Allows you to edit general options that affect the radio as a whole. The options include LEDs, self test, etc.

F3 - BUTTON OPTIONS — Used to configure the radio hardware controls.

F4 - PHONE OPTIONS — Allows you to edit phone information for the radio. (This screen is accessible only if the radio supports this feature).

F5 - SCAN OPTIONS — Allows you to enable scan and modify radio-wide scan parameters. (This screen is accessible only if the radio supports this feature).

Radio Wide Options

From the MAIN MENU, press **F4**, **F3** and then **F2** to access this screen.

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW:CONFIG: RADIO OPTIONS

USE UP/DOWN Arrows to Select Choice.

RADIO WIDE OPTIONS

Self Test Alert Tone	Enabled
Self Test LED	Enabled
Low Battery	
Tx Chirp	Enabled
Rx Chirp	Enabled
Alert Interval (sec).....	120
LED	Enabled
Light Button Alert.....	Enabled
Auto-Backlight.....	Enabled
Backlight Timer (sec)	4.800
Display Flip	Enabled
Channel Control Lock	Disabled
Flip/Lock Delay (ms)	1200
Flip/Lock Alert	Enabled
Channel Wrap Around.....	Enabled
Wrap Around Alert	Enabled
Channel Control Alert	Enabled
Slow Scroll Delay (ms)	475
Fast Scroll Delay (ms).....	150
Scroll Change Time (ms).....	750
Numeric Channel Display ...	Disabled
Mode Numbering.....	Enabled

F1 HELP F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

This screen allows you to set up various options that affect radio-wide operation. The options on this screen should be correctly edited and verified before proceeding to edit personality data.

Press **Tab** to select the desired field, or press the desired function key (**F1 - F10**). If a field is selected, press the UP/DOWN arrow keys to select the desired choice or value.

Field Definitions

Self-Test Alert Tone

When enabled, an alert tone beep will sound each time the radio is turned on and the self-test is completed. The factory default is Enabled.

Self-Test LED

Use the UP/DOWN arrow keys to enable the power-up Self-Test LED. If enabled, the green LED will light during the power-up Self-Test each time the radio is turned on. The factory default is Enabled.

Low Battery TX Chirp

Use the UP/DOWN arrow keys to enable the Transmit Low Battery Alert Tone. When a low battery condition is detected during transmit, the radio will sound a chirp tone immediately after the PTT switch is released. The factory default is Enabled.

Low Battery RX Chirp

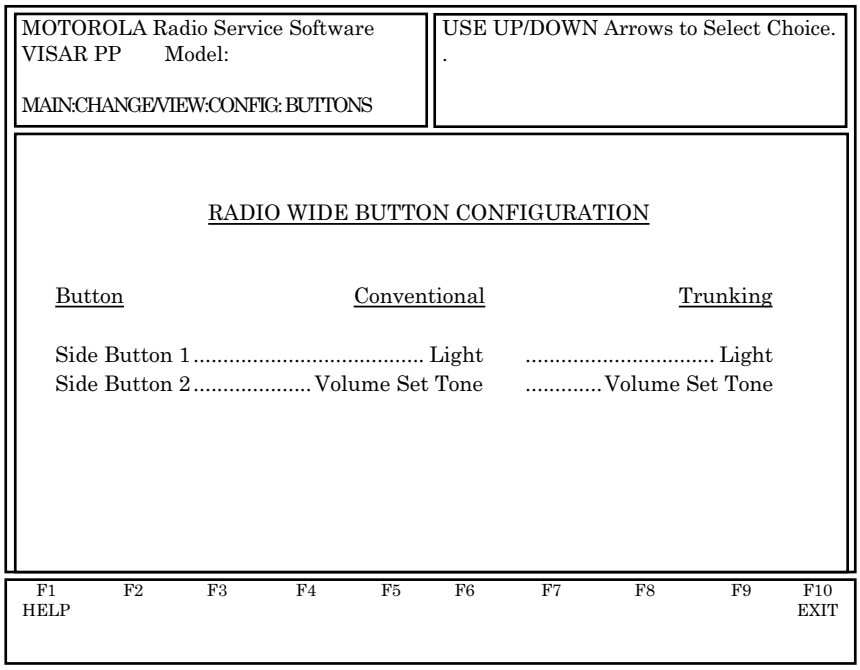
Use the UP/DOWN arrow keys to enable/disable the Receive Mode Low Battery Alert Tone. The radio will sound a chirp tone at intervals determined by the Low Battery Alert Interval. Selecting Disabled will prevent the radio from sounding alarms when the radio is idle. However, the Low Battery Alert Tone will still sound during transmit if the Low Battery TX Chirp is enabled. The factory default is Enabled.

Low Battery Alert Interval (sec)	Use the UP/DOWN arrow keys to select the Low Battery Alert Tone interval. Valid entries are from 5 to 640 seconds in five-second increments. The factory default is 120 seconds.
Low Battery LED	Use the UP/DOWN arrow keys to enable a visual indication of low battery during transmit. If enabled, the red TX LED will flash when a low battery condition is detected and the radio is transmitting. The factory default is Enabled.
Light Button Alert	Use the UP/DOWN arrow keys to enable/disable the Light Button Alert option. When enabled, this will cause the radio to sound a beep when the light button is pressed. The factory default is Enabled.
Auto-backlight	Use the UP/DOWN arrow keys to enable the Auto Light option. When enabled, this option causes the display to light up each time a button or key is pressed (except for PTT). How long the backlight will stay lit depends on the Backlight Timer setting. The factory default is Enabled.
Backlight Timer	This is the amount of time the display backlight will automatically stay on once it has been turned on. The factory default is 4.8 seconds.
Display Flip	When enabled, the text on the top display may be flipped so it can be read from the front or the back. This is accomplished by pressing both channel controls simultaneously. The radio user is able to read the display while the radio is attached using the belt clip. This function is mutually exclusive of Channel Control Lock. The factory default is Enabled.
Channel Control Lock	Use the UP/DOWN arrow keys to enable the ability to lock the current Zone/Channel setting by holding down both Channel Controls simultaneously. This function is mutually exclusive with Display Flip. The factory default is Disabled.
Flip/Lock Delay (ms)	Use the UP/DOWN arrow keys to set the Flip/Lock Delay. Valid entries are from 100 to 6375 ms in 25-ms increments. This is the time delay between the moment that the user presses both buttons until the time that action is taken. The action may be to flip the display or to lock the channel. The factory default is 1200 ms.
Flip/Lock Alert	Use the UP/DOWN arrow keys to enable/disable the Flip/Lock Alert feature. When this feature is enabled, an alert tone will sound whenever the Channel Lock or Display Flip function is engaged or disengaged. The factory default is Enabled.
Channel Wraparound	Use the UP/DOWN arrow keys to enable the Channel Wraparound function. When this field is set to enabled, the Zone/Channel setting is allowed to wrap around from the last entry in the table to the first entry (moving forward) or from the first entry to the last entry (moving backward), as the Channel Controls are used. The factory default is Enabled.
Wraparound Alert	When this feature is enabled, the radio will “chirp” when wrapping to the beginning. The factory default is Enabled.
Channel Control Alert	When this feature is enabled, a “chirp” will sound whenever the UP/DOWN channel selector is pressed. The factory default is Enabled.

Slow Scroll Delay (ms)	Use the UP/DOWN arrow keys to select the Slow Scroll Delay. Valid entries are from 100 to 6375 ms in 25-ms increments. The Slow Scroll Delay should be greater than or equal to Fast Scroll Delay but less than or equal to 6375 (75 <= Fast Scroll Delay <= Slow Scroll Delay <= 6375) This is the time delay before moving to the next item in the list during Slow scroll. The radio will first Slow scroll, then it will Fast scroll after the Scroll-Change Timer expires. The factory default is 475 ms.
Fast Scroll Delay (ms)	Use the UP/DOWN arrow keys to select the Fast Scroll Delay. Valid entries are from 75 to 6375 ms in 25-ms increments. The Fast Scroll Delay should be greater than or equal to 75 but less than or equal to Slow Scroll Delay (i.e. 75 <= Fast Scroll Delay <= Slow Scroll Delay <= 6375). This is the time delay before moving to the next item in the list during Fast scroll. The radio will first Slow scroll and then Fast scroll after the Scroll Change Timer expires. The factory default is 150 ms.
Scroll Change Time (ms)	Use the UP/DOWN arrow keys to select the Scroll Change Time. Valid entries are from 250 to 6375 ms in 25-ms increments. This is the time it takes to change from Slow Scroll to Fast Scroll. The factory default is 750 ms.
Numeric Channel Display	Use the UP/DOWN arrow keys to enable/disable the Numeric Channel Display option. When enabled, the channel display will take on these values: 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G. When disabled, the channel display will take on these values: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P. The factory default is Disabled.
Mode Numbering	Use the UP/DOWN arrow keys to enable/disable the Mode Numbering option. This field is significant only if the radio software looks for the UP/DOWN button and writes to the display. When enabled, the display will show the current Zone and Channel numbers and scroll through each channel in the current Zone before moving into the next Zone. When disabled, the Zone will be displayed in one digit and the channel in the second digit as before. However, the buttons will behave differently. One button will scroll the Zone number and the other the Channel number. The factory default is Enabled.

Radio Wide Button Configuration

At the MAIN MENU, press **F4** and then **F3** twice to access this screen.



This screen allows you to modify the function performed by the radio control buttons, which include the two buttons on the side of the radio. The buttons may be defined as separate functions for conventional and trunking operation (if the model being programmed supports both conventional and trunking) but commonality is strongly urged for shared features such as Light or Phone.

Press **Tab** to select the desired field, or press the desired function key (**F1 - F10**). If a field is selected, press the UP/DOWN arrow keys to select choice or value.

Depending on your radio version and model number, you will be able to choose from all or some of the functions listed below.

Caution

Do NOT duplicate a function on multiple buttons. This may cause the radio to malfunction, and may confuse the operator.

Field Definitions (Conventional Buttons)

Use the UP/DOWN arrow keys to select the function of each button for conventional operation. Depending on your radio version and model number, you will be able to choose from all or some of the functions listed below.

Unprogrammed	No function assigned. A bad key chirp tone will sound.
Blank	No function assigned.
Volume Set Tone	Generates a tone for the duration of the press. Use the volume control knob to adjust the setting.
/Light	Turns on the display backlight.
Scan	Enables/Disables Scan. For the radio to function properly, this feature must be enabled on the CONVENTIONAL PERSONALITY **(F4/F6/F3)** screen.
Scan Program	A short button press Enables/Disables Scan. A long button press will Enable/Disable Scan Program mode. For the radio to function properly, this feature must also be enabled on the SCAN OPTIONS screen **(F4/F3/F5/F9)**.
Nuisance Delete	Removes the current active channel from the scan list. For the radio to function properly, this feature must also be enabled on the SCAN OPTIONS screen **(F4/F3/F5/F9)**.
Monitor	Radio will unsquelch when the button is pressed, allowing you to listen to activity on the channel.
Scan List Edit	When in Scan Program Mode, the button will be used to add or remove Zone/Channels from the Scan List. When not in Scan Program Mode, the button will be used according to its corresponding function. For the radio to function properly, this feature must also be enabled on the SCAN OPTIONS screen **(F4/F3/F5/F9)**.

Field Definitions (Trunking Buttons)

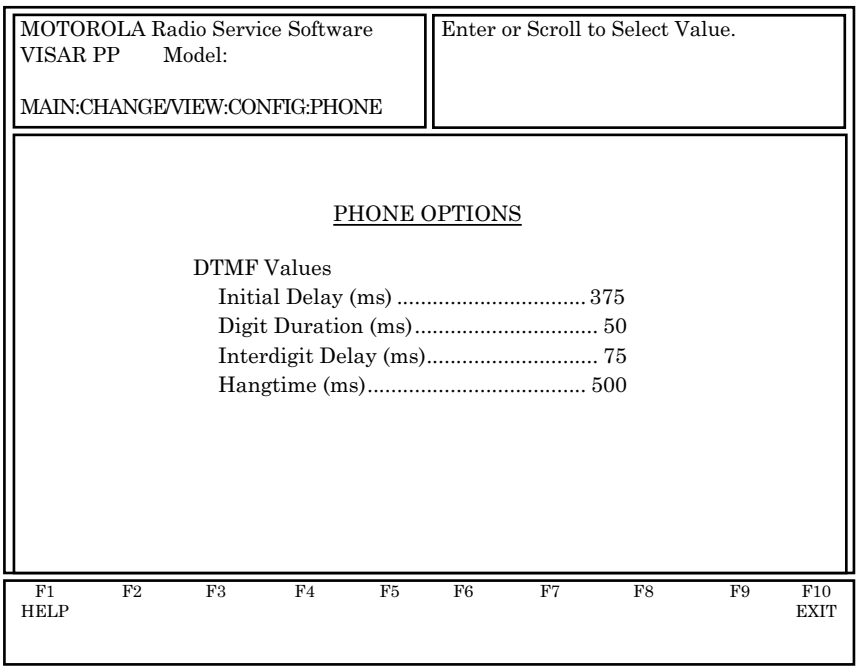
Use the UP/DOWN arrow keys to select the function of each button for trunking operation. Depending on your radio version and model number, you will be able to choose from all or some of the functions listed below.

Unprogrammed	No function assigned. A bad key chirp tone will sound
Blank	No function assigned.
Volume Set Tone	Generates a tone for the duration of the press. Use the volume control knob to adjust the setting.
Light	Turns on the display backlight.
Scan	Enables/Disables Scan. For the radio to function properly, this feature must be enabled on the TRUNKING PERSONALITY (**F4/F4/F4**) screen. A Full Feature Radio is also required.
Scan Program	A short button press Enables/Disables Scan. A long button press will Enable/Disable Scan Program mode. For the radio to function

	properly, this feature must also be enabled on the SCAN OPTIONS **(F4/F3/F5/F9)** screen. A Full Feature Radio is also required.
Phone	Used to answer and/or initiate a Phone Call. For the radio to function properly, this feature must also be enabled on the TRUNKING PERSONALITY (**F4/F4/F4**) screen. A Full Feature Radio is also required.
Page	Used to answer and/or initiate a Call Alert (Page). For the radio to function properly, this feature must be enabled on the TRUNKING PERSONALITY (**F4/F4/F4**) screen. A Full Feature Radio is also required.
Private Call	Used to answer and/or initiate a Private Call. For the radio to function properly, this feature must be enabled on the TRUNKING PERSONALITY (**F4/F4/F4**) screen. A Full Feature Radio is also required.
Call Response	Used to respond to a Private Call, Call Alert, or Phone Call. This function should be used for 'Response Only' radios. For the radio to function properly, this feature must be enabled on the TRUNKING PERSONALITY (**F4/F4/F4**) screen. A Full Feature Radio is also required.
Nuisance Delete	Removes the current active channel from the scan list. For the radio to function properly, this feature must also be enabled on the SCAN OPTIONS **(F4/F3/F5/F9)** screen. A Full Feature Radio is also required.
Scan List Edit	When in the Scan Program mode, the button will be used to add or remove Zone/Channels from the Scan List. When not in the Scan Program mode, the button will be used according to its corresponding function. For the radio to function properly, this feature must also be enabled on the SCAN OPTIONS **(F4/F3/F5/F9)** screen. A Full Feature Radio is also required.

Phone Options

From the MAIN MENU, press **F4**, **F3** and then **F4** to access this screen.



This screen allows you to modify Radio Wide DTMF Phone timing parameters. Press **Tab** to select the desired field, or press the desired function key (**F1 - F10**). If a field is selected, press the UP/DOWN arrow keys to select choice or value.

Field Definitions

Initial Delay (ms)

Use the UP/DOWN arrow keys to select the DTMF Initial Digit Delay. Valid selections are 0 to 6375 ms in 25-ms increments. The DTMF Initial Digit Delay is the pretime for DTMF signalling. This is the length of time that carrier is transmitted before the DTMF digit is transmitted. The factory default is 375 ms.

Digit Duration (ms)

Use the UP/DOWN arrow keys to select the DTMF Digit Duration. Valid selections are 25 ms to 6375 ms in 25-ms increments. The DTMF Digit Duration is the length of time that the DTMF digit will be transmitted. The factory default is 150 ms.

Interdigit Delay (ms)

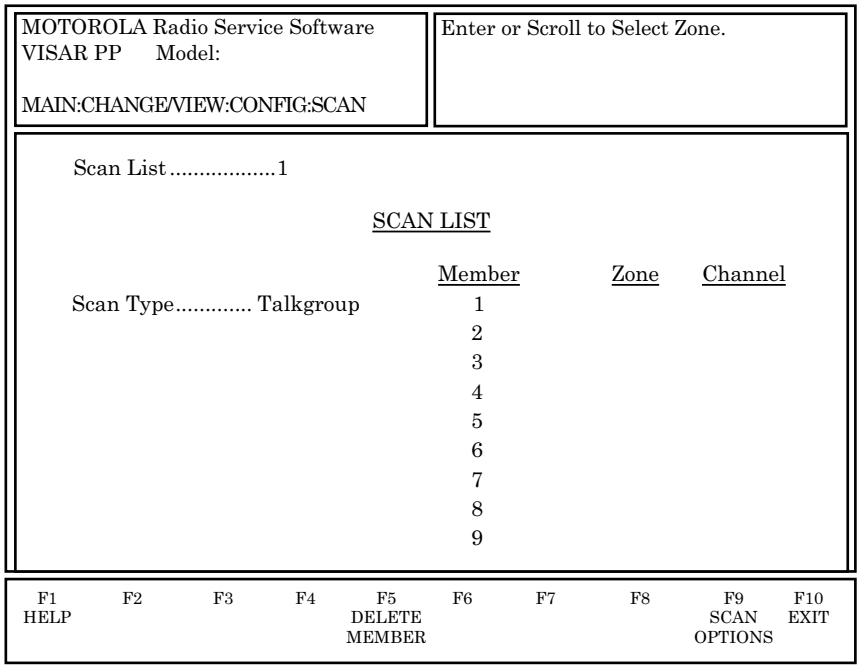
Use the UP/DOWN arrow keys to select the DTMF Interdigit Delay. Valid selections are 0 to 6375 ms in 25-ms increments. The DTMF Interdigit Delay is the time delay between the transmission of digits in a DTMF digit transmission sequence. The factory default is 75 ms.

Hangtime (ms)

Use the UP/DOWN arrow keys to select the DTMF Digit Hangtime. Valid selections are 25 to 6375 ms in 25-ms increments. The DTMF Digit Hangtime is the amount of time the radio continues transmitting after completion of a DTMF digit transmission. The factory default is 500 ms.

Scan List and Options

From the MAIN MENU, press, **F4**, **F3** and then **F5** to access this screen.



This screen is used to enter the scan list. Both conventional and trunking may use the scan list by enabling the Scan option on the CONVENTIONAL and TRUNKING PERSONALITY screens.

> **Caution** All systems, personalities, and zone (system)/channel (subfleet) assignments must be completed before attempting to create a Scan list.

Function Key Descriptions

F5 - DELETE MEMBER — Allows you to delete a member from the scan list.

F9 - SCAN OPTIONS — Takes you to the SCAN OPTIONS screen where you will be able to customize the Channel Scan feature for specific applications.

Field Definitions

Zone — Use the UP/DOWN arrow keys to select the Zone (or System) for this member of the scan list.

Channel — Use the UP/DOWN arrow keys to select the Channel (or Subfleet) for this member of the scan list.

Scan Options

From the MAIN MENU, press **F4**, **F3**, **F5** and then **F9** to access this screen.

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW:CONFIG: SCAN: OPTIONS

USE UP/DOWN Arrows to Select Choice.

SCAN OPTIONS

RADIO WIDE		CONVENTIONAL	
Nuisance Mode Delete	Enabled		
Rx Hold Time (sec)	3	Monitor Hold Time (sec)	3
Scan List Programming	Enabled		
Designated Tx Mem	Talkback		

TRUNKING

Failsoft Hold Time (sec)	6
System Search Time (sec)	1

F1 HELP F2 F3 F4 F5 F6 F7 F8 F9 F10 EXIT

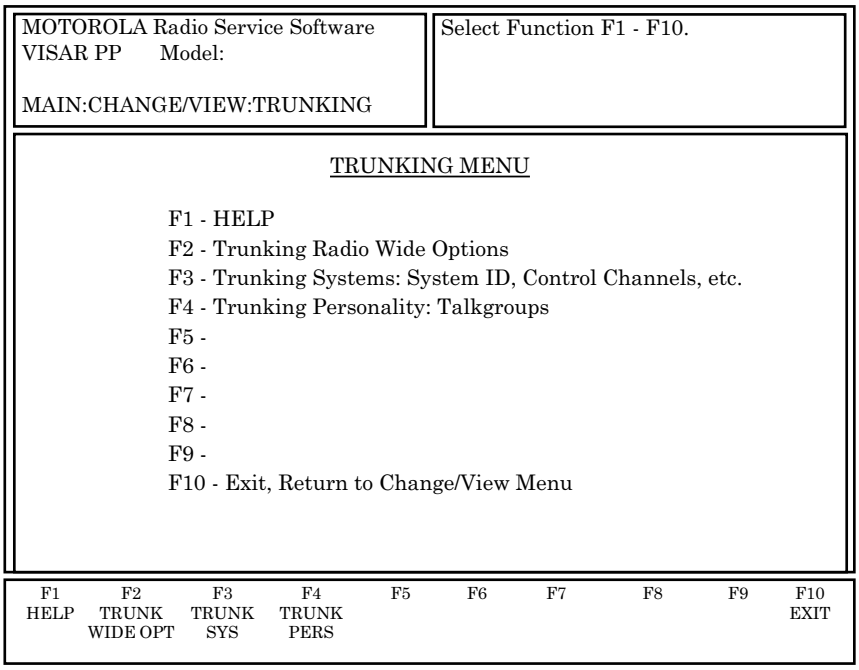
This screen is used to customize the Channel Scan feature for specific applications. Options and parameters that affect radio-wide operation, conventional operation, and trunking operation are available.

Field Definitions

Nuisance Mode Delete	Use the UP/DOWN arrow keys to enable/disable this feature. The Nuisance Mode Delete setting allows you to temporarily delete from the scan list non-priority channels that are constantly busy. Such activity may cause the scanner to be constantly locked onto a channel. A channel deleted using this option will remain deleted until scan is turned off. When scan is turned on, all channels which were previously deleted will be replaced. The factory default is Enabled.
RX Hold Time (sec)	Use the UP/DOWN arrow keys to select the Receive Hold Time. Valid entries are 0 to 10 seconds in one-second increments. The Scan Receive Hold Time is the time the scanner remains on a channel after a message has been received before scanning resumes. The factory default is 3 seconds.
Scan List Programming	Use the UP/DOWN arrow keys to enable/disable the Scan List Programming option. When this field is enabled, entering into scan list programming mode is allowed depending on the features available in your radio. The factory default is Enabled.
Designated TX Mem	Use the UP/DOWN arrow keys to select the Designated Transmit Talkback channel. Choose Selected Chan to transmit on the last user-selected channel. Select Talkback to transmit on the same channel that the scanner stopped on. If the channel is a receive-only channel, the radio will warn that transmission is not possible when PTT is pressed.
Monitor Hold Time (sec)	Use the UP/DOWN arrow keys to select the Monitor Hold Time. Valid entries are from 1 to 10 seconds in one-second increments. Scan monitor hold time is the time the radio remains on a conventional channel during scan after the monitor button is released. The factory default is 3 seconds.
Failsoft Hold Time (sec).	Use the UP/DOWN arrow keys to select the Trunking Failsoft Activity Time. Valid entries are Disabled, and from 1 to 255 seconds in one-second increments. This timer determines how long the radio will stay unmuted on a failsoft channel if failsoft is found while in talkgroup scan. The factory default is 6 seconds.
System Search Time (sec)	Use the UP/DOWN arrow keys to select the Trunk Activity Search Time. Valid entries are from 1 to 255 seconds in one-second increments. This timer determines how long the radio will stay on a control channel searching for voice activity before scanning the next system. The factory default is 10 seconds for 900 MHz, and one second for all other bands.

Trunking Menu

From the MAIN MENU, press **F4** twice to access this screen.



This screen allows you to navigate to the trunking edit screens. The options in these menus pertain only to Trunking radio features.

Function Key Descriptions

F2 -TRUNK WIDE OPT (Trunking Radio Wide Options)

These screens are applicable to all trunking operation, regardless of system type or signalling type.

F3 - TRUNK SYS (Trunking Systems)

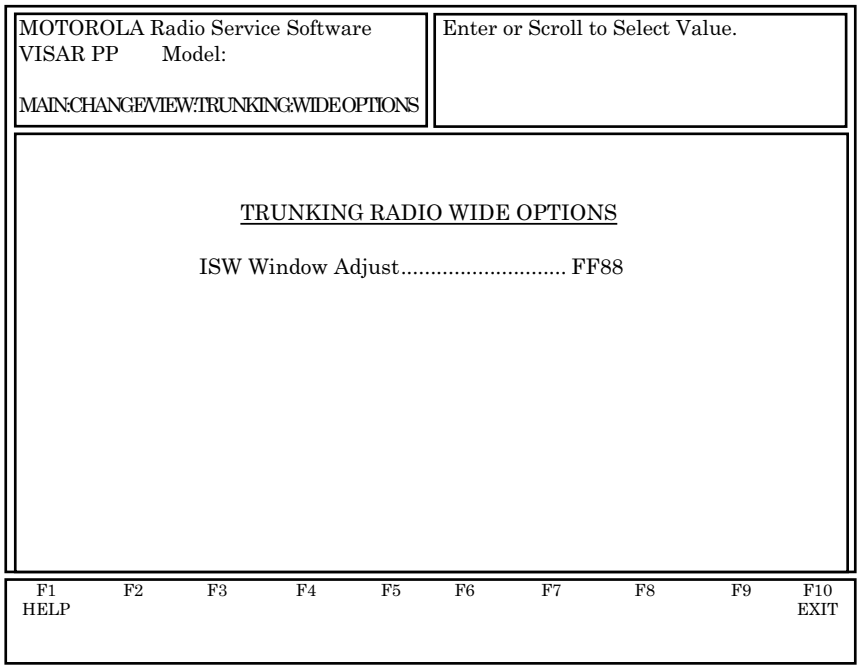
Used to change and view trunked system parameters. A trunking system refers to a specific repeater site, system ID, the individual radio ID for that system, control channel frequencies, and the connect tone required to operate on that system.

F4 - TRUNK PERS (Trunking Personality)

Allows you to change and view the parameters for a trunking personality. A trunking personality refers to the type of features and options used on a trunking channel/talkgroup. Multiple personalities may use the same system. Multiple talkgroups may also use the same personality.

Trunking Radio Wide Options

From the MAIN MENU, Press **F4** twice and then **F2** to access this screen.



The options and parameters on this screen apply to all trunking operation, independent of system, personality, or talkgroup. Other Radio Wide options that apply to both conventional and trunking operation are located on the RADIO WIDE OPTIONS screen **(F4/F3/F2**). Conventional options are located on the CONVENTIONAL RADIO WIDE OPTIONS screen (**F4/F6/F2**).

Field Definition

ISW Window Adjust

The ISW Window Adjust value is a timing parameter that is used to fine-tune trunking system performance.

> **Caution**
>
> Do not modify this field unless you are a Motorola Field Technical Representative or you understand trunking system timing and are absolutely certain that your modification is correct. Changing the ISW Window Adjust field may actually degrade trunking system performance.

Trunking System (Type I)

F4 F4 F3

From the MAIN MENU, press **F4** twice and then **F3** to access this screen.

```
MOTOROLA Radio Service Software          Enter or Scroll to Select System.
VISAR PP       Model:

MAIN:CHANGE/VIEW:TRUNKING:SYSTEM

System ...................... 1        TRUNKING SYSTEM

  System Key .......................... Disabled   UNIVERSAL ID ............................. 1
  System Type ..................................... I
  System ID ................................... 0001   Size Code ......................................... A
                                                     Fleet ID..................................... 0001
                                                     Individual ID ............................... 000
  Connect Tone ................ #0-105.88 Hz         Access Type ............................... Slow
                                                     Conversation Type ............. Message
                                                     Tx Defeat ............................ Disabled

                                                     This Call ID .......................... 000016

F1     F2      F3      F4      F5      F6       F7   F8   F9       F10
HELP   ADD     PREV    NEXT    DELETE  CONTROL             MORE     EXIT
       SYSTEM  SYSTEM  SYSTEM  SYSTEM  CHANNEL             OPTIONS
```

This screen is used to program the Trunking System configuration for your radio.

The steps for Trunking programming are shown below, all beginning from the MAIN MENU:

1. Program the system. Bring up the CONTROL CHANNELS screen (**F4/F4/F3/F6**).
2. Create Personalities (**F4/F4/F4**) and link them to the system. Enter Talkgroups (Subfleets) for each Personality (**F4/F4/F4/F7**).
3. Assign Buttons for System and Personality features (**F4/F3/F3**).
4. Assign the Talkgroups (Subfleets) to the Zone/Channel map (**F4/F8**).

A Trunking System refers to a specific repeater site, the System ID, the individual radio ID for that System, the control channel frequencies, and the connect tone required to operate on that System. Each System that your radio is programmed to operate on is 'linked' to one or more trunking personalities. The personality defines the features available to your radio when it is operating on that System.

Function Key Descriptions

F2 - ADD SYSTEM	Allows you to add a system.
F3 - PREV SYSTEM	Allows you to move back to the previous system.
F4 - NEXT SYSTEM	Allows you to move forward to the next system.
F5 - DELETE SYSTEM	Allows you to delete an existing system.
F6 - CONTROL CHANNEL	Allows you to change/view the control channels for this system.
F9 - MORE OPTIONS	Permits access to additional features and options to further customize radio configuration.

Field Definitions

System	Use the UP/DOWN arrow keys to scroll through the available systems. Alternately the **F3/F4** function keys can be used to navigate through available systems.
System Key	This field indicates if a system key has been enabled. If no system keys are present, the system key field will display Disabled.
System Type	This is the trunking radio type for the system. System type is either Type I or Type II/IIi depending on the radio model.
System ID	This field contains the four-digit hexadecimal number which identifies the trunked system. This number must match the trunking Repeater System ID. A system key or FTR key is required to access this field. Otherwise, the TCMS download procedure must be used (**F3/F4**).
Connect Tone (Hz)	The Connect Tone is a sub-audible tone that is required on the voice channel to access the trunked repeater. The function is similar to the conventional repeater access tone.
Universal ID	Use the UP/DOWN arrow keys to select the Universal ID personality for the selected system. When a Universal ID personality is selected the Universal Size Code, Individual ID and Fleet fields will be updated to reflect the selected personality. When Trunking type I is selected, a Universal ID is used. All individual calls (Phone, Private Call, and Call Alert) will be received if they are addressed to the Universal ID, even though the operator might have another personality in the selected system. This simplifies communications with the radio.
Access Type	Use the UP/DOWN arrow keys to select the appropriate Trunking Access type. This information must be coordinated with your system manager to ensure proper operation of the system.

Slow	The original trunking signalling protocol with acknowledgments (high speed) for all channel grants [Rx = Slow, Tx = Slow].
Fast	An enhancement to the original protocol that eliminated channel grant acknowledgments, thus improving channel access time. [Rx = Fast, Tx = Fast].

Conversation Type

Use the UP/DOWN arrow keys to select the Trunking 'Conversation' Type, either Message or Transmission.

Message-Trunked Systems	After the initiator de-keys the radio, the voice channel stays active (hangtime) so that other members of the talkgroup can respond on the same channel. If a radio in the talkgroup transmits during another user's transmission, the transmissions will overlap.
Transmission-Trunked Systems	No hang time and no talk over. When a radio is de-keyed, the channel is immediately deallocated and reassigned. If a user tries to talk over an active channel, the radio will not respond until the channel is clear.

TX Defeat

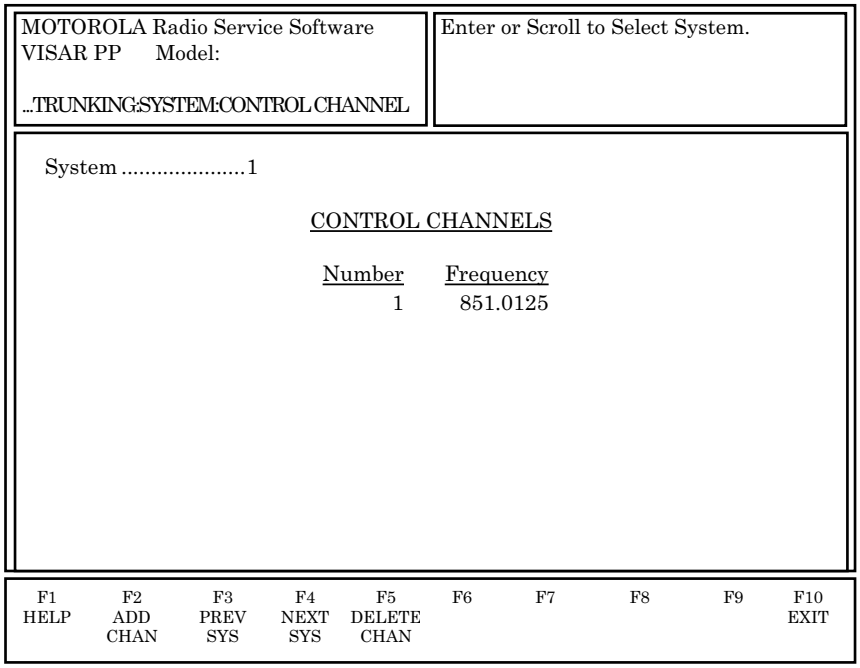
Use the UP/DOWN arrow keys to override the Universal ID for individual calls. When this option is enabled, the radio will use the PFI (Personal Fleet ID) to initiate individual calls instead of the Universal ID. The factory default is Disabled.

This Call ID

This is the Universal Call ID number that all calls will be addressed to.

Trunking System Type I (Control Channels)

From the MAIN MENU, press **F4** twice, and then **F3** and **F6** to access this screen.



This screen allows you to change/view the control channels for this system. A system key or FTR key is required to access these fields. Otherwise the TCMS download procedure must be used (**F3/F4**). The function keys at the bottom of the screen are used to add and delete control channels.

Field Definition

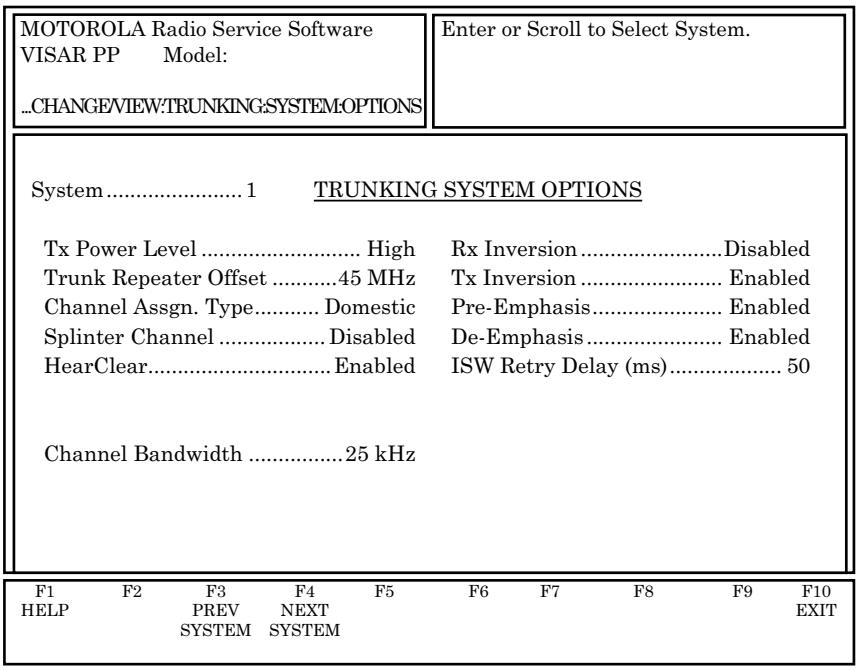
Frequency

Enter the Control Channel Receive frequency directly in MHz. The UP/DOWN arrow keys may also be used to scroll through valid frequencies. A system key or FTR key is required to access this field. Otherwise the TCMS download procedure must be used (**F3/F4**).

Control channels are used by the radio to send/receive information to the central trunking repeater system. Up to four control channels are used for standard trunking operation; up to eight are used for WAC AMSS.

Trunking System Type I (Trunking System Options)

From the MAIN MENU, press **F4** twice and then **F3** and **F9** to access this screen.



The TRUNKING SYSTEM OPTIONS screen permits access to additional features and options to further customize the radio configuration to specific communication needs.

Be careful when changing parameters on this screen. System parameter changes can substantially degrade performance if they are not made system wide.

Function Key Descriptions

F3 - PREV SYSTEM — Allows you to move back to the previous system.

F4 - NEXT SYSTEM — Allows you to move forward to the next system.

Field Definitions

TX Power Level

Use the UP/DOWN arrow keys to select either High or Low Transmit Power operation for the radio on this system. The transmit power may be reduced using this field. The factory default is High.

Trunk Repeater Offset

This value must be set to the frequency separation between the transmit and receive frequencies used at the central repeater site. The factory default is 45 MHz for 800-band radios and 39 MHz for 900-band radios.

Channel Assgn. Type

Use the UP/DOWN arrow keys to select the Channel Assignment Type.

Domestic	25 kHz Channel Spacing used in the USA.
International	12.5 kHz Channel Spacing used outside the USA.

Splinter Channel

Use the UP/DOWN arrow keys to enable/disable Splinter Channel operation for this system (800-MHz radios only). The control channels and failsoft frequencies will be shifted down 12.5 kHz, and the radio will interpret the channel numbers received over the air as splinter channels as well. Channels in the 821 band will not be affected. The factory default is Disabled.

RX Inversion

Use the UP/DOWN arrow keys to enable/disable RX Inversion. When this feature is enabled, the data is inverted after being received from a trunking system.

TX Inversion

Use the UP/DOWN arrow keys to enable/disable TX Inversion. When this feature is enabled, the data is inverted prior to be being transmitted to a trunking system.

Pre-Emphasis

Use the UP/DOWN arrow keys to enable/disable Pre-Emphasis. Pre-Emphasis amplifies higher frequencies so that the signal-to-noise ratio is better during transmission. The factory default is Enabled.

De-Emphasis

Use the UP/DOWN arrow keys to enable/disable De-Emphasis. De-Emphasis reverses the Pre-Emphasis after the signal has been received. The factory default is Enabled.

ISW Retry Delay (ms)

This field changes the interim spacing between ISW retries. Spacing between retries is extended to accommodate System access delays. Valid entries range from Disabled to 75 ms in 25-ms increments. The factory default is 50 ms.

HearClear

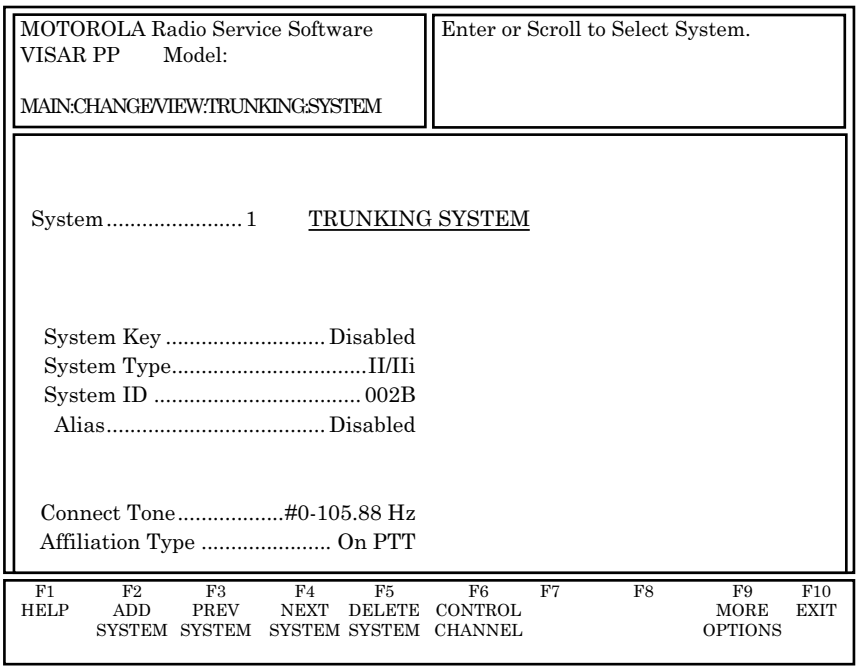
This option allows HearClear during voice operation. Hear Clear is a feature used primarily in the 900-MHz band to reduce noise caused by the smaller bandwidth used in the 900 band. The factory default is Enabled for 900-MHz radios and Disabled otherwise. This feature is available for 900-MHz radios only.

Channel Bandwidth

This value must be set to the Channel Bandwidth of the system that the radio is to operate on. The factory default is 25 kHz. This feature is available with UHF/VHF radios only.

Trunking System (Type II/IIi)

From the MAIN MENU, press **F4** twice and then **F3** to access this screen.



This screen is used to program the Trunking System (Type II/IIi) configuration for your radio.

Function Key Descriptions

F2 - ADD SYSTEM — Allows you to add a system.

F3 - PREV SYSTEM — Allows you to move back to the previous system.

F4 - NEXT SYSTEM — Allows you to move forward to the next system.

F5 - DELETE SYSTEM — Allows you to delete an existing system.

F6 - CONTROL CHANNEL — Allows you to change or view the control channels for this system.

F9 - MORE OPTIONS — Allows you to change or view more trunking personality parameters.

Field Definitions

System Key

This field indicates if a system key has been enabled. If no system keys are present, the system key field will display Disabled.

System Type

This is the trunking radio type for the system. System type is either Type I or Type II/IIi depending on the radio model.

System ID

Enter the Trunking system ID as a four-digit hexadecimal number. This number uniquely identifies a Trunked System. A system key or FTR key is required to access this field. Otherwise the TCMS download procedure must be used (**F3/F4**). This number must match the ID of the Trunking Repeater System.

System Alias

Use the UP/DOWN arrow keys to enable/disable the System ID alias feature. When enabled, the upper 8 bits of the System ID are ignored. The factory default is Disabled.

Connect Tone (Hz)

The Connect Tone is a sub-audible tone required on the voice channel to access the trunked repeater. This function is similar to the conventional repeater access tone.

Use the UP/DOWN arrow keys to select the connect tone for this system. A system key or FTR key is required to access this field. Otherwise the TCMS download procedure must be used (**F3/F4**). The valid selections are:

0	105.88 Hz
1	76.60 Hz
2	83.72 Hz
3	90.00 Hz

4	97.30 Hz
5	116.13 Hz
6	18.57 Hz
7	138.46 Hz

Channel Assignment Data: Other-Band Trunking (UHF/VHF)

From the MAIN MENU, press **F4** twice, and then **F3** and **F6** to access this screen.

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW:TRUNKING:SYSTEM

Enter or Scroll to Select System.

System.....1 CHANNEL ASSIGNMENT DATA

	Rx Channel Changes - MHz				Tx Channel Changes - MHz			
#	Status	kHz	Start	End	Status	kHz	Start	End
1	Enable	25.00	168.0000	168.00000	Enable	25.00	163.00000	163.00000
2	Enable	25.00	153.0000	168.00000	Enable	25.00	163.00000	152.47500
3	Enable	25.00	160.0000	168.00000	Enable	25.00	163.00000	163.47500

F1 HELP | F2 | F3 PREV SYSTEM | F4 NEXT SYSTEM | F5 | F6 CONTROL CHANNEL | F7 | F8 | F9 | F10 EXIT

This screen is used to enter the Channel Assignment data used for OBT (Other-Band Trunking). Three different frequency splits may be defined for each system. A maximum total of 380 receive channels and 380 transmit channels can be assigned. The number of channels per range is:

Number = (End Frequency - Start Frequency) / Spacing + 1.

> **Note:** This information must match the Central Controller exactly or the system will not function.

After the Receive and Transmit ranges are defined, press **F6** to enter Control Channel frequencies.

Function Key Descriptions

F3 - PREV SYSTEM — Allows you to move back to the previous system.

F4 - NEXT SYSTEM — Allows you to move forward to the next system.

F6 - CONTROL CHANNEL — Allows you to change or view the control channels for this system.

Field Definitions

KHz Spacing

This value specifies the channel spacing for the preceding frequency range. The end frequency, minus the start frequency, must be evenly divided by the channel spacing.

Start (start value)

This value specifies the frequency range start-up point in MHz. The start frequency must be less than the end frequency, but must be within the allowable frequency range of the radio.

> **Note:** This information must match the Central Controller exactly or the system will not work.

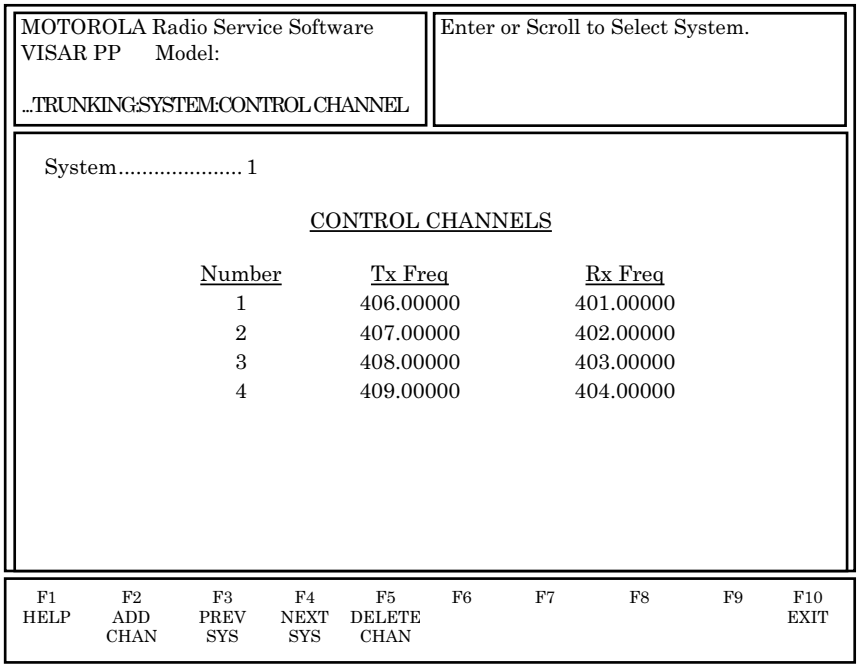
End (end value)

This value specifies the frequency range end point in MHz. The end frequency must be larger than the start frequency, but must be within the allowable frequency range of the radio.

> **Note:** This information must match the Central Controller exactly or the system will not work.

Trunking Control Channels: Other-Band Trunking (UHF/VHF)

From the MAIN MENU, press **F4** twice, and then **F3**, **F6** and **F6** to bring up this screen.



This screen allows you to change/view the control channels for this system. A system key or FTR key is required to access these fields. Otherwise, the TCMS download procedure must be used (**F3/F4**).

Function Key Descriptions

F2 - ADD SYSTEM — Allows you to add a system.

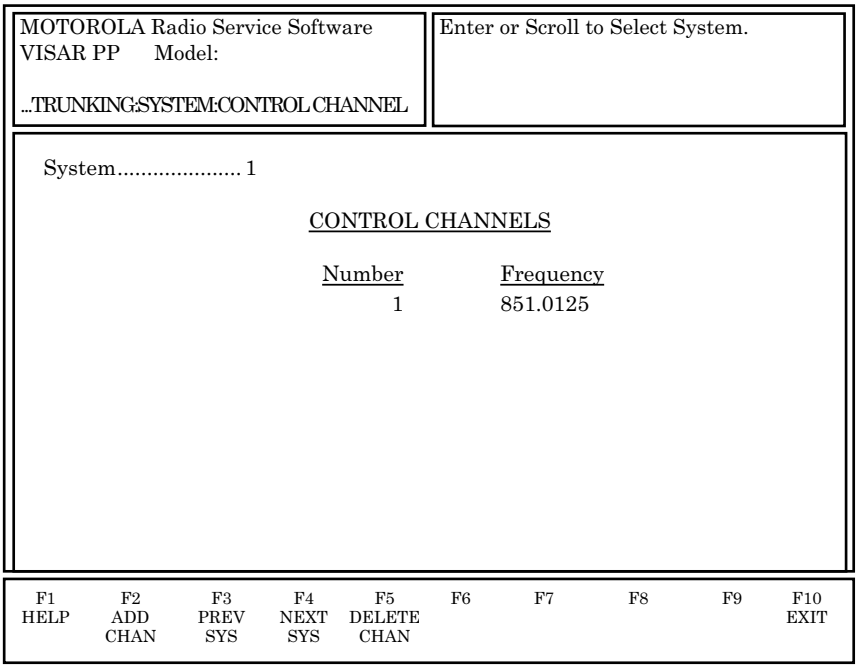
F3 - PREV SYSTEM — Allows you to move back to the previous system.

F4 - NEXT SYSTEM — Allows you to move forward to the next system.

F5 - DELETE SYSTEM — Allows you to delete an existing system.

Trunking Control Channels: 800/900 MHz

From the MAIN MENU, press **F4** twice, and then **F3** and **F6** to bring up this screen.



This screen allows you to change/view the control channels for this system. A system key of FTR key is required to access these fields. Otherwise, the TCMS download procedure must be used (**F3/F4**).The function keys at the bottom of the screen are used to add and delete control channels.

Function Key Descriptions

F2 - ADD SYSTEM — Allows you to add a system.

F3 - PREV SYSTEM — Allows you to move back to the previous system.

F4 - NEXT SYSTEM — Allows you to move forward to the next system.

F5 - DELETE SYSTEM — Allows you to delete an existing system.

Trunking Personality (Type I)

From the MAIN MENU, press **F4** three times to bring up this screen.

```
MOTOROLA Radio Service Software                 Enter or Scroll to Select
VISAR PP      Model:                            Personality.

MAIN:CHANGE/VIEW:TRUNKING:PERS

Personality..... 1          TRUNKING PERSONALITY

Protocol Type.....I                    Private Call .....II - Respond Only
System/ID..... 1-0734                    Supervisor Pool ID..... 01
  Type .....I
Size Code .....A                       Call Alert Operation ..... Page & Resp
Fleet ID.....200                       Phone Operation .....Disabled
                                       Hot Keypad (DTMF) .....Enabled

Individual ID..... 0-0000
Failsoft Type .....Disabled
                                       This Call ID (PC I) ..... 600080
Time-Out Timer (sec).....60            This Call ID (PC II)..... 000016
                                       Scan List.....None

F1      F2      F3      F4      F5      F6      F7      F8      F9      F10
HELP    ADD     PREV    NEXT    DELETE          SUB             MORE    EXIT
        PERS    PERS    PERS    PERS            FLEETS          OPTIONS
```

This screen is used to view and edit the main information for a trunking personality, such as the system number and the Time-Out Timer value. It also allows the user to navigate to the other trunking personality-related screens.

Function Key Descriptions

F2 - ADD PERS — Allows you to add a personality.

F3 - PREV PERS — Allows you to go to the previous personality.

F4 - NEXT PERS — Allows you to go to the next personality.

F5 - DELETE PERS — Allows you to delete the current personality.

F7 - SUBFLEETS — Allows you to edit the position of the subfleets.

F9 - MORE OPTIONS — Allows you to change or view more trunking personality parameters.

Trunking Personality (Type II/IIi)

From the CHANGE/VIEW MENU, press **F4** three times to access this menu.

```
MOTOROLA Radio Service Software          Enter or Scroll to Select
VISAR PP      Model:                     Personality.

MAIN:CHANGE/VIEW:TRUNKING:PERS

Personality..... 1          TRUNKING PERSONALITY

Protocol Type.....II
System/ID..... 1-0001
   Type .....II/IIi

Announcement Group..... None

Individual ID..... I-0001
Failsoft Type ..... Disabled


Time-Out Timer (sec)..... 60

F1     F2      F3      F4      F5      F6      F7      F8      F9      F10
HELP   ADD     PREV    NEXT    DELETE          TALK            MORE    EXIT
       PERS    PERS    PERS    PERS            GROUPS          OPTIONS
```

Function Key Descriptions

F2 -ADD PERS — Allows you to add a personality.

F3 - PREV PERS — Allows you to go to the previous personality.

F4 - NEXT PERS — Allows you to go to the next personality.

F5 - DELETE PERS — Allows you to delete the current personality.

F7 - TALKGROUPS — Allows you to edit the position of the talkgroups.

F9 - MORE OPTIONS — Allows you to change or view more trunking personality parameters.

Field Definitions

Personality Number

Use the UP/DOWN arrow keys to scroll through the available personalities. Alternately the **F3/F4** function keys can be used to navigate through the available personalities. Personalities can be added by pressing **F2** or deleted by pressing **F5**. You will be prompted a second time before the delete occurs.

Protocol Type

Specifies the trunking type of the personality.

System ID

The UP/DOWN arrow keys will select the Trunking System this personality is to use. (The system ID is shown by the system number.) The trunking system (**F4/F4/F3**) should be set up before the personality information is entered since some of these fields depend on system information.

Type

Trunking System Types are either I, or II/IIi.

Size Code

Valid size codes determine the maximum number of fleets, subfleets, and individual IDs allowed. The size code and fleet ID choices must match the programming of the Central Controller.

Size Code	Prefix	Fleet	Subfleet	Individual ID
A	0 - 7	00 - 7F	A - C	000 - 00F
B	0 - 7	00 - 0F	A - G	000 - 03F
C	0 - 7	00 - 07	A - G	000 - 07F
D	0 - 7	00 - 00	A - O	000 - 1FF
E	0 - 7	00 - 3F	A - C	000 - 01F
F	0 - 7	00 - 1F	A - G	000 - 01F
G	0 - 7	00 - 1F	A - C	000 - 03F
H	0 - 7	00 - 0F	A - C	000 - 07F
I	0 - 7	00 - 07	A - C	000 - 0FF
J	0 - 7	00 - 03	A - G	000 - 0FF
K	0 - 7	00 - 01	A - O	000 - 0FF
M	0, 2, 4, 6	00 - 00	A - O	000 - 3FF
O	0. 2	00 - 00	A - O	000 - 7FF
Q	0-0	00 - 00	A - O	000 - FFF

Fleet ID

Fleet ID is a three-digit hexadecimal number where the first digit is the prefix and the second two digits refer to the fleet number. For any size code, the subfleets for Fleetwide will always be available.

Announcement Group

For Type II/IIi only. Enter the Announcement Talkgroup in this field. This field contains the user Talkgroup for the Announcements for the current personality. The Announcement Talkgroup is a three-digit hexadecimal number.

Individual ID

Contains the Individual ID, a number that uniquely identifies your radio on a particular system. Valid IDs will be between 1 and the FFFE range for Type II/IIi. The Type I range depends on the size code selected. The decimal equivalent of the Individual ID is used for your radio's Private Conversation Call ID (7 + ID#), interconnect land-to-portable unit calls (7 + ID #), and interconnect land-to-portable talkgroup calls (7 + ID #).

Failsoft Type

When the Central Site Controller fails in a Trunked system, the system goes into Failsoft operation. This means that the radio will transmit and receive on the same frequency. Depending on the type of system, there will be different choices for Failsoft operation:

Disabled	No failsoft is used.
Fleet (Type I)	Uses the frequency set in the Failsoft Frequency field.
Announce Grp (Type II)	Uses the Announcement Group Failsoft Frequency.

Frequency

This field allows you to enter the frequency that will be used for Failsoft operation of this personality.

Time-Out Timer (TOT)

This field determines the amount of time the radio can continuously transmit before the radio must be de-keyed. When this time up, the radio beeps and stops transmitting. Choices are (in seconds) 15, 30, 45, 60, 90, 120, 180, and Infinite (i.e., TOT disabled). The factory default is 60 seconds.

Private Call

Use the UP/DOWN arrow keys to select the Private Call type and operation for this personality.

Disabled	Deactivates Private Call feature for this personality.
I - Non Supervisor	Allows the radio to accept Private Calls from the PC I Supervisor radio limited to the selected fleet and pool.
I - Supervisor	Allows the user to make Private Calls from the keypad and accept Private Calls from either a Non Supervisor radio or another Supervisor radio. This applies to PC I calls only.
II - Respond Only	Allows the radio to accept Private Calls from the current fleet and other fleets. The user may respond to the person who called, but cannot choose the person to whom they wish to initiate a call.
II - Call & Respond	Allows the user to make Private Calls from the keypad and accept Private Calls from the current fleet and other fleets.
I/II - Respond Only	Allows the user to accept both PC I and PC II calls.
I/II - Call & Respond	Allows the user to make/accept both PC I and PC II calls.

Note: Radio controls may require an additional setup for your Private Call configuration. Refer to the RADIO WIDE BUTTON screen (**F4/F3/F3)**.

Private Call allows the operator to receive and transmit Private Calls. The factory default is II - Respond Only.

Supervisor Pool ID

Use the UP/DOWN arrow keys to select the Supervisor Pool ID for this personality. Valid Pool IDs range from 2 to one less than the number of subfleets allowed in the fleet. In normal operation there will be only one supervisor per Pool ID per fleet. The Pool ID, used for Type I only, allows a group of radios to get connected together as supervisors and non-supervisors for private calls. A PC I radio with Call & Respond will act as the supervisor, and PC I radios with Respond Only will act as non-supervisors.

Supervisor radios will receive all PC I private calls made with their Pool ID within their current fleet. Non-supervisors will only be able to call their supervisors, i.e., the supervisor radio that matches its Pool ID.

Call Alert™

Use the UP/DOWN arrow keys to select the operation of the Call Alert (Page) feature for this personality:

Disabled	No Call Alert operation is allowed.
Respond Only	Allows the radio to accept pages (Call Alerts) only.
Page & Respond	Allows the radio user to send pages from the keypad. Also allows the radio to accept pages. (Requires full keypad.)

Note: The radio controls may require additional setup for your Call Alert configuration. Refer to the RADIO WIDE BUTTON screen **(F4/F3/F3)**.

Call Alert allows the operator to receive pages and to transmit pages by typing in a six-digit Decimal ID. The factory default is Page & Respond for keypad models and Respond Only for non-keypad models.

Phone Operation

Use the UP/DOWN arrow keys to select the type of Phone Operation for this personality:

Call Alert Operation	
Disabled	No phone operation is allowed.
Answer Only	Allows the radio to accept phone calls only.
Call & Answer	Allows the radio user to make phone calls from the keypad. This also allows the radio to accept phone calls. (Requires full keypad.)

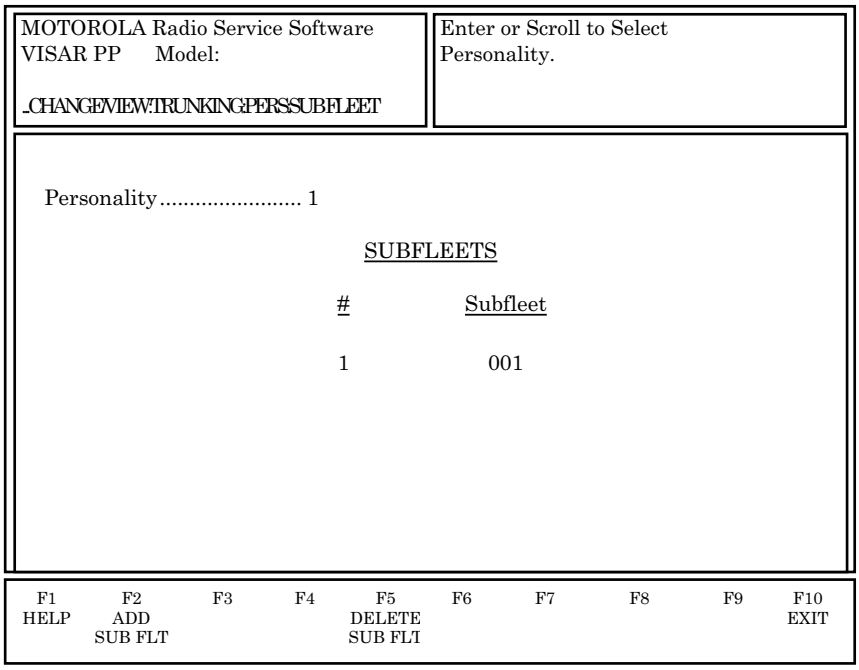
Note: The radio controls may require additional setup for your Phone Operation. Also refer to the RADIO WIDE BUTTON screen (**F4/F3/F3**).

This option allows the radio to initiate and receive land-to portable telephone calls and specifies the type of interconnect. The factory default is Call & Answer for keypad models and Answer Only for non-keypad models.

Hot Keypad (DTMF)	Use the UP/DOWN arrow keys to enable/disable Hot Keypad (DTMF while transmitting) operation for this personality. When this feature is enabled, the keypad is live during all dispatch operation. Pressing any digit 0-9, *, or # will cause that digit to be transmitted. The factory default is Enabled.
This Call ID (PC I and PC II)	These fields display the Call ID that the radio will use for PC I and PC II calls These fields are display only, and are shown for Full Feature radios only.
Scan List	Displayed for Full Feature only. This mimics the Scan field on the SCAN LIST AND OPTIONS screen since there is only one scan list per radio. If Scan is enabled, Scan List.....1 is displayed. Otherwise, Scan List is set to None.

Subfleets/ Talkgroups (Type I)

From the MAIN MENU, press **F4** three times and then **F7** to bring up this screen.



This screen is used to enter the Talkgroups (Subfleets) that will use each personality. Once the Talkgroups/Subfleets are entered, they are assigned to the Zone/System or Channel/Subfleet selector at the ZONE/SUMMARY screen (**F4/F8**).

Function Key Descriptions

F2 - ADD SUB FLT — Allows you to add a Subfleet.

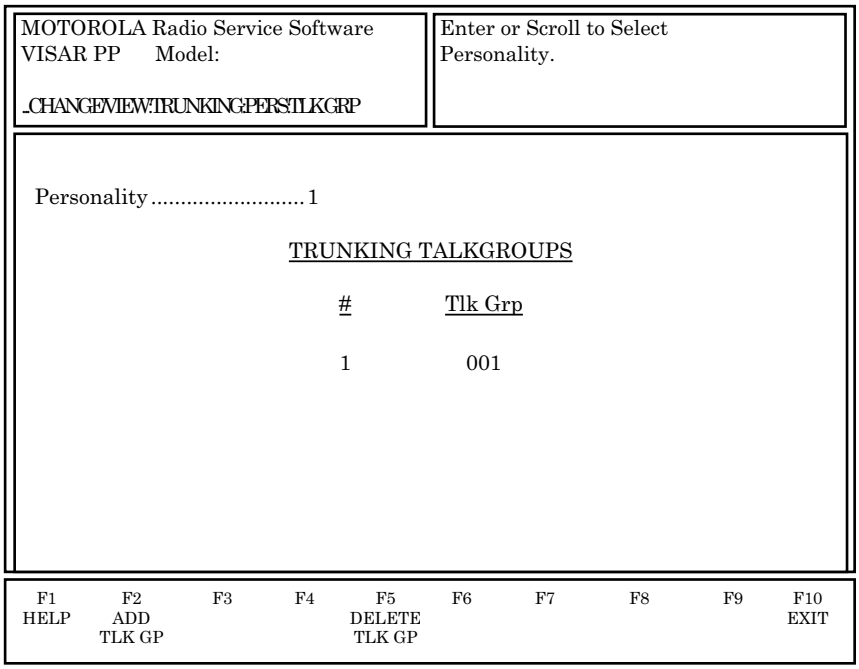
F5 - DELETE SUB FLT — Allows you to delete the current Subfleet.

Field Definition

Subfleet — Enter the Subfleet IDs for this personality as three-digit hexadecimals. A Subfleet is a logical grouping of members of an organization. This is the Trunking equivalent of the conventional channel.

Subfleets/ Talkgroups (Type II/IIi)

From the MAIN MENU, press **F4** three times and then **F7** to access this screen.



This screen is used to enter the Talkgroups that will use each personality. Once the Talkgroups/Subfleets are entered, they are assigned to the Zone/System or Channel/Subfleet selector at the ZONE/SUMMARY screen (**F4/F8**).

Function Key Descriptions

F2 - ADD TLK GP — Allows you to add a Subfleet.

F5 - DELETE TLK GP — Allows you to delete the current Subfleet.

Field Definition

Tlk Grp (Talkgroup) — Enter the Talkgroup IDs for this personality in three-digit hexadecimals. A Talkgroup is a logical grouping of members of an organization. This is the Trunking equivalent of the conventional channel.

Trunking Personality Options

From the CHANGE/VIEW MENU, press **F4** three times and then **F9** to access this screen.

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW:TRUNKING:PERS:OPTIONS

Enter or Scroll to Select
Personality

Personality.....1 TRUNKING PERSONALITY OPTIONS

Conversation Type.....Message
Talk Group Scan.....Enabled
Auto Scan .....Disabled
Access Type.....Fast
Twenty Channel Synthesized.....Enabled
Talk Permit Tone .....Disabled
CA/PC Decode Ignore .....Disabled

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
HELP		PREV PERS	NEXT PERS						EXIT

Type I

MOTOROLA Radio Service Software
VISAR PP Model:

MAIN:CHANGE/VIEW:TRUNKING:PERS:OPTIONS

Enter or Scroll to Select
Personality

Personality.....1 TRUNKING PERSONALITY OPTIONS

Conversation Type ..... Message

Talk Permit Tone ..... Disabled

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
HELP		PREV PERS	NEXT PERS						EXIT

Type II/IIi

Field Definitions

Personality

Use the UP/DOWN arrow keys to scroll through the available personalities. Alternately the **F3/F4** function keys can be used to navigate through the available personalities.

Conversation Type

Use the UP/DOWN arrow keys to select Trunking Conversation type from among the following:

Message Trunked	After the initiator de-keys the radio, the voice channel stays active (hangtime) so that other members of the talkgroup can respond on the same channel. If a radio on the talkgroup transmits during another user's transmission, the transmissions will overlap.
Transmission Trunked	No hangtime and no talkover. When a radio is de-keyed, the channel is immediately deallocated and reassigned. If a user tries to talk over an active channel, the radio will not key until the channel is clear.
PTT-ID	PTT-ID systems are similar to Message conversation type systems with hangtime and talkover, but it sends an ID code to the controller when PTT is pressed. After the ID transmission, the radio goes back to the voice channel to talk.

Talkgroup Scan

Use the UP/DOWN arrow keys to enable/disable the Talkgroup Scan option for this personality. When this feature is enabled, the user may use a button or Auto Scan to scan when on this personality. The factory default is Disabled.

Auto Scan

Use the UP/DOWN arrow keys to enable/disable the Auto Scan option for this personality. When this feature is enabled, the radio will automatically scan when on this personality. To use a scan on/off button, this option must be Disabled. The factory default is Disabled.

Access Type

Use the UP/DOWN arrow keys to select the Trunking Access type for Type I and Type II/IIi personality. This information must be coordinated with your system manager to ensure proper operation on the system.

Slow	Refers to the use of high-speed acknowledgments for channel grants. (RX = slow, TX = slow).
Fast	Refers to the elimination of high-speed acknowledgment which improves channel access time. (RX = Fast, TX = Fast). To use the fast trunking access type, the system and the fleet must be capable of Fast Access Protocol.

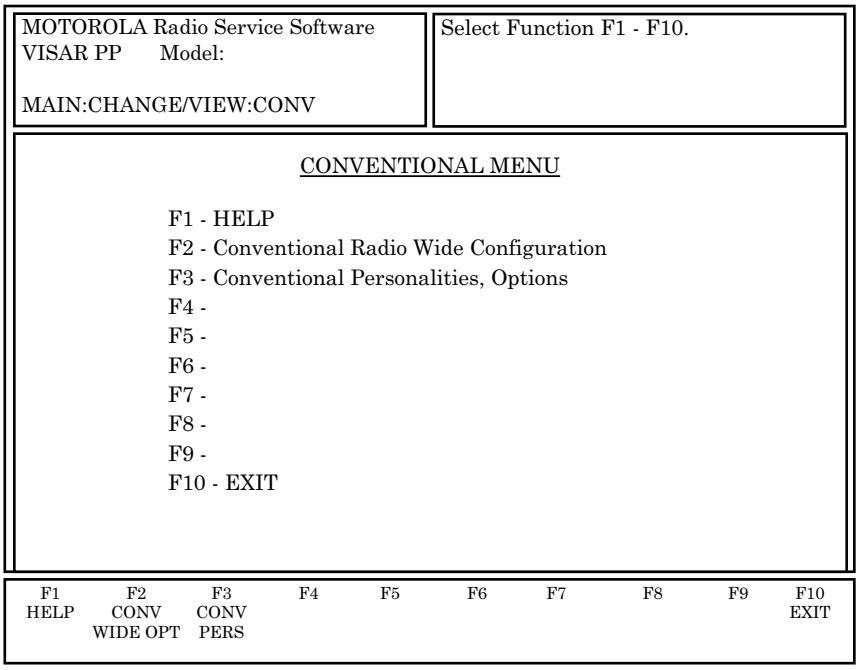
Twenty Channel Synthesized

Select Disabled Only for compatibility with older systems that were limited to five voice channels. The Radio will request only the first five channels of the trunking system for any voice calls. The factory default is Enabled.

Talk Permit Tone	Use the UP/DOWN arrow keys to enable/disable Talk Permit Tones. The Talk Permit Tone (which consists of three quick tones) is sounded when the radio has received a channel from the system and is ready to transmit. The factory default is Disabled.
CA/PC Decode Ignore	Use the UP/DOWN arrow keys to enable/disable Blocking of Pending Call Alerts or Private Calls. When this feature is enabled, the radio will ignore all successive Call Alerts (or Private Calls) after receiving a Call Alert (or Private Call) with a different ID than that of the pending call. The factory default is Disabled.

Conventional Menu

From the MAIN MENU, press **F4** and then **F6** to access this screen.



This screen allows you to navigate to the Conventional edit screens. The options in these menus pertain only to Conventional radio features.

Function Key Descriptions

F2 - CONV WIDE OPT (Conventional Radio Wide Options)

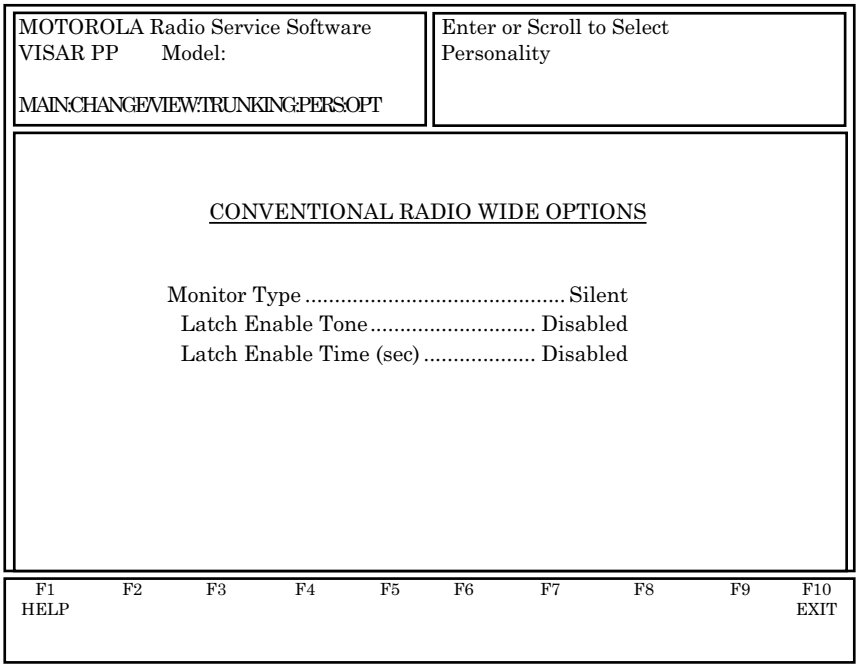
Applicable to all conventional channels, such as monitor type.

F3 - CONV PERS (Conventional Personality)

This screen is used to define conventional frequencies, coded squelch type (PL/DPL), and conventional options (phone, scan, etc.) permitted on each channel.

Conventional Radio Wide Options

From the MAIN MENU, press **F4**, **F6** and then **F2** to access this screen.



The options and parameters on this screen apply to all conventional channels and personalities.

Other radio-wide options that apply to both conventional and trunking operation are located on the RADIO WIDE OPTIONS screen (**F4/F3/F2**).

Trunking options are located on the TRUNKING RADIO WIDE OPTIONS screen (**F4/F4/F2**).

Field Definitions

Monitor Type

Use the UP/DOWN arrow keys to select the type of Monitor operation.

Open Squelch	Monitor button disables squelch.
Silent	Monitor button disables PL or DPL.

This option determines how the radio unmutes when the monitor button is pressed. Silent Monitor, also called PL Defeat, allows the user to monitor the channel before transmitting. The factory default is Open Squelch.

Latch Enable Tone

Use the UP/DOWN arrow keys to enable a Latch Tone (beep) when the monitor button is latched. The monitor button may be momentarily pressed, or may be latched by pressing the monitor button for a short period of time.

This option causes the radio to give a short beep each time the permanent monitor function has been enabled. Permanent monitor is canceled by pressing the monitor button again. The factory default is Disabled.

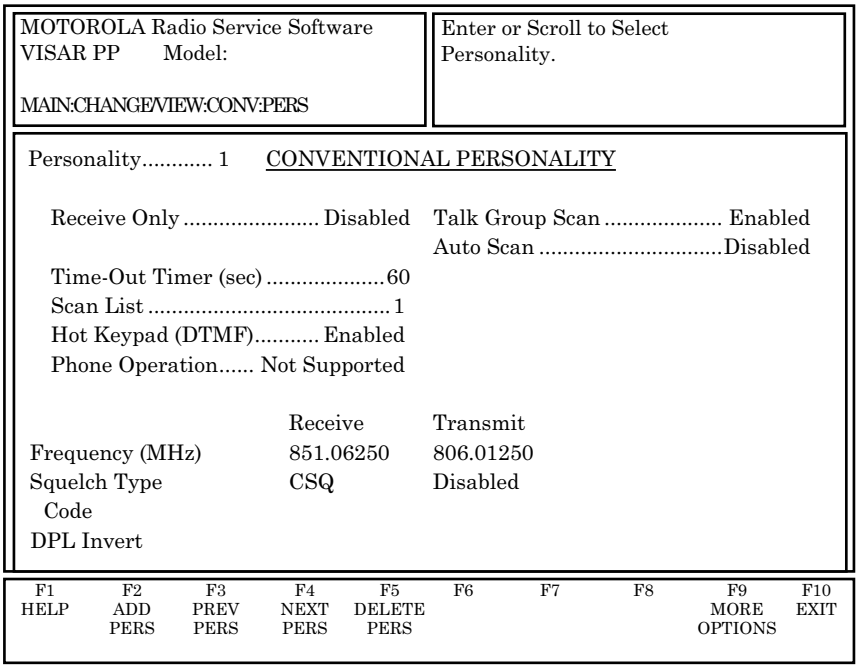
Latch Enable Time (sec)

Use the UP/DOWN arrow keys to select the Latch Time for the Permanent Monitor option. Values of between 0 and 6 seconds may be selected in 0.5-second increments. When this field is set to zero, Permanent Monitor is disabled.

The monitor button may be momentarily pressed, or may be latched by pressing the monitor button for the Latch Enable Time. The option causes the radio to give a short beep each time the permanent monitor function has been enabled. Permanent monitor is canceled by pressing the monitor button again. The factory default is 2 seconds.

Conventional Personality

From the MAIN MENU, press **F4**, **F6** and then **F3** to access this screen.



This screen allows the user to edit information for conventional operation.

Function Key Descriptions

F2 - ADD PERS — Allows you to add a Conventional personality.

F3 - PREV PERS — Allows you to move back to the previous personality.

F4 - NEXT PERS — Allows you to move forward to the next personality.

F5 - DELETE PERS — Removes the current personality. You will be prompted for a second response before the personality is deleted. The only way to recover a deleted personality is to immediately re-read the radio or the archive file. However, any other changes that were made and not previously saved will still be lost.

F9 - MORE OPTIONS — Allows access to additional parameters that can be used to customize your radio to your specific system requirements.

Field Definitions

Receive Only

Use the UP/DOWN arrow keys to enable/disable Receive-only operation on this personality. If enabled, all transmissions including signaling are inhibited. The factory default is Disabled.

Time-Out Timer (sec)

Use the UP/DOWN arrow keys to select the Time-Out Timer (TOT) for this personality. Time-Out Timer determines the amount of time the radio can continuously transmit before the radio must be de-keyed. When the Time-Out Timer is about to expire, the radio beeps and then stops transmitting. Each personality may choose one of eight different TOT values. These values are: 15, 30, 45, 60, 90, 120 and 180 seconds and Infinite (i.e., Time-Out Timer disabled). The factory default is 60 seconds.

Hot Keypad (DTMF)

Use the UP/DOWN arrow keys to enable/disable Hot Keypad (DTMF while transmitting) operation for this personality. When this feature is enabled, the keypad is live during all dispatch operation. Pressing any digit 0-9, *, or # will cause that digit to be transmitted. The factory default is Disabled.

Receive Frequency (MHz)

Enter the Receive frequency directly in MHz. Optionally, the UP/DOWN arrow keys may be used to scroll through valid channels. Blank receive frequencies are not allowed. Refer to the Motorola Catalog Sheets and/or Price Pages for valid receive frequencies for this model.

Transmit Frequency (MHz)

Enter the Transmit frequency directly in MHz. Optionally, the UP/DOWN arrow keys may be used to scroll through valid channels. Refer to the Motorola Catalog Sheets and/or Price Pages for valid transmit frequencies for this model.

Squelch Type

Use the UP/DOWN arrow keys to select the desired squelch type from among the following:

CSQ	Carrier Squelch (Receive Only)
PL	Tone Private-Line
DPL	Digital Private-Line
Disabled	(Transmit and Direct Only)

A data field for PL/DPL code will be displayed if PL or DPL are selected.

Code

Enter the PL/DPL Digital (Private-Line) code directly (ex., 023). Leading zeros are required. Optionally, the UP/DOWN arrow keys may be used to scroll through the standard codes.

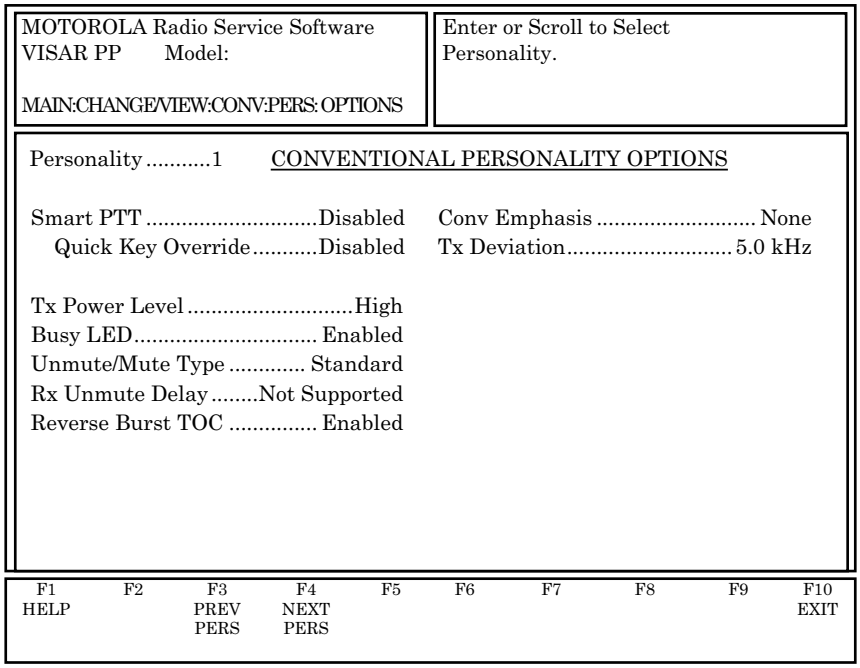
DPL Invert

Use the UP/DOWN arrow keys to invert the transmitted DPL code. The factory default is Disabled.

Talkgroup Scan	Use the UP/DOWN arrow keys to enable/disable the Talkgroup Scan option for this personality. When enabled, the user may use a button or Auto Scan to scan while on this personality. The factory default is Disabled.
Auto Scan	Use the UP/DOWN arrow keys to enable/disable the Auto Scan option for this personality. When enabled, the radio will automatically scan when on this personality. To use a scan on/off button, this option must be Disabled. The factory default is Disabled.

Conventional Personality Options

From the MAIN MENU, press **F4**, **F6**, **F3** and then **F9** to access this screen.



The CONVENTIONAL PERSONALITY OPTIONS MENU permits access to additional features and options to further customize the radio configuration to your specific communication needs. Caution should be observed when changing parameters on this screen. System parameter changes can substantially degrade performance if they are not made system-wide.

Function Key Descriptions

F3 - PREV PERS — Allows you to move back to the previous personality.

F4 - NEXT PERS — Allows you to move forward to the next personality.

Field Definitions

Smart PTT

Use the UP/DOWN arrow keys to enable/disable the Smart PTT function.The radio can either inhibit transmission on detection of a carrier, or inhibit transmission upon detection of a non-matching PL code.

This feature prevents users from listening in to conversations (or transmitting over conversations) that they are not part of. The Monitor button is Disabled when this feature is active. The factory default is Disabled.

Quick-Key Override

Use the UP/DOWN arrow keys to enable/disable the Smart PTT (Push-to-Talk) Override feature. If this feature is enabled, the user can transmit on a busy channel by a quick key (double press) of the PTT switch. The factory default is Disabled.

TX Power Level

Use the UP/DOWN arrow keys to select High or Low transmit power for this personality. The transmit power may be reduced by one watt for 800- and 900-MHz models, and by two watts for VHF and UHF models. The factory default is High.

Busy LED

Use the UP/DOWN arrow keys to enable/disable the flashing red LED to indicate the presence of a carrier (busy channel). The factory default is Enabled.

Unmute/Mute Type

Use the UP/DOWN arrow keys to select the receiver muting and unmuting characteristics for this personality from among the following:

Standard	The radio unmutes audio when there is a valid PL (or DPL) signal, and mutes when the PL (DPL) signal is no longer present. Use this option for Carrier Squelch operation.
Unmute, Std Mute	The radio unmutes only when there is a valid PL (or DPL) signal AND there is a carrier strong enough to break squelch. The radio mutes when the PL (or DPL) signal is no longer present.
Unmute, OR Mute	The radio unmutes only when there is a valid PL (or DPL) signal AND there is a carrier strong enough to break squelch. The radio mutes when the PL (or DPL) signal is no longer present OR the squelch closes (weak carrier).

The factory default is Standard.

Reverse Burst TOC

Use the UP/DOWN arrow keys to enable/disable the Reverse Burst (PL), or turn-off code (DPL), to be transmitted after the radio is de-keyed. The Reverse Burst or turn-off code is used to signal to the receiving radio that the transmission is ending, and to mute the audio. By muting before the carrier drops, the noise burst (squelch tail) on the receiving end is substantially reduced. The factory default is Enabled.

Conv Emphasis

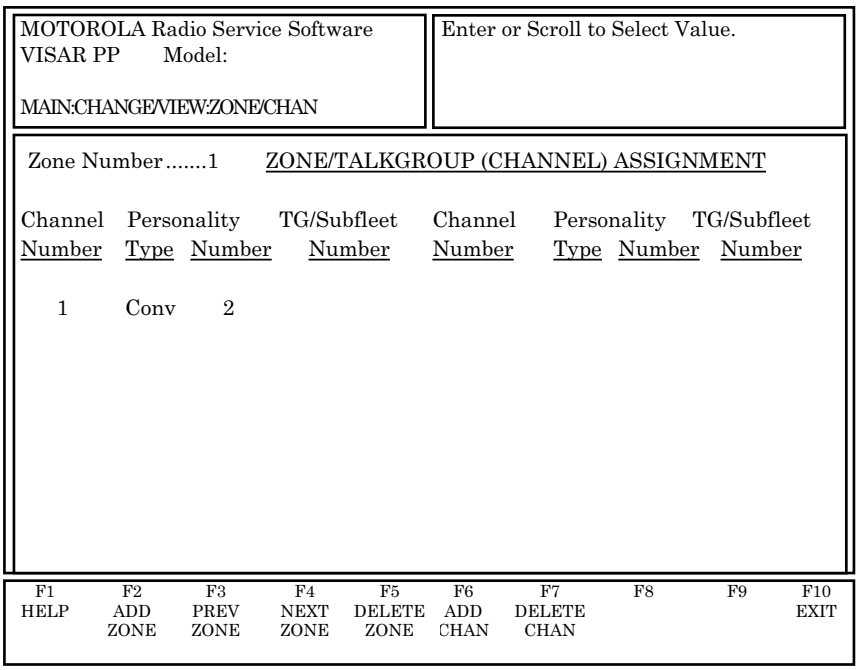
Use the UP/DOWN arrow keys to select the Emphasis for this personality. Pre-Emphasis amplifies the higher frequencies so that when they are transmitted, the signal-to-noise ratio is better. De-emphasis reverses the pre-emphasis after the signal has been received. The choices are:

None	No Emphasis
De-Emphasis	De-Emphasis only
Pre-Emphasis	Pre-Emphasis only
De-Emph/Pre-Emph	Both De-Emphasis and Pre-Emphasis.

The factory default is De-Emph/Pre-Emph.

Zone/Channel Assignment

At the MAIN MENU, press **F4** and then **F8** to access this screen.



A zone is an artificial grouping of channels (or talkgroups) to permit ease of operation. Generally, all members of a zone will reflect some common characteristic such as geographic location, job function, signaling type, etc. Each member of a zone is defined by selecting a conventional personality, or a trunking personality and a talkgroup/subfleet. Zones and channels can be added and deleted via the function keys specified at the bottom of the screen.

Press **Tab** to select the desired field, or press the desired function key (**F1- F10**). If a field is selected, press the UP/DOWN arrow keys to select choice or value.

> **Note:** The maximum Zone/Channel combinations allowed is 16. This means that the sum of all channels in all the zones should not be more than 16.

Function Key Descriptions

F2 - ADD ZONE — Allows you to add a zone.

F3 - PREV ZONE — Allows you to go to the previous zone.

F4 - NEXT ZONE — Allows you to go to the next zone.

F5 - DELETE ZONE — Allows you delete a zone.

F6 - ADD CHAN — Allows you add a channel.

F7 - DELETE CHAN — Allows you to delete a channel.

Field Definitions

Zone Number	Use the UP/DOWN arrow keys to select the desired zone. The number may also be entered directly. Zones may be added or deleted using function keys specified at the bottom of the screen.
Channel Number (Read-only)	A channel number refers to the position in the list which a particular member occupies.
Personality Type	Use the UP/DOWN arrow keys to select either a conventional or trunked personality for each zone member. Both types may be assigned within a single zone. Personalities must be defined before they can be assigned on this screen. Trunking personalities are entered on the TRUNKING PERSONALITY screen (**F4/F4/F4**), and conventional personalities are entered on the CONVENTIONAL PERSONALITY screen (**F4/F6/F3**).
Personality Number	Use the UP/DOWN arrow keys to select the personality number for this channel. The number may also be entered directly. Personalities must be defined before they can be assigned on this screen. Trunking personalities are entered on the TRUNKING PERSONALITY screen, (**F4/F4/F4**), and conventional personalities are entered on the CONVENTIONAL PERSONALITY screen (**F4/F6/F3**).
Subfleet Number	Use the UP/DOWN arrow keys to select the Trunking Talkgroup (or Subfleet) ID for this channel. The ID will be displayed in hexadecimal. Select ATG for an Announcement Group or FLT for Fleet wide. Valid talkgroups for each personality must be defined on the TRUNKING TALKGROUPS MENU (**F4**/**F4**/**F4**/**F7**) before they may be assigned on this screen.

6

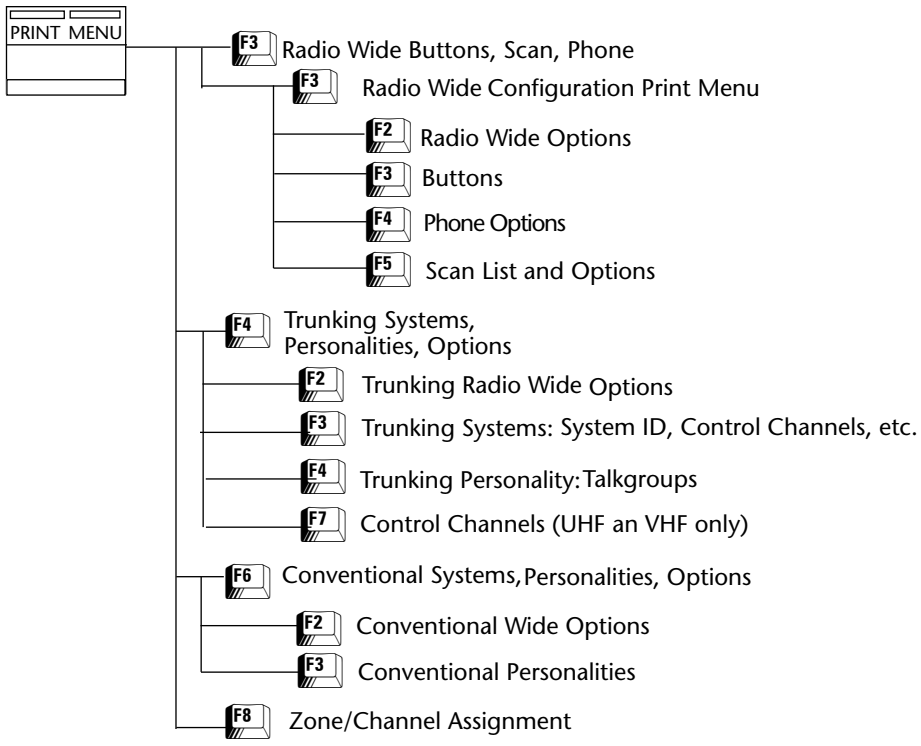
Print Menu Functions

The print function is used to produce permanent records of codeplug configurations and/or RF alignment settings. A printer is required and should be connected to your computer according to the user's manual that came with your computer. Graphics capability is NOT required.

In order to print radio configuration data, you must first read or get a codeplug file using the GET/SAVE MENU and related screens.

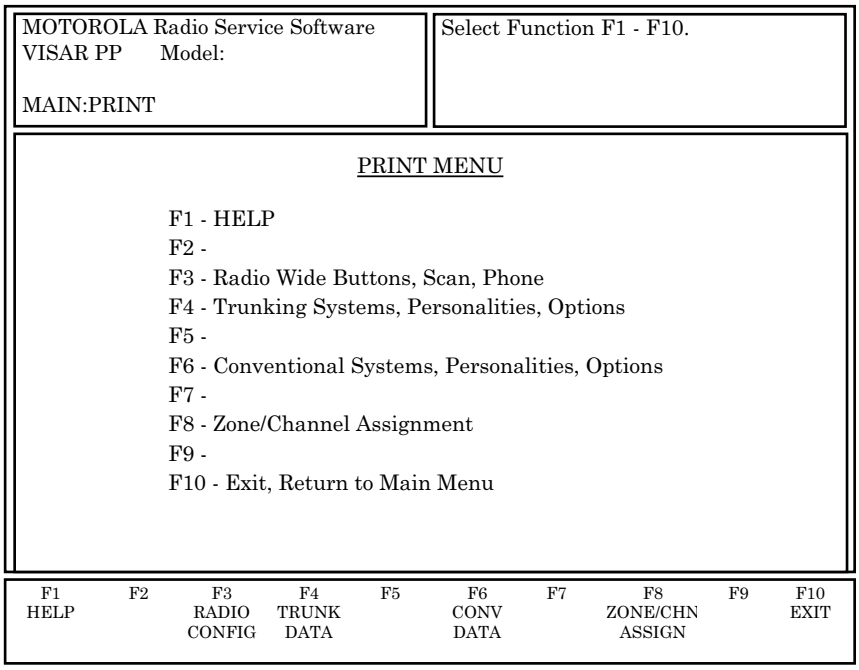
Each print-out will contain the following data in addition to configuration information: radio model and serial number information, software version numbers, RSS version numbers, and the date and time of the print-out.

Menu Map



Print Menu

At the MAIN MENU, press **F5** to access the PRINT MENU.



Make sure you have read a codeplug file using the GET/SAVE functions before you attempt to print configuration information.

Function Key Descriptions

F3 - RADIO CONFIG (Radio Configuration)

This function prints out a summary of radio configuration information, including Button programming, Phone Options and Scan List.

F4 - TRUNK DATA (Trunking Data)

This function prints a summary of all trunking system information, including control channels, IDs and connect tones of all major personality features.

F6 - CONV DATA (Conventional Data)

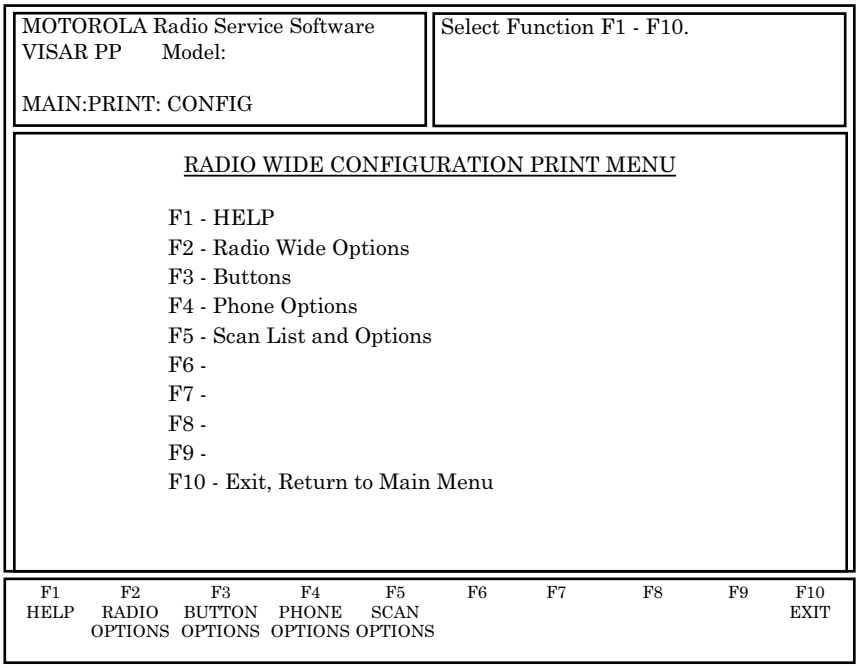
This function prints out a summary of conventional personalities information.

F8 - ZONE/CHANNEL ASSIGNMENT

This function prints out a summary of current Zone/Channel information for the radio.

Print Radio Wide Features Configuration Menu

From the MAIN MENU, press **F5** and then **F3** to access the RADIO WIDE CONFIGURATION PRINT MENU.



The PRINT function is used to produce permanent records of codeplug configurations. A printer is required and should be connected to your computer according to instructions in the user's manual that came with your computer. Graphics capability is NOT required.

You must use the GET/SAVE functions to first read or get a codeplug for printing radio configuration data.

Each print-out contains radio model and serial number information, software version numbers, Radio Service Software version numbers, and the date and time of the print-out.

Function Key Descriptions

F2 - RADIO OPTIONS — Prints a summary of radio configuration information.

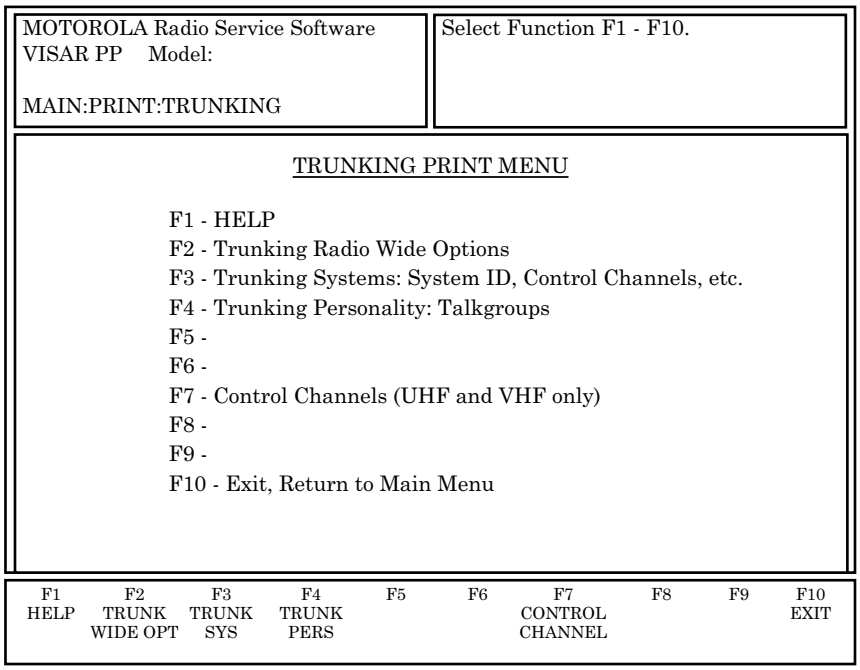
F3 - BUTTON OPTIONS — Prints a summary of button programming information.

F4 - PHONE OPTIONS — Prints a summary of phone settings information.

F5 - SCAN OPTIONS — Prints a summary of the scan list.

Trunking Print Menu

At the MAIN MENU, press **F5** and then **F4** to bring up the TRUNKING PRINT MENU.



The PRINT function is used to produce permanent records of codeplug configurations. A printer is required and should be connected to your computer according to the instructions in the user's manual that came with your computer. Graphics capability is NOT required.

You must use the GET/SAVE functions to first read or get a codeplug for printing radio configuration data.

Each print-out contains radio model and serial number information, software version numbers, Radio Service Software version numbers, and the date and time of the print-out.

Function Key Descriptions

F2 - TRUNK WIDE OPT (Trunking Radio Wide Options) — Prints out Trunking Radio Wide Options information.

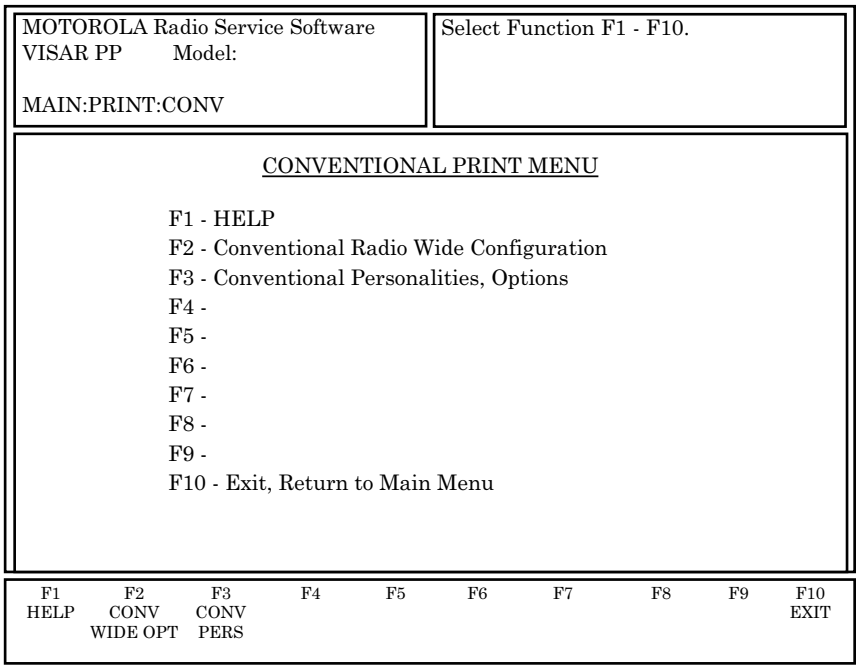
F3 - TRUNK SYS (Trunking Systems) — Allows you to print the Trunking Systems information such as data pertaining to system IDs, control channels, etc.

F4 - TRUNK PERS (Trunking Personality) — Prints a summary of the Trunking Personality information such as talkgroups, emergency options etc.

F7 -CONTROL CHANNEL — Prints out Control Channel data for UHF and VHF radios.

Conventional Print Menu

At the MAIN MENU, press **F5** and then **F6** to access the CONVENTIONAL PRINT MENU.



The PRINT function is used to produce permanent records of codeplug configurations. A printer is required and should be connected to your computer according to instructions in the user's manual that came with your computer. Graphics capability is NOT required.

You must first read or get a codeplug using the GET/SAVE functions in order to print radio configuration data.

Each print-out contains radio model and serial number information, software version numbers, Radio Service Software version numbers, and the date and time of the print-out.

Function Key Descriptions

F2 - CONV WIDE OPT (Conventional Radio Wide Options)

Prints a summary of the conventional radio wide options information.

F3 - CONV PERS (Conventional Personality)

Prints a summary of the conventional personality information.

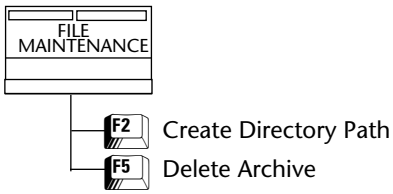
Notes

File Maintenance Menu Functions

7

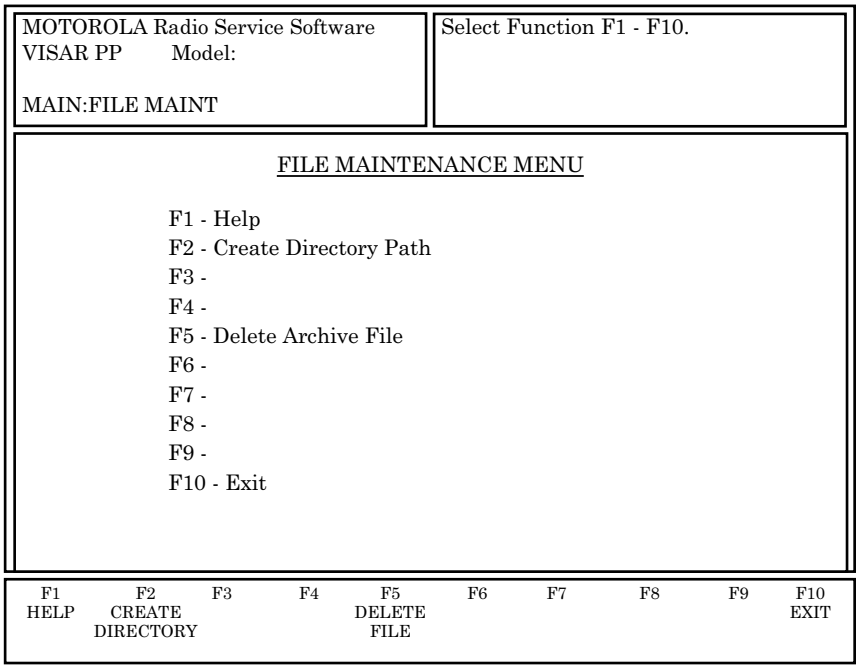
This section describes all the functions available from the FILE MAINTENANCE MENU. To guide you through these functions, related menus and screens are shown with their paths from the MAIN MENU, function key descriptions and field definitions.

Menu Map



File Maintenance Menu

At the MAIN MENU, press **F6** to access the FILE MAINTENANCE MENU.



This RSS feature allows you to perform file management tasks from within the Radio Service Software package. Such tasks as creating directories, deleting files, updating back-up files and restoring database files, can be accomplished without exiting the program.

Function Key Descriptions

F2 - CREATE DIRECTORY

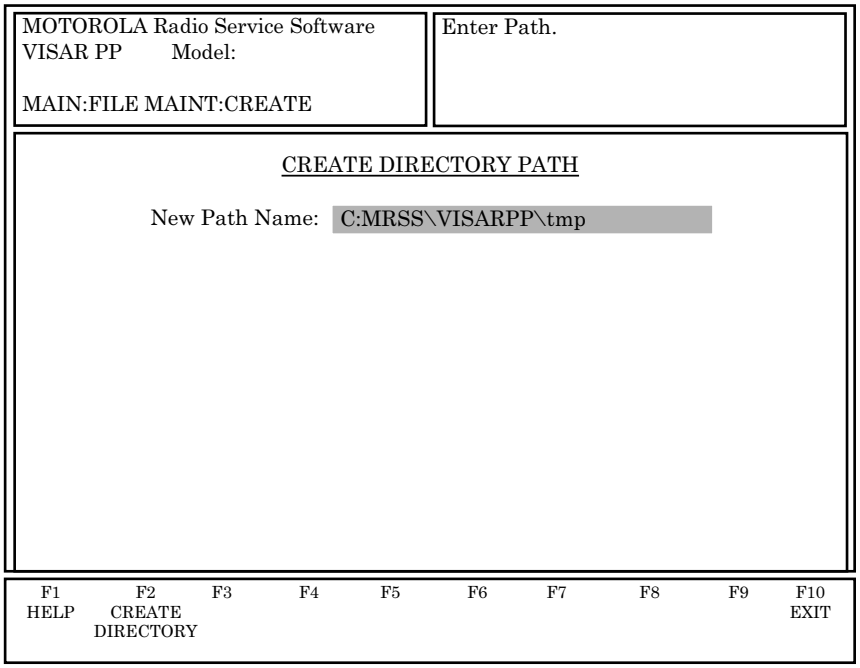
Allows you to create a directory. This function is similar to the DOS MKDIR command.

F5 - DELETE FILE

Allows you to delete a file from the path. This feature is similar to the DEL file name command in DOS.

Create Directory Path

From the MAIN MENU, press **F6** and then **F2** to bring up this screen.



This screen allows you to create a new directory on your computer disk drive. This is similar to the MKDIR command in DOS.

Type in the new directory path name, or press the desired function key (**F1** - **F10**). If you created a new directory path, press **F2** to create an archive.

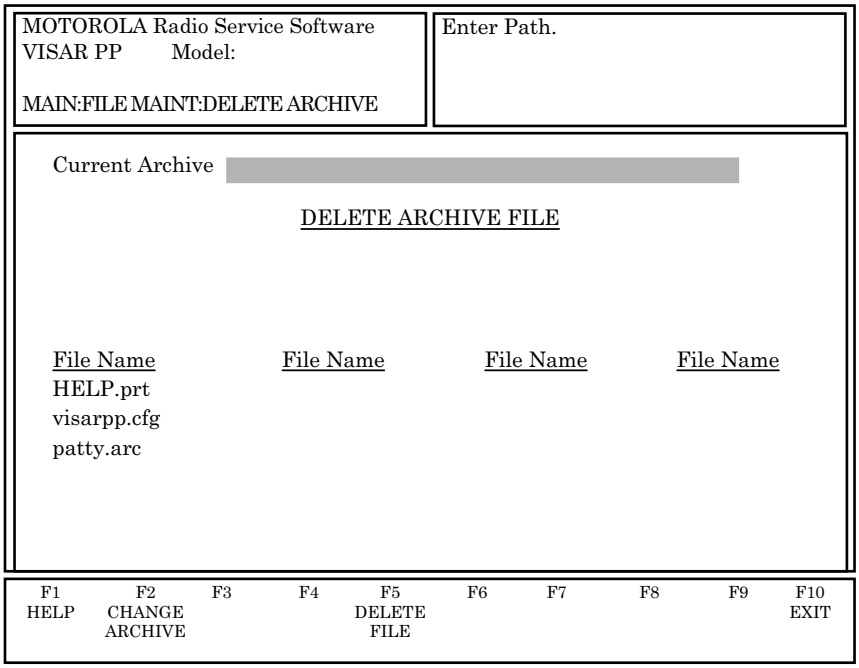
Function Key Description

F2 - CREATE DIRECTORY

Allows you to create a directory. This command is similar to the MKDIR command in DOS.

Delete Archive File

From the MAIN MENU, press **F6** and then **F5** to bring up this screen.



This screen allows you to delete unwanted files. Enter the path of the directory which holds the unwanted files by typing the path name in the Current Archive field. Press **Tab** or **Enter** to select the desired file name. Once you have selected the file name, press the desired function key (**F1 - F10**).

Function Key Descriptions

F2 - CHANGE ARCHIVE

Allows you to log on to a different directory from the current directory. This function is similar to the CHDIR command in DOS.

F5 - DELETE FILE

Allows you to delete a file from the path. This function is similar to the DEL file name command in DOS.

Field Definitions

Current Archive

The default archive path will always be the specified default path from the SETUP CONFIGURATION MENU (**F9**). Refer to the owner's manual that came with your computer for a complete description of directories and path names.

File Name

This is the name of the file that contains codeplug data. Refer to the owner's manual that came with your computer for a complete description of file names.

Programming Interface Cable Connections

A

RIB-to-Computer Cable Connections

Signal Description	RIB End (15-pin)	30-80369B71 PC XT End (25-pin)	30-80369B72 PC AT End (9-pin)
CTS (Clear to Send)	N.C.	5*	8*
DTR (Data Terminal Ready)	13	20	4
GND (Signal Ground)	9	7	5
RxD (Received Data)	10	3	2
RI (Ring Indicator)	14	22*	9*
TxD (Transmitted Data)	11	2	3
* = Jumper Together N.C. = No Connection			

RIB-to-VISAR Radio Cable Connections (30-80369B73)

Signal Description	RIB End (25-pin)	Radio End (9-pin)
Busy	6	9*
Bus +	15	14
Bus -	11	10
Ground	1	8*
Ignition Sense	N.C.	5
Speaker Hi	N.C.	6
Speaker Lo	N.C.	7
Switched B+	12	4
Emergency	N.C.	2*
* = Jumper Together N.C. = No Connection		

Notes

Glossary

Active channel	A channel upon which the radio is receiving or transmitting.
Adjustment	A means of tuning a radio parameter to a specified value.
Align	To adjust any parameter that can be tuned to obtain optimum product performance.
Antenna connector	The UHF/VHF RF coax connector located on the top of the radio used to connect the antenna to the radio.
Archive file	The contents of the radio's codeplug. A computer disk or diskette file that contains the personality data of a radio. Archive files are named according to radio serial numbers.
Asynchronous Communication	A method of data communication in which information is transmitted one character at a time, with no specific starting time. Each character is preceded by a start bit and followed by one or more stop bits.
CA	Call Alert.
Call Alert	A Stat-Alert signalling feature that is similar to a tone-only or a tone-and-voice pager. The "page" can leave a persisting indication on the target radio. A Call Alert stops the channel scan until the alert is cleared.
Call light	A visual indicator that flashes when a transmission is received.
Call list	A list of IDs, from one or more signalling formats, used to send a message to individual groups.
Channel	A single path, separated by frequency or time divisions, for transmitting electrical signals. A receive (one-way) or receive-and-transmit (two-way) frequency path.
Cloning	A Radio Service Software function which allows quick duplication programming of a radio's codeplug data to many radios. Electronic tuning/alignment information is the only data not copied.
Cloning cable	A radio-to-radio connector cable used to program one radio's personality into another radio.
Codeplug	The solid-state EEPROM device inside a radio that contains the radio's personality data.
COMport	The logical name of the serial port available on IBM PC computers. They may be COM1, COM2, COM3 or COM4.

Communications port	See COMport.
Database	An organized file containing records or related data.
Data entry screen	Formatted display with highlighted fields for entering data/ parameters.
Data Operated Squelch	See “DOS”.
Defaults	Standard settings that the RSS uses for I/O port locations, file locations and display settings.
Default Drive	The disk or diskette drive that the RSS will use to get or save data or files. You can change the default drive from the SERVICE SOFTWARE CONFIGURATION MENU.
Default field value	The values a field will automatically contain if a user does not specifically change it.
Directory	A location for a group of files on a disk/diskette which are similar in content.
Diskette	An alterable, semi-flexible, magnetic storage medium used by microcomputers to store data and files. Also called a disk, floppy disk, or mini diskette. The RSS is delivered on diskettes.
Diskette drive	A disk drive that uses removable magnetic diskettes.
Display	The CRT terminal that the computer displays information on.
DOS	Data Operated Squelch. When enabled, DOS will detect an incoming packet of the same signalling scheme as the radio, and squelch the audio for the duration of the packet. A small blip of data will be heard, but most of the packet will not be heard.
EEPROM	Electronically Erasable Programmable Read Only Memory. Used by the radio microcomputer system to store the radio’s codeplug data (personality).
Emergency Alarm	A feature that triggers an alarm output on a console when an emergency signalling message is received.
Encoder features	Features relating to transmit (or encode) portion of a signalling system or systems.
Error	Any condition that prevents the RSS from functioning normally or any input/response that deviates from what the RSS was designed to accept. The RSS typically displays an error message and the computer “beeps”.
Exit	To leave the current display screen and return to the previous screen. The RSS uses the **F10** function key for all exit operations.
Field	The modifiable area located next to a feature on the screen. The currently selected field is always highlighted.

Field choices	A set of direct-entry values (or values that can be scrolled) from which a user may select to populate a field (feature) on an RSS screen.
File	A collection of data or information stored on a computer disk or diskette that can be read by a computer. If a file is "executable" (a .EXE at the end of a file name), it is sometimes called a command or a program. Also see "Archive file".
Fixed disk	See "Hard Disk".
Floppy disk	See "Diskette".
Floppy disk drive	A disk drive that uses removable magnetic disks.
Frequency	The location of an RF channel operating in the radio spectrum (typically measured in MHz).
Function keys	The ten (or twelve) keys located on the PC keyboard that are labeled **F1** through **F10** (or **F1** through **F12**) that perform specific functions within the RSS.
GET	The computer action that transfers data from a radio codeplug or from a radio archive file to the computer's RAM for use by an RSS user. Synonymous with "read".
Hard disk	An alterable permanent magnetic storage medium with a much larger storage capacity than a diskette, located inside the computer's system unit, not visible from the outside. Typically a microcomputer hard disk can store 10 to 200 million pieces of data, compared to approximately 400,000 to one million pieces for a diskette.
Help	An on-line reference manual accessed using the **F1** function key. Press the **F1** function key at any time for additional information about the current menu or highlighted data field on a screen.
Highlighting	Displaying text on the display by using dark letters on lighter background or vice-versa.
Home channel	The channel the user was on prior to pushing the scan button.
Inverse video	Displaying text on the monitor by inverting the video (For instance, black becomes white and white becomes black.)
kHz	Kilohertz, thousands of cycles per second.
Logic board	The circuit board within the radio that contains the embedded microprocessor and other logic-related components.
Menu	Contains a list of functions that can be selected and performed by pressing a function key. Also see "Screen".
Microcomputer	A personal computer that comprises a keyboard, a monitor, and a system unit (used to program features into and control the functioning of the radio).
MHz	Megahertz, million of cycles per second.

Mode	A mode is a collection of personality values, such as frequency, PL codes and scan lists, and is assigned a number in the Name field.
Mode number	The number assigned to a particular mode.
MS-DOS	Microsoft Disk Operating System. DOS is a group of programs that control the way the computer interfaces with other programs, that instructs the computer how to use, read and return information to and from application programs and how to organize/use information on disks.
Operating System	A computer program that coordinates your computer's activities, such as memory allocation, file management, input and output operations, communications and interfacing to other application software packages, such as the RSS.
Path	The location of a sub-directory on a disk or diskette. Paths start at the root directory of the disk or diskette and end at the directory containing the desired file. For example, the directory path C:\MRSS\GM300\ARCHIVE shows the hierarchy or ordering of directories the computer must descend to reach a file located under the ARCHIVE directory.
Path name	See "Path".
PC	Personal computer.
Personality	A term used to describe the data in the radio's codeplug or in an archive file that contains a set of unique features that is customer specific.
Personality file	A file that contains the data to be stored in a radio's EEPROM. This file contains information such as receive frequency, transmit frequency, squelch code, etc.
Pop-up window	A message area which overlaps on a data entry/display area; used to indicate a data entry error or to verify destructive commands and provide function key choices for the next course of action. Also known as the Dialog Box.
Port	A parallel or serial hardware interface connection at the back of a computer used to communicate with other hardware devices, such as a radio, a modem or a printer. A port is normally designated by a slot position such as COM1, COM2, COM3 or COM4.
Program	1) A set of computer instructions designed to have the computer perform a specific sequence of actions. 2) A means by which data in the workspace is transferred from the computer to the radio's EEPROM.
Program tree	A figurative term used to describe the organization of a multi-level menu-driven software program
PTT	Push-To-Talk feature or button.

PTT-ID	Push-To-Talk IDentification. A feature that sends your radio's identification number on each transmission.
Radio Interface Box	See "RIB".
Radio Interface Cable	A cable that allows the radio to be connected (interfaced) with a host computer for programming or tuning.
Radio Service Software	Software purchased by Motorola product resellers through a license agreement that is delivered on 5-1/4" diskettes and 3-1/2" diskettes and used to program two-way radios with a unique set of features called personalities.
RAM	Random Access Memory. A PC's RAM is used to store the contents of the current workspace. The radio's RAM is loaded with a copy of the EEPROM data. The program will sometimes write to the radio's RAM to temporarily change certain features in order to provide the user with immediate feedback. These changes will not become permanent in the radio's codeplug until the radio is programmed.
Read	The means by which a radio's codeplug information is transferred from the radio's EEPROM to the workspace via the RIB.
Receive frequency	The center of the receive channel in MHz.
Restore	File management function which enables copying from one computer file to another existing file (i.e., from back-up to working copy).
RIB	Radio Interface Box. Used to connect a computer system to a radio for the purpose of communication between the radio and the computer. The RIB consists of level-shifting circuits that convert from the standard RS-232 voltage levels of the computer's asynchronous serial interface to the single-ended voltage levels present on the Serial Bus contacts of the radio's feature connector. In conjunction with the RIB, an appropriate RIB-to-radio cable and RIB-to-computer cable must be used.
Root	The highest or topmost directory level of a computer disk or diskette.
RS-232	An asynchronous, serial data transmission standard that defines the required sequencing, timing and hardware interface.
RX	Receiver.
Scan	Scan is the process by which the radio checks receive frequencies stored in a list for activity. If activity is found, then the radio is locked on that frequency until the frequency is no longer active.
Screen	A screen contains four rectangular areas, one of which (the working area) contains a list of fields (features) that can be viewed and programmed by the RSS user by pressing certain keyboard keys. Also see "Menu".
Serial ports	See "Port".
Signalling systems	Systems used to alert radio operators or to perform specific functions using the radio.

Squelch	A radio circuit which eliminates noise from the loudspeaker when a "received" signal is not present.
Sub-directories	A group of related files that are located on a hard disk or diskette. Sub-directories are used to organize your disks. Also see "Path".
Synthesizer	The frequency generating unit of a radio.
Tab	A keyboard key which moves the prompt to the next data entry field.
Talkaround frequency	A frequency used for simplex conversions or radio-to-radio communications without the use of a repeater.
Talkback	Indicates that a call can be answered by pressing PTT and dispatching a response.
Talkback scan	Allows the operator to respond to a call on the same channel as the call during the talkback time in scan.
Time-Out Timer (TOT)	A function that limits the transmission period to a pre-defined time. The radio will automatically stop transmitting when the timer goes off after the pre-defined time and will generate an alert tone to notify you that no transmission is taking place.
Workspace	The contents of the radio's EEPROM transformed into ASCII values and stored in the computer's RAM while the RSS is being used.

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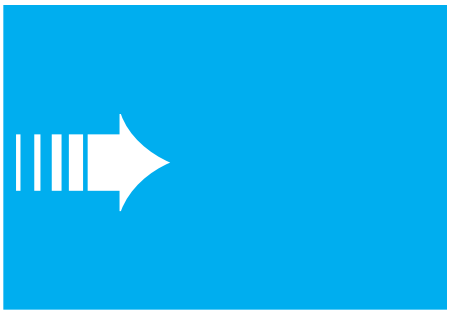

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