GE Mobile Communications
PC Programming

TMX™-8712

For
IBM PC/XT
Or True PC Compatible

Programming Guide

PERSONAL COMPUTER PROGRAMMING
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CHAPTER 1
PREPARATION

INTRODUCTION

This manual is designed to introduce you to the programmable features of the **TMX™ 8712** mobile radio and guide you through the steps of programming a radio. These instructions will help you prepare and document the information required to program a selected "personality" (a set of radio characteristics) into the **TMX 8712** and will provide answers to your questions on program directions.

The manual is organized to support you in programming a **TMX 8712** radio, whether you are a first-time user of PC programming or an technician experienced in programming other GE radios. In each of three Chapters, the manual will:

1) Describe the steps required to configure your computer with the **TMX 8712** Programmer and install the Programmer software (Chapter 1).

2) Provide a description of the program software and user interface commands (Chapter 2).

3) Guide you through a procedure for organizing the data required for programming and the basic programming process itself (Chapter 3).

If you are familiar with the procedures for configuring and installing GE PC Programmers, you can simply review the highlights of Chapter 1 and begin with Chapter 2. Although the structure of the TMX 8712 program is similar to that of other GE PC Programmers, there are differences in the Screens. We recommend that you spend time studying the Screen Definitions in Chapter 2 before proceeding to program a radio. Once you are familiar with the program, Chapter 3 guides you step-by-step through the programming process.

CHAPTER PREVIEW

In this chapter, you will be introduced to the steps required to: 1) prepare and configure your computer for the **TMX 8712** programmer; 2) install the software; 3) set up the radio for programming; and 4) start up the **TMX 8712** program.

PC PROGRAMMING REQUIREMENTS

The following hardware and software is required to program the **TMX 8712** radio:

A. IBM PC/XT/AT or any true compatible with MS-DOS, version 3.1 or later, with the following minimum configuration:

1. Two Disk Drives, either dual flexible (floppy) or a single floppy and a fixed (hard) disk drive system.

2. 640K Internal RAM.

3. Serial Port.

4. Parallel Port (recommended) for connection of a printer.

B. Serial Programming Interface Module and RS-232 Cable (Part of TQ-3310).

C. GE Mobile Radio Programming Cable (TQ-3314).

D. TMX 8712 Programming Software (TQ-3326).

E. Printer (optional, but recommended).

We recommend that you have a printer as one of your output devices, but emphasize that it is not required for the **TMX 8712** PC Programming Software to successfully operate.

BEFORE YOU BEGIN

Software Configuration

The **TMX 8712** PC Programming Software is provided on two double-sided, double-density, 5.25 inch floppy diskettes. One is labeled "**Program**" and the other is labeled "**Setup & Helps**" If you have purchased the PC Programming Software on a 3.5 inch diskette, it will be provided on one double sided, double density 3.5 inch diskette. The "**Program**" and "**Help**" information is on the 3.5 inch diskette. These diskettes are fragile and should be handled with care and stored in a secure area.

The **TMX 8712** PC Programming software may be run off the floppy diskettes or may be copied onto a hard disk. If this is desired refer to **APPENDIX A.**

Diskette Handling

While working with your diskettes consider the following handling procedures:

A. Always store your diskettes in their envelopes.

B. Insert diskettes into the drive carefully.

C. Use only felt tipped pens to write on diskette labels.

D. Store your diskettes at room temperature.

E. Refrain from touching the recording surface.

F. Do not bend the diskettes.

G. Do not allow liquid to come in contact with the diskettes.

H. Keep diskettes away from magnetic fields found around electronic equipment.

If you follow these simple guidelines you will receive long service from your diskette.

Making Backup Disks

We recommend that a backup copy be made of the original diskettes. This ensures the availability of an accurate program should a copy fail during PC Programming Software applications.

Put write-protect tabs on the original disks to prevent their accidental erasure.

Insert one TMX 8712 PC Programming software disk into the A: drive of your computer. This is the source disk. Type:

Diskcopy A: B: <Enter>

Insert a blank, formatted disk into disk drive B:. This is the target disk. If you only have one floppy disk drive, it will function as both A: and B: drives.

Follow the instructions as they appear on the screen. Repeat this procedure with the second disk if your are using 5.25 inch diskettes.

Computer Equipment Assembly

Connect all peripheral equipment prior to configuring the PC Programming Software items. Remember to refer to the operating manuals of each device for correct installation procedures.

PROGRAMMER CONFIGURATION

TMX 8712 Programmer Equipment Interface Configuration

To configure the **TMX 8712** PC Programming Interface Equipment, follow the diagram in Figure 1. First, locate a serial port on your computer. This port is normally located on the rear of the computer (refer to your computer's operator's manual for directions).

The IBM PC/XT/AT systems support up to two serial ports. There are two physical standards for the serial port configurations of personal computers. The most common is the 25 pin RS-232 output that has a DB-25 male connector at the computer. The other standard is a DB-9 male connector at the computer (used on the IBM-AT and many portable laptop computers). The TMX 8712 Programming Interface Module, like most data communications equipment, uses a standard RS-232, DB-25, female connector. If your computer uses a DB-9 connector, you will need to purchase a DB-9/DB-25 interface cable from a computer dealer.

The PC Programming Software only communicates with the radio and its interface on the serial ports designated **COM1** or **COM2.** Your computer references will assist you in determining which serial port has been so designated. Once located, examine the keyed plug on the RS-232 cable for the correct keyed end and insert it into the appropriate serial port.

Connect the other end of the RS-232 cable into receptacle J4 on the Serial Programming Interface Module. Check to ensure that plugs are fully seated in the receptacle and, if retaining screws are included, that they are carefully tightened to hold the plug in place. Should the plug not seat correctly in the receptacle, remove the plug and examine the pins, first to determine if the proper plug was inserted, and second, to determine if pins are aligned and undamaged. Damaged pins and broken connections may result in an inability to program the radio.

Locate the computer in a convenient work area. The mobile requires a power source for programming.

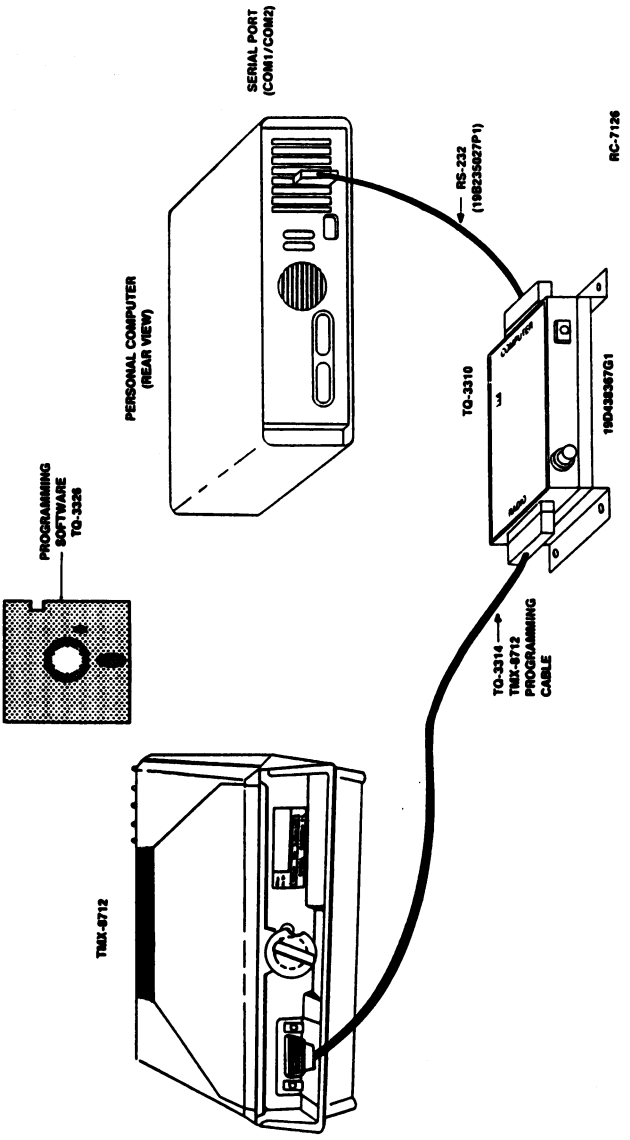

Figure 1 - Programming System Hook Up

Connect the PC Programming Software Cable to the jack where the handset is normally plugged. The Programming Cable is inserted into receptacle J5 on the face of Serial Programming Interface Module.

Information Transfer Between Radio and Programmer

The TMX 8712 PC Programming Software has the capability to store or retrieve TMX 8712 radio data. Each TMX 8712 radio contains an EEPROM (Electrically Erasable Programmable Read Only Memory) where the personality of the radio is stored. Check the serial number and model of the radio to ensure that you are programming the correct radio before downloading your program to the radio.

The radio power source should not be turned on until it is required for programming.

CAUTION
DO NOT PLUG THE PROGRAMMING CABLE INTO THE RADIO WITH POWER APPLIED.

SOFTWARE INSTALLATION AND PROGRAM ENTRY

Installation

When installation of the **TMX 8712** PC Programming Software is to be made to a fixed or hard disk system, an automatic installation routine is included on the **TMX 8712** PC Programming SETUP & HELPS disk. Insert the SETUP & HELPS disk in drive A and at the A:\ prompt, type:

INSTALL <Enter>

Then follow the installation instructions provided on the screen for the PROGRAM disk. Once both diskette information has been installed on the fixed or hard disk system, remove them from the disk drive and store them in a secure place. Your working copy of the programming software is now on the fixed or hard disk for you to call up at any time.

If you are using dual floppy drives, the install routine is not required. You may now go to the Program Entry procedures.

Program Entry

If the program is to be run on dual floppy drives, place the PROGRAM disk into drive A and the SETUP & HELPS disk into drive B. At the A:\ prompt, type:

8712 <Enter>

The program will now run and you may enter, correct or change data in the various windows.

If the program was installed on a fixed or hard disk system, at the C:\ prompt, type:

8712 <Enter>

The program will now run and you may enter, correct or change data in the various windows.

CHAPTER 2

TMX 8712 PC PROGRAM OVERVIEW

CHAPTER PREVIEW

This Chapter will introduce you to the TMX 8712 PC Program and keyboard commands, software assistance, and error detection capabilities.

PC PROGRAM STRUCTURE

Screen Definitions

Each screen in divided into three areas:

- Title
- Screen Windows
- Active Function Keys

The **Title** shows the position in the program hierarchy. The **Screen Windows** are provided for input of data to the screen. The **Active Function Keys** provide access to the commands (or actions) available within that screen. The function key commands are labelled along the bottom of the screen. Only the function keys with labels are enabled in a given screen.

Window Help

Help messages are provided to assist you in using this product. **<Shift> F9** will provide a help message for the entire window. This provided general information on what the window function is as well as what each of the function keys do. **F9**, when pressed, will provide a special help, specific only for the field the cursor is in at the time **F9** is pressed.

Screen Windows

A window is the section of a screen that displays previously stored information, enables programming alternatives, or accepts data currently being entered. There may be more than one window within a particular screen. Each window is outlined within the screen presentation. In the event that there is more than one window to a screen, borders may overlap.

There are two types of windows. The passive window is displayed but is unavailable for program execution. The active window is available for data entry

or revision and can be identified by its highlighted borders. There may be up to three windows displayed at a time, only one of which is active. In the case that windows have overlapping borders, the active window is presented in the foreground.

Like the screen, windows are divided into three distinct sections. They are:

- Window Title
- Work Area
- Prompt Line

The **Window Title** describes the function currently being performed. The **Work Area** is the space provided for your input to the window. The **Prompt Line** is printed information in the lower portion of the window defining in further detail the action to be taken in the work area.

Default Values

The **TMX 8712** Programming Software provides predetermined (default) values in a majority of the data entry fields within the program. Exceptions to this rule are fields requiring numerical variables (Frequencies, Group Sets), dates, and serial numbers. The default values assume that the radio will be used without optional features. Before changing these default values, we recommend that you be familiar with the operational implications of adding a particular feature or option to the radio being programmed.

Error Detection

The accuracy of information entered into the PC Programming Software is of critical importance. To ensure that correct information is entered into data fields, a validity check operation has been built into this program.

Before the PC Programming Software allows you to execute further data entry, it reviews and validates the current data entry. In the case of incorrect information, a message appears across the screen indicating the problem and the cursor remains stationary at the error field until corrective action is undertaken.

Although the validity check is designed to prevent the input of invalid data, it is not infallible. Check the accuracy of your work prior to exiting a particular screen or window.

KEYBOARD ORIENTATION

The following sections will provide background needed to use your computer's keyboard in executing GE PC programs.

Key Definitions

The PC Programming Software provides five categories of operational keys. They are:

- Function Keys
- Character Keys
- Editing Keys
- Movement/Acceptance Keys
- Special Usage Keys

Function Keys

Function keys are the keys, often found on the left-hand portion of your PC's keyboard, which begin with the prefix F. The function keys are used in the PC Programmer to execute a particular command. The command or action associated with a particular function key is labeled on the lower portion of your screen. There are two types of function keys: **Inactive** and **Active.**

Inactive function keys have no operational capabilities during the execution of a given screen or window (where they have been disabled by the software). You will note that inactive function keys are not labeled on the screen (see example below).

Active function keys are labeled. By pressing a specific function, the software executes the action delegated to that particular key. The following is an example of the lower portion of a screen (in this case, the Personality Directory Screen), with the Active function keys and associated actions labeled. In this screen, **F1, F7,** and **F8** are inactive function keys:

The function keys are alpha-numerically labeled F1 - F10. These keys will perform the following functions, depending on the screen or window in which the key appears:

F1

Execute—**Yes (F1)** Function Key: Activates the selected operation. (At numerous times during the operation of the PC Programmer, the program will ask you if you wish to complete an operation.) When you press the function key labeled Yes, the selected operation will be completed.

Communications Port Setup—**Port (F1)** Function Key: From the Utility Screen, this key selects which port on your personal computer will be used for communications with the radio or printer.

F2

Abort—**No (F2)** Function Key: Pressing this function key terminates the selected operation. (At numerous times during the operation of the PC Programmer, the program will ask you if you wish to complete an operation.) When you press the function key labeled No, the selected operation will not be executed.

Change—**Change (F2)** Function Key: This function key is enabled in the Personality Directory Screen to allow you to change an existing file. This key, along with the F4 (New) key, provides access to the Systems Definition Screen.

F3

Utilities—**Utilt (F3)** Function Key: This key provides access to the Utility Screen from the Personality Directory Screen. The Utility Screen allows you to print a personality, change file extensions, change file directories or select a communications port setup.

Change Directory—**Dir (F3)** Function Key: This command is enabled within the Utility Screen and changes directories without having to exit the PC program.

Select Print Output—**Print (F3)** Function Key: From the Utility Screen, you can choose to print a personality to a file, to the screen or to a printer. The personality will be sent to the printer if you select function key F3 (Print) within the "Print Personality" Window. (Note: This key is subordinate to the F6 Print function key within the Utility Screen.)

Text Select—**Text (F3)** Function Key: This key enables use of the "Text" window within the Systems Definition Screen. This window automatically provides the software revision number and software revision date of the PC Programmer. This window also accepts additional information (in text format) which you may wish to include about a particular radio personality.

New—**New (F3)** Function Key: This key is subordinate to the **F4 Freqs** and **F5 Tones** function key and is used to create a new frequency and tone set in the personality.

F4

New—**New (F4)** Function Key: This function key is enabled in the Personality Directory Screen to allow you to create a new radio personality. This key, along with the Change (F2) key provides access to the Create Personality Screen.

File—**File (F4)** Function Key: From the "Print Personality" window in the Utility Screen, personality data, is sent to a specific output file, using the F4 key. (Note: this key is subordinate to the F6 Print function key within the Utility Screen.)

Frequency Sets—**Freqs (F4)** Function Key: This key is pressed to review or create frequency sets in the **TMX-8712** radio.

Next—**Next (F4)** Function Key: This key is subordinate to **F4 Freqs** and **F5 Tones** and is used to review the programmed list of Frequency Sets or Tone Sets. **Next** pulls up the next frequency set or tone set in the order programmed.

F5

Program—**Progrm (F5)** Function Key: This key is enabled in both the Personality Directory Screen and the Systems Definition Screen. In the Personality Directory Screen, this function writes a personality stored on disk to the radio. In the Systems Definition Screen, this key writes the latest changes made in the selected personality to the radio.

Screen—**Screen (F5)** Function Key: From the "Print Personality" window in the Utility Screen, personality data, is sent to the screen for immediate presentation, using the F5 key. (Note: this key is subordinate to the F6 Print function key within the Utility Screen.)

Prior—**Prior (F5)** Function Key: This key works similarly to **F4 Next** except that it pulls up the previous frequency or tone set. Frequency and tone sets are reviewed in the order programmed.

F6

Print—**Print (F6)** Function Key: This function generates a hard (paper) copy of the personality data stored in memory. This key is enabled in the Utility Screen, and also provides the capability to print personality data to a file or to the screen.

Read Select—**Read (F6)** Function Key: From the Personality Directory Screen, the F6 key reads a specific radio personality into a file.

Groups—**Group (F6)** Function Key: From the Create Personality Screen, this key allows entry of the groups desired for the area(s) indicated.

F7

Extension Select—**Exten (F7)** Function Key: From the Utility Screen, the F7 key specifies which files are to be displayed in the Personality Directory Window. This function also permits the definition of a new three-letter default extension.

Area Options—**Aropt (F7)** Function Key: This key allows programming all the options that are area programmable (e.g., busy tone type, Auto-interconnect enable, duplex, etc).

F8

Delete—**Delete (F8)** Function Key: Deletes files or personalities. **Caution: There is no recovery from this operation. Data, once deleted, is destroyed.** Pressing this key from within the Frequency Set (F4) or Tone Set (F5) window will allow you to delete a frequency set or tone set. The set must be unused. Attempting to delete a frequency or tone set that is in use, will result in an error message.

F9

Help—**Help (F9)** Function Key: Select F9 for more information about the execution of an operation.

F10

Back—**Back (F10)** Function Key: This key returns the user to a previous window, thus making it active again for further revisions or data entry. In some cases, it will return control of the program to the Personality Directory Screen.

Exit—**Exit (F10)** Function Key: When selected from the Personality Directory Screen, the program is terminated and the user is returned to the control of your disk operating system (DOS).

Character Keys

Character keys are used to enter data into a field. When pressed, the software inserts the selected character in the field position designated by the cursor and then advances to next available character position.

Character Keys relevant to this PC Programmer Software package are:

- Alphabetic: (a - z) and (A - Z)
- Numeric: (0 -9)
- Special Characters: ' ~ ! @ # $ % ^ & * ( ) _ - \ ¦ [{ }] ? / < >

Editing Keys

Editing Keys manipulate the data within a field. These keys are:

Left Arrow: Each time the arrow is pressed it moves the cursor one character to the left until the left most position is reached.

Right Arrow: Each time the arrow is pressed it moves the cursor one character to the right until the right most position is reached.

Backspace: As the cursor moves to the left the character immediately to the left of the cursor is deleted.

Insert: This key toggles the insert operation on and off. The insert operation enables you to insert a character or a string of characters without overwriting any previously entered information.

Cap Lock: When enabled, the Cap Lock Key writes all alphabetic characters in capitalized letters.

Control/Left Arrow: When both keys are simultaneously pressed, the cursor is moved to the left most character in the field.

Control/Right Arrow: When both keys are simultaneously pressed, the cursor is moved to the right most character in the field.

Control/Backspace: By simultaneously pressing both keys all data in the field is cleared and the cursor is left in the first space in the field.

Movement and Acceptance Keys

These keys enable movement or cursor positioning on the screen. They are also used to indicate an end of input in the current field.

Enter: The data entered into the present field is accepted and the cursor is advanced to the first character position in the next field.

Up Arrow: The data entered into the present field is accepted and the cursor is returned to the first character position in the previous field.

Down Arrow: The data entered into the present field is accepted and the cursor is advanced to the first character position in the next field.

Home: Moves the cursor to the first character position in the next window.

End: Moves the cursor to the final character position in the window.

Tab: Toggles a predetermined field between selections such, as a "Yes" or "No" response.

Special Usage Keys

Two keys are represented in this category.

Page Up (Pg Up): Used to return to a previous page on the Help Screen. The Help Screen will retreat one page at a time until the beginning page is presented. This key is also used to change Frequency and Group Set selections during user edit procedures.

Page Down (Pg Dn): Used to advance to the following page on the Help Screen. The Help Screen can be advanced one page at a time until the end page is presented. This key is also used to change Frequency and Group Set selections during user edit procedures.

CHAPTER 3
TMX 8712 INTRODUCTION TO SCREENS

TMX, the PC Programmer software for the TMX 8712 trunked mobile radio, consists of three major data entry screens.

- Personality Directory Screen
- Utilities Screen
- Radio Personality Screen

The Radio Personality and Utility screens are both accessible from the Personality Directory screen (refer to figure 2). From each of these screens "pop-up" windows are activated to facilitate entering data related to the superordinate (parent) screen. Also, **HELP** messages are provided from any screen or any window by pressing **'Help' (F9** function key).

NOTE: Programming examples are provided for each data entry screen illustrated in this manual.

From the Personality Directory Screen, the user may select an existing personality file for editing or create a new personality. Additional operations may be initiated by pressing the associated function key. Function key operations are indicated by the labeled boxes along the bottom of the screen. Only the function keys with labels are enabled.

From the Utilities Screen, the user may change the current directory, print a formatted personality file (either to the screen, the printer, or saved in a file), change the file name extension, delete a personality file, or change the active communication port.

From the Radio Personality Screen the area name, frequency sets (encode and decode) and tone sets (special call and individual decode) may be specified.

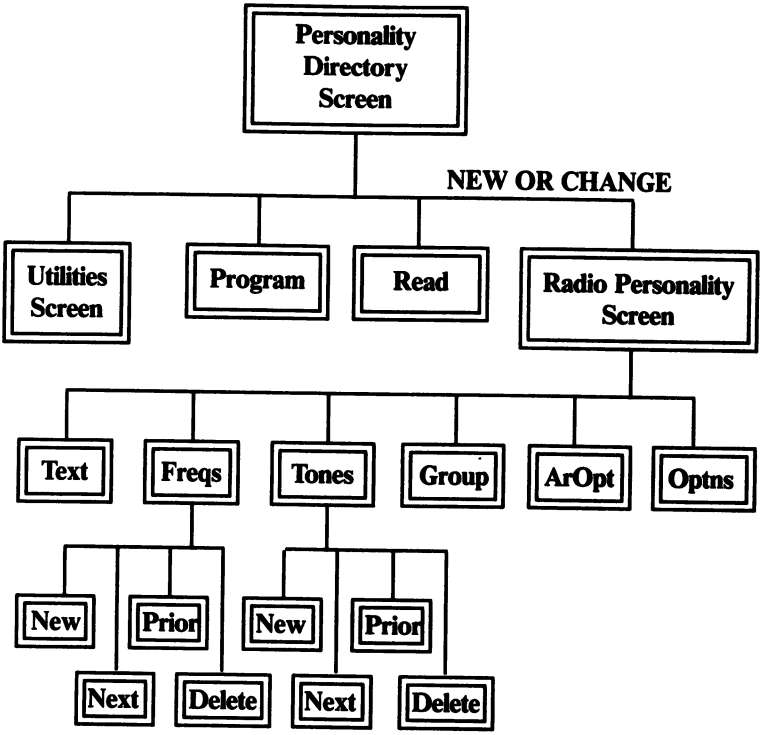

Figure 2 — Screen/Window Hierarchy

SCREEN DEFINITIONS

PERSONALITY DIRECTORY SCREEN

When initiating the **TMX 8712** PC Programming software, the Personality Directory Screen is the first displayed. This screen, shown in Figure 3, lists the file name of each personality stored in the selected directory.

A highlighted background indicates which personality file is selected. Any file on the directory screen may be selected, by moving the highlighted area using the right/left/up/down cursor keys. Function keys **F2 (Change)** and **F5 (Program)** apply to the selected file. Pressing one of these keys activates a pop-up window displaying the operation and the selected file.

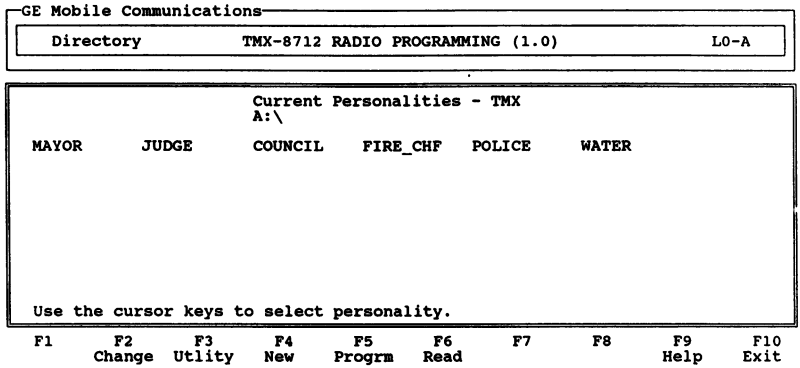

Figure 3 — Personality Directory Screen

Function key definitions and descriptions for the Personality Screen follow:

F2—Change: Change/edit the selected file.

F3—Utlity: Enter the utility screen (provides for delete, dir, etc.).

F4—New: Create a new radio personality.

F5—Progrm: Program a radio with the selected personality.

F6—Read: Read the personality from the radio into a file.

F9—Help: Display help messages for the function keys.

F10—Exit: Exit the program.

Change Personality Window

The Change/Edit Personality Window (figure 4) is activated when **Change (F2)** is pressed from the Current Personality Screen. This window solicits the name of the personality file to edit. The default name is the one highlighted when **F2** is pressed. When the desired personality has been identified, press **Yes (F1)** to continue or **No (F2)** or **Back (F10)** to cancel the operation. Pressing **Yes (F1)** at this point activates the Radio Personality Screen which will be covered later. Pressing **No (F2)** reactivates the Current Personality Screen.

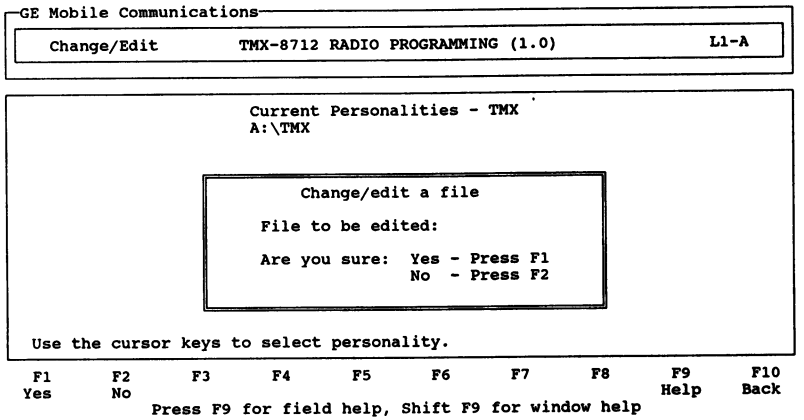

Figure 4 — Change Personality Window

Program Radio Window

The Program Radio Window (figure 5) is activated by pressing **Progrm (F5)** from the Personality Directory Screen. After the desired personality file name has been entered, press **Do (F1)** to initiate the radio programming sequence. Press **Dont (F2)** or **Back (F10)** to reactivate the Personality Directory Screen without programming the radio.

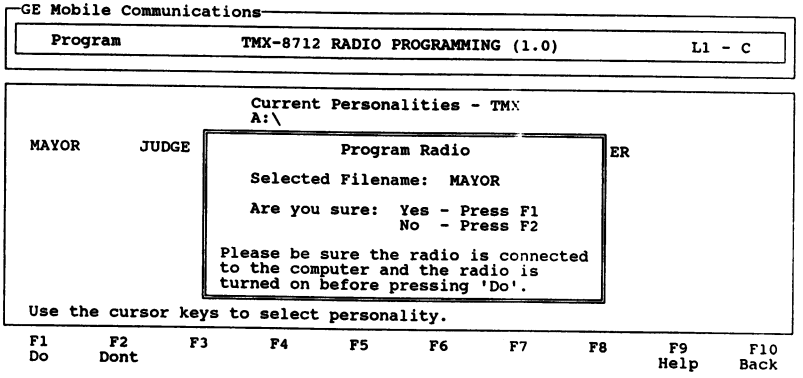

Figure 5 — Program Radio Window

Various progress messages are displayed as the sequence of handshaking with the radio, writing data, and verifying are accomplished.

Error messages will be displayed if the transfer does not go correctly. See the Error Appendix for messages and explanations.

Read Radio Personality Window

To activate the Read Radio Personality Window (figure 6) press **Read (F6)** from the Personality Directory Screen. To read the radio into a file, enter the destination file name and press **Do (F1).** To reactivate the Personality Directory Screen without reading the radio press **Dont (F2).**

NOTE

When a personality is created by reading the radio the program uses generic labels for all data. (E.g., area1, fset1, tset1, etc.)

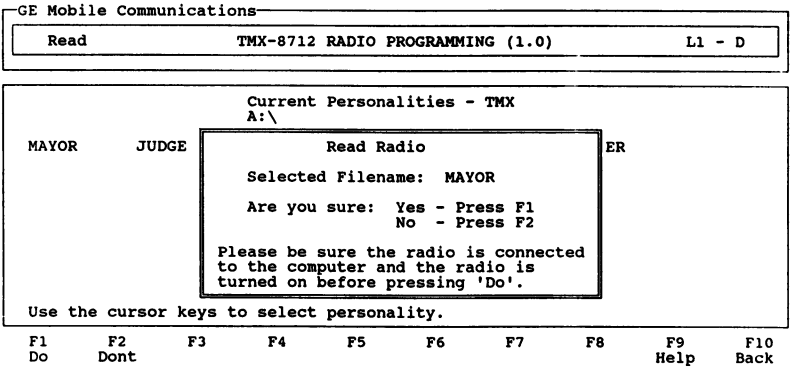

Figure 6 — Read Radio Personality Window

RADIO PERSONALITY SCREEN

The Radio Personality Screen (figure 7) is activated by selecting **New (F4)** or **Change (F2)** from the Personality Directory Screen. When **New** is selected, the Radio Personality Screen is activated immediately. Data to be used in the personality may now be entered.

When **Change** is selected the Change Personality Window is activated (refer to figure 4). The operation of this window has been described in a previous section.

The screen for **New** is similar to that for **Change**, with the exception data elements are not initialized from an existing file.

In the TMX 8712, a personality is built in two steps. First, the frequency and tone data tables are constructed. The second step is configuration of each programmed area with frequency and tone data.

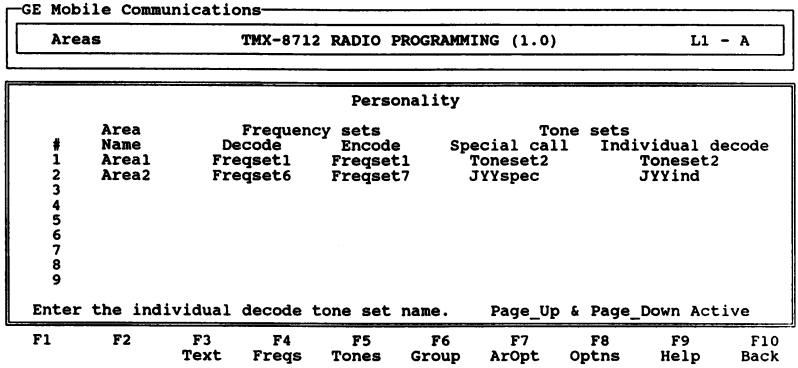

Figure 7 — Radio Personality Screen

All fields within this screen are 8 character, alpha-numumeric fields. The name of the area is left to the user. However, if an area is to be programmed for operation a name must be entered. If a name is not entered, no more data for that area may be entered. For instance, the cursor may not be moved into the decode frequency set field. An attempt to do so will result in an error message. However, the cursor may always be moved to another area name field.

Data entered in the frequency set fields must correspond to names of programmed frequency sets. Data entered in the tone set fields must correspond to names of programmed tone sets. For an area to be programmed for operation a decode and encode frequency set must be defined. Therefore, an attempt to leave these fields blank will result in an error message. This is not true of special call and individual call tone set data. Separate frequency sets may be specified for decoding and encoding calls.

Before proceeding with the area data, frequency sets and tone sets must be created. (Refer to 'Frequency Set Windows' and 'Tone Set Windows' sections of this document).

The following rules must be adhered to when editing and/or creating a personality:

1. No two area names may be the same. Area names may be changed or deleted if the area is not referenced as a scan area (area 1 may only be modified). If an area name is deleted all data for that area will be deleted.

2. Encode and decode frequency sets may be changed as long as the new names correspond to names of programmed frequency sets.

3. Special call and individual call tone sets may be deleted. They may also be changed as long as the new names correspond to names of programmed tone sets.

4. Group tone set data may be added or deleted.

5. Any or all area option data may be altered.

6. The name of an area referenced as a scan area may **NOT** be changed or deleted. Attempts to do so will result in an error message (see Error Appendix).

Text Window:

The Text Window (figure 8) is activated by pressing **Text (F3)** from the Radio Personality Screen. The Text Window is a pop-up window containing eight lines of user defined text, and indicators for Software Version and Last Date Programmed. The text may be entered or modified at the user's discretion. The Software Version field corresponds to the version of software used in the TMX 8712. The date in the Last Date Programmed field corresponds to the last time this personality was used to program a radio. These fields are updated each time a radio is programmed with this personality.

Help is available by pressing **Help.** To reactivate the Radio Personality Window press **Back.**

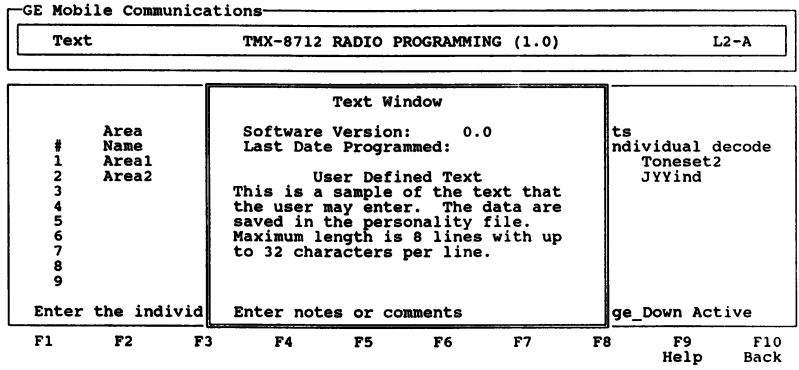

Figure 8 — Text Window

Frequency Sets Window:

The Frequency Sets Window (figure 9) is activated when **Freqs (F4)** is pressed from the Radio Personality Window. If the personality is new, the fields will be blank. If an existing personality is being edited, the fields will be initialized with either data from the first frequency set or the data of the last frequency set accessed.

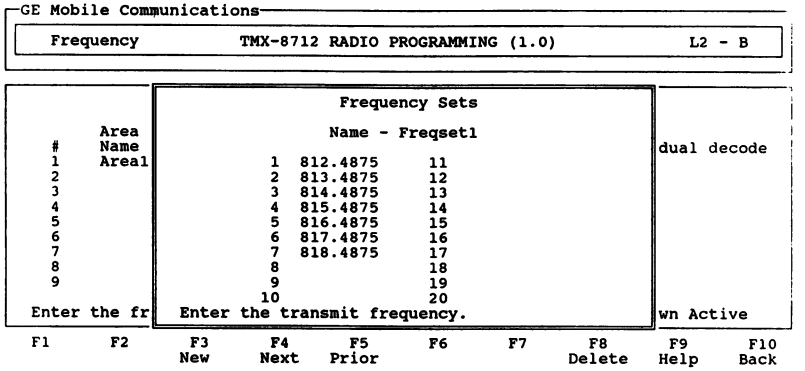

Figure 9 — Frequency Sets Window

The **Next (F4)** and **Prior (F5)** keys provide a scrolling function. The Next key increments through the list of sets in the order programmed. The Prior key decrements through the list.

Pressing the **New (F3)** key initializes a new frequency set. A name must be entered if the frequency set is to be programmed. If the name specified is the name of a frequency set already programmed, an error message will be displayed (refer to Error Appendix).

If the name has not been used before, the cursor will move to the first frequency field.

Only frequencies within the 800 MHz trunked band (806.0125 through 825.9875 MHz) may be entered. In addition each frequency entered must also be evenly divisible by 12.5 KHz. Entry of data not meeting these two requirements will result in the display of an error message (see error appendix for explanation).

Pressing **Delete (F8)** activates the Delete Frequency Set Window (figure 10). The Delete Frequency Set Window is used to remove a frequency set from the personality. If the selected frequency set is not referenced as either an encode or decode frequency set in any programmed area of the personality it may be deleted. If it is referenced in the personality it may not be deleted unless the reference to it is removed first.

If a frequency set is referenced in the personality:

1. The name may **NOT** be changed.
2. Elements of the set may be changed (i.e., 816.2625 changed to 812.9375).
3. If elements are added to the frequency set the number of scanned channels is verified to be 20 or less. If the number of scanned channels exceeds 20 an error message is displayed.
4. The frequency set may **NOT** be deleted.

If a frequency set is not referenced in the personality anywhere, it may be edited as follows:

1. The name of the frequency set may be changed.
2. All frequencies in the set may be changed.
3. Frequencies may be added to or deleted from the set. (To delete a frequency, place the cursor on the desired frequency, hold down the Ctrl key and press Backspace.)
4. The set may be deleted from the personality.

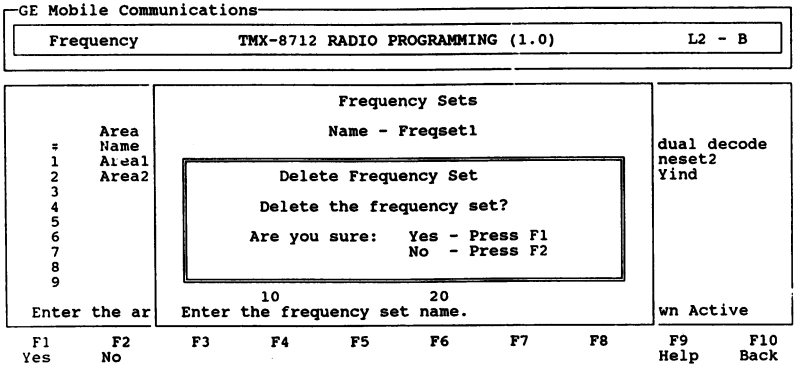

Figure 10 — Delete Frequency Set Window

Tone Sets Window

The Tone Sets Window (figure 11) is activated by pressing **Tones (F5)** from the Radio Personality Window. If the personality is new, the tone fields will be blank and options will be initialized to default values. If an existing personality is being edited, the fields will be initialized with either the data of the first tone set or the data of the last tone set accessed.

Operation of the Tone Sets Window is very similar to the operation of the Frequency Sets Window. **New, Next,** and **Prior** keys function as described above in **Frequency Sets Window.** The name field has the same restrictions as described above in **Frequency Sets Window.**

Pressing **Delete (F8)** activates the Delete Tone Set Window (figure 12). A tone set may be deleted only if it is not referenced in the personality.

To be valid, a tone set must have a name and valid tones (tones 1—34 inclusive).

By definition, the **GE-MARC** system only allows two tone and four tone combinations (i.e., 18, 09 or 18, 10, 12, 13 are valid combinations; 03 or 13, 10, 17 are not valid combinations).

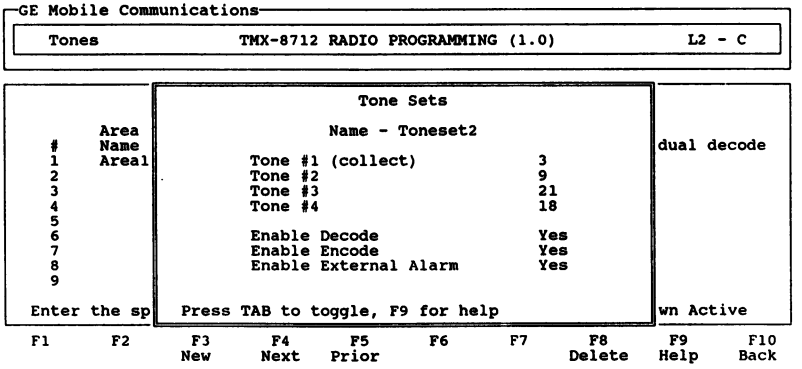

Figure 11 — Tone Sets Window

If a tone set is referenced in the personality:

1. The name of the tone set may **NOT** be changed.
2. The elements of the tone set may be modified (i.e., change 10 to 12 or 01 to 34).
3. The options (i.e., decode enable, encode enable, external alarm) may be changed.
4. Elements may not be deleted or added (i.e., change from a four-tone set to a two-tone set or two-tone set to a four-tone set).
5. The tone set may **NOT** be deleted.

If a tone set is not referenced in the personality, it may be edited as follows:

1. The tone set name may be changed.
2. Any or all elements of the set may be modified.
3. Elements may be added or deleted from the tone set (i.e., change two-tone set to a four-tone set and vice versa).
4. The tone set may be deleted.

Refer to the Error Appendix for information on displayed error messages.

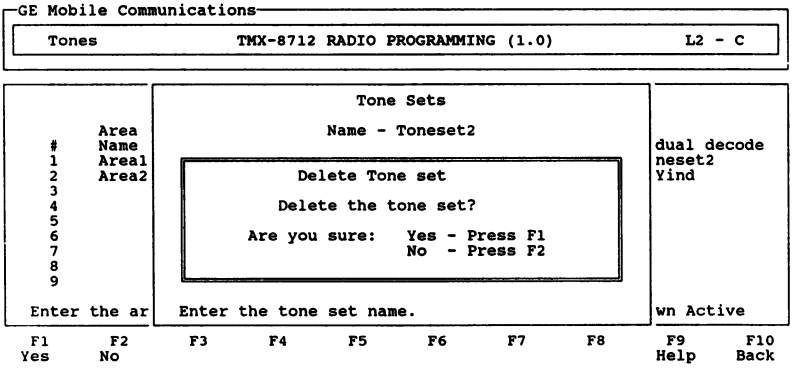

Figure 12 — Delete Tone Set Window

Group Data Window

The Group Data Window (figure 13) is activated when **Group (F6)** is pressed from the Radio Personality Window. If the personality is new, the data fields will be blank. If an existing personality is being edited, the data fields will be initialized with the selected area's group tone data. The displayed tone data is the 9 possible groups for the area. The selected area is determined by the cursor position on the Radio Personality Window prior to pressing Group.

All entries must be valid names of tone sets If an entry is not valid an error message will be displayed. (See Error Appendix for more information)

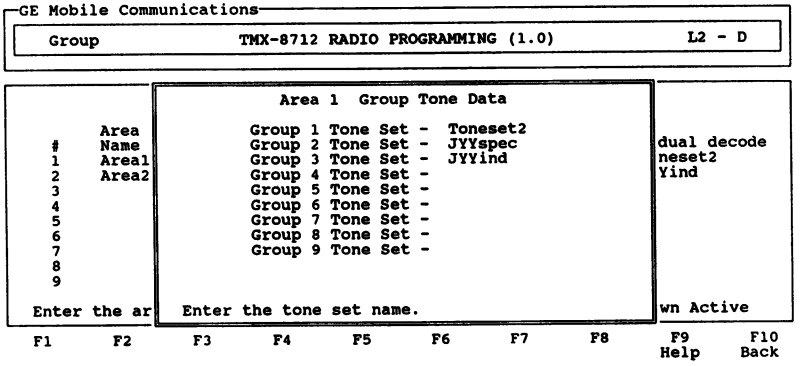

Figure 13 — Group Data Window

Area Option Window

The Area Option Window (figure 14) is activated by pressing **ArOpt (F7)** from the Radio Personality Window. To enter or modify the option data for any given area, place the cursor on the desired area of the Radio Personality Window and press **ArOpt.**

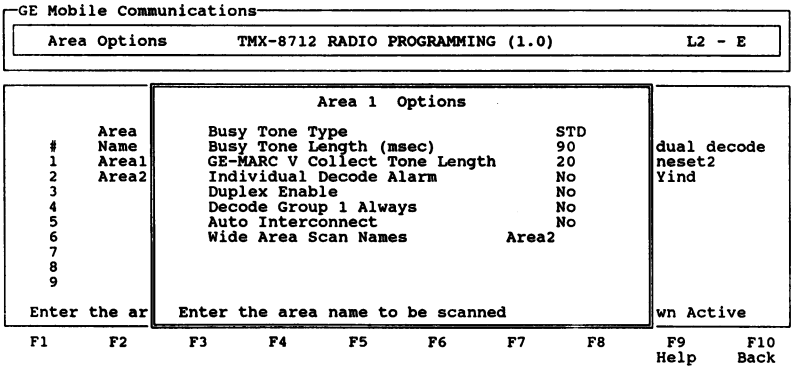

Figure 14 — Area Option Window

A description of the option data follows:

Busy Tone Type This is a toggle field. Pressing the **Tab** key toggles the data between **STD** (standard) or **ALT** (alternate). Press **<Enter>** when the desired choice appears.

Busy Tone Length Pressing the Tab key advances the selection by one. The choices are 90, 180, 270, and 360. Press **<Enter>** to select.

GE-MARC V Collect Tone Length This is a data entry field. Enter the number of channels the collect tone should be sent for in **GE MARC two** tone signalling. Choices are **5** to **20.**

Individual Decode Alarm This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press **<Enter>** to select. When answered **Yes** the user is alerted (by external relay) when the individual tone set for this area is decoded.

Duplex enabled This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press **<Enter>** when the desired choice appears. When answered **Yes,** the duplex feature for the area is activated when special call and individual call tone sets are used. Duplex operation is automatic

when a special call is placed. Duplex operation is not allowed when encoding or decoding group tone sets.

Decode Group 1 Always — This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press <**Enter**> when the desired choice appears. When answered **Yes** the group 1 tone set is decoded regardless of which group is displayed. This does not affect encoding. The radio will still encode the displayed group. Responding **NO** will allow the radio to decode the individual and the selected group, provided they have common collect tones.

Auto Interconnect — This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press <**Enter**> when the desired choice appears. When answered Yes, the user may interconnect and dial without sending a DTMF star (*). Responding **Yes** to this question also results in the radio immediately operating in duplex mode after decoding an individual call if duplex is enabled.

Wide Area Scan Area Names — This is a data entry field. The name entered must be the name of a programmed area. In addition, the total number of channels to be scanned (the number of frequencies in the decode frequency set of this area plus the number of frequencies in the decode frequency set of each additional scan area) must not exceed 20.

GE-MARC V/VE Window

The GE-MARC V/VE Window (figure 15) is activated after answering **YES** to the Duplex Enable question and then only if both the individual decode and special call tone sets are 2-tone tone sets. If either is a 4-tone tone set this area (by default) will be used in a GE-MARC VE system. In a VE system the radio sends a 180 millisecond burst of busy every 9 seconds. In GE-MARC V systems the radio must send a burst of busy every 2 seconds.

If the area is to be used on a GE-MARC VE system press **VE (F2).** If the area is to be used on a GE-MARC V system press **V (F1).** If it is to be used on two different systems and one is **V** and the other is **VE,** press **V.**

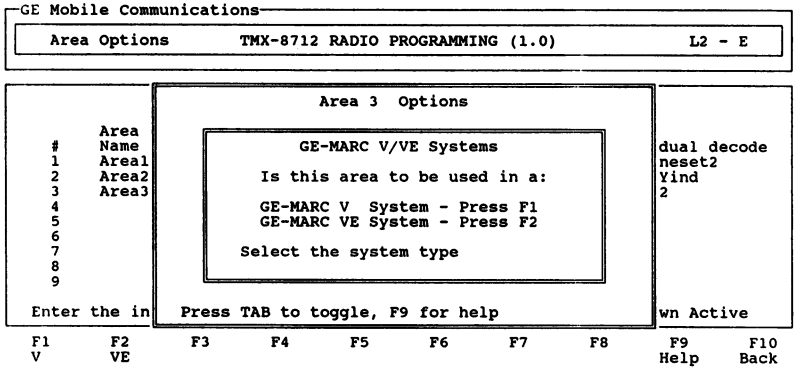

Figure 15 — GE-MARC V/VE Window

Radio Option Window

The Radio Options Window (figure 16) is activated by pressing **Optns (F8)** from the Personality Directory Screen. This window contains all the option data for the radio.

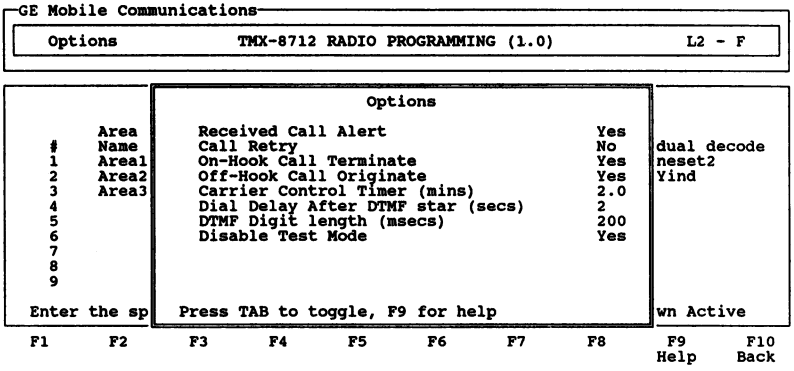

Figure 16 — Radio Options Window

Received Call Alert This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No. Press <Enter>** when the desired choice appears. Answering **Yes** to this question results in alert tones being heard when a tone set is decoded.

Call Retry Enable This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press **<Enter>** when the desired choice appears. To enable call retry (for up to 15 times) in the event of system busy, answer **Yes.** When **No** is selected, an outbound call must be re-initiated when the system is busy.

On-Hook Call Terminate This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press **<Enter>** when the desired choice appears. Answering **Yes** results in automatic termination of in-progress calls when the handset is returned to the cradle. If answered **No,** the user must push the **END/FCN** key to terminate a call.

Off-Hook Call Originate This is a toggle field. Pressing the **Tab** key toggles the data between **Yes** and **No.** Press **<Enter>** when the desired choice appears. Answering **Yes** results in automatic initiation of a call with the displayed group when the handset is removed from the cradle. Answering **No** will force the user to press the push-to-talk or the **SND** key to initiate a call.

Carrier Control Timer This is a data entry field. Values from **0.5** to **7.5 minutes** (in 0.5 minute increments) may be entered. To disable the Carrier Control Timer enter **DIS.**

Dial Delay After DTMF star (secs) This is a scroll field. The choices are **0, 1, 2, 3, 4, 5, 6** and **7** seconds. Press the **Tab** key until the desired choice appears and then press **<Enter>.** This delay is only used when making interconnect calls and determines how long the radio waits before sending the number dialed.

NOTE

If dial tone is detected before the delay expires the radio sends the number without waiting.

DTMF Digit Length This is a scroll field. The choices are **100, 150, 200, 250, 300, 350, 400** and **450** msecs. Press the **Tab** key until the desired choice appears and then press **<Enter>**. This is the length of the DTMF digits that are dialed out when placing an interconnect call.

Disable Test Mode This is a toggle field. Press **Tab** to toggle between **Yes** and **No.** Press **<Enter>** when the desired choice appears. To disable test mode operation respond **Yes.** To enable test mode answer **No.**

UTILITY SCREEN

The Utility Screen (figure 17) is activated by pressing **Utlity (F3)** from the Personality Directory Screen. The Utility Screen looks similar to the Personality Directory Screen. The notable differences are the function keys.

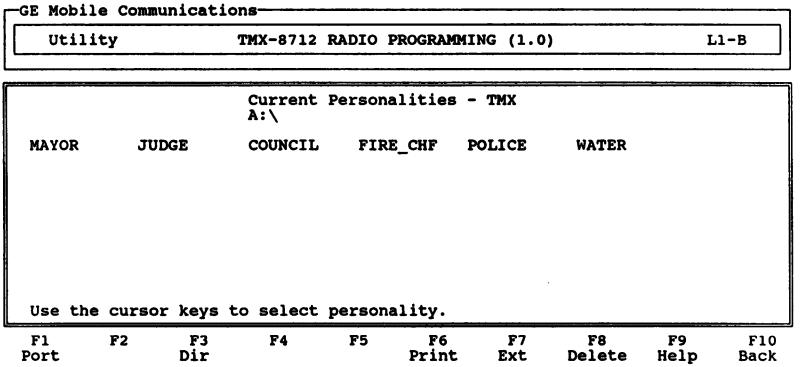

Figure 17 — Utilities Screen

Select Communication Port Window:

The Communication Port Window (figure 18) is activated by pressing **Port (F1)** from the Personality Directory Screen. This window enables user to select a port of the personal computer for communication with the radio. The user is prompted to enter the number of a valid port. The default is the port 1. Once the port number has been entered, select **Yes (F1)** to initiate the action or **No (F2)** to leave the data unchanged.

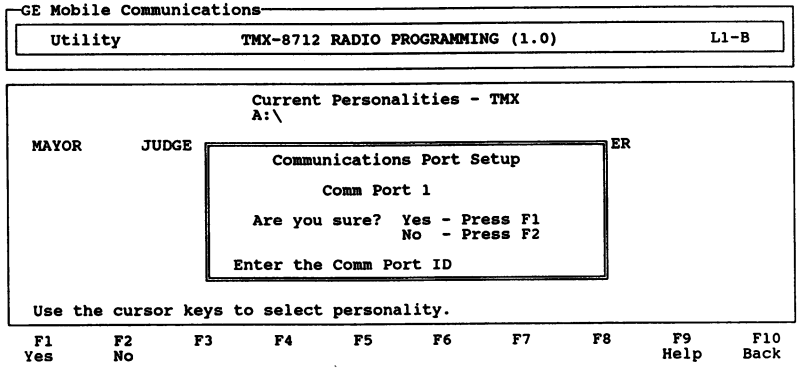

Figure 18 — Communication Port Window

Change Directory Window:

The Change Directory Window (figure 19) is activated by pressing **Dir (F3)** from the Utility Screen. This window enables the user to specify a different working directory by entering the new directory name. When the name has been entered, select **Do (F1)** to change directories. If the directory name is illegal or non-existent an error message will be displayed. Selecting **Dont (F2)** reactivates the Utility Screen without changing directories.

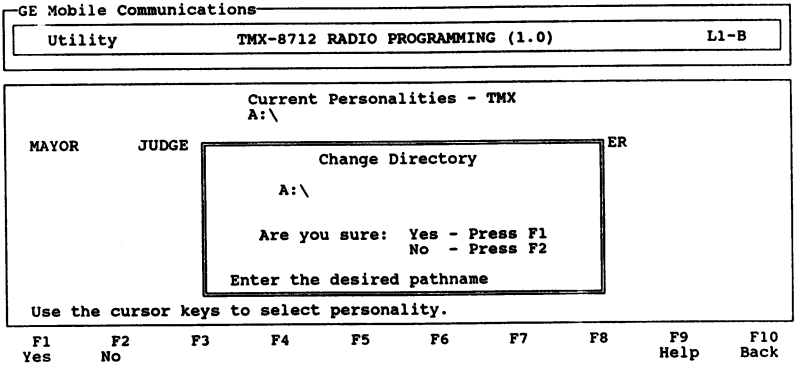

Figure 19 — Change Directory Window

Delete Personality Window:

The Delete Personality Window (figure 20) is activated by pressing **Delete (F8)** from the Utility Screen. Entering illegal or non-existent file names will result in an error message. When the desired file name has been entered, press **Yes (F1)** to delete the file or **No (F2)** to reactivate the Utility Screen.

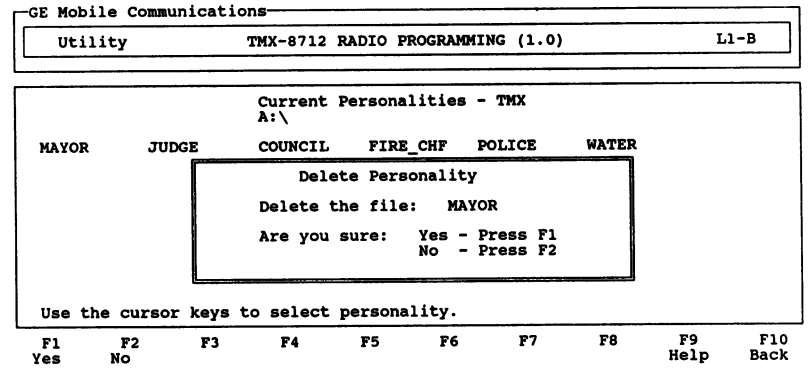

Figure 20 — Delete Personality Window

Print Window

The Print Window (figure 21) is activated by pressing **Print (F6)** from the Utility Screen. The user may enter a personality file name or use the default. Once the file name has been entered, the user directs the output via the **Print (F3), File (F4),** and **Screen (F5)** keys. If **Print** is selected, the personality file will be directed to the printer. If **File** is selected, the user will be prompted for the output file name via the Print Personality File Name Window (figure 22). If **Screen** is selected the output is directed to the screen (as shown in figure 23).

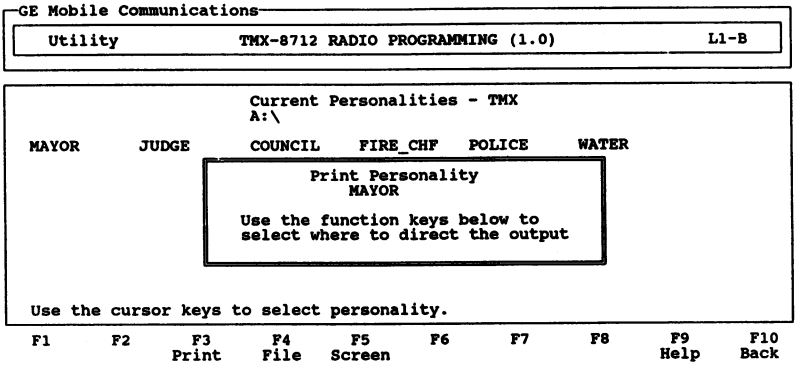

Figure 21 — Print Window

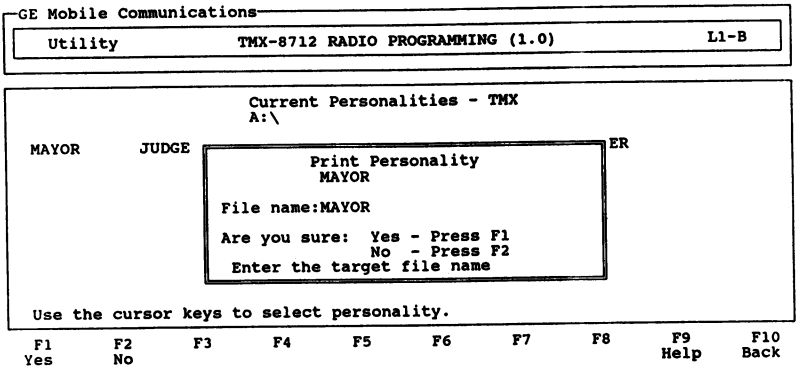

Figure 22 — Print Personality File Name Window

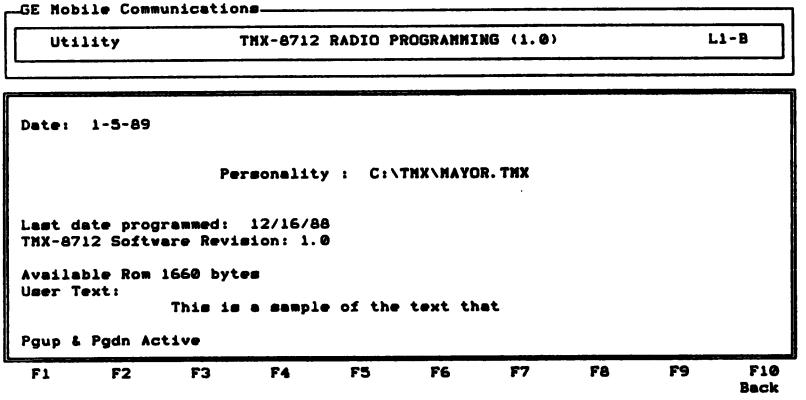

Figure 23 — Print Personality Screen Window

Change Extension Window:

The Change Extension Window (figure 24) is activated by pressing **Ext (F7)** from the Utility Screen. The specified extension is always displayed at the top of the personality directory screen to the right of "Current Personalities."

The value of the extension is maintained between program invocations. The default extension is **TMX** for the TMX 8712 radio.

The extension is used as the filename extension for saving personality files, creating personality files via a 'Read Radio' operation, and to display all personality files in a specified directory.

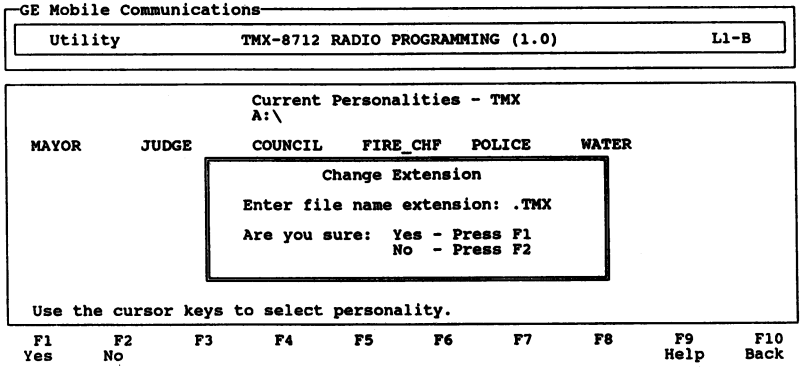

Figure 24 — Change Extension Window

BASIC PROGRAMMING PROCEDURE

To start the program type **TMX** at the DOS prompt and press the **<Enter>** key. The first active screen is the Personalities Directory Screen. The file names displayed have a common extension (i.e., .TMX). Typically only one extension is used and the display is really a listing of personality files. These personalities may be reviewed, edited, or used to program radios as desired. These procedures are covered later.

To create a new radio personality perform the following:

NEW RADIO PERSONALITY

1. Press **New (F4)** to activate the Radio Personality Screen.

2. Press **Freqs (F4)** to activate the Frequency Sets Window.

3. Initially, the cursor is positioned in the name field of the Frequency Sets Window. Enter an appropriate name (up to 8 characters) and press **<Enter>**.

4. Enter mobile transmit frequencies (806.0125 to 825.9875) in as many of the 20 slots as desired.

5. When the frequency set is complete, another may be created by pressing **New (F3)**. Repeat steps 3 - 4 until all desired frequency sets have been created.

6. After the frequency sets have been created, **Next (F4)** and **Prior (F5)** may be used to scroll through them. **Prior** decrements through the list and **Next** increments through the list (in the order entered). To delete an unwanted frequency set, press **Delete (F8)** and when the Delete Frequency Set Window is activated, press **Yes (F1)**. To reactivate the Frequency Sets Window without deleting the set, press **No (F2)**.

7. Press **Back (F10)** to reactivate the Radio Personality Screen.

8. Press **Tones (F5)** to activate the Tone Sets Window.

9. Initially, the cursor is positioned in the name field of the Tone Sets Window. Enter an appropriate name (up to 8 characters) and press **<Enter>**.

10. Enter the first mobile tone number (**1** to **34**) in the first tone field and press <**Enter**>. Enter the remaining tone numbers (only combinations of 2-tones or 4-tones are allowed). If a 2-tone tone set is desired, press <**Enter**> to step through tone number fields 3 and 4. After the tones are entered, set the tone set option data to the desired states (I.e., enable decode, encode, external alarm).

11. When the tone set is complete, another may be created by pressing **New (F3)**. Repeat steps 9 - 10 until all desired tone sets have been created.

12. After the desired tone sets have been input, **Next (F4)** and **Prior (F5)** may be used to scroll through them. **Prior** decrements through the list and **Next** increments through the list (in the order entered). To delete an unwanted tone set, press **Delete (F8)** and when the Delete Tone Set Window is activated, press **Yes (F1)**. To reactivate the Tone Sets Window without deleting the set, press **No (F2)**.

13. Press **Back (F10)** to reactivate the Radio Personality Screen.

14. Position the cursor in the area name field for area 1. Enter an appropriate name (up to 8 characters) and press <**Enter**>. The cursor moves to the decode frequency set field.

15. Type the name of the frequency set (from the list of frequency sets created in steps 3 - 5) to be used for incoming calls and press <**Enter**>. The cursor moves to the Encode Frequency Set field.

16. Type the name of the frequency set (from the list of frequency sets created in steps 3 - 5) to be used for outbound calls and press <**Enter**>. The cursor moves to the Special Call Tone Set field.

17. Type the name of the tone set (from the list of tone sets created in steps 9 - 11) to be used for special call in this area and press <**Enter**>. If special call is not desired in this area, press <**Enter**> without entering any characters. The field will be left blank (special call is disabled) and the cursor moves to the Individual Decode Tone Set field.

18. Type the name of the tone set (from the list of tone sets created in steps 9 - 11) to be used for individual decode in this area and press <**Enter**>. If individual decode is not desired in this area press <**Enter**> without entering any characters. The field will be left blank (individual decode is disabled) and the cursor moves to the name field of the next area.

19. Areas are arranged in 4 pages of 9 each. (i.e. 1 to 9 on page 1, 10 to 18 on page 2 etc.) Other pages may be accessed by pressing **PgDn** and **PgUp.**

20. Repeat steps 14 - 18 until all desired areas are programmed. To skip an area, place the cursor in the area name field and press down arrow.

21. When all desired areas have been programmed, position the cursor in any field of the first programmed area. Press **Group (F6)** to activate the Groups Window. Type the names of the tone sets (from the list of tone sets created in steps 9 - 11) to be used for group tone encode and decode of this area and press **<Enter>** after each entry.

22. When the desired groups have been specified press **Back (F10)** to reactivate the Radio Personality Screen.

23. Press **ArOpt (F7)** to activate the Area Options Window. Set each option to the desired value and press **<Enter>** after each selection. To select additional scan areas (up to 4), enter the name of the area (from the areas programmed in steps 14 - 18) in the Wide Area Scan field.

24. Press **Back (F10)** to reactivate the Radio Personality Screen.

25. Position the cursor in any field of the next programmed area and repeat steps 21 - 24. Continue until the group and option data for all programmed areas is correct.

26. Press **Optns (F8)** to activate the Radio Options Window. Set each option to the desired value and press **<Enter>** after each selection.

27. Press **Back (F10)** to reactivate the Radio Personality Screen.

28. Press **Back (F10)** to activate the Save Personality Window.

29. Enter the name the personality is to be known by. Press **Do (F1)** to save the personality to disk. The Personality Directory Screen is reactivated and the new personality name is displayed. If the personality is not to be saved, press **Dont (F2).** The Personality Directory Screen is reactivated but the personality name is not displayed.

30. To program the radio, print the personality, or edit the personality, continue reading. To exit the program press **Exit (F10).**

Program

NOTE

The programming port defaults to COM1. If the user wishes to use COM2 it must be reconfigured before programming a radio or reading a file from a radio.

1. From the Personality Directory Screen press **Progrm (F5).** The Program Radio Window is activated.

2. If the displayed file name is not the personality the radio is to be programmed with, enter the correct name. Press **Do (F1)** to initiate programming of the radio. Press **Dont (F2)** to reactivate the Personality Directory Screen without programming the radio.

3. To print the personality, edit the personality, or read the radio personality (assuming the radio is programmed), continue reading. To exit the program press **Exit (F10).**

Print Personality

1. From the Personality Directory Screen press **Utlity (F3).** The utility functions are displayed. Press **Print (F6).** The Print Personality Window is activated.

2. If the displayed file name is not the personality to print, enter the correct name. To direct the output to a printer press **Print (F3).** To save the output in a file press **File (F4).** To display the output on the screen press **Screen (F5).**

3. If **Print** is selected the output will be directed to the printer connected to the PC.

4. If **File** is selected, the Verify Output File Name Window is activated. The highlighted area is the name of the file in which the output will be stored. The file extension for this kind of file is .LST. If the name is incorrect, enter the desired name. Press **Do (F1)** and the file will be generated and saved. Press **Dont (F2)** and the Print Personality Window is reactivated without generating and saving the file.

5. If **Screen (F5)** is selected the file is displayed on the computer monitor. Press **Back (F10)** to return to the Print Personality Window.

6. Press **Back (F10)** to reactivate the Utility Screen.

7. Press **Back (F10)** to reactivate the Personality Directory Screen.

8. To change a personality file or read a personality file from a radio, continue reading. To exit the program press **Exit (F10).**

CHANGE RADIO PERSONALITY

From the Personality Directory Screen, select a personality file for editing. This may be done by positioning the cursor on the desired file name. (Use the arrow keys to move the cursor.)

1. Press **Change (F2)** to activate the Change/Edit Window (figure 4). Verify the displayed file name is the personality to be edited. If it is not, enter the correct name. To begin the edit process, press **Do (F1).** To reactivate the Personality Directory Screen without editing the file, press **Dont (F2).**

2. Data may be added, deleted or modified. Refer to New Radio Personality above for function key operation and general information.

3. To delete data (e.g. a frequency, a group, or a wide area scan name), place the cursor in the field that is to be deleted. Hold down the **Ctrl** key and press **Backspace.**

4. To delete an unwanted area, place the cursor in the name field of the area in question. Hold down the **Ctrl** key and press **Backspace.** Press up arrow or down arrow and the area data is eliminated.

NOTE

Areas that are referenced as additional scan areas can **NOT** be deleted in this manner. They must be removed from the scan list first.

5. To read a personality from a radio continue reading.

Read

The Read Radio Personality function is provided to facilitate reconstruction of a personality file from the contents of the radio. This will prove useful in verification of operating parameters (i.e., the radio works as programmed). The resultant file may also be edited, printed, etc., in the same manner described in

prior sections. One notable difference is the names of areas, frequency sets, etc. Generic names are used instead of the originals (e.g., area1, fset1, tset1).

1. To activate the Read Radio Window press **Read (F6)** from the Personality Directory Screen.

2. Enter the desired filename.

3. To initiate the read process, press **Do (F1).** To reactivate the Personality Directory Screen without reading the radio press **Dont (F2).** If the specified file already exists, a message will be displayed inquiring if the user intends for the file to be overwritten. If answered **Yes,** the existing file will be overwritten. If answered **No,** the Personality Directory Screen will be reactivated without reading the radio.

NOTE

Be sure that the radio is connected and turned on before pressing **Do (F1).**

APPENDIX A

ERROR MESSAGES

The following is a list of error messages that may be generated during execution of the **TMX 8712 PC PROGRAMMER** program. The messages are listed in alphabetical order. Associated with each message is a 'Source', 'Cause', and 'User Action' field. The 'Source' field indicates the software module from which the error is generated and is for use by GE technical personnel. The 'Cause' field indicates what steps resulted in the error message being displayed. The 'User Action' field contains information pertaining to how the user might correct the problem (in the event the problem is procedural).

Area name used before.

Source: validate _ a _ name

Cause: The user entered an area name which has been used previously.

User Action: Enter an unique, valid area name.

Area1 not valid.

Source: validate _ a _ name

Cause: User attempted to exit the first area name field without entering a name. Area 1 must be valid for the personality to be valid.

User Action: Program area 1.

Area referenced as scan area.

Source: a _ refd

Cause: The user attempted to delete an area which is referenced as an additional scan area.

User Action: Either delete the additional scan area reference or do not attempt to delete the area.

Cannot change from 4 to 2 tones in referenced tone set.

Source: validate _ tone

Cause: The user attempted to change a referenced 4-tone tone set to a 2-tone tone set.

User Action: Either delete the reference and modify the tone set or do not modify the tone set.

Cannot change from 2 to 4 tones in referenced tone set.

Source: validate _ tone

Cause: The user attempted to change a referenced 2-tone tone set to a 4-tone tone set.

User Action: Either delete the reference and modify the tone set or do not modify the tone set.

Cannot delete area1.

Source: validate _ a _ name

Cause: User attempted to delete area 1.

User Action: User may modify any or all data in area1 (including the area name) but may not delete it.

Cannot delete frequency set name.

Source: validate _ d _ name, validate _ e _ name

Cause: User attempted to delete a decode or encode frequency set name.

User Action: The user may enter a different frequency set name, but deleting the decode or encode frequency set reference would invalidate the area.

Cannot open setup file.

Source: tmwrite (get _ comm _ port), tmrend (get _ comm _ port)

Cause: Could not open file containing port and extension information.

User Action: None.

Checksum failed.

Source: tmread (main)

Cause: The calculated checksum of the data did not match the checksum value stored in the personality prom.

User Action: None.

Could not delete file.

Source: delete _ personality

Cause: User attempted to delete a file with read-only access rights (modification of access rights would have to be done external to this program) or which did not exist.

User Action: None.

Could not open file.

Source: save _ personality

Cause: Error encountered while trying to open file.

User Action: None.

Could not save file.

Source: save _ personality, tmread (main)

Cause: Error encountered while trying to save the personality file.

User Action: Verify required disk space is available.

Could not update last date programmed.

Source: tmwrite (main)

Cause: When the radio is programmed the 'software rev' of the radio and the 'last date programmed' fields of the text screen are updated. After programming is completed this updated file is written back to the disk. This message is displayed in the event an error occurs during the save to disk. The programming operation is not affected.

User Action: None.

Directory does not exist.

Source: change _ directory

Cause: User attempted to change to a non-existent directory.

User Action: None.

Enter valid area name.

Source: validate _ a _ name

Cause: The user attempted to move the cursor from 'Area 1' (of the areas screen) without entering a name. Area 1 must be valid for the personality to be valid and a name must be entered for the area to be valid.

User Action: Enter a valid area name.

Error changing baud rate.

Source: read _ radio _ into _ buffer, write _ radio

Cause: An error was encountered while trying to change the baud rate from 300 to 9600.

User Action: None.

Error—Check connections. Recycle power on radio.

Source: read _ radio _ into _ buffer

Cause: The handshake sequence failed. Possible problems:

1. Wrong port specified.

2. Bad cable connection (or wrong cable).

3. Cycle power on radio.

User Action: Verify 1 - 3 above.

Failed verify.

Source: tmwrite (main)

Cause: After programming the radio, the personality prom contents are read back and compared with the original data. This message appears if a miscompare occurs.

User Action: Retry programming operation.

File does not exist.

Source: do _ change, do _ program, do _ printer

Cause: User referenced a file which does not exist.

User Action: None.

File is not correct type.

Source: do _ change, do _ program, do _ screen

Cause: User attempted to "Change/Edit" a file or "Program" a radio with a file which is not a personality file for this radio/program.

User Action: None.

Frequency out of range or invalid.

Source: validate _ freq

Cause: The specified frequency is either less than 806.0125 MHz, greater than 825.9875 MHz, or not evenly divisible by 12.5 KHz.

User Action: Correct the specified frequency.

Frequency set does not exist.

Source: validate _ d _ name, validate _ e _ name

Cause: User entered a frequency set name which does not correspond to an element in the frequency set.

User Action: Enter a valid frequency set name.

Frequency set in use, cannot delete.

Source: delete _ fset

Cause: The user attempted to delete a frequency set that is referenced as either a decode or an encode frequency set in a programmed area.

User Action: None.

Frequency set in use. Cannot modify name.

Source: validate _ freq _ name

Cause: The frequency set is referenced as either a decode or encode frequency set in a programmed area.

User Action: Either delete the reference to the specified frequency set and change the name or do not attempt to modify the name.

Frequency set name already in use.

Source: validate _ freq _ name

Cause: The specified frequency set name has already been used in this personality.

User Action: Enter a different name or modify the prior reference.

Frequency used before.

Source: validate _ freq

Cause: The specified frequency has previously been entered in this frequency set.

User Action: Change the specified frequency.

GE-MARC V collect tone length out of range.

Source: validate _ gmv _ len

Cause: The user attempted to program the collect tone to either less than 5 or greater than 20.

User Action: Enter a value between 5 and 20 inclusive.

Help environment variable not set.

Source: do _ screen

Cause: The environment variable specifying the path to the help files is not set. This variable is set in TMX.BAT. If the user boots up the executable directly (tm), then this variable is not set.

User Action: Boot up program by typing 8712.

Incorrect radio type.

Source: read _ radio _ into _ buffer,
write _ buffer _ to _ radio

Cause: The radio ID byte in the personality prom indicates the radio is not a TMX 8712.

User Action: None.

Individual Decode or Special Call must be specified.

Source: validate _ duplen

Cause: The user answered 'YES' to 'Duplex Enable' with no special call or individual decode call tone set specified.

User Action: Either specify a special call tone set or an individual decode tone set or answer 'NO' to 'Duplex Enable'.

Insufficient ROM to store personality. Delete some data.

Source: calc _ pers _ size

Cause: The personality, as specified, would result in a hex file larger than 2048 bytes.

User Action: Delete data until the message no longer appears when trying to exit the current screen.

Invalid CCT value.

Source: validate _ cct

Cause: The user entered a carrier control timer value which is either greater than 7.5 or not evenly divisible by .5.

User Action: Correct the value.

Invalid extension specified.

Source: change _ extension

Cause: The specified extension contained invalid characters (e.g. any non-alphanumeric character).

User Action: Correct the extension.

Invalid frequency set name.

Source: validate _ freq _ name

Cause: No frequency set name was entered.

User Action: Enter a valid frequency set name.

Invalid number of tones in set.

Source: validate _ tone

Cause: User attempted to create either a 1-tone or 3-tone tone set.

User Action: Enter either 2 or 4 tones.

Invalid port entered.

Source: check _ port

Cause: The user entered a serial port number other than 1 or 2.

User Action: Enter the correct port number.

Invalid tone.

Source: validate _ tone

Cause: User attempted to enter a 0 (in tone 1 or tone 2) or a value greater than 34.

User Action: Correct the tone.

Invalid tone set.

Source: valdidate _ tone

Cause: User attempted to create a 3-tone tone set.

User Action: Enter 2 or 4 tones.

Invalid tone set name.

Source: validate _ tone _ name

Cause: No tone set name was entered.

User Action: Enter a valid tone set name.

Maximum channels has been exceeded, delete some.

Source: check _ max _ channels

Cause: The user entered a combination of scan channels (number of frequencies in the decode frequency set plus the number of frequencies in each additional scan area) that exceeded 20.

User Action: Reduce the number of scanned channels to 20 or less.

Maximum frequency sets reached.

Source: new _ fset

Cause: The user attempted to create a '73rd' frequency set.

User Action: None.

Maximum tone sets reached.

Source: new _ tset

Cause: User attempted to create a '129th' tone set.

User Action: None.

Must enter frequency set name.

Source: validate _ d _ name, validate _ e _ name

Cause: User attempted to cursor past the frequency set field without entering a name.

User Action: Enter a valid frequency set name.

Must specify a file name.

Source: do _ read, do _ program, tmwrite (main), tmread (main)

Cause: The user attempted to read/write the radio without specifying a target file name.

User Action: Enter a valid MS-DOS file name.

Must specify valid MS-DOS file name.

Source: do _ read, do _ change, do _ program

Cause: The user entered an invalid file name.

User Action: Enter a valid MS-DOS file name.

Not a valid area.

Source: validate _ scan _ area

Cause: The user entered a name in the 'additional scan areas' field that did not refer to a valid area.

User Action: Enter a valid area name.

Not enough free memory to execute tmprint.

Source: do _ printer, do _ file, do _ screen

Cause: Not enough memory to spawn process.

User Action: Terminate all memory resident programs and restart TMX. If the problem still exists, the user's system does not have 512k memory.

Not enough free memory to execute tmread.

Source: do _ read

Cause: Not enough memory to spawn process.

User Action: Terminate all memory resident programs and restart TMX. If the problem still exists,the user's system does not have 512k memory.

Not enough free memory to execute tmwrite.

Source: do _ program

Cause: Not enough memory to spawn process.

User Action: Terminate all memory resident programs and restart TMX. If the problem still exists, the user's system does not have 512k memory.

Problem writing to radio.

Source: tmwrite (main)

Cause: This is a generic error message indicating an error occured while programming the radio.

User Action: None.

Read failed. Check connection.

Source: read _ radio _ g7

Cause: Fewer than the specified number of bytes were returned from the radio during the read operation.

User Action: Retry.

Tone set does not exist.

Source: validate _ group, validate _ s _ name, validate _ i _ name

Cause: The user entered a tone set name which does not correspond to a valid tone set.

User Action: Enter a valid tone set name.

Tone set in use, cannot delete.

Source: delete _ tset

Cause: User attempted to delete a tone set referenced as either a special call, individual decode, or a group decode tone set.

User Action: Either delete the reference to the tone set or do not delete the tone set.

Tone set in use, cannot modify name.

Source: validate _ tone _ name

Cause: The tone set is referenced as either a special call, individual decode, or group decode tone set and the name may not be modified.

User Action: Either delete the reference to the tone set and modify the name or do not attempt to modify the name.

Tone set name already in use.

Source: validate _ tone _ name

Cause: The specified tone set name has already been used in this personality.

User Action: Enter a different name or modify the prior reference.

Two successive tones of same value.

Source: validate _ tone

Cause: The user entered two tones of the same value in a row.

User Action: Correct the specified tone.

MAKING A WORKING COPY

The **TMX 8712** Programmer software can be installed on a fixed drive or the diskettes provided with the Programmer can be used to run the program.

The Dual Diskette System

If you have identified your system to be the two diskette system, that is, it provides for two diskette drives, then you want to be familiar with the procedures.

To make a working copy of **TMX 8712** PC Programming Software you need your DOS diskette, two blank diskette and your **TMX 8712** original **Setup & Helps** and **Program** diskettes.

First, insert your DOS diskette into drive A and turn the power on. If the power is on then follow the procedures to boot your particular personal computer system.

Insert your blank working copy diskette into drive B. When the A prompt appears on the screen, type

FORMAT B:

and then press <**Enter**>

You are then prompted to press any key. So, simply press any letter on the keyboard.

At this point, DOS formats the blank working copy. Various types of information pertaining to the operation appears on the screen relevant to the operation being executed. You are not required to initiate any action until the format sequence has been completed. When the personal computer system has completed the format for your files, it queries if you wish to format another. At this time you may wish to format a disk for your backup. If you do, type in the letter **Y**. If you don't, type the letter **N**.

If you type in the letter **Y** press <**Enter**>, you will be prompted to enter the second blank diskette and press <**Enter**>. Do so at the prompt. When the second diskette is complete, press **N** to stop the format process.

You may now remove the DOS diskette from Drive A and insert the original **TMX 8712** System diskette into Drive A. The blank working copy diskette remains in Drive B now contains DOS and has been formatted to accept the **TMX 8712** Radio program. **A>** now appears. Your next step is to type:

DISKCOPY A: B:

then press <**Enter**>

The personal computer system reacts by copying all files from **TMX 8712** PC Programming Software **Setup & Helps** Diskette to the working copy diskette in Drive B. Upon completion, remove the TMX 8712 Utility diskette from Drive A and store it in a safe place.

Repeat the same process with the **TMX 8712** software Program diskette.

The Fixed Or Hard Disk System

If you are operating with a fixed or hard disk system, a drive enclosed within the framework of the personal computer, then your actions are a little simpler than using systems with one or two floppy disk drives.

The software installation is accomplished by inserting the SETUP & HELPS diskette in floppy drive A and at the A:\ prompt, type:

INSTALL <Enter>

This file will complete the installation for you. It will create all the necessary subdirectories for you and copy all the necessary files. Follow the directions provided on the screen with the second diskette labelled PROGRAM.

Once both diskettes have been installed you may remove them from the disk drive and store them in a secure place. Your working copy is now held on the fixed or hard disk drive, ready for you to call up at any time.

To invoke the program, at the C:\ prompt, type:

8712 <Enter>