Model TQ3342 V2

ERICSSON

Mobile Communications
PC Programming

MLS

For
IBM PC/XT
Or True PC Compatible

Programming Guide

PERSONAL COMPUTER PROGRAMMING

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INTRODUCTION

Ericsson GE Mobile Communications Inc. welcomes you to the world of mobile communications. We believe there is no equal to our products and have made a commitment to our customers to ensure that product satisfaction and reliable service is our number one priority.

Quality built and dependable, MLS radios are designed with your radio needs in mind. The MLS Radio is a lightweight unit designed to give you exceptional performance. Whether you are defining two, eight, or up to sixteen channels, the MLS radio offers an unparalleled level of flexibility and user friendliness.

To support you in programming the MLS radio, this manual will cover:

- the steps necessary to install the program,
- the procedures to actually program the personality,
- answers to some of your questions.

If you are a technician experienced in programming radios or a first time radio programmer, this manual has been written to give you a clear and concise understanding of the MLS radio.

CHAPTER 1
BEFORE YOU BEGIN

ABOUT THIS MANUAL

Specifically, this manual is designed to present you with all the necessary information required to connect the MLS radio to the computer and run the programming software.

Chapter 1 - provides you with some basic information you will need to know prior to running the software. It explains how to use the work sheets, keyboard layout, commonly used terms and screen/window functionality.

Chapter 2 - contains a list of the contents of this package and instructions for installing the MLS Radio.

Chapter 3 - is a short tutorial that will lead you through the basic operation of the MLS programmer. If you are not familiar with programming procedures it is recommended that you take the time to complete the tutorial.

Chapter 4 - will instruct you in the creation of an MLS Radio personality. The purpose of each screen/window is discussed in detail and what is required so that your radio will operate the way you want it to.

Chapter 5 - supplies file management information such as changing directories, changing file extensions, and deleting files.

Chapter 6 - is devoted to problem solving. It identifies the error messages that you will encounter and provides solutions and alternatives.

Appendices - The Appendices follow Chapter 6 and contain the following reference materials:

A. Terms - Definitions of frequently used words.

B. Function Keys - A listing of function keys you will run across and a definition of what function they will perform.

C. Acceptable Values - The range of values the programmer will accept for a specific field.

D. Primary & Equivalent Digital Codes - A table indicating usable Digital Channel Guard codes.

E. Channel Guard Tone Frequencies - A table indicating standard EIA Channel Guard tone frequencies.

F. Work Sheets - Prepared forms to assist you in organizing your thoughts prior to entering the data in the program.

Screen diagrams are used throughout this manual to help clarify section discussions. Each item being discussed is denoted by a number for easy identification.

Please pay particular attention to NOTES as they contain pertinent information that you should be aware of.

IMPORTANT TERMS

Default Value - The MLS radio software provides predetermined (default) values in a majority of the data entry fields within the program. Exceptions to this rule are fields requiring variable names, 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 Messages - Each time data is entered in the program a validity check is made to ensure that reasonable values were entered. In the event that the data does not fall within the acceptable range of values, an error message will be displayed in the center of the screen indicating non acceptance.

Field - Refers to the area of the screen/window which allows data entry. This area is readily identifiable by a reverse video bar when moving the cursor across the screen.

Help - Throughout the MLS radio software, Help denotes or refers to on-line assistance. This can be accessed by pressing the **F9 Help** key from any field.

Personality - Used generically to refer to information that is stored in the radio that makes one radio perform differently from all other radios. That

information can be created, deleted, or modified and stored on a disk for later reference.

Prompt Line - Assistance text located on the last line of the window. This line provides directions for entering data and changes when moving from field to field.

HOW TO USE WORK SHEETS

Work sheets can be found in Appendix F. They are pre-printed forms to assist you in organizing personality information prior to going to the computer. You are encouraged to make copies of these work sheets and fill them in before programming begins. Doing so can prevent costly and time consuming mistakes and can be used for future reference. Empty blocks in the work sheets are provided for you to fill in the desired values. Blocks with information already typed in represent toggle fields in the program where the appropriate response should be circled.

MLS Personality Data - Work Sheet A in the Work Sheet Folder. This work sheet will assist you in defining the radio personality. You should indicate the frequencies, Channel Guards, preference for squelch tail elimination (either transmit or receive) and preference for using the carrier control timer for each channel.

Radio/Scan Options or Radio Options - Work Sheet B in the Work Sheet Folder. This work sheet allows you to define radio options for the MLS radio.

HOW SCREENS WORK

Each screen is divided into three areas: (1) screen title, (2) screen windows, and (3) active function keys. The title tells you where you are in the program hierarchy. Screen windows provide for input of data to the screen. Active function keys provide access to commands (or actions) available within that screen. The function key commands are labeled along the bottom of the screen. Only the function keys with labels are enabled in a given screen or window.

A window is a 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.

There are two types of windows: active and passive. The active window is available for data entry or revision and can be identified by its highlighted borders. The passive window is displayed but is unavailable for program execution. 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: (1) window title, (2) work area, and (3) 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 action to be taken in the work area.

This program uses a series of presentation screens to guide you easily through the programming of a radio. There are two major categories of data entry screens:

- Current Personalities Screen
- MLS Personality Screen

Current Personalities Screen - The Current Personalities Screen lists the file names of all stored radio personalities presently maintained in this special directory. From this screen you can create a new personality (file) or make changes to existing personalities. You then have the option of initiating one of the actions indicated by the function keys at the bottom of the screen.

MLS Personality Screen - Data defining the radio personality is entered into the MLS Personality Screen which can be accessed from the Current Personalities Screen by pressing **F2 Change** or **F4 New**. Within this screen you can define the operational characteristics of the unit.

SCREEN/WINDOW LAYOUT

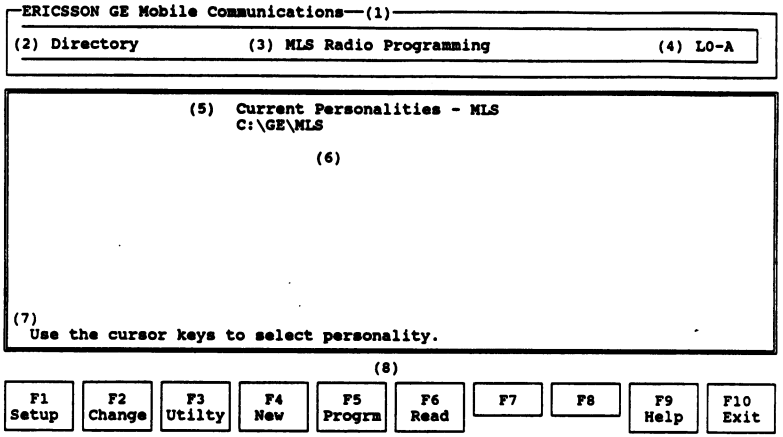


Figure 1-1 - Screen/Window Layout

(1)	Division	- indicates company division
(2)	Function	- indicates current function
(3)	Product Title	- identifies product
(4)	Level Indicator	- screen/window location in software
(5)	Title	- screen/window title
(6)	Work Area	- screen/window field area
(7)	Prompt Line	- current field instruction line
(8)	Function Keys	- supplies programming options

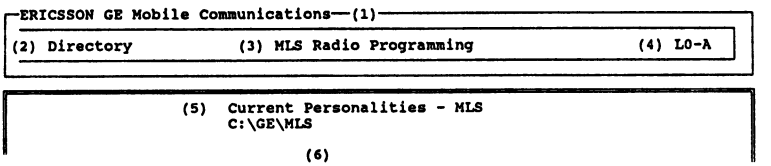
All screens and windows will have some basic fields that are consistent throughout this document. The overall layout will be the same as shown in Figure 1-1.

Division (1) The **Company** field indicates the MLS radio manufacturer.

This is a "Display Only" field which is always displayed at the top of the screen.

Function (2) The **Function** field is used to indicate which programming function is active.

This is a "Display Only" field which indicates the particular function of programming of a screen/window.



Product Title (3) The **Product Title** field is used to specify the product name and will identify which radio the programmer is intended to be used with.

This is a "Display Only" field which is always displayed in the screen title.

Level Indicator (4) The **Level Indicator** field is used to indicate the screen/window location in the program.

This is a "Display Only" field indicating the particular window level in the program.

Window Title (5) The **Window Title** field is used to indicate the title of a particular screen/window.

This is a "Display Only" field consistently displayed at the top of each window. This field will vary to indicate which window is being displayed.

Work Area (6) The **Work Area** is the area of a screen or window where input fields are defined. Each window is unique in its available fields and each of these fields are identified in the window descriptions.

Entry to these fields will be determined by the purpose and content of each window. In most windows you can move between fields by using the arrowed cursor keys, **Home** and **End** keys, **Tab** and **<enter>** keys. Within a field you can use the arrowed cursor keys, space bar, **Delete**, **Backspace**, **Control Backspace**, and alphanumeric keyboard keys. Sometimes, the field will be toggle only where the **Tab** key is the only active key in the field and the **<enter>** key will move you between

fields. Usually, normal cursor progression is left to right, top to bottom.

NOTE

Throughout this document, the terms screen and window are used interchangeably.

Prompt Line (7) The **Prompt Line** field is used to instruct you in field definition for specific fields.

This is a "Display Only" field, displayed at the bottom of a window. As you move from field to field, the prompt line will direct you for input in the particular field.

Function Keys (8) The **Function Keys** are used to provide access to other options pertaining to the screen/window currently being displayed.

Pressing the desired function key will cause the program to perform the indicated function for that particular key. Following each window definition is a brief description of the operational function keys.

Occasionally, a screen or window will have subordinate windows that perform functions relating to them. These windows will be smaller in size and are referred to as "pop-up windows". Figure 1-2 illustrates a "pop-up" window overlaying a main screen. The highlighted border identifies the "pop-up" window as being active and all data entry/acceptance occurs within this window. Pressing **F10 Back** will always return you to the original window.

Please notice that the "pop-up" window is smaller in size than the regular window. The overall layout is still the same with the title at the top center of the screen and the prompt line at the bottom of the screen (when appropriate). The active function keys will continue to be listed below the window. When the "pop-up" window requests an action that will change the data base on disk, a continue prompt will appear requesting selection of a function key option.

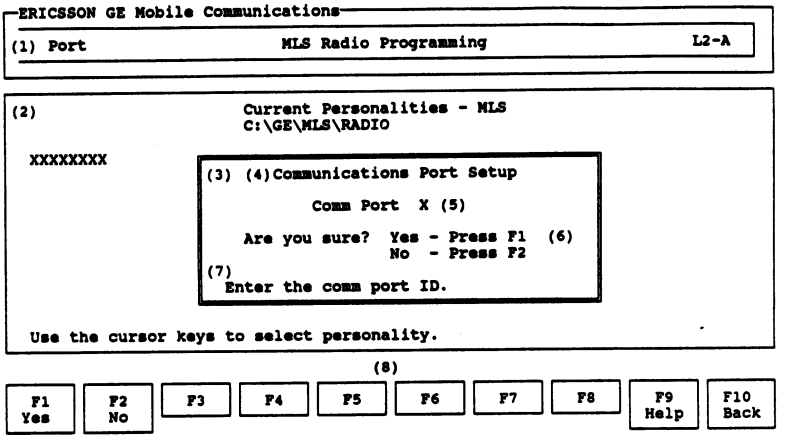


Figure 1-2 - "Pop-up" Window

(1) Function - indicates current function
(2) Main Screen - indicates the main screen
(3) "Pop-up" Window - indicates pop-up window
(4) Title - window title
(5) Work Area - area for specific field(s)
(6) Continue Prompt - continue or abort option
(7) Prompt Line - current field instruction line
(8) Function Keys - supplies programming options

Main Screen/ Window (2) The **Main Screen/Window** is shown as a backdrop to the preceding "pop-up" window.

To enter this screen, you must press the appropriate function key(s).

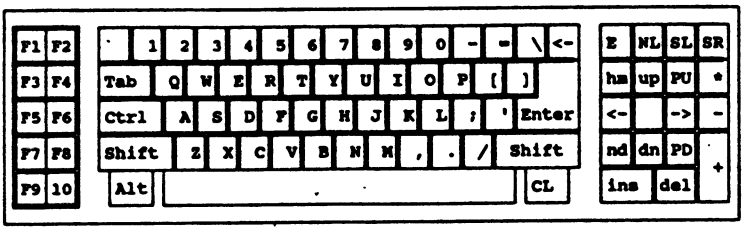
"Pop-up" Window (3) The **"Pop-Up" Window** is shown as the front window. This window is laid out the in the same manner as the main window. The title is displayed at the top, fields are in the center and where appropriate, the prompt line is displayed in the lower left corner.

Access is granted in this window as it is active.

Continue Prompt (6) The **Continue Prompt** field is used to indicate whether or not you want to continue with the selected field selection.

By pressing **F1 Yes**, the field selection will be confirmed and the programmer will continue with the operation selected. Selecting **F2 No** indicates that the operation should not be performed and will return you to the previous window.

USING THE KEYBOARD

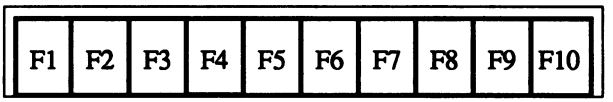


It is important that you be familiar with the keyboard of your computer system. Each keyboard is different in relation to the placement of some of the keys. In the PC Programming Software package there are categories of operational keys:

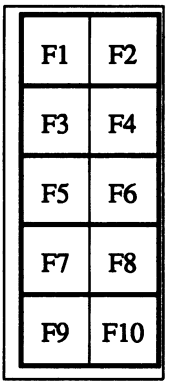
- Function
- Character
- Editing
- Movement
- Special Usage

The following sections give an overview of which keys are included in these categories and their functions. However, in some screens, such as the Current Personalities Screen, only the use of cursor keys is allowed because selection operation is all that is needed.

Function Keys



OR:



The purpose of a particular function key is dependent upon the screen or window that is currently highlighted at any given point in the program. In other words, a function key may be labeled differently from one screen or window to the next. Be sure that you fully understand the purpose for any function key prior to pressing it.

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 execution of a given screen and are not labeled on the screen.

Active function keys, on the other hand, are labeled. By pressing a specific function, the software executes the action delegated to that particular key.

The function keys are alphanumerically labeled F1 - F10. These keys will perform specific functions, depending upon which screen/window they appear in. The following Function Key Table represents their functionality in the MLS PC Programming Software.

FUNCTION KEY TABLE

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
A	Setup	Change	Utilty	New	Progrm	Read			Help	Exit
B	Port		Dir		Delete	Print	Ext		Help	Back
C	Switch								Help	Back
D				Test			Option		Help	Back
E	Yes	No							Help	Back
F									Help	Back

A. Current Personalities Screen

B. Utility Window

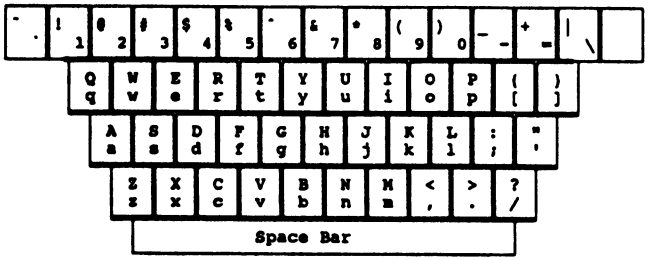
C. Channels Window and Frequency Range Window

D. MLS Personality Screen

E. Change/edit File Window, Communications Port Window, Change Directory Window, Delete Personality Window, Print Personality to Printer/Screen/File Window, Change Extension Window, Save Personality Window, Program Radio Window, and Read Radio into the File Window

F. Text Window, Radio/Scan Options Window

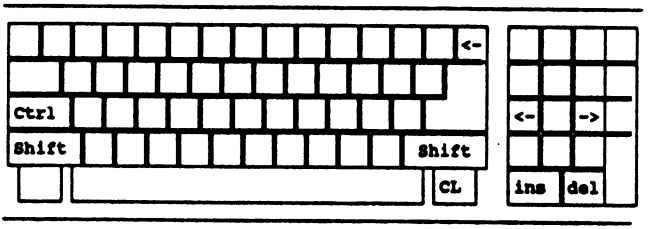
Character Keys



Character keys are used to enter data into a field. When pressed, the software inserts that character in the field position designated by the cursor and then advances to the next available character position. Character keys for the purposes of this PC Programming Software package are:

- Alphabetic: (a - z) and (A - Z)
- Numeric: (0 - 9)
- Special Characters ~ ‘ ’ " , . ? ! ; : @ # $ % ^ & * | - + = < > { } [ ] ( ) \ /
- Space Bar

Editing Keys



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

Left and Right Arrows: Each time one of these arrows is pressed it moves the cursor one character to the left or right until the left or 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.

Delete: This key enables you to delete a character or a string of characters.

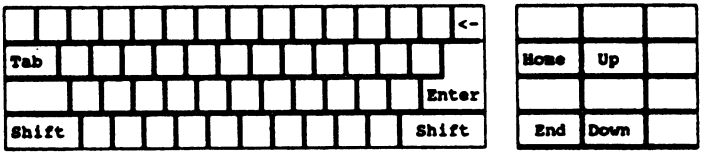
Shift/Caps Lock: Enabled, the Shift and Caps Lock key writes all alphabetic characters in capitalized letters.

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 characters to the left of the cursor are deleted and then all characters opposing the deletion are moved right or left to fill the space.

Movement Keys



These keys enable the 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 next field.

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

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

Home: Moves the cursor to the first field in the window.

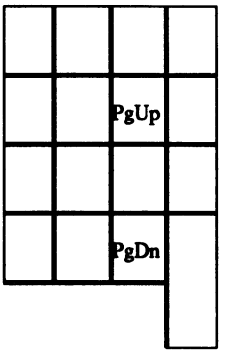
End: Moves the cursor to the final field in the window.

Tab: Toggles a predetermined field between selections such as a Yes or No response. May also move the cursor into the next field.

Shift-Tab: Like the Tab key, the Shift-Tab (or Back-Tab) toggles a predetermined field between selections only in the opposite direction.

Delete: Erases or deletes the character the cursor is presently on.

Special Usage Keys



There are two keys that are represented in this category:

Page Up (**Pg Up**): Is used to return you to the previous page in the MLS Personality Screen and some of the Help Windows. This key causes the screen/window to advance one page at a time until the beginning page is presented.

Page Down (**Pg Dn**): Is used to advance you to the following page in the MLS Personality Screen, and in some of the Help Windows. This key causes the screen to retreat one page at a time until the last page is reached.

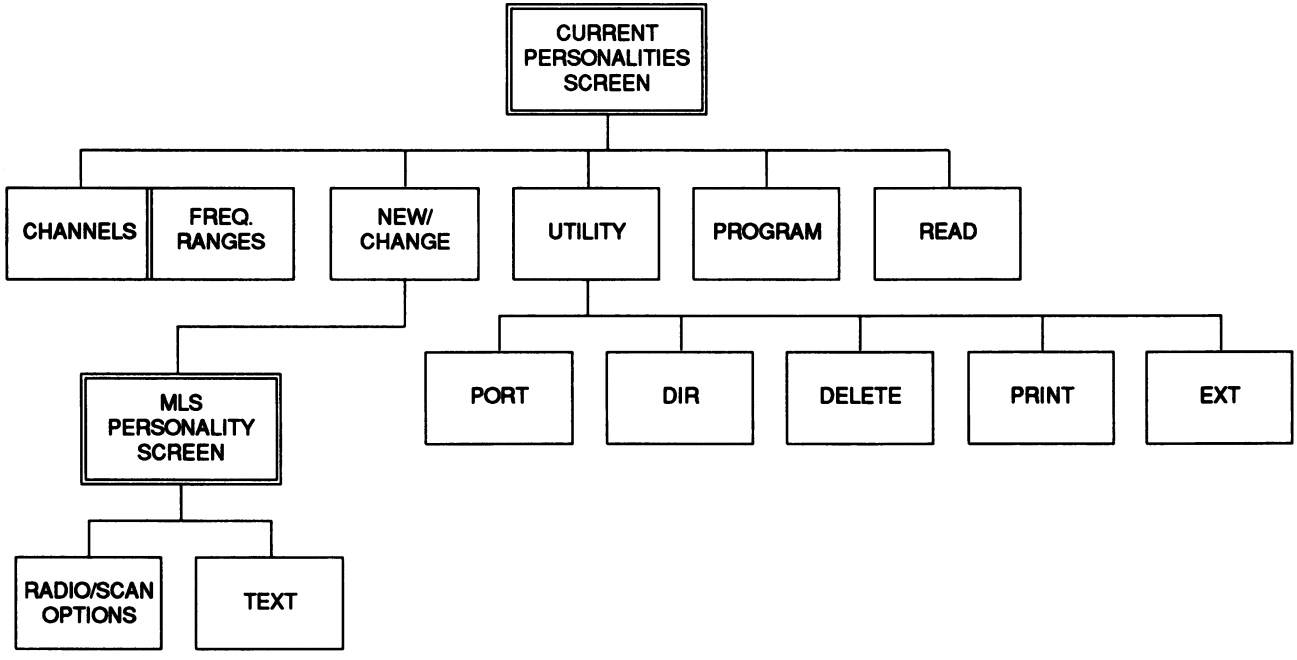


Figure 1-3 - MLS PC Programming User Interface Flow Chart

CHAPTER 2
INSTALLATION

UNPACKING

Upon unpacking this package you should be sure you have received the following:

MLS Programming Software (TQ-3342), to include:
Two double-sided, double-density 5-1/4 inch diskettes, (labeled "Program Disk #1 and Program Disk #2").
Or, one 3-1/2 inch diskette.

PC PROGRAMMING SOFTWARE REQUIREMENTS

The following hardware and software is required to program the MLS radio:

A. IBM PC/XT/AT or any true compatible with MS-DOS version 3.0 or later, and having the following minimum configuration:

1. Two Disk Drives, either dual flexible (floppy) or a single floppy with 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 (TQ-3310) and RS-232 Cable (19B235027P1).

C. Radio Programming Cable (TQ-3343).

D. MLS (TQ-3342) Radio Programming Software.

E. Printer (optional, but recommended).

DISKETTE HANDLING

While working with your diskettes you may want to consider the following handling procedures:

- Always store your diskettes in their envelope.
- Insert diskettes into the drive carefully.
- Use only felt tipped pens to write on diskette labels.
- Store your diskettes at a comfortable room temperature.
- Refrain from touching the recording surface.
- Do not bend the diskettes.
- Do not allow any form of liquid to come in contact with the diskette surface.
- Keep diskettes away from magnetic force fields as found in electronic equipment.

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

Making Backups

The PC Programming Software is provided to you on two double-sided double-density 5-1/4 inch diskettes, labeled "Program Disk #1" and "Program Disk #2". These diskettes are very sensitive and fragile and, therefore, should be handled with care and stored in a secure area. A 3-1/2 inch diskette is also provided in this package.

We recommend that, upon receipt of your diskettes, you copy the original PC Programming Software diskettes to other diskettes or a fixed disk and store the originals in a safe place. This ensures the availability of an accurate program should a copy fail during program applications.

NOTE

It is important to use the Diskcopy command when making backups and not the Copy or Xcopy command. Each diskette contains a volume label that is required for the installation process. Copy and Xcopy do not copy volume labels so please refrain from using these commands.

SYSTEM HOOK-UP

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

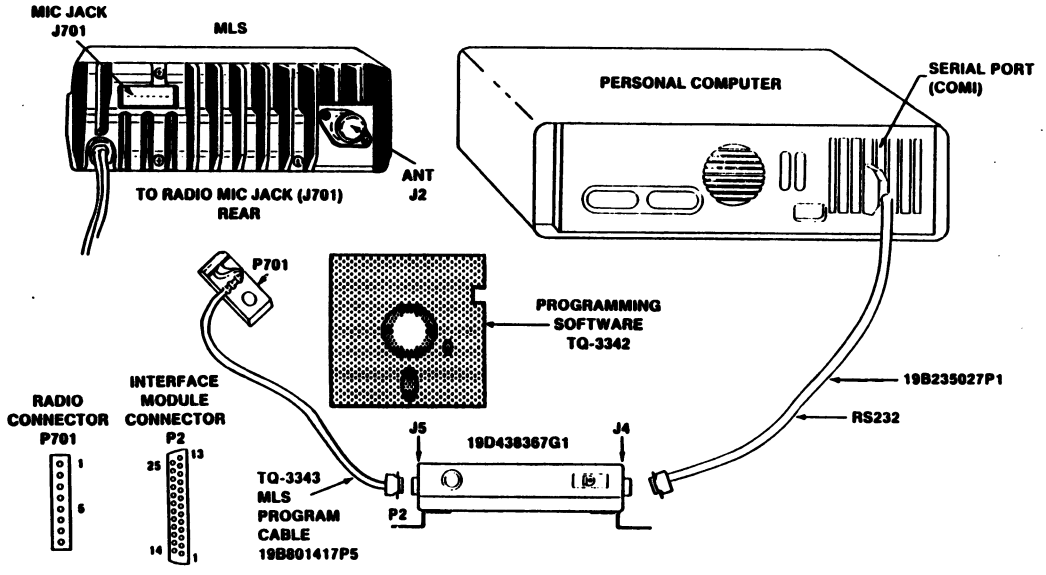
If your system is already established, check to see that you have all the equipment necessary to execute the program. Isolate all cables connecting computer to devices to prevent tangling, interference and damage.

Step One:

Refer to Figure 2-1, Programming System Hook-Up, and then look at your computer to locate a serial port. This port will usually be located at the rear of the computer. However, since this is dependent upon the design of your computer refer to the computer 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 lap-top computers). The PC 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 your local computer dealer.

Please note at this point that the MLS PC Programming Software only communicates with the radio and its interface on the serial port designated as 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 carefully into the appropriate serial port on the computer.



CONNECTION CHART FOR TQ-3343		
WIRE COLOR	FROM	TO
YELLOW	P2-6	P701-6
WHITE	P2-9	P2-13
BLACK	P2-11	P701-7
RED	P2-12	P701-2
VIOLET	P2-25	P701-5

Figure 2-1 - Programming System Hook-Up

Step Two:

The other end of the RS-232 cable should now be connected into the computer receptacle on the PC Interface Module. Check carefully to ensure that plugs are fully seated in the receptacle and, if retaining screws are included, that they are carefully tightened to firmly hold the plug in place. Should the plug not seat correctly to its receptacle, remove the plug and examine the pins to determine if the proper plug was inserted and to determine if pins are aligned and undamaged. Damaged pins and broken connections will cause the PC Programming Software to fail.

Step Three:

Position your MLS radio on your work area in a convenient place. In order to program the unit, you must connect the radio to a DC power supply. Ensure that power is applied to the radio prior to attempting programming.

Connect the PC Programming Cable (TQ-3343) as depicted in Figure 2.1. The Programming Cable is inserted into the receptacle on the back of the radio. Again, you should ensure that the plug is fully seated in its receptacle.

LOADING THE SOFTWARE

The PC software can be installed on a fixed drive or run from floppy diskettes in a dual floppy drive configuration.

Software Installation

This section is for hard drive users only. If dual floppies are being used, skip this section and go on to "Program Entry".

5-1/4 Inch Diskettes:

When using 5-1/4 inch diskettes, the software installation is initiated by inserting Program Disk #1 in floppy drive A: and typing the following:

INSTALL <enter>

The screen in Figure 2-2, Software Installation Screen, will appear.

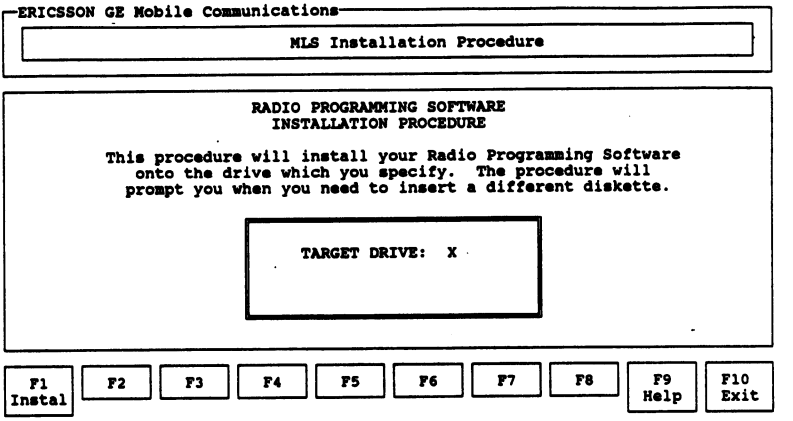


Figure 2-2 - Software Installation Screen

Enter the target drive and press **F1 Instal.** This will cause the program to copy the files from the distribution diskettes to your hard drive. The program will prompt you to remove the current disk and insert the next disk during the install routine.

3-1/2 Inch Diskette:

When using the 3-1/2 inch diskette the software installation is initiated by inserting the Program Disk in drive A: and typing the following:

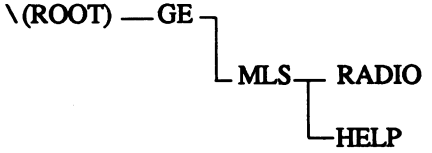
INSTALL <enter>

When the screen in Figure 2-2 appears, enter the target drive and press **F1 Instal.** This will cause the program to copy the files from the distribution diskette to your hard drive.

Program Entry

To help you manage your PC Programming Software, General Electric has created a directory structure, or filing system, for your programs. This filing system is created whenever any PC Programming Software is installed on your hard disk and also applies to floppy disk users.

When the MLS PC Programming Software is installed, a directory structure consisting of five subdirectories is created. This structure is represented graphically as follows:



The first directory created is the GE directory; the main directory under which all GE PC Programming Software will be stored. This directory will contain a batch file that is used to invoke the MLS software. From the GE directory, one subdirectory is created, (MLS). The MLS subdirectory contains all of the executable programs.

The PC programming software is distributed with a number of help files that reside in the Help directory and are used by the program whenever the **F9 Help** key is pressed. These files are only required to support the on-line help facility and may be removed if on-line help is no longer required. The final directory created is the radio directory. The purpose of this directory is to hold the personalities created during program operation.

Directories can be used very effectively in organizing your programming personalities. It is highly recommended that you familiarize yourself with directories. Refer to your DOS Users Manual for more information.

Hard Disk:

Once you have completed the installation procedure, the following steps may be taken to access the MLS PC Programming Software:

Type: **C: <enter>**	this step will ensure that the current drive is C:
Type: **cd\GE <enter>**	this step will ensure that the current path is the root directory
Type: **MLS <enter>**	

The MLS PC Programming Software is now loaded into memory and an introductory screen appears identifying the program.

Dual Floppy:

When the MLS PC Programming Software is used in a dual floppy configured computer, several additional steps are required before loading the software.

1. Insert the DOS disk in Drive A: and "boot" or turn on the system.

2. Place a blank diskette in Drive B: and format this diskette according to your DOS user's manual.

> **NOTE**
>
> The formatted disk in Drive B will become your data disk on which you will store the personality information and data for your unit.

3. At the prompt, type

   MD B:\GE <enter>

   MD B:\GE\MLS <enter>

   MD B:\GE\MLS\RADIO <enter>

4. Replace DOS disk in Drive A: with PC Programming Software disk labelled Program Disk #2.

5. At the prompt, type

   CD\GE\MLS\RADIO

   COPY *.MLS B:\GE\MLS\RADIO

This will transfer the sample radio personality files from the distribution disk to the data disk.

6. Replace Program Disk #2 in Drive A: with disk labelled Program Disk #1.

7. At the prompt type

A:	to ensure that the current drive is A:
cd\GE <enter>	to ensure the current path is the root directory
MLS_2F <enter>	to bring you into the introductory screen (Current Personalities Screen).

When the Current Personalities Screen appears, replace Program Disk #1 in drive A: with Program Disk #2.

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CHAPTER 3
GETTING STARTED

The following brief tutorial is designed to give you an understanding of how the program operates and to also give you some hands on experience before you begin actual programming. We encourage you to explore the program and view all screens and windows during this tutorial. If you need on-line assistance at any point in this program, press **F9 Help** and a help message for the field you are in will appear. You can also press **Shift F9** and a help message regarding the window you are in will appear.

Before you start the tutorial refer to your hardware setup and ensure that the radio has been set up according to the installation procedures in Chapter 2. Once installation has been completed follow the Program Entry steps. After you have typed in MLS and pressed **<enter>**, the Current Personalities Screen will appear. You are now ready to begin this tutorial.

When programming a radio, it is advised that you first fill out the necessary work sheets (located in Appendix F of this manual). These work sheets will assist you while you are programming the radio and serve as reference material should questions arise during radio operation. Work sheets for this tutorial have already been filled out and precede the window you will be working in. To become better acquainted with the work sheet/window layout, please reference the work sheets as you complete the tutorial.

From the Current Personalities Screen, press **F1 Setup**.

This will take you into the Channels Window. Before you can create a personality the number of channels the radio should have must be selected. For the purpose of this tutorial, we will demonstrate programming for a two channel radio.

Position your cursor on "2 Channel Radio" and press **F1 Switch**.

This will tell the programmer that a two channel radio is being programmed and will bring you into the Frequency Range Window located to the right of the Channels Window. This window allows you to

select the frequency range of the radio you are programming. For the purpose of this tutorial, we will use VHF frequency range 150 - 174.

Position your cursor on "VHF - 150 - 174" frequency range and press **F10 Back** to return to the Current Personalities Screen. Select **F4 New** and the MLS Personality Screen will appear.

Work Sheet A
MLS Personality

CHAN NO.	TRANSMIT FREQUENCY	RECEIVE FREQUENCY	TRANSMIT CHANNEL GUARD	RECEIVE CHANNEL GUARD	STE TX RX	CCT
1	154.000	154.200	123	123	(Y) (Y) N N	Y (N)
2	160.000	160.000	67.0	67.0	(Y) (Y) N N	(Y) N
					Y Y N N	Y N
					Y Y	Y

NUMBER OF CHANNELS 2

Once the MLS Personality work sheet has been filled out, you are ready to define the MLS Personality Screen. The first field to define will be the Transmit Frequency field.

Type **154** and press **<enter>.**

Notice that this field is automatically copied into the Receive Frequency field. However, you want the Receive Frequency to be different than the Transmit Frequency.

Press **Control Backspace** simultaneously to clear the field. Type **154.2.**

Now you can continue on into the Transmit Channel Guard field.

Press **<enter>. Type 123,** press **<enter>.**

The Transmit Channel Guard field is also copied automatically into the Receive Channel Guard field.

Since you want these two fields to be the same, press **<enter>.**

The STE field enables squelch tail elimination during radio transmission and reception when yes is indicated.

> Using the **Tab** key as a toggle switch, toggle the STE TX field to "**Y**". Press **<enter>**. Again using the **Tab** key as a toggle switch, select "**Y**" in the STE RX field. Press **<enter>**.

The CCT field enables the carrier control timer for the channel.

> Using the **Tab** key as a toggle switch, toggle the CCT field to "**N**". Press **<enter>**.

The first channel for the radio has been programmed. Using the work sheet you can now define channel two.

> Type **160** in the Transmit Frequency field. Press **<enter>**. Press **<enter>** again to continue into the Transmit Channel Guard Field. Type **67.0** and press **<enter>**. Press **<enter>** again to continue into the STE TX field. Use the **Tab** key to toggle and select "**Y**". Press **<enter>** to continue into the STE RX field. Use the **Tab** key to toggle and select "**Y**" in this field. Press **<enter>** to continue into the CCT field. Using the **Tab** key, select "**Y**" in this field.

The second channel for the radio has now been programmed. Because you selected "Y" in the CCT field you will now want to indicate the number of minutes before transmission is dropped.

> Select the **F7 Option** key.

This will bring you into the Radio/Scan Options Window. This window allows you to define carrier control time.

> Type **1.0**. Select **F10 Back** to return to the MLS Personality Screen.

Congratulations! You have completed defining a personality and are now ready to name and save that personality.

> Press **F10 Back**.

The Save Personality Window will appear. This window is where you name the personality and save it to disk.

Type **PERS1**. Select **F1 Yes**.

The new personality name will appear in the Current Personalities Screen.

The next step is to program the personality into the radio.

NOTE

Do not attempt the next sequence without ensuring that the Serial Programming Interface Module is properly connected. Failure to attach the Serial Programming Interface Module prior to a program or read operation may result in system lock-up. Should this occur, refer to Chapter 6 of this manual.

Select **F5 Progrm** and the Program Radio Window will appear. Select **F1 Yes**.

A message will appear on the screen indicating that the personality is being downloaded into the radio. The program operation is finished when the program window disappears from the screen.

Select **F6 Read** and type **PERS2**. Press **F1 Yes**.

The program will then handshake with the radio and read the personality out of the radio into the file PERS2. When the operation is finished the windows will disappear and the Current Personalities Screen will reappear showing newly created personalities PERS1 and PERS2.

You have now completed this tutorial. You can delete the personalities if you like or keep them in your program for future reference.

To delete a personality move cursor to the personality you want deleted. Select **F3 Utilty**, press **F5 Delete**, press **F1 Yes** and type **Y**.

The selected personality will be deleted from the disk and will no longer appear in the Current Personalities Screen.

CHAPTER 4
RUNNING THE PROGRAM

INITIALIZATION

Depending on its manufacturer, your personal computer will have certain unique operating characteristics which make it different from other computers of similar capability. For example, file names and file extensions must conform to the requirements of your disk operating system. We, therefore, recommend that you become fully conversant with your computer's disk operating system and its operating manual prior to beginning this program.

When you turn on your personal computer, it begins an initialization routine which every system must go through to prepare for operation. During the initialization of your system, the MS-DOS program is loaded into memory. Remember that MS-DOS is the interpreter between your keyboard actions and the capabilities of the PC Programming Software.

Once the PC is initialized and you have received the DOS prompt, you should type:

cd/GE <enter>

MLS <enter>

After a brief introductory screen the Current Personalities Screen will appear.

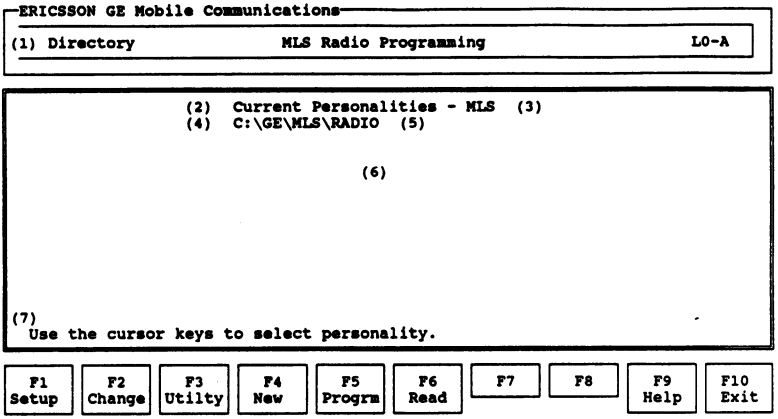


Figure 4-1 - Current Personalities Screen

(1)	Function	- indicates directory function
(2)	Screen Title	- current personalities screen
(3)	Default Extension	- designated default extension
(4)	Current Drive	- designated drive
(5)	Current Directory	- designated directory name
(6)	Personality Area	- personalities in current directory
(7)	Prompt Line	- current field instruction line

The Current Personalities Screen, shown in Figure 4-1, is the main screen for the MLS radio programmer. From this screen you will be able to create personalities, program personalities into the radio and read personalities out of the radio. To access a personality, move the cursor (reverse video bar) across the screen using the arrowed cursor keys. There is room available for up to 63 personalities on the screen. Once the screen is full additional personalities can be accessed by using the **Pg Dn** and **Pg Up** cursor keys.

NOTES

1) Throughout this document the term personality is used. Personality is used generically to refer to the information stored in one radio causing it to operate differently from another radio.

2) Whenever the program is initiated, the extension will default to the extension used when the program was last run. Only personalities with the extension identified are listed in this screen.

From the Current Personalities Screen, your options are:

F1 - Setup Select this option if you want to:
Select personality creation defaults.

F2 - Change Select this option if you want to:
Change or edit an existing personality.

F3 - Utilty Select this option if you want to:
Change communications port entry, change the directory, delete a personality, print a personality, or change the extension.

F4 - New Select this option if you want to:
Create a new personality.

F5 - Progrm Select this option if you want to:
Program a radio with the personality selected.

F6 - Read Select this option if you want to:
Read the personality out of the radio.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Exit Select this option if you want to:
Terminate the program and return to the control of DOS.

SETTING UP THE PROGRAM

To set up the program you will first need to select the F1 Setup key while in the Current Personalities Screen. The setup portion of this program consists of: The Channels Window and the Frequency Range Window.

The Channels Window allows you to select the number of channels your radio will have. The Frequency Range Window allows you to determine the band split default for a particular personality and will identify the appropriate frequency range during personality creation.

Once the channels and frequency range are established you can continue to create a personality by entering information into the MLS Personality Window and other appropriate windows.

Channels

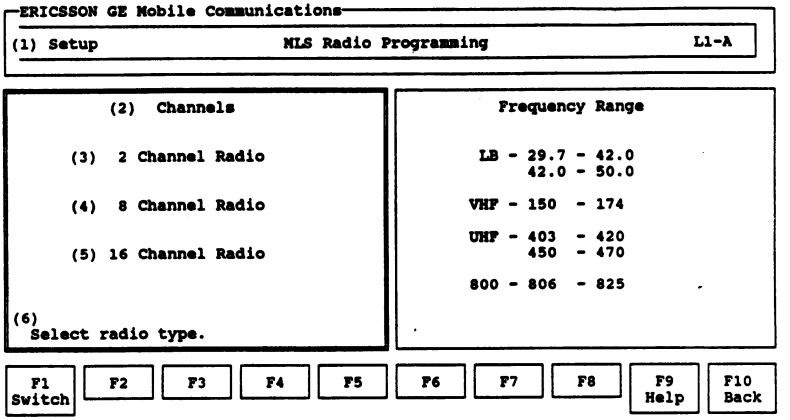


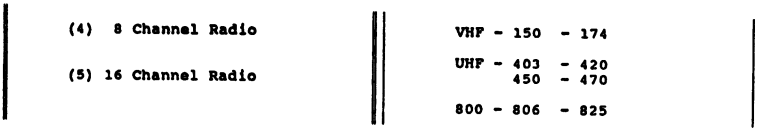
Figure 4-2 - Channels Window

(1) Function - indicates setup function
(2) Window Title - channels window
(3) 2 Channel Radio - indicates two channel radio
(4) 8 Channel Radio - indicates eight channel radio
(5) 16 Channel Radio - indicates sixteen channel radio
(6) Prompt Line - current field instruction line

The Channels Window, shown in Figure 4-2, is accessed by selecting **F1 Setup** while in the Current Personalities Screen. This window is used to select the default radio size to be created when the **F4 New** key is selected from the Current Personalities Screen. A selection here only applies to "new" personalities.

2 Channel Radio (3) The **2 Channel Radio** field indicates that the radio will default to two channels during personality creation.

Position the cursor (reverse video bar) on this selection and exit the window by pressing **F1 Switch** or **F10 Back**. The MLS two channel radio type will be saved to disk so that the program will remember it the next time it is initiated.



8 Channel Radio (4) The **8 Channel Radio** field indicates that the radio will default to eight channels during personality creation.

Position the cursor (reverse video bar) on this selection and exit the window by pressing **F1 Switch** or **F10 Back**. The MLS eight channel radio type will be saved to disk so that the program will remember it the next time it is initiated.

16 Channel Radio (5) The **16 Channel Radio** field indicates that the radio will default to 16 channels during personality creation.

Position the cursor (reverse video bar) on this selection and exit the window by pressing **F1 Switch** or **F10 Back**. The MLS 16 channel radio type will be saved to disk so that the program will remember it the next time it is initiated.

From the Channels Window, your options are:

F1 - Switch Select this option if you want to:
Change/select the default frequency range.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Current Personalities Screen.

Frequency Range

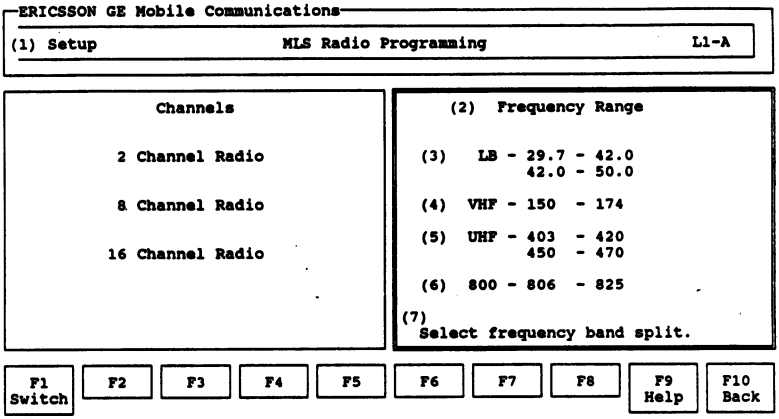


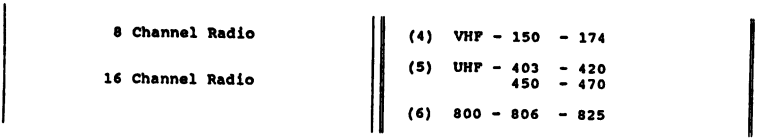
Figure 4-3 - Frequency Range Window

(1) Function - indicates setup function
(2) Window Title - frequency range window
(3) LB Frequency Range - indicates LB band split
(4) VHF Frequency Range - indicates VHF band split
(5) UHF Frequency Range - indicates UHF band splits
(6) 800 Frequency Range - indicates 800 band split
(7) Prompt Line - current field instruction line

The Frequency Range Window, shown in Figure 4-3, is accessed by pressing **F1 Switch** while in the Channels Window. This window is used to select the default band split that the programmer will use for channel data creation.

LB (3) The **LB** field indicates the default band split used for channel data creation in the LB range.

To specify a LB band split, use the cursor keys to move the highlighted video bar over the LB range desired. Select **F1 Switch** or **F10 Back**. This range will be saved to disk and remembered until changed.



VHF (4) The **VHF** field indicates the default band split used for channel data creation in the VHF range.

To specify a VHF band split, use the cursor keys to move the highlighted video bar over the VHF range. Select **F1 Switch** or **F10 Back**. This range will be saved to disk and remembered until changed.

UHF (5) The **UHF** field indicates the default band split used for channel data creation in the UHF range.

To specify a UHF band split, use the cursor keys to move the highlighted video bar over the UHF range desired. Select **F1 Switch** or **F10 Back**. This range will be saved to disk and remembered until changed.

800 (6) The **800** field indicates the default band split used for channel data creation in the 800 Mhz band split range.

To specify an 800 band split, use the cursor keys to move the highlighted video bar over the 800 range. Select **F1 Switch** or **F10 Back**. This range will be saved to disk and remembered until changed.

From the Frequency Range Window, your options are:

F1 - Switch Select this option if you want to:
Change the channel number selection.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Current Personalities Screen.

CREATE/CHANGE A PERSONALITY

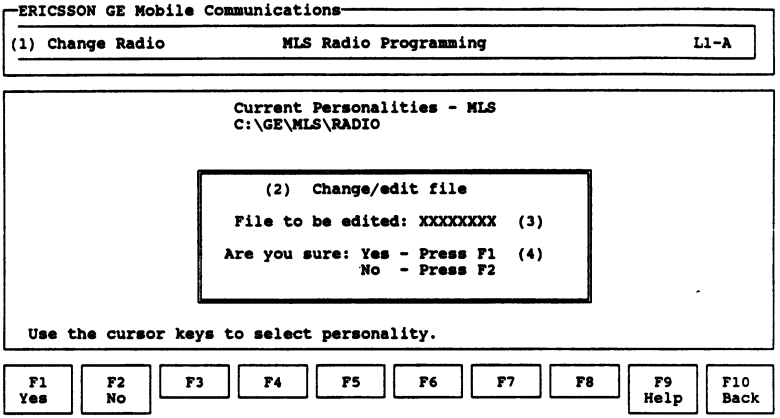


Figure 4-4 - Change Personality Window

(1) Function - indicates change radio function
(2) Window Title - change personality window
(3) Change/edit Field - personality to be edited
(4) Continue Prompt - continue or abort option

In order to create or change a personality you will need to access the MLS Personality Screen. After defining your setup functions, select **F4 New** from the Current Personalities Screen to create new personalities. If you select **F2 Change**, while in the Current Personalities Screen, the Change/edit File window, shown in Figure 4-5, will appear. This window enables you to select the personality you want to modify without cursoring through the Current Personalities Screen. Once the personality is entered, selecting **F1 Yes** allows access to the MLS Personality Window.

File to be Edited (3) The **File to be Edited** field identifies the personality to be changed.

Enter the personality you wish to edit. This field will accept up to eight valid characters in any alphanumeric combination. Alphabetic characters will automatically be converted to upper case. This field will not accept file names that are not acceptable to DOS.

Valid characters are A - Z, 0 - 9, or -.

From the Change/edit File Window, your options are:

F1 - Yes	Select this option if you want to: Change the personality selected.
F2 - No	Select this option if you want to: Discontinue with this procedure.
F9 - Help	Select this option if you want to: Receive further information pertaining to a field area.
F10 - Back	Select this option if you want to: Return to the Current Personalities Screen.

Defining the MLS Personality

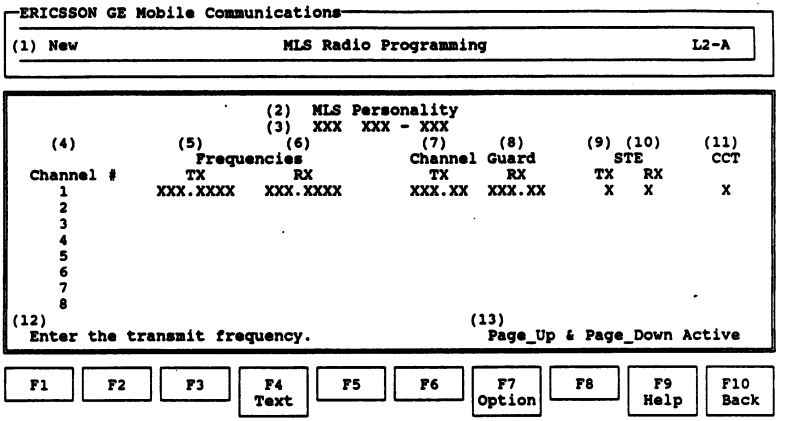
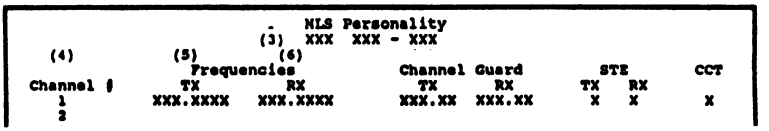


Figure 4-5 - MLS Personality Screen

(1) Function - indicates new function
(2) Window Title - MLS personality screen
(3) Band Split - indicates current band split
(4) Channel # - positional channel indicator
(5) Tx Frequency - defines channel transmit frequency
(6) Rx Frequency - defines channel receive frequency
(7) Tx Channel Guard - transmit Channel Guard for channel
(8) Rx Channel Guard - receive Channel Guard for channel
(9) STE TX - squelch tail elimination transmission
(10) STE RX - squelch tail elimination reception
(11) CCT - carrier control timer enable
(12) Prompt Line - current field instruction line
(13) Page Prompt - indicates Pg Up/Pg Dn function

The MLS Personality Screen, shown in Figure 4-6, is accessed by selecting **F2 Change** or **F4 New** from the Current Personalities Screen. This screen is the main data entry screen for defining a personality. A MLS personality consists of one or more channels (16 maximum), where each channel definition consists of a signalling scheme, channel guard specification and squelch tail elimination.

The screen will display up to eight channel definitions at a time. Additional channel definitions can be accessed by the **Pg Dn** and **Pg Up** keys. These keys are only active when the 16 channel radio is selected in the Channels Window.



Band Split (3) The **Frequency Set Band Split** field is used to indicate the frequency entries that will be acceptable in defining a personality.

This field is "Display Only" and cannot be accessed from this screen. The band split values should be entered in the Frequency Range Window before inputting data in this screen.

Channel (4) The **Channel Number** field identifies the numerical order of each channel within the current unit.

This field is "Display Only" and cannot be accessed. Up to eight channels can be displayed in the screen at one time, out of a maximum of 16. If there are eight or more channels, the **Pg Dn** and **Pg Up** keys become active allowing you access to other channels.

NOTE

The number of channels displayed are determined in the Channels Window in the setup portion of this program.

Tx Freq (5) The **Transmit Frequency** field is used to specify the channel transmit frequency. This value indicates the frequency the radio will transmit at while tuned to this channel.

Input the frequency the radio should transmit at while tuned to this channel. Only frequencies within the currently defined band split are acceptable as valid. When defining a new channel, the transmit frequency is copied over to the receive frequency as a default in the LB,

TX Freq Cont'd

(5) VHF, or UHF split. When working with frequencies in the 806 - 824 Mhz range, 45 Mhz is added to the value before copying it to the receive frequency side.

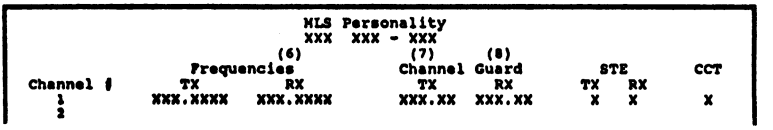
- LB frequencies must be evenly divisible by .005 (5 Khz).
- VHF frequencies must be evenly divisible by either .005 (5 Khz) or .00625 (6.25 Khz).
- UHF frequencies must be evenly divisible by .00625 (6.25 Khz).
- 800 band frequencies must be evenly divisible by .0125 (12.5 Khz). If the receive frequency is empty, the transmit frequency will be copied to the receive frequency. In the 806 - 824 range, 45 Mhz is added to the transmit frequency prior to copying it over to the receive frequency.

Rx Freq

(6) The **Receive Frequency** field is used to specify the channel receive frequency. This value indicates the frequency the radio will receive at while tuned to this channel.

Ensure that the receive frequency is stated correctly and falls within the currently defined band split. When defining a new channel, the receive frequency will be copied over from the transmit frequency as a default in the LB, VHF, or UHF split. When working with frequencies in the 806 - 824 Mhz range, 45 Mhz is added to the transmit value before copying it to this field.

- LB frequencies must be evenly divisible by .005 (5 Khz).
- VHF frequencies must be evenly divisible by either .005 (5 Khz) or .00625 (6.25 Khz).



RX Freq Cont'd (6)

- UHF frequencies must be evenly divisible by .00625 (6.25 Khz).
- 800 band frequencies must be evenly divisible by .0125 (12.5 Khz). If the receive frequency is empty, the transmit frequency will be copied to the receive frequency. In the 806 - 824 range, 45 Mhz is added to the transmit frequency prior to copying it over to the receive frequency.

Tx CG (7) The **Transmit Channel Guard** field is used to enter the transmit Channel Guard for this channel.

Enter the desired transmit Channel Guard code for this channel, or to specify no channel Guard, enter an "N", an "0", or leave the field blank. To enter a transmit Channel Guard Code, use either tone, Digital or Inverted Digital Channel Guards.

- Tone Channel Guards are identified by the placement of a decimal point within the field. For example: 67.0 identifies a tone Channel Guard of 67 Hz. Valid tone Channel Guards are in the range of 67.0 to 210.7 Hz and must be evenly divisible by .1. Pressing **Cntrl E** will expand the range to accept 50.0 to 255.0 and must also be evenly divisible by .1.
- Digital Channel Guards do not have a decimal point within the field. For example: 023, 047, 315, etc. When using a Digital Channel Guard, it must be included in the Digital Channel Guard Table shown in Appendix D.

TX CG Cont'd (7)

- Inverted Digital Channel Guard codes do not have a decimal point within the field but are preceded by an I. For example: I023, I047, I315, etc. When using an Inverted Digital Channel Guard, the Digital Channel Guard must be included in the Digital Channel Guard Table shown in Appendix D.

When the transmit Channel Guard is entered, it is automatically copied to the receive Channel Guard providing it has not previously been defined.

Rx CG (8) The **Receive Channel Guard** field is used to enter the receive Channel Guard for this channel.

Ensure the receive Channel Guard is stated correctly or enter the desired receive Channel Guard for this channel, or to specify no channel Guard, enter an "N", an "0", or leave the field blank. To enter a transmit Channel Guard Code, use either tone, Digital or Inverted Digital Channel Guard codes.

- Tone Channel Guards are identified by the placement of a decimal point within the field. For example: 67.0 identifies a tone Channel Guard of 67 Hz. Valid tone Channel Guards are in the range of 67.0 to 210.7 Hz. Pressing **Cntrl E** will expand the range to accept 50.0 to 255.0 and must also be evenly divisible by .1.

- Digital Channel Guards do not have a decimal point within the field. For example: 023, 047, 315, etc. When using a Digital Channel Guard, it must be included in the Digital Channel Guard Table shown in Appendix D.

```
                           MLS Personality
                           XXX  XXX - XXX
                                                 (8)        (9) (10)     (11)
                  Frequencies               Channel Guard       STE       CCT
Channel #          TX          RX             TX      RX      TX   RX
    1           XXX.XXXX    XXX.XXXX        XXX.XX  XXX.XX     X    X       X
    2
```

RX CG Cont'd

(8) • Inverted Digital Channel Guard codes do not have a decimal point within the field but are preceded by an I. For example: I023, I047, I315, etc. When using an Inverted Digital Channel Guard, the Digital Channel Guard must be included in the Digital Channel Guard Table shown in Appendix D.

When the transmit Channel Guard is entered, it is automatically copied to the receive Channel Guard.

TX STE

(9) The **Transmit Squelch Tail Elimination** field is used to indicate whether or not squelch tail elimination should be enabled when the radio is set to this channel and is transmitting.

Using the **Tab** key as a toggle switch, select between "Y" and "N" values. Selecting "Y" indicates that squelch tail elimination will be enabled when the radio is set to this channel and is transmitting.

NOTE

> Channel Guard must be programmed on this channel in order for squelch tail elimination to function.

RX STE

(10) The **Receive Squelch Tail Elimination** field is used to indicate whether or not squelch tail elimination should be enabled when the radio is set to this channel and is receiving.

Using the **Tab** key as a toggle switch, select between "Y" and "N" values. Selecting "Y" indicates that squelch tail elimination will be

RX STE Cont'd (10) enabled when the radio is set to this channel and is receiving.

NOTE

Channel Guard must be programmed on this channel in order for squelch tail elimination to function.

CCT (11) The **Carrier Control Timer** field is used to indicate whether or not the carrier control timer should be enabled for this channel.

Using the **Tab** key as a toggle switch, select between "Y" and "N" values. Selecting "Y" will enable the carrier control timer for this channel. The timeout period can be defined in the Radio/Scan Options Window. Selecting "N" indicates there will be no carrier control time.

From the MLS Personality Screen, your options are:

F4 - Text Select this option if you want to:
Enter textual information pertaining to the personality.

F7 - Option Select this option if you want to:
Define the radio options.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Current Personalities Screen.

Radio/Scan Options for Two Channel Radios

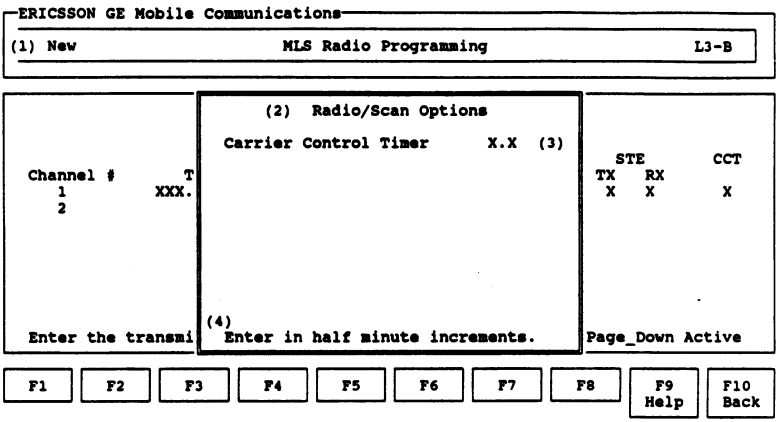


Figure 4-6 - Radio/Scan Options Window For Two Channel Radios

(1) Function - indicates new function
(2) Window Title - radio/scan options window
(3) Carrier Control Timer - indicates carrier control time period
(4) Prompt Line - current field instruction line

The Radio/Scan Options Window, shown in Figure 4-6, is accessed by selecting **F7 Option** while in the MLS Personality Screen. This window is used to define specific options associated with two channel MLS radios.

CCT (3) The **Carrier Control Timer** field is used to indicate the amount of time before the carrier control timer will drop a transmission. The carrier control timer ensures that the radio will not continuously transmit over a specific amount of time.

Enter a value between 0.5 minutes to 7.5 minutes in .5 minute increments. This value will cause the radio to automatically stop transmitting if the transmission period exceeds the period specified. To disable the carrier control timer, enter 0.

From the Radio/Scan Options Window, your options are:

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the MLS Personality Screen.

Radio/Scan Options for 8 or 16 Channel Radios

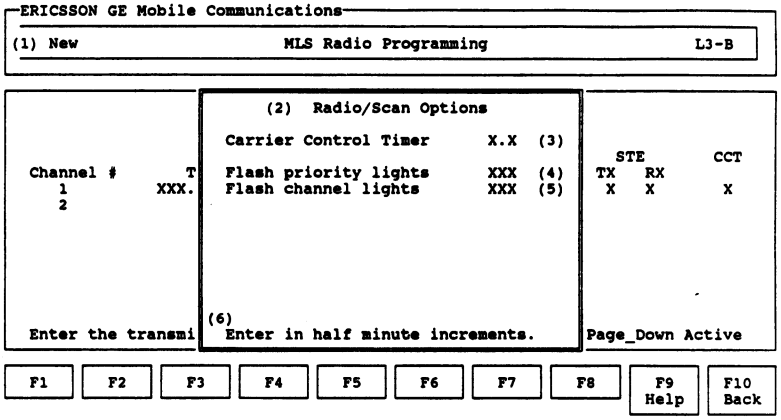
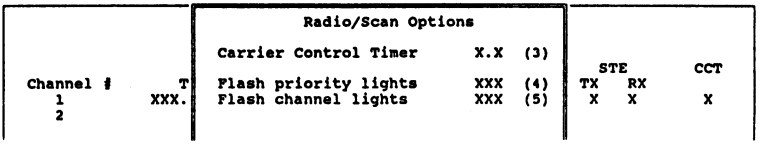


Figure 4-7 - Radio/Scan Options Window For 8 Or 16 Channel Radios

(1) Function - indicates new function
(2) Window Title - radio/scan options window
(3) Carrier Control Timer - indicates carrier control time period
(4) Flash Priority Lights - sets action of radio priority lights
(5) Flash Channel Lights - sets action of channel display LED's
(6) Prompt Line - current field instruction line

The Radio/Scan Options Window, shown in Figure 4-7, is accessed by selecting **F7 Option** while in the MLS Personality Screen. This window is used to define specific options associated with eight or sixteen channel MLS radios.



CCT

(3) The **Carrier Control Timer** field is used to indicate the amount of time before the carrier control timer will drop a transmission. The carrier control timer ensures that the radio will not continuously transmit over a specific amount of time.

Enter a value between 0.5 minutes to 7.5 minutes in .5 minute increments. This value will cause the radio to automatically stop transmitting if the transmission period exceeds the period specified. To disable the carrier control timer, enter 0.

Flash Priority Lights

(4) The **Flash Priority Lights** field is used to indicate the action of the priority lights while the radio is in scan.

Using the **Tab** key as a toggle switch, select between "Yes" and "No". Selecting "Yes" indicates that the priority indicator lights will flash each time that a channel is scanned, regardless of whether there is activity on it or not. Selection of "No" indicates that the priority indicator lights will only flash when a channel has activity on it.

Flash Channel Lights

(5) The **Flash Channel Lights** field is used to indicate the action of the channel display LED's while the radio is in scan.

Using the **Tab** key as a toggle switch, select between "Yes" and "No". Selecting "Yes" indicates that the channel display LED will change each time that a channel is scanned, regardless of whether there is activity on it or not. Selection of "No" indicates that the channel display LED will only change when a channel has activity on it.

From the Radio Options Window, your options are:

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the MLS Personality Screen.

Defining Personality Text

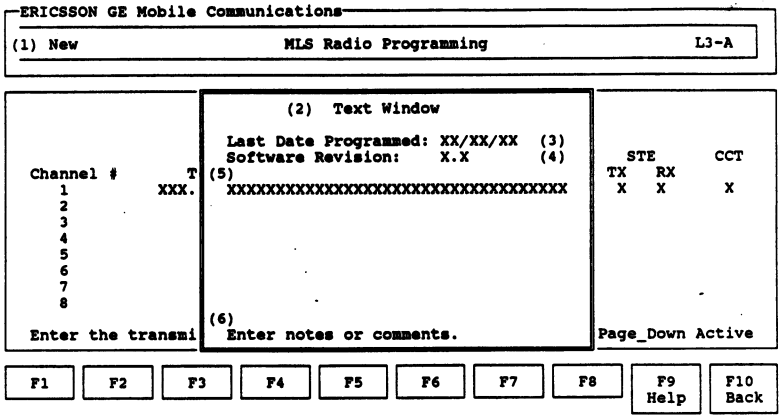
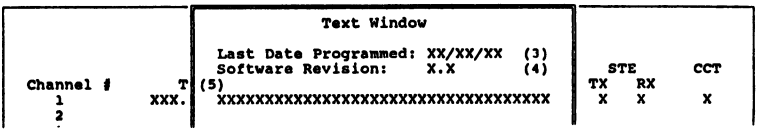


Figure 4-8 - Text Window

(1) Function - indicates new function
(2) Window Title - text window
(3) Last Date Programmed - date last personality was written
(4) Software Revision - current radio software version
(5) Text - indicates user defined text field
(6) Prompt Line - current field instruction line

The Text Window, shown in Figure 4-8, is accessed by selecting **F4 Text** from the MLS Personality Screen. This window allows you to view the software version and programming date of the radio last programmed with this personality. There is also space to store a few lines of text for future reference.



Date Last Programmed (3) The **Date Last Programmed** field is used to indicate the last date when the personality was written to the radio. When the personality is programmed from the Current Personalities Screen, the programmer will capture the system date and store that date in this field.

This is a "Display Only" field and cannot be accessed. It is automatically updated when the personality is programmed from the Current Personalities Screen and the write is successful.

Software Revision (4) The **Software Revision** field indicates the current radio software version. This field is only established during the programming process.

This is a "Display Only" field and cannot be accessed. It is automatically updated when the personality is programmed from the Current Personalities Screen and the write is successful.

Text (5) The **User Defined Text** field is used to specify a line of user defined text that will be stored with the personality on disk. Any line of text you want to enter will be saved.

Enter the desired text. You can enter up to eight lines of text using any valid alphanumeric character combination.

Valid characters for this field consist of A - Z, 0 - 9, ~, !, @, #, $, %, ^, &, *, (,), _, +, |, :, ", {, }, [,], „, ., <, >, ?, /, \, ; or a space.

From the Text Window, your options are:

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the MLS Personality Screen.

SAVING A PERSONALITY

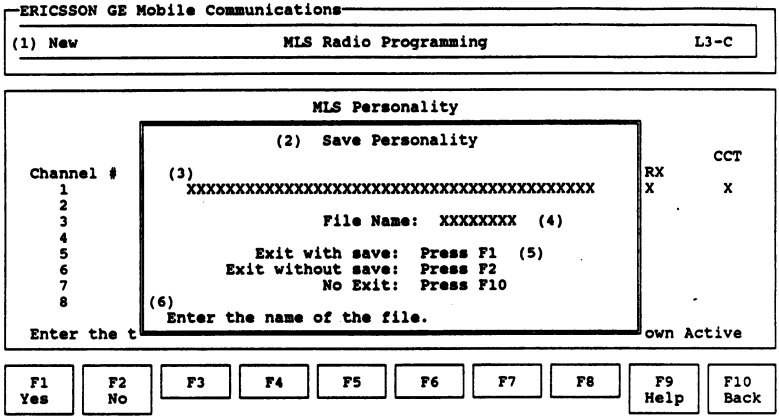
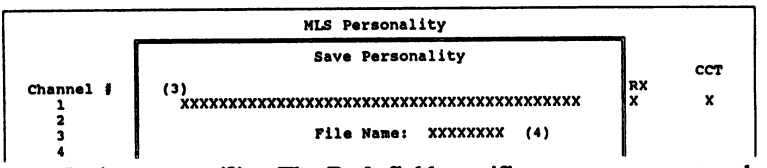


Figure 4-9 - Save Personality Window

(1) Function - indicates new function
(2) Window Title - save personality window
(3) Path - current personality destination path
(4) File Name - current personality name to be saved
(5) Continue Prompt - continue or abort option
(6) Prompt Line - current field instruction line

The Save Personality Window, shown in Figure 4-9, is accessed whenever you try to exit the MLS Personality Screen. This window is used to enter data for saving the personality to disk.



Path (3) The **Path** field specifies a new or target path where the current personality will be stored.

To change the path field, press the up arrow key to enter the field. Enter the desired target path if different from the default path.

File Name (4) The **File Name** field specifies the name under which the current personality is to be saved.

Enter the destination file name. This field will accept up to eight valid characters in any alphanumeric combination. Alphabetic characters will automatically be converted to upper case. This field will not accept file names that are not acceptable to DOS.

Valid characters are A - Z, 0 - 9, or -.

From the Save Personality Window, your options are:

F1 - Yes Select this option if you want to:
Save data to disk and return to the Current Personalities Screen.

F2 - No Select this option if you want to:
Return to the Current Personalities Screen without saving data.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the MLS Personality Screen.

PROGRAMMING THE PERSONALITY INTO THE UNIT

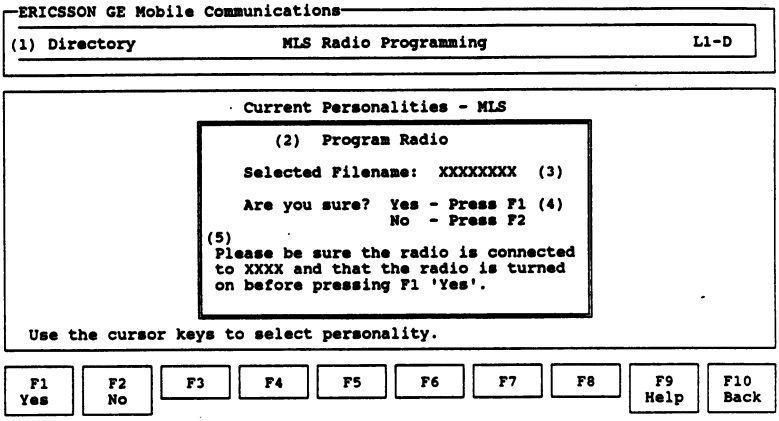


Figure 4-10 - Program Radio Window

(1) Function - indicates directory function
(2) Window Title - program radio window
(3) Filename - program operation personality name
(4) Continue Prompt - continue or abort option
(5) Note Line - denotes steps necessary to continue

The Program Radio Window, shown in Figure 4-10, is accessed by selecting **F5 Progrm** while in the Current Personalities Screen. This window is used to solicit the personality name to be programmed.

Selected Filename (3) The **File Name** field is used to specify the name of the personality to use for programming the radio.

Enter the name of the personality you want to use for the program operation. To be valid, the name must correspond to a currently defined personality. This field will accept up to eight valid characters in any alphanumeric combination. Alphabetic characters will automatically be converted to upper case.

From the Program Radio Window, your options are:

F1 - Yes	Select this option if you want to: Program the personality selected.
F2 - No	Select this option if you want to: Discontinue with this procedure.
F9 - Help	Select this option if you want to: Receive further information pertaining to a field area.
F10 - Back	Select this option if you want to: Return to the Current Personalities Screen.

READING THE PERSONALITY OUT OF THE RADIO

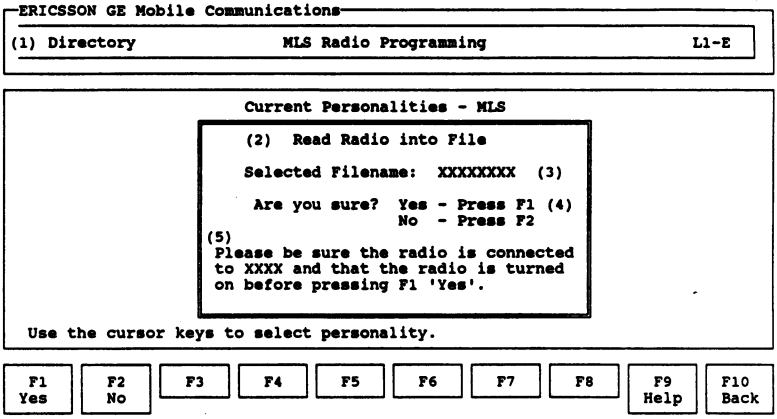


Figure 4-11 - Read Radio Into File Window

(1) Function - indicates directory function
(2) Window Title - read radio into file window
(3) Selected Filename - read operation personality name
(4) Continue Prompt - continue or abort option
(5) Note Line - denotes steps necessary to continue

The Read Radio into File Window, shown in Figure 4-11, is accessed by selecting **F6 Read** while in the Current Personalities Screen. This window allows you to specify the name of the personality you want to read into the radio.

Enter Filename (3) The **Enter File Name** field is used to specify the name of the personality to use for the read operation.

Enter the name of the personality you want to use for the read operation. To be valid, the name must correspond to a currently defined personality. This field will accept up to eight valid characters in any alphanumeric combination. Alphabetic characters will automatically be converted to upper case.

From the Read Radio into File Window, your options are:

F1 - Yes	Select this option if you want to: Read the personality selected.
F2 - No	Select this option if you want to: Discontinue with this procedure.
F9 - Help	Select this option if you want to: Receive further information pertaining to a field area.
F10 - Back	Select this option if you want to: Return to the Current Personalities Screen.

CHAPTER 5
USING THE UTILITIES

UTILITY WINDOW

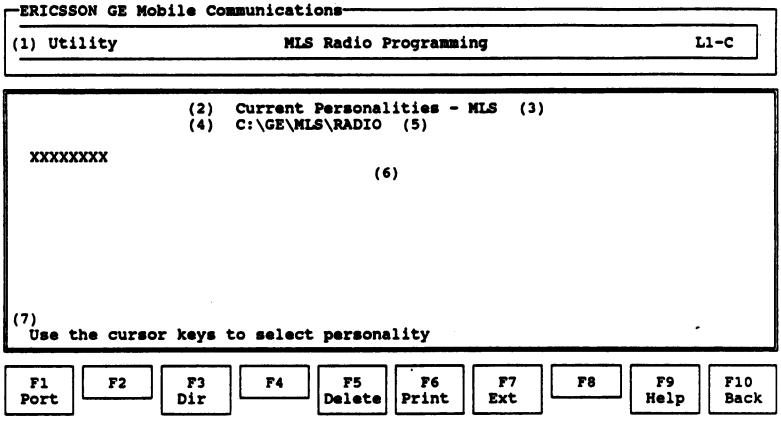


Figure 5-1 - Utility Window

(1)	Function	- indicates utility function
(2)	Window Title	- current personalities window
(3)	Default Extension	- designated default extension
(4)	Current Drive	- designated drive
(5)	Current Directory	- designated directory name
(6)	Personality Area	- personalities in current directory
(7)	Prompt Line	- current field instruction line

The Utility Window, shown in Figure 5-1, is accessed by pressing **F3 Utilty** while in the Current Personalities Screen. This window allows access to infrequently used functions which have little relationship to the actual programming of a radio. This window and its fields are much like the Current Personalities Screen. Note, however, the Function field changes to "Utility" and the Function Key options also change.

From the Utility Window, your options are:

F1 - Port	Select this option if you want to: Change the port to use for programming radios.
F3 - Dir	Select this option if you want to: Change your current directory.
F5 - Delete	Select this option if you want to: Delete a personality from the disk.
F6 - Print	Select this option if you want to: Print out the personality to the printer, screen, or file.
F7 - Ext	Select this option if you want to: Change the current extension.
F9 - Help	Select this option if you want to: Receive further information pertaining to a field area.
F10 - Back	Select this option if you want to: Return to the Current Personalities Screen.

Changing The Communications Port

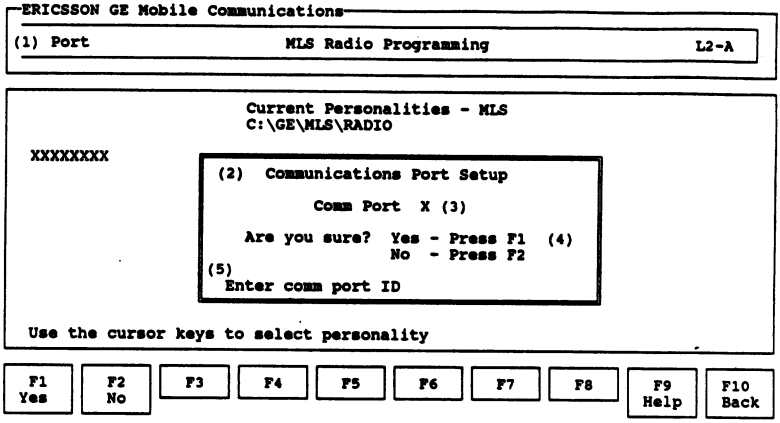


Figure 5-8 - Communications Port Setup Window

(1) Function - indicates port function
(2) Window Title - communications port setup window
(3) Comm Port Field - communications port indicator
(4) Continue Prompt - continue or abort option
(5) Prompt Line - current field instruction line

The Communications Port Setup Window, shown in Figure 5-8, is accessed by selecting **F1 Port** while in the Utility Window. This window allows you to select the communications port you want to use in programming the radio.

Comm Port (3) The **Communications Port Identification** field is used to identify the communications port to use for programming the unit. There are only two ports available for this purpose: COM1 and COM2.

Enter the desired port by selecting a "1" to indicate COM1 or a "2" to indicate COM2. No other numbers will be accepted in this field. After selection has been made, press **F1 Yes** to perform the change.

From the Communications Port Setup Window, your options are:

F1 - Yes Select this option if you want to:
Continue with this change.

F2 - No Select this option if you want to:
Cancel this procedure.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

NOTE

Once the **F1 Yes** key is selected, the setup file is updated to reflect the new selection and that selection will become the default until a new selection is made.

Change Directories

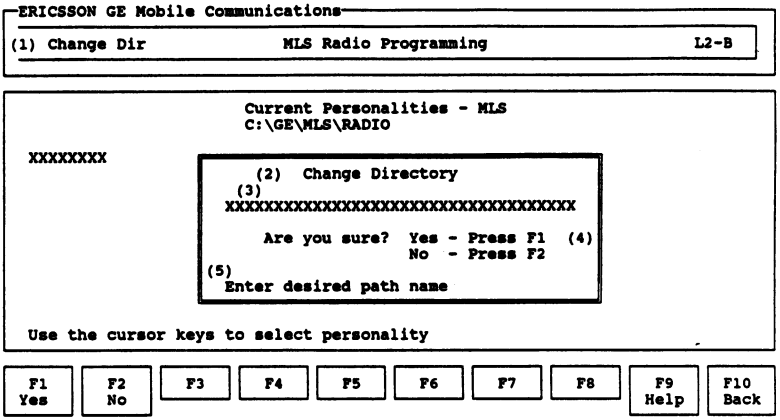


Figure 5-6 - Change Directory Window

(1)	Function	- indicates change directory function
(2)	Window Title	- change directory window
(3)	Path Field	- identify path to be changed
(4)	Continue Prompt	- continue or abort option
(5)	Prompt Line	- current field instruction line

The Change Directory Window, shown in Figure 5-6, is accessed by selecting **F3 Dir** while in the Utility Window. This window allows you to change directories without leaving the program.

Path (3) The **Path** field is used to specify the new path.

Enter the desired path. Any valid DOS path identifier with no more than 32 characters will be accepted. To perform the actual change, press **F1 Yes**.

From the Change Directory Window, your options are:

F1 - Yes Select this option if you want to:
Continue with this change.

F2 - No Select this option if you want to:
Cancel this procedure.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

Delete Personality

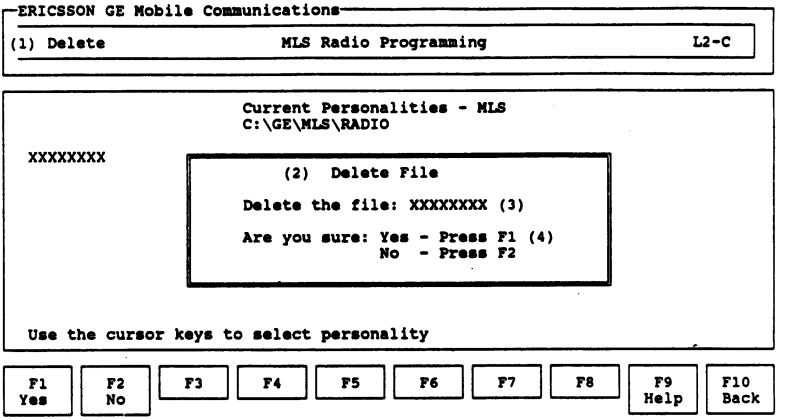


Figure 5-5 - Delete File Window

(1) Function - indicates delete function
(2) Window Title - delete file window
(3) Personality Field - personality to be deleted
(4) Continue Prompt - continue or abort option

The Delete Personality Window, shown in Figure 5-5, is accessed by selecting **F5 Delete** while in the Utility Window. This window allows you to delete a personality without leaving the program.

Delete the File (3) The **Delete the File** field is used to indicate the name of the personality to be deleted.

Enter the name of the existing personality you want to delete and press **F1 Yes**. The program will display a confirmation prompt before deletion occurs.

NOTE

Deletion of a personality will remove it permanently.

From the Delete Personality Window, your options are:

F1 - Yes Select this option if you want to:
Continue with this change.

F2 - No Select this option if you want to:
Cancel this procedure.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

NOTE

If **F1 Yes** is selected the personality named will be PERMANENTLY deleted. If you do not wish to delete the personality, select **F2 No**.

Print Personality

Print to Printer Option

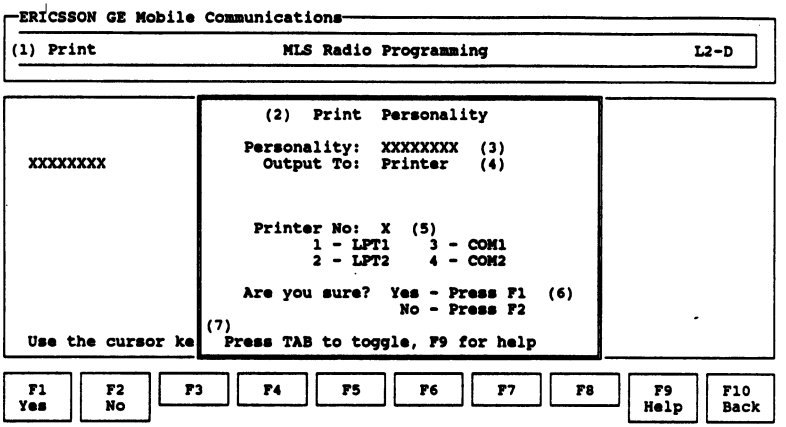


Figure 5-3 - Print Personality "Printer" Window

(1)	Function	- indicates print function
(2)	Window Title	- print personality "printer" window
(3)	Personality Field	- identifies personality to print
(4)	Output to Field	- personality will print to printer
(5)	Printer Number Field	- identify printer selection
(6)	Print Que	- que to print option
(7)	Prompt Line	- current field instruction line

The Print Personality "Printer" Window, shown in Figure 5-3, is accessed by selecting **F6 Print** while in the Utility Window and toggling to "Printer" while in the Output To field. This window allows you to generate a hard copy printout.

Personality (3) The **Personality** field is used to identify the personality you wish to print. The default personality will be the current personality.

This field automatically defaults to the current personality. To change the file name simply cursor into the field and type in the desired personality.

Output To (4) The **Output To** field is used to identify where you will print the personality.

Using the **Tab** key as a toggle switch, specify "Printer" as the printout destination.

Printer No (5) The **Printer Number** field is used to identify which printer port you will be printing to.

Using the **Tab** key as a toggle switch, select the printer port for your printer:

- 1: LPT1 printer port
- 2: LPT2 printer port
- 3: COM1 printer port
- 4: COM2 printer port

After selecting the appropriate printer port, press **F1 Yes** to generate a hard copy printout.

From the Print Personality "Printer" Window, your options are:

F1 - Yes Select this option if you want to:
Print to the printer.

F2 - No Select this option if you want to:
Cancel the print que and return to the window.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

NOTE

If you select **F1 Yes**, the PC Programming Software will perform a final edit check notifying you if your printer is not on-line. If the printer is on-line the information will then print.

Print to Screen Option

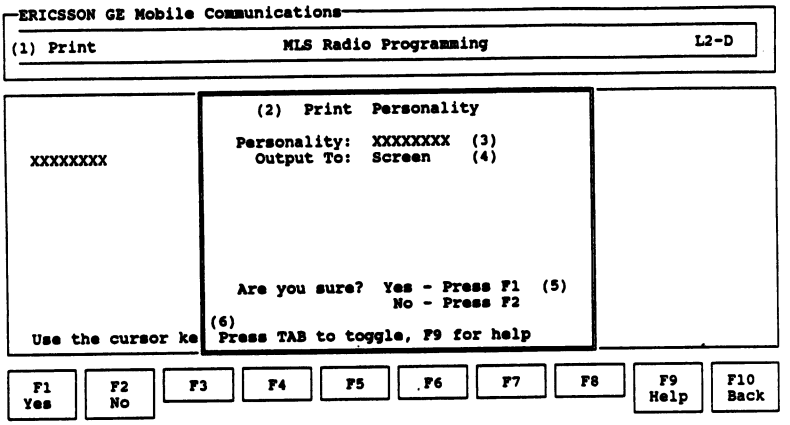


Figure 5-2 - Print Personality "Screen" Window

(1)	Function	- indicates print function
(2)	Window Title	- print personality "screen" window
(3)	Personality Field	- identifies personality to print
(4)	Output to Field	- personality will print to screen
(5)	Print Que	- que to print option
(6)	Prompt Line	- current field instruction line

The Print Personality "Screen" Window, shown in Figure 5-2, is accessed by selecting **F6 Print** while in the Utility Window and toggling to "Screen" while in the Output To field. From this window you can generate a printout of the personality data to the screen allowing you to page through it.

Personality (3) The **Personality** field is used to identify the personality you wish to print. The default personality will be the current personality.

This field automatically defaults to the current personality. To change the file name simply cursor into the field and type in the desired personality.

Output To (4) The **Output To** field is used to identify where you will print the personality.

Using the **Tab** key as a toggle switch, specify "Screen" as the printout destination.

Pressing **F1 Yes** will generate the printout and the personality data will appear on the screen allowing you to page through it.

From the Print Personality "Screen" Window, your options are:

F1 - Yes Select this option if you want to:
Print to the screen.

F2 - No Select this option if you want to:
Cancel the print que and return to the window.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

Print to File Option

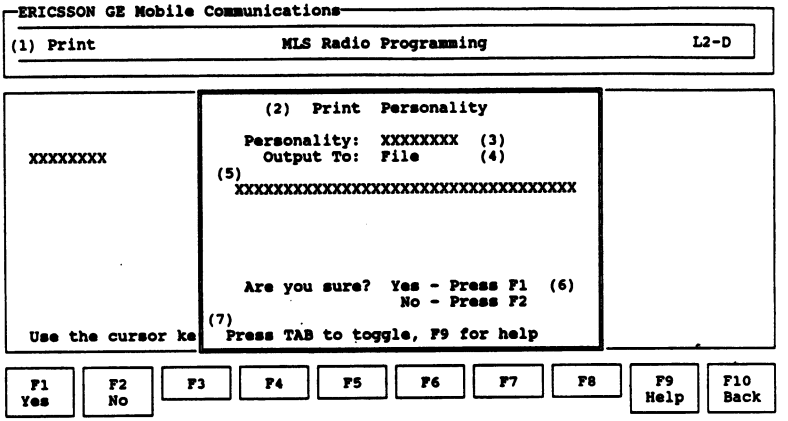


Figure 5-4 - Print Personality "File" Window

(1)	Function	- indicates print function
(2)	Window Title	- print personality "file" window
(3)	Personality Field	- identifies personality to print
(4)	Output to Field	- personality will print to file
(5)	Destination Field	- path/file name to print to
(6)	Print Que	- que to print option
(7)	Prompt Line	- current field instruction line

The Print Personality "File" Window, shown in Figure 5-4, is accessed by selecting **F6 Print** while in the Utility Window and toggling to "File" while in the Output To field. This window allows you to cause the printout to be generated to the specified file for printout at a later time.

Personality (3) The **Personality** field is used to identify the personality you wish to print. The default personality will be the current personality.

This field automatically defaults to the current personality. To change the file name simply cursor into the field and type in the desired personality.

Output To (4) The **Output To** field is used to identify where you will print the personality.

Using the **Tab** key as a toggle switch, specify "File" as the printout destination.

Destination (5) The **Destination** field is used to enter the path/file name for the printed output.

Enter a valid path/file name. You can use up to 35 characters in this field.

Pressing **F1 Yes** causes the printout to be generated to the specified file for printout at a later time.

From the Print Personality "File" Window, your options are:

F1 - Yes Select this option if you want to:
Print to the file.

F2 - No Select this option if you want to:
Cancel the print que and return to the window.

F9 - Help Select this option if you want to:
Receive further information pertaining to a field area.

F10 - Back Select this option if you want to:
Return to the Utility Window.

NOTE

When **F1 Yes** is selected, the PC Programming Software will perform a final edit check to see that you are not overwriting a file with information already stored on it. If you are, a warning will appear to let you know. If no file is being overwritten, a message will indicate that the printout is being generated and return you to the Utility Window.

Change Extensions

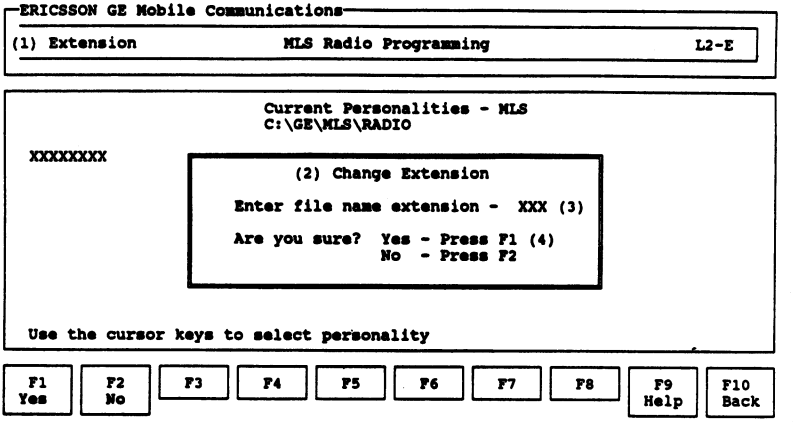


Figure 5-7 - Change Extension Window

(1) Function - indicates extension function
(2) Window Title - change extension window
(3) Extension Field - identifies extension
(4) Continue Prompt - continue or abort option

The Change Extension Window, shown in Figure 5-7, is accessed by selecting **F7 Ext** while in the Utility Window. This window allows you to select the extension in which personalities are displayed on the screen.

Enter File Name Extension (3) The **Enter File Name Extension** field is used to enter the new file extension to use as the default. This extension will be displayed at the top of the Current Personalities Screen.

Enter three alphanumeric characters as valid file extension. After specifying the extension, press **F1 Yes** to perform the change.

From the Change Extension Window, your options are:

F1 - Yes	Select this option if you want to: Continue with this change.
F2 - No	Select this option if you want to: Cancel this procedure.
F9 - Help	Select this option if you want to: Receive further information pertaining to a field area.
F10 - Back	Select this option if you want to: Return to the Utility Window.

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CHAPTER 6
WHEN PROBLEMS ARISE

This chapter is devoted exclusively to explaining the error messages you might encounter and how to rectify the situation while programming the unit. However, should your program lock up and no error message appear, it is best to reboot the system by pressing **Cntrl-Alt-Del** simultaneously. What you have previously programmed will probably be lost so don't do this unless the keyboard keys no longer function.

NOTICE TO USERS

Some TSR's (Terminate and Stay Resident Programs) cause an undesired interaction with the PC programmer causing it to act strangely or lock the machine up. If you experience strange behavior with the PC programmer, please remove all memory resident programs and TSR's.

C

Problem: "Cannot page down."

This is an indication that you can no longer page down through your display data on the window either because you have reached the physical end of your data or the window is not complete.

Solution: If you are at the end of your data, you can do nothing more than page up. Otherwise check to ensure that your current window is completely filled in.

Problem: "Cannot page up."

This is an indication that you are at the very beginning of a data display window.

Solution: Discontinue paging up.

Problem: "Cannot save file - disk full."

This message is an indication that your disk is running out of storage space. You will not be able to save the personality unless you have enough disk space in which to store a personality.

Solution: You will need to create disk space on your disk or get a new data disk. Refer to your DOS User's Guide for help in deleting files.

Problem: "Carrier control timer value is out of range or invalid."

An attempt was made to enter a carrier control timer value that was not divisible by .5 or was outside the range of 0.5 - 7.5 minutes.

Solution: Enter a carrier control timer value that is divisible by .5 or that is within the correct range.

Problem: "Could not delete file."

An attempt was made to delete either a personality or a frequency set that could not be deleted because the file doesn't exist, the drive is write protected, or there is a problem with the diskette.

Solution: Ensure that the personality or frequency set you are trying to delete actually exists. Next check to ensure that the diskette is not write protected.

Problem: "Could not open file."

This message is an indication that the program could not read one of the temporary files it created.

Solution: Please contact GE Mobile Communications if you receive this message.

Problem: "Could not open port."

An attempt was made to print a personality to a communications port that was not installed or was non-functional.

Solution: Ensure that the port specified is correctly installed in your machine and is operational. Refer to your Technical Reference Manual for more information on communications ports.

Problem: "Could not open temporary file."

At various times, the PC Programmer creates temporary files for storage. This message is an indication that the program could not read one of the temporary files it created.

Solution: Please contact GE Mobile Communications if you receive this message.

D

Problem: "Device not present."

An attempt was made to print the personality to a printer that was either not installed or was non-functional.

Solution: Ensure that the printer specified is correctly installed and operational before attempting further prints. Most printers are installed on LPT1.

Problem: "Directory does not exist."

This is an indication that the directory you tried to change to does not exist. The programmer will ask if it should create the directory.

Solution: Only specify a valid path/directory when attempting to change directories, or specify that the programmer should create it.

F

Problem: "File exists. Press 'Y' to overwrite, 'N' to quit."

An attempt was made to read or store a personality, frequency set, or group set to disk while a file with the same exists.

Solution: Select 'Y' to overwrite the existing file or select 'N' in order to rename the file.

Problem: "File is not correct type."

An attempt was made to change either a personality or frequency set and the file selected was not of the correct type.

Solution: Remove or do not use the questionable file.

Problem: "File not found."

An attempt was made to change/delete or print a personality or frequency set that does not exist.

Solution: Correct the file name entry before further attempts are made.

Problem: "Frequency out of range."

An attempt was made to enter a frequency that does not fall within the band split selected.

Solution: Ensure that the frequency specified falls within the band split indicated at the top of the window.

I

Problem: "Incorrect file size/type."

An attempt was made to change either a personality or frequency set and the file selected was not of the correct type.

Solution: Remove or do not use the questionable file.

Problem: "Insufficient Space on Specified Drive."

An attempt was made to save a personality to disk when the disk was full.

Solution: Change the path specified to redirect the personality to another drive. After saving the personality, exit the programmer and remove old/unused files. Refer to your DOS User's Guide for more information on deleting files.

Problem: "Invalid Channel Guard entered."

An attempt was made to enter an invalid Digital Channel Guard or a tone Channel Guard that is outside of the acceptable range.

Solution: Enter a tone Channel Guard within the range of 67.0 to 210.7 or refer to Appendix D for a valid Digital Channel Guard.

Problem: "Invalid channel spacing."

An attempt was made to enter a frequency that has an incorrect channel spacing for this particular split.

Solution: Enter a frequency that is evenly divisible by this band's proper spacing, (i.e., 5.00 KHz at low band, 5.00 or 6.25 at high band, etc.)

Problem: "Invalid Device Number."

An attempt was made to print the personality to a device that is not supported.

Solution: Enter a valid device. Valid devices are 1-LPT1, 2-LPT2, 3-COM1, and 4-COM2.

Problem: "Invalid Drive Specification."

An attempt was made to save the personality to a drive that does not exist.

Solution: Enter only a valid drive specification.

Problem: "Invalid extension specified."

An attempt was made to specify an extension (from the Change Extension Window) that does not meet the conditions for a valid extension.

Solution: Ensure that the extension specified consists of only alphanumeric characters.

Problem: "Invalid file name."

An attempt was made to enter a file name that is not acceptable to DOS or the programmer.

Solution: Correct the file name entry before further attempts are made. Refer to your DOS User's Guide for more information on file naming convention.

Problem: "Invalid port entered."

An attempt was made to specify a communications port other than COM1 or COM2. The PC Programmer Software only supports COM1 or COM2.

Solution: Use either COM1 or COM2 for programming.

M

Problem: "Multiple periods not allowed."

An attempt was made to specify a file extension from the change/edit or delete window.

Solution: These windows do not require the addition of a file extension when the file name is specified. Remove the file extension before further attempts are made.

O

Problem: "Out of paper."

An attempt was made to print to a printer where there was not paper.

Solution: Insert paper in the printer and re-initiate the print function.

P

Problem: "Printer busy."

An attempt was made to print to a printer where other information was already being printed.

Solution: Either designate another printer to print to or wait until the present printer is no longer busy.

Problem: "Printer error - printer not on line."
"Printer not on line."
"Printer off line."

An attempt was made to print to a printer that is either not powered up or is off line.

Solution: Ensure that power is applied to the printer in that the on line indicator is illuminated.

Problem: "Problem with Print."

An attempt was made to print a personality and the main program could not initiate the print task. There are three common reasons for the print initiate to fail. There is not enough memory available, the print executable is not in the right directory for the initiate, or you are using a version of DOS earlier than version 3.0 or higher.

Solution: First, check to ensure that you are running the right version of DOS. Exit the program and at the DOS prompt, type **VER <enter>**. Typing this command will cause the DOS version to appear on the window. If this number is 1.XX or 2.XX you will need to upgrade to DOS 3.0 or higher. Next, check to ensure that MLSPRINT.EXE file resides in the same directory as the MLS.EXE file. If the MLSPRINT.EXE file is not there, copy it from the distribution diskettes. However, if the print is there then you must be running out of memory. If you have any memory resident programs installed then remove them before continuing.

Problem: "Problem with Read."

An attempt was made to read the unit and the main program could not initiate the read task. There are three common reasons for the read initiate to fail. There is not enough memory available, the read executable is not in the right directory for the initiate, or you are using a version of DOS earlier than version 3.0 or higher.

Solution: First, check to ensure that you are running the right version of DOS. Exit the program and at the DOS prompt, type **VER <enter>**. Typing this command will cause the DOS version to appear on the window. If this number is 1.XX or 2.XX you will need to upgrade to DOS 3.0 or higher. Next, check to ensure that MLSREAD.EXE file resides in the same directory as the MLS.EXE file. If the MLSREAD.EXE file is not there, copy it from the distribution diskettes. However, if the read is there then you must be running out of memory. If you have any memory resident programs installed then remove them before continuing.

Problem: "Problem with Write"

An attempt was made to write a personality and the main program could not initiate the write task. There are three common reasons for the write initiate to fail. First, there is not enough memory available, the write executable is not in the right directory for the initiate or you are using a version of DOS earlier than version 3.0 or higher.

Solution: First, check to ensure that you're running the right version of DOS. Exit the program and at the DOS prompt, type **VER <enter>**. Typing this command will cause the DOS version to appear on the window. If this number is 1.XX or 2.XX you will need to upgrade to DOS 3.0 or higher. Next, check to ensure that MLSWRITE.EXE file resides in the same directory as the MLS.EXE file. If the MLSWRITE.EXE file is not there, copy it from the distribution diskettes. However, if the write is there then you must be running out of memory. If you have any memory resident programs installed then remove them before continuing.

R

Problem: "Read failed. Check connection."

This message will appear whenever handshaking with the unit fails. There are several reasons for the program being unable to handshake with the unit: power is not applied to the unit, cabling is not properly seated or connected, incorrect communications port has been specified, or the unit is turned off or malfunctioning.

Solution: The first step is to try and isolate the cause of the problem. Is the unit malfunctioning? Replace the unit with a known good unit and attempt a read. If the message reappears, then the problem is not with the unit. Is your cabling connected and seated correctly? Refer to the hardware configuration in Chapter 2 for help in making this determination. Lastly, do you have the right port specified? Go into the Utility Window and change the port setup. If the problem still appears you should check your asynchronous card in your computer for functionality.

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ERICSSON

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Printed in U.S.A.

APPENDIX A

TERMS

Cursor Keys - The keys on the right hand side of the keyboard marked with arrows (Up Arrow, Right Arrow, Down Arrow and Left Arrow keys). They are used to control the direction of the cursor.

Default Value - The MLS radio software provides predetermined (default) values in a majority of the data entry fields within the program. Exceptions to this rule are fields requiring variable names, 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 Messages - Each time data is entered in the program a validity check is made to ensure that reasonable values were entered. In the event that the data does not fall within the acceptable range of values, an error message will be displayed in the center of the screen indicating non acceptance.

Field - Refers to the area of the screen/window which allows data entry. This area is readily identifiable by a reverse video bar when moving the cursor across the screen.

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 Software to execute a particular command.

Help - Throughout the MLS radio software, Help denotes or refers to on-line assistance. This can be accessed by pressing the **F9 Help** key from any field.

PC Programmer Software - This term is used to identify the programming software for the MLS radio.

Personality - Used generically to refer to information that is stored in the radio that makes one radio perform differently from all other radios. That information can be created, deleted or modified and stored on a disk for later reference.

Prompt Line - Assistance text located on the last line of the window. This line provides directions for entering data and changes when moving from field to field.

Screen - Refers to a major or parent data entry process and is used to show position within the program. Each screen is divided into three distinct areas: (1) screen title, (2) screen windows, and (3) active function keys. The title tells you where you are 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 labeled along the bottom of the screen. Only the function keys with labels are enabled in a given screen or window.

Squelch Tail Elimination - Refers to inverting the phase of the Channel Guard tone in order to mute the audio of the receiving radio while the carrier is diminishing after transmit ends.

Window - A window is a 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.

There are two types of windows: active and passive. The active window is available for data entry or revision and can be identified by its high-lighted borders. The passive window is displayed but is unavailable for program execution. 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: (1) window title, (2) work area, and (3) 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.

APPENDIX B

FUNCTION KEYS

F1

F1 Port - From the Utility Window the Communications Port Setup key allows you to select a port on your personal computer to be used for communicating with the radio.

F1 Setup - This key allows you to select personality defaults by selecting number of channels for the radio and entering frequency ranges.

F1 Switch - From the Channels Window, selection of this key will activate the Frequency Range Window. From the Frequency Range Window, selecting this key will activate the Channels Window.

F1 Yes - The selected operation will be executed. At numerous times during programming of the radio, the program may ask you if you want to complete an operation. When you press this key the selected operation will be completed.

F2

F2 Change - From the Current Personalities Screen this key, along with the **F4 New** key, provides access to the MLS Personality Screen.

F2 No - The selected operation will be canceled. At numerous times during programming of the radio, the program will ask if you wish to complete an operation. When you press this key the selected operation will not be executed.

F3

F3 Dir - The Change Directory Function Key command is enabled within the Utility Window and allows you to change directories without having to exit the program.

F3 Utilty - The Utility Function Key provides access to the Utility Window from the Current Personalities Screen. The Utility Window allows you to print a personality, change file extensions, select a com-

munications port setup, change file directories, or delete personalities without exiting the program.

F4

F4 New - From the Current Personalities screen, this key allows you to create a new radio personality.

F4 Text - The Text Select Function Key enables use of the "Text" window within the MLS Personality Screen. This window will automatically provide the software revision number and software revision date for the MLS . radio when last programmed. This window also accepts additional information (in text format) which you may wish to include about a particular radio personality.

F5

F5 Progrm - The Program Function Key is enabled in the Current Personalities Screen. This function writes a personality stored on disk to the radio.

F6

F6 Print - This function allows you to obtain a hard (paper) copy of the personality data stored in memory. This key is enabled in the Utility Window, and also provides the capability to print personality data to a file or to the window.

F6 Read - The Read Select Function Key is accessed from the Current Personalities Screen. This key provides the capability to read a specific radio personality into a file.

F7

F7 Option - The Option Select Function Key allows you to define specific options for the MLS radio with 2, 8, or 16 channels.

F8

The F8 key remains inactive during programming for MLS radios.

F9

F9 Help - Is used to provide assistance from any screen or window. Whenever you have a question about the execution of an operation, select this key. There are two levels of help messages:

Field Level Help messages are provided from any screen or any window by simply pressing the **F9 Help** key and provides additional information on the field in question.

Window Level Help messages are provided by pressing the **Shift F9 Help** key and describes the purpose of the data presented in the window.

F10

F10 Back - When this key is pressed you will return to a previous window, making it active again for further revisions or data entry. In some cases, it will return control of the program to the Current Personalities Screen.

F10 Exit - When selected from the Current Personalities Screen, the program is terminated and you are returned to the control of your disk operating system (DOS).

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APPENDIX C

ACCEPTABLE VALUES

Input Field	Acceptable Values	Default Value
MLS Personality		
Tx Freq	LB - evenly divisible by .005 VHF - evenly divisible by .00625 or .005 UHF - evenly divisible by .00625 800 - evenly divisible by .0125	blank
Rx Freq	LB - evenly divisible by .005 VHF - evenly divisible by .00625 or .005 UHF - evenly divisible by .00625 800 - evenly divisible by .0125	Tx Freq
Tx CG	Tone Channel Guard range 67.0 - 210.7. Digital Channel Guard range - see CG Table (Appendix D). If CNTRL-E is selected, range is 50. - 255.	blank
Rx CG	Tone Channel Guard range 67.0 - 210.7. Digital Channel Guard range - see CG Table (Appendix D). If CNTRL-E is selected, range is 50. - 255.	Tx CG

Input Field	Acceptable Values	Default Value
Tx STE	Y or N	N
Rx STE	Y or N	N
CCT	Y or N	N
MLS Personality		
Radio/Scan Options		
Carrier Control Timer	0.5 to 7.5 minute intervals in .5 minute increments	0.5
Radio Options		
Carrier Control Timer	0.5 to 7.5 minute intervals in .5 minute increments	0.5
Flash Priority Lights	Yes or No	No
Flash Channel Lights	Yes or No	No
Text Window		
User Defined Text	Any line of text, using valid characters, user wishes to enter.	blank
Current Personalities		
Program Radio		
Enter Filename	Any eight character alphabetic valid DOS file name that corresponds to a currently defined personality.	The highlighted name in the current personalities screen.
Read Radio into the File		
File Name	Valid DOS file name	blank

APPENDIX D

PRIMARY & EQUIVALENT DIGITAL CODES

PRIMARY CODE	EQUIVALENT CODE	PRIMARY CODE	EQUIVALENT CODE	PRIMARY CODE	EQUIVALENT CODE
023	340,766	132	605,634,714	237	464,642,772
025		133	413,620	243	267,342
026	566	134	273	245	370,554
031	374,643	135	205,610	246	542,653
032		136	502,712	252	661
036	137	142	174,270	254	314,612,706
037	560,627	143	333	255	425
043	355	144	466,666	262	316,431,730
047	375,707	145	525	266	655
051	520,771	147	303,306,761	271	427,510,762
053		150	256,703	274	652
054	405,675	152	366,415	276	326,432
056	465,656	153	606,630	307	362,565
057	172	155	233,660	311	330,456,561
060	116,737	156	517,741	312	515,663,743
065	301	157	322,503	315	321,673
066	734	161	345,532	317	546,614,751
067	516,720	162	416	324	343,570
071	603,717,746	163	460,607,654	325	550,626
072	470,701	164	207,732	331	372,507
073	640	165	354	332	433,552
074	360,721	171	265,426	344	471,664,715
075	501,624	176	244,417	346	616,635,724
076	203,754	212	253	351	353,435
104	226,557	213	263,736	356	521
107	365	217	371,453,530	363	436,443,444,662
114	327,615	222	445,457,575	446	467,511,672
115	534,674	223	350,475,750	447	473,474,731,744
117	411,756	224	313,506,574	452	524,765
122	535	225	536	454	513,545,564
123	632,657	227	261,567	455	533,551
125	173	231	504,631,636,745	462	472,623,725
127	412,441,711	234	423,563,621,713	523	647,726
130	364,641	235	611,671,723	526	562,645
131	572,702	236	251,704,742		

APPENDIX D

PRIMARY & INVERTED DIGITAL CODES

PRIMARY CODE	INVERTED CODE	PRIMARY CODE	INVERTED CODE	PRIMARY CODE	INVERTED CODE
023	47	132	317	237	26
025	176	133	54	243	351
026	237	134	223	245	72
031	37	135	213	246	523
032	51	136	114	252	462
036	57	142	74	254	346
037	31	143	127	255	446
043	222	144	363	262	235
047	23	145	274	266	454
051	32	147	71	271	65
053	452	150	307	274	145
054	133	152	115	276	67
056	331	153	231	307	150
057	36	155	447	311	344
060	76	156	171	312	163
065	271	157	162	315	234
066	217	161	324	317	132
067	276	162	157	324	161
071	147	163	312	325	526
072	245	164	227	331	56
073	224	165	236	332	455
074	142	171	156	344	311
075	123	176	25	346	254
076	60	212	356	351	243
104	117	213	135	356	212
107	125	217	66	363	144
114	-136	222	43	446	255
115	152	223	134	447	155
117	104	224	73	452	53
122	225	225	122	454	266
123	75	227	164	455	332
125	107	231	153	462	252
127	143	234	315	523	246
130	131	235	262	526	325
131	130	236	165		

APPENDIX E

CHANNEL GUARD TONE FREQUENCIES

STANDARD TONE FREQUENCIES (Hz)				
67.0	88.5	107.2	131.8	167.9
71.9	91.5	110.9	136.5	173.8
74.4	94.8	114.8	141.3	179.9
77.0	97.4	118.8	146.2	186.2
79.7	100.0	123.0	151.4	192.8
82.5	103.5	127.3	156.7	203.5
85.4			162.2	210.7

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APPENDIX F
WORK SHEET FOLDER
MLS RADIO

Work Sheet B

RADIO/SCAN OPTIONS

For 2 Channel Radios

Carrier Control Timer: _____

OR

RADIO/SCAN OPTIONS

For 8 or 16 Channel Radios

Carrier Control Timer: _____	
Flash Priority Lights	Flash Channel Lights
Yes No	Yes No

APPENDIX F
WORK SHEET FOLDER
MLS RADIO
Work Sheet A
MLS Channel Data

NUMBER OF CHANNELS _____

CHAN NO.	TRANSMIT FREQUENCY	RECEIVE FREQUENCY	TRANSMIT CHANNEL GUARD	RECEIVE CHANNEL GUARD	STE TX RX	CCT
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N
					Y Y Y N	Y N