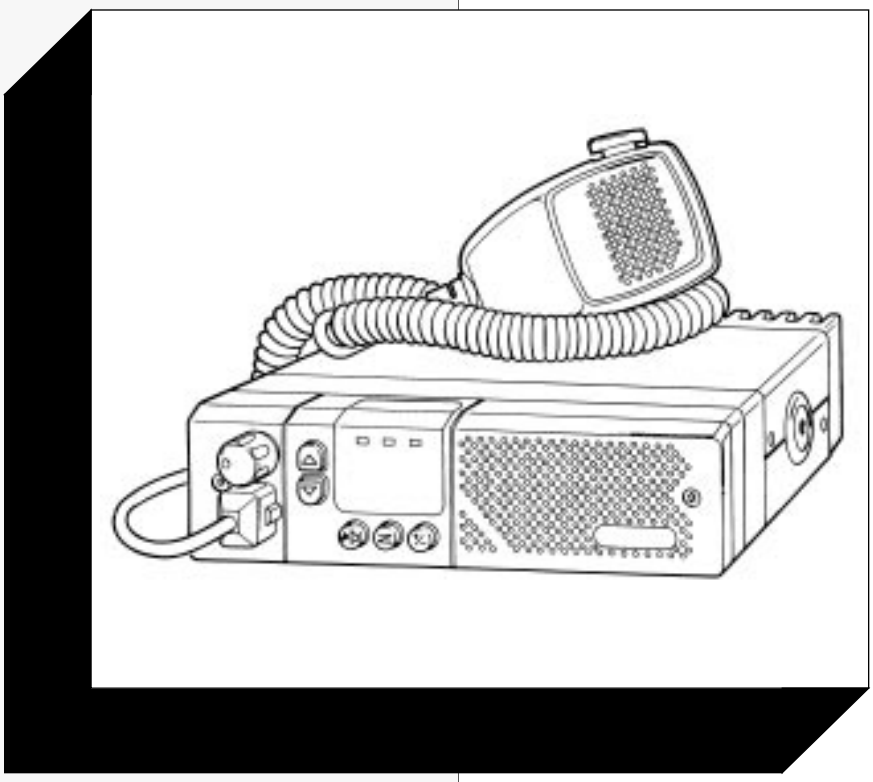
Radius GM300

Mobile Radio

The Dealer's Radio Service Software Manual



MOTOROLA

Radius Products Division
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Radius

Radius Products Division
Hwy 34, West
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USA

Dedicated to Radius dealers and servicers world-wide...

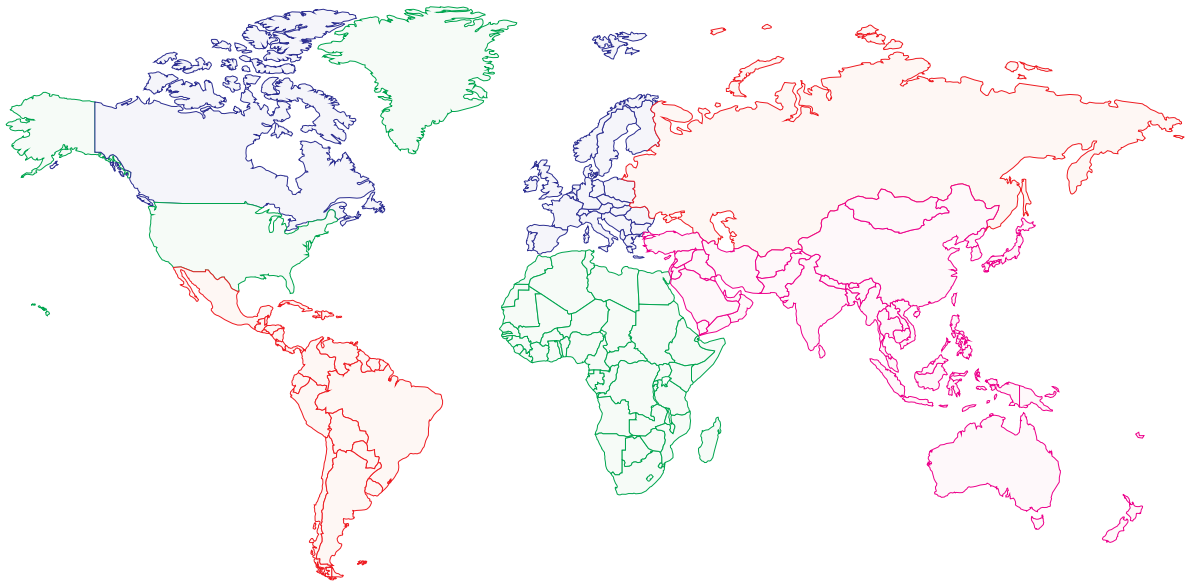

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Table of Contents

1 Introduction

1.1 Overview

Welcome to the world of two-way radio programming from Radius a division of Motorola. This manual is targeted for anyone who wants to program features into the Radius GM300 mobile radio. This feature programming, or customizing, personalizes a radio for an individual customer's needs, resulting in radios with unique “personalities.”

The Radius GM300 series of mobile radios has a unique set of features, including:

- ❏ Programmable accessory connector
- ❏ Unique PL/DPL codes for each channel
- ❏ Signalling capabilities with the RapidCall Signalling system
- ❏ Channel scan
- ❏ Maintenance-free tuning, due to the wideband capability

This feature set makes the Radius GM300 an ideal radio for commercial businesses and police and fire protection services that typically use radios in their service vehicles.

How can Radius design radios with such a wide range of features and still offer radio servicers the ability to customize and personalize radios? The answer is in the modern microprocessor chip technology in the radio and the use of Radius' Radio Service Software (RSS) - a computer program that, when interfaced with a radio, electronically programs and personalizes a radio with a unique set of features for each individual customer. The RSS program is found on the diskettes included with this manual (Package HVN8177).

Note: No tools are needed to use the RSS program.

1

The following are some of the features and functions available when using the RSS program:

GM300 RSS Programmable Features	GM300 RSS Service Functions
Transmit (Tx) frequencies	Reference oscillator alignment
Receive (Rx) frequencies	Transmit deviation alignment
PL/DPL codes	Transmit power alignment
Signalling system parameters*	Replaced power amplifier calibration
Scan lists and scan options	Replaced logic board calibration
Accessory connector definition*	Replaced RF board calibration

(** 16 Channel Model only*)

Figure 1-1. RSS Programmable Features and Functions

This radio customizing and servicing is accomplished by using a standard IBM-XT/AT (or compatible), IBM convertible, or System/2 Model 30/50/70 computer.

Note: Prior to purchasing a computer, we recommend you test any computer's RSS "compatibility" by connecting all the hardware, installing the software, starting the RSS and reading and writing data to and from a radio. If problems occur, call the phone number on the front cover for help.

1.2 Prerequisites

To use RSS and to program the radios, we recommend a basic working knowledge of the following:

- ❏ Microcomputers.
- ❏ Microsoft Disk Operating System (MS-DOS), version 3.2 or later.
- ❏ The radio's available features (see Feature Chart in Basic Features section),
- ❏ The GM300 Study Guide, and the GM300 Operator's Manual.
- ❏ Your customers' needs.

For computer beginners, we shall teach some computer and DOS basics. However, this manual is written for both beginners and advanced users, so the primary prerequisite for using RSS is the desire to program and deliver an excellent radio to your customer.

1.3 Using This Manual

This manual is designed to teach basic feature programming and to speed up access to technical reference information. It is intended for both beginners and advanced users of computers and RSS. To speed up access to the information, we've included key words in the page headers, numerous tables and lists, and a revised Table of Contents and reference sections. To help you better understand the information presented, we've expanded the Getting Started section, Glossary and Abbreviation list, and added a Tutorials section to get new users started faster. The table below lists suggested ways to use this manual.

Table 1-1. How to Use this Manual

First Time User	Occasional User	Frequent User
1. Read the *Introduction* section	1. Review *Getting Started* to set up the hardware, install, start or move around in the RSS	1. Decide what features you want radio-wide and permode; write them down
2. Read and do the steps in section 2, *Getting Started*	2. Decide what features you want radio-wide and per-mode; write them down.	2. Decide whether to start from scratch or to clone from an existing file.
3. Do one or more of the tutorials.	3. To add more features to a radio, either read in a archive file (see the Cloning tutorial, in Section 3) you previously saved, or redo the steps in the first tutorial, then for each additional feature, use the *Reference* sections to program the feature	3. Use sections 1, 2, 3 and the appendixes only as needed
4. Use the *Glossary* for terms and abbreviations you don't understand	4. For adding scan features, review the *Feature Chart*, and use the *Reference* sections as needed	4. Find most of your information from Sections 4 through 8 (Fanning or thumbing through the *reference* sections may be all you need.)
5. Know the phone number of a frequent user or Radius technical support (see Table 1-2)		5. To install an RSS update, refer back to Section 2. For servicing, see Section 8.
6. Do another tutorial within 48 hours of the first one for better memory retention		

The page layout and type selection is designed to speed up access to the information and to provide visual clarity and distinction between certain types of information.

- **Headers**

  The header area (top) of each page shows the name of the manual on the inside edge of the page and a section and subsection name on the outside edge of the page.

- **Footers**

  The footer area (bottom) of each page contains the page number on the outside edge of the page and the manual number on the inside edge of the page for easy identification if a page becomes separated from the original manual.

- **Type Styles**

  Keyboard keys and words typed from the keyboard are shown in bold font. RSS menu and screen names are shown in ALL CAPITAL LETTERS RSS field names (features) are shown in Initial Capital Letters.

- **Tables**

  Tables are used abundantly to list steps and procedures. A table is anything contained within a box with vertical or horizontal lines through it. Shaded tables apply only to procedures for diskette use and not for hard disk use.

- **Figures**

  Figures can be drawings or pictures of hardware and equipment, screen-captured images of RSS menus and screens, or computer-created graphics.

A stop light represents an important warning.

1.4 Subscription Information

Your RSS is part of a subscription. We shall keep you advised of changes and automatically mail revisions throughout the life of the subscription.

A subscription is good for one site. Under the terms of your subscription, you may install the RSS on as many personal computers as desired at that one site. Another site location requires another subscription.

When contacting the Radius Distribution Center for your region of the world, you may need to reference your subscription model number. See Table 1-2 below for your region and model number.

Table 1-2. Subscription and Support Group Numbers.

Region/Location	Subscription Model Number	Support Group
Japan	H5106	
U.S.	H5028	Radius North America Distribution Center, 1-800-356-1520
Canada	H5041	Technical Hotline Center, 1-800-663-1771
Australia	H5044	
Europe	H5114	Local Radius Dealer*
Germany	H5133	Local Radius Dealer*
Rest of world	H5030	Radius North America Distribution Center, 1-319-385-5395

** Your local dealer has access to Motorola technical help.*

2 Getting Started

2.1 Overview

In this section you will identify, install and learn to use the necessary hardware and software to run RSS. You will become familiar with the computer, the keyboard, RSS menus, screens and fields. This section prepares you for Section 3 - Tutorials, in which you will actually program a radio.

If you cannot complete this section at one time, we recommend you first set up the hardware (15 minutes). As time permits, continue with the remaining second-level subsections, finishing one second-level subsection before allowing an interruption. Most of the second-level subsections can be read in 15 minutes. Actually starting RSS only takes a few minutes for a first-time user, but the exploration of the menus and screens can vary from user to user.

2.2 Assembling The Hardware

Figure 2-1 below shows the required and optional equipment to program a radio.

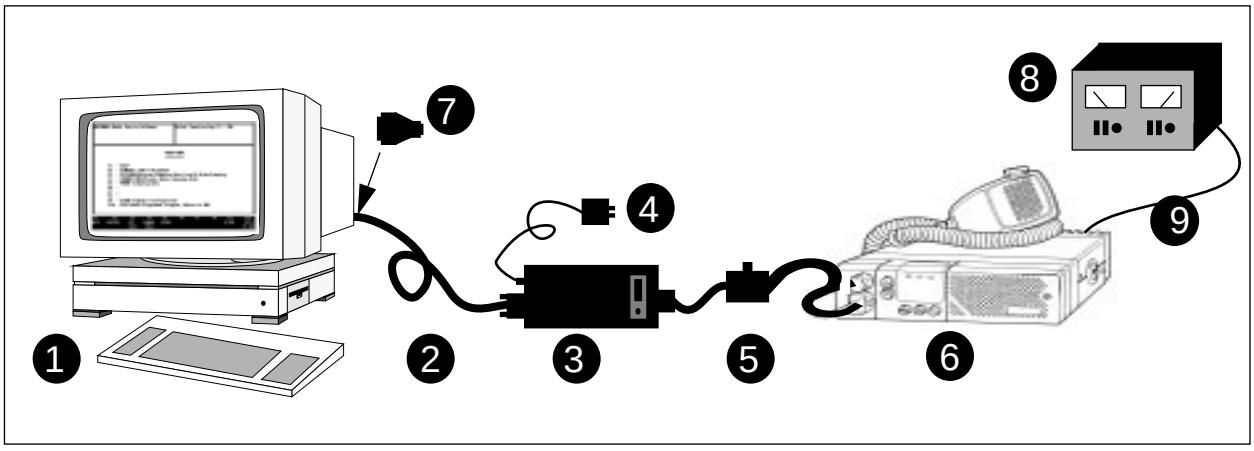
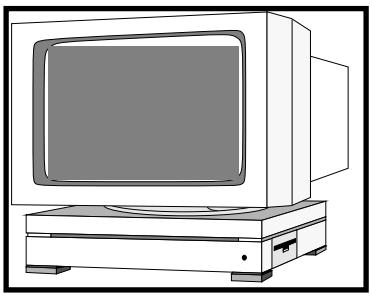


Figure 2-1. Equipment Setup

Note: Items 2, 3, 4, 5 and 7 are in the "first-time start-up package" (H5040), which is available from the Radius Distribution Center.

1. **Computer**.

   Recommend IBM-XT/AT or compatible, IBM convertible or IBM System/2 Model 30/50/70, with 640 K of RAM, and one diskette drive plus one hard disk drive. Computer should run DOS 5.0. or greater. See Hardware Platform - below.



2. **Cable**.

   Radius **HKN9216**. Radio Interface Box (RIB)-to-IBM-AT cable. Has a 9-pin end and a 15-pin end.

3. **RIB**.

   Radius **HLN9214**. Radio Interface Box.

4. **RIB Power Supply**.

   Radius **HSN9412**.

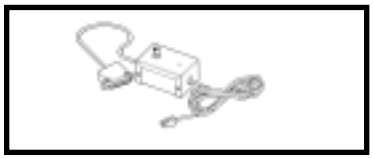
   (110 VAC) Using the power supply is more reliable than using a weak battery. A 220 VAC wall supply is available (01-80358A56).

   (For laptop computer and on-the-road use only, omit the RIB Power Supply and use 9V battery (not included)).

Warning: LED remains lit with a weak battery - this may cause certain errors on screen. Use a fresh 9V battery.

5. **Cable**.

   Radius **HKN9217**. RIB-to-Radio cable.

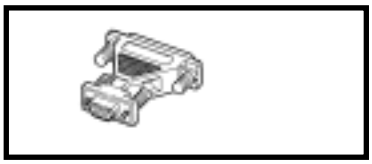


6. **Radio**.

   Radius GM300 Mobile Radio.

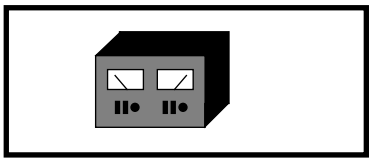
7. **Optional Adapter**.

   Radius **HLN9390** XT- to-AT-computer cable adapter.



8. **Radio Power Supply**.

   0 - 15 VDC, 15A. Set between 11 and 15 volts.



9. **Power Cable**.

   HKN4137AR, HKN9402A, HKN4137A.

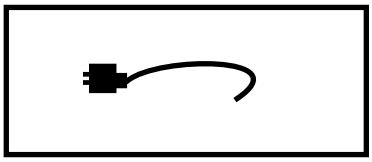


Table 2-1. Steps to Connect Hardware

1. **Connect 1 and 3 with 2.** First plug the 9-pin end of B into the communications port of A. Then connect the 15-pin end to C. *(If your computer has an XT-style communications port (25 pin connector), you will need the extra adapter 8 (HLN9390) to insert between 1 and 2.)*	3. **Plug 4 into an AC wall outlet**, and connect the other end to 3.
2. **Connect 6 and 3 with 5**. The 25-pin end of 5 goes into 3, and the "modular telephone" connector end plugs into the microphone jack on the front of 6.	4. Connect 6 to power supply 8 with 9.

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..

Table 2-2. Hardware tones

This tone...	Means this...
Higher-pitched, short tone	Hardware is connected correctly, and the radio's internal firmware is operating correctly.
High-pitched short tone followed by long (10 sec.) low-pitched tone	Hardware is incorrectly connected (check connections), radio is not receiving enough power (radio needs between 11 and 15 volts), or a checksum error is present in the radio's codeplug (call 1-800-356-1520 and report what you did and heard)
Continuous long, low tone	Critical failure - a radio's internal software malfunction.

You can install, start or explore RSS using just the diskettes and your computer if you don't have all the hardware. You can even update existing radio archive files stored on disk. What you cannot do without the hardware is read from or save to an actual radio.

When programming or calibrating a radio, DO NOT disconnect the radio from the RIB when the computer is communicating with the radio - it may leave the radio in an inoperable state. The only recommended time to disconnect the radio is at the MAIN MENU or GET/SAVE screens.

Note: If you are using a laptop computer (for example an IBM PC Convertible) 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 done with the application diskette supplied by the computer manufacturer. If this is not done, you will receive serial bus errors.

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

2.3 Hardware and Software Platform

2.3.1 Minimum Platform Requirements

We recommend the following minimum hardware/software platform:

- ❏ 80286 Microprocessor
- ❏ 640 K of RAM
- ❏ HDD (Hard Disk Drive) 30 Mb or higher
- ❏ DOS 5.0 or higher
- ❏ 3.5 inch FDD (Floppy Disk Drive)

2.3.2 Recommended Buy

We recommend that as your computer systems are upgraded, they should meet the following minimum standards:

- ❏ 80386 Microprocessor
- ❏ 4Mb of RAM
- ❏ HDD (Hard Disk Drive) 80 Mb or higher
- ❏ DOS 5.0 or higher
- ❏ 1.44 Mb 3.5 inch FDD (Floppy Disk Drive)
- ❏ Two (2) serial ports
- ❏ Mouse or trackball

Purchasing an 80386 computer with the minimum configuration as detailed above will ensure that your computer systems will not be quickly outdated.

2.4 Understanding Computer Basics

If you are already familiar with computers, skip this section and proceed to Section 2.7 on page 2-19 - *Starting RSS*.

Your computer can be compared to both a file cabinet and an electronics technician. A file cabinet provides easy handling, storage and retrieval of written data. So does a computer. The technician can, with tools, manually and physically alter the radio's features and functionality. So does a computer with RSS. A radio dealer can give a radio unique features, save those features for future reference, and service a radio internally, all without opening a drawer, thumbing through papers, picking up a tool or disassembling the radio.

Let's learn some of the types of computers that can be used for programming radios, the major parts of a computer, and the ways to store your desired radio personality data.

2.4.1 Which Computers Run RSS

RSS is designed to run on the following IBM computers and their compatibles and convertibles: IBM XT/AT, and IBM System/2 Model 30/50/70 computers. If you wish to use a laptop computer, we recommend the Everex Tempo Carrier laptop.

The following table lists computers with known compatibility problems:

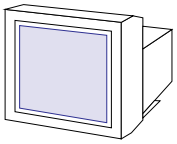
Table 2-3. Computers with Known Compatibility Problems

Computer Type	Problems	Recommendation
AT&T® 6300 Plus	This is an AT clone with an XT bus.	Not recommended.
Bondwell®	Compatibility problem.	Not recommended.
Compaq® III 386/20	RSS won't work when executed from a diskette drive - causes a failure on the serial port.	Execute from hard drive only.
Compaq LTE	Error #5 with COM test	Not recommended.
Compaq Model 1605	I/O port pinouts are not compatible.	Not recommended.
Epson® Equity 3	I/O port pinouts are not compatible.	Not recommended.
Epson Laptop Q150A	Power failure during COM test.	Not recommended.
Everex®1800D	RSS won't run for portables	External serial port solves problem.
IBM Model 50Z	Machine hardware problem	Replace mother board or add asynchronous COM card.
IBM Model 70	Machine hardware problem	Replace mother board or add asynchronous COM card.
Memorex®	Unknown	Not recommended.
Sperry® AT	Unknown	Not recommended.
Tandon® TN7000	Clock rate/speed problems	Not recommended.
Tandy®	Clock rate/speed problem.	4.7 MHz rate only works for mobile applications.
Toshiba® 1000	Unknown.	Not recommended.
Zenith® Supersport 286	Chip problem	Not recommended. Zenith dealers can fix. Newer versions may work.

2.4.2 Identifying Major Computer Parts

Computers range in complexity and size from small laptops to large mainframes. Falling between this range is the microcomputer. Most microcomputers consist of a monitor, a system unit, and a keyboard. These components are:

1. **Monitor**

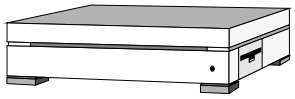
   

   Monitors perform like a window into the computer, allowing you to see the data inside the computer. Monitors come in a variety of sizes and colors. Some can be bigger than a 19-inch diagonal television, though a common size is 12 inches diagonally.

   Monochrome monitors have only one color behind the words and pictures on the display, which in many cases is either green, amber, white or black. Color monitors can display two or more colors on the display at a time, but with color monitors a slight decrease in picture sharpness or text legibility may be experienced. Colors on the RSS screen can be selected or changed by the user by using the RSS. To help users quickly find their place on the display before typing, a flashing underscore, called a "cursor" serves as a visual place indicator.

   Besides the display, a monitor has a power cord, an on/off switch, brightness and contrast dials, and a cable connection to the system unit. The RSS can function with either monochrome, CGA, EGA or VGA-based monitors.

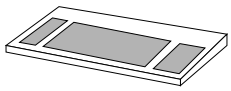
2. **System Unit**

   The system unit contains a special chip that is the "brain" of the computer, one or more diskette drives, a hard-disk drive (if so equipped), a cable connection to the keyboard, one or more communications ports and an on/off switch. System units use an 8088, 8086, 80286, 80386 or 80486 chip with speeds between 4.77 MHz and 50 MHz. The system unit should be treated with care, as jarring and hot temperatures could internally damage the unit.

Note: The RSS program may not function properly on computers with speeds greater than 20MHz.

3. **Keyboard**

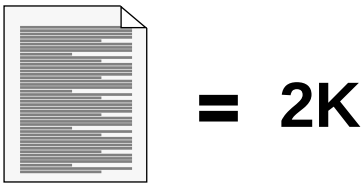
   

   A user instructs the computer what to do by typing commands on the keyboard. The monitor shows the commands as they are typed. Most keyboards have letter keys, numeric keys, and a number of special keys that perform special functions. Section 2.8.1 on page 2-26 - *Keyboards and Their Functions* describes some of these special keys and how they perform with RSS.

2.4.3 Understanding Computer Storage Systems

The computer can store large amounts of data (software programs, code, data, files) in several places. Some of these places are:

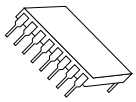
- ❏ Random-Access Memory (RAM)
- ❏ Read-Only Memory (ROM)
- ❏ Hard disk
- ❏ Diskettes.



The RAM, ROM, hard disks and diskettes all vary in function and all have certain size limits (memory). They all store data in terms of bytes; a byte equals approximately one character as typed on the keyboard. 1,024 bytes equals one kilobyte, or 1K. For comparison purposes, one page of double-spaced, typed text equals approximately 2K.

1. **RAM**

   The Random Access Memory (RAM) is a storage area in the system unit used to run programs and operating systems. The amount of RAM varies from computer to computer, and it directly affects which programs will run on your computer. With more RAM, you can run larger programs. Most programs indicate how much RAM is required to run RSS. We recommend at least 2 MB of RAM to run the RSS program. The Radius radios also have RAM embedded in them.

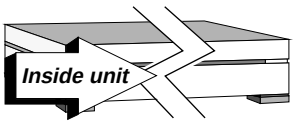


2. **ROM**

   The Read Only Memory (ROM) is a storage area in the system unit used by the computer for start-up and Power-On Self-Test (POST) purposes. The ROM is “read-only”, which means a user cannot write or save data to it, over it, delete it, or in any other way destroy it by using the keyboard keys. The program in the ROM is hard-coded into the ROM chip, and as such is protected from user errors. The Radius radios also have ROM embedded in them.

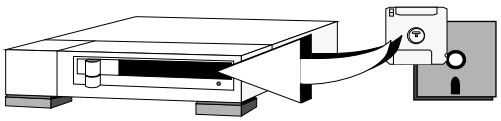
3. **Hard Disk and Hard-Disk Drive**

   A hard disk is a storage area inside the hard disk drive, both within the system unit. Hard disks store a user's programs and files (data). The hard disk drive accesses the hard disk data the same way a record player accesses the music (data) on a record, or a CD player accesses the music on a CD. Both the disk and the disk drive are needed to store (write or save) or retrieve (read) any data. The data stored on a hard disk can originate from data the you gener-



ate at the keyboard, or from data copied from a diskette. Hard disks can store from 20 megabytes (1 megabyte(MB) = 1 million characters) to over 100MB of data, depending on model type. Most hard-disk drives are labelled as the “C” drive.

4. **Diskettes and Diskette Drive**



Diskettes also store users' programs and files, but are different from hard disks because of their transportable, small size and packaging. A diskette must be “formatted” before storing your files and programs on it. After a diskette is inserted into a diskette drive, data on the magnetic diskette can be retrieved, stored, manipulated or erased. The operation of the diskette drive is also similar to the record-player concept described in the hard disk subsection.

Diskettes come in two sizes: 3.5 inch and 5.25 inch. Each diskette size has two memory capacities - low density and high density. The table below shows the memory capacity of both diskette size.

Table 2-4. Diskette Size and Capacity

Size	Low Density	High Density
3.5 inch	720K	1.44MB
5.25 inch	360K	1.2MB

The RSS program is distributed to you on one 3.5" low density diskette and two 5.25" low density diskettes so that it may be easily loaded onto any appropriate computer, regardless of the type of diskette drive that is available. Handle the diskettes carefully - avoid contact with the shiny, brown, magnetic disk surface under the protective plastic cover on the 5.25" diskette and the magnetic disk surface under the sliding metal plate on the 3.5" diskette. Such contact could damage the data and make it unreadable by the drive.

Diskette drives come in two sizes; one to accommodate the 5.25" diskettes and one to accommodate the 3.5" diskettes. With the 5.25" diskette drives, after inserting a diskette as far as it will go, you must close or push down the “drive door” located on the outside of the drive or else the computer will not read the data on the diskette. This drive door generally swings down and locks into place when firmly pressed, and it releases when gently pressed back the other direction when you want to remove your diskette. With the 3.5" diskette drives, the diskette is inserted into the slot until it locks into place. The drive does not have a door like the 5.25" drive. Instead it has an eject button, which when pressed firmly will release the diskette.

Most diskette drives are labelled “A” or “B”, with “A” generally being the first (or highest) one. The drives are sometimes labelled by the computer dealer before delivery to the customer.

Though it requires more steps, it is possible to run the RSS with only one diskette drive and no hard drive. Most businesses today have computers equipped with at least two drives, whether they are a hard drive and a diskette drive or two diskette drives. Instructions, steps, tables and procedures that apply to computers with only diskette drives (no hard disk drive) will be displayed in a shaded box.

To learn more about computer basics, read "The Personal Computer Book" by Peter McWilliams, Prelude Press, Los Angeles, CA. Call 1-800-LIFE-101 to order or secure further information.

2.4.4 Understanding the Disk Operating System (DOS)

A computer user operates, communicates with and commands the computer using the computer's Disk Operating System (DOS). DOS commands have special meanings to the computer.

Before you can use DOS commands, they must be either installed on your hard disk, or loaded into the computer's RAM via your diskette drive. The table below lists the procedure to "Load DOS" if your computer does not have a hard disk. This table assumes your computer has a diskette drive labelled A.

Table 2-5. Loading DOS From a Diskette

Instruction	How to Do It/What it Means
1. Insert DOS diskette into drive A	Put DOS diskette into the slot on the diskette drive and insert it as far as it will go. Close the drive door
2. Power up the computer	Power up the monitor, then the system unit. The computer will read the data on the diskette and load DOS into the computer's temporary storage - RAM. The computer's prompt will be: **A**
3. Remove DOS diskette	Open the drive door and remove the DOS diskette.

DOS version 3.2 or later is required to run RSS. However, we highly recommend later versions, the later the better, such as DOS 5.0.

Note: An intermittent serial bus error may occur when using DOS 4.01 - if after checking the communications between the computer and the radio you receive the same error, try a different DOS version.

DOS commands can be either upper case or lower case letters, it doesn't matter, but we show all DOS command in upper case letters.

The table below lists some of the DOS commands that you may use now or in the future for RSS work. Words in italics mean you should substitute that word for the word that is appropriate for your specific situation (such as your file's name or your directory name). After each command, press the Return (or Enter) key.

Table 2-6. Common DOS Commands

DOS Command	What it Means
A:	Go to drive "A".
B:	Go to drive "B".
C:	Go to drive "C"
CD\	Return to the root directory. **CHDIR** also works.
CD *DIRNAME*	Change directory to the directory named DIRNAME, maximum directory length is 8 characters. CD used alone will display the current working path name.
COPY B:*.* A:	Makes an identical copy of all files from root directory of diskette in "B" drive to root directory of diskette in "A" drive. The *.* means all files within the directory specified. You can also copy files in the same directory giving the file a different name as the second argument to the copy command, and you can combine several files into one file or append files. In all cases, the first argument is the source file (the one to copy from) and the last argument is the target file (the one to copy to).
DEL *.*	Delete all files in current directory. WARNING: files cannot be recovered after executing this command without backups located in a different directory! 
DIR	Lists the files in the current working directory. You can list files in other directories too by specifying a pathname following the command. If you have more files than will fit on the display, you can type DIR /P, which will make DOS pause when the display is full. Pressing any key resumes the listing. DIR /W specifies a wide display (5 columns) of file names.
DISKCOPY B: A:	Copies the contents of the disk in drive B to the disk in drive A. Drives must be of the same size and density. If your drives are not the same size and density, use the same drive name twice, such as DISKCOPY A: A:.
FORMAT A:	Format an unused, new or old diskette in drive "A" of the computer so it will accept DOS files.
MD DIRNAME	Make a new sub-directory called DIRNAME of 8 characters or less. (You substitute your own directory name for the italicized word DIRNAME.) MKDIR also works.
PROMPT PG	Change the display's prompt to include the current working directory's drive and path name, followed by the ">" sign.
PATH	Set a command search path (such as PATH=C:\MRSS\GM300\ARCHIVE). This tells the computer to search this directory after the working directory when a command is entered.
RD *DIRNAME*	Remove a sub-directory called DIRNAME. Removal of the sub-directory requires that it be empty. Files can be deleted by the DOS DEL command. RMDIR also works.
VER	Prints the DOS version installed on the computer, such as "DOS Version 5.0".
XCOPY	Copies files and directories, including all sub-directories. This command uses disk space more efficiently and can speed up file access time.

For further information on these and other commands, consult your DOS User's Manual.

You may have noticed some special characters in the preceding table (*, $, .). Certain keyboard characters mean special things to DOS. Some of these are:

Table 2-7. DOS Special Characters

DOS Special Character	What It Means
*	Wildcard character. You can substitute this character for any type or quantities of characters/digits that follow (not precede) it
\	Backslash. A special character to separate directories when specifying path names. By itself, it also represents the root directory
?	Wildcard character meaning you can substitute/match it for any single-digit or character
PG	Sets the display's default prompt to be the current drive and path name, followed by the ">" character
.	Period (or "dot"). This character, though not visible when a **DIR** command is executed, separates DOS file names from their extensions. Remember this when copying or deleting files.

There are a couple limitations you may want to know about DOS, RSS files and directories.

- ❏ DOS only allows file names to be 8 characters long. However, file names can have an optional 1, 2 or 3-character extension after the file name. The extension must be separated from the file name by a period (sometimes called a "dot").
- ❏ DOS allows only 111 files under the root directory (topmost) on any diskette or hard disk. We highly recommend that you further subdivide your files into more directories before you accumulate this many files in any directory, not just the root directory. It's very confusing and time-consuming to work with or view this many files at once.
- ❏ The maximum number of files allowed by RSS in any non-root directory, whether diskette or hard disk, is approximately 400. This is an RSS limitation, not a DOS or computer limitation. If you have more than 400 files, create another directory.

2.4.5 Using RSS with Window Applications

The RSS is not a Microsoft Windows program. The RSS program can be executed only from the DOS prompt on computers which are running Microsoft Windows.

2.5 RSS Diskettes Contents

Table 2-8 and Table 2-9 on page 2-14 list the files located in the diskettes you received with this manual.

Table 2-8. RSS Diskette Contents - ROOT DIRECTORY

File Name	File Type	Description
HDINSTAL.EXE	installation	Installs RSS on the hard disk. To install RSS on your hard disk from 3.5" diskettes, type: **HDINSTAL C: 3.5** To install RSS on your hard disk from 5.25" diskettes, type: **HDINSTAL C: 5.25** HDINSTAL accepts three parameters, the first is the targeted installation drive letter, the second is an optional installation pathname, and the third is the disk size of 3.5 or 5.25 (5.25 is the default)
GM300.EXE	executable file	Runs the RSS. If using 5.25” diskettes, insert diskette #1. To start the RSS, type: **GM300**
GM300_1.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_2.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_3.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_4.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_5.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_6.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_7.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_8.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_9.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_10.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_11.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300_12.OVL	executable overlay file	Part of the RSS after the .EXE file starts
GM300.CFG	diskette configuration data	Default computer configuration data for running the RSS off the diskette
GM300.MDF	definition file	Data file used by RSS
GM300._HD	hard disk configuration data	Default computer configuration data for the hard disk. The installation must be executed to have this file correctly initialized
GM300.HLP	help	Contains on-line help for the RSS, accessed via the RSS

Table 2-9. RSS Diskette Contents - ON DEMO Diskette (Not Copied by HDINSTAL command)

File Name	File Type	Description
DEMO1.BAT	demo/tutorial file	Starts up the on-line demonstration of how to program a radio. The demo will start when you type: **DEMO1**
DEMOTRAY.001	demo slide tray file	Lists the order of the picture slides
PRESENTS.COM	presentation software	Public domain software that presents the demo outlined in the demo slide tray file
PIC	picture slides	These are the demo slides used in the presentation
A*9999999.999*	archive file	An image of a radio's personality (codeplug). Archive files always start with an "A". The rest of the file name (italic 9's) is the radio's serial number. It is created
GM300.DBF	archive database header file	Created by RSS the first time an archive directory path is specified. Helps RSS locate/retrieve archive files

A "file" can be a program (a set of commands to tell the computer what to do), or a collection of data or information. As mentioned in the DOS section, DOS files generally have two parts - a file name followed by an optional file extension. The extension provides an easy way to, at a glance, identify or tag files for easy grouping or categorizing. In the computer world, some file extension naming conventions have evolved, and Radius uses these conventions in RSS.

The "A" in the file name "A9999999.999" in Table 2-9 indicates that the file being saved is a radio "Archive" file. The "9999999.999" refers to the radio's 10-digit serial number. As DOS file names are limited to 8 characters in the prefix and 3 characters in the extension, this RSS default radio archive file naming system conforms correctly. For example, the sample file name "A1234567.890" could be a valid radio archive file name.

The RSS also creates files. These files are:

- ❏ GM300.DBF - An archive data base header file created on the hard disk after RSS is started, and also created on the diskette if you save archive files to a diskette. It allows the RSS to locate and retrieve archive files.
- ❏ GM300.BAT - A file generated by the hardware installation command (HDINSTAL) and located under the root directory of the hard drive, enabling RSS to startup from the root directory.
- ❏ Archive files - Computer files of the radio personalities stored on the hard disk or a diskette.
- ❏ Backup files - Extra copies of the archive files stored on a different diskette and/or drive than the original archive files.

Next you'll learn how to organize your own disk and diskettes that you'll use to store your radio archive files. We suggest that frequent RSS users and computer pros skip Organizing Your Disk and Diskettes and go directly to Starting RSS. New users should read all sections.

2.6 Organizing Your Disk and Diskettes

When you first start using computers you typically do not have many files to organize. But after a while it gets increasingly difficult to distinguish between file types, to pick out a specific file in a long list, to keep track of what's in which file, or to remember which files are similar in content. Therefore, it's important to spend some time now deciding which types or groups of files should be located together in a common place, called a directory.

You can make directories using the DOS MD or MKDIR commands (or inside RSS via the FILE MAINTENANCE MENU).

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 offer a few suggestions.

- Put as few directories as possible near the top, or root, of your directory tree, considering your future growth too. (For example, if you have 100 customers within 4 geographical areas, we suggest your first level of "sub" directories be the areas that encompass the customer. The next level of directories would be the customer names within each of those areas.) The idea is to make the root system spread out wider the deeper you grow, similar to a pyramid shape.
- Keep the RSS diskette contents in one directory and your archive files in a different directory.
- Keep archive files in separate directories according to radio model type (GM300, GP300, etc.). It is not possible to know a file's model type by looking at the file name. Have a separate directory name for each radio model, then store the archive files for that specific model within the appropriate model directory. This way archive files for multiple model types are not located in the same directory.
- Dedicate and create a separate diskette for your backup files, and always make backup copies of your files. If you routinely store archive files on your hard disk, make backup copies of your files on a diskette. This is very easy to do using the RSS, and is explained in Table 2-12 on page 2-20. If you don't have a hard disk, you can use the DOS diskcopy command to make a backup copy of your archive files. This command is discussed in Table 2-5 on page 2-10

2.6.1 Organizing Your Hard Disk

Figure 2-2 is a sample directory tree for storing your radio archive files on your computer's hard disk. Though your hard disk directory tree may be a little different based upon your way of doing business, this setup may be a starting point for you. To create this directory tree on your hard disk, follow the steps below. After each command, press the Return (or Enter) key.

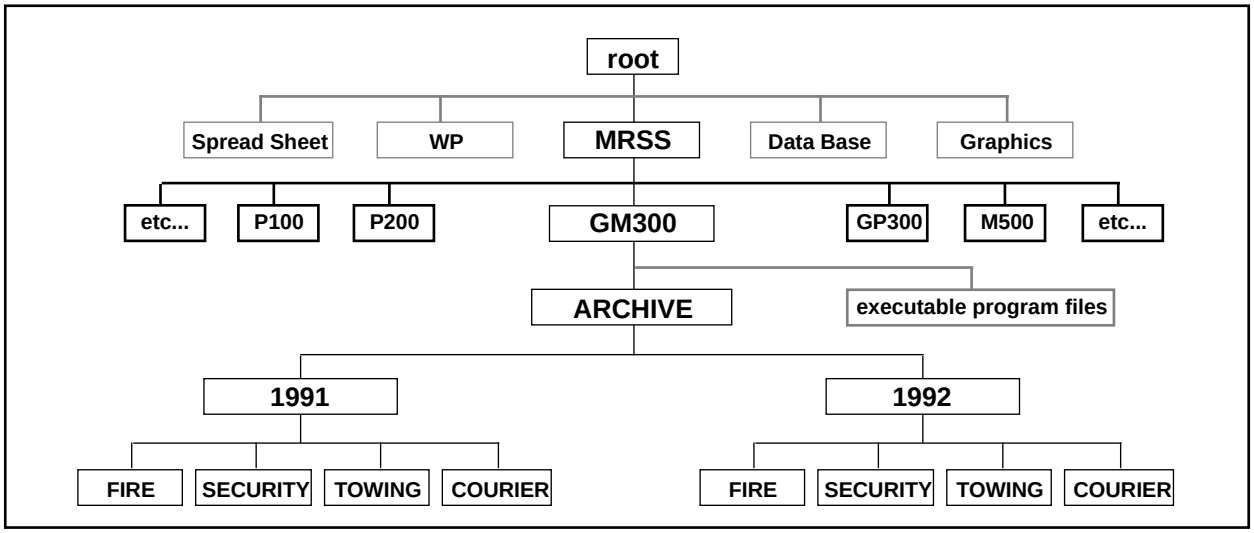


Figure 2-2. Hard Disk Directory Tree

Table 2-10. Steps to Create Hard Disk Directory Tree

Instruction	What To Type	Explanation
1. Go to drive C	C:	Go to Drive C
2. Go to root directory	CD\	Move (change directory) to the root directory
3. Make MRSS directory	MD MRSS	Make a directory under root called "MRSS". You may have several other directories under root, such as spread sheet or word processing applications
4. Go to MRSS directory	CD MRSS	Change directory to the MRSS directory
5. Make GM300 directory	MD GM300	Make a directory under MRSS called "GM300"
6. Go to GM300 directory	CD GM300	Change directory to the GM300 directory
7. Make ARCHIVE directory	CD ARCHIVE	Change directory to the ARCHIVE directory
8. Make 1992 directory	MD 1992	Make a directory under here (at C:\MRSS\ GM300\ARCHIVE) called "1992".
9. Make FIRE directory	MD 1992\FIRE	Make a directory under 1992 called "FIRE"
10. Make SECURITY directory	MD 1992\SECURITY	Make a directory under 1992 called "SECURITY
11. Make TOWING directory	MD 1992\TOWING	Make a directory under 1992 called "TOWING"
12. Make COURIER directory	MD 1992\COURIER	Make a directory under 1992 called "COURIER"
13. Make 1991 directory	MD 1991	OPTIONAL - Repeat steps 7-11 for the 1991, FIRE, SECURITY, TOWING and COURIER directories (for the year 1991) if you want to arrange past files in this way.

2.6.2 Organizing Your Archive File Diskettes

Figure 2-3 below shows a sample directory tree for storing your radio archive files on a diskette.

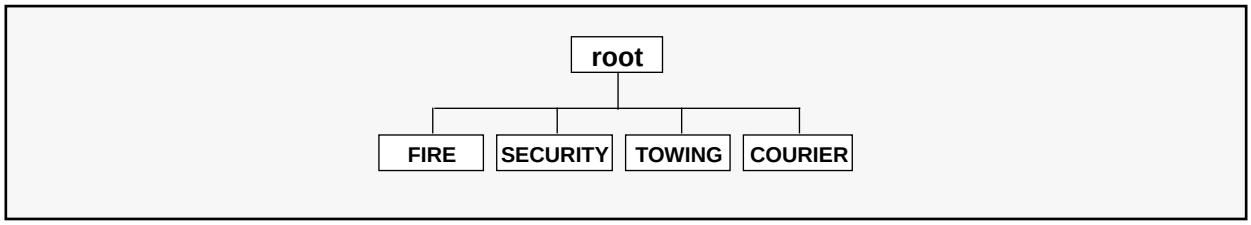


Figure 2-3. Diskette Directory Tree

Organizing a diskette is easier simply due to the limited space on a diskette. Though your tree may be different based upon your way of doing business, this set-up may be a starting point for you. Be sure to label the outside of your diskettes accurately, such as "1992 GM300 Archive Files." Depending on the size of your business, you may even have a separate diskette for FIRE, one for SECURITY, etc.

To create the directory tree shown in Figure 2-3 on your diskette, follow the steps listed in Table 2-11 on page 2-19. After each command, press Tab (or Return or Enter). This exercise assumes you are using drive A and the diskette contains only GM300 archive files (not RSS files and not backup files).

Table 2-11. Steps to Create Diskette Directory Tree

Instruction	What to Type	Explanation
1. Create diskette label		Label formatted diskette to correspond to the contents of the diskette such as “GM300 Archive Files”. Don’t apply it to the diskette yet.
2. If no hard disk, load DOS		See Table 2-5 on page 2-10 to load DOS using drive A. Remove DOS diskettes after loading. If not at the root directory of drive A, type: CD
3. Put new diskette in A		Insert a new diskette into drive A. Close the drive door.
4. Format diskette	FORMAT A:	Format the new diskette in drive A. Discard diskette if errors occur and try another.
5. Label diskette		Remove formatted diskette; apply label without covering the exposed magnetic areas.
6. Insert diskette again		Insert diskette into drive A again. Close door.
7. Start at root	CD\	Move (change directory) to the root (uppermost) directory of the diskette.Omit if already at root level.
8. Make FIRE directory	MD FIRE	Make a directory under root called “FIRE”.
9. Make SECURITY directory	MD FIRE	Make a directory under root called “SECURITY”.
10. Make TOWING directory	MD TOWING	Make a directory under root called “TOWING”.
11. Make COURIER directory	MD COURIER	Make a directory under root called “COURIER”.
12. Create other directories		Make more directories for each additional category you may need.

2.7 Starting RSS

You are now ready to start RSS on your computer. This subsection, which takes about 30 minutes, explains when to install, reinstall or discard the RSS diskettes, then guides you through installing RSS on a hard disk, and finally lists how to start RSS with the appropriate executable command.

If your computer has a hard disk, we recommend running RSS from the hard disk whenever possible, as the response time with it is faster and the files are less susceptible to external damage.

2.7.1 Making Backup Copies of RSS Diskettes

As with any program, it's important to make a backup copy of the RSS diskette before you begin to use it. Whenever you receive a new version of RSS, you should make a backup copy.

If your computer has both 3.5" and 5.25" diskette drives, use one size diskette you received from us as your working copy and the other size for your backup copy. Both sizes we deliver contain the exact same files. If one becomes damaged, immediately make a working copy from the backup one.

If your computer has only one size diskette drive, the other size diskette(s) will be useless to you. For example, if you have only a 5.25" diskette drive, the 3.5" diskette will not work in your drive. In this case, make a backup copy of the 5.25" diskettes.

We recommend making a backup copy of the RSS diskette whose size matches your computer's diskette drive, even if you have a hard disk. To make a backup copy, follow the steps in Table 2-11 on page 2-19. These steps assume you have one diskette drive named A or you have two diskette drives that are not the same size and density, and that DOS is loaded. (DISKCOPY will not copy from one drive to another if the drives are not the exact same size and density.)

Table 2-12. Steps to Backup the RSS Diskettes

Instruction	What to Type	Explanation
1. Insert RSS diskette		Put supplied RSS diskette into drive A; close the door.
2. Make the backup copy	DISKCOPY A: A:	This copies the data on the source diskette in drive A (supplied RSS diskette) to the target diskette (the newly-formatted diskette). Careful - 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 (RSS one) and when to insert the *target* diskette (the newly-formatted one). When the diskcopy is complete, use the target diskette as the new working copy. (If you have 5.25" diskette drives, do another diskcopy for the second diskette).
3. Keep originals safe		Store the original RSS diskettes in a safe place - away from magnets, moisture, heat and where they won't be bent.

2.7.2 What to Do with Previous Versions of RSS Diskettes

After you make a backup copy of the new RSS diskettes, you may wonder what to do with the old, previous RSS versions you may have accumulated. We recommend discarding them so you always have the most current version available and you won't mistakenly program a radio with outdated data.

2.7.3 Starting RSS From Hard Disk

To run RSS from the hard disk, it must first be installed there. A hard-disk drive installation program is in the RSS diskettes. After installing RSS on your hard disk, follow the startup procedure.

2.7.3.1 *Installing RSS on Hard Disk*

Install the latest RSS version as soon as you receive it - using the install program with the diskettes you received with this manual insures you have the latest and greatest version of the RSS. It also keeps important files in a consistent place for cross-referencing and future use. The software installation takes approximately three minutes.

The install program will:

- ❏ Create the MRSS, GM300 and ARCHIVE directories, if they are not already there.
- ❏ Write over the old version's program files with the same name, if present.
- ❏ Create certain files on the hard disk to make using the RSS easier (“.CFG”, “.DBF”, “.MDF”).

The install program will *not*:

- ❏ Write over your archive files.
- ❏ Write over your backup files.

Before doing the installation steps that follow, be sure you have made a backup copy of the RSS.

The steps shown in Table 2-13 install RSS on a computer equipped with a hard-disk drive and two diskette drives. After each "What to type" step below, press Return or Enter.

Table 2-13. RSS Hard Disk Installation Procedure

Instruction	What to Type	Explanation
1. Put RSS diskette in drive **A**		Insert the RSS diskette into drive A (close the door). If you must use the 5.25" RSS diskettes, insert RSS diskette # 1 first. Later you will be instructed to insert the other one
2. Go to drive **A**	A:	This tells the computer to work from drive A.
3. Start the installation.	If installing from 3.5" diskettes type: **HDINSTAL C: 3.5** If installing from 5.25" diskettes type: **HDINSTAL C: 5.25**	This transfers the RSS program to your hard disk. Follow directions and answer questions on the display when they appear. When the DOS prompt returns, you may start the RSS program.
4. Store diskettes in safe place.		Keep the RSS diskettes in a safe place and start RSS from the hard disk from now on.

Note: The RSS program takes up less than 1MB of storage on your hard disk.

After installing RSS on a hard disk, you may notice a .BAT, extension, a .CFG extension, a .DBF extension and a .MDF extension on some files. These types of files are explained briefly below. Do not delete or move these files from the C:\MRSS\GM300 directory.

- **".BAT"** A batch file. The HDINSTAL command file creates a file called GM300.BAT in the top level directory of the hard drive.
- **".CFG** "Created and modified by the RSS, the configuration file (".CFG") contains the PC port choice, default pathnames and the display-type data.
- **".DBF"** Created by the RSS the first time an archive file directory path is specified. This archive database header file allows the RSS to locate and retrieve archive files, based on serial numbers. **DO NOT OVERWRITE OR DELETE THIS FILE. If you do, contact Radius Product Services.**
- **".MDF"** The model definition file defines which radio models the RSS can program.

2.7.3.2 *Installing on Multiple Computers or Networks*

You may install RSS on several personal computers and laptop computers at a single site, according to your license. If you have additional sites, you should purchase additional subscriptions.

2.7.3.3 *Hard Disk RSS Startup Procedure*

To start RSS from your hard disk, follow the steps in the table below. After each "What to type" step, press Tab (or Return or Enter).

Table 2-14. Hard Disk Startup Procedure

Instruction	What to Type	How To Do It What It Does
1. Move to C drive	C:	Work from hard disk, the C drive. If you have a hard disk and you bring up your computer with no diskettes in the diskette drives, you will already be at the C drive.
2. Start the RSS program	GM300	This command starts the RSS program. If it does not start correctly, you may hear a tone or see an error message or error code printed on the display (see Appendix A and B). (This command makes the MRSS, GM300 and ARCHIVE directories if not already present.) If the RSS program does not start, verify that the file GM300.BAT appears under the root directory of the C drive

After you start RSS from the hard disk, you will see the BANNER screen. Hard disk users can proceed to Banner Screen.

2.7.4 Starting RSS From Diskettes

Start RSS from diskettes only when there is no hard disk available. The following sections list the steps to start the RSS for each size of diskettes. If you have both a 3.5" diskette drive and a 5.25" diskette drive, we recommend using the 3.5" diskette and drive.

2.7.4.1 *Startup Procedure Using 3.5" Diskette*

The RSS startup procedure in Table 2-15 assumes the 3.5" diskette drive is labelled drive A.

Table 2-15. 3.5" Diskette Startup Procedure

Instruction	What to Type	How to do it/ What to Type
1. Insert diskette		Insert the 3.5" diskette into drive A
2. Move to drive A	A:	Direct computer to work from your 3.5" diskette drive
3. Start the RSS program	GM300	This command starts the RSS program. If it does not start correctly, you may hear a tone or see an error message or error code printed on the display (see Appendix A)

When you start RSS for the first time from a 3.5" diskette, you will see the following:

- ❏ SERVICE SOFTWARE CONFIGURATION MENU. (Press the F10 key to exit it for now, we'll return to it later.) This menu will not appear subsequent times.
- ❏ BANNER screen.
- ❏ MAIN MENU.

2.7.4.2 *Startup Procedure Using 5.25" Diskettes*

The RSS startup procedure in the table below assumes the 5.25" diskette drive is labelled “A.”

When you start RSS from a 5.25" diskette, you will see the screens below in the following order:

- ❏ SERVICE SOFTWARE CONFIGURATION MENU.
- ❏ BANNER screen.
- ❏ MAIN MENU.

To prevent the SERVICE SOFTWARE CONFIGURATION MENU from appearing every time you start RSS, see the specific instructions for 5.25" diskette use in “Setting Default Archive and Backup Paths” on page 2-36.

2.7.4.3 *Service Software Configuration Menu*

If you are using diskettes to run RSS for the first time, you will see the SERVICE SOFTWARE CONFIGURATION MENU (see below):

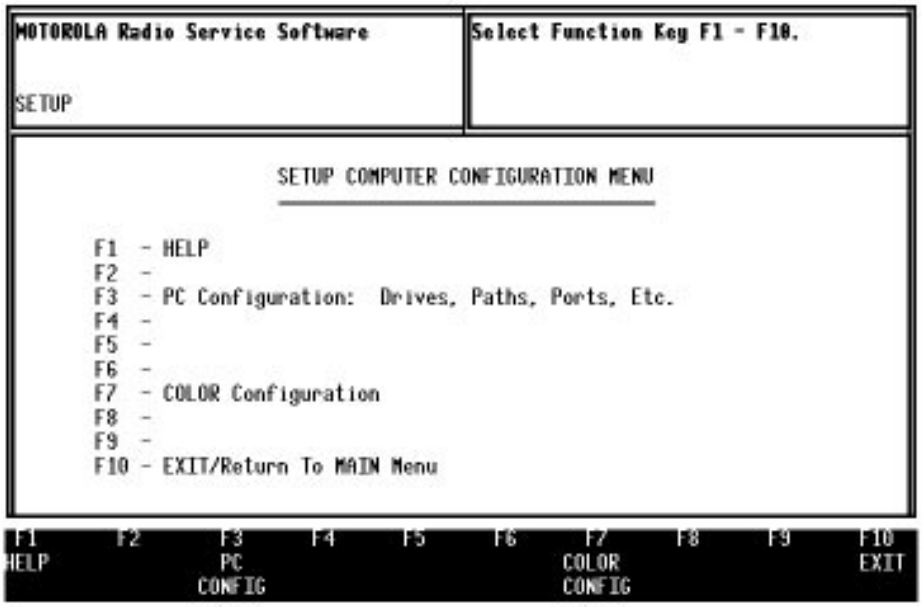


Figure 2-4. Service Software Configuration Menu

For now, press the F10 key on your keyboard to exit this menu. We will return to it later.

2.7.4.4 *Banner Screen*

When the program correctly loads, you will see a "BANNER" screen (see below) with the Motorola logo and copyright information.

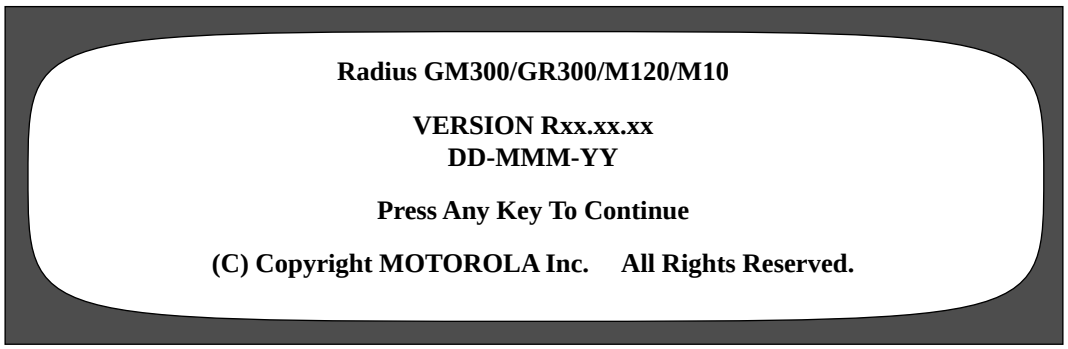


Figure 2-5. Banner Screen

Press any key. You will now see the MAIN MENU.

2.7.4.5 *Main Menu*

After pressing any key at the BANNER screen, the MAIN MENU (see below) appears.

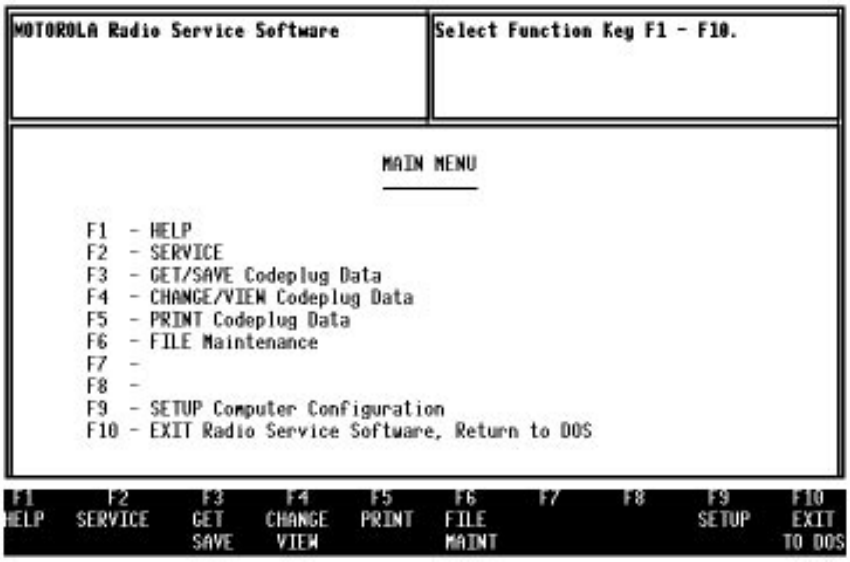


Figure 2-6. The Main Menu

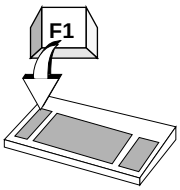
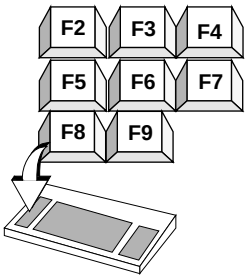
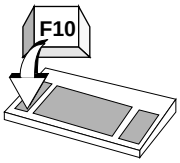
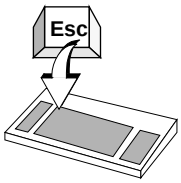
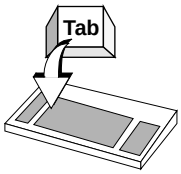
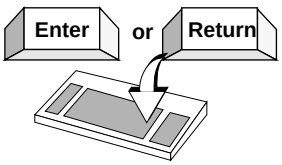
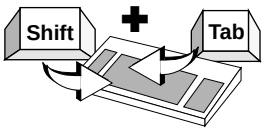
From here you can begin to program a radio, but first we will explain how to move around within the menus and screens of the RSS with the keyboard keys. The parts of a menu are described in Section 2.8.2 - *Anatomy of a Menu*.

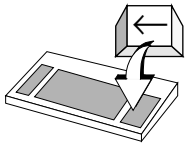
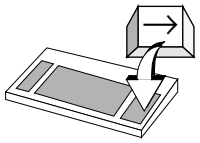
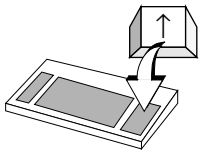
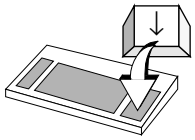
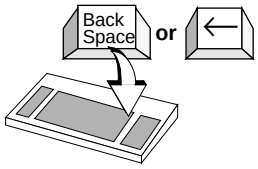
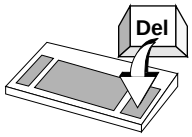
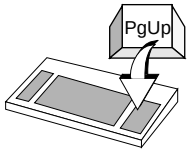
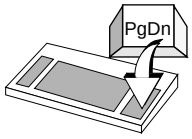
2.8 Navigating Through RSS Menus

You have successfully started RSS and are ready to learn just what it is you see on the display, how to move around, how RSS is organized, how to change the feature choices, and finally, how to exit.

2.8.1 Keyboards Keys and Their Functions

Now that the RSS Main Menu is on your display, to proceed any further you may want to know about the keyboard keys and what they do. Every action of RSS is controlled by you through the use of formatted displays and function keys. The function keys are the ten keys labelled F1 to F10 grouped on the left hand side of the keyboard on some keyboards or the twelve keys labelled F1 to F12 at the top of other keyboards.

	**F1** - Displays help information on every screen and menu. This online help provides information on how to use the currently displayed menu, screen, line or field. You may also find system setup information. In many cases the help is provided for the specific line of the screen that is currently highlighted.
	**F2 - F9** - Perform special functions. The **F2** through **F9** keys perform specific functions and actions which can vary from menu to menu and screen to screen. *On some screens*, **F5** will print the current screen to your printer, and **F8** will save the data and options currently displayed.
	**F10** - Exit to previous menu or screen. The **F10** key moves the display backward in the RSS tree, one screen or menu at a time. **F10** performs this function on every menu and screen.
	**Esc** - Exit to **MAIN MENU**. **Esc** performs this function on every menu and screen.
	**Tab** - Accepts data currently in field then moves prompt forward one field. If a field's entry is not accepted, an "error beep" will sound. Performs exactly like **Enter** or **Return** key.
	**Enter** or **Return** - Accepts data currently in field then moves prompt forward one field. If entry is not accepted, an "error beep" will sound. This key is usually two to four times as big as the letter keys on the keyboard. Performs exactly like **Tab** key.
	**Back Tab (Shift + Tab)** - Accepts data currently in field then moves the prompt backward one field at a time. To backtab, press and hold a **Shift** key and then press the **Tab** key.

	**Left Arrow** moves cursor left one character. The **Backspace** key will also move the cursor backwards (left) one space at a time. **Num Lock** (a keyboard key) must be turned off.
	**Right Arrow** moves cursor right one space. **Num Lock** (a keyboard key) must be turned off.
	**Up Arrow** - Scrolls through selections, or increases the current relative value. **Num Lock** (a keyboard key) must be turned off.
	**Down Arrow** - Scrolls through selections, or decreases the current relative value. **Num Lock** (a keyboard key) must be turned off.
	**Back Space** - Erases the current character in the field *and* moves cursor one space backward (left). The back space key on some keyboards is a left arrow. **Num Lock** (a keyboard key) must be turned off.
	**Del** - Erases current character in field.
	**PgUp** - Displays the previous page of information on the screen. This is on the numeric keypad, generally found on the right side of the keyboard. **NUM LOCK** (a keyboard key) must be turned off.
	**PgDn** - Displays the next page of information on the screen. This is on the numeric keypad, generally found on the right side of a keyboard. **NUM LOCK** (a keyboard key) must be turned off.

2.8.2 Anatomy of a Menu

Within RSS, there are menus that take you 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 shown in the working area, shown as 3 in Figure 2-7. A menu or screen has four areas, labelled below as 1, 2, 3, and 4.

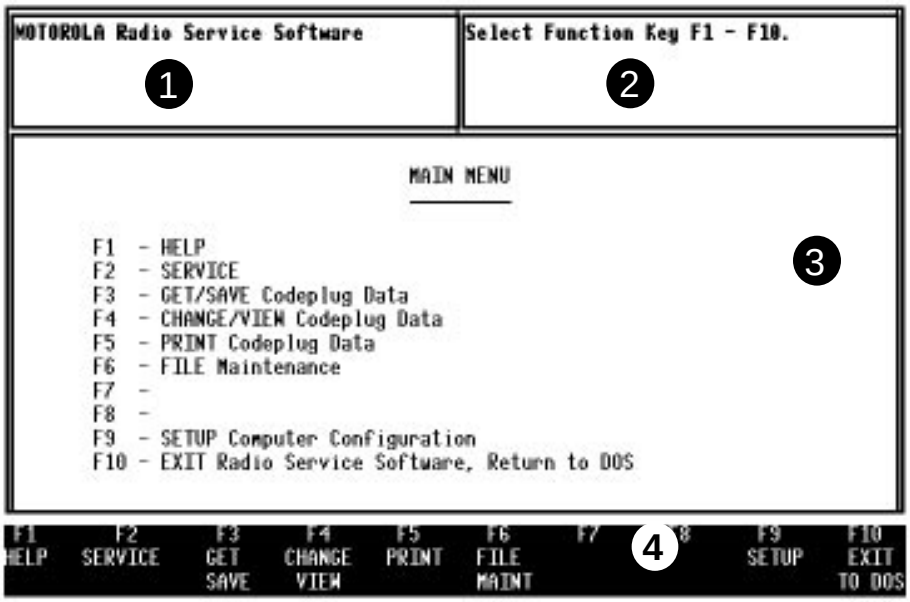


Figure 2-7. An RSS Menu

1. 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. Each menu and screen name will be separated by a colon (:). For some examples of this pathname, glance ahead in this manual to see the menus and screens that are deeper into the RSS tree (past this MAIN MENU (the highest root level), which is the assumed, default starting point). If a radio is connected, the current radio model being read will also be displayed in this area.

2. Instruction Area. This area tells you the allowable actions for the current menu or screen. It is divided into 4 lines; the first two lines are reserved for messages to the user, and the last two lines are status lines.

3. 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-number key. Pressing an F-number key advances you to another menu or screen (see Figure 2-9).

4. F-Key ID Area. This area displays the F-number keys and function names for the current menu or screen.

2.8.3 Anatomy of a Screen

As stated before, the only difference between a menu and a screen is the contents of the working area, shown as 3 in Figure 2-7, and shown in Figure 2-8 as the "Working area". Screens list features (fields) that can be viewed or edited.

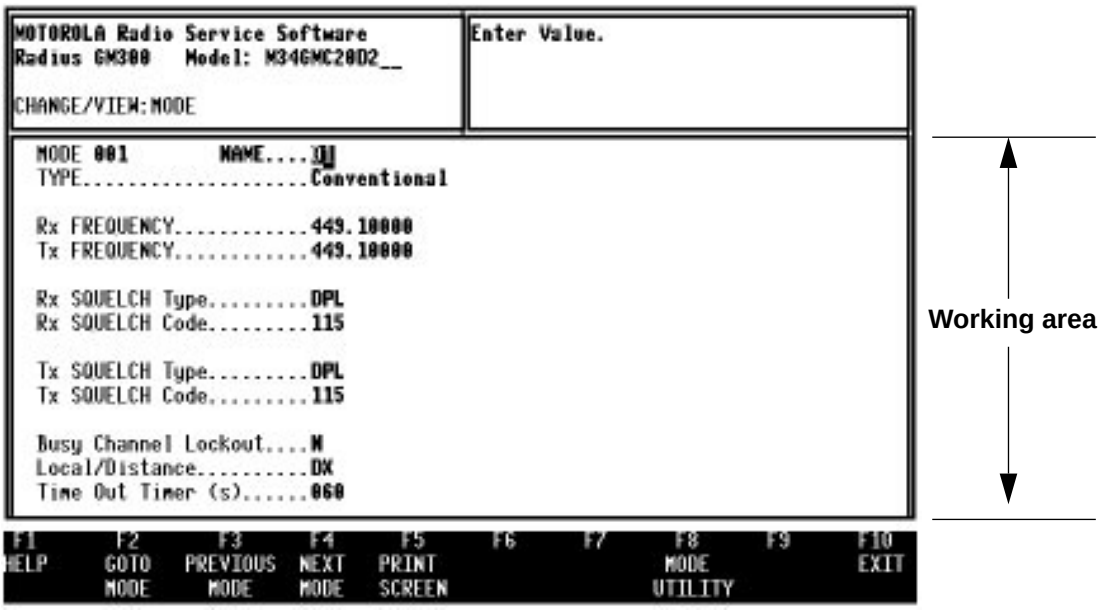


Figure 2-8. An RSS Screen

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 are features that can be selected for each individual channel (hereafter we will refer to a channel as a "mode"); these features are selected on a "per-mode" basis. On other screens are features that can be selected for all modes of the radio ("radio-wide" features). And still other screens list those features that perform a certain RSS function, such as servicing the radio or printing the personality data. Fields are further described in Section 2.9 on page 2-33.

2.8.4 Complete Menu Mapping at a Glance

The screens are organized in a tree-root fashion as shown in Figure 2-9 on page 2-31. Though this tree-root system is shown sideways in the following picture, it shows how the whole system starts with a main root (MAIN MENU) at the left side and branches outward from the main root. This branching grows deeper as you get closer to the precise screen which contains the feature you want to program into the radio.

Traveling from one RSS menu or screen to another is similar to the way a car must use the road system to drive to the other side of a lake, instead of flying directly as a plane would. To move forward from one screen to another, use one of the F-keys until you've reached the menu that contains the other screen you want. To back up, use the F10 key. Each time you press F10 you retreat to the previous screen or menu, moving closer to the MAIN MENU. For example, to move from A to B in Figure 2-9 on page 2-31, from the READ CODEPLUG screen you would press F10 to retreat to the GET/SAVE MENU, then F10 to retreat to the MAIN MENU, then press F4 to advance to the CHANGE/VIEW MENU (Figure 2-10), then finally press F5 to proceed to the MODE CONFIGURATION screen.

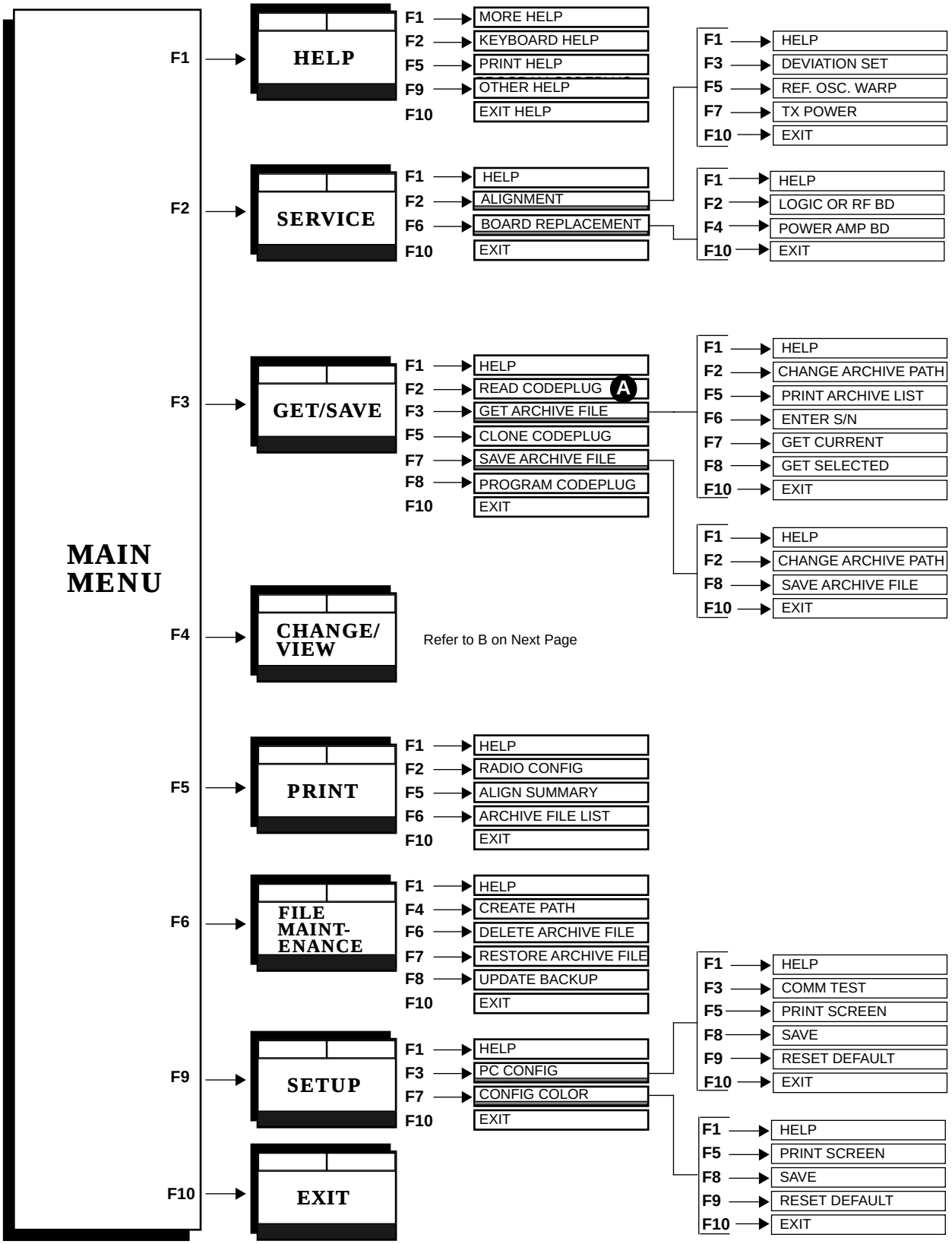


Figure 2-9. RSS Menu Mapping at a Glance

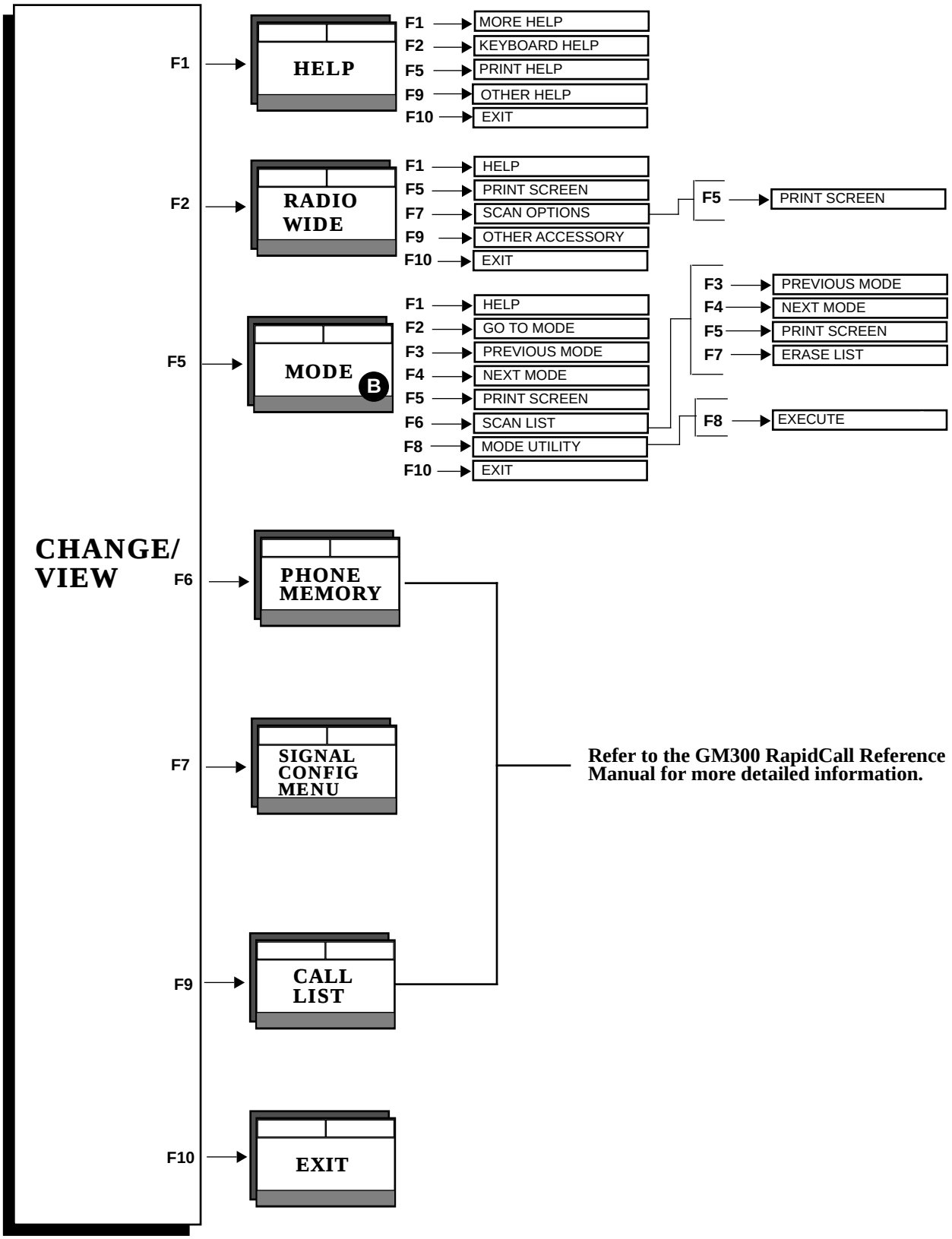


Figure 2-10. Change/View Mapping at a Glance

2.8.5 The Relationship Between Screens

Some screens contain fields that require or take values from other screens and features, and thus are dependent upon each other. For example, the signalling system values specified on the CHANGE/VIEW:SIGNAL screen are “assigned” at the CHANGE/VIEW:MODE screen's PHONE Signalling Name field (Figure 2-11).

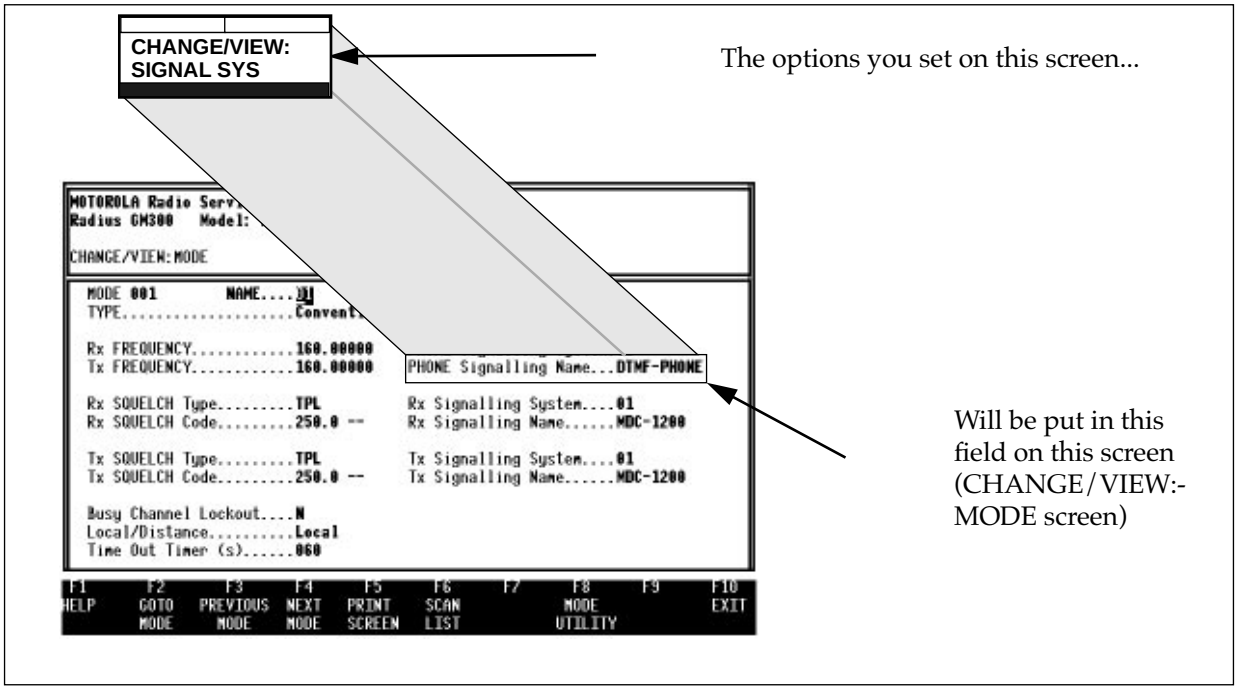


Figure 2-11. Relationship Between Screens

2.9 Changing A Field Value

Screen fields come in three basic types:

- ❏ Information fields - non-editable fields which cannot be altered or changed.
- ❏ Scrollable fields - to edit or change a choice, press the arrow key(s).
- ❏ Direct-entry fields - to edit or change a choice, type in an acceptable value.

Changing a field's value is typically done by either scrolling through a list of options for scrollable fields or by typing in a correct value for direct-entry fields as shown in Figure 2-12 on page 2-34. Scrolling is done with the arrow keys.

The Reference sections in this manual, detail each feature, its default value, and its programmable choices.

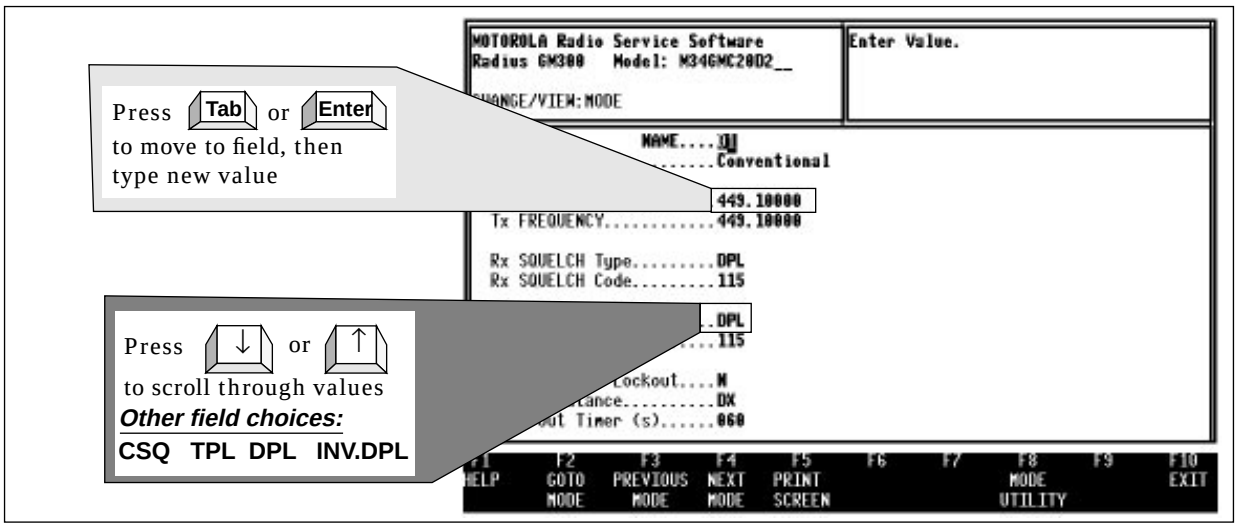


Figure 2-12. Changing a Field Value

2.10 Setting (Configuring) RSS Computer Defaults

Now that you are aware of how fields, screens and menus relate to one another, this section introduces the concept of saving certain default computer information. Setting the computer defaults eliminates the need to specify them every time you enter RSS or program a radio.

Read this section if you want to:

- ❏ Set a default archive and backup file path name so you won't have to specify it every time you save a radio archive file,
- ❏ Set or change the default port used to interface with the radio and RIB,
- ❏ Set the default colors you see on your RSS screen, or
- ❏ Eliminate the SETUP COMPUTER CONFIGURATION MENU as shown in Figure 2-13 on page 2-35 from appearing every single time you start RSS from the diskettes.

Otherwise proceed to Section 2.11 - *Exit RSS*.

If you've been with us from the start, you should be at the MAIN MENU. If you've just joined us or got lost inside the RSS screens, press Esc to get to the MAIN MENU. From the MAIN MENU, press F9 to get to the SETUP COMPUTER CONFIGURATION MENU.

From the SETUP COMPUTER CONFIGURATION MENU you can either read the on-line help, set some default computer values, or exit. Pressing F3 on the SETUP COMPUTER CONFIGURATION MENU will display the PC CONFIGURATION screen, where you can specify the default drive and path names for future archive and backup files. Pressing F7 on the SETUP COMPUTER CONFIGURATION MENU displays COLOR CONFIGURATION screen where you can specify the colors for your screen's text, lines, background and highlighted fields.

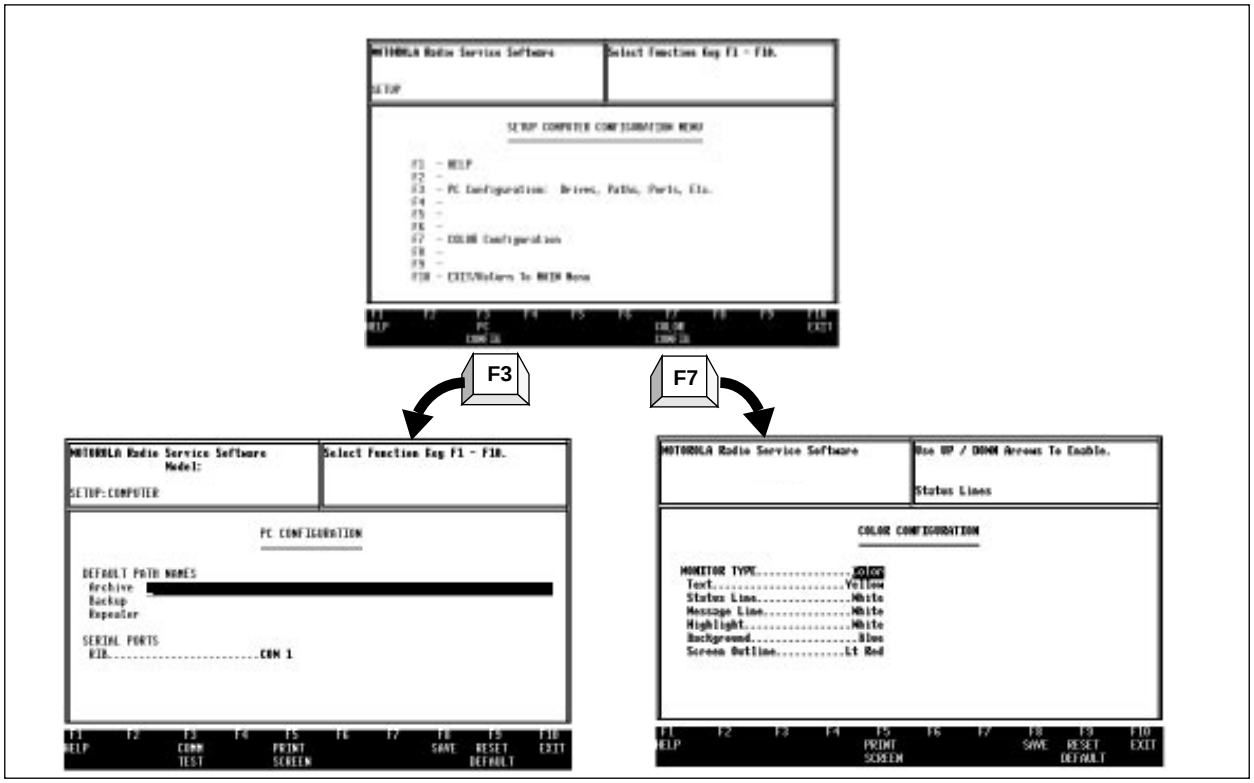


Figure 2-13. Setup Computer Configuration Menu Options

2.10.1 Setting Default Archive and Backup Paths

First, you can set the drive name and path names for both archive files and backup archive files you will create later. Making and using backup archive files can save a lot of programming time should your archive files become damaged. We highly recommend making backup files. Also, specifying a default path name here will save much typing time later every time you go to save an archive file. Here's how to set the default archive and backup file paths.

Table 2-16. Creating Archive/Backup File Paths

Instruction	What to Type	Explanation
1. Go to PC CONFIGURATION		Press F3 at the SETUP COMPUTER CONFIGURATION MENU to get to PC CONFIGURATION
2. Specify archive file path	C:\MRSS\GM300\ARCHIVE	At PC CONFIGURATION, type this archive file path name if you have a hard disk. This is where you keep you radio archive file. If you don't have a hard disk, specify one of your diskette drives: **A:**
3. Go to next field		Pressing **Tab** (or **Enter** or **Return**) advances to the next field.
4. Specify backup file path.	A:\BACKUP	Always use a diskette for backup files. Depending on the number of radios you program, you may want to make sub-directories as well. If you are already using the A drive for archive files, use the B drive for backups. Remember to correctly label the diskette's contents on the outside sticker (e.g. GM300 back-ups). Proceed to step 2 in Table 2-17 on page 2-37 to select the communications port connected to the RIB.
5. Save this configuration		**F8** save the field options displayed on the screen.

The following paragraph is a work-around for the problem of the SETUP COMPUTER CONFIGURATION MENU appearing every time you start RSS using the 5.25" diskettes. Our goal is to have it appear the first time to allow you to set your defaults once - then subsequent times eliminate it from the display, as the RSS finds the information it is looking for within a file on the diskette.

When using the 5.25" diskettes to start RSS, we recommend putting diskette #1 back into the drive before pressing F8 at the PC CONFIGURATION screen. Doing this puts the computer configuration file named GM300.CFG (tells RSS the computer's configuration and default paths) onto the diskette you use when you start RSS. If RSS finds this file when the program is started next time, it won't ask you again for the information it can find in this file, and the SETUP COMPUTER CONFIGURATION MENU will not automatically appear.

Next are the steps to specify the serial port you use for interfacing with the radio and RIB. The default port is COM1

2.10.2 Setting a Default Port

Table 2-17. Setting a Port

Instruction	What to type	Explanation
1. Go to PC CONFIGURATION		Press **F3** at SETUP COMPUTER CONFIGURATION MENU to go to PC CONFIGURATION.
2. Go to serial port RIB field		Pressing **Tab** (or **Enter** or **Return)** advances to the next field. Press **Tab** two times.
3. Select a port		Use the arrow keys to scroll through the available field options. Options are *COM1* or *COM2*. Pick a port.
4. Test the port		You can test the port by pressing **F3**, COMM TEST - if ok it will beep and in the **Instruction Area** (see number **2** in Figure 2-7) of the screen the words "Radio Communications OK" will appear.
5. Save this configuration		**F8** saves the field options on the screen. "Saved" appears in **Instruction Area** of the screen.
6. Exit screen when done		Press **F10** to exit this screen and go to previous menu.

2.10.3 Setting Default Menu and Screen Colors

Table 2-18. Selecting the Color of Menus and Screens

Instruction	What to type	Explanation
1. Go to COLOR CONFIGURATION		Press **F7** at the SETUP COMPUTER CONFIGURATION MENU to get to COLOR CONFIGURATION.
2. Specify monitor type		At COLOR CONFIGURATION, press an arrow key to scroll through the available monitor type field options. The only options for this field are *Color* and *Mono*. If you have a monochrome or LCD monitor, select *Mono* and go to Step 7. If you have a color monitor, select *Color* and go to Step 3.
3. If ***Color,*** go to next field		After selecting *Color,* press the **Tab** or **Enter** key to advance to the next field, called Text.
4. Select color for this field		Use the up or down arrow keys to scroll through the available field options. Pick a color.
5. Move to next field		Press **Tab** (or **Enter** or **Return)** to go to the next field
6. Select colors for all fields		Repeat steps 4 and 5 for each of the remaining fields
7. Save this configuration		**F8** saves the field options displayed on the screen.
8. Exit screen when done		Press **F10** to exit this screen and go to previous menu.

2.11 Exit RSS

If you want to program a radio or do a tutorial, don't exit yet. Instead, proceed to Section 3 - *Tutorials* section. Whenever exiting RSS, always ask yourself these questions:

- ❏ Did you apply the changes to the radio (save to the radio)?
- ❏ Did you apply the changes to a computer file (save archive file)?
- ❏ Did you save the changes to a backup computer file (save backup file)?

If you do want to exit, use the Esc key to return to the MAIN MENU, then press F10 twice to exit to the DOS prompt.

The tutorials that follow in Section 3 - *Tutorials* will give you a working knowledge of RSS and the ability to proceed with more advanced feature programming.

3 Tutorials

3.1 Overview

The tutorials in this section can be used to personalize radios for customers. We've created an imaginary but practical scenario to demonstrate the need for radios programmed with different features for various applications. In each tutorial, the setting is the Longwood Hotel and Convention Center, a full-service hotel and convention facility specializing in large-scale corporate meetings. The Longwood Center must prepare for a major upcoming radio convention which will offer extended lodging, exposition and banquet facilities. There are three major communication requirements involved in the setup of the convention which fall into the following areas:

- ❏ Convention setup and maintenance staff

  Needs radios to coordinate forklift and towing services involved in preparing the exposition display floor.
- ❏ Security staff

  Needs radios to provide crowd control and security force patrol at the exposition center, at the hotel, in the parking garage and on the complex grounds.
- ❏ Banquet and food commissaries

  Needs radios to provide internal and external coordination of catering and banquet resources using a van fleet.

The first tutorial (Programming Basic Radios) walks you through the steps of programming a new, basic 8-channel radio and takes approximately 45 minutes to complete. An on-line demo version of this tutorial is on the RSS demo diskette. To view it, type DEMO1. To quit the demo, press the Esc or Del key. We suggest you view the demo after reading Section 3.2.4 - Step-by-Step Programming Instructions of the tutorial.

The second tutorial (Cloning Radios) goes much faster, and involves cloning (copying) the personality data from an archive file of one pre-programmed radio to other radios. Cloning is used when there is a need for multiple radios equipped with the same radio features and functions.

Each tutorial provides the following:

1. Sets the scene
2. Lists the desired features for the particular application
3. Gives an overview in a list format of the major steps involved in programming the radio
4. Walks you through the specific steps to program the features into the radio.

The tutorials assume that RSS is running and the MAIN MENU is displayed. If the MAIN MENU is not displayed, refer to Table 3-1.

For all tutorials, F1 displays help information corresponding to the current highlighted field or current screen. F10 backs you out of RSS one menu level at a time. Esc goes directly to the MAIN MENU.

Table 3-1. Steps to Bring Up RSS MAIN MENU

Using Two Diskette Drives	Using Hard Drive
1. Assemble, connect and power up the hardware. 2. Load DOS from drive A. After the computer has successfully booted, the prompt will be **A:**. 3. Insert the "working copy" RSS diskette into drive B, then move to drive B by typing the command below, followed by **Return** (If using 5.25" diskettes, insert diskette #1 first.) **B:** 4. Type the command below, followed by **Return**: **GM300** (If using 5.25" diskettes, remove diskette #1 and insert diskette #2 when the RSS instructs you.) 5. If this is the first time this RSS version is started and the CONFIGURE COMPUTER SCREEN appears, you can either skip this screen by pressing **F10**, or work through it (see Figure 2-4 on page 2-25) to set up your archive path, display colors and choice of COM ports, then save the configuration (**F8**) and exit the screen (**F10**). 6. Press any key at the BANNER screen (see Figure 2-5 on page 2-25). 7. The MAIN MENU appears.	1. Assemble, connect and power up the hardware and the computer. 2. After the computer has successfully booted, the prompt will be **C:**. 3. If you have not yet installed the latest RSS version, see the Starting RSS subsection to make a backup RSS copy and to install it on your hard disk. 4. Type the command below, followed by **Return**: **GM300** 5. If this is the first time this RSS version is started and the CONFIGURE COMPUTER SCREEN appears, you can either skip this screen by pressing **F10**, or work through it (see Figure 2-4 on page 2-25) to set up your archive path, display colors and choice of COM ports, then save the configuration (**F8**) and exit the screen (**F10**). 6. Press any key at the BANNER screen (see Figure 2-5 on page 2-25). 7. The MAIN MENU appears.

3.2 Programming Basic Radios

This tutorial gives step-by-step instructions for programming the 8-channel Radius GM300 mobile radio.

3.2.1 Scenario

The Longwood Hotel and Convention Center's setup and maintenance staff needs a basic 8-channel radio to coordinate the forklift and towing services required in the setup of the exposition's display floor. A central dispatcher will direct the setup activities by communicating with the mobile forklift and truck drivers.

3.2.2 Desired Features

The convention setup and maintenance radios will need the following features:

- ❑ A Transmit Frequency
- ❑ A Receive Frequency
- ❑ Private Line/Digital Private Line (TPL/DPL) Codes
- ❑ Carrier Squelch
- ❑ Time-Out Timer (TOT)

3.2.3 Major Decisions Involved

To program the desired features above, the approach with the RSS will be:

- ❑ Decide which radio model to use.
- ❑ Decide which frequencies to use.
- ❑ Pick the number of modes (channels) desired.
- ❑ Decide which feature systems to use (basic, scan, signalling).
- ❑ Decide which features to program radio-wide (all channels).
- ❑ Decide which features to program per-mode (individual channels only).
- ❑ Do the step-by-step specific programming instructions.

3.2.4 Step-by-Step Programming Instructions

Table 3-2 on page 3-4 is a chart of the desired features for each mode of the radio being programmed in this tutorial. Check them off as you do them in the sections to follow. See Appendix I for a blank form you can use for future radios.

Table 3-2. Radio Personality Chart

RADIO PERSONALITY CHART									
Feature Name	Radio Wide	Mode 1 #____	Mode 2 #____	Mode 3 #____	Mode 4 #____	Mode 5 #____	Mode 6 #____	Mode 7 #____	Mode 8 #____
Tx Frequency									
Rx Frequency									
PL codes									
Squelch									
Time Out Timer (TOT)									
Busy Channel Lockout									
Tx Inhibit on Busy									
Signalling Systems									
KEY: ✔ = origi- ✚ = feature ✚✚ = feature ■ =									

3.2.4.1 *Read Current Radio's Personality (Codeplug)*

Before programming the radio with some features, you must read and access the current radio's personality (codeplug data).

Table 3-3. Steps to Read a Radio's Personality (Codeplug)

Instruction	What to type	What it does or means
1. Go to GET/SAVE menu		Press **F3** at the MAIN MENU to get to the GET/SAVE Menu.
2. Get radio's current codeplug data		At the GET/SAVE menu, press **F2** to execute the function. In the Instruction Area of the screen, the message "Accessing Serial Bus" will flash a few times while the RSS is retrieving the radio's codeplug data. If it does not, make sure that all the cables are properly connected and that both the radio and RIB are powered up.

3.2.4.2 *Program The Radio-Wide Features First*

After the radio's codeplug data is read, the RSS allows you to access the CHANGE/VIEW menu. From here you can program the features you want on every channel, and the ones you want common to all channels. First you'll program the common (radio-wide) ones.

Table 3-4. Steps to Program Radio-Wide Features

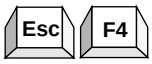
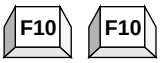
Instruction	What to type	What it does or means
1. Go to CHANGE/VIEW menu		(Press **Esc** to back up to MAIN MENU.**)** Press **F4** at the MAIN MENU to see the CHANGE/VIEW Menu.
2. Go to RADIO-WIDE screen		At the CHANGE/VIEW menu, press **F2** to see the RADIO-WIDE screen. The TOT Rekey Time field should be highlighted.
3. Select choice		
4. Go to TOT Rekey Time		Pressing **Tab** advances the prompt to the next field
5. Select choise		
6. Go to Forced Monitor field		Pressing **Tab** advances the prompt to the next field.
7. Select choice		
8. Go to Handset field		Pressing **Tab** advances the prompt to the next field.
9. Select choice		

Table 3-5. Steps to Program Radio-Wide Scan Features

Instruction	What to Type	What it does or means
1. Go to SCAN OPTIONS screen		From the RADIO-WIDE screen press F7 to see the SCAN OPTIONS screen. Thge PRI Sampling Method field should be highlighted.
2. Select Choice		
3. Go to Scan Speed field		Pressing Tab advances the prompt to the next screen.
4. Select Choice		
5. Go to User PRI2 Allowed field		Pressing Tab advances the prompt to the next screen.
6. Select Choice		
7. Go to PRI Sampling Rate field		Pressing Tab advances the prompt to the next field.
8. Select Choice		
9. Go to PRI Channel Tone field		Pressing Tab advances the prompt to the next field.
10. Select Choice		
11. Go to Scan Hang Time field		Pressing Tab advances the prompt to the next field.
12. Select Choice		
13. Go to Scan Talk Back field		Pressing Tab advances the prompt to the next field.
14. Select Choice		
15. Return to CHANGE/VIEW menu		From the SCAN OPTIONS screen press F10 to return to the RADIO-WIDE screen, then press F10 to return to the CHANGE/VIEW menu.

3.2.4.3 *Program The Per-mode Features*

Now that the radio-wide features are programmed, you can now program the per-mode features. Figure 3-1 shows the MODE CONFIGURATION screen. You will become very familiar with this screen, as you will change the field options on this screen for each mode you program on a "per-mode" basis.

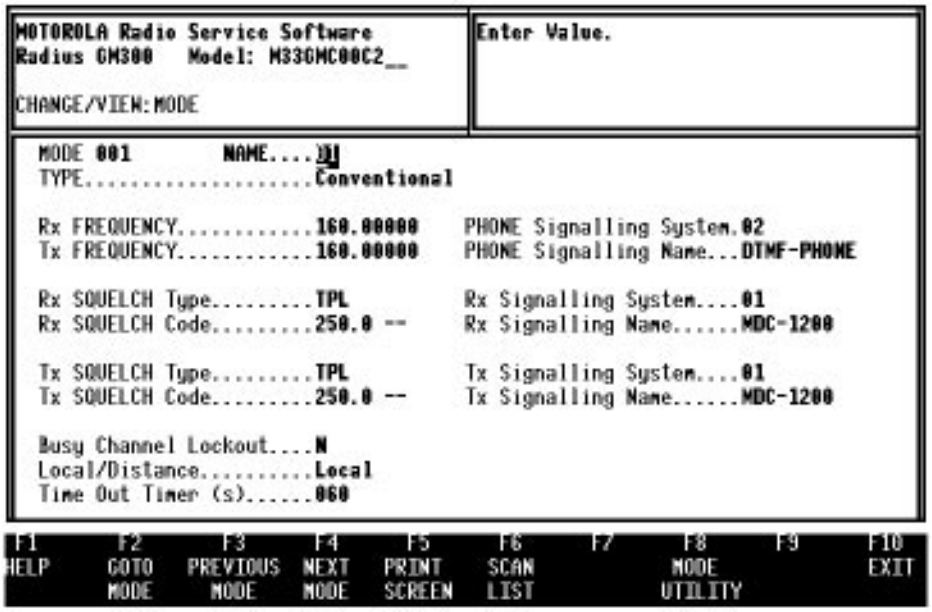


Figure 3-1. Per-Mode Features on MODE screen

To keep track of where you are, use Table 3-2 on page 3-4 to check off the features, per mode, after you program them. In Table 3-6 on page 3-8, the Enter or Return key can be used instead of the Tab key.

Table 3-6. Steps to Program Per-Mode Features

Instruction	What to type	What it does or means
1. Go to CHANGE/VIEW menu	F4	(Press **Esc** to back up to MAIN MENU.**)** Press **F4** at the MAIN MENU to see the CHANGE/VIEW Menu.
2. Go to MODE CONFIG menu	F5	At CHANGE/VIEW menu, press **F5** to go to MODE CONFIGURATION menu. You will be at mode 1.
3. Go to Name field		The prompt will be on the Name field when you move to this screen, as it is the first field.
4. Select a Name		
5. Skip Type field	Tab	The Type field cannot be accessed at this time.
6. Go to Rx Frequency field	Tab	Pressing **Tab** advances the prompt to the next field.
7. Select an Rx Frequency		A frequency number can be typed in or selected.
8. Go to Tx Frequency field	Tab	Pressing **Tab** advances the prompt to the next field.
9. Select a Tx Frequency		A frequency number can be typed in or selected.
10. Go to Rx Squelch type field	Tab	Pressing **Tab** advances the prompt to the next field.
11. Select an Rx Squelch type	↓	
12. Go to Rx Squelch Code field	Tab	Pressing **Tab** advances the prompt to the next field.
13. Select an Rx Squelch Code	↓	
14. Go to Tx Squelch Type field	Tab	Pressing **Tab** advances the prompt to the next field.
15. Select a Tx Squelch Type	↓	
16. Go to Tx Squelch Code field	Tab	Pressing **Tab** advances the prompt to the next field.
17. Select a Tx Squelch Code	↓	
18. Go to Busy Channel Lockout field	Tab	Pressing **Tab** advances the prompt to the next field.
19. Select BCL choice	↓	
20. Go to Local/Distance field	Tab	Pressing **Tab** advances the prompt to the next field.
21. Select a Local/Distance value	↓	
22. Go to Time-Out Timer field	Tab	Pressing **Tab** advances the prompt to the next field.
23. Select a Time-Out Timer value.	↓	

Table 3-6. Steps to Program Per-Mode Features (Cont'd.)

Instruction	What to type	What it does or means
24. Program the next mode	F4	Repeat steps 4-11 for each mode (channel).
25. Create additional mode	F4 ↓	Press **F8** at the MODE CONFIGURATION menu to go to the MODE UTILITY screen, then press the down arrow key to scroll through the mode utility list until the ADD mode choice appears.

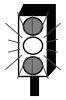
3.2.4.4 *Program The Personality Into The Codeplug (Radio)*

Now that you have set values for all the features you want, it's 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.

Note: Make sure that the radio is connected to the Radio Interface Box (RIB) and that both the RIB and radio are powered up before pressing F8. On newer RIBs that have a built-in battery supply, make sure the power LED is on. If you have serial bus errors or other warnings, try a fresh RIB battery even though the power LED may be on.

Table 3-7. Steps to Save Personality to Radio's Codeplug

Instruction	What to type	What it does or means
1. Go to GET/SAVE menu	F3	Press **Esc** to back up to MAIN MENU.) Press **F3** at the MAIN MENU to see the GET/SAVE menu.
2. Go to PROGRAM CODEPLUG	F7	Pressing **F8** at the GET/SAVE menu advances you to the PROGRAM CODEPLUG screen, where the current data stored in the computer's RAM (what you can see on the RSS screens) is programmed to the radio's codeplug.
3. Complete the programming	F2	A warning box appears to verify what you are about to do. The choices are **F2** to complete the programming or **F10** to abort the programming. Press **F2** to complete.



When programming or calibrating a radio DO NOT disconnect the radio from the RIB when the computer is communicating with the radio - it may leave the radio in an inoperable state. The only recommended time to disconnect the radio is at the MAIN MENU or GET/SAVE screens.

3.2.4.5 *Save The Personality To An Archive File*

You've just saved the personality to the radio, but it's important to save it on disk too. Below are the steps to save the radio's personality to an archive file and a backup file.

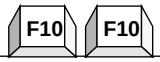
Table 3-8. Steps to Save Radio Personality to Archive and Backup Files

Instruction	What to type	What it does or means
1. Go to GET/SAVE menu		(Press **Esc** to back up to MAIN MENU.**)** Press **F3** at the MAIN MENU to see the GET/SAVE menu.
2. Go to SAVE ARCHIVE FILE		Press **F7** at GET/SAVE to see SAVE ARCHIVE FILE screen. This displays the archive diskette drive and path name, current model number, current radio serial number, and customer ID. If there is no customer ID, it can be added at this time.
3. Specify archive file path	C:\MRSS\GM300\ARCHIVE	This is where we recommend you save your radio personality archive files for GM300 radios.
4. Specify backup path	B:\	Specify the root directory of the diskette inserted in drive B to be the backup file location.
5. Insert formatted diskette		Put a formatted diskette (or use your existing archive file diskette) into drive A so the RSS will save your backup archive file.
6. Save the file		Pressing **F8** at the SAVE ARCHIVE FILE screen saves the data in an archive file specified above. (**F2** allows you to change the disk path and drive name.)
7. Save backup file		After saving the archive file, the RSS will ask for the backup diskette if it is not already inserted into the drive. Follow the instructions.

3.2.5 Exit RSS

You now have a foundation for programming more radios. If you don't want to proceed to the next tutorial, *Cloning Radios*, then use the steps outlined in Table 3-9 to exit RSS. To retain a good portion of what you've learned so far, please review this material or program another radio within 48 hours.

Table 3-9. Steps to Exit the RSS

Instruction	What to type	What it does or means
1. Go to MAIN MENU		Press **Esc** to back up to MAIN MENU.
2. Exit to DOS		Press **F10** twice to exit to DOS.

3.3 Cloning Radios

To clone, radios must be of the same model type and version.

3.3.1 Scenario

To make the best use of their time, the Longwood Hotel and Convention Center's setup and maintenance staff will need at least two tow trucks and two forklifts equipped with identical Radius GM300 mobile radios, as their duties are very similar.

3.3.2 Desired Features

The desired features are the exact same ones listed in the previous tutorial.

3.3.3 Major Decisions Involved

The major steps for cloning in this tutorial are reduced from the six steps in the first tutorial to three steps here, as most of the questions were answered by the decision to have identical radio personalities for all setup and maintenance operations.

To program the cloned radio, the approach will be:

- ❏ Pick Desired Archive File.
- ❏ Decide Whether to Change IDs.
- ❏ Decide How Many Radios to Clone.

3.3.3.1 *Pick Desired Archive File*

To clone, the radios must be from the same product family, must be of the same model type and product vintage. In this case, you will use the archive file created and saved in the first tutorial, A999999.999.

3.3.4 Step-by-Step Specific Cloning Instructions

In this subsection, you will:

- ❏ Read (get) into the RSS the specific file you want to clone from (source file),
- ❏ Clone that source file into the current radio's codeplug (target),
- ❏ Clone the remaining two radios the same way, and then
- ❏ Exit RSS.

3.3.4.1 *Read Desired Source Archive File*

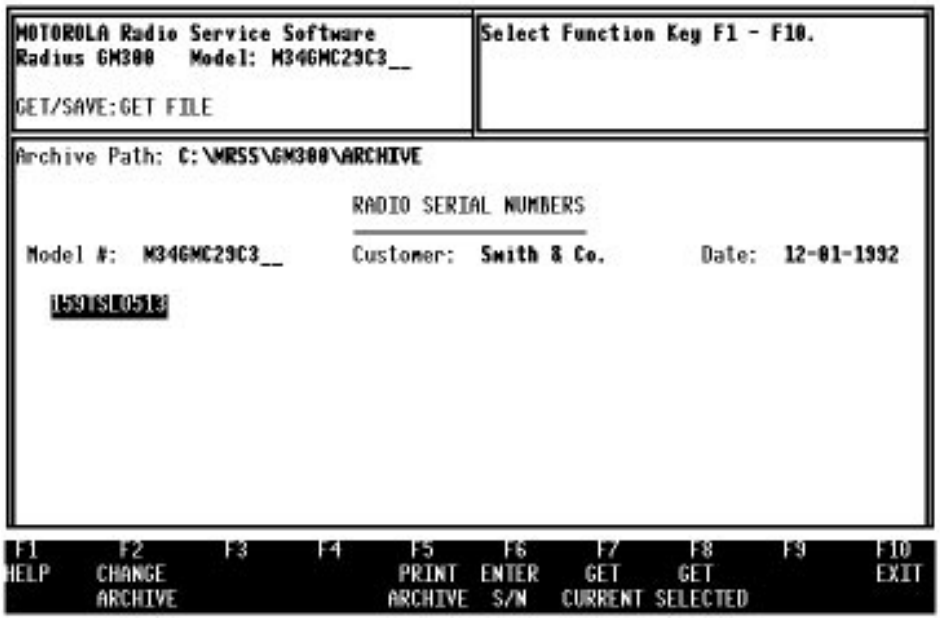


Figure 3-2. Reading (Getting) an Archive File from Disk

3.3.4.2 *Clone Current Radio From Archive File*

Radio codeplugs consist of both personality and tuning data. Cloning allows you to "merge" two codeplugs together. The archive file or radio with the desired personality is referred to as the source file or source radio. The other file is referred to as the target radio. The result is an image that can be programmed into a radio and/or saved to an archive file. This image will have the source codeplug's personality, yet the tuning data of the target codeplug remains unchanged. In this tutorial, the source personality is the file saved in the first tutorial, and the target radios are the three radios not yet programmed. The procedures listed in Table 3-10 on page 3-13 should be followed:

Note: The IDs for MDC-1200, Quik Call II, DTMF, etc. must be changed manually if you want to have unique IDs. You may do this by going to CHANGE/VIEW immediately after cloning each radio.

Table 3-10. Steps to Clone Radios

Instruction	What to type	What it does or means
1. Go to GET/SAVE menu		(Press **Esc** to back up to MAIN MENU.) Press **F3** at the MAIN MENU to see the GET/SAVE menu.
2. Go to GET ARCHIVE FILE		Press **F3** at GET/SAVE menu to go to GET ARCHIVE FILE screen. (A list of files is displayed which look like serial numbers) that the RSS program found under the directory path shown.)
3. Type in path name	C:\MRSS\GM300\ACRHIVE	This tells RSS to display the file names found in this directory. You will see the file named A9999999.999 that you saved in the first tutorial.
4. Select desired file		Press **Tab** until the A9999999.999 file is highlighted.
5. Get selected file		Get the selected (highlighted) file.
6. Connect target radio		Assemble the hardware and connect the radio you want cloned.
7. Save source into target radio		After Step 5 you should be back at the GET/SAVE menu. Press F5 from GET/SAVE to clone the current radio's codeplug with the selected source file's personality. The cloning process will check for compatibility of the two radios automatically. You will receive an error message if cloning cannot be performed. If for any reason the radios cannot be cloned, an error message will appear. Check all connections or refer to Appendix A (Error Code Explanations) and B (Troubleshooting Problems).
8. Disconnect radio		When Step 7 is finished, you can disconnect the radio. In a matter of seconds the second radio was cloned. Disconnecting the radio should only be done at the GET/SAVE menu or the MAIN MENU, or the radio may be left in an inoperable state.
9. Proceed to step 1 in next table.		

3.3.5 Clone Remaining Radios

Table 3-11. Cloning Additional Radios

Instruction	What to type	What it does or means
1. Do Steps 1-5 in Table 3-10.		Do steps 1-5 in Table 3-10.
2. Connect next target radio		Connect cable from RIB to the radio.
3. Clone the radio		Press **F5** at the GET/SAVE menu to clone the radio. This saves (reads) the source file into the current radio. The cloning process will check for compatibility of the two radios automatically. You will receive an error message if cloning cannot be performed.
4. Disconnect radio		When Step 3 is finished, disconnect the radio.
5. Clone remaining radios		Repeat Steps 2-4 for the last two radios. If for any reason the radios cannot be cloned, an error message will appear. Check all connections or refer to Appendix A (Error Code Explanations) and B (Troubleshooting Problems).

3.3.5.1 *Exit RSS*

To exit RSS, follow the steps in Table 3-9 on page 3-11.

In a matter of minutes three more radios were programmed identically to the first one. Additional features can be added by following the programming procedures in the corresponding reference pages in the Reference sections that follow.

4 Basic Features

4.1 Overview

The feature chart (Table 4-1 on page 4-2) shows a complete list of GM300 radio features.

Only one feature or function is shown on a page. On each reference page you will find a standard page layout with consistent categories of information. Below is a list and explanation of all the categories. The categories with an asterisk (*) appear on every reference page. The other categories appear only when they apply to the specific feature.

- **FEATURE NAME*** Identifies the name of the reference feature.
- **RSS LOCATION*** Provides a quick visual map of where you'll find a particular feature within the RSS, showing the keys to press to arrive at the feature's or function's screen location. More details of this map follow in the PROGRAMMING PROCEDURE section.
- **DEFINITION*** Summaries the feature's function - it defines and briefly explains the feature.
- **DEFAULT/CHOICES*** Identifies and explains both the default value the feature is automatically set to (with no user input) and the other available choices a user can select.
- **DEPENDENCIES** Identifies items that have a direct impact or influence upon the feature.
- **EXCEPTIONS** Identifies when the general rules concerning a feature may not apply.
- **RECOMMENDATIONS** Provides advice for the most common applications and usages, and informs you when things work best.
- **WARNINGS** Identifies areas of caution and important concerns. Be sure to read and act upon warnings. They are more serious in nature than IMPORTANT NOTES.
- **IMPORTANT NOTES** Explains other issues to consider.
- **PROGRAMMING PROCEDURES*** Summaries how to access and change a given feature. It explains the RSS LOCATION mapping in more detail.

4.2 GM300 Features

Table 4-1. GM300 Features

Feature	8 Channel	16 Channel	Feature	8 Channel	16 Channel
Radio Wide Features			Scan Features		
Accessory External		X	Priority 2 Mode		X
Accessory Internal		X	Priority Channel Tone	X	X
Accessory Custom		X	Priority Sampling Method	X	X
TOT Rekey Time	X	X	Priority Sampling Rate	X	X
Forced Monitor	X	X	Scan Hang Time	X	X
Handset	X	X	Scan Talk Back	X	X
By-Mode Features			Scan Speed	X	X
Busy Channel Lockout	X	X	User PRI 2 Allowed	X	X
Local/Distance	X	X	Accessory Connector Features		
Phone Signalling System		X	Active Level		X
Rx Frequency	X	X	Data Direction		X
Rx Signalling System		X	Debounce		X
Rx Squelch Type	X	X	External Accessories		X
Rx Squelch Code	X	X	Function Descriptions		X
Time-Out Timer	X	X	Internal Accessories		X
Tx Frequency	X	X	PIN #		X
Tx Signalling		X	Power Up Delay		X
Tx Squelch Type	X	X	Rapidcall Signalling Features		
Tx Squelch Code	X	X	Please Refer to the Rapidcall Signalling Reference for a description of these features		
Other Features					
Select V		X	Please Refer to the Rapidcall Signalling Reference for a description of these features		
Call Lists		X			
Phone Dialer		X			

Busy Channel Lockout

RSS LOCATION

DEFINITION

Limits audible conversations from other user groups and reduces transmissions on top of other user groups.

DEFAULT/CHOICES

Default: **N**

Choices: ■ ***Y*** ■ ***N***

DEPENDENCIES

Receive squelch type not equal to carrier squelch.

EXCEPTIONS

Does not apply when receive squelch type is equal to carrier squelch, therefore it is incompatible with Tx Inhibit on Busy.

RECOMMENDATIONS

Use when you don't want to hear anybody else's conversations, or when you don't want one user group "eavesdropping" on another. Compatible with Rapid-call signalling and scan.

WARNINGS

Not compatible with carrier squelch channels. May cause operational difficulties when talking through community repeaters. Operation is less reliable when used with Channel Scan, since it is more probable that you will key up on another group.

IMPORTANT NOTE

If you press PTT on radio while there is a carrier on the channel, the radio follows this protocol:

a. If the carrier has your TPL/DPL, then you are allowed to transmit just like normal
b. If the carrier has no TPL/DPL or the wrong TPL/DPL, then you will hear a busy tone while you hold PTT. Release PTT and try again later.

A short carrier 'break' is required to return to the BCL protected state.

SEE ALSO

Tx Inhibit On Busy.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Busy Channel Lockout field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Busy Channel Lockout value.
3. At the MODE CONFIGURATION screen, select the mode number that you want to change Busy Channel Lockout value by pressing either the **F3** or **F4** keys until the desired mode number is displayed in the Name field.	6. To change the Busy Channel Lockout value on other modes, repeat steps 3-5.

Forced Monitor

RSS LOCATION

DEFINITION

Forces radio to be in monitor (Rx PL disabled) before radio can be keyed. When PTT is pressed when not in monitor, the operator will hear a low-pitched (error) tone and the monitor light will illuminate. Pressing PTT a second time will cause the radio to key.

DEFAULT/CHOICES

Default: **OFF**

Choices: ■ ***OFF*** ■ ***ON***

RECOMMENDATIONS

Use to force operator to monitor channel before transmitting or in markets where this is a regulatory requirement. Normally not needed unless customer does not want to use the microphone hang-up feature.

WARNINGS

Using this feature with Busy Channel Lockout or Transmit Inhibit On Busy is not recommended. Busy Channel Lockout rules prevail when both features are enabled.

SEE ALSO

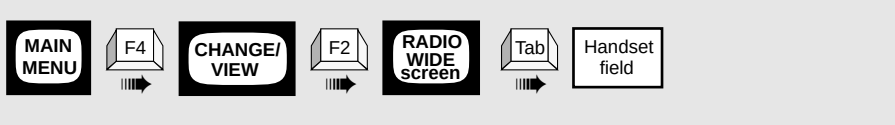
Busy Channel Lockout, Transmit Inhibit On Busy

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select the desired Forced Monitor value.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	
3. Press **Tab** (or **Enter** or **Return**) until the Forced Monitor field is highlighted.	

Handset

RSS LOCATION



DEFINITION Selects how receive audio is routed for handset. Mutes loudspeaker when handset is removed from hang-up cup, enables loudspeaker when handset is hung up.

DEFAULT/CHOICES **Default: N**

Choices: ■ ***Y*** ■ ***N***

RECOMMENDATIONS Use when the handset is connected to the radio.

WARNINGS If this feature is enabled, and a handheld microphone is used, you will not hear the audio speaker when microphone is off-hook.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select the desired Handset value.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	
3. Press **Tab** (or **Enter** or **Return**) until the Handset field is highlighted.	

Local/Distance

RSS LOCATION

DEFINITION A feature that affects radio sensitivity and interference rejection.

DEFAULT/CHOICES **Default: Local**

Choices: ■ ***Dx*** ■ ***Local***

Local Use Local in areas of dense radio usage (suburbs and major cities). Local improves IM performance dramatically, but loses some sensitivity.

Dx Use Dx (distance) when in an area where radio is decoding weak signals (rural area).

RECOMMENDATIONS Use Local when in an area where there is a lot of interference (in the city). When frequently traveling between local and distant areas, use two channels with the same frequencies, only program one as Local and one as Dx. This way you can simply switch from the local channel to the distance channel as you travel from the city to a more rural area. Most control stations should be Local.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Local/Distance field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Local/Distance value.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to change the Local/Distance value by pressing either the **F3** or **F4** keys until the desired mode number is displayed in the Name field.	6. To change the Local/Distance value on other modes, repeat steps 3-5.

Mode Name

RSS LOCATION

DEFINITION The number to be displayed on the front of the radio for this mode.

DEFAULT/CHOICES **Default: The current channel number.**

Choices: 1 through 99

The number you type here will be the number displayed on the front of the radio. For example, the radio could have three modes, named 1, 5 and 98.

RECOMMENDATIONS Use when your customer needs the channels in a specific sequence for compatibility with existing radios. It can also be used when a customer wants to "ship" channel positions.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the mode Name field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Name.
3. At the MODE CONFIGURATION screen, select the mode number that want you to change by pressing either the **F3** or **F4** keys until the desired mode number is displayed in the Name field.	

Rx Frequency

RSS LOCATION

DEFINITION A designated frequency in MHz for receiving messages and signals.

DEFAULT/CHOICES See Motorola catalog, price sheets or your service manual for valid Rx frequencies.

A radio will receive on this frequency when the radio display shows the corresponding "mode name". Frequencies must be within the advertised band and divisible by 5 kHz or 6.25 kHz (12.5 kHz or 25 kHz for 800 MHz/900 MHz bands). These frequencies may have poor receive performance due to self-quieting:

We do not recommend using these frequencies due to possible self-quieting. Contact Product Services for other frequencies.

RECOMMENDATIONS If the mode will be receive only, type BLANK for the Tx Frequency.

A "talk-around" frequency is entered by making the Tx frequency equal to the Rx frequency.

WARNINGS Cannot have a null or blank frequency. If you need blank Rx channels, then delete the mode or use mode naming.

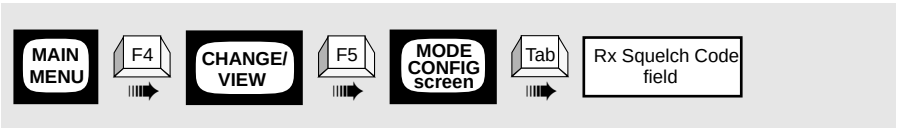
SEE ALSO Tx Frequency, Rx Squelch Code and Rx Squelch Type

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Rx Frequency field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Type in the desired Rx Frequency in MHz. Be sure to type in the decimal point too. (You could scroll through the list too using an arrow key.)
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program contains the Rx Frequency by pressing either the **F3** or **F4** keys until the desired mode # is displayed in the Name field.	6. To change the Rx Frequency on other modes, repeat steps 3-5.

Rx Squelch Code

RSS LOCATION



DEFINITION

Receiver unmutes if carrier with this specific subaudible code is present. Receiver unmutes when it detects this code, allowing more users and privacy on a frequency.

DEFAULT/CHOICES

Default: **BLANK**

Choices: ■ ***see TPL/DPL tables (Appendix C) or press F1 to display help***

If the Rx Squelch Type = TPL, then enter a frequency in hertz (Hz) or any code from Appendix C.

If Rx Squelch Type = DPL, type a 3-digit numeric code from the table in Appendix C.

DEPENDENCIES

Rx Squelch Type.

EXCEPTIONS

If a Rx Squelch Type = Carrier Squelch, then squelch code is not available.

RECOMMENDATIONS

Use when you want to have multiple groups using same frequency or when you want more privacy.

Receiver response time of the PL detector can be improved slightly, for some codes, by detuning the PL code frequency by ±0.1 Hz.

IMPORTANT NOTE

TPL tones above 220 Hz will have more bleed-through to the speaker. DPL code 645 is a reserve code and will have a greater false opening probability. TPL codes near 120 Hz and 180 Hz have a high false opening probability due to 60 Hz AC power harmonies. Countries having 50 Hz AC power may have false opening on 100 Hz (code 1Z) and 150 Hz. TPL 134 Hz can be false-opened by DPL dekey.

SEE ALSO

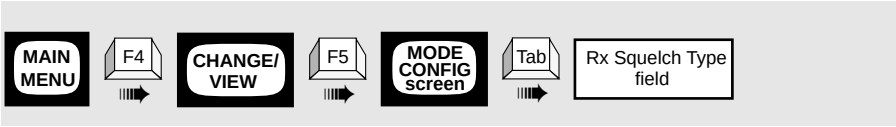
Rx Squelch Type

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Rx Squelch Code field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Rx Squelch Code or type in the desired code directly.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program the desired Rx Squelch Code by pressing either the **F3** or **F4** keys until the desired mode # is displayed in the Name field.	6. To change the Rx Squelch Code on other modes, repeat steps 3-5.

Rx Squelch Type

RSS LOCATION



DEFINITION

Determines what form of continuous subaudible code (along with carrier) is needed to open receive audio.

DEFAULT/CHOICES

Default: **CSQ**

Choices: ■ ***CSQ*** ■ ***TPL*** ■ ***DPL*** ■ ***INV.DPL***

CSQ Carrier Squelch. For receiver to unmute for all carriers.

TPL Tone Private Line, CTCSS. If you want the receiver to unmute only specific carriers with specific codes, use TPL or DPL. For TPL you can type either the frequency in MHz or a 2-digit tone code (see Appendix C).

DPL Digital Private Line, Digital CTCSSS. If you want the receiver to unmute only specific carriers with specific codes, use TPL or DPL. For DPL, enter a 3-digit tone code (see Appendix C).

INV.DPL Inverted DPL is only needed if a customer's system has an audio path "flipped".

DEPENDENCIES

Rx Squelch Type

RECOMMENDATIONS

Use when you want to have multiple groups using the same frequency or when you want more privacy.

WARNINGS

Do not use Inverted DPL (INV.DPL) for new systems! Inverted DPL is needed only for special applications, such as a "flipped" audio path or a multi-hop repeater.

SEE ALSO

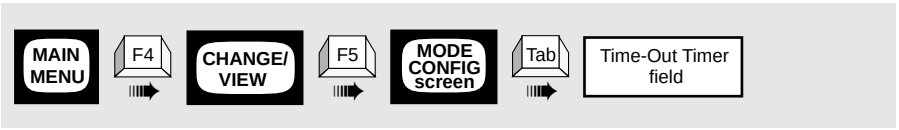
Rx Squelch Code

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Rx Squelch Type field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press F5 to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Rx Squelch Type.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program the desired Rx Squelch Type by pressing either the F3 or F4 keys until the desired mode # is displayed in the Name field.	6. To change the Rx Squelch Type on other modes, repeat steps 3-5.

Time-Out Timer (TOT)

RSS LOCATION



DEFINITION

Limits the time allowed for any continuous transmission. When time limit is reached, the radio dekeys and a constant tone is heard until PTT is released.

DEFAULT/CHOICES

Default: 60 seconds

Choices: ■ ***Off*** ■ ***1-255 seconds***

Increments: 1 second - scroll or direct-entry

Off To turn TOT off, type in a 3-digit value, such as "OFF" or "000". (One zero followed by pressing the space bar two time will also work. A single zero (0) will not work. Two zeros will not work.)

1 - 255 Specify TOT time in seconds, ranging from one second to 255 seconds.

RECOMMENDATIONS

Set for 60 seconds. Should be used when you want to limit the amount of time one person can continuously talk. This eliminates accidentally tying up the channel. If you do not wish to limit the amount of time one person can continuously talk, set value to be a very large time (255 seconds). Only when it is absolutely needed should you choose OFF.

Time-Out Timer is useful to eliminate stuck mics and other channel abuse.

IMPORTANT NOTE

Rx operation is not affected.

SEE ALSO

TOT Rekey Time

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the TOT field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired TOT value or type in the value directly.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to change Time-Out Timer value by either the **F3** or **F4** keys until the desired mode number is displayed in the Name field	6. To change the TOT value on other modes, repeat steps 3-5.

Time-Out Timer (TOT) Rekey Time

RSS LOCATION

DEFINITION

The wait time before transmitting after reaching the maximum allotted time for continuous transmission. Ensures that time is available after reaching the maximum allotted time for continuous transmission for other conversations to begin.

DEFAULT/CHOICES

Default: **OFF**

Choices: ■ ***OFF*** ■ ***6 sec***

RECOMMENDATIONS

Use to keep one user from continuously transmitting and thus not allowing other conversations to occur. If you have problems with users abusing the channel, then you might use this!

SEE ALSO

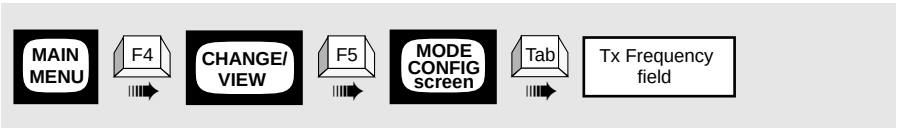
Time-Out Timer

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select the desired TOT Rekey Time value.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	
3. At the RADIO WIDE CONFIGURATION screen, press **Tab** (or **Enter** or **Return**) key until the TOT Rekey Time field is highlighted.	

Tx Frequency

RSS LOCATION



DEFINITION A designated frequency in MHz for sending outgoing messages and signals from the radio.

DEFAULT/CHOICES See Motorola catalog, price sheets or your service manual for valid Tx frequencies.

RECOMMENDATIONS If you want a receive-only frequency, enter B, and transmit frequency will display blank.

A "talk-around" frequency is entered by making the Tx frequency equal to the Rx frequency.

If you type an invalid frequency, you'll hear a beep, and the original frequency returns.

SEE ALSO Rx Frequency, Tx Squelch Code and Tx Squelch Type

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) key until the Tx Frequency field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Type in the desired Tx Frequency in MHz. Be sure to type in the decimal point too. (You can scroll the list too.)
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program the desired Tx Frequency by pressing either the **F3** or **F4** keys until the desired mode # is displayed in the Name field.	6. To change the Tx Frequency on other modes, repeat steps 3-5.

Tx Inhibit On Busy

RSS LOCATION

DEFINITION Disables transmit while carrier is present on channel (channel is busy). A busy tone will be heard when the PTT is pressed.

DEFAULT/CHOICES **Default: N**

Choices: ■ ***Y*** ■ ***N***

DEPENDENCIES Receive squelch type is equal to carrier squelch.

EXCEPTIONS Does not apply when receive squelch type is not equal to carrier squelch, therefore it is not compatible with Busy Channel Lockout.

RECOMMENDATIONS Use when channel is shared by several users. Prevents accidentally transmitting on top of other users. Pressing PTT when a carrier is present causes the radio to generate a busy tone. Compatible with RapidCall signalling and scan.

WARNINGS Not compatible with TPL or DPL receive channels. May cause operational difficulties when talking through repeater systems.

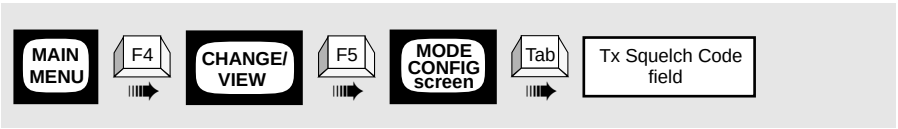
SEE ALSO Busy Channel Lockout.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Tx Inhibit On Busy field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Tx Inhibit On Busy value.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to change the Tx Inhibit On Busy value by either the **F3** or **F4** keys until the desired mode number is displayed in the Name field.	6. To change the Tx Inhibit On Busy value on other modes, repeat steps 3-5.

Tx Squelch Code

RSS LOCATION



DEFINITION

The subaudible code the radio will transmit. Allows for more users and privacy on a frequency. Receiver unmutes when code is detected.

DEFAULT/CHOICES

Default: **BLANK**

Choices: ■ ***see TPL/DPL tables (Appendix C) or press F1 to display help***

If the Tx Squelch Type = **TPL**, then enter a frequency in hertz (Hz) or any 2-digit PL code from Appendix C.

If Tx Squelch Type = **DPL** or **INV.DPL**, type a 3-digit numeric code from the table in Appendix C.

DEPENDENCIES

Tx Squelch Type and Tx Frequency

EXCEPTIONS

If a Tx Squelch Type = CARRIER SQUELCH or Tx Frequency = blank, then this field is not available.

RECOMMENDATIONS

Use when you want to have multiple groups using same frequency or when you want more privacy.

IMPORTANT NOTE

TPL tones above 220 Hz will have more bleed-through to the speaker. DPL code 645 is a reserve code and will have a greater false opening probability. TPL codes near 120 Hz and 180 Hz have a high false opening probability due to 60 Hz AC power harmonies. Countries having 50 Hz AC power may have false opening on 100 Hz (code 1Z) and 150 Hz. TPL 134Hz can be false-opened by DPL dekey.

SEE ALSO

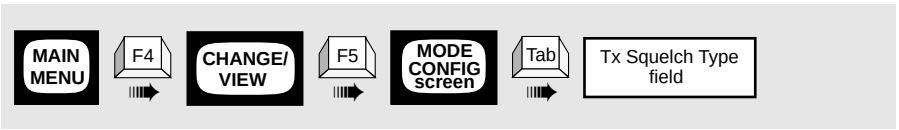
Tx Squelch Type, Tx Frequency

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) until the Tx Squelch Code field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Tx Squelch Code.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program the desired Tx SQUELCH Code by pressing either the **F3** or **F4** keys until the desired mode # is displayed in the Name field.	6. To change the Tx Squelch Code on other modes, repeat steps 3-5.

Tx Squelch Type

RSS LOCATION



DEFINITION Determines the form of continuous subaudible code the radio will transmit.

DEFAULT/CHOICES **Default:** **CSQ**

Choices: ■ ***CSQ*** ■ ***TPL*** ■ ***DPL*** ■ ***INV.DPL***

CSQ Carrier Squelch. For receiver to unmute all carriers, transmit no specific signal.

TPL If you want the receiver to unmute only specific carriers with specific codes, use TPL or DPL. For TPL you can type either the frequency in MHz or a 2-digit tone code (see Appendix C).

DPL If you want the receiver to unmute only specific carriers with specific codes, use TPL or DPL. For DPL, enter a 3-digit tone code (see Appendix C).

INV.DPL Inverted DPL is only needed if a customer's system has an audio path "flipped".

DEPENDENCIES Tx Frequency

EXCEPTIONS When Tx Frequency = blank, this field is not available.

RECOMMENDATIONS Use when you want to have multiple groups using same the frequency or when you want more privacy.

WARNINGS Do not use Inverted DPL (INV.DPL) for new systems! Inverted DPL is needed only for special applications, such as a "flipped" audio path or a multi-hop repeater.

SEE ALSO Tx Squelch Code, Tx Frequency

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** (or **Enter** or **Return**) key until the Tx Squelch Type field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Tx Squelch Type.
3. At the MODE CONFIGURATION screen, select the mode number for which you want to program the desired Tx Squelch Type by pressing either the **F3** or **F4** keys until the desired mode # is displayed in the Name field.	6. To change the Tx Squelch Type on other modes, repeat steps 3-5.

5 Scanning Features

5.1 Overview

Only one feature or function is shown on a page. On each reference page you will find a standard page layout with consistent categories of information. Below is a list and explanation of all the categories. The categories marked with an asterisk (*) appear on every reference page. The other categories appear only when they apply to the specific feature.

- **FEATURE NAME*** Identifies the name of the reference feature.
- **RSS LOCATION*** Provides a quick visual map of where you'll find a particular feature within the RSS, showing the keys to press to arrive at the feature's or function's screen location. More details of this map follow in the PROGRAMMING PROCEDURE section.
- **DEFINITION*** Summarizes the feature's function - it defines and briefly explains the feature.
- **DEFAULT/CHOICES*** Identifies and explains both the default value the feature is automatically set to (with no user input) and the other available choices a user can select.
- **DEPENDENCIES** Identifies items that have a direct impact or influence upon the feature.
- **EXCEPTIONS** Identifies when the general rules concerning a feature may not apply.
- **RECOMMENDATIONS** Provides advice for the most common applications and usages, and informs you when things work best.
- **WARNINGS** Identifies areas of caution and important concerns. Be sure to read and act upon warnings. They are more serious in nature than IMPORTANT NOTES.
- **IMPORTANT NOTES** Explains other tips to consider.
- **PROGRAMMING PROCEDURES*** Summarizes how to access and change a given feature. It explains the RSS LOCATION mapping in more detail.

5.2 Scan Features

The following reference pages describe the various Scan Features available.

Priority Channel Tone

RSS LOCATION

DEFINITION Whenever the radio's scan stops on a priority channel, a short tone can be sounded. Enabling the tone draws the user's attention to a message of high importance.

DEFAULT/CHOICES **Default: N**

Choices: ■ ***Y*** ■ ***N***

DEPENDENCIES Applies to all scan lists (user and mode-slaved).

RECOMMENDATIONS Enable when customer requests. Not used in conjunction with 8-channel radios.

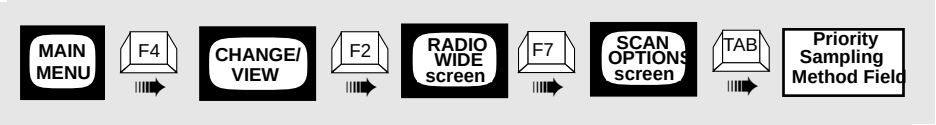
WARNINGS Enabling the tone can cause a loss of 100 ms of the priority channel audio.

PROGRAMMING PROCEDURE

1. Press F4 at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Priority Channel Tone field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Priority Channel Tone option.
3. At the RADIO WIDE CONFIGURATION screen, press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

Priority Sampling Method

RSS LOCATION



DEFINITION

Determines the way in which the priority channel(s) is checked for activity during a "lookback" from an active second priority or non-priority channel.

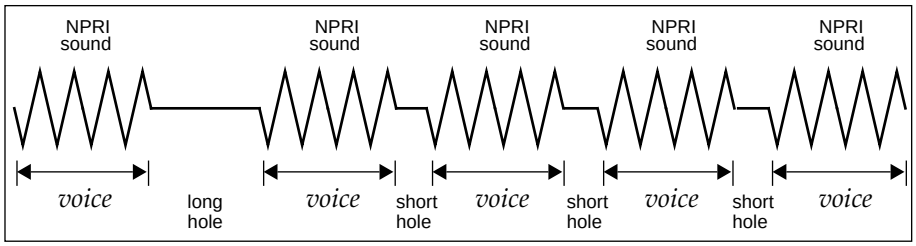
DEFAULT/CHOICES

Default: Continuous

Choices: ■ ***Continuous*** ■ ***1-SHOT PL***

Continuous Continuous always performs a complete check of the channel. If no carrier is present, then the sampling ends. If a carrier is present, a full PL check is made on each sample.

1-Shot PL For 1-Shot PL, once a carrier is seen, a full PL sample is only done once until a sample is seen with no carrier present (that is, a carrier "break"). See PIX.



RECOMMENDATIONS

Almost always use Continuous. Use 1-Shot PL to reduce hole size on shared channels (for example, community repeaters, timeouts). Your best advantage occurs if you reduce the priority sampling rate when using 1-Shot PL.

WARNINGS

There is a risk that messages will be lost on the priority channel. Use Continuous for critical priority channels (public safety, etc.).

IMPORTANT NOTE

Best performance of 1-Shot PL is attained on a well-controlled channel, since a wide carrier break is needed to reduce lost priority activity. Your repeater panel may have an access timer that will help. Busy Channel Lockout on all radios will help.

SEE ALSO

Busy Channel Lockout, Priority Sampling Rate

PROGRAMMING PROCEDURE

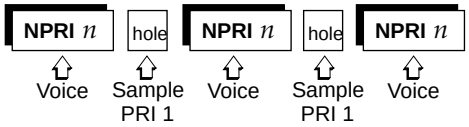
1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Priority Sampling Method field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Priority Sampling Method.
3. At RADIO WIDE CONFIGURATION, press **F7** to get to theRADIO-WIDE SCAN OPTIONS screen.	

Priority Sampling Rate

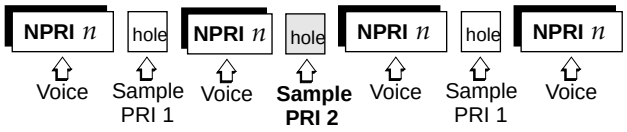
RSS LOCATION

DEFINITION

Determines how often the priority channel is sampled for activity when listening to priority 2 or non-priority channels. This sampling process is known as "look-back" and causes holes in received audio. The time chosen determines the length of time between samples. The following picture shows the sequence information.



Single Priority "Lookback" Sequence



Dual Priority "Lookback" Sequence

DEFAULT/CHOICES

Default: **0.9 seconds**

Choices: ■ ***0.5 seconds to 4.0 seconds***

RECOMMENDATIONS

Only used when list has priority channels. Applies to user scan lists also. The best choice is always a compromise between probability of missed syllables on the priority channel and intelligibility of the lower priority channel. Each customer's preference may be different. For critical use (public safety, etc.) we suggest the fastest choice.

SEE ALSO

Priority Sampling Method, and Appendix Timing diagrams

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Priority Sampling Rate field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select or directly type in the desired Priority Sampling Rate.
3. At the RADIO WIDE CONFIGURATION screen press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

Priority 2 Mode

RSS LOCATION

DEFINITION

A mode-slaved scan list can be either non-priority, single-priority, or dual-priority. In the case of dual-priority, the second priority is defined once for all mode-slaved scan lists. The mode number entered will be the only available Priority 2 channel in any mode-slaved scan list

DEFAULT/CHOICES

Default: **Off**

Choices: ■ ***Any channel in radio or OFF***

EXCEPTIONS

Not available on 8-channel models..

RECOMMENDATIONS

Leave at default unless the application requires a specific second priority channel. Should a user want a "dynamic" second priority, implement "user-scan" instead.

SEE ALSO

User Scan List

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU screen.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Priority 2 Mode field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select or directly type in the desired Priority 2 Mode.
3. At the RADIO WIDE CONFIGURATION screen press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

Scan Hang Time

RSS LOCATION

DEFINITION Determines how long the radio will remain on the channel after receiving the end of a transmission or after releasing PTT.

DEFAULT/CHOICES **Default:** **2.5 seconds**

Choices: ■ ***0.0 - 4.1 seconds***

DEPENDENCIES Applies to all scan lists (user and mode-slaved).

RECOMMENDATIONS The hang time provides both received message continuity and allows the user time to "grab the microphone" to respond to a received message. Some systems, such as split simplex, require a zero hang time to hear both sides of a conversation.

IMPORTANT NOTE During the hang time, the radio remains on the last active channel.

SEE ALSO Scan Talkback

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Scan Hang Time field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION.	5. Use the ↑ ↓ arrow keys to select or directly type in the desired Scan Hang Time.
3. At the RADIO WIDE CONFIGURATION screen press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

Scan Nuisance Delete

RSS LOCATION	*NOT PROGRAMMABLE WITH THE RSS*
DEFINITION	When listening to an active channel, it may be temporarily deleted from the scan list by the user. User holds SELECT for 2 seconds. The channel returns to the scan list upon exiting/re-entering scan, or cycling radio off/on.
DEPENDENCIES	Home channels and priority channels cannot be deleted.
IMPORTANT NOTE	No RSS programming is required/available.

Scan Speed

RSS LOCATION

DEFINITION

Determines how long each channel is checked for carrier and PL. Allows adjustment for radio hardware improvements and customer preference.

DEFAULT/CHOICES

Default: Normal

Choices: ■ ***Fast*** ■ ***Normal*** ■ ***Slow***

Normal Most customers will use Normal.

Fast Fast risks a loss of carrier detect, degrading the range. Fast is most applicable when Rx frequencies are less than 5 MHz. Fast should only be used where strong signal conditions exist.

Slow Slow is the most reliable and does not affect sensitivity.

SEE ALSO

Appendix E - Timing Diagrams.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen press **Tab** (or **Enter** or **Return**) until the Scan Speed field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Scan Speed.
3. At the RADIO WIDE CONFIGURATION screen, press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

Scan Talkback

RSS LOCATION

DEFINITION Determines which channel the radio will revert to when either the microphone is taken off hook or transmits while the scanner has stopped (hanging) on activity.

DEFAULT/CHOICES **Default:** **N**

Choices: ■ ***Y*** ■ ***N***

Y If Scan Talkback is enabled (Y), the radio will remain on the currently active channel when transmitting and/or mic is taken off hook.

N If disabled (N), then the radio will revert to the home channel.

DEPENDENCIES Applies to all scan lists (user and mode-slaved).

EXCEPTIONS Does not affect radio operation when scanning with no activity present (scan bars on the display). In such circumstances the radio always reverts to the home channel.

RECOMMENDATIONS Enable talkback for most customers; disable when most channels are being scanned for receive-only purposes. Some public safety users prefer to disable Scan Talkback.

SEE ALSO Scan Hang Time.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the Scan Talkback field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION screen.	5. Use the ↑ ↓ arrow keys to select the desired Scan Talkback option.
3. At the RADIO WIDE CONFIGURATION screen, press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

User Pri 2 Allowed

RSS LOCATION

DEFINITION The second priority feature of the user scan list can be disabled.

DEFAULT/CHOICES **Default:** **N**

Choices: ■ ***Y*** ■ ***N***

N If customer only needs one priority, then leave disabled.

Y Allows programming of user scan priority 2.

RECOMMENDATIONS To simplify user operation, choose N (disabled) so operator can only select one priority channel in the user scan.

SEE ALSO Priority Sampling Rate.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At the RADIO-WIDE SCAN OPTIONS screen, press **Tab** (or **Enter** or **Return**) until the User PRI 2 Allowed field is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO WIDE CONFIGURATION.	5. Use the ↑ ↓ arrow keys to select the desired User PRI 2 Allowed.
3. At the RADIO WIDE CONFIGURATION screen, press **F7** to get to the RADIO-WIDE SCAN OPTIONS screen.	

User Scan List

RSS LOCATION *NOT PROGRAMMABLE WITH THE RSS*

DEFINITION Each radio can have a single user-programmed scan list. The list is edited via the front panel of the radio. The RSS cannot view or change the user list.

Hold the SCAN button on the radio for 2 seconds; the display will flash. A vertical bar in the upper left corner indicates a channel is in the user list. Press SELECT to add/delete. An extended hold of SELECT sets the priority channel. Press SCAN to save the list. You may blank the user list by deleting all channels as described above.

DEFAULT/CHOICES **Default: Blank list**

WARNINGS The user scan list is erased by the RSS each time the radio is reprogrammed.

SEE ALSO Mode Slaved Scan List (next issue), Scan Nuisance Delete, User PRI 2 Allowed.

6 Accessory Connector

(16 Channel Models Only)

6.1 Overview

The Expanded Accessory Connector has six programmable I/O pins to allow it to adapt to various accessories for the 16 channel model. For ease of programming, commonly used accessories have their pin functions predefined and can be programmed on one data field. Some accessories will need to be programmed on a pin by pin basis. The Radio Service Software provides screens for customizing your application pin by pin.

6.2 Customizing the Expanded Accessory Connector

The Expanded Accessory Connector's pin functions may be modified on the ACCESSORY CONNECTOR CONFIGURATION screen. This screen is displayed when the function key F9 is pressed on the RADIO WIDE CONFIGURATION screen. Customizing the Expanded Accessory Connector is necessary when more than one accessory requires programmable functions or a nonstandard accessory. The screen also contains useful information on the characteristics of each function. These are:

- ❏ Data Direction

  Indicates whether the information is to or from the radio. OUTPUT means that the data comes from the radio. INPUT means that the data comes from the accessory. Mismatching the Data Direction with the accessory may result in damage to the radio or accessory or both. Therefore, use caution when selecting functions for nonstandard accessories. The direction is determined by the selected function and is not programmable.
- ❏ Debounce

  Determines whether the radio waits a short period of time before acting. This is done to make sure that any mechanical switch bounce is accounted for. This parameter is programmable.
- ❏ Active Level

  Determines whether a high voltage or low voltage means to “do something”. This parameter is programmable.

Note: The same function (except NULL and CHANNEL STEERING) should NEVER be assigned to more than one pin on the connector. Also ALWAYS verify the levels and polarities of the signals prior to connecting any custom accessory to the connector.

Each programmable pin on the Expanded Accessory Connector has a limited number of functions that could be assigned to it. There are two type of functions: independent and dependent. Dependent functions cannot be reprogrammed. They are dependent on the assigned pin when used with the selected accessory. Independent functions can be reprogrammed to different pins.

Table 6-2 on page 6-19 lists the input functions and Table 6-3 on page 6-20 lists the output functions. Both tables give the type of function and a short description. For details on each function refer to the RapidCall Planning Guide. Each function has a function number assigned to it. This number is used to assign a function to a pin. The Accessory Input and Output Function tables can be used to determine which functions are necessary for your application. Table 6-4 on page 6-21 defines what functions can be assigned to each pin. Using the tables and the ACCESSORY CONNECTOR CONFIGURATION screen, you should be able to configure the accessory connector to suit your application.

6.2.1 Accessory Connector Packages

The table below list packages that are available for customizing the Expanded Accessory Connector. A description and programming procedure for each of the packages *not* marked with an asterisk (*) are given in this chapter. Descriptions for the packages marked with an asterisk (*) can be found in the GR300 Repeater Station Manual.

Table 6-1. Accessory Connector Packages

Community PA *	Public Address
Community Rmt *	Radius RICK-Tx *
DTMF Decoder Board (internal only)	Radius RICK-RX *
General I/O	Remote
Paging Encoder	RPB50 Interface
Phone Base PA-Tx *	Phone Remote PA-Tx *
Phone Base PA-Rx *	Phone Remote PA-Rx *
Phone Base Rmt-Tx *	Phone Remote Rmt-Tx *
Phone Base Rmt-Rx *	Phone Remote Rmt-Rx *
Phone Patch	

(*) can be found in the GR300 Repeater Station Manual

Active Level

RSS LOCATION

DEFINITION

The programmable pins are binary. They become active on either a high or low voltage signal. Some non-standard accessories may not have the same active level as the defaults.

DEFAULT/CHOICES

Default: **See Accessory Package default tables in Appendix H.**

Choices: ■ *High* ■ *Low*

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** or **Enter/Return** until the Active Level field for the desired pin is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. Use the ↑ ↓ arrow keys to select the desired choice.
3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.	

Custom

6

RSS LOCATION

Not Programmable with the RSS

DEFINITION

This indicates that the default package has been used in a modified fashion for this radio. For example, changing a pin function, Debounce, and/or Active Level will cause the radio to be "custom".

DEFAULT/CHOICES

Default: **See Accessory Package default tables in Appendix H.**

Choices: ■ *Y* ■ *N*

IMPORTANT NOTE

No RSS programming is required/available.

Data Direction

RSS LOCATION

Not Programmable with the RSS

DEFINITION

This indicates whether the information is an input or output to the radio. Input is data that comes from the accessory. Output is data that comes from the radio. The data direction is determined by the selected function and is not programmable.

WARNING

Mismatching the Data Direction with the accessory may result in damage to the radio or the accessory. Therefore, use caution when selecting functions for non-standard accessories.

IMPORTANT NOTE

No RSS programming is required/available.

Debounce

RSS LOCATION

DEFINITION

Debounce determines whether the radio waits a short period of time before acting. This is to account for any mechanical switch bounce. It applies only to inputs and is usually required for pins that are driven by relays or other mechanical devices.

DEFAULT/CHOICES

Default: **See Accessory Package default tables.**

Choices: ■ ***Yes*** ■ ***No***

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** or **Enter/Return** until the Debounce field for the desired pin is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. Use the ↑ ↓ arrow keys to select the desired choice.
3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.	

DTMF Decoder Board (internal only)

RSS LOCATION

DEFINITION This internal accessory provides DTMF decode capabilities in the radio. It is an internal board that must be installed before the radio accessory connector is programmed.

DEFAULT/CHOICES Please refer to *Table 10-17 on page 10-13*, *Table 10-20 on page 10-14*, and *Table 10-22 on page 10-14* in Appendix H for defaults

EXCEPTIONS When this internal accessory is installed, the external accessory packages that can be used are Public Address, Remote, and General I/O.

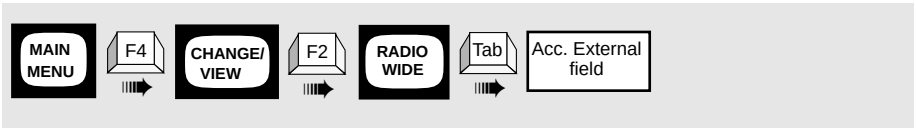
SEE ALSO Internal Accessories

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	5. A popup warning asks if you have installed the internal option board in the radio. If YES, press **F2**. If NO, press **F10** and install the internal DTMF decoder option board.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	6. If the External Accessory has been set to something other than Public Address, Remote, or General I/O, another popup warning will appear. You must **Tab** to the External Accessory field and change the value to a compatible type.
3. Press **Tab** or **Enter/Return** until the Acc. Internal field is highlighted.	7. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
4. Use the ↑ ↓ arrow keys to select DTMF.	

External Accessories

RSS LOCATION



OR

DEFINITION

Refers to the External Accessory that is connected to the radio via the Expanded Accessory Connector.

DEFAULT/CHOICES

Default: **See Accessory Package default tables in Appendix H.**

Choices: ■ *Public Address* ■ *Remote* ■ *General I/O*

■ *Phone Patch* ■ *Paging Encoder* ■ *RPB50 Interface*

See Table 6-1 on page 6-2 for the available repeater packages.

SEE ALSO

Public Address, Remote, General I/O, Phone Patch, Paging Encoder, RPB50 Interface

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	**OR**	1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.		2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.
3. Press the **Tab** or **Enter/Return** key until the Acc.External field is highlighted.		3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.
4. Use the ↑ ↓ arrow keys to select the desired choice.		4. Pres **F3** or **F4** to select the previous or next external package.

6

Function Description

RSS LOCATION

DEFINITION

This refers to the functions that can be assigned to the programmable pins on the Expanded Accessory Connector. There are two types of functions: Dependent and Independent. Dependent functions cannot be reprogrammed. They are dependent on the assigned pin when used with the selected accessory. Independent functions can be reprogrammed to other pins in any package. *Table 6-2 on page 6-19* and *Table 6-3 on page 6-20* list the available INPUT and OUTPUT functions and whether they are independent or dependent.

DEFAULT/CHOICES

Default: See Accessory Package default tables.

WARNING

The same function (except NULL and CHANNEL STEERING) should NEVER be assigned to more than one pin on the connector. Also, always verify the levels and polarities of the signals prior to connecting any custom accessory to the connector pins.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select the desired function.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	
3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.	

General I/O

RSS LOCATION

DEFINITION Designed to give the user the flexibility needed to support other accessories not covered under the predefined packages. There are no dependent functions, which leaves all pins open to be assigned an independent function of the user's choice.

DEFAULT/CHOICES Refer to Appendix H for Accessory Package defaults.

SEE ALSO External Accessories, Internal Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select General I/O.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

Internal Accessories

RSS LOCATION

DEFINITION Refers to the accessories that are physically placed inside the radio and do not actually use the connector. Connections are made internal to the radio, but still use the pin functions.

DEFAULT/CHOICES **Default: None.**

Choices: ■ ***None*** ■ ***DTMF***

DEPENDENCIES External Accessory MUST be Public Address, Remote, or General I/O in order to select the DTMF Internal Accessory.

IMPORTANT NOTE The Internal Accessory should be installed in the radio before programming.

SEE ALSO External Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select the internal accessory.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. A popup warning asks if you have installed the internal option board in the radio. If YES, press **F2**. If NO, press **F10** and install the internal option board before proceeding.
3. Press **Tab** or **Enter/Return** until the Acc. Internal field is highlighted.	6. If the External Accessory has been set to something other than Public Address, Remote, or General I/O, another popup warning will appear. You must **Tab** to the External Accessory field and change this field to one of the acceptable external packages.

Paging Encoder

RSS LOCATION

DEFINITION

This package allows the microphone to remain plugged into the front of the radio with the modem connected to the rear of the radio. This package was designed to be used with the Modem 100 which was produced by Motorola. This package can be used with a variety of Motorola or third party paging encoders.

DEFAULT/CHOICES

Refer to *Table 10-24 on page 10-15* in Appendix H for defaults.

IMPORTANT NOTE

Incompatible with DTMF Decoder Board.

SEE ALSO

External Accessories, DTMF Decoder Board, Internal Accessories

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select Paging Encoder.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

Phone Patch

RSS LOCATION

DEFINITION The phone patch interface package was designed for the i50x phone patch, but can be used with a variety of Motorola and third party phone patches.

DEFAULT/CHOICES Refer to Table 10-23 on page 10-14 in Appendix H for defaults.

DEPENDENCIES The Internal Accessory MUST be set to NONE.

IMPORTANT NOTE Incompatible with DTMF Decoder Board.

RECOMMENDATIONS To avoid any transients that may occur while turning on the radio, we suggest that the power-up delay be at least 500ms.

SEE ALSO External Accessories, Internal Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press F4 at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select Phone Patch. If the choice does not appear, check that the Internal Accessory is set to NONE.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

Pin

RSS LOCATION

Not Programmable with the RSS

DEFINITION

This refers to the programmable pins on the Expanded Accessory Connector. Pins can be INPUT and/or OUTPUT. Each programmable pin has a limited number of functions that can be assigned to it. Pin numbers can not be programmed or changed. Only the functions tied to pins can be changed. There are two types of functions: Dependent and Independent. Dependent functions cannot be reprogrammed. They are dependent on the assigned pin when used with the selected accessory. Independent functions can be reprogrammed. Table 6-4 lists the input & output capabilities of each pin, and the independent functions that can be assigned to the various pins.

SEE ALSO

Function Descriptions

Power-Up Delay

RSS LOCATION

DEFINITION

This is the time during which the radio ignores the active levels on the programmable input pins in order to allow the accessory device time to initialize itself.

DEFAULT/CHOICES

Default: **0.255 seconds**

Choices: ***0.0 - 4.3 seconds***

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **Tab** or **Enter/Return** until the Power-Up Delay field for the desired pin is highlighted.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. Use the ↑ ↓ arrow keys to select the desired choice.
3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.	

Public Address

RSS LOCATION

DEFINITION This package is designed for use with public address systems. The speaker output is routed to the public address system. In addition, transmit capability is such that the broadcaster's voice is only heard on the public address speaker system.

DEFAULT/CHOICES Refer to *Table 10-17 on page 10-13* in Appendix H for defaults.

IMPORTANT NOTE Public Address can also be installed on 8-channel model radios.

SEE ALSO External Accessories, Internal Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select Public Address.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

Remote

RSS LOCATION

DEFINITION This package is designed for applications where the radio will be remotely controlled. This might be an extended local deskset, DC remote deskset, tone remote deskset, or a second microphone.

DEFAULT/CHOICES Refer to *Table 10-19 on page 10-13* in Appendix H for defaults.

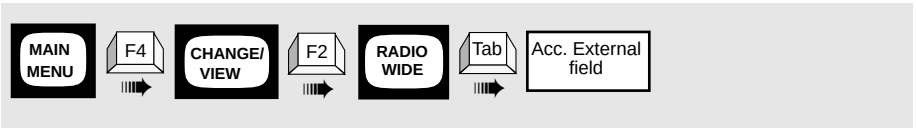
SEE ALSO External Accessories, Internal Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Use the ↑ ↓ arrow keys to select Remote.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	5. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

RPB50 Interface

RSS LOCATION



DEFINITION This paging-based interface is designed for the RPB50.

DEFAULT/CHOICES Refer to *Table 10-25 on page 10-15* in Appendix H for defaults.

IMPORTANT NOTE Incompatible with DTMF Decoder Board.

SEE ALSO External Accessories, Internal Accessories, DTMF Decoder Board

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. To customize the accessory package, press **F9** to get to the ACCESSORY CONNECTOR CONFIGURATION screen and make the desired changes.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	
3. Press **Tab** or **Enter/Return** until the Acc. External field is highlighted.	

6.3 Accessory Connector Function Tables

Table 6-2. Accessory Connector Input Functions

Function	Function Type	Description
NULL1	Independent	Pin has no function
Emergency Switch	Independent	Connection to emergency switch for RapidCall
PA Switch	Dependent	Inhibits PTT for Public Address
Tx PL Inhibit	Independent	When active, the radio strips PL from any transmission
TOC Disable	Independent	When active, disables TPL/DPL turn off code at the end of Tx
Mic Off Hook	Independent	Indicates to radio when a remote microphone is off hook
Page PTT	Dependent	PTT for paging or data encoders using flat Tx audio
Tx Audio Mute	Independent	When active, inhibits microphone audio from being sent
Data Ready	Dependent	Input from DTMF decoder board
DTMF Data	Dependent	Input from DTMF decoder board
Rx Audio Mute	Independent	Mutes received audio for data applications
Special Off Hook	Independent	Same as I/O Off Hook but also readies audio amplifier to accept externally generated sidetones
Channel Select 1	Independent	BCD channel selector input (all released: operator's channel). Least significant bit.
Channel Select 2	Independent	BCD channel selector input (all released: operator's channel)
Channel Select 3	Independent	BCD channel selector input (all released: operator's channel)
Channel Select 4	Independent	BCD channel selector input (all released: operator's channel)
Channel Select 5	Independent	BCD channel selector input (all released: operator's channel). Most significant bit.
External Call Button	Independent	Transmits a specified encode sequence
Auto PTT	Independent	Strips PTT ID and system busy alert tone
Request-To-Send	Independent	Strips PTT ID (except for Select V) and executes a PL strip and a TOC disable

6

Table 6-3. Accessory Connector Output Functions

Function	Function Type	Description
NULL2	Independent	Pin has no function
External Alarm	Independent	Driver pin for external relay when an Alert is received
PL/DPL & CSQ Detect	Independent	Pin is active when TPL/DPL and carrier are detected
CSQ Detect	Independent	Pin is active when a carrier is detected by the radio
Data Clock Out	Dependent	Output to the DTMF Decoder board
Phone Patch Inhibit	Dependent	Output to inhibit the phone patch when radio is handling priority activity
Clear-To-Send	Independent	Handshake with RTS to communicate with external device; audio path is ready

Table 6-4. Possible Pin Assignments

Pin	Function
4 (Output)	External Alarm NULL2 PL/DPL & CSQ Detect CSQ Detect Clear to Send
6, 9 (Input)	NULL1 Emergency Switch TX PL Inhibit TOC Disable TX Audio Mute RX Audio Mute Special Off Hook Channel Select 1-5 Mic Off Hook Auto PTT Request to Send Ext. Call Button
8, 12, 14 (Input & Output)	External Alarm (*low current drive on these pins)* NULL1 PL/DPL & CSQ Detect CSQ Detect Emergency Switch TX PL Inhibit TOC Disable TX Audio Mute Clear to Send Rx Audio Mute Special Off Hook Channel Select 1-5 Mic Off Hook Auto PTT Request to Send Ext. Call Button NULL2

7 RSS Functions

7.1 Overview

Only one feature or function is shown on a page. You'll find the feature or function name in the header at the top of the page, for quick access. On each reference page you will find a standard page layout and consistent categories of information. Below is a list and explanation of all the categories. The categories marked with an asterisk (*) appear on every reference page. The other categories appear only when they apply to the specific feature.

- **FEATURE NAME*** Identifies the name of the reference feature.
- **RSS LOCATION*** Provides a quick visual map of where you'll find a particular feature within the RSS, showing the keys to press to arrive at the feature's or function's screen location. More details of this map follow in the PROGRAMMING PROCEDURE section.
- **DEFINITION*** Summarizes the feature's function - it defines and briefly explains the feature.
- **DEFAULT/CHOICES*** Identifies and explains both the default value the feature is automatically set to (with no user input) and the other available choices a user can select.
- **DEPENDENCIES** Identifies items that have a direct impact or influence upon the feature.
- **EXCEPTIONS** Identifies when the general rules concerning a feature may not apply.
- **RECOMMENDATIONS** Provides advice for the most common applications and usages, and informs you when things work best.
- **WARNINGS** Identifies areas of caution and important concerns. Be sure to read and act upon warnings. They are more serious in nature than IMPORTANT NOTES.
- **IMPORTANT NOTES** Explains other issues to consider.
- **PROGRAMMING PROCEDURE*** Summarizes how to access and change a given feature. It explains the RSS LOCATION mapping in more detail.

7.2 Function Descriptions

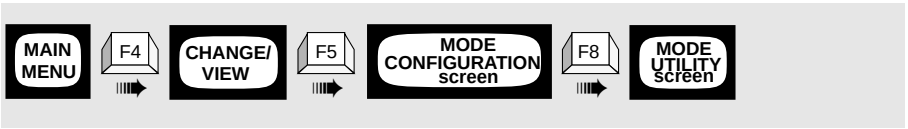
This section describes the RSS functions, as opposed to radio features in the previous section(s). Here are two examples of functions: (1) adding a mode to a radio and (2) printing a radio's archive file. These two examples are not radio features, but instead, are functions you may find useful. Table 7-1 on page 7-2 lists the RSS functions that appear on the following pages.

Table 7-1. RSS Functions Chart

Add Mode	Next Mode
Archive Path Configuration	Previous Mode
Backup Path Configuration	Print Alignment Summary
Change Archive	Print Archive File List
Clone Codeplug	Print Help
Color Configuration	Print Mode Configuration
COM Test	Print Mode Configuration Summary
Copy Mode	Print Radio-Wide Configuration
Create Directory Path	Print Screen
Delete Archive File	Program Codeplug
Delete Mode	Read Codeplug
Exit to DOS	Restore Archive File
Exit to Previous Screen	RIB Port Configuration
Get Archive File	Save Archive File
Goto Mode	Update Backup File
Help	
Move Mode	

Add Mode

RSS LOCATION



DEFINITION This function allows the user to add modes to the codeplug configuration.

DEFAULT/CHOICES

Default: **Insert After Mode is set to the last mode number. Copy From Mode is set to mode 1.**

Choices: ***Insert After Mode and Copy From Mode can be any value from 1 to the total number of modes in the current configuration.***

RECOMMENDATIONS Configure the features on mode 1 that will be the same on the remaining modes. Then add modes using mode 1 as a template.

WARNINGS In order to save changes made using the MODE UTILITY, the radio MUST be programmed before exiting the RSS or before reading up another radio or archive file.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

SEE ALSO Copy Mode, Delete Mode, Move Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	5. Press **Tab** to get to the Insert After Mode field. If you want to insert the new mode somewhere other than after the last mode, then type in the mode number and press **Tab** or **Return**.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	6. Press **Tab** to get to the Copy From Mode field, If you want to copy mode attributes from a mode other than mode 1, then type in the mode number and press **Tab** or **Return**.
3. Press **F8** to access the MODE UTILITY screen.	7. Press **F8** to add the new mode.
4. The Utility field should be highlighted and be set to the ADD MODE utility. If not, then use the ↑ ↓ arrow keys to select the ADD MODE utility.	

Archive Path Configuration

RSS LOCATION

DEFINITION

Defines the archive path name that will be used by the RSS. This value can be permanently or temporarily changed. If the user wishes to change the path name for this session ONLY, simply type in the path name and exit the screen. If the user wants to make the change permanent, type in the path name and press F8 to save the changes before exiting the screen.

This function is also available on screens where archive files are accessed so that the user can specify an alternate path without having to go back to the SETUP MENU.

DEFAULT/CHOICES

Default: Blank

Choices: Any existing DOS path name.

RECOMMENDATIONS

Configure archive and backup path names when you install the RSS.

IMPORTANT NOTE

If you do not configure the archive path name when you install the RSS, you will have to enter in the path name each time you need to access archive files.

If archive files have not been previous created in the archive path directory, the SAVE ARCHIVE FILE function will allow you to create them.

SEE ALSO

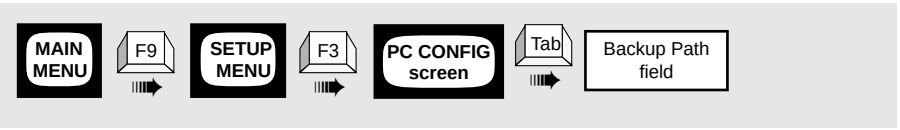
Backup Path Configuration, Change Archive

PROGRAMMING PROCEDURE

1. Press **F9** at the MAIN MENU to get to the SETUP MENU.	4. To save the path name permanently, press **F8**.
2. At the SETUP MENU, press **F3** to get to the PC CONFIGURATION screen.	
3. Enter the archive file path name by manually typing it, then press **Tab** (or **Enter** or **Return**).	

Backup Path Configuration

RSS LOCATION



DEFINITION Defines the backup path name that will be used by the RSS.

This value can be permanently or temporarily changed. If the user wishes to change the path name for this session ONLY, simply type in the path name and exit the screen. If the user wants to make the change permanent, type in the path name and press F8 to save the changes before exiting the screen.

DEFAULT/CHOICES **Default: Blank**

Choices: Any existing DOS path name.

RECOMMENDATIONS The backup path name is typically a floppy drive, since it is common for users to store their backup files on floppy disks.

WARNINGS The RSS does NOT check to see if the backup path exists, so caution must be taken in entering a correct path name.

IMPORTANT NOTE It is very important that you make backup copies of your archive files.

SEE ALSO Archive Path Configuration, Change Archive

PROGRAMMING PROCEDURE

1. Press **F9** at the MAIN MENU to get to the SETUP MENU.	4. To save the path name permanently, press **F8**.
2. At the SETUP MENU, press **F3** to get to the PC CONFIGURATION screen.	
3. Enter the backup file path name by manually typing it, then press **Tab** (or **Enter** or **Return**).	

Change Archive

RSS LOCATION

OR

7

DEFINITION Modify the default path where the RSS searches for archive files.

DEFAULT/CHOICES **Default:** **C:\MRSS\GM300\ARCHIVE**

Choices: ***Any valid DOS pathname***

RECOMMENDATIONS If you wish to have archive path change from session to session, use second programming procedure (below).

IMPORTANT NOTE Do not leave an archive pathname blank.

SEE ALSO Backup Path Configuration, Archive Path Configuration

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the GET/SAVE MENU.	3. Enter the archive file path name by manually typing it, then press **Tab** (or **Enter** or **Return**).
2. At the GET/SAVE menu, press **F3** to get to the GET ARCHIVE FILE screen.	4. This path name will not be permanently saved
2a. Press **F2** to change the archive file pathname.	

OR

1. Press **F9** at the MAIN MENU to get to the SETUP MENU.	4. To save the path name permanently, press **F8**.
2. At the SETUP MENU, press **F3** to get to the PC CONFIGURATION screen.	
3. Enter the archive file path name by manually typing it, then press **Tab** (or **Enter** or **Return**).	

Clone Codeplug

RSS LOCATION

DEFINITION This functions allows the user to program the configuration of one radio into another radio of the same model and version. An archive file can be used as the master codeplug in place of a radio.

RECOMMENDATIONS Use this function if you have several radios that will have exact or similar configurations. The configuration can be edited between each cloning operation so that each radio can be customized. Remember that these custom changes will be the new configuration used by the RSS, so save custom changes for last.

IMPORTANT NOTE Master and target radios MUST be of the same product line, model and version.

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Connect the target radio and press **F5** again to complete the procedure.
2. At the CHANGE/VIEW CODEPLUG MENU, load the master codeplug by using one of the following methods: a.Connect master radio and press **F2**. b.Press **F3**, select the desired master codeplug from the archive file list and press **F8.**	5. For additional radios of the same model and version as the master, repeat Steps 3-4.
3. Press **F5**.	

Color Configuration

RSS LOCATION

DEFINITION Defines the color configuration of the RSS menus and screens.

DEFAULT/CHOICES **Default:** **Mono**

Choices: ■ ***Mono*** ■ ***Color***

If Monitor Type = Color then the following attributes can be configured:

Text	Highlight
Status Line	Background
Message Line	Screen Outline

The changes will be displayed instantaneously.

EXCEPTIONS If you choose color settings for a monochrome monitor, the RSS will revert back to Mono for the Monitor Type.

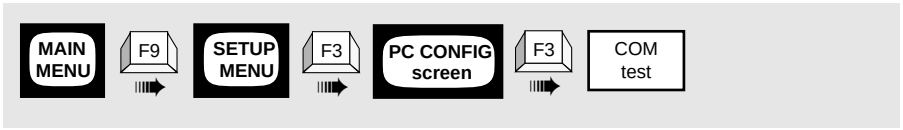
IMPORTANT NOTE Make sure you save any changes (F8). If you fail to do to save changes, they will be lost when you exit the RSS. If you need to reset the default colors, use the F9 key.

PROGRAMMING PROCEDURE

1. Press **F9** at the MAIN MENU to get to the SETUP COMPUTER MENU.	5. Use the ↑ ↓ arrow keys to select the desired color for that attribute.
2. At the SETUP COMPUTER MENU, press **F7** to get to the COLOR CONFIGURATION screen.	6. Repeat Steps 5-6 for each of the remaining color attributes.
3. Use the ↑ ↓ arrow keys to select the desired Monitor Type.	7. If you want to save your changes, press **F8**. To reset to the default configuration, press **F9**.
4. If Monitor Type = **Color**, press **Tab** (or **Enter** or **Return**) until the desired color attribute field is highlighted.	8. Press **F10** to exit the COLOR CONFIGURATION screen.

COM Test

RSS LOCATION



DEFINITION Tests serial bus communications with the radio.

WARNINGS Make sure that the COM port that you select does NOT have a modem installed on it.

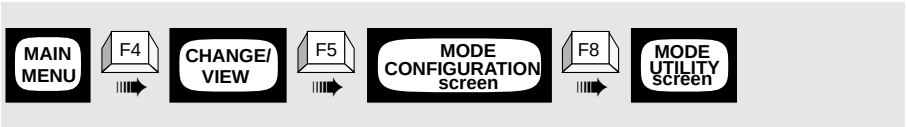
SEE ALSO Appendix A - Error Code Explanations
Appendix B - Troubleshooting Problems

PROGRAMMING PROCEDURE

1. Press **F9** at the MAIN MENU to get to the SETUP MENU.	3. If necessary, press **Tab** to get to the RIB field select the desired port choice by pressing the ↑ ↓ arrow keys.
2. At the SETUP MENU, press **F3** to get to the PC CONFIGURATION screen.	4. To test the selected RIB port, connect a radio to the RIB, turn it on, and press **F3** to run the COM TEST. You should get a 'Radio Communications OK' message. If you receive an error, refer to Appendices A and B for further information.

Copy Mode

RSS LOCATION



DEFINITION This function allows the user to copy the attributes of one mode into another.

DEFAULT/CHOICES **Default:** **Mode To Copy From is blank.**
Mode To Copy To is blank.

Choices: ***Mode To Copy From and Mode To Copy From can be any value from 1 to the total number of modes in the current configuration.***

EXCEPTIONS The radio MUST have at least two modes defined before this function is available.

WARNINGS In order to save changes made using the MODE UTILITY, the radio MUST be programmed before exiting the RSS or before reading up another radio or archive file.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

SEE ALSO Add Mode, Delete Mode, Move Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	5. Press **Tab** to get to the Mode To Copy From field. Type in the mode number and press **Tab** or **Return**.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	6. Press **Tab** to get to the Mode To Copy From field. Type in the mode number and press **Tab** or **Return**.
3. Press **F8** to access the MODE UTILITY screen.	7. Press **F8** to execute the command.
4. The Utility field should be highlighted and be set to the ADD MODE utility. Use the ↑ ↓ arrow keys to select the COPY MODE utility.	

Create Directory Path

RSS LOCATION

DEFINITION

Creates a directory from the specified path name and creates an initial copy of the archive map file (.DBF). This is extremely useful if you need to create a directory for archive/backup files. It allows you to do so without having to exit the RSS.

DEFAULT/CHOICES

Default: **The archive path name specified on the PC CONFIGURATION screen.**

Choices: ***Any existing DOS path name.***

PROGRAMMING PROCEDURE

1. Press **F6** at the MAIN MENU to get to the FILE MAINTENANCE MENU.	4. The RSS will inform you if the path was created.
2. At the FILE MAINTENANCE MENU, press **F4**.	
3. At the CREATE DIRECTORY PATH screen, enter the desired path name by manually typing it and then press **Tab** (or **Enter** or **Return**).	

Delete Archive File

RSS LOCATION

DEFINITION Deletes the specified archive file.

DEFAULT/CHOICES

Default: **The archive files displayed are those found in the archive path name specified on the PC CONFIGURATION screen.**

Choices: ***The archive path name can be changed to any existing DOS path name.***

WARNINGS Always use this utility to delete archive/backup files. Do NOT use the DOS Delete command to delete archive/backup files from the directory.

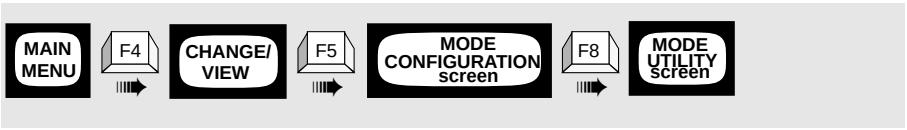
IMPORTANT NOTE If no files are located in the specified archive path name, the RSS will prompt you to enter another archive path name.

PROGRAMMING PROCEDURE

1. Press **F6** at the MAIN MENU to get to the FILE MAINTENANCE MENU.	4. Press **Tab** until the desired archive file serial number is highlighted.
2. At the FILE MAINTENANCE MENU, press **F6** to get to the DELETE ARCHIVE FILE screen.	5. Press **F7** to initiate the deletion.
3. If necessary, change the archive pathname by pressing **F3** and typing in the desired pathname. Then press **Tab** (or **Enter** or **Return**).	6. Press **F7** again if you wish to delete the selected archive file OR press **F10** to exit the DELETE ARCHIVE FILE operation.

Delete Mode

RSS LOCATION



DEFINITION This function allows the user to delete modes from the radio.

DEFAULT/CHOICES **Default:** **Mode To Delete is the last mode in the current configuration.**

Choices: ***Mode To Delete can be any value from 1 to the total number of modes in the current configuration.***

EXCEPTIONS At least one mode must exist, therefore, you will not be able to delete all the modes from the radio configuration.

WARNINGS In order to save changes made using the MODE UTILITY, the radio MUST be programmed before exiting the RSS or before reading up another radio or archive file.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

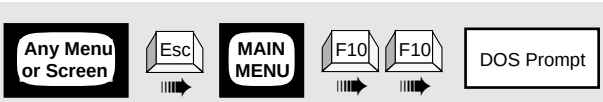
SEE ALSO Add Mode, Copy Mode, Move Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. The Utility field should be highlighted and be set to the ADD MODE utility. Use the ↑ ↓ arrow keys to select the DELETE MODE utility.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	5. Press **Tab** to get to the Mode To Delete field. If you want to delete a mode other than the last mode, then type in the mode number and press **Tab** or **Return**.
3. Press **F8** to access the MODE UTILITY screen.	6. Press **F8** to delete the mode.

Exit To DOS

RSS LOCATION



DEFINITION Exits the current RSS session.

WARNINGS Any modifications that you have not saved from this session will be lost when you exit.

IPROGRAMMING PROCEDURE

1. Press **ESC** on the current screen to get to the MAIN MENU.	3. A popup warning will remind you that you will lose any changes that you have not saved. Press **F10** to return to the MAIN MENU or press **F2** to exit to DOS.
2. At the MAIN MENU, press **F10**.	

Exit To Previous Screen

RSS LOCATION

DEFINITION

This displays the menu/screen one level up from the current screen. For example, if you are viewing the MODE CONFIGURATION screen, press F10 will take you to the CHANGE/VIEW CODEPLUG MENU. If you are viewing the SCAN OPTIONS screen and press F10, you will return to the RADIO-WIDE CONFIGURATION screen. You would have to press F10 once more to return to the CHANGE/VIEW CODEPLUG MENU.

IMPORTANT NOTE

You will not lose codeplug modifications when you exit to the previous menu/screen, but the codeplug MUST be saved BEFORE exiting the RSS.

SEE ALSO

Figure 2-9 “RSS Menu Mapping at a Glance” on page 2-31, Figure 2-10 “Change/View Mapping at a Glance” on page 2-32 and “Menus and Screens” on page 8-1.

PROGRAMMING PROCEDURE

1. Press **F10** on the current screen.	
2. You should exit to the previous menu/screen.	

Get Archive File

RSS LOCATION

DEFINITION

This function loads a radio codeplug from an archive file. There are three ways of selecting an archive file.

- ❏ The first method is to use the Tab (or Enter) key to highlight the desired file.
- ❏ The second method is by using the ENTER S/N (F6) function. It allows the user to type in the exact serial number of the radio to avoid searching through pages of archive files.
- ❏ The third method is to use the GET CURRENT (F7). It selects the archive file associated with the radio which is currently connected to the RIB. The radio MUST be turned on to perform this function.

DEFAULT/CHOICES

Default: **The archive files displayed are those found in the archive path name specified on the PC CONFIGURATION screen.**

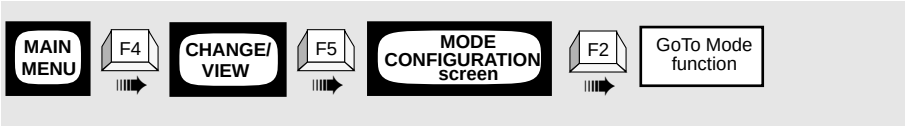
Choices: ***The archive path name can be changed to any existing DOS path name.***

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the GET/ SAVE MENU.	4. Select the desired archive file using one of the three following methods: a. Press **Tab** or **Enter** until the desired archive file is highlighted. If you cannot locate the serial number on the current page, press **PgUp** or **PgDn** to view another page of serial numbers. b. Press **F6** and directly enter the serial number of the radio. c. Connect the radio to the rib, turn it on and press **F7**.
2. At the GET/SAVE MENU, press **F3** to get to the GET ARCHIVE FILE screen.	5. If the archive file cannot be located you may have to repeat Step 3.
3. If necessary, change the archive pathname by pressing **F2** and typing in the desired pathname.	6. Once you have the desired archive file highlighted, press **F8** to load the file.

GoTo Mode

RSS LOCATION



DEFINITION This function allows the user to go directly to a specific mode.

DEFAULT/CHOICES **Default: Last mode displayed**

Choices: 1 through the total number of modes in the current configuration.

IMPORTANT NOTE The RSS will blank out the Mode field and allow the user to input a mode number. If the number is an invalid choice or is left blank, the RSS will revert back to the last mode displayed. Otherwise, the specified mode will be displayed.

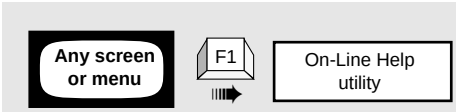
SEE ALSO Next Mode, Previous Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F2**.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	4. The Mode field should be highlighted and blank. Type in the mode number and press **Tab** or **Return**.

Help

RSS LOCATION



DEFINITION

Allows the user to obtain on-line help. If you are at the menu level, you will get general help on that menu and its functions. If you are on a screen, you will get help on the field that is currently highlighted. Once you have entered the HELP utility, help in additional areas is available.

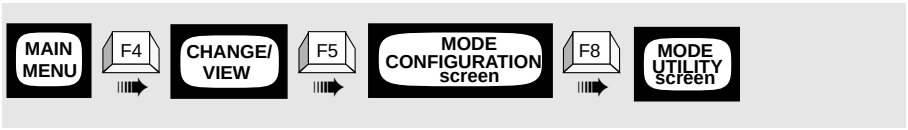
MORE HELP (F1)	Gives general information about a screen.
KEYBOARD HELP (F2)	Gives information about keyboard operation.
PRINT HELP (F5)	Prints the current help page(s).
OTHER HELP (F9)	Gives information about the radio, the RSS and part numbers.

PROGRAMMING PROCEDURE

1. On any screen or menu, press **F1** to display help.	4. Press **F5** to print the current help page(s).
2. Press **F1** to get more general help.	5. Press **F9** to get information on the current radio, the RSS, and equipment part numbers.
3. Press **F2** to get help on the keyboard.	6. Press **F10** to exit the HELP utility.

Move Mode

RSS LOCATION



DEFINITION This function allows the user to move modes in the current configuration. This function actually changes the order of the modes.

DEFAULT/CHOICES

Default: **Mode To Move is blank.**
Insert At Mode is blank.

Choices: ***Mode To Move and Insert At Mode can be any value from 1 to the total number of modes in the current configuration.***

EXCEPTIONS The radio MUST have at least two modes defined before this function is available.

WARNINGS In order to save changes made using the MODE UTILITY, the radio MUST be programmed before exiting the RSS or before reading up another radio or archive file.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

SEE ALSO Add Mode, Copy Mode, Delete Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	5. Press **Tab** to get to the Mode To Move field. Type in the mode number and press **Tab** or **Return**.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	6. Press **Tab** to get to the Insert At Mode field. Type in the mode number and press **Tab** or **Return**.
3. Press **F8** to access the MODE UTILITY screen.	7. Press **F8** to execute the command.
4. The Utility field should be highlighted and be set to the ADD MODE utility. Use the ↑ ↓ arrow keys to select the MOVE MODE utility.	

Next Accessory

RSS LOCATION

DEFINITION This function advances the screen to the next external accessory function in the list of available packages.

IMPORTANT NOTE If the current accessory is the last accessory in the list, then the first system will be displayed when this function is used.

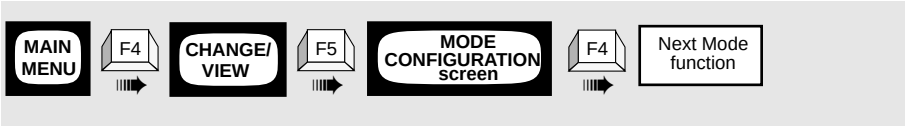
SEE ALSO Previous Accessory

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. Press **F4** to move forward through the list of accessory packages.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	
3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.	

Next Mode

RSS LOCATION



DEFINITION This function allows the user to display the next mode in the radio configuration.

IMPORTANT NOTE If the current mode is the last mode the radio will wrap around to the first mode when this function is used.

SEE ALSO GoTo Mode, Previous Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F4** to move forward to the next mode.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	4. Repeat Step 3 until you have reached the desired mode.

Previous Accessory

RSS LOCATION

DEFINITION This function advances the screen to the previous external accessory function in the list of available packages.

IMPORTANT NOTE If the current accessory is the first accessory in the list, then the radio will wrap around to the last accessory when this function is used.

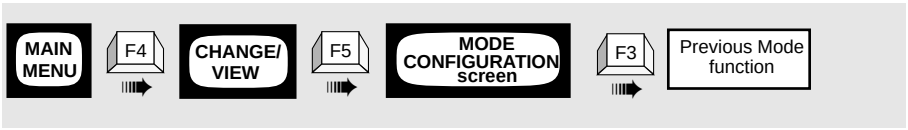
SEE ALSO Next Accessory

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	4. Press **F4** to move backward through the list of accessory packages.

Previous Mode

RSS LOCATION



DEFINITION This function allows the user to display the previous mode in the radio configuration.

IMPORTANT NOTE If the current mode is the first mode the radio will wrap around to the last mode when this function is used.

SEE ALSO GoTo Mode, Next Mode

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F3** to move backward to the previous mode.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F5** to get to the MODE CONFIGURATION screen.	4. Repeat Step 3 until you have reached the desired mode.

Print Accessory Connector Screen

RSS LOCATION

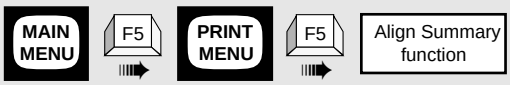
DEFINITION Prints the Accessory Connector Configuration screen as it appears on the display.

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	4. Press **F5** to print the current Accessory Connector Configuration. Press **F10** to cancel the print screen function.

Print Alignment Summary

RSS LOCATION



DEFINITION

Prints out an RF alignment summary for the radio. The summary includes the following:

Deviation Adjustment (VCO, PL, DPL)
Reference Frequency Warp
Tx Power
Tx Power Calibration
Tx Deviation Calibration

IMPORTANT NOTE

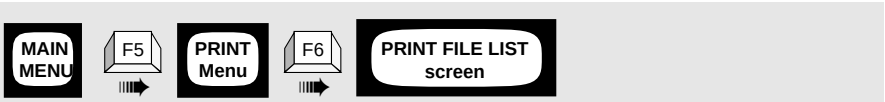
A radio MUST be connected in order to perform this function. If you disconnect or turn off the radio before the print is finished, the report may be incomplete.

PROGRAMMING PROCEDURE

1. Press **F5** at the MAIN MENU to get to the PRINT CODEPLUG MENU.	4. The RSS will inform you that it is accessing the radio via the serial bus. If you receive an error, refer to Appendices A and B for further information. To abort the print, press **F10**.
2. Connect the radio to the RIB and turn it on.	5. When the PRINT ALIGNMENT SUMMARY function is finished, you will return to the PRINT CODEPLUG MENU.
3. At the PRINT CODEPLUG MENU, press **F5**.	

Print Archive File List

RSS LOCATION



OR

7

DEFINITION Prints a complete list of archive files for the specified archive path. This information printed in list-form includes Serial Number, Model Number, Customer Name, and Date Created for all archive files in the specified archive path name.

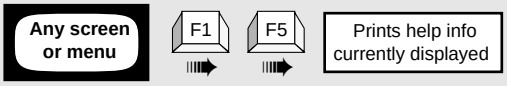
DEPENDENCIES Does not require that a radio codeplug be read.

PROGRAMMING PROCEDURE

OR	
1. Press **F5** at the MAIN MENU to get to the PRINT CODEPLUG MENU.	1. Press **F3** at the MAIN MENU to get to the GET/SAVE CODEPLUG MENU.
2. At the PRINT CODEPLUG MENU, press **F6**.	2. At the GET/SAVE CODEPLUG MENU, press **F3** to get to the GET ARCHIVE FILE screen.
3. If necessary, change the archive path name by pressing **F2** and typing in the desired path name.	3. If necessary, change the archive path name by pressing **F2** and typing in the desired path name.
4. Press **F8** to print the archive file list. Press **F10** at any time to abort the print.	4. Press **F5** to print the archive file list. Press **F10** at any time to abort the print.
5. When the PRINT ARCHIVE FILE LIST function is finished, you will return to the PRINT CODEPLUG MENU.	5. When the PRINT ARCHIVE FILE LIST function is finished, you will return to the GET ARCHIVE FILE screen.

Print Help

RSS LOCATION



DEFINITION Allows the user to print the help page(s) that are currently displayed.

PROGRAMMING PROCEDURE

1. On any screen or menu, press **F1** to display help.	
2. Press **F5** to print the current help page(s).	

Print Mode Configuration

RSS LOCATION

DEFINITION Prints the Mode configuration of the current codeplug configuration. This is a complete listing of each mode as it would appear on the MODE CONFIGURATION screen.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

SEE ALSO Print Mode Configuration Summary

PROGRAMMING PROCEDURE

1. Press **F5** at the MAIN MENU to get to the PRINT CODEPLUG MENU.	3. Press **F5** to print the mode configuration. Press **F10** at any time to abort the print.
2. At the PRINT CODEPLUG MENU, press **F2** to get to the PRINT RADIO CONFIGURATION MENU.	4. When the PRINT MODE CONFIGURATION function is finished, you will return to the PRINT RADIO CONFIGURATION MENU.

Print Mode Configuration Summary

RSS LOCATION

DEFINITION Prints the Mode configuration summary of the current codeplug configuration. This listing includes mode attributes such as mode name, Rx/Tx frequencies, Rx/Tx squelch codes and signalling systems (if applicable).

RECOMMENDATIONS This printout is commonly used as a one-page reference that can be reduced and attached to the radio for quick reference of what is on each mode.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

SEE ALSO Print Mode Configuration

PROGRAMMING PROCEDURE

1. Press **F5** at the MAIN MENU to get to the PRINT CODEPLUG MENU.	3. Press **F4** to print the mode configuration summary. Press **F10** at any time to abort the print.
2. At the PRINT CODEPLUG MENU, press **F2** to get to the PRINT RADIO CONFIGURATION MENU.	4. When the PRINT MODE CONFIGURATION SUMMARY function is finished, you will return to the PRINT RADIO CONFIGURATION MENU.

Print Radio Wide Configuration

RSS LOCATION

DEFINITION Prints the Radio-Wide configuration of the current codeplug configuration. This listing includes features from the RADIO WIDE CONFIGURATION screen and the RADIO WIDE SCAN OPTIONS screen.

IMPORTANT NOTE A radio codeplug MUST be loaded, either from an archive file or a radio, in order to access this utility.

PROGRAMMING PROCEDURE

1. Press **F5** at the MAIN MENU to get to the PRINT CODEPLUG MENU.	3. Press **F2** to print the radio-wide configuration. Press **F10** at any time to abort the print.
2. At the PRINT CODEPLUG MENU, press **F2** to get to the PRINT RADIO CONFIGURATION MENU.	4. When the PRINT RADIO WIDE CONFIGURATION function is finished, you will return to the PRINT RADIO CONFIGURATION MENU.

Print Screen

RSS LOCATION

DEFINITION Allows the user to print a copy of the current screen.

PROGRAMMING PROCEDURE

1. On any screen, press **F5** to print the current screen.	

Program Radio

RSS LOCATION

DEFINITION This function programs the current codeplug configuration directly to the radio.

IMPORTANT NOTE A radio MUST be connected and powered up. The connected radio MUST have the same serial number as the currently loaded codeplug.

If you need to abort the PROGRAM RADIO function, press F10 when the RSS displays the pop-up window. This can be useful if additional changes need to be made or if you accidentally selected the PROGRAM RADIO function.

SEE ALSO Appendix A (Error Code Explanations)
Appendix B (Troubleshooting Problems)

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. At this time, a popup window will appear to verify that you want to program the radio. Press **F2** to continue, press **F10** to abort.
2. Connect the radio you wish to program.	5. You will see the programming gauge which indicates what percent of the radio codeplug has been programmed.
3. At this time, a popup window will appear to verify that you want to program the radio. Press **F2** to continue, press **F10** to abort.	6. When the programming procedure is complete, you will return to the CHANGE/VIEW CODEPLUG MENU.

Read Radio

RSS LOCATION

DEFINITION This function loads a codeplug by reading a radio.

IMPORTANT NOTE A radio MUST be connected and powered up.

SEE ALSO Appendix A (Error Code Explanations)
Appendix B (Troubleshooting Problems)

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	4. You will see the gauge which indicates what percent of the radio codeplug has been read.
2. Connect the radio you wish to read.	5. When the RSS finishes reading the radio, you will return to the CHANGE/VIEW CODEPLUG MENU.
3. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to read the radio.	6. If you encountered an error message instead, refer to Appendices A and B for further information.

Reset Default

RSS LOCATION

DEFINITION Resets all of the pins to the default values for the current package.

SEE ALSO Accessory Packages Default Tables (Appendix H).

PROGRAMMING PROCEDURE

1. Press **F4** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	3. Press **F9** to enter the ACCESSORY CONNECTOR CONFIGURATION screen.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F2** to get to the RADIO-WIDE screen.	4. Press **F9** to reset to the default values for the selected accessory package.

Restore Archive File

RSS LOCATION

DEFINITION

Restores the specified archive file from a backup file of the same radio serial number.

DEFAULT/CHOICES

Default: **The target and source path names are taken from the archive and backup path names, respectively, that are specified on the PC CONFIGURATION screen.**

Choices: ***The target and source path names can be changed to any existing DOS path names.***

RECOMMENDATIONS

This utility is helpful for restoring an archive working area that has been corrupted, either from a computer failure or from accidental deletion.

WARNINGS

The RESTORE ARCHIVE FILE utility does NOT differentiate between archive and backup path names. Be careful to specify the correct path names.

IMPORTANT NOTE

If archive files have not been previous created in the target path directory, the RESTORE ARCHIVE FILE utility will allow you to create them.

PROGRAMMING PROCEDURE

1. Press **F6** at the MAIN MENU to get to the FILE MAINTENANCE MENU.	5. Press **Tab** until the desired serial number is highlighted.
2. At the FILE MAINTENANCE MENU, press **F7** to get to the RESTORE ARCHIVE FILE screen.	6. Press **F7** to restore the file OR press **F10** to exit the RESTORE ARCHIVE FILE utility.
3. If necessary, change the source pathname by pressing **F3** and typing in the desired pathname. Then press **Tab** (or **Enter** or **Return**).	7. If the target path name has NEVER had any archive files written to it, you will be asked if you wish to create files in this directory. Press **F2** to create files OR press **F10** to abort.
4. If necessary, change the target pathname by pressing **F4** and typing in the desired pathname. Then press **Tab** (or **Enter** or **Return**).	8. After the restore is complete, the cursor will advance to the next serial number for the next restore.

RIB Port Configuration

RSS LOCATION

DEFINITION Defines which COM port will be used for serial bus communications with the radio.

DEFAULT/CHOICES **Default:** **COM1**

Choices: ■ ***COM1*** ■ ***COM2***

WARNINGS Make sure that the COM port that you select does NOT have a modem installed on it.

IMPORTANT NOTE Make sure you save any changes (F8). If you fail to save changes, they will be lost when you exit the RSS. If you need to reset the default configuration, use the F9 key.

PROGRAMMING PROCEDURE

1. Press **F9** at the MAIN MENU to get to the SETUP MENU.	4. Select the desired port choice by pressing the ↑ ↓ arrow keys, then press **Tab** (or **Enter** or **Return**).
2. At the SETUP MENU, press **F3** to get to the PC CONFIGURATION screen.	5. To test the selected RIB port, connect a radio to the RIB, turn it on, and press **F3** to run the COM TEST. You should get a 'Radio Communications OK' message. If you receive an error, refer to Appendices A and B for further information.
3. At the PC CONFIGURATION screen, press **Tab** to get to the RIB field.	6. To save the RIB port permanently, press **F8**.

Save Archive File

RSS LOCATION

DEFINITION This function saves the current codeplug configuration to an archive file.

RECOMMENDATIONS It is highly recommended that ALL archive files be backed up onto a floppy disk and stored in a safe location. You can do this using the Backup Procedure that appears each time you save an archive file. If you prefer to back up the file all at once, as opposed to each time you save the file, you can use the FILE MAINTENANCE utility.

PROGRAMMING PROCEDURE

1. Press **F3** at the MAIN MENU to get to the CHANGE/VIEW CODEPLUG MENU.	6. Press **F8** to save the file.
2. At the CHANGE/VIEW CODEPLUG MENU, press **F7** to get to the SAVE ARCHIVE FILE screen.	7. You will see the gauge which indicates what percent of the radio codeplug has been saved to the file.
3. If necessary, change the archive pathname by pressing **F2** and typing in the desired pathname.	8. When the RSS finishes saving the file, you will see the BACKUP PROCEDURE.
4. If the file does not exist in the archive pathname, you will be given the option of creating it. If you wish to quit, press **F10**.	9. If you wish to make a backup, follow the directions on the screen. If you wish to bypass making a backup, press **F10**.
5. The Customer Name field should appear highlighted. Type in the desired information.	

Update Backup File

RSS LOCATION

DEFINITION Updates the specified backup file from an archive file of the same radio serial number.

DEFAULT/CHOICES

Default: **The target and source path names are taken from the backup and archive path names, respectively, that are specified on the PC CONFIGURATION screen.**

Choices: ***The target and source path names can be changed to any existing DOS path names.***

RECOMMENDATIONS This utility is helpful for updating a large number of backup files. It can be accomplished from one screen without having to read, save and backup each archive file one by one.

WARNINGS The UPDATE BACKUP FILE utility does NOT differentiate between archive and backup path names. Be careful to specify the correct path names.

IMPORTANT NOTE If backup files have not been previous created in the target path directory, the UPDATE BACKUP FILE utility will allow you to create them.

PROGRAMMING PROCEDURE

1. Press **F6** at the MAIN MENU to get to the FILE MAINTENANCE MENU.	5. Press **Tab** until the desired serial number is highlighted.
2. At the FILE MAINTENANCE MENU, press **F8** to get to the UPDATE BACKUP FILE screen.	6. Press **F7** to update the file OR press **F10** to exit the UPDATE BACKUP FILE utility.
3. If necessary, change the source pathname by pressing **F3** and typing in the desired pathname. Then press **Tab** (or **Enter** or **Return**).	7. If the target path name has NEVER had any backup files written to it, you will be asked if you wish to create files in this directory. Press **F2** to create files OR press **F10** to abort.
4. If necessary, change the target pathname by pressing **F4** and typing in the desired pathname. Then press **Tab** (or **Enter** or **Return**).	8. After the update is complete, the cursor will advance to the next serial number for the next update.

8 Menus and Screens

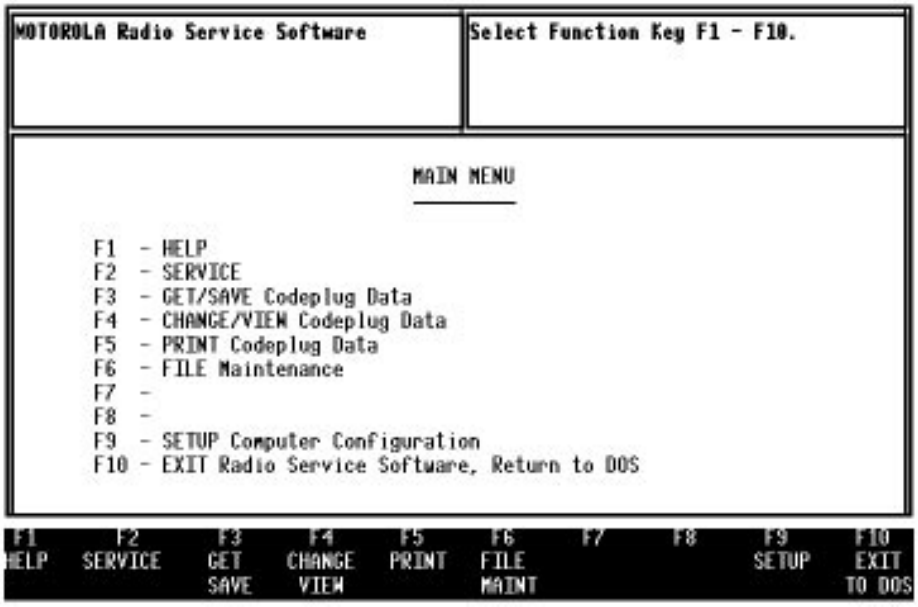
8.1 Overview

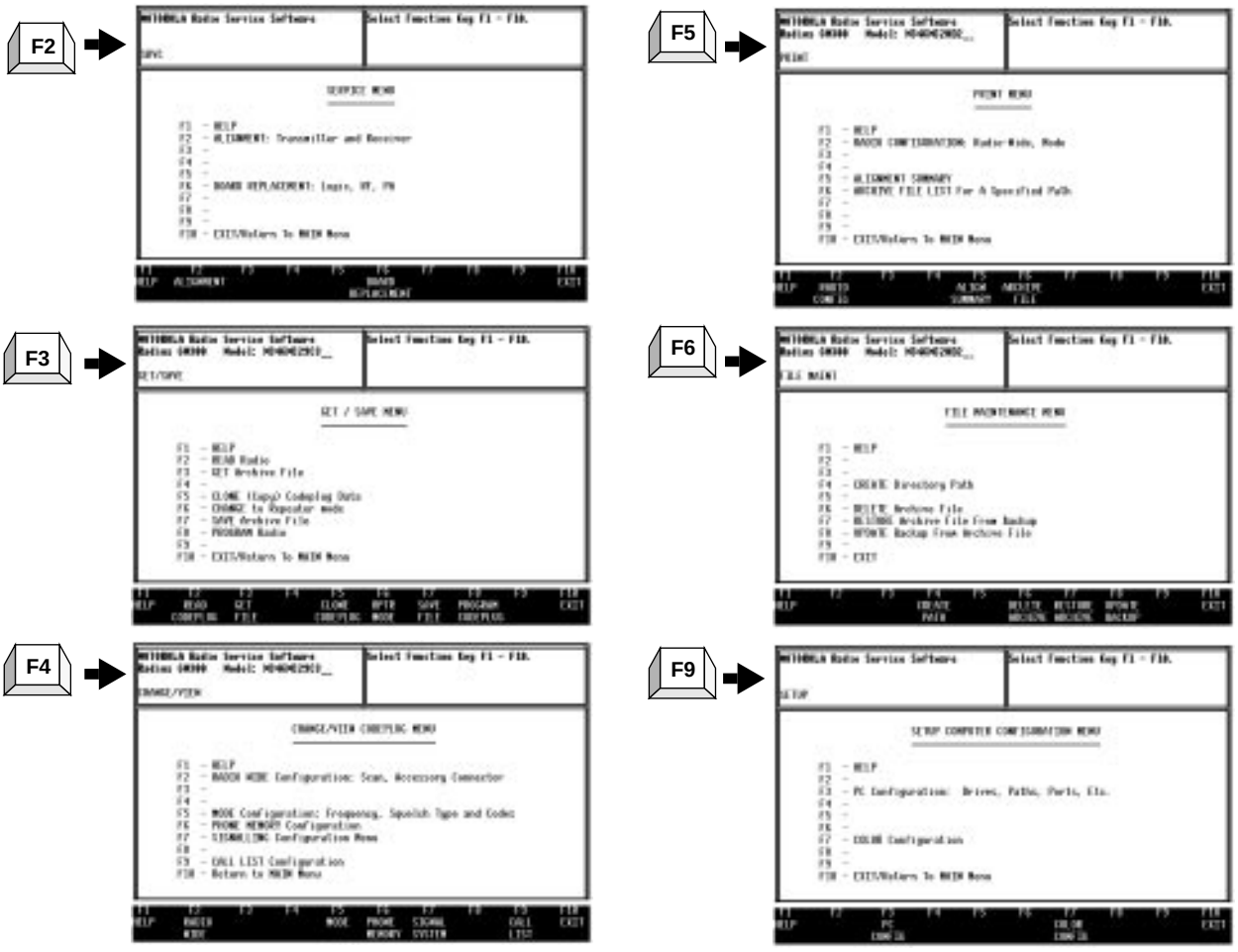
This section shows every RSS menu and screen that can be displayed on your monitor.

We start with the MAIN MENU, then proceed numerically by F-number keys. A smaller screen or menu indicates that it is an option on the larger screen or menu.

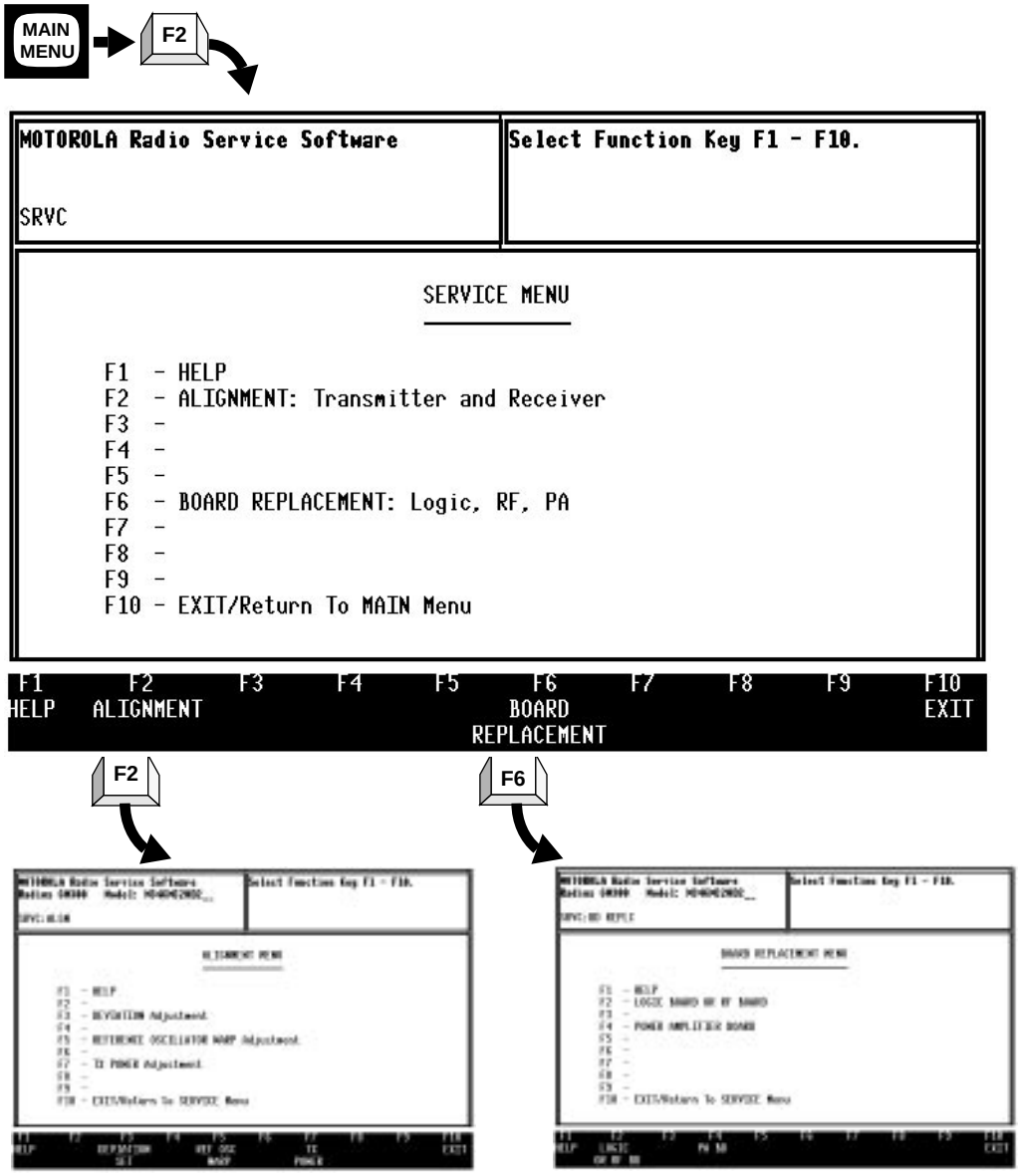
If a function is not shown it means that the function is performed without a menu or screen appearing. For example, the print function on some screens will print to a printer without showing a print screen. Likewise, F10, exit to previous screen, will not have its own screen, but instead will directly execute the function.

8.2 Main Menu

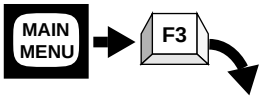

MOTOROLA Radio Service Software
Select Function Key F1 - F10.
MAIN MENU
F1 - HELP
F2 - SERVICE
F3 - GET/SAVE Codeplug Data
F4 - CHANGE/VIEW Codeplug Data
F5 - PRINT Codeplug Data
F6 - FILE Maintenance
F7 -
F8 -
F9 - SETUP Computer Configuration
F10 - EXIT Radio Service Software, Return to DOS
F1 HELP
F2 SERVICE
F3 GET SAVE
F4 CHANGE VIEW
F5 PRINT
F6 FILE MAINT
F9 SETUP
F10 EXIT TO DOS

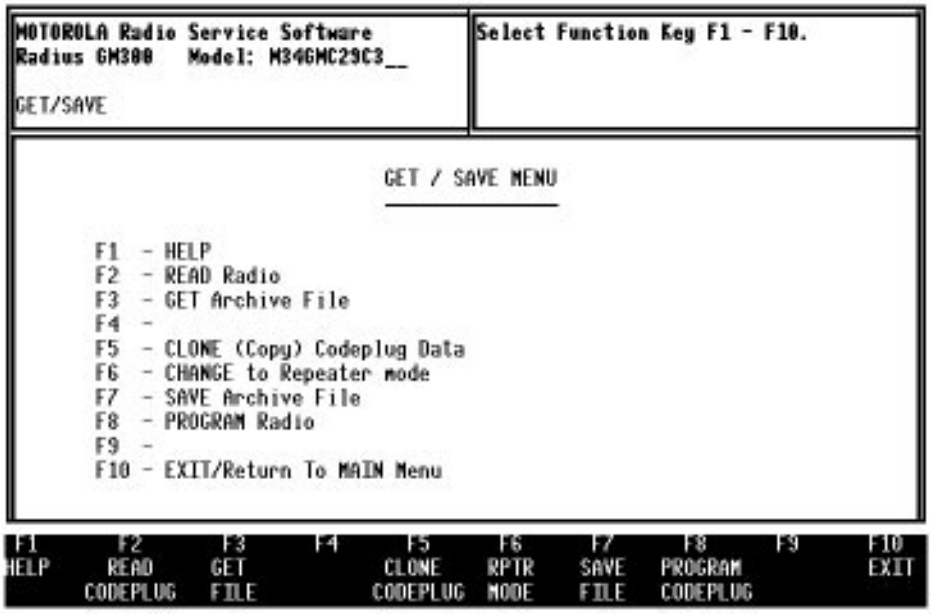

F2
F5
F3
F6
F4
F9

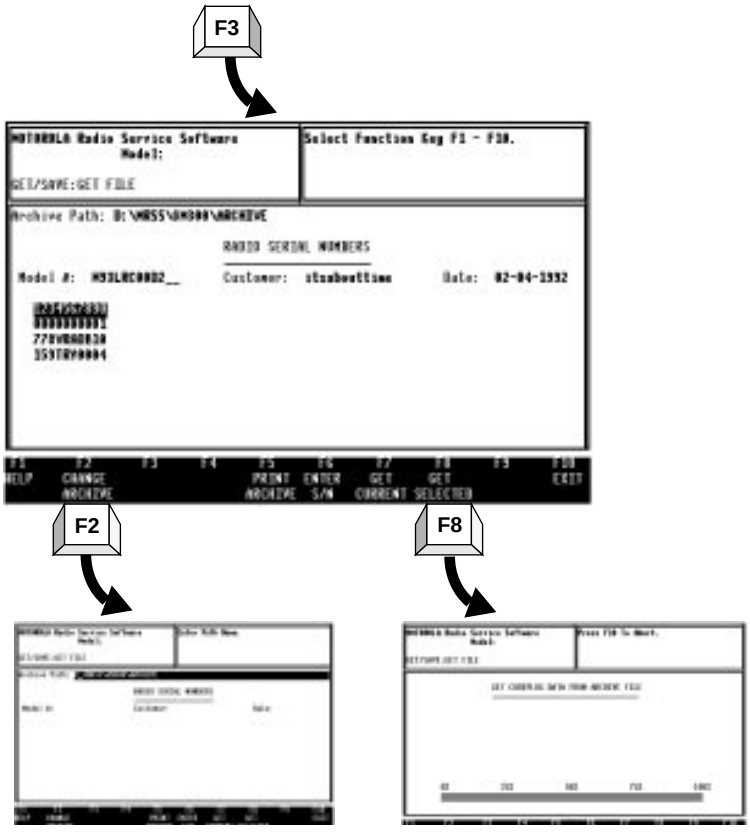
8.3 Service Menu



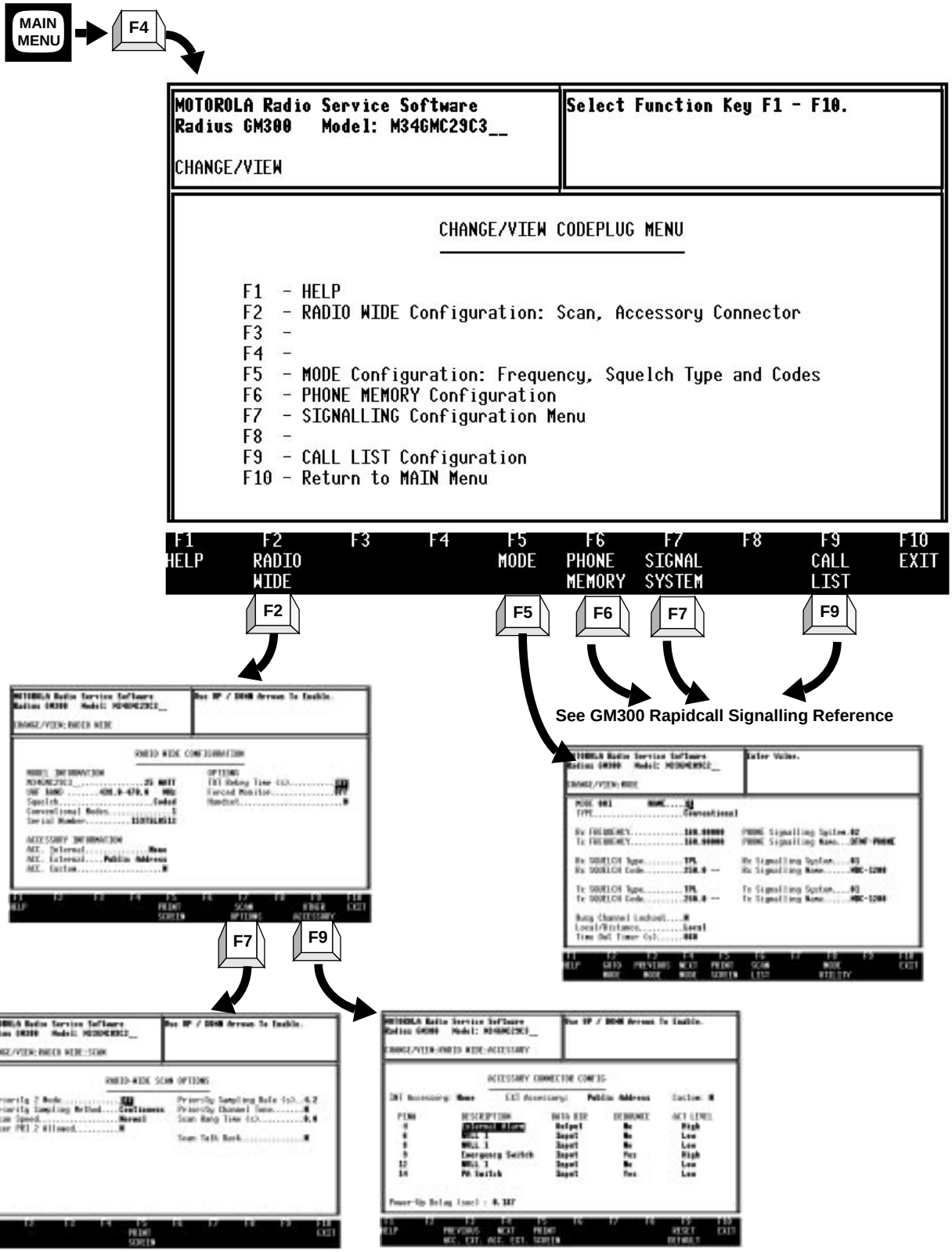
8.4 Get/Save Menu

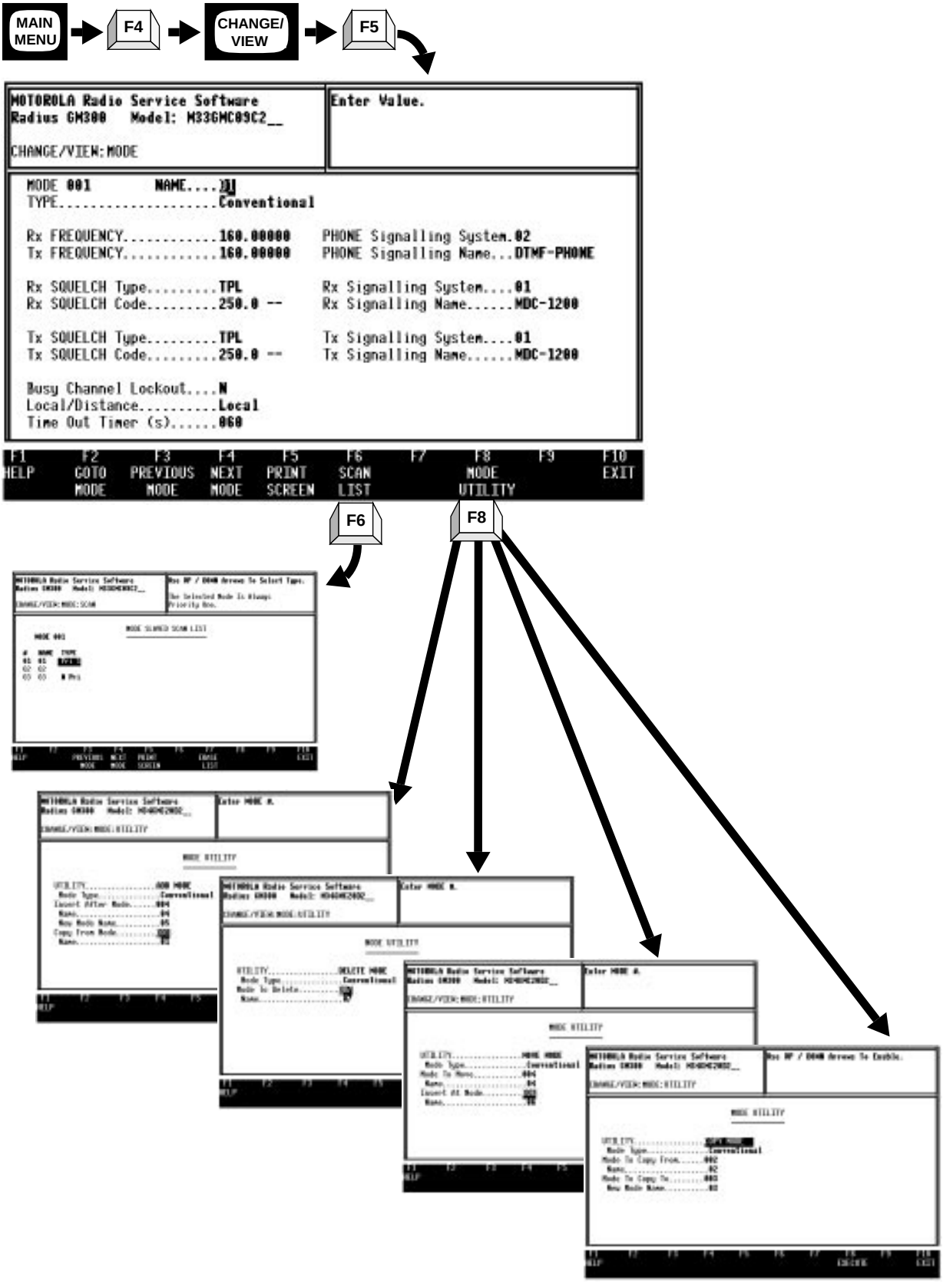


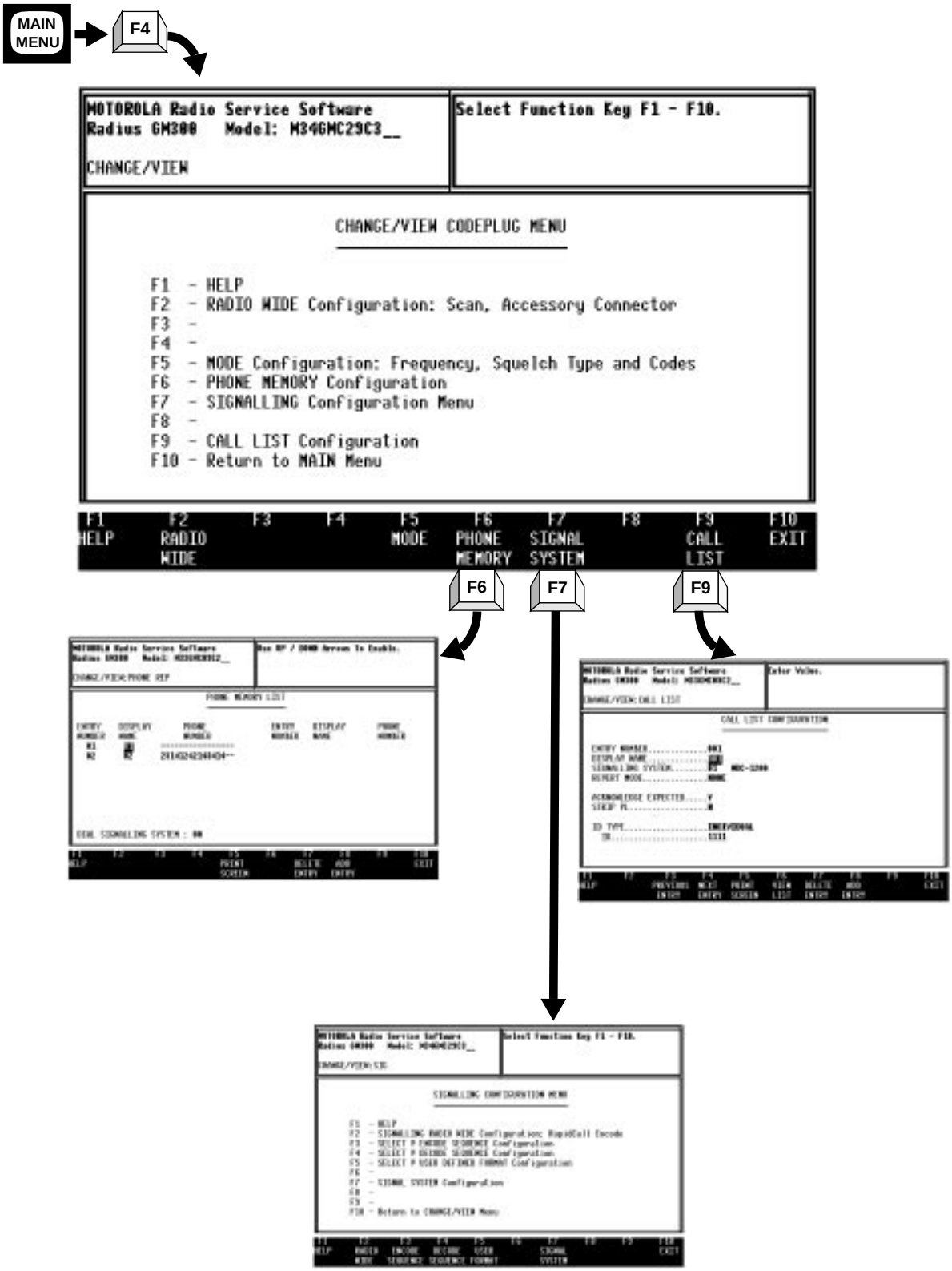




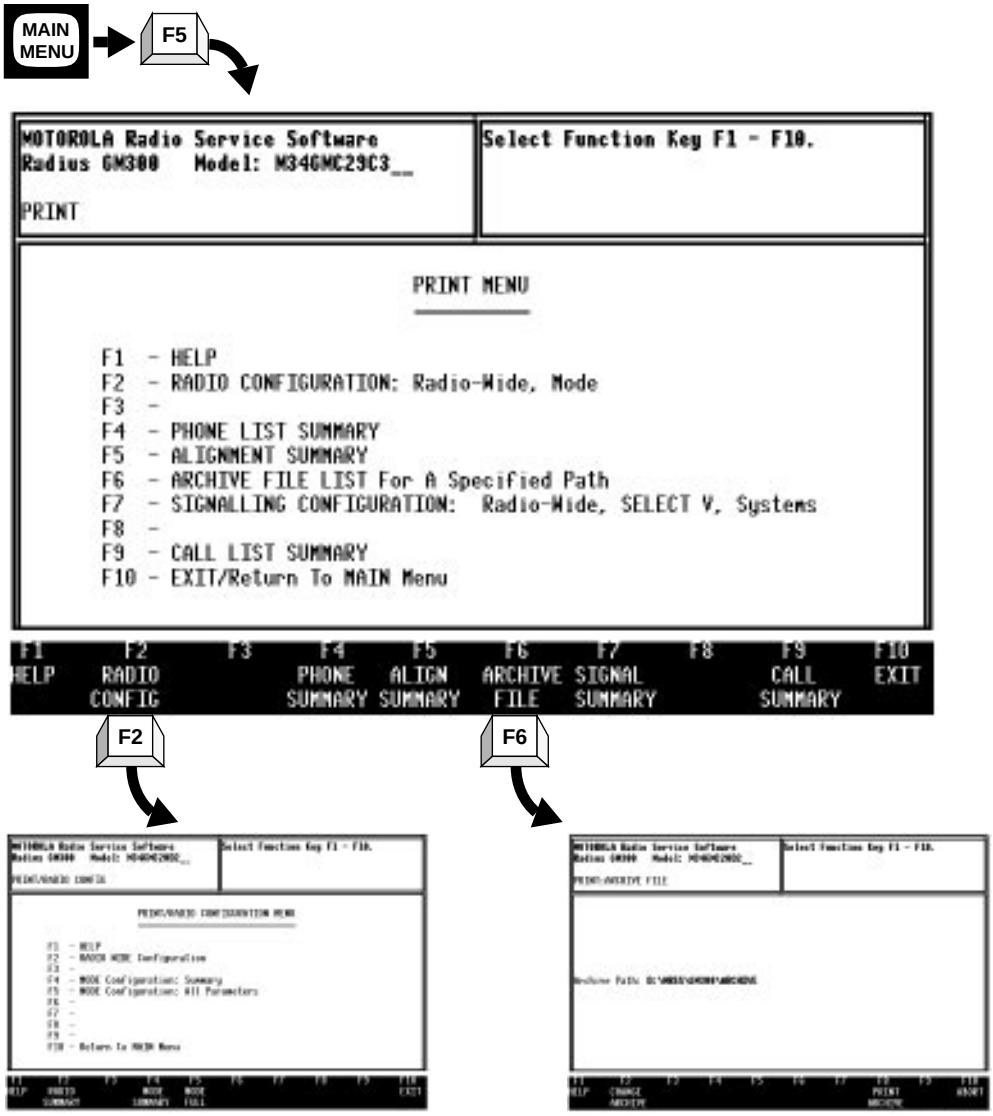
8.5 Change/View Codeplug Menu



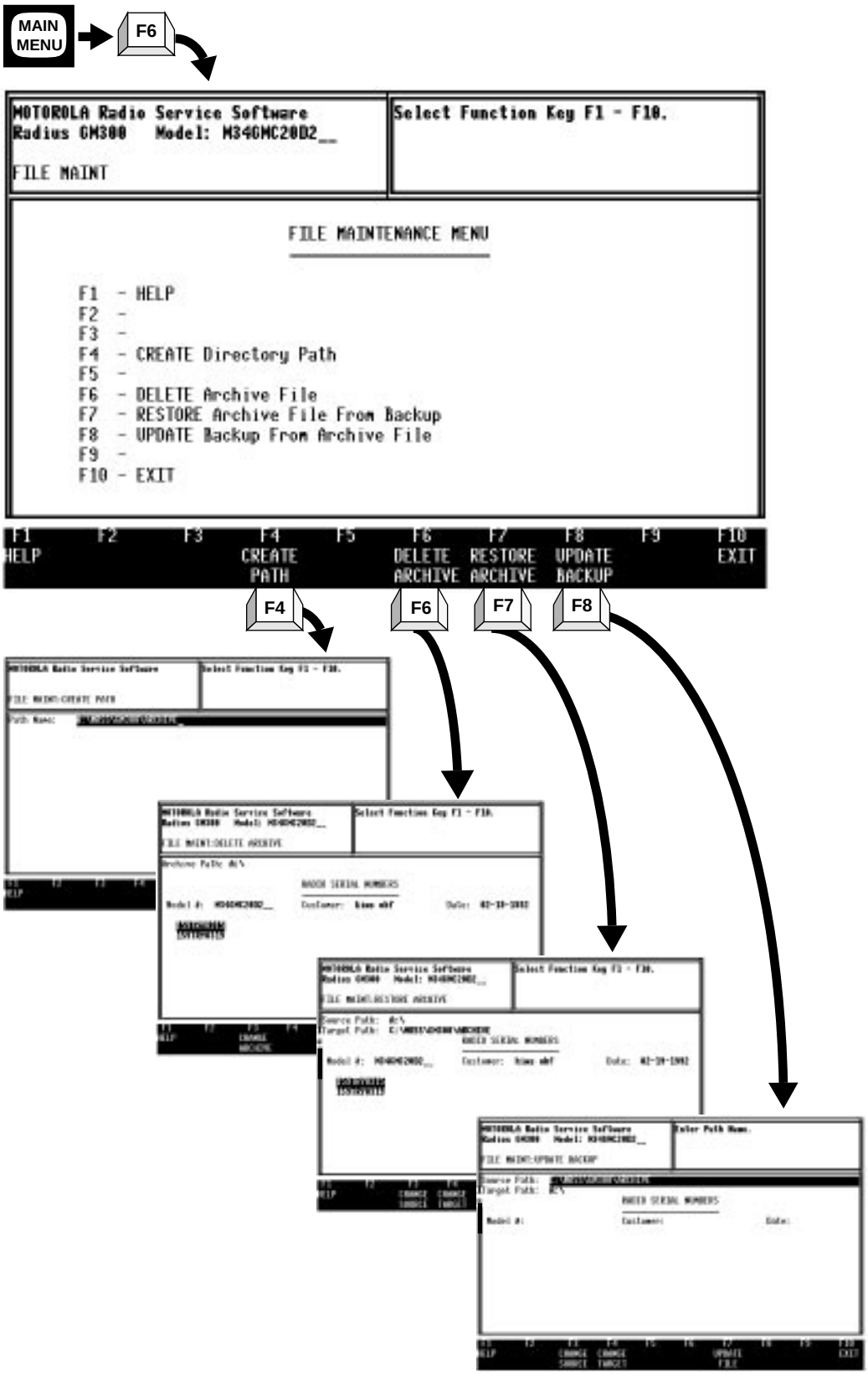

MAIN MENU
F4
CHANGE/ VIEW
F5
MOTOROLA Radio Service Software
Radius GM300 Model: M33GMC09C2__
CHANGE/VIEW: MODE
Enter Value.
MODE 001 NAME....
TYPE.....Conventional
Rx FREQUENCY.....160.00000
Tx FREQUENCY.....160.00000
PHONE Signalling System.02
PHONE Signalling Name...DTMF-PHONE
Rx SQUELCH Type.....TPL
Rx SQUELCH Code.....250.0 --
Rx Signalling System....01
Rx Signalling Name.....MDC-1200
Tx SQUELCH Type.....TPL
Tx SQUELCH Code.....250.0 --
Tx Signalling System....01
Tx Signalling Name.....MDC-1200
Busy Channel Lockout....N
Local/Distance.....Local
Time Out Timer (s).....060
F1 HELP
F2 GOTO MODE
F3 PREVIOUS MODE
F4 NEXT MODE
F5 PRINT SCREEN
F6 SCAN LIST
F7
F8 MODE UTILITY
F9
F10 EXIT
F6
F8


MAIN MENU
F4
MOTOROLA Radio Service Software
Radius GM300 Model: M34GMC29C3__
CHANGE/VIEW
Select Function Key F1 - F10.
CHANGE/VIEW CODEPLUG MENU
F1 - HELP
F2 - RADIO WIDE Configuration: Scan, Accessory Connector
F3 -
F4 -
F5 - MODE Configuration: Frequency, Squelch Type and Codes
F6 - PHONE MEMORY Configuration
F7 - SIGNALLING Configuration Menu
F8 -
F9 - CALL LIST Configuration
F10 - Return to MAIN Menu
F1 HELP
F2 RADIO WIDE
F3
F4
F5 MODE
F6 PHONE MEMORY
F7 SIGNAL SYSTEM
F8
F9 CALL LIST
F10 EXIT
F6
F7
F9

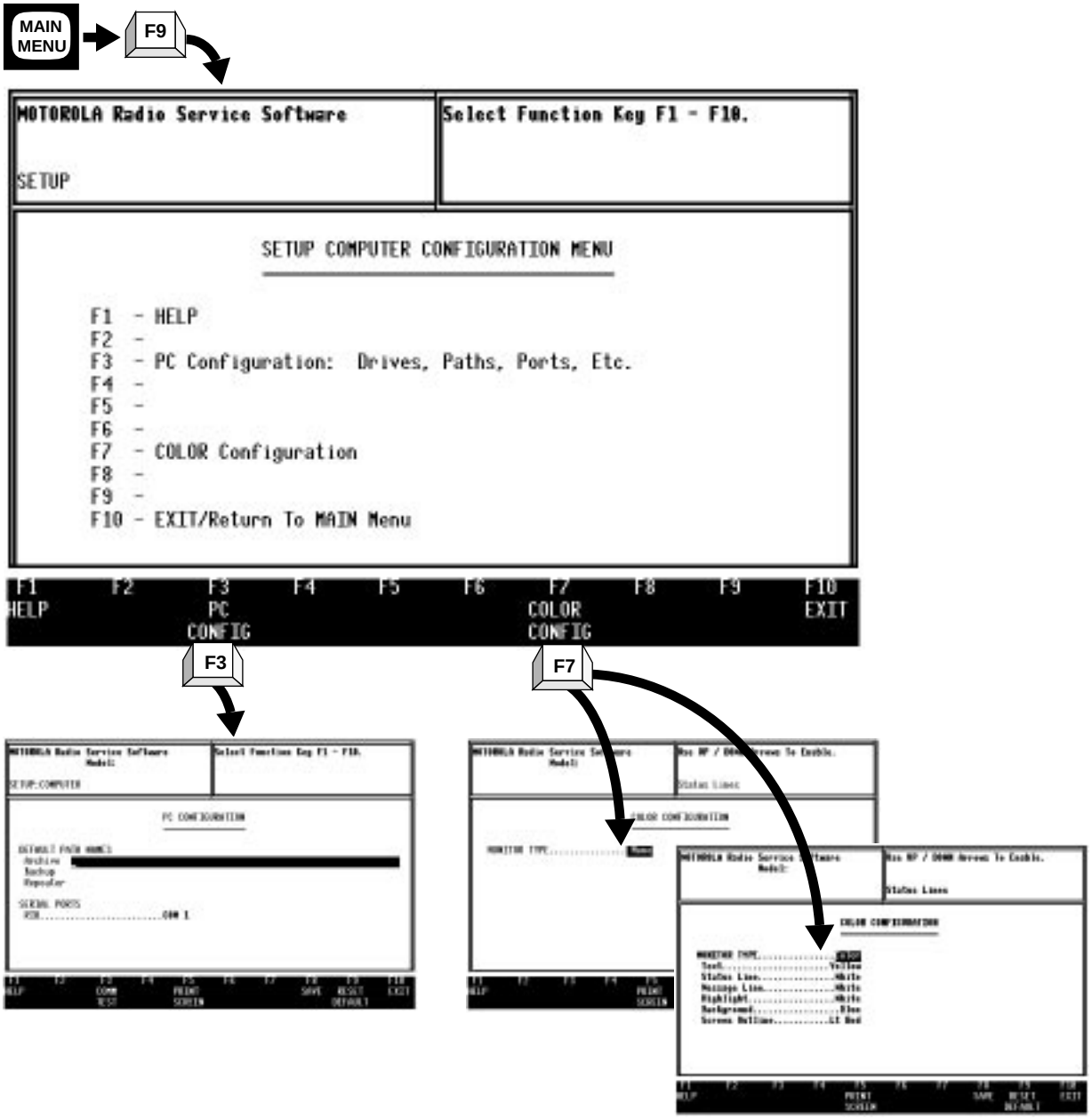
8.6 Print Menu



8.7 File Maintenance Menu



8.8 Setup Computer Configuration Menu



9 Servicing Features

9.1 Overview

The Radius GM300 mobile radio is a wide band product. In order to use high reliability circuits, the radio utilizes the internal microcomputer to re-adjust the radio, compensating for the particular frequency and temperature of operation. The complete band is broken into sixteen separate calibration points. Transmitter Power Output, Transmitter Modulation, and Reference Oscillator Stability are calibrated at the factory to ensure optimum performance across the band. Doing this eliminates customer specific tuning as was done with previous two-way radio products. If for some reason one of the circuit boards or major circuit component is replaced, the radio MUST be recalibrated to regain the ability to perform optimally. Seriously degraded operation will result if ANY of the recalibration steps are not performed!

Note: When replacing any circuit board, the Board Replacement steps MUST be followed in the correct sequence. When any major components in the Reference Oscillator, Power Amplifier, Synthesizer, or D/A Control circuitry are changed, the Board Replacement steps must be followed. See Calibration subsection for more details.

9.1.1 Configuring the Alignment and Calibration Equipment

The frequency meter, deviation meter and power meter are all connected to the antenna connector of the radio depending on which tests are being performed (Figure 9-1 on page 9-2). The audio generator is connected to the RIB to radio cable at the junction box with a BNC connector.

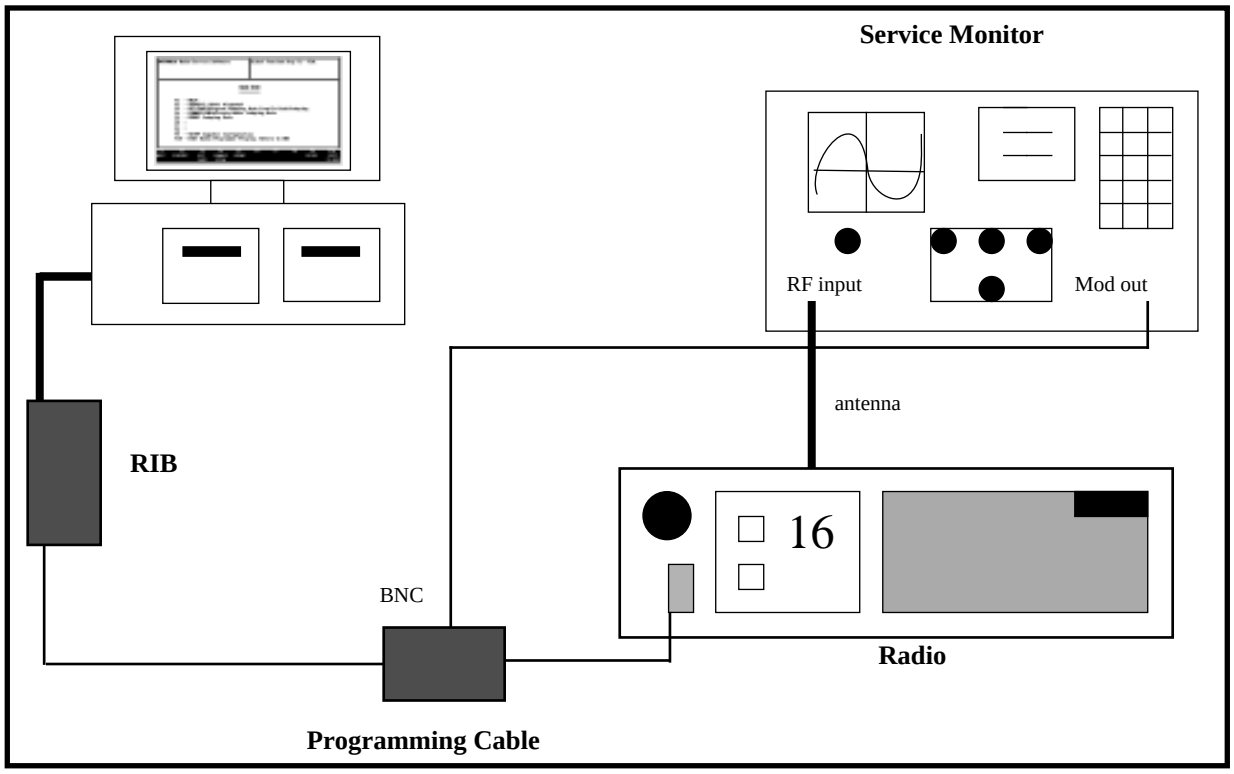


Figure 9-1. Test Equipment Configuration

9.1.2 Service Menu Screen

Pressing the F2 at the MAIN MENU will display the SERVICE MENU screen (Figure 9-2). The radio must be connected to the RIB and turned on at this time. The SERVICE MENU screen has two available functions. Function F2 is alignment of the transmitter power, deviation and reference oscillator. Function F6 is used to calibrate a board kit after it has been replaced

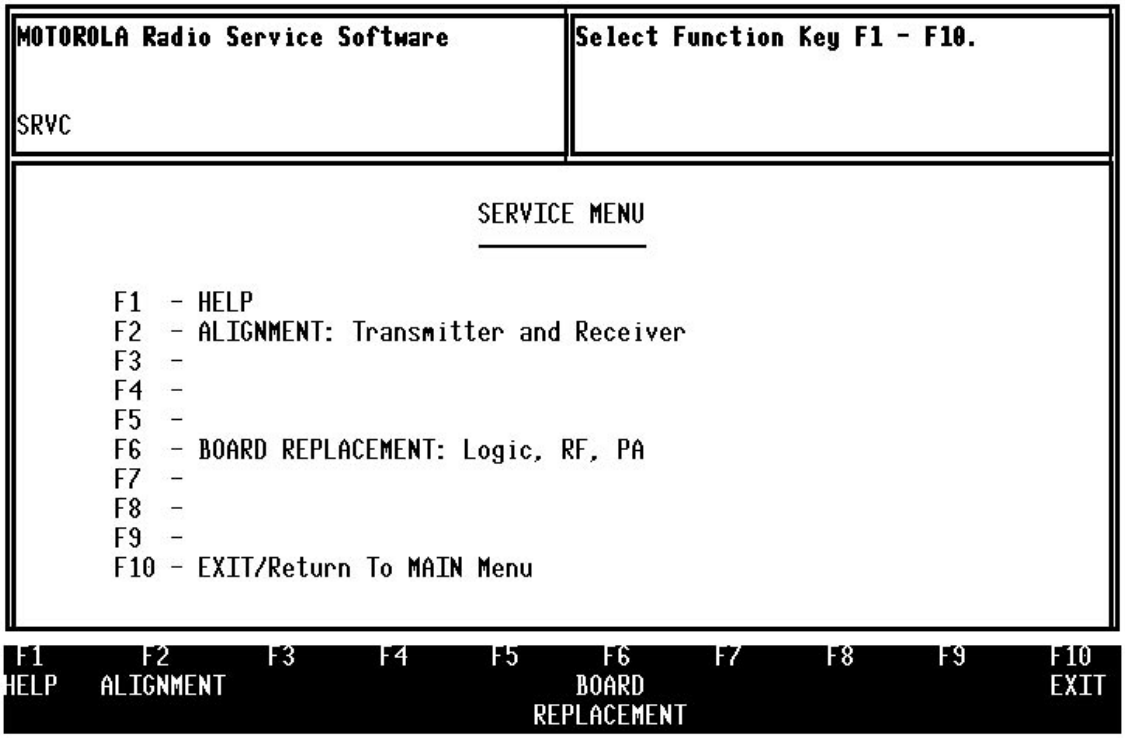


Figure 9-2. Service Menu

9.1.3 Alignment versus Calibration

The term “Alignment” is the Radio Service Software's ability to adjust transmitter power, deviation, and reference oscillator on a test frequency. The term “Calibration” is the Radio Service Software's ability to adjust transmitter power and deviation on sixteen frequency points that span the entire radio bandwidth.

When the radio is calibrated at the factory, it will perform within specification on any customer frequency within the frequency band. Therefore, any further alignment or calibration should not be necessary in the field. The only exception to this rule is the alignment of the reference oscillator. Because of aging characteristics of crystals the frequency of the oscillator will change with time. This means that the reference oscillator needs to be re-aligned periodically. This is not true, however, for transmitter power and deviation.

Because transmitter power and deviation do not change with time it is not recommended to use the alignment screens for power and deviation, unless you feel it is absolutely necessary. If you find a radio that needs more than 2 Watts adjustment, first check your equipment, antenna loads and cables. Remember that setting a radio beyond its rated power will affect the radio's long term reliability. If you find a radio that needs more than 500 Hz deviation adjustment, first check your equipment. If the radio is operating beyond these limits, it is recommended that calibration be done instead of alignment.

9.2 Alignment

The ALIGNMENT screen (Figure 9-3) has three functions available for aligning the transmitter deviation (F3), reference oscillator (F5), and transmitter power (F7)

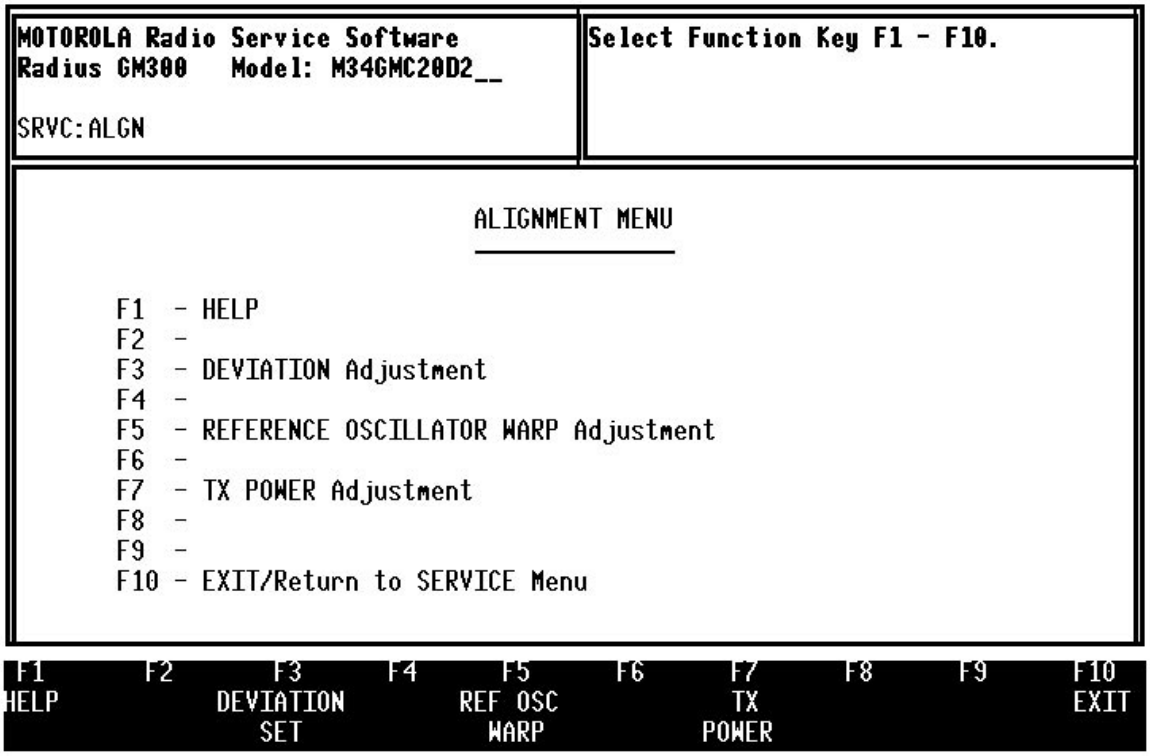


Figure 9-3. Alignment Menu

9.2.1 Transmitter Deviation Alignment (F3)

The TRANSMIT DEVIATION ALIGNMENT (Figure 9-4) screen is similar to the REFERENCE OSCILLATOR ALIGNMENT, except in this case the scale represents a deviation adjustment instead of a frequency adjustment. Use the following steps to align the transmitter deviation:

1. Connect the audio generator to the BNC connector on the RIB to Radio cable. Set the generator to 800 mV RMS at a frequency of 1000 Hz.
2. Connect a deviation meter to the antenna connector of the radio.
3. Key radio using the F6 key. The screen will display "TRANSMIT ON".
4. Using the up and down arrow keys, set the radio to rated deviation by reading the deviation meter. The relative position of the adjustment will be displayed on the scale. If the radio cannot be adjusted for rated deviation and the relative position is a MIN or MAX position, you should refer to the service manual for repair procedures.
5. Dekey radio using the F6 key. The screen will display "TRANSMIT OFF".
6. Press F8 to save the new calibration value into the radio codeplug and return to the ALIGNMENT screen.

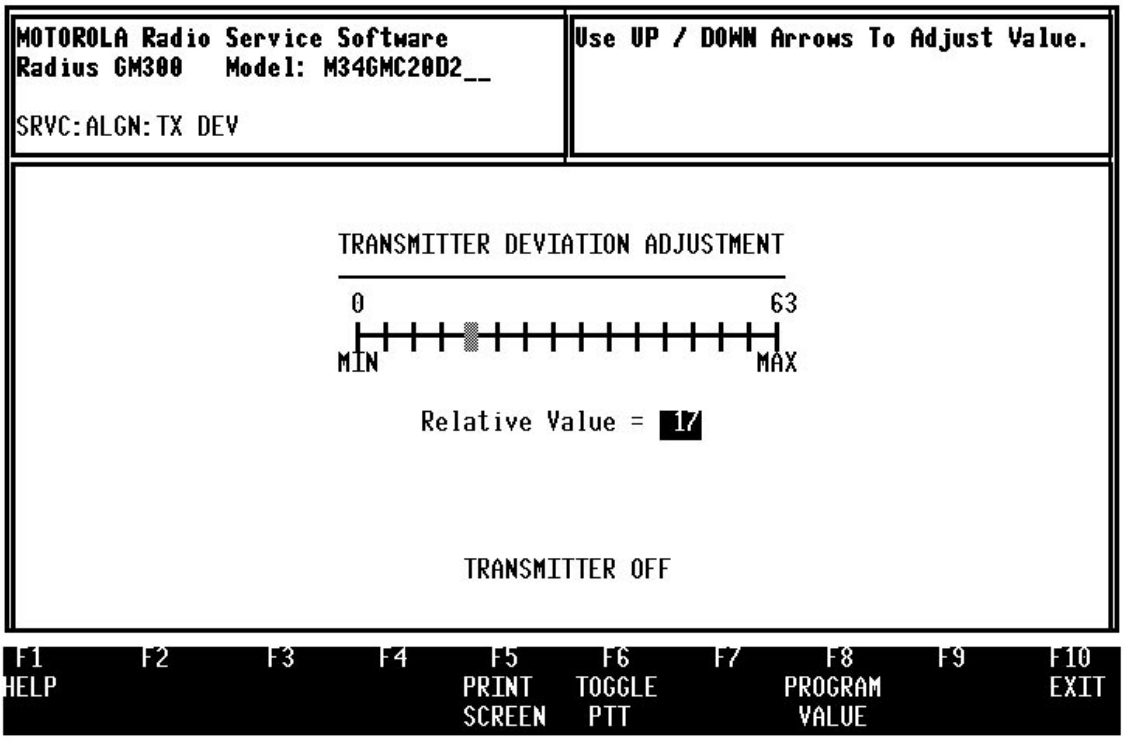


Figure 9-4. Deviation Adjustment

9.2.2 Reference Oscillator Warp Adjustment (F5)

The reference oscillator is aligned in the field electronically with this RSS. The Radius radio is not aligned by a variable capacitor or inductor as with previous products. This allows alignment of the oscillator without opening the radio. The REFERENCE OSCILLATOR ALIGNMENT screen displays a relative scale of the alignment range available and the current position of the alignment inside that range (Figure 9-5). Use the following procedure to align the reference oscillator:

1. Connect a frequency counter to the antenna connector of the radio.
2. Key radio using the F6 key. The screen will display “TRANSMIT ON”.
3. Using the up and down arrow keys set the radio to ±100 Hz of the customer frequency. The relative position of the adjustment will be displayed on the scale. Note, it may take up to 10 seconds before the radio is updated. If the radio cannot be adjusted for correct frequency and the relative position is a MIN or MAX position, you should refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display “TRANSMIT OFF”.
5. Press F8 to save the new calibration value into the radio codeplug and return to the ALIGNMENT screen.

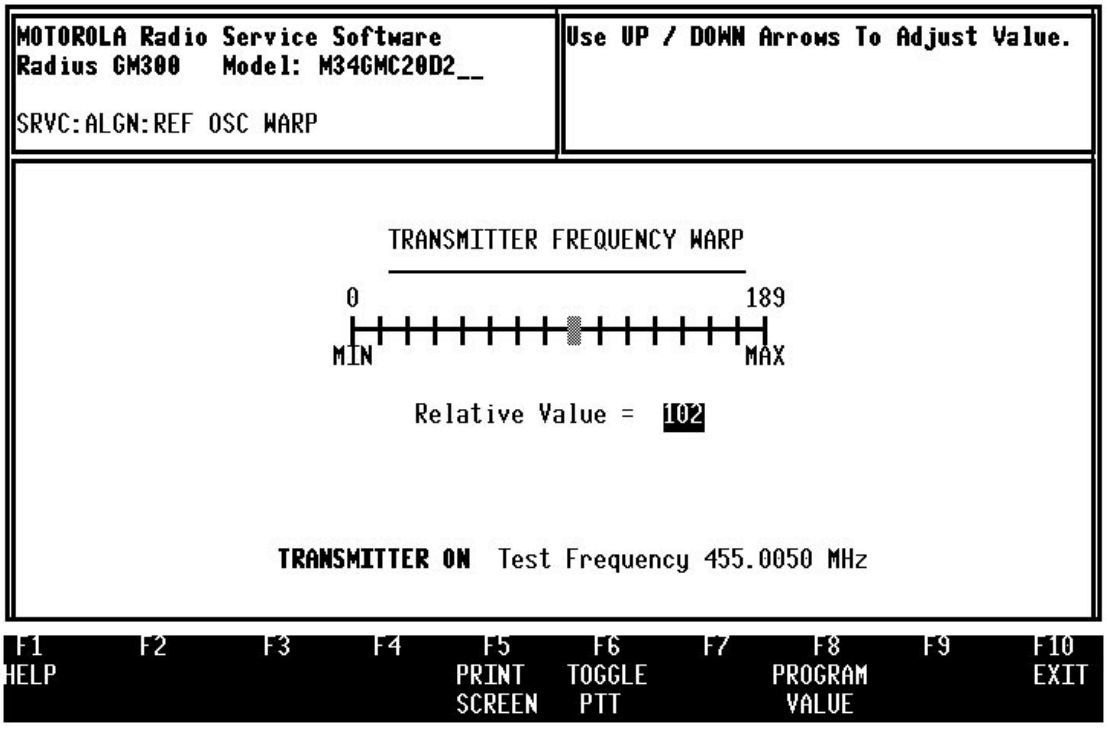


Figure 9-5. Frequency Warp

9.2.3 Transmitter Power Alignment (F7)

The TRANSMIT POWER ALIGNMENT (Figure 9-6) screen is similar to the REFERENCE OSCILLATOR ALIGNMENT. Except in this case the scale represents a power adjustment instead of a frequency adjustment. Use the following procedure to align the transmitter:

1. Connect a power meter to the antenna connector of the radio.
2. Key radio using the F6 key. The screen will display "TRANSMIT ON"
3. Using the up/down arrow keys set the radio to rated power by reading the power meter. The relative position of the adjustment will be displayed on the scale. If the radio cannot be adjusted for rated power and the relative position is a MIN or MAX position, refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display "TRANSMIT OFF".
5. Press F8 to save the new calibration value into the radio codeplug and return to the ALIGNMENT screen.

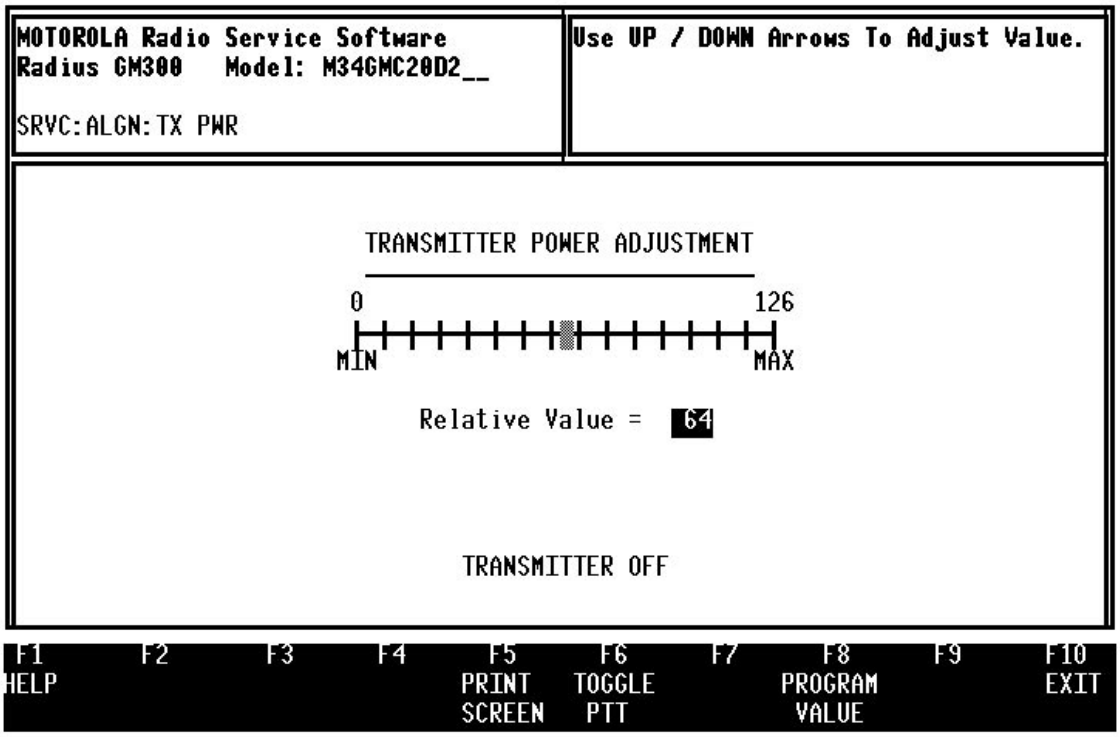


Figure 9-6. Power Adjustment

9.3 Calibration

9.3.1 Calibration After Board Replacement (F6)

Pressing the F6 function key from the SERVICE screen will display the BOARD REPLACEMENT menu (Figure 9-7). There are two functions available to cover every board kit. *Because the microcomputer controls the reference oscillator, transmit deviation, and transmit RF power, the microcomputer must learn the characteristics of each board in the radio. Each board has its own set of unique characteristics.* This is due to component and manufacturing tolerances. Data that describes these tolerances are entered from labels attached to the boards or determined by measuring certain radio parameters. Some of the calibration is done over sixteen test frequencies that cover the band or eight frequencies for some 800 MHz models. Below is a description of the screens that follow the selection of one of the function keys.

***Important!* Under this test procedure DO NOT key the transmitter for longer than one minute. If you do it, may affect the calibration setting. If the transmitter is keyed for one minute, you must allow four minutes cooling time before continuing the calibration.**

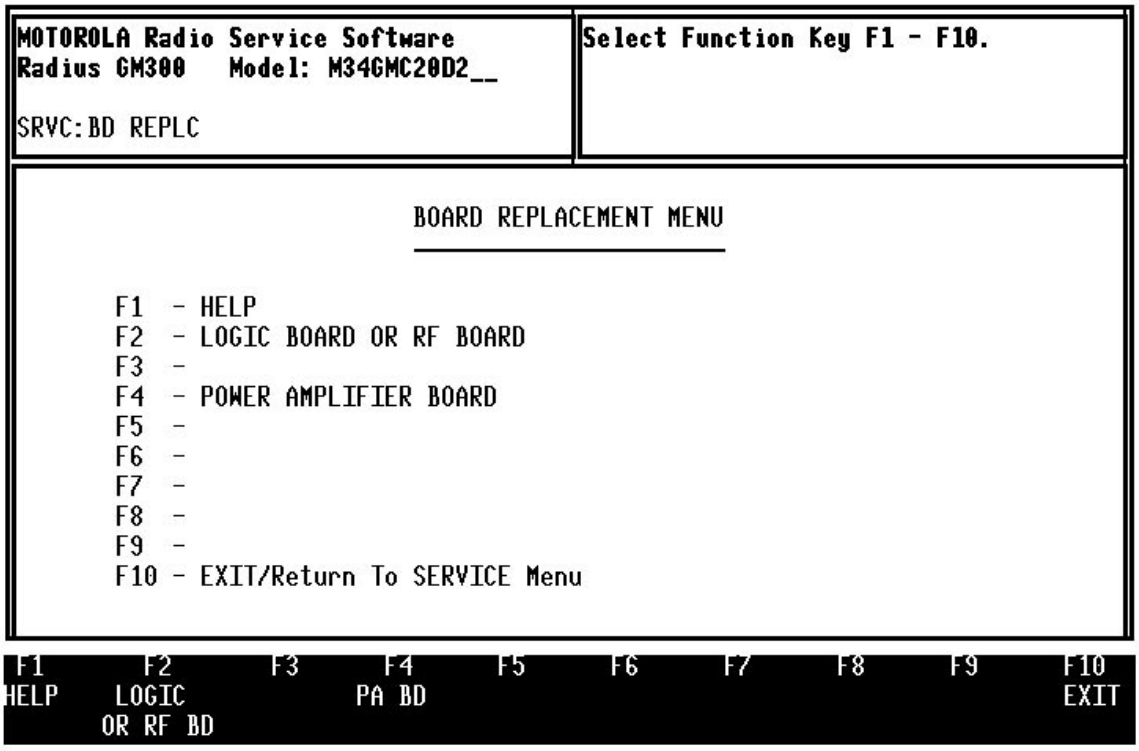


Figure 9-7. Board Replacement

9.3.2 Replaced Logic Board or RF Board (F2)

To calibrate either the logic board or the RF board, first make sure the radio is turned on and connected to the RIB. Also, have a RF frequency counter, deviation meter, audio generator, and power meter on hand to connect to the radio's antenna connector.

After pressing F2 the Radio Service Software will determine if the codeplug of the logic board has been initialized. If the codeplug has not been initialized then model definition data must first be programmed

into the codeplug according to the Model of the radio. Upon detecting an un-initialized codeplug the Radio Service Software will display the BLANK BOARD INITIALIZATION screen (Figure 9-8 on page 9-10). Six pieces of information are needed to initialize the codeplug. They are Product Line, Model Name, Model Number, Frequency Range, Panel Number and Serial Number. Use the following procedure to initialize the codeplug:

1. With the cursor on the Product Line data field select the correct Product for your radio using the up and down arrow keys. Examples of Product Lines are "Radius GP300" and "Radius GM300". If the product line of the radio you are trying to repair is not listed, then this version of the Radio Service Software is not compatible with the radio.
2. Move the cursor to the Model Name data field and select the correct Model Name using the up and down arrow keys. If the radio's Model Name is not listed, then the version of the Radio Service Software you are using is not compatible with this radio model or you have selected the incorrect Product Line.
3. Move the cursor to the Model Number data field and select the correct Model Number using the up and down arrow keys. If the radio's Model Number is not listed, then the version of the Radio Service Software you are using is not compatible with this radio model.
4. Move the cursor to the Range data field and select the correct frequency range for this radio using the up and down arrow keys. If the radio's frequency range is not listed, then the version of the Radio Service Software you are using is not compatible with this radio model.
5. Move the cursor to the Panel Number field and enter the correct panel number for the model of this radio. See Table 9-1 to determine this value.
6. Move the cursor to the Serial Number field and enter the serial number from the radio label and then press the Enter key.

Important! ***It is important that the information on the BLANK BOARD INITIALIZATION screen is correct. Once an uninitialized codeplug is programmed with model definition data it CAN NOT BE CHANGED AGAIN. If the codeplug is incorrectly initialized the logic board will have to be replaced again.***

7. Review the information on the screen and if incorrect, edit the information. Now press F8 to program the model definition data into the radio's codeplug.
8. Press F10 to return to the BOARD REPLACEMENT MENU.

Table 9-1. Blank Board Initialization Information

Product Line	Model Number	Model Name	Panel Number
Radius GM300	GM300	MxxGMCxxCx	5
Radius GM300	GM300	MxxGMCxxDx	5
Radius GM300	GM300	MxxGMRxxxx	5

Pressing F2 with an initialized codeplug in the radio will display the LOGIC BOARD AND RF BOARD REPLACEMENT PROCEDURE screen (Figure 9-9 on page 9-10). This screen displays a menu that is arranged in the order the board should be calibrated. The status message box (upper right box) will tell you which calibration function key is active. Only one of the calibration function keys will be active at one time. The following will describe the operation of each function key in the order that they will be done.

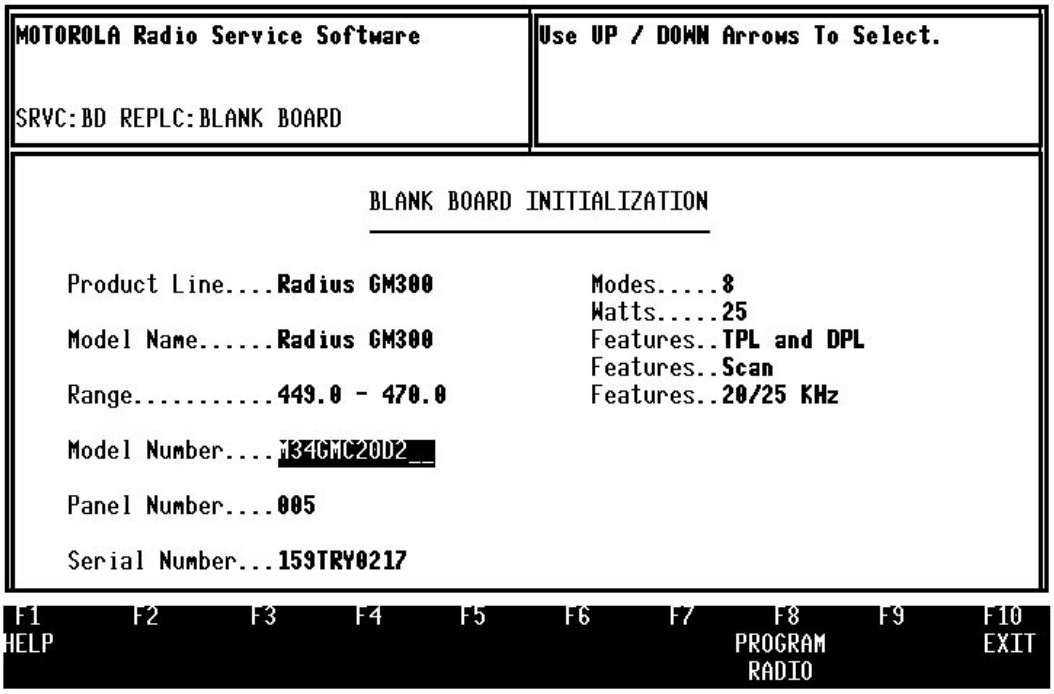


Figure 9-8. Blank Board Initialization

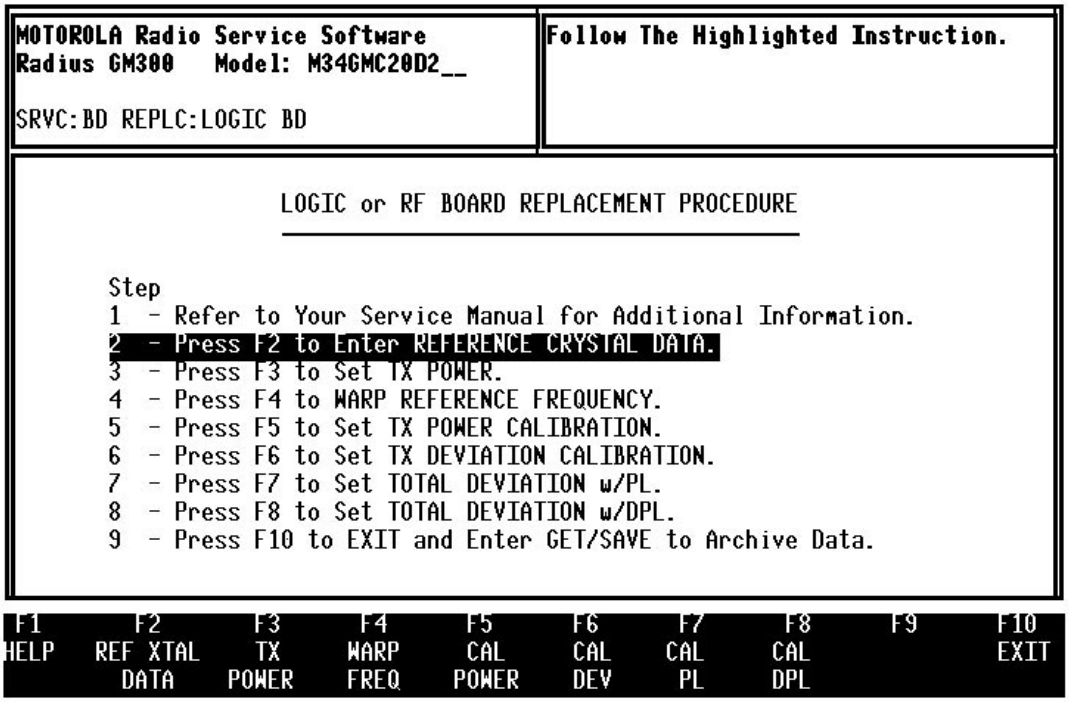


Figure 9-9. Logic and RF Board Replacement

9.3.3 Reference Crystal Data (F2)

The first calibration screen is REFERENCE CRYSTAL DATA (Figure 9-10). This screen requires that the radio be open and the RF and synthesizer shields be removed. There are two labels inside the synthesizer compartment. The first is called the CRYSTAL LABEL. This label is located on the crystal itself. It has two rows of four digits. The second label is called the TUNING LABEL. This label is located on the synthesizer shield frame near the crystal. It has two rows. The first row has three digits. The second row has four digits. You will also need a DVM to measure regulator voltage. Use the following procedure to complete this screen:

1. Read the top four digits from the CRYSTAL LABEL. Enter the digits into the top Crystal Label line.
2. Read the bottom four digits from the CRYSTAL LABEL. Enter the digits into the bottom Crystal Label line.
3. Read the top three digits from the TUNING LABEL. Enter the digits into the top Tuning Label line.
4. Read the bottom four digits from the TUNING LABEL. Enter the digits into the bottom Tuning Label line.
5. Measure the voltage of the 9.6 volt regulator (Pin 1 of J6). Enter the voltage. Verify that the data that you have entered is correct. Press the F8 key to save the new calibration values into the radio and return to the LOGIC BOARD AND RF BOARD CALI BRATION screen.

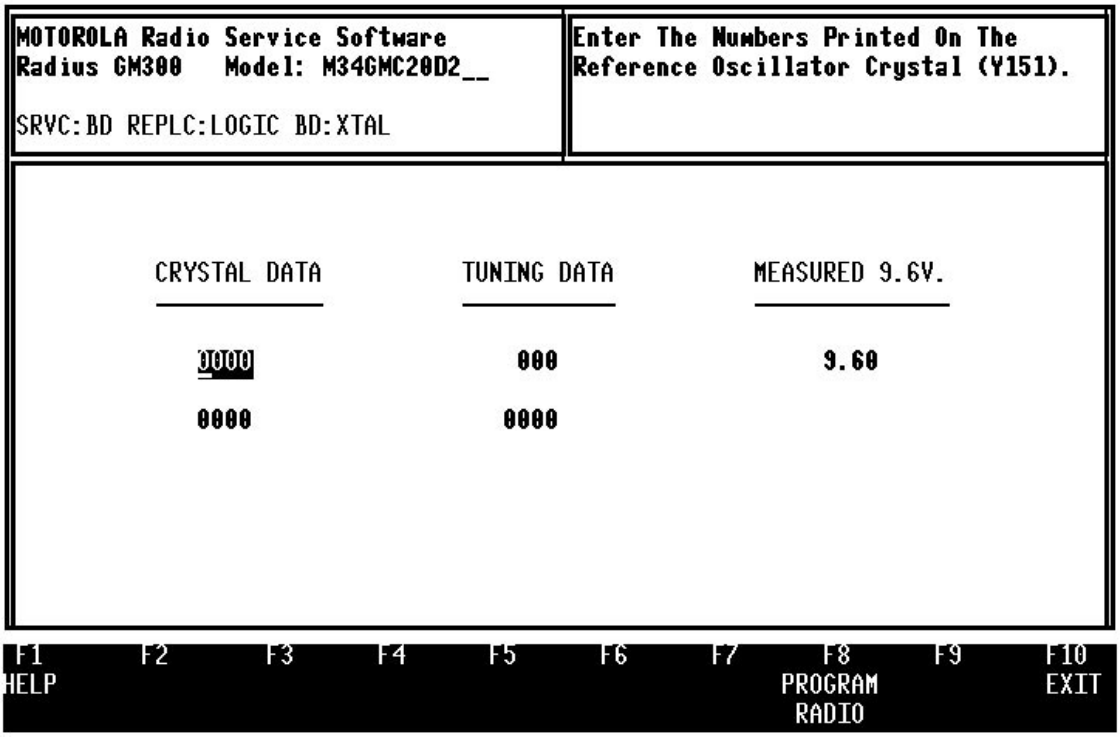


Figure 9-10. Reference Crystal Data

6. Repeat steps 4 and 5 above until all sixteen points have been calibrated.
7. Dekey radio using the F6 key. The screen will display “TRANSMITTER OFF”.
8. Pressing Tab or Shift-Tab will allow you to step to any desired calibration point to recheck a setting if necessary.

9.3.4 Transmitter Power Set (F3)

The next screen is the TRANSMIT POWER ALIGNMENT (Figure 9-11). This is the same screen that is used to align the transmitter power found in the alignment screens. Use the following procedure to align the transmitter:

1. Connect a power meter to the antenna connector of the radio.
2. Key radio using the F6 key. The screen will display "TRANSMIT ON".
3. Using the up and down arrow keys set the radio to rated power by reading the power meter. The relative position of the adjustment will be displayed on the scale. If the radio cannot be adjusted for rated power and the relative position is a MIN or MAX position, you should refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display "TRANSMIT OFF".
5. Press F8 to save the new calibration value into the radio codeplug and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.

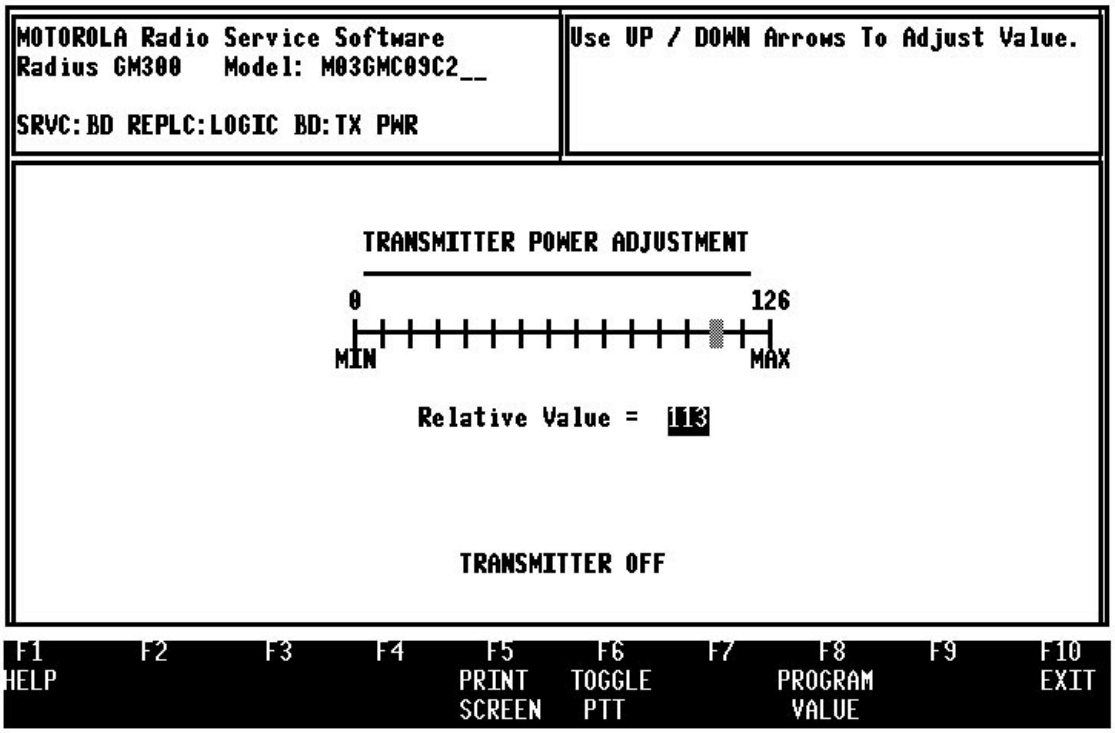


Figure 9-11. Deviation Calibration

9.3.5 Reference Oscillator Alignment (F4)

The next screen is the REFERENCE OSCILLATOR ALIGNMENT screen (Figure 9-12). This screen is exactly the same as the TRANSMITTER FREQUENCY WARP found in the alignment screens. Use the following procedure to align the reference oscillator:

1. Connect a frequency counter to the antenna connector of the radio.
2. Key radio using the F6 key. The screen will display "TRANSMITTER ON".
3. Using the up and down arrow keys set the radio to ± 100 Hz of the displayed frequency. The relative position of the adjustment will be displayed on the scale. Note, it may take up to 10 seconds before the radio is updated. If the radio cannot be adjusted for correct frequency and the relative position is a MIN or MAX position, you should refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display "TRANSMIT OFF".
5. Press F8 to save the new calibration value into the radio and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.

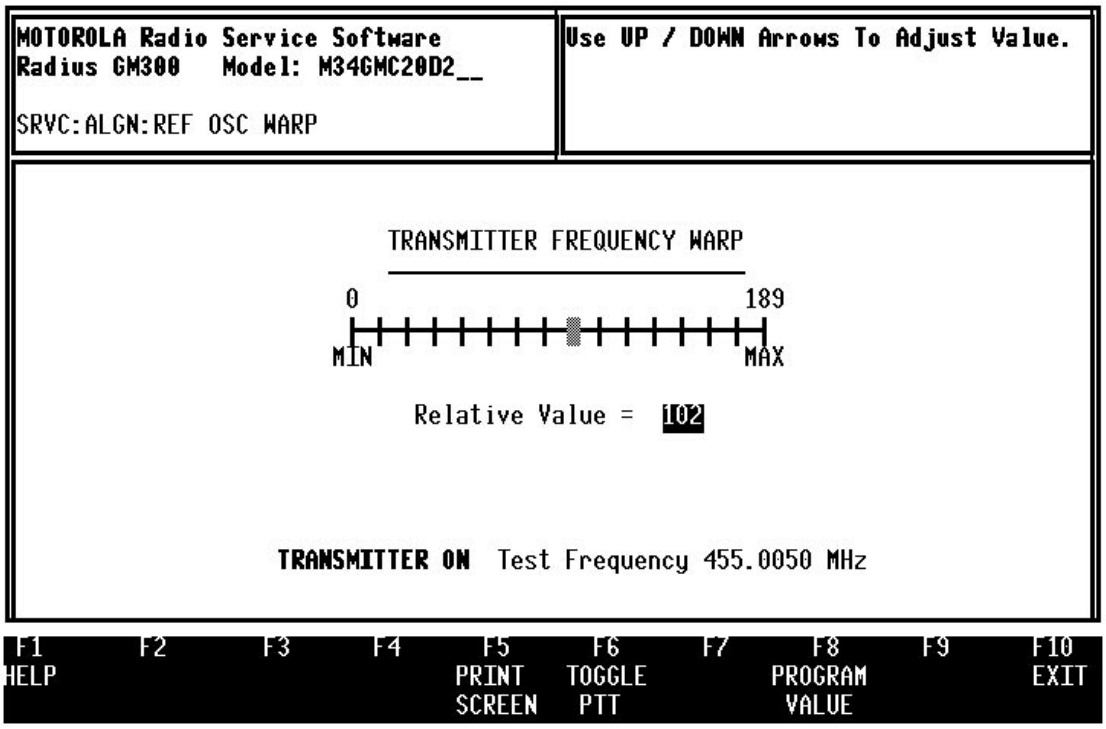


Figure 9-12. Frequency Warp

9.3.6 Calibrate Power (F5)

The next screen is the CALIBRATE POWER screen (Figure 9-13). This screen is the same as the one used in the Replace Power Amplifier section (section 9.3.10). Use the following procedure to calibrate the power amplifier:

1. Make sure the radio is turned on. Connect a power meter to the antenna connector of the radio.
2. Key radio using the F6 key. The screen will display "TRANSMITTER ON".
3. Using the up and down arrow keys set the radio to the rated power by reading the power meter. The relative position of the adjustment will be displayed on the scale. The relative position may be entered directly from the keyboard. For example, if the previous calibration points have been running about the relative value of 33, then for the next calibration point you may start by entering 33 and then using the up and down arrows for the final adjustment. If the radio cannot be adjusted for rated power and the relative position is at the Min or Max position, you should refer to the service manual for repair procedures.
4. Press Tab to move to the next calibration point. The calibration point number (1 to 16) will be highlighted.
5. Repeat steps 3 and 4 above until all sixteen points have been calibrated.
6. Dekey radio using the F6 key. The screen will display "TRANSMITTER OFF".
7. Pressing Tab or Shift-Tab will allow you to step to any desired calibration point to recheck a setting if necessary.
8. When the calibration is complete press the F8 function key to save the new calibration value into the radio and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.

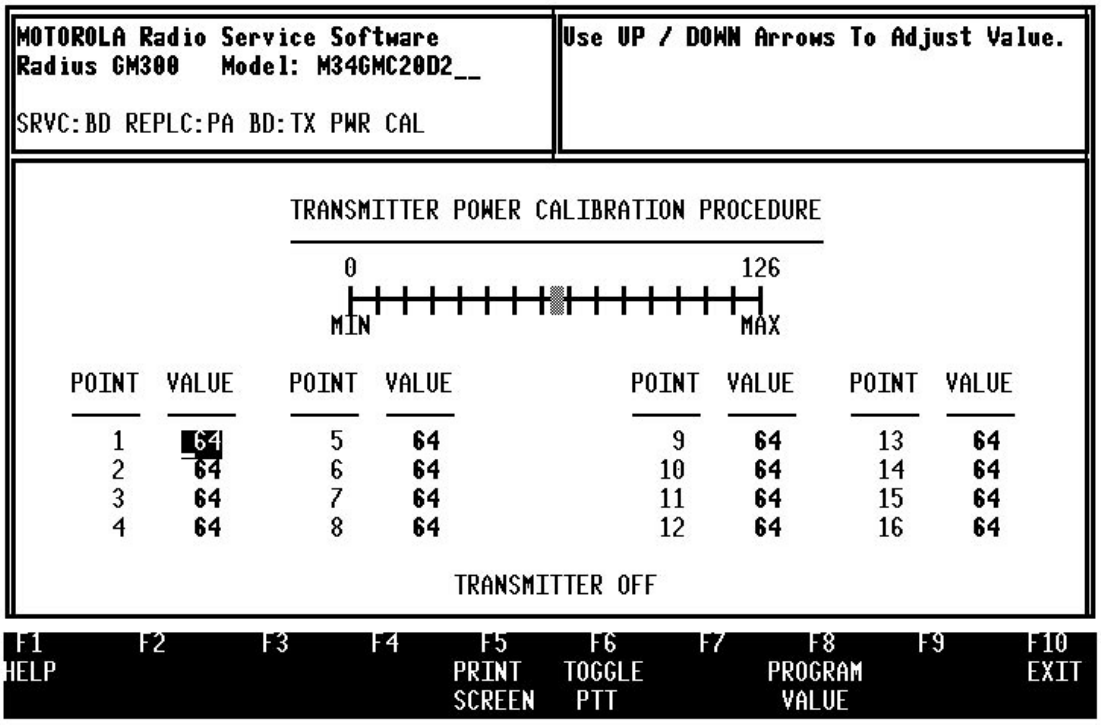


Figure 9-13. Power Calibration

9.3.7 Calibrate Deviation (F6)

The next figure is the CALIBRATE DEVIATION screen (Figure 9-14). This screen is similar to the CALIBRATE POWER screen. The exception in this case is that the scale represents the deviation adjustment instead of power.

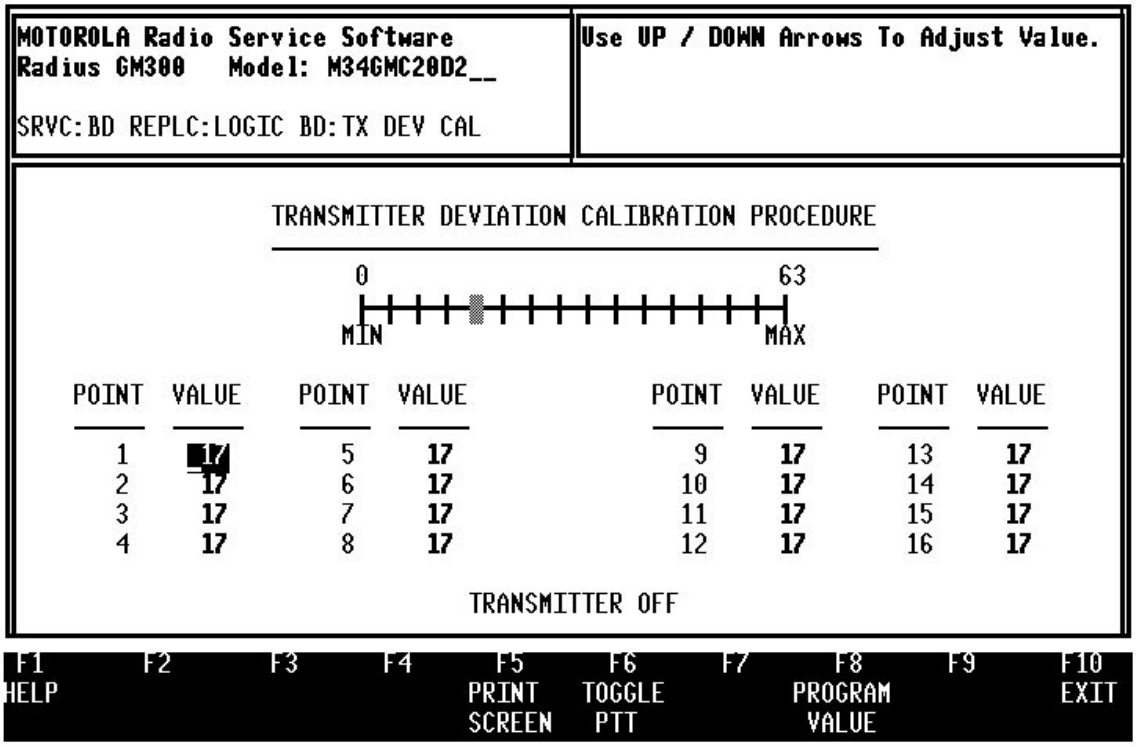


Figure 9-14. Deviation Calibration

Use the following sequence to calibrate deviation:

1. Connect the audio generator to the BNC connector on the RIB to Radio cable. Set the generator to 800 mV RMS at a frequency of 1000 Hz.
2. Make sure the radio is turned on. Connect a deviation meter to the antenna connector of the radio.
3. Key radio using the F6 key. The screen will display “TRANSMITTER ON”.
4. Using the up and down arrow keys set the radio to the rated deviation by reading the deviation meter. The relative position of the adjustment will be displayed on the scale. The relative position may be entered directly from the keyboard. For example, if the previous calibration points have been running about the relative value of 33, then for the next calibration point you may start by entering 33 and then using the up and down arrows for the final adjustment. If the radio cannot be adjusted for rated deviation and the relative position is at the Min or Max position, you should refer to the service manual for repair procedures.
5. Press Tab to move to the next calibration point. The calibration point number (1 to 16) will be highlighted.
6. When the calibration is complete press the F8 function key to save the new calibration value into the radio and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.

9.3.8 Calibrate Total Deviation with PL (F7)

The next screen is the CALIBRATE PL DEVIATION screen (Figure 9-15). This screen is similar to the CALIBRATE DEVIATION screen. On this screen, however, there is only one calibration point. Follow the procedure below to calibrate PL deviation:

1. Make sure the radio is turned on. Connect a deviation meter to the antenna connector of the radio. Connect the audio generator to the BNC connector on the RIB to Radio cable. Set the generator to 800 mV RMS at a frequency of 1000 Hz.
2. Key radio using the F6 key. The screen will display “TRANSMITTER ON”.
3. Using the up and down arrow keys set the radio to the rated deviation by reading the deviation meter. The relative position of the adjustment will be displayed on the scale. If the radio cannot be adjusted for rated deviation and the relative position is at the Min or Max position, you should refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display “TRANSMITTER OFF”.
5. When the calibration is complete press the F8 function key to save the calibration into the radio and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.

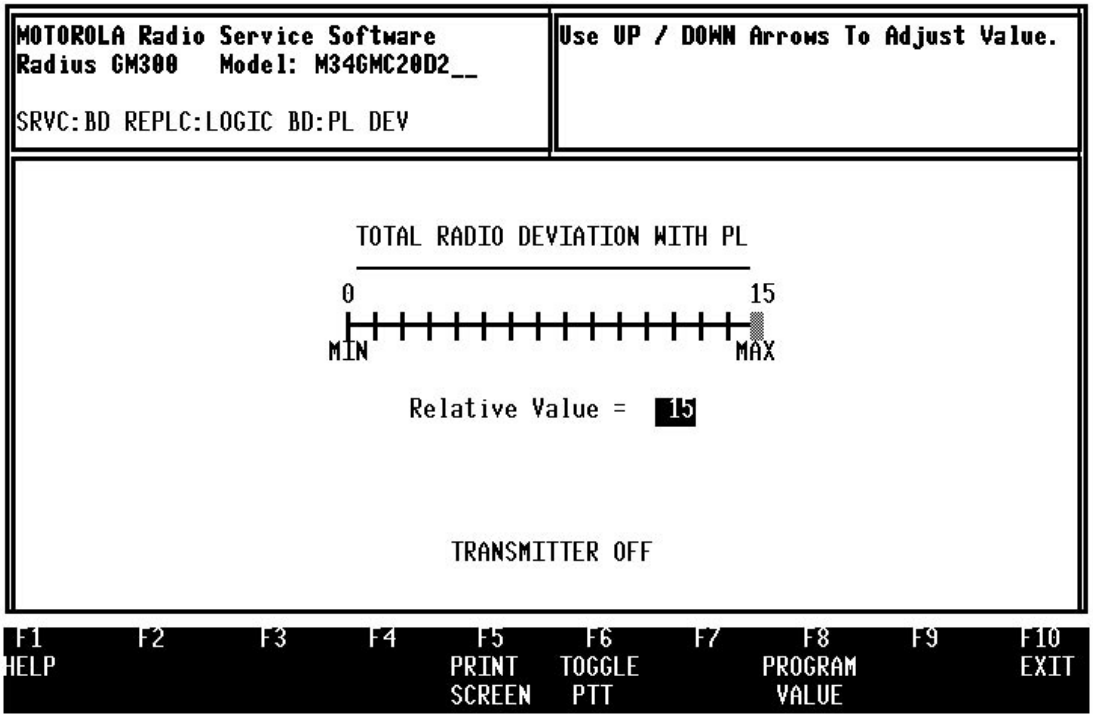


Figure 9-15. Deviation with PL Adjustment

9.3.9 Calibrate Total Deviation with DPL (F8)

The DPL CALIBRATE DEVIATION screen (Figure 9-16) is exactly the same as the PL CALIBRATE screen. Follow the procedure below to calibrate DPL deviation:

1. Make sure the radio is turned on. Connect a deviation meter to the antenna connector of the radio. Connect the audio generator to the BNC connector on the RIB to Radio cable. Set the generator to 800 mV RMS at a frequency of 1000 Hz.
2. Key radio using the F6 key. The screen will display "TRANSMITTER ON".
3. Using the up and down arrow keys set the radio to the rated deviation by reading the deviation meter. The relative position of the adjustment will be displayed on the scale. If t the radio cannot be adjusted for rated deviation and the relative position is at the Min or Max position, you should refer to the service manual for repair procedures.
4. Dekey radio using the F6 key. The screen will display "TRANSMITTER OFF".
5. When the calibration is complete press the F8 function key to save the calibration into the radio and return to the LOGIC BOARD AND RF BOARD CALIBRATION screen.
6. This completes the calibration. Press F10 to return to the BOARD REPLACEMENT MENU. It is recommended that you go to the GET/SAVE MENU to archive the personality and calibration points that have been saved in the codeplug of the radio. Remember the codeplug must be first read from the radio before saving to the disk archive file.

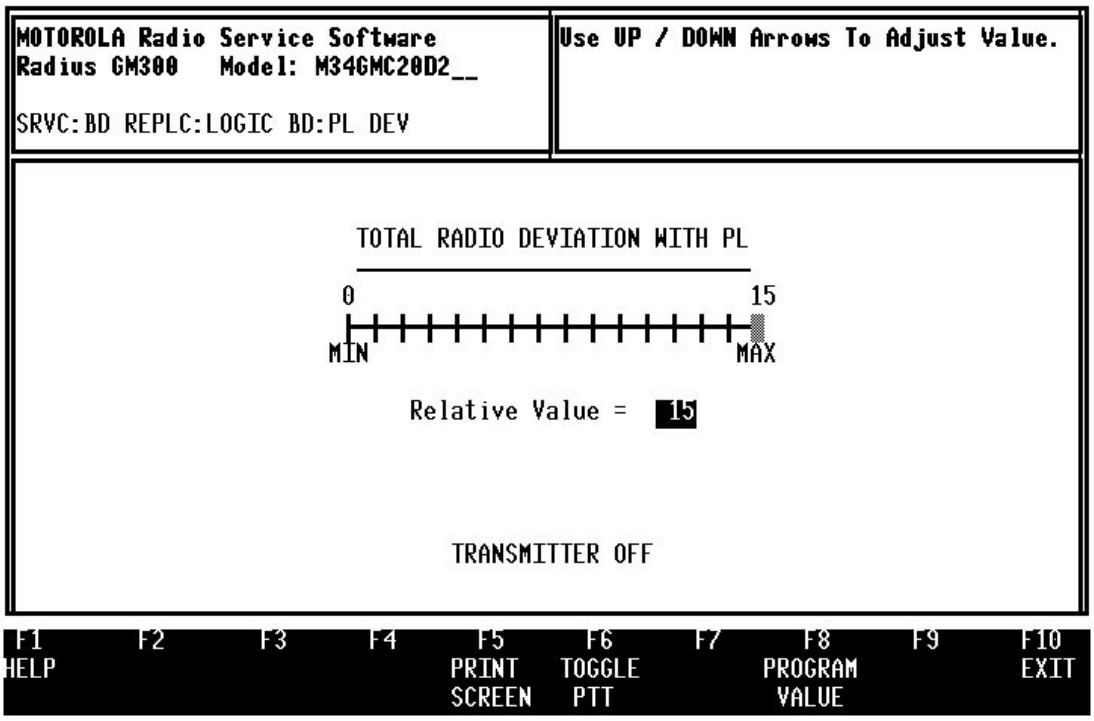


Figure 9-16. Deviation with DPL Adjustment

9.3.10 Replaced Power Amplifier Board (F4)

To calibrate the power amplifier board, first make sure that the radio is turned on, connected to the RIB and the antenna connector of the radio is connected to a RF power meter. After pressing F4, the Radio Service Software will display the TRANSMITTER POWER CALIBRATE screen (Figure 9-17). The radio has sixteen calibration points. Each point must be set to the rated power of the radio. This is accomplished in the following manner:

1. Key radio using the F6 key. The screen will display "TRANSMITTER ON".
2. Using the up and down arrow keys, set the radio to the rated power by reading the power meter. The relative position of the adjustment will be displayed on the scale. The relative position may be entered directly from the keyboard. For example, if the previous calibration points have been running about the relative value of 33, then for the next calibration point you may start by entering 33 and then using the up and down arrows for the final adjustment. If the radio cannot be adjusted for rated power and the relative position is at the Min or Max position, you should refer to the service manual for repair procedures.
3. Press Tab to move to the next calibration point. The calibration point number (1 to 16) will be highlighted.
4. Repeat steps 2 and 3 above until all sixteen points have been calibrated.
5. Dekey radio using the F6 key. The screen will display "TRANSMITTER OFF".
6. Pressing Tab or Shift-Tab will allow you to step to any desired calibration point to recheck a setting if necessary.
7. When the calibration is complete press the F8 function key to save the calibration to the radio and return to the BOARD REPLACEMENT MENU.

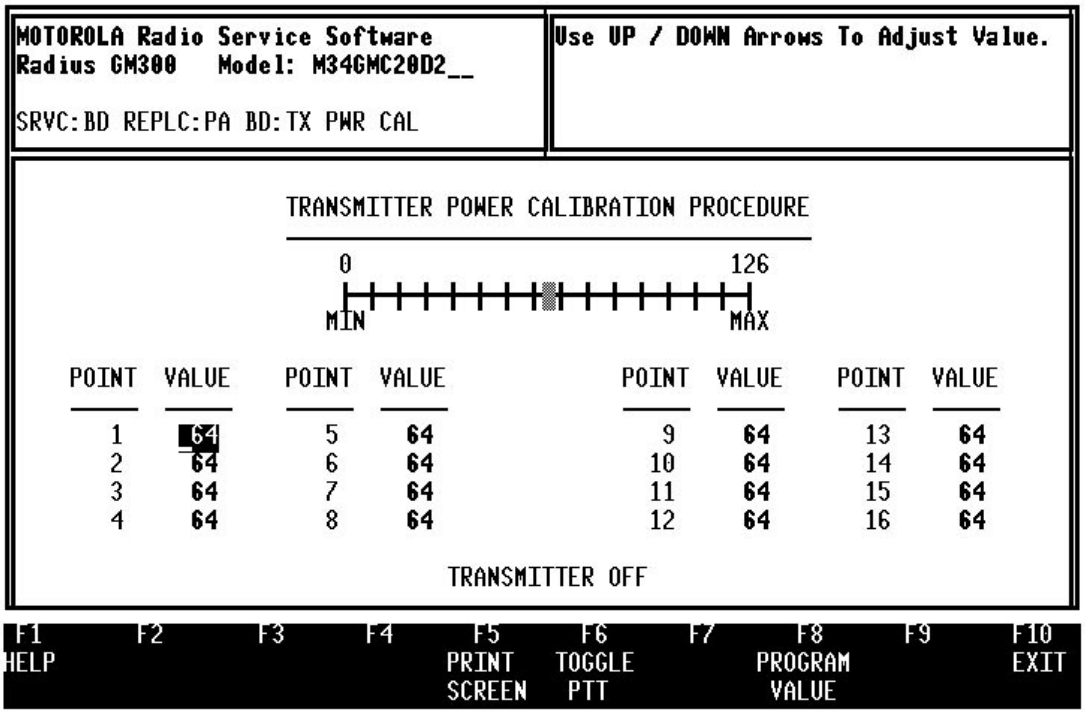


Figure 9-17. Power Calibration

10 Appendices

This section contains the following Appendices:

Appendix A: Error Code Explanations

Appendix B: Troubleshooting Problems

Appendix C: TPL/DPL Tables

Appendix D: Feature Performance Specifications

Appendix E: Timing Diagrams

Appendix F: Alert Tone Tables

Appendix G: Quik Call II Tone Tables

Appendix H: Package Description Defaults

Appendix I: Radio Personality Form

10.1 Appendix A - Error Code Explanations

For any other error codes - please contact Radius Product Support.

Table 10-1. Error Code Explanations

Code #	Problem Description	Probable Cause	Solution
1	Parity Error	1. Poor or no connection to radio. 2. Bad logic board	1. Check connections 2. Replace logic board
2	No Response after Send	1. Poor or no connection to radio 2. Poor connection to RIB 3. Bad logic board or RIB 4. Radio or RIB off	1. Check that radio and RIB are on, check their power range limits 2. Check all connections. Try a different radio or computer.
3	Innerbyte Delay Error	1. Bad logic board.	1. Replace logic board
4	Checksum Error.	1. Bad logic board 2. Codeplug data bad	1. Replace logic board 2. Use default archive file
5	No power	1. No DC power to RIB or Radio	1. Check power 2. Try other COM port
6	Multiple Collisions	1. Bad logic board	1. Try other COM port 2. Replace logic board
7	Serial Bus Error	1. Invalid opcode 2. Wrong COM port 3. Poor connections	1. Try other COM port 2. Check connections
8	Negative Acknowledge	1. Radio or RSS version Incompatible	1. Use latest version of RSS
15	Model numbers do not match	1. Radio model info does not match computer workspace model info.	1. Read connected radio then program 2. Try cloning codeplug from another radio.
20	RSS version does not match Radio Codeplug		1. Use correct RSS version for this model radio
21	Radio not supported	1. Model definition file is wrong	1. Copy ".MDF" file from original disks to MRSS\GM300
22	Blank board - radio not initialized	1. An attempt to read blank EEprom	1. Initialize logic board.
30	Serial Number mismatch Model Number mismatch Configuration Register mismatch	1. Attempting to program the codeplug with codeplug data from another radio 2. Bad logic board	1. Read connected radio, program as desired 2. Use latest RSS version
51-58	Radio Codeplug Error	1. Bad Codeplug data	1. Codeplug is corrupted - replace logic board.

10.2 Appendix B - Troubleshooting

Table 10-2. Troubleshooting Advice

Problem	Probable Cause	Possible Solution
Serial bus errors	1. No/Poor RIB power 2. No/Poor radio power 3. No/poor connection	1. If using a battery, be sure battery is good (or use power supply) - the LED can still light with a bad/weak battery
Radio has long, low tone during power-up	1. Corrupted codeplug	1. Replace radio's logic board.
RSS won't start - returns directly to DOS prompt	1. All RSS files are not in MRSS\GM300 directory.	1. Reinstall RSS on hard disk, or 2. Verify diskette contents - if any files are missing, do another diskcopy to MRSS\GM300 directory.
RSS won't start	1. Not enough RAM	1. Move or remove any unwanted memory-resident programs from RAM.
Error #5 during COM test or "radio must be connected and powered up to continue" message error while reading a radio.	1. Incompatible computer	1. Check all connections and power to radio and RIB 2. Change COM ports and try again 3. Use different computer
Deleted archive files still appear on RETRIEVE ARCHIVE FILE screen	1. Did not delete specific access to archive file. Access to archive file is through the ".DBF "file	1. Use delete function on FILE MAINTENANCE menu to delete the files
Can't retrieve archive files into RSS, and files do still exist in directory.	1. Corrupted or deleted ". DBF" file.	
Can't retrieve all archive files	1. 400 or more archive files are within one directory	1. Split archive files into multiple directories, preferably separated by model type
"Integer divide by zero on startup" error message.	1. Computer's clock speed is too fast.	1. Decrease clock speed to 8 MHz
Receive memory error messages upon startup.	1. Not enough RAM	1. Move or remove any unwanted memory-resident programs

10.3 Appendix C - TPL/DPL Tables

FREQUENCY (Hz)	MOTOROLA CODE	FREQUENCY (Hz)	MOTOROLA CODE	FREQUENCY (Hz)	MOTOROLA CODE
67.0	XZ	107.2	1B	173.8	6A
69.3	WZ	110.9	2Z	179.9	6B *
71.9	XA	114.8	2A	186.2	7Z
74.4	WA	118.8	2B *	192.8	7A
77.0	XB	123.0	3Z	203.5	M1
79.7	WB	127.3	3A	206.5	8Z
82.5	YZ	131.8	3B	210.7	M2
85.4	YA	136.5	4Z	218.1	M3
88.5	YB	141.3	4A	225.7	M4
91.5	ZZ	146.2	4B	229.1	9Z
94.8	ZA	151.4	5Z *	233.6	M5
97.4	ZB	156.7	5A	241.8	M6
100.0	1Z *	162.2	5B	250.3	M7
103.5	1A	167.9	6Z	254.1	0Z

TONE PRIVATE-LINE CODES

***** 50/60 Hz power distribution systems may 'false' open these codes

023	114	174	315	445	631
025	115	205	331	464	632
026	116	223	343	465	645 +
031	125	226	346	466	654
032	131	243	351	503	662
043	132	244	364	506	664
047	134	245	365	516	703
051	143	251	371	532	712
054	152	261	411	546	723
065	155	263	412	565	731
071	156	265	413	606	732
072	162	271	423	612	734
073	165	306	431	624	743
074	172	311	432	627	754

DIGITAL PRIVATE-LINE CODES

+ Reserve Code

10.4 Appendix D - Feature Performance Specifications

All specifications are subject to change without notice. Signalling formats are not available in all models.

Table 10-3. PL (Private Line) Decode Table

frequency range	67.0 to 254.1 Hz
sensitivity	< 8 dB SINAD
minimum deviation	400 Hz (200 Hz for 12.5 kHz systems)
bandwidth	EIA
minimum detect time	< 0.250 sec. @ 8 dB SINAD
reverse burst detect time	<0.150 sec.
falsing characteristic	< 1 in 8 hours

Table 10-4. PL (Private Line) Encode Table

frequency range	67.0 to 254.1 Hz
deviation window	500 to 1000 Hz (250 to 500 Hz for 12.5 kHz systems)
distortion	< 5%
frequency stability	< 1%
reverse burst duration	0.186 sec. ± 0.017 sec.
hum and noise (67.0 to 192.8 Hz)	30 db minimum

Table 10-5. DPL (Digital Private Line) Decode Table

sensitivity	< 8 dB SINAD
minimum deviation	400 Hz (200 Hz for 12.5 kHz systems)
bandwidth	EIA
minimum detect time	< 0.250 sec. @ 8 dB SINAD
polarity	can be inverted
turn-off code detect time	< 0.150 sec.
falsing characteristic	< 1 in 8 hours

Table 10-6. DPL (Digital Private Line) Encode Table

deviation window	500 to 1000 Hz (250 to 500 Hz for 12.5 kHz systems)
frequency stability	< 1%
polarity	can be inverted
turn-off code (TOC) duration	186 ms +/- 17 ms

All specifications are subject to change without notice. Signalling formats are not available in all models.

Table 10-7. Channel Scan Specification Table

Scan rate/channel - no carrier	15 channels/sec. typical (no activity)
priority sample rate	0.5 sec. to 4.2 sec, 0.9 sec. default (from the end of previous sample hole)
hang time	0 sec. to 4.1 sec., 2.5 sec. default
priority sample hole:	
no carrier	0.1 sec.
incorrect PL on priority channel	0.265 sec. to reject wrong PL > ±5 Hz 0.4 sec. to reject wrong DPL or adjacent PL
incorrect DPL on priority	0.4 sec.

Table 10-8. MDC-1200 General Specification Table

message length	0.173 sec. PTT ID
calling features	PTT ID, Call Alert, Voice Selcall, Radio Check (group and individual calls, acknowledges)
number of available IDs	approx. 65,000

Table 10-9. MDC-1200 Decode Specification Table

sensitivity for MER < 1% (static)	+0 dB above 12 dB SINAD
EIA 20% MER sensitivity (static)	-2 dB above 12 dB SINAD
EIA fading degradation @ 20% MER	<5 dB
noise/voice falsing	virtually none
acceptable deviation	1.6 to 4.0 kHz
pre-emphasis characteristics	sent flat

Table 10-10. MDC-1200 Encode Specification Table

sidetone	optional
deviation window	3.5 kHz ±300 Hz (1.8kHz for 12.5 kHz systems)
pre-emphasis characteristic	sent flat
DOS (data operated squelch) detect time @ 12 dB SINAD	< 75 ms for 95% probability
voice falsing	< 1 in 4 days of continuous voice

All specifications are subject to change without notice. Signalling formats are not available in all models.

Table 10-11. Quik Call II General Specification Table

message length	1 sec/3 sec individual 8 sec group call
call formats	A-B, A-B/A-C, C-B/C-B, A-B/Long B, A-B/Long C, A-B/A-C/Long C, A-B/Long B/Long C, A-B/A-C/Long B/Long C
calling features	Call Alert, Voice Selcall
number of available IDs	Depends upon format, tone frequencies 288.5 to 2470 Hz

Table 10-12. Quik Call II Decode Specification Table

EIA 20% MER sensitivity (static)	8 dB SINAD
EIA fading degradation @ 20% MER	10 dB degradation
adjacent code falsing	<1:10,000
acceptance bandwidth	±0.5%
minimum deviation (3 KHz nominal)	3 kHz ±300 Hz
minimum detect time	1 sec./3 sec. individual 8 sec group

Table 10-13. DTMF General Specification Table

message length	0.1 sec. to 10 sec.
calling features	PTT ID, Call Alert, Voice Selcall
Number of available IDs	>10,000 1 to 8 digits including characters 0 to 9, *, *, A, B, D

Table 10-14. DTMF Encode Specification Table

sidetone	optional
Frequency Stability	± 0.17%
total harmonic distortion	better than -21 dB
tone duration	programmable 0.05 sec. to 4 sec.
inter-digit gap	programmable 0.05 sec. to 4 sec.
deviation window	2.5 kHz ±300 Hz
Tx twist limits	0 to +4 dB measured at a point beyond the receiver de-emphasis

10.5 Appendix E - Timing Diagrams

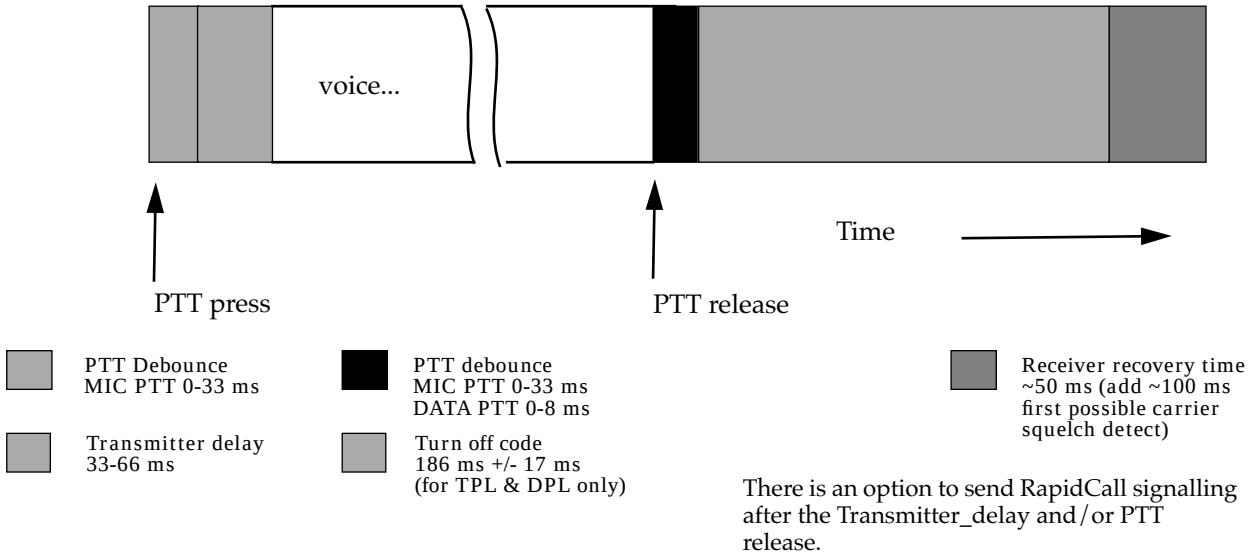


Figure 10-1. Transmit/Receive Timing

All specifications are subject to change without notice

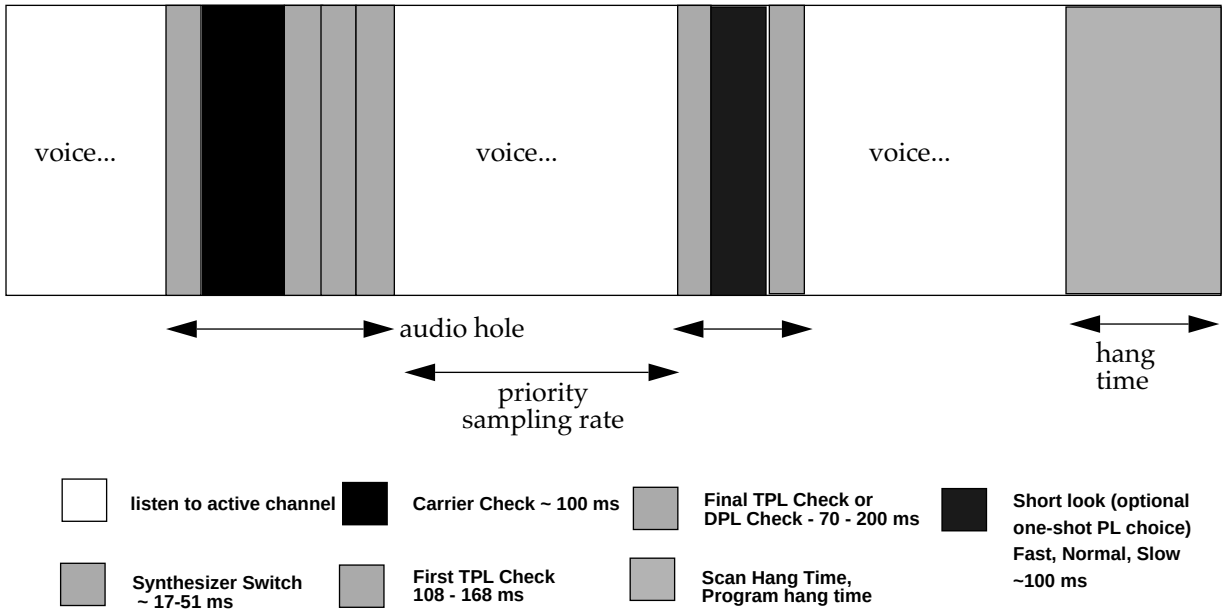


Figure 10-2. Transmit/Receive Timing

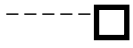
Table 10-15. Typical Audio Hole Sizes (ms) vs. Priority Activity

speed	no activity	'far away' PL	'close by' PL	incorrect DPL
fast	100	268	337	337
normal	120	268	404	404
slow	160	268	470	470

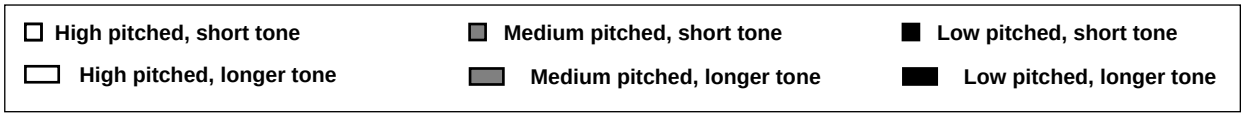
All specifications are subject to change without notice

10.6 Appendix F - Alert Tone Tables

Table 10-16. Alert Tone Names

Tone Name	Tone Code	Description
Powerup/Radio Self Test OK		High-pitched tone when radio is first turned on.
Codeplug Failure		High pitched tone followed by 10-sec low pitched tone.
Radio Code Corrupted		Low continuous tone following powerup tone.
Button Entry Accepted		High-pitched key chirp.
Button Entry Not Accepted		Low-pitched key chirp.
Talk Prohibit		Low continuous tone while holding PTT.
Busy Channel		Repeating low-pitched tones while holding PTT.
Time Out Timer		Low continuous tone while holding PTT upon timeout.
PTT Sidetone		Medium-pitch in transmit while data is sent.
PTT Short Sidetone		High-pitched beep at end of data transmission (after PTT sidetone).
Voice SelCall Decode		2 medium-pitched tones.
Call Alert Decode		4 medium-pitched tones.

Tone Code Key



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10.7 Appendix G - Quik Call II Tone Tables

FIRST DIGIT OF CAP CODE	TONE GROUP FOR TONE a	TONE GROUP FOR TONE B
1	1	1
2	2	2
3	1	2
4	4	4
5	5	5
6	2	1
7	4	5
8	5	4
9	2	4
0	4	2
A	3	3

General Encoding Plan

TONE NO.	A SERIES		B SERIES		Z SERIES	
	REED	FREQ	REED	FREQ	REED	FREQ
1	DA	398.1	DB	412.1	DZ	384.6
2	EA	441.6	EB	457.1	EZ	426.6
3	FA	489.8	FB	507.0	FZ	473.2
4	GA	543.3	GB	562.3	GZ	524.8
5	HA	602.6	HB	623.7	HZ	582.1
6	JA	668.3	JB	691.8	JZ	645.7
7	KA	741.3	KB	767.4	KZ	716.7
8	LA	822.2	LB	851.1	LZ	794.3
9	MA	912.0	MB	944.1	MZ	881.0
0	CA	358.9	CB	371.5	CZ	346.7

"Quik Call" Tones
Code Type "Y" Tone Groups

TONE NO	TONE GROUP 1		TONE GROUP 2		TONE GROUP 3		TONE GROUP 4		TONE GROUP 5		TONE GROUP 6		TONE GROUP 10		TONE GROUP 11	
	CODE	FREQ	CODE	FREQ	CODE	FREQ	CODE	FREQ	CODE	FREQ	CODE	FREQ	CODE	FREQ	CODE	FREQ
1	111	349.0	121	600.9	138	288.5	141	339.6	151	584.8	191	1153.4	170	1427.9	200*	1930.2
2	112	368.5	122	634.5	106	296.5	142	358.6	152	617.4	192	1185.2	171	1513.5	201*	1969.0
3	113	389.0	123	669.9	139	304.7	143	378.6	153	651.9	193	1217.8	172	1555.2	202*	2043.8
4	114	410.8	124	707.3	109	313.0	144	399.8	154	688.3	194	1251.4	173	1598.0	203*	2094.5
5	115	433.7	125	746.8	160	953.7	145	422.1	155	726.8	195	1285.8	174	1642.0	204*	2155.6
6	116	457.9	126	788.5	130	979.9	146	445.7	156	767.4	196	1321.2	175	1687.2	205*	2212.2
7	117	483.5	127	832.5	161	1006.9	147	470.5	157	810.2	197	1357.6	176*	1733.7	206	2271.7
8	118	510.5	128	879.0	131	1034.7	148	496.8	158	855.5	198	1395.0	177*	1781.5	207	2334.6
9	119	539.0	129	928.1	162	1063.2	149	524.6	159	903.2	199	1433.4	178*	1830.5	208	2401.0
0	110	330.5	120	569.1	189	1092.4	140	321.7	150	553.9	190	1122.5	179*	1881.0	209	2468.2

*Second or Third Digit of Cap Code

Tone Groups

CAP CODE 1ST DIGIT	TYPE/tone B		C		D		E		F		G		H		J		K		L		M		N		P		Q		R		S		T		U		V		W		Y	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	3	2	3	2	4	2	4	2	5	3	4	3	4	3	5	4	6	A	A
2	2	2	2	2	2	2	2	2	1	3	1	3	1	3	1	4	1	4	1	5	2	2	2	2	2	2	2	2	2	2	2	2	4	3	4	3	5	3	6	4	B	B
3	3	3	1	2	1	2	1	2	3	3	3	3	3	3	4	1	4	1	5	1	3	3	3	3	3	3	4	2	4	2	5	2	3	3	3	3	3	3	5	6	Z	Z
4	1	2	4	4	1	5	2	1	4	4	3	1	3	1	4	4	4	4	1	6	4	4	3	2	3	2	4	4	4	4	2	6	4	4	4	4	3	6	4	4	A	B
5	1	3	1	4	5	5	1	6	3	1	5	5	1	6	5	5	1	6	5	5	3	2	5	5	2	6	5	5	2	6	5	5	5	5	3	6	5	5	5	5	A	Z
6	2	1	2	1	2	1	6	6	1	4	1	5	6	6	1	5	6	6	6	6	2	4	2	5	6	6	2	5	6	6	6	6	3	5	6	6	6	6	6	6	B	A
7	3	1	4	1	5	1	6	1	4	1	5	1	6	1	4	5	6	1	6	5	4	2	5	2	6	2	4	5	6	2	6	2	4	5	6	3	6	3	4	5	Z	A
8	2	3	2	4	2	5	2	6	3	4	3	5	3	6	5	4	4	6	5	6	3	4	3	5	3	6	5	4	4	6	5	6	6	4	4	6	5	6	5	4	B	Z
9	3	2	4	2	5	2	6	2	4	3	5	3	6	3	5	1	6	1	6	5	4	3	5	3	6	3	5	2	6	4	6	5	5	3	6	4	6	5	6	5	Z	B
0	2	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	4	2	4	2	x	x	x	x	4	2	4	2	4	2	4	2	4	2	4	2	x	x

Code Plan Table

AP

10.8 Appendix H - Accessory Package Defaults

Table 10-17. Public Address without DTMF Internal Accessory

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Null	Input	No	Low
8	Null	Input	No	Low
9	Emergency Switch	Input	Yes	High
12	Null	Input	No	Low
14	PA Switch	Input	Yes	Low

Table 10-18. Public Address with DTMF Internal Accessory

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Data Ready	Input	No	Low
8	Data Clock Out	Output	No	Low
9	Emergency Switch	Input	Yes	High
12	DTMF Data	Input	No	Low
14	PA Switch	Input	Yes	Low

Table 10-19. Remote without DTMF

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Null	Input	No	Low
8	Null	Input	No	Low
9	Emergency Switch	Input	Yes	High
12	Null	Input	No	Low
14	I/O Mic Off Hook	Input	Yes	Low

Table 10-20. Remote with DTMF

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Data Ready	Input	No	Low
8	Data Clock Out	Output	No	Low
9	Emergency Switch	Input	Yes	High
12	DTMF Data	Input	No	Low
14	Mic Off Hook	Input	Yes	Low

Table 10-21. General I/O without DTMF

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Null1	Input	No	Low
8	Null1	Input	No	Low
9	Emergency Switch	Input	Yes	High
12	Null1	Input	No	Low
14	Null1	Input	No	Low

Table 10-22. General I/O with DTMF

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Data Ready	Input	No	Low
8	Data Clock Out	Output	No	Low
9	Emergency Switch	Input	Yes	High
12	DTMF Data	Input	No	Low
14	Null1	Input	No	Low

Table 10-23. Phone Patch

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Tx PL Inhibit	Input	No	Low
8	PL/DPL & CSQ Det	Output	No	Low
9	Emergency Switch	Input	Yes	High
12	Patch Inhibit	Output	No	Low
14	CSQ Detect	Output	No	Low

Table 10-24. Paging Encoder

Pin	Function	Data Direction	Debounce	Active Level
4	External Alarm	Output	No	High
6	Page PTT	Input	No	Low

Table 10-24. Paging Encoder

Pin	Function	Data Direction	Debounce	Active Level
8	Tx Audio Mute	Input	No	Low
9	Emergency Switch	Input	Yes	High
12	Tx PL Inhibit	Input	No	Low
14	Null1	Input	No	Low

Table 10-25. RPB50 Interface

Pin	Function	Data Direction	Debounce	Active Level
4	Null2	Output	No	Low
6	Tx PL Inhibit	Input	No	Low
8	Null1	Input	No	Low
9	Null1	Input	No	Low
12	CSQ Detect	Output	No	Low
14	Mic Off Hook	Input	Yes	High

10.9 Appendix I - Radio Personality Form

RADIO PERSONALITY FORM

Customer Name _____ Radius Model # _____

Phone _____ Radius Serial # _____

Address _____ File Location _____

_____ Date Programmed _____

_____ Date 1st Update _____

Type of business _____ Date 2nd Update _____

CHANNEL/MODE PROGRAMMING ***(check any that apply - use different color or mark for updates)***

Feature Name	Radio Wide	Mode 1 #____	Mode 2 #____	Mode 3 #____	Mode 4 #____	Mode 5 #____	Mode 6 #____	Mode 7 #____	Mode 8 #____	Mode 9 #____	Mode 10 #____	Mode 11 #____	Mode 12 #____	Mode 13 #____	Mode 14 #____	Mode 15 #____	Mode 16 #____

KEY: ✔ ***= original personality*** ✚ ***= feature added,1st update*** ✚✚ **= feature added, 2nd update** ■ **= feature removed**

ALIGNMENT AND CALIBRATION

Alignment function name _____ set to _____ on _____

Alignment function name _____ set to _____ on _____

Alignment function name _____ set to _____ on _____

Calibration function name _____ set to _____ on _____

Calibration function name _____ set to _____ on _____

Calibration function name _____ set to _____ on _____

SERVICING

Date Serviced _____ By Whom _____

Problem _____ Solution _____

_____ _____

_____ _____

11 Glossary

- **=**
  equals; a logically “True” statement.

- **< >**
  not equal; a logically “False” statement.

- **Active channel**
  A channel upon which the radio is receiving or transmitting a signal.

- **Adjustment**
  A means of tuning the radio to a specified value.

- **Antenna connector**
  The Mini-UHF RF coax connector located on the rear of the radio for connecting the antenna to the radio.

- **Archive file**
  A computer disk or diskette file that contains the personality data of a radio. Archive files are stored by radio serial numbers.

- **Archive file cloning**
  The procedure of merging the data from two codeplugs to pass on customer personalities quickly from one radio to another.

- **Arrow keys**
  The keyboard keys with left, right, up or down arrows on them which move the cursor within a field or increment/decrement/scroll data with a field.

- **Asynchronous Communications**
  A method of data communications 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 bit(s)

- **Backup file**

  A duplicate copy of the archive file that is used in event that the original archive file becomes damaged, lost or erased.

- **Blank frequency**

  A channel that is not assigned a transmit frequency.

- **Blank PL code**

  A channel that is not assigned a receive or transmit PL code.

- **BNC Quick connect**

  RF coax connector used in a service shop.

- **Busy Channel Lockout (BCL)**

  A feature on conventional modes that gives 'listening privacy'. The radio will not key when there is a carrier on channel unless it is your PL/DPL Group. Instead, you will hear a busy tone while PTT is held. Also, you will not be allowed to monitor the channel. If all users that share the channel have BCL enabled, then the users have a privacy similar to what a trunked radio system provides.

- **CA**

  Call Alert.

- **Calibration**

  The means of teaching the radio how to adjust itself for optimum performance.

- **Call Alert**

  A RapidCall 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 Call Alert or Voice Selcall call is cleared.

- **Call Light**

  A visual indicator (yellow MON LED) that flashes when a Call Alert or Voice SelCall is received.

- **Call list**

  A list of IDs from one or more signalling formats used to send a message to individual or groups.

- **Carrier**

  A term that represents any channel activity.

- **Carrier Squelch**

  A transmit or receive squelch code selection that enables the radio to transmit or receive audio with no subaudible data message.

- **CH**
  Radio check.

- **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. RSS refers to this as a mode.

- **Cloning**
  Radio Service Software function which allows quick duplication programming of a radio codeplug data to many radios. The electronic tuning/alignment information (Unit ID) is the only data not copied.

- **Codeplug**
  The solid state chip inside a radio where the radio personality data is located and used by the radio in its operation.

- **COM1/COM2**
  Computer serial port1/port2. See "Port".

- **Communications port**
  See "Port".

- **CSQ**
  Carrier Squelch.

- **CTCSS**
  Continuous Tone Coded Squelch System.

  A generic term for subaudible tone/code used to create communications groups. Also see "PL".

- **Cursor**
  A marker on the computer display that represents the place where input from the keyboard will appear when the keys are pressed, thus marking the current location. Cursors can appear alone, or sometimes follow a "prompt". A flashing underscore cursor "_" typically follows the DOS prompt of "C:".

- **Data Entry Screen**
  Formatted display with highlighted fields for entering data/parameters.

- **Default**
  Standard data or parameter values.

❑ **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 value a field will automatically contain if a user does not specifically change it.

❑ **Directory**

A location for a group of files on a disk or diskette which are similar in content.

❑ **Disk Drive**

A device that reads and writes information to and from a permanent magnetic storage medium; i.e., diskettes or hard disks.

❑ **Diskette**

An alterable, semi-flexible, magnetic storage medium used by microcomputers to store data and files. Also called a disk, floppy, floppy disk or mini diskette. The RSS is delivered on diskettes.

❑ **Diskette Drive**

A disk drive that uses removable magnetic diskettes. Service Software, Archive and Backup files are stored on these diskettes.

❑ **Display**

(a) The CRT terminal that the computer displays information on.

(b) The LED or LCD indicators on the radio.

❑ **DOS**

(a) Disk Operating System. The computer disk operating system.

(b) MDC-1200 term meaning “Data Operated Squelch.”, automatic speaker muting when data is received.

❑ **DPL**

Digital Private Line‘Coded Squelch. Also known as Digital Channel Guard, Digital Quiet Call, and DCTCSS. Digital Private-Line coded squelch - a continuous sub-audible data signal that is transmitted along with a carrier. A radio that has DPL on the receive frequency will require both the presence of carrier and the correct DPL code before it will unmute. Also, if there is DPL on the transmit frequency, the DPL code during transmissions made on that channel will be continuous.

❑ **DTMF**

Dual-Tone Multi-Frequency

- **DVM**
  Digital Volt Meter.

- **EE**
  Abbreviation for “Emergency” when it appears on the radio's display.

- **EEPROM**
  Electronically Erasable Programmable Read Only Memory. Used by the radio microcomputer system to store the radio's codeplug data.

- **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.

- **Enter**
  A keyboard key which moves the prompt to the next data entry field. A synonym for the Return or Tab keys.

- **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 choices**
  A set of scrollable or direct-entry values 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's disk or diskette that can be read by a computer.If a file is “executable” (a.EXE at the end of the file name) it is sometimes called a command or a program. Also see “Archive file”.

- **Field**
  The place on an RSS screen where a feature's current value (and available choices) is displayed (and can be edited). A highlighted (inverse video) area on a menu or screen represents the current field.

- **Fixed disk**
  See “Hard Disk”.

❑ **Floppy Disk**

See “Diskette”.

❑ **Frequency**

(a) The location of the center of a channel of operating in the radio spectrum (measured in MHz).

(b) A computer speed.

❑ **Function Keys**

The keys at the left or the top of the keyboard labelled F1 - F10. The RSS uses these keys for moving through the RSS and executing specified functions.

❑ **Function Keys**

The ten (or twelve) keys located on the PC keyboard that are labeled F1 to F10 (or F1 to 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”.

❑ **Group**

A collection of radios which communicate together is a Group.

❑ **Hz**

Hertz.

❑ **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 50 million pieces of data, compared to approximately 400 thousand to one million pieces for a diskette.

❑ **Hard Disk Drive**

A disk drive that uses a solid non-removable magnetic disk. Service Software, Archive and Backup files are stored on these diskettes.

❑ **Hardware**

Physical kits of PC boards, solid state devices, and interconnect cabling.

❑ **Help**

An on-line reference source about the RSS, accessed via the F1 Function Key.

❑ **Highlighting**

Displaying text on the display by using dark letters on a light background.

- **Home channel**
  The channel the user was on prior to pushing the scan button.

- **Home Revert**
  The channel the user will revert to when PTT is pressed while in scan unless scan talkback feature is enabled. Defines the transmit channel requirement for a feature. Typically it refers to scan mode operation.

- **Key**
  (a) A button on the computer's keyboard. See" Function keys".

  (b) The action of turning the transmitter to the on position.

- **kHz**
  Kilohertz.

- **Log onto**
  The process of turning on and booting the computer system.

- **Logic Board**
  The circuit board within the radio that contains the embedded microprocessor, other logic-related components.

- **MDC-1200**
  A Motorola proprietary signalling format. It is a binary format using 1200 baud minimum shift keying modulation.

- **Memory dialer**
  A DTMF phone number dialer that provides up to 16 numbers with up to sixteen DTMF digits in each number.

- **Menu**
  A menu contains a list of functions that can be selected and performed by the RSS user by pressing a function key. A menu contains four rectangular areas, one of which (the working area) contains a list of functions. Also see "Screen".

- **Microcomputer**
  A personal computer that contains a keyboard, a monitor, and a system unit used to program features into and control the functioning of the radio.

- **MHz**
  Megahertz.

❑ **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. Often used in place of the term ‘channel' in the RSS manual.

❑ **Mode name**

A programmable, two-digit number used to identify a radio's mode, and displayed on the front panel of the radio. Personality values are in effect for the mode displayed.

❑ **Mode number**

The number assigned in the mode's Name field.

❑ **Mode-slaved**

Describes features that are associated with a particular mode.

❑ **Mode-slaved scan**

A scan type that uses a scan list associated with a particular mode.

❑ **Mode-slaved scan list**

A scan list that is associated with one and only one mode.

❑ **Monitor**

(a) The computer unit containing the display.

(b) A latched state of the radio operation in which the radio receives all signals (CSQ Receiving).

❑ **MS-DOS**

MicroSoft Disk Operating System. The operating system used by IBM compatible computers.

❑ **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 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\GP300\ARCHIVE shows the hierarchy or ordering of directories the computer must descend to reach a file located under the ARCHIVE directory.

❑ **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.

- **PL Private Line Coded Squelch.**

  A subaudible tone/code used to create communications groups. Generic term is CTCSS (Continuous Tone Coded Squelch System). Sometimes a generic term used when referring to both TPL and DPL.

- **PL code**

  A 2-digit alphanumeric code for specific subaudible tones.

- **Pop-up Window**

  A message area which overlaps on a data entry/display area; used to indicate non-data entry error or to verify destructive commands and provide function key choices for next course of action. Also known in the computer industry as a 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, COM4.

- **Priority channel**

  A channel that is deemed more important to the radio operator than any other. The radio is required to always unmute on activity there even though receiving activity on another channel during priority scan.

- **Priority sample rate**

  The rate in which the priority channel is checked in priority scan for activity.

- **Private Line**

  See “DPL” and “PL”.

- **Program**

  (a) A set of computer instructions designed to have the computer perform a specific sequence of actions.

  (b) The transfer of information from the computer's temporary memory (RAM) to the radio codeplug (EEPROM).

- **Prompt**

  A consistent marker, word, or group of words on the computer's display that indicates the current position on the display where data or commands will be input by the keyboard - a visual book or place marker. The RSS prompt is a bright rectangle. The DOS prompt typically is the drive name, followed by a “greater-than” sign (>). A flashing underscore (cursor) typically follows the DOS prompt. Also see “Cursor”.

- **PTT**

  Push-To-Talk feature or button.

- **PTT ID**

  Push-To-Talk IDentification. A RapidCall feature that sends your radio's identification number on each transmission.

- **Quik Call II**

  A two-tone sequential tone signalling system.

- **Radio Check**

  A RapidCall signalling feature that lets your radio to be “polled” to see if it is turned on and in range. The user receives no indication of the poll, except perhaps a brief lighting of the transmit or busy light.

- **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” 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 storage space used by the computer to temporarily run a program. Anything stored in RAM is lost when the computer is turned off.

- **RapidCall**

  A method of signalling designed by Motorola Radius. The signalling formats may include both industry standard and proprietary formats, but utilizes common ergonomics and features for each.

- **Read**

  The transfer of information from the radio codeplug to the computer's temporary memory (RAM) via the RIB communication link. Also see “Get”.

- **Receive frequency**

  The center of the receive channel in MHz.

- **Restore**

  File management function which allows copying from one computer file to another existing file (i.e., from backup to working copy).

- **Return**

  A keyboard key which moves the prompt to the next data entry field. A synonym for the Enter or Tab keys.

- **RIC**
  Radio Interface Cable

- **R.I.C.K.**
  Repeater Interface Communications Kit. An accessory that forms a radio repeater from two mobile radios.

- **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 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.

- **RMS**
  Root Mean Square. Unit of amplitude measure for AC waveforms.

- **Root**
  The highest or topmost directory level of a computer disk or diskette.

- **RSS**
  Radio Service Software.

- **Rx**
  Receiver

- **Save**
  The action of transferring information from computer's RAM to the radio's codeplug or an archive file on a disk or diskette.

- **SC**
  SelCall.

- **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 till 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 perform specific functions via the radio. See “Rapid-Call”.

- **Software**

  A set of instructions that tells the computer what to do. Also see “Program”.

- **Squelch**

  A radio circuit which eliminates noise from the loudspeaker when a received signal is not present.

- **STAR**

  A tone signalling system by General Electric.

- **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. Identical to the Enter or Return key.

- **Talkaround frequency**

  A frequency used for simplex conversations or radio to radio communications without the use of a repeater.

- **Talkback**

  Indicates that a call can be answered by pressing PTT and responding.

- **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**

  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.

- **TOT**

  Time Out Timer

- **TPL**

  Tone Private Line Squelch'. The Private Line Squelch that uses sub-audible tones to unmute the receiver. Also known as Channel Guard, Quiet Call, CTCSS.

- **Transmit deviation alignment**

  An electronic method of adjusting the modulation of the transmitter to a constant value across the operating frequency range.

- **Transmit frequency**

  The center of the transmit channel in MHz.

- **Transmit power alignment**

  An electronic method of adjusting the power output of the transmitter to a constant value across the operating frequency range.

- **Tree**

  A way to describe the organization of the Radio Service Software. The MAIN Menu is considered the trunk and the functions listed on the menu are considered branches.

- **Tx**

  Transmit

- **Unit ID**

  The electronic tuning/alignment information of a particular radio.

- **User-scan**

  Scan type which is programmable through the front panel buttons on the radio.

- **Voice Selcall**

  A RapidCall signalling feature that allows your radio to be called selectively or as part of a small group. The speaker will only open when your ID is sent using RapidCall signalling. The call leaves no persisting visual nor audible indication.

GL

RADIUS 2-WAY RADIO SURVEY

Are you a: ❑ 1st-time RSS user ❑ Occasional RSS user ❑ Frequent RSS user

Are you a: ❑ Radius dealer ❑ Dealer employee ❑ Radio servicer ❑ Shop owner
❑ Secretary/clerk ❑ Technician ❑ Part-timer
❑ Other _____

What's your computer knowledge/comfort level?

❑ No computer knowledge ❑ Beginner ❑ Intermediate ❑ Advanced

Do you use Microsoft Windows? ❑ Yes ❑ No

What version of DOS do you use? _____

How much RAM (memory) does your computer have? _____

What type(s) of computer do you have (check all that apply):

❑ XT-type ❑ AT-type ❑ Laptop ❑ Macintosh
❑ 286-based ❑ 386-based ❑ 486-based ❑ Hard disk-_____MB
❑ 3.5" floppy ❑ 5.25" floppy ❑ No hard disk

What brand name and model number computer do you use? _____

Did your subscription/revision arrive in good shape? ❑ Yes ❑ No
If not, what was wrong? _____

Check which sections of this manual you have read:

❑ Introduction ❑ Getting Started ❑ Tutorials ❑ Basic Features ❑ Scanning Features
❑ RSS Functions ❑ Menu & Screen ❑ Servicing Features ❑ Accessory Connector

Were you able to find the information you wanted quickly and easily? ❑ Yes ❑ No

What best describes the tone of this manual?

❑ Friendly ❑ Technical ❑ Formal ❑ Other _____
Comments _____

Was the presentation of material and concepts covered:

❑ Too easy ❑ Too complex ❑ Too Slow ❑ Builds well ❑ Just right

What's your most common problem with the RSS program?

_____

_____

_____

Did the manual address this problem? ❑ Yes ❑ No

Comments: _____

_____

Is this manual helpful for quick-reference purposes? ❑ Yes ❑ No

Why or why not? _____

_____

What part of the manual did you like best? _____

What part of the manual did you like least? _____

How does this manual compare with our competitor's manuals?

❑ Excellent ❑ Good ❑ Fair ❑ Poor

(over)

RADIUS 2-WAY RADIO SURVEY

What real-life examples would you like to see covered in an Application Manual? _____

_____

_____

_____

_____

_____

_____

_____

_____

fold here

What do you still need help with? _____

Your name: _____

Business _____

Address: _____

_____

_____

Your phone: _____

fold here

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