THALES

MA6941F
PC PROGRAMMER

User's Manual

12 December 2002

MultiBand Inter/Intra Team Radio (MBITR)
Revision E, Version 1.04

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UPGRADE NOTES

Upgrade notes for MBITR PC Programmer, revision E, version 1.04

1. Configuration files (.cfg files) created/saved with versions C and earlier **are not** compatible with the revision D and later PC Programmer. In order to convert these files for use, follow these steps.
   a. Load revision E PC Programmer onto your computer.
   b. Make sure that you can run both Rev. C and Rev. E Programmer software (not simultaneously – this will cause a COM port conflict).
   c. Flash Download new operating software (revision U, version 2.31) into your radio using the revision E PC Programmer.
   d. Close the revision E PC Programmer after successful flash download.
   e. Use the revision C PC Programmer to download to the radio the configuration (.cfg) file to be converted.
   f. Close the revision C PC Programmer.
   g. Use the revision E PC Programmer to upload the .configuration from the radio.
   h. Save the configuration (as a .cfg file) in the revision E PC Programmer
2. This technique **does not** work backwards. Revision D or E PC Programmer files cannot be converted for use with older Programmer versions.
3. During conversion, all channels are set to PT (Plaintext). Individual channels will have to be re-programmed as CT (Cyphertext) if desired.
4. During conversion, the Programmer may set “Access Control” to “Denied”. Check the “Access Control” tab in the PC Programmer before downloading to the radio and reset to “Granted” if desired.

1 - INTRODUCTION

1-1 INTRODUCTION

The MA6941F PC Programmer is a Windows-based program that allows quick and easy programming of the MultiBand Inter/Intra Team Radio (AN/PRC-148) using an IBM-compatible computer. While the MBITR Man-Machine Interface (MMI) gives the user the ability to configure the radio using the built-in Liquid Crystal Display (LCD) and the keypad, the PC Programmer significantly enhances this ability by enabling the use of a larger screen and a full keyboard. In addition, the Graphical User Interface (GUI) allows the user to program "restricted radio parameters" that cannot be changed using the radio keypad and display. The GUI front-end also allows the user to:

- Upload an operational data file from a radio,
- Download an operational data file from a diskette or the hard drive to a radio,
- View or modify channel, group, scan plan, and global parameters,
- Control the programming menus available through the radio display,
- Download individual modules or complete radio code from a diskette or the hard drive to a radio,
- Save modified data to a file,
- Print the operational data file on a printer, and
- Enable upgradeable operating modes.

Upon configuring the various radio parameters, the user can download the configuration parameters to the radio. The GUI performs error checking to ensure that the data entered do not violate any operational limits. Upon transferring the radio parameters to the radio, the low-level communication protocol between the computer and the radio will ensure that the data has been properly transferred and it will flag and report any errors. The user can also save and open radio parameters in a configuration file and upload radio parameters from a working MBITR to the programmer.

1-2 MANUAL ORGANIZATION

This manual is intended to provide the user with the information required to program an MBITR using the PC Programmer. This manual has four (4) sections:

Section 1 - Introduction
Section 2 - Installation
Section 3 - Running the Program
Section 4 - Definitions

A brief summary of each section is provided below.

Section 1 – Introduction. Provides information needed before installing the package and defines terms used in this manual.

Section 2 – Installation. Lists the contents of this package and the minimum system requirements for operating this package. Provides instructions for software and hardware installation.

Section 3 - Running the Program. Contains instructions on starting the program, basic operating instructions needed to program a radio's channel, group, scan plan, global, access control, and HAVEQUICK parameters, and definitions of menu bar and speed menu commands.

Section 4 – Definitions. Provides definitions of programmable parameters listed in Section 3.

1-3 TERMS AND DEFINITIONS

Definitions of terms used in this manual are provided in Table 1-1. Most Global and Channel Parameters listed below are defined in Section 4-1 of this guide.

Table 1-1. Terms and Definitions

Term	*Definition*
Channel Parameters	Parameters programmable on a channel-by-channel basis: Channel Name, Channel Type, Modulation Type, Encryption State, Access Control, RF Power, Cryptographic Key, Synchronization Delay, Repeater Delay, Fade Delay, Traffic Rate, Data Rate, Receive (Rx) and Transmit (Tx) Frequencies; Rx and Tx Continuous Tone-Controlled Squelch System (CTCSS) Values, Rx Noise Squelch Level, SINCGARS Channel and Offset, Training Frames, and Time Delay. (**Not all parameters are available on all channel types**.)
Group Parameters	Parameters that apply to channel Groups within the radio. These include Group Name, Group Number, and channel mapping to the channel select switch.
Scan Plan Parameters	Parameters that apply to Scan Plans within the radio. These include Scan Plan Name, Scan Plan Number, Priority Channels, and channel mapping to the channel select switch.
Global Parameters	Parameters that apply to the radio (independent of the selected channel): Transmit Timeout, Backlight Timeout, Current Group, Current Scan Plan, Emergency AM Beacon Transmit Frequency, On Time, and Off Time, Tone Level, Audio Output, Mic Level, Combat ID, Transmit and Receive Situational Awareness, and Side Keys programmable functions.

Term	*Definition*
Access Control Parameters	Parameters that control which menus the operator can access using the radio LCD and keypad.
Word of Day/Frequency Managed Training	Used only for HAVEQUICK Channels. Used to set up radio networks.

2 - INSTALLATION

2-1 UNPACKING

The PC Programmer package contains the following:

- User's Manual (Slip Case and Binder)
- PC Programmer Cable, Part No. 3500393-501
- One Compact Disk (CD) containing the radio programming software, Part No. 1700308-501

2-2 SYSTEM REQUIREMENTS

The system requirements for operating the PC Programmer are as follows:

Pentium 133 or higher IBM-compatible PC with:

- Microsoft Windows 95/98/2000/XP or Windows NT operating system,
- CD Drive,
- Hard Disk with at least 10 Megabytes (20 MB preferred) free space,
- ***Minimum*** 16 MB Random Access Memory (32 MB RAM preferred), and
- Mouse.

2-3 HARDWARE INSTALLATION

The cable provided with the PC Programmer is used to connect the radio side connector to the serial port of the computer that contains the PC Programmer software.

Locate the serial port on the computer and using a small flat-blade screwdriver, secure the PC Programming Cable's DB-9 connector to the computer's serial port. The other end of the PC Programming Cable is connected to the radio's side connector as follows. Align the pin on the cable connector with the hole on the radio side and press the cable connector straight in until it is as tight as possible against the radio. Then, attach the cable connector to the radio using the captive screw.

2-4 SOFTWARE INSTALLATION

To install the application on Windows95/98/2000/XP/NT, click on 

and select “Settings”, select “Control Panel”, and then select “Add/Remove Programs”. Insert the program disk in the computer’s CD drive and select "INSTALL". The software should automatically select SETUP.EXE. Follow the on-screen instructions and enter information when required. The default directory for PC Programmer files is C:\Program Files\ThalesCommunications \MBITRPCP. The setup program will then prompt the user through the installation process. The program can also be installed using the "Run" command as follows. Click on 

, click on "Run", click on "Browse", select the CD drive, and double click on the SETUP.EXE file. The setup will proceed the same as above. The user can also put the disk in the CD drive, use Windows Explorer, and double-click on the SETUP.EXE file.

At the completion of the install, a shortcut (PCPROG) is created that can be dragged to the desktop.

To remove the PC Programmer, go to “Add/Remove Programs”, select MBITR PCP, and click “Remove”.

3 - RUNNING THE PROGRAM

3-1 PROGRAM STARTUP

To start the program, double-click on the PCPROG icon on the desktop or select the "Run" command line from the Start Command Menu. Use the BROWSE command, select the drive and directory containing PC Programmer (default location is Program Files\Thales Communications\MBITRPCP) and double-click on the PCPROG.EXE file. If a desktop shortcut is not created during program installation, create one now. Press the right mouse button, click on "New" and then click on "Shortcut". Either fill in the command line or click on "Browse" and select the directory in which the PC Programmer resides. Click on the PCPROG.EXE file and click on the "Open" button to fill in the command line. Click on "Next", enter a name for the shortcut, and click on "Finish". The PC Programmer icon will appear on the computer desktop screen. To start PC Programmer, simply double-click on the icon.

NOTE: To communicate with (upload data from or download data to) a radio, the PC Programming Cable (p.n. 3500393-501) must be connected to the selected serial port and to the radio side connector. **The radio side connector must also be enabled.**

3-2 USER INTERFACE

After the opening version screen at program start-up (Figure 3-1), a blank PC Programmer Channel screen will appear (Figure 3-2). The operator can then upload a file from a radio (using the "UP" button on the speed bar), open an existing file (using the "Open" option in the File pull-down menu or the "Open File" speed button), or create a new file (using the "New" option in the File pull-down menu or the "Open New File" speed button). Once a file is loaded, six overlapping screens are displayed with the top screen being the Channels screen. The main components of the interface are the pull-down Menu Bar, described in paragraph 3-4.1; the Speed Bar, described in paragraph 3-4.2; the Channels, Groups, Scan Plans, Globals, Access Control, and WOD/FMT screens; and the Status Bar described in paragraph 3-4.4. At start-up, the pull-down menus or the speed bar can be used to load an operational data file from the hard drive, a CD, a diskette, or a radio into PC Programmer for editing.

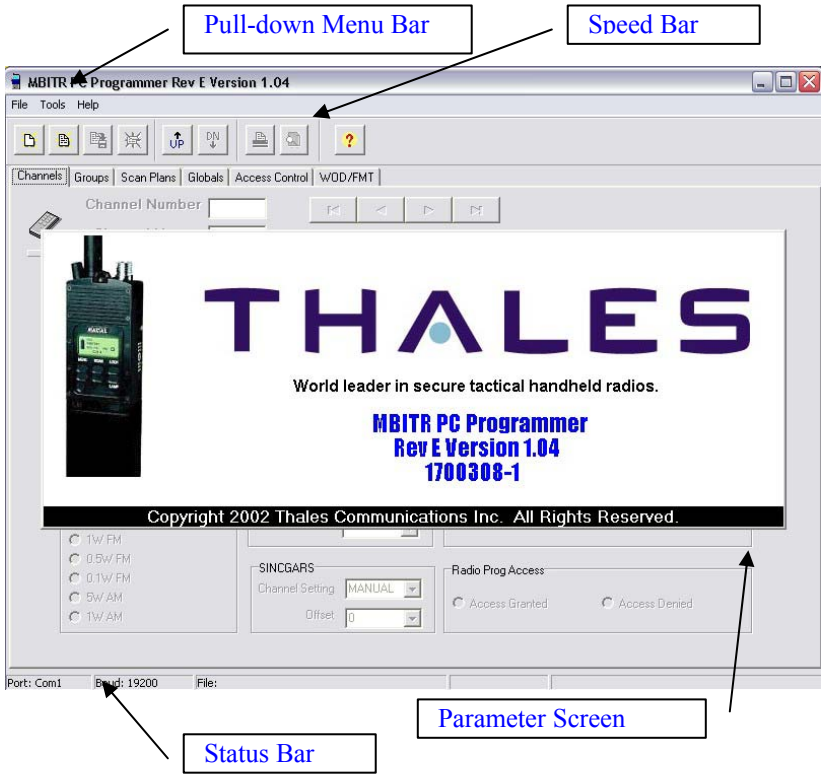

Figure 3-1. MBITR PC Programmer Start-Up Screen

3-3 PC PROGRAMMER EDIT SCREENS

The PC Programmer allows the user to view and edit Channel, Group, Scan Plan, Global, and Access Control parameters of an operational data file or radio.

3-3.1 CHANNEL PARAMETERS

Depending on the software installed into the MBITR, the radio will be able to support Basic (Amplitude modulation (AM), Frequency Modulation (FM) or Narrowband (NB)), Single Channel Ground and Airborne Radio System (SINGCARS) (fixed frequency and frequency hopping), HAVEQUICK (fixed

frequency and frequency hopping), and Advanced Narrow Band Digital Voice Terminal (ANDVT) channels.
To move from one channel to another, the user can change the number in the "Channel Number" box or use the navigation keys to the right of the Channel Number box. The first navigation key displays the first channel (Channel 0) screen. The second navigation key will display the next lower channel (e.g., from Channel 5 to Channel 4) screen. The third navigation key will display the next higher (e.g., from Channel 5 to Channel 6) screen. The rightmost navigation key displays the last channel (Channel 99) screen. Navigation keys are the same for the Group and Scan Plan screens.

3-3.1.1 BASIC CHANNELS

The Basic Channels screen (Figure 3-2) allows the user to program the channel to provide clear AM analog voice, encrypted AM digital voice, and encrypted AM digital data; clear FM analog voice, encrypted FM digital voice, and encrypted FM digital data; or clear FM Narrowband (12.5 kHz) operation.

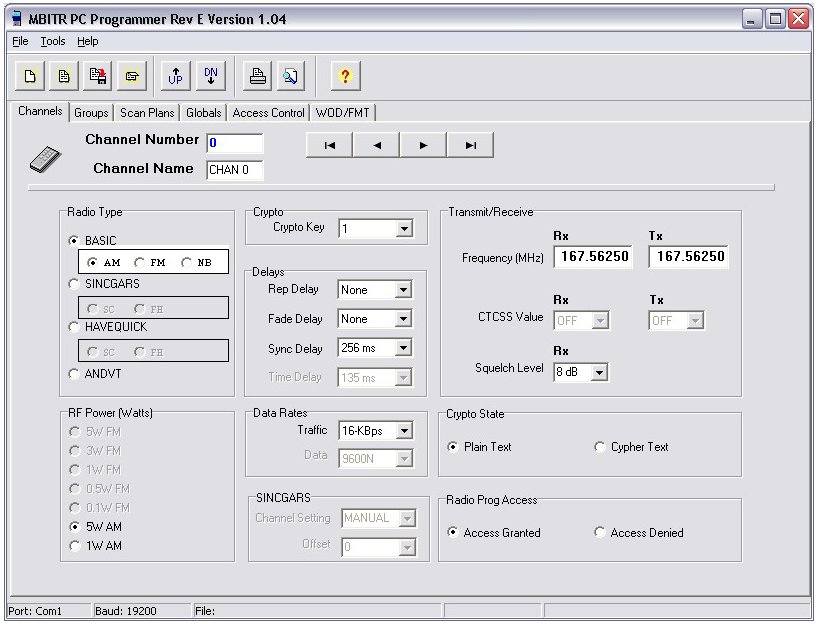

Figure 3-2 Basic Channel Parameters Screen

3-3.1.2 SINCGARS CHANNELS

(The radio must have the SINCGARS software option enabled.) The SINCGARS Channels screen (Figure 3-3) allows the user to program a channel to provide Single Channel (SC) or Frequency Hopping (FH) Clear Analog or Encrypted Digital Voice operation. SC and FH channels can also provide over-the-air transfer of encrypted digital data. The operating frequency range for a SINCGARS channel is 30.000 to 87.975 MHz FM only. When operating in SINCGARS mode, the radio can **not** perform half-duplex operations, where receive and transmit operations are performed on different frequencies.

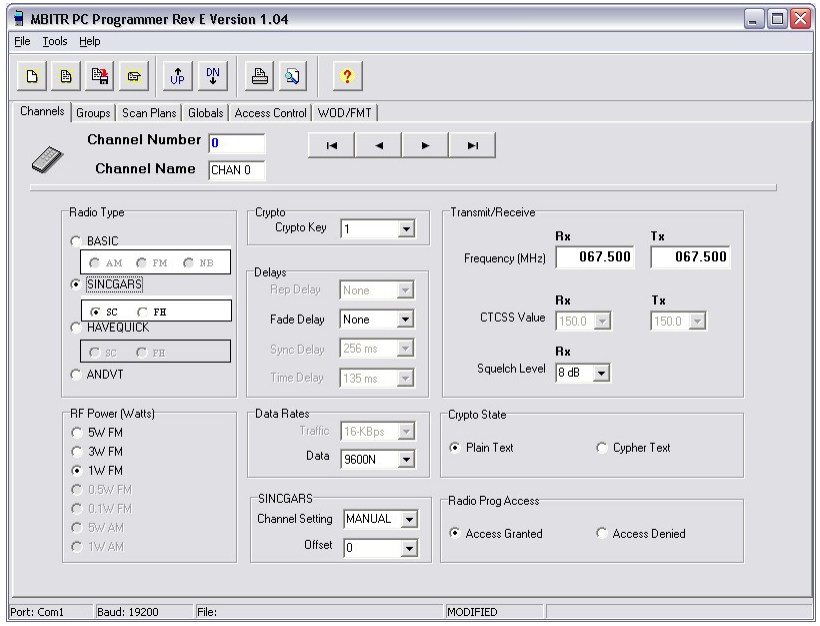

Figure 3-3 SINCGARS Channel Parameters Screen

Before downloading a new configuration to a radio, the Programmer queries the radio. If the radio does not support SINCGARS and a channel has been configured for SINCGARS in the Programmer, the Programmer will report an error and not configure the radio.

3-3.1.3 HAVEQUICK CHANNELS

(The radio must have the HAVEQUICK software option enabled.) The HAVEQUICK Channels screen (Figure 3-4) allows the user to program the channel to Single Channel (SC) Clear and Encrypted AM Voice or Encrypted data, or Frequency Hopping (FH) Clear Analog Voice or Encrypted Digital Voice operation. The operating frequency range for a HAVEQUICK I/II channel is 225.000 to 399.975 MHz.

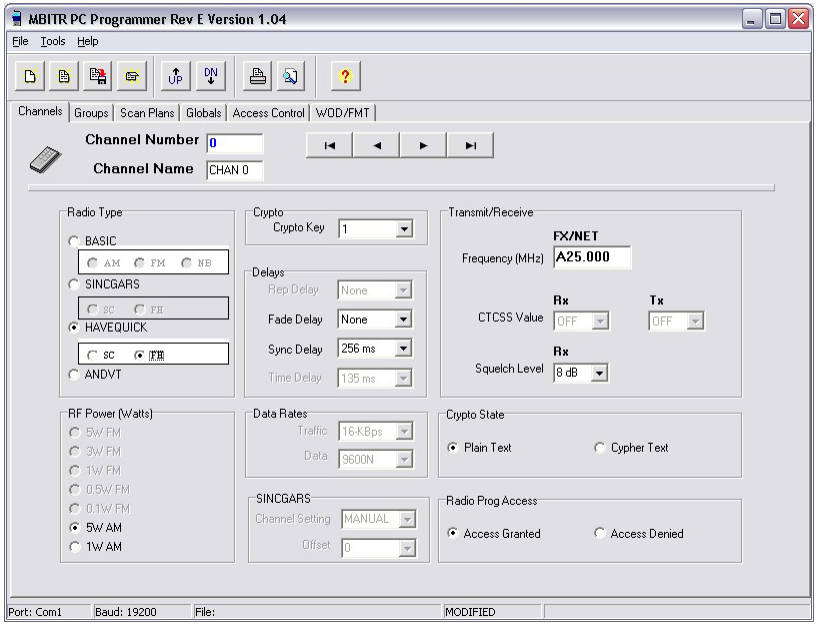

Figure 3-4 HAVEQUICK Channel Parameters Screen

Before downloading a new configuration to a radio, the Programmer queries the radio. If the radio does not support HAVEQUICK and a channel has been configured for HAVEQUICK in the Programmer, the Programmer will report an error and not configure the radio.

3-3.1.4 ANDVT Channels

(The radio must have the ANDVT software option enabled.) The ANDVT Channels screen (Figure 3-5) allows the user to program the channel to ANDVT operation. ANDVT uses Phased Shift Keying (PSK) modulation, has a data rate of 2400 bits per second, and only operates in encrypted mode. The operating frequency range for an ANDVT channel is 30.000 to 512.000 MHz.

Before downloading a new configuration to a radio, the Programmer queries the radio. If the radio does not support ANDVT and a channel has been configured for ANDVT in the Programmer, the Programmer will report an error and not configure the radio.

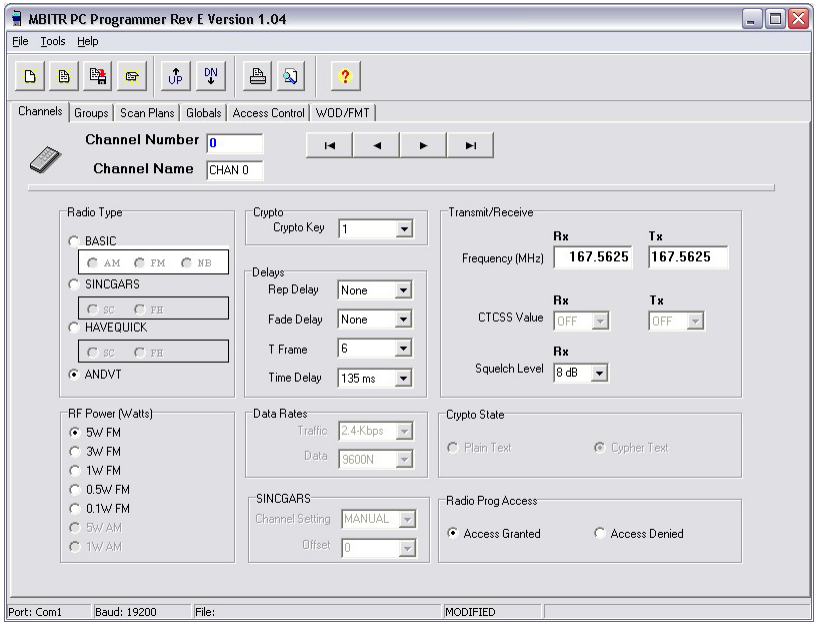

Figure 3-5 ANDVT Channel Parameter Screen

Table 3-1 contains the allowable values for channel parameters. Some parameters are channel type specific (i.e., the parameters only apply to one type of channel). Data Rate, SINCGARS Channel Setting, and Offset are

SINCGARS only parameters and will be grayed out on any non-SINCGARS channel. Repeater Delay applies only to Basic Channels. The CTCSS Value applies to Basic FM and NB channels only. Sync Delay applies to Basic and HAVEQUICK channels. The traffic rate for SINCGARS and HAVEQUICK channels is fixed at 16 kbps.

Table 3-1. Channel Parameters

Channel Parameter	***Values***
Channel Number	0 through 99.
Channel Name	A seven character alphanumeric label.
Radio Type	Basic (AM, FM or NB), HAVEQUICK I/II (Single Channel or Frequency Hopping), SINCGARS (Single Channel or Frequency Hopping), or ANDVT. SINCGARS is FM only; HQ I/II is AM only; ANDVT is PSK. (SINCGARS, HAVEQUICK, and ANDVT are optional software upgrades to the basic radio).
RF Power	0.1, 0.5, 1, 3, or 5 Watts for FM; 1 or 5 Watt for AM; 1, 3, or 5 Watts FM for SINCGARS; 0.1, 0.5, 1, 3, or 5 Watts for ANDVT (PSK). .
Cryptographic Key	Key Positions 1 through 5.
Repeater Delay	None, 0.2, 0.4, 0.6, 0.8, or 1 second.
Fade Delay	None, 1, 2, 3, or 4 seconds.
Synchronization Delay	None, 0.256, 0.384, or 1.067 seconds. (Not applicable to ANDVT.)
Traffic Rate	12 or 16 kilobits per second (kbps).
Data Rate	600, 1200, 1200N, 2400, 2400N, 4800, 4800N, 9600N, 16000, PCKT, or RS232.
SINCGARS Channel Setting	CUE, MANUAL, 1, 2, 3, 4, 5, or 6.
SINCGARS Offset	0, +5, +10, -5, or –10 (kHz)
Receive Frequency	30.00000 to 512.00000 MHz for Basic and ANDVT, 30.000 to 89.975 for SINCGARS, and 225.000 to 399.975 for HAVEQUICK.
Transmit Frequency	Same as Receive Frequency
Rx and Tx CTCSS	CTCSS tones are 67.0, 69.3, 71.9, 74.4, 77.0,

Channel Parameter	Values
Value (Basic FM and NB only)	79.7, 82.5, 85.4, 88.5, 91.5, 94.8, 97.4, 100.0, 103.5, 107.2, 110.9, 114.8, 118.8, 123.0, 127.3, 131.8, 136.5, 141.3, 146.2, 150.0, 151.4, 156.7, 162.2, 167.9, 173.8, 179.9, 186.2, 192.8, 203.5, 210.7, 218.1, 225.7, 233.6, 241.8, 250.3, or OFF (all values listed are Hertz (Hz).
Squelch Level	6, 8, 10 12, 14 or 16 decibels.
Crypto State	Plain Text or Cypher Text (ANDVT is Cypher Text only)
Radio Prog Access	Access Granted or Access Denied. Programming access can be set for individual channels.
Training Frames	ANDVT setting of 6, 9, 12, 15, 30, or 60.
Time Delay	ANDVT setting of 135, 295, 600, 895, or 1200 msecs.

3-3.2 GROUP PARAMETERS

The Groups screen (Figure 3-6) allows the user to view, assign channels, and assign 3-character alphanumeric labels for up to 10 channel groups. A group may consist of up to 16 channels. Any channels not assigned to a group cannot be accessed by the radio during normal operations. A channel can be assigned to more than one group. Channel numbers are entered in the spaces provided. A small box will appear showing the Channel Type (B is Basic, SG is SINCGARS, HQ is HAVEQUICK, and AN is ANDVT), Channel Name, RF Power setting, Modulation Type (AM, or FM), and RX and TX Frequencies for that channel. The 16 positions correspond to the 16-position channel select switch. When the group is active in the radio, channels are selected with the channel select switch. To edit the channels, click in the Channel Number Box, press the right mouse button, and select "Edit". The Channels Screen for the selected channel will be displayed.

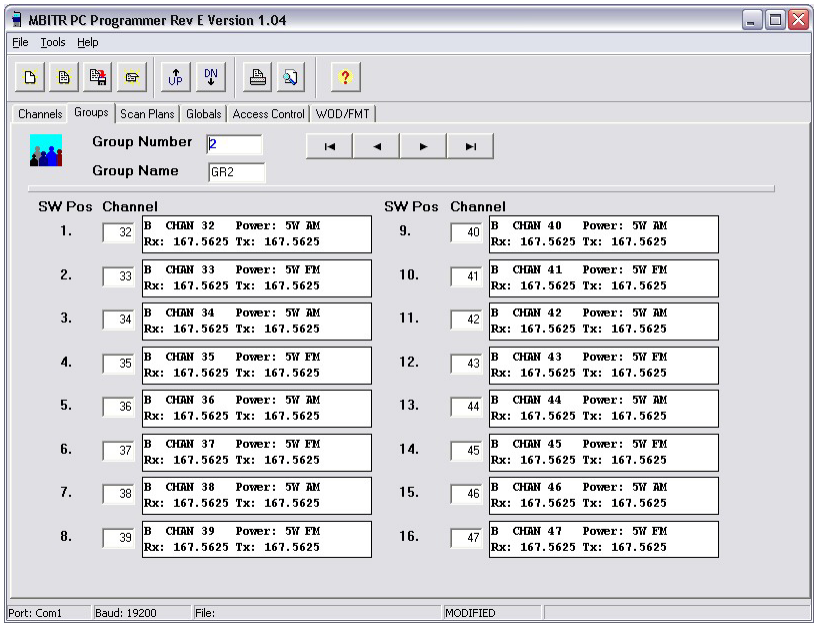

Figure 3-6 Group Parameters Screen

3-3.3 SCAN PLAN PARAMETERS

The Scan Plans Screen (Figure 3-7) allows the user to view, assign channels, and assign 3-character alphanumeric labels for up to 10 scan plans. Channel numbers are entered in the spaces provided. A small box will appear showing the Channel Type, Channel Name, RF Power setting, Modulation Type, and RX and TX Frequencies for that channel. The 16 channel positions correspond to the 16-position channel select switch. When the scan plan is active in the radio, channels are selected with the channel select switch. The active Scan Plan must match the active Group (e.g., if Group 3 is active, then Scan Plan 3 is active). Although it is not necessary for the Group and Scan Plan with the same number to contain all the same channels, **Thales recommends that corresponding Groups and Scan Plans have at least one common channel**. To edit the channels, click in the Channel Number Edit Box, press the right mouse button, and select "Edit". To change channels in the Scan Plan, highlight the channel to be changed and type in the new number. To edit the

channels, click in the Channel Number Box, press the right mouse button, and select "Edit". The Channels Screen for the selected channel will be displayed. One or two of the channels in a Scan Plan can be selected as Priority Channels (scanned before and after every other channel). Frequency hopping (SINCGARS and HAVEQUICK) channels cannot be scanned. If any of these channels are assigned to a Scan Plan, the radio will skip them while scanning. ANDVT channels will not scan with other modes in the same scan plan. It is best to configure ANDVT scanning with only ANDVT programmed channels. It is possible to configure scan plans that contain both ANDVT and other channel types. However, in those cases, the radio will only scan either the ANDVT channels or the non-ANDVT channels, depending on the channel type of the active channel when scan is initiated.

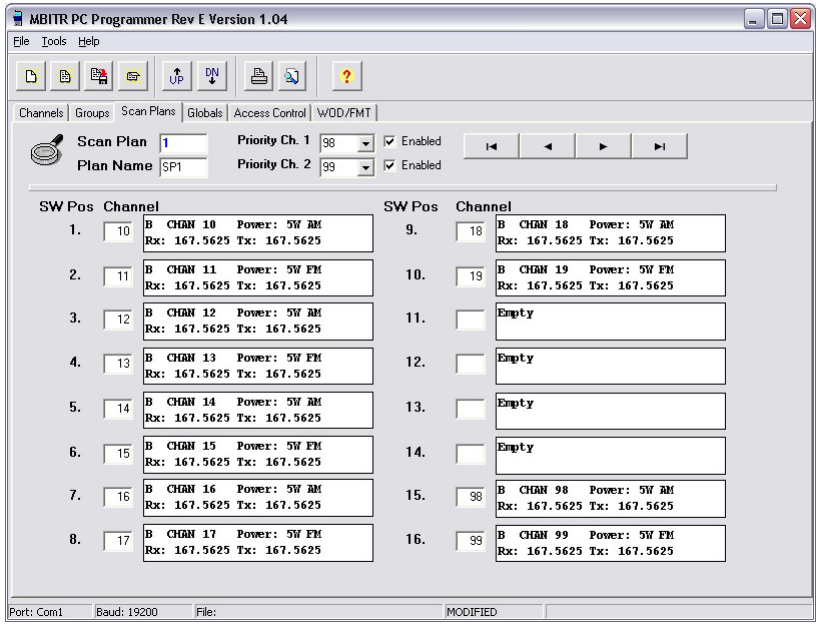

Figure 3-7 Scan Plan Parameters Screen

3-3.4 GLOBAL PARAMETERS

The Globals screen (Figure 3-8) allows the user to view and change parameters that apply to all the channels of the radio, such as Transmit Timeout and

Backlight Timeout. The global parameters and their accepted values are listed in Table 3-2. Transmit Timeout allows the radio to automatically end transmissions after the chosen time limit. An alarm will sound during the last five seconds before the Transmit Timeout implements. Current Group/Scan Plan sets the Scan Plan and Group in which the radio will operate when it is turned on (the group and scan plan numbers must match).

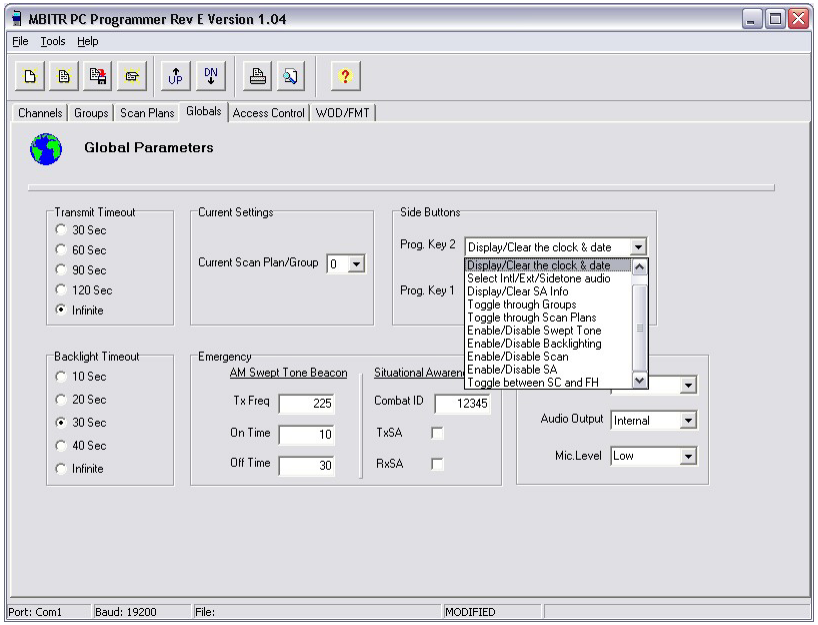

Figure 3-8 Global Parameters Screen

These settings can be changed using the radio keypad and LCD. Emergency parameters allow the user to program the emergency beacon frequency and beacon on (transmit) and off (standby) times. TxSA and RxSA, when checked, enable the radio to send and receive Situation Awareness (SA)/ Global Positioning System (GPS) information. Side Buttons parameters allow a user to select one of the programmable side key functions. Audio Settings allow a user to set the volume of radio alert tones, send the audio output to the internal speaker or an external audio device, and set the Mic Level to High or Low.

Table 3-2. Global Parameters

Parameter	*Acceptable Values*
Transmit Timeout	Prevents inadvertent or prolonged operation in transmit mode in order to preserve battery power. Values are 30, 60, 90, 120 seconds, or Infinite.
Backlight Timeout	Turns off the radio backlight after a period of inactivity to preserve battery power. Values are 10, 20, 30, 40 seconds, or Infinite.
Side Buttons	
Programmable Key 1 and Key 2	Programs the functions of the side keys. Available functions are: Disabled, Display/Clear clock and date, Select Internal/External/Sidetone audio, Display/Clear SA Info, Toggle through Groups, Toggle through Scan Plans, Enable/Disable Swept Tone, Enable/Disable Backlighting, Enable/Disable Scan, Enable/Disable SA, Toggle between SC and FH.
Current Settings	
Current Group/Scan Plan	Sets the initial channel Group and Scan Plan in the radio when it is turned on.
Emergency – AM Swept Tone Beacon	
Transmit Frequency	Set the transmit frequency for the Emergency Beacon. Value must be between 116.000 to 149.975 MHz or 225.000 to 399.975 MHz.
On Time	Amount of time the beacon will transmit. Values are 1 - 30 seconds.
Off Time	Amount of time between beacon transmissions. Values are 0 - 30 seconds.
Emergency – Situational Awareness	
Combat ID	A number used to identify a radio/user. Values are from 00000 to 99999.

Parameter	*Acceptable Values*
TxSA	Enable the radio to transmit its GPS location (when connected to a PLGR).
RxSA	Enable the radio to receive a sending radio's GPS location.
Audio Settings	
Tone Level	Determines the volume of radio alerts and pip tones. Values are 0-7. 0 is the lowest level and will blank everything except the crypto alarm and radio pip tones.
Audio Output	Determines if audio will be routed to the internal speaker/mic or to an external audio accessory. Sidetone is the same as external except that the user can hear their own transmission through the audio accessory.
Mic Level	HIGH or LOW. The HIGH mic level increases the gain at all volume switch settings. The LOW mic level increases the gain only at the two lowest volume switch settings. The HIGH setting works best with accessories using a dynamic microphone such as the H-250 or carbon element helmet microphones. The LOW setting works best with accessories employing electret microphones. The LOW setting uses a whisper mode that amplifies the mic input at the two lowest volume settings.

3-3.5 ACCESS CONTROL PARAMETERS

The Access Control Screen (Figure 3-9) allows the user to control access to programming menus through the radio LCD and keypad.

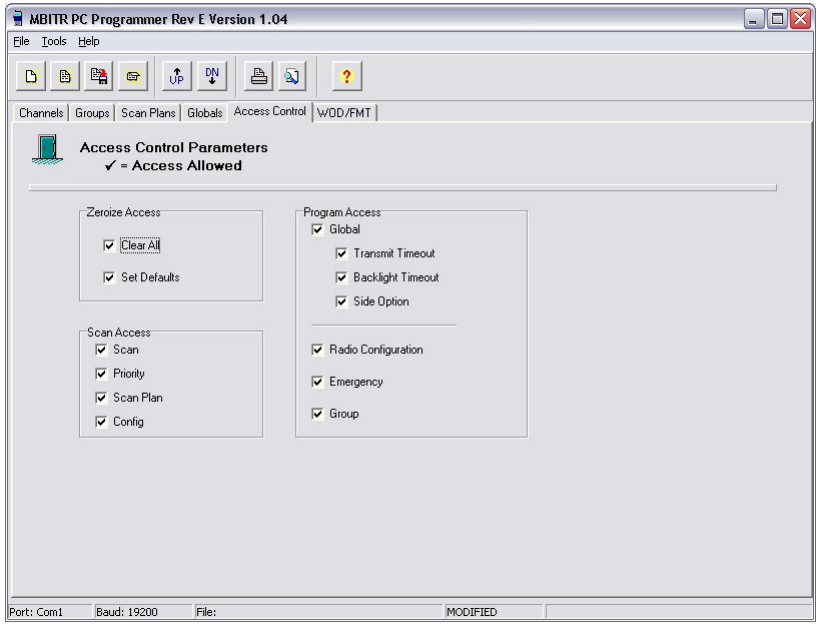

Figure 3-9 Access Control Parameters Screen

If the box is checked then the radio operator will have access to that menu using the LCD and keypad. Under Program Access, if 'Global" is not checked, the operator will not have access to any of the submenus underneath "Global" (i.e., Transmit Timeout) even if the box for that submenu is checked. If Radio Configuration is not checked, individual channel access selections are overridden and no channel access is available to the user.

3-3.6 WORD OF DAY/FREQUENCY MANAGED TRAINING (WOD/FMT) PARAMETERS

The Word of Day/Frequency Managed Training (WOD/FMT) screen (Figure 3-10) allows a user to configure the HAVEQUICK I WOD, HAVEQUICK II multiple WODs (MWODs), and the HAVEQUICK II FMTs. There are up to six MWODs for HAVEQUICK II, each requiring a Day of the Month to be associated with it. The FMT contains 16 frequencies (P20 through P5) used for HAVEQUICK training nets. The WOD/MWOD and FMT values must be between 225.000 and 399.975 MHz. The last two digits of P20 must be 00, 25,

or 50. The Day of the Month must be between 00 and 31 (selecting 00 makes that MWOD inoperative).

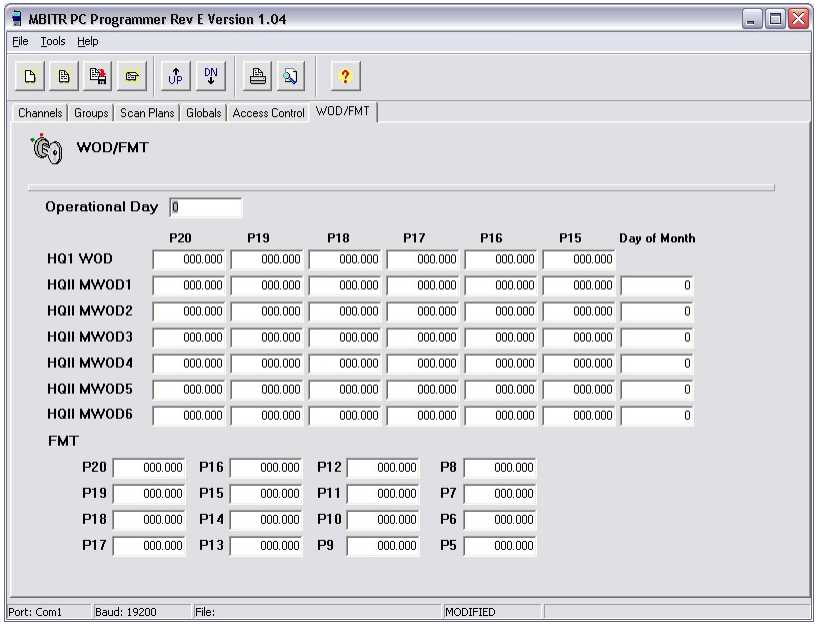

Figure 3-10 WOD/FMT Parameters Screen

3-4 GUI COMPONENTS

The PC Programmer GUI main components consist of a pull-down menu bar, a speed bar, speed menu, parameter screen, and a status bar. The parameter screens are described in paragraph 3-2. The menus and the status bar are described below.

3-4.1 PULL DOWN MENU

The pull-down menu appears at application start-up. To display a brief description of the menu item's functionality, place the arrow cursor on the menu item. Items that appear disabled (grayed out) are not applicable in the current context. For instance, no items in the EDIT menu are applicable until

an operational data file is loaded into PC Programmer. The four menu headings listed below are described in the following sections:

1. File
2. Edit
3. Tools
4. Help

3-4.1.1 FILE

Contains all items relating to file operations. The available menu items are described in the following sections. Only one operational data file at a time can be resident in the PC Programmer. Using the "New" or "Open" commands when an operational data file is currently in PC Programmer will cause that file to be overwritten. Therefore, PC Programmer prompts the user before overwriting the file.

3-4.1.1.1 NEW

Opens an operational data file with default (factory) parameters. This file is the same as a default radio or a new from-the-factory radio.

3-4.1.1.2 OPEN

Loads an operational data file from the hard drive or a disk drive into PC Programmer. Clicking on "Open" will display the "Open File" dialog box. The user may then select the file to be opened. The operational files do not have to reside in the same directory as the executable program files. To load an operational file, either double-click on the file name or single click on the file name to highlight it and then click on "Open".

3-4.1.1.3 SAVE

Saves the operational data file currently in PC Programmer. It will save the file in its original path and will overwrite the older version of the file. If the file has not been saved (uploaded from radio or new file) previously, a "Save As" dialog box will appear and allow the user to save the file as described in paragraph 3-4.1.1.4.

3-4.1.1.4 SAVE AS

Saves the operational data file currently in PC Programmer. A "Save As" dialog box allows the user to name or rename a file and designate the directory to which it will be saved. "Save As" must be used to initially save an

operational data file uploaded from a radio or to save a file created using the "New" command under the "File" pull-down menu. Using "Save As" on a file that has already been saved allows the user to save the file under a different file name and, therefore, not overwrite the original file.

3-4.1.1.5 CLOSE

Closes the file currently in PC Programmer and returns the user to the start-up screen (Figure 3-1). If the file has been modified, a dialog box that allows the user to save the file before exiting will appear. This dialog box will not appear if the file has not been modified.

3-4.1.1.6 UPLOAD

Loads an operational data file from an attached radio into PC Programmer. Clicking on "Upload" displays a dialog box (Figure 3-11) showing the status as information is loaded and formatted in PC Programmer. Once the program is loaded and formatted, click the "U OK" box (to get to the operational data file in PC Programmer).

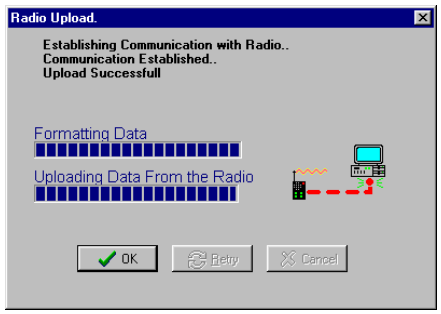

Figure 3-11. Radio Upload Box

3-4.1.1.7 DOWNLOAD

Sends an operational data file in PC Programmer to an attached radio. This operation will overwrite the operational data file currently in the radio. Clicking on "Download" displays a dialog box (Figure 3-12) showing the status as information is formatted and loaded into the radio.

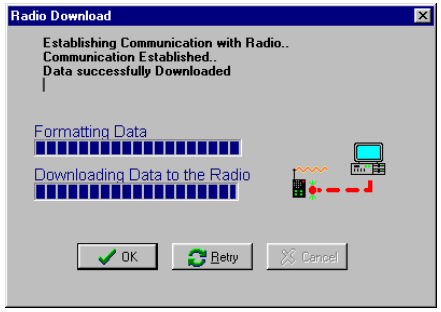

Figure 3-12. Radio Download Box

3-4.1.1.8 PRINT

Prints the operational data file (radio current configuration data) in hard copy.

3-4.1.1.9 PRINT PREVIEW

Allows the user the view the output before it is printed. From the print preview screen the user can scroll through the report, setup the printer, print the report, save the report to a file, or load an existing report file.

3-4.1.1.10 PRINT SETUP

Sets certain operational characteristics of the printer. These characteristics, which depend on the type of printer being used, can include paper (size and orientation), paper source (i.e., upper tray), number of copies, graphics (resolution, scaling, and halftone), and device options (page protection and resolution enhancement).

3-4.1.1.11 EXIT

Exits PC Programmer. The program can also be exited by double clicking on the PC Programmer icon in the upper left corner of the PC Programmer screen, or by single clicking on the icon and then clicking on "Close".

3-4.1.2 EDIT

Contains the basic Windows edit functions of Undo, Cut, Copy, and Paste. Also contains Group, Channel, Global, Scan Plan and Access Control options that cause the appropriate parameter screen to appear.

3-4.1.3 TOOLS

Contains interface parameters between the radio and PC Programmer. There are four available menu items: Default, Flash Download, Options, and Update Radio Functions Enabled (see Figure 3-13).

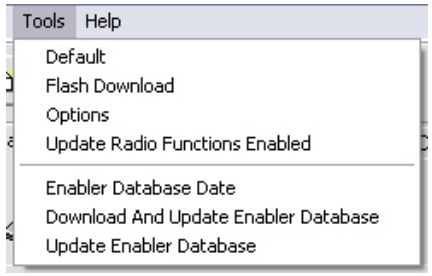

Figure 3-13. Tools Pulldown Menu

3-4.1.3.1 DEFAULT

Sets all operational data file parameters to default (factory) parameters. A dialog box (Figure 3-14) will request verification that the user wants to set the parameters to the original factory defaults.

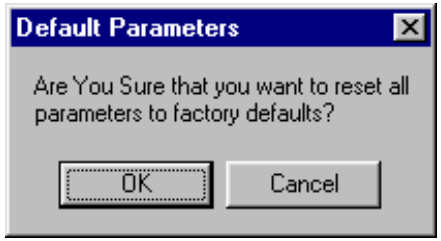

Figure 3-14. Default Warning Box

3-4.1.3.2 FLASH DOWNLOAD

Allows the user to load complete updated radio operating code from the hard drive or a disk drive into the radio. A download box (Figure 3-15) will keep the user appraised of the download status. At the completion of the download, the PC Programmer will automatically re-enable all optional functions for the

radio. If the radio's (electronic) serial number is not available in the PC Programmer database, a message will be displayed and the previously enabled functions will be reloaded into the radio at the end of the Flash Download operation. If the database does not contain the radio's electronic serial number, follow the procedure in paragraph 3-4.1.3.8 to download and install a current database.

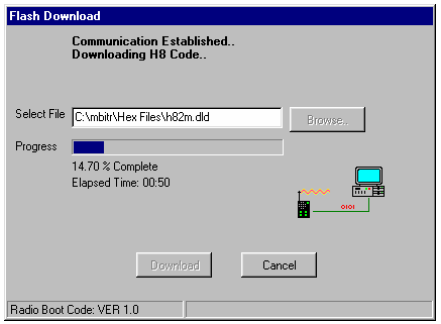

Figure 3-15. Flash Download Box

NOTE: Carefully follow the instructions on the screen prior to and during the closing of this window. The PC Programmer cable should not be disconnected from the radio and the CLOSE box should not be selected "Yes" until the radio completely re-boots. Otherwise, **NO ENABLED FUNCTIONS WILL BE RESTORED IN THE RADIO**.

3-4.1.3.3 OPTIONS

Allows the user to select the communications port to which the PC Programming Cable is connected and the "baud rate" (communication speed) between the computer and the radio (Figure 3-16). Available baud rates are 9,600, 19,200, and 38,400 bits per second (bps). Currently, the radio communicates with the PC Programmer at 19,200 bps for regular programming and 38,400 bps for flash download.

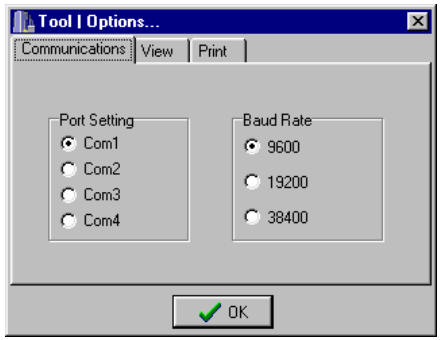

Figure 3-16. Options Parameters Screen

3-4.1.3.4 VIEW

Contains a check box that allows the user to turn off the hints that are shown when the mouse is positioned on the speed bar buttons or the navigation buttons.

3-4.1.3.5 PRINT

Contains four check boxes (Channel, Group, Scan Plan, and Global), which allow the user to choose which parameters should be included on printed reports.

3-4.1.3.6 UPDATE RADIO FUNCTIONS ENABLED

Allows the update of optional radio functions. The current optional functions are ANDVT, SINCGARS, HAVEQUICK, and RETRANS. The PC Programmer includes a database of all radios and the functions associated with each one. If a function has been disabled in a radio, it can be reinstated using this operation.

3-4.1.3.7 ENABLER DATABASE DATE

Displays the date of the currently installed Enabler database. The database identifies the enabled functions of all radios shipped prior to the database date.

3-4.1.3.8 DOWNLOAD AND UPDATE ENABLER DATABASE

The database is updated by Thales each month and posted on the Internet. If the displayed database date is more than 30 days past the current date, select

this option to download the current database from Thales and automatically install it in the programmer.

3-4.1.3.9 UPDATE ENABLER DATABASE

If you do not have Internet access, you can request a copy of the current database on disk from Thales Customer Service (1-800-914-0303). When you receive the disk, insert it in your computer and select this option. Follow the on-screen instructions to install the new database in the programmer.

3-4.1.4 HELP

The only item menu under the HELP menu is "About". "About" displays a dialog box that indicates the version number of the installed PC Programmer software. Clicking on the www.thalescomminc.com command line will open a connection to the Thales Communications web site, if the user is connected to the Internet with a suitable web browser.

3-4.2 SPEED BAR

The speed bar (Figure 3-1) is a quick method of accessing menu commands. To display a brief description of a tool's functionality, place the arrow cursor on the tool icon and pause for a second. The items on the Speed Bar are described in the following paragraphs.

3-4.2.1 OPEN NEW

Clicking on this icon (Figure 3-17) opens a new operational file with default parameters. This is the same as using the "New" menu item at paragraph 3-4.1.1.1.

Figure 3-17. "Open New" Speed Bar Icon

3-4.2.2 OPEN EXISTING

Clicking on this icon (Figure 3-18) opens an existing operational file. This is the same as using the "Open" menu item at paragraph 3-4.1.1.2.

Figure 3-18. "Open Existing" Speed Bar Icon

3-4.2.3 SAVE FILE

Clicking on this icon (Figure 3-19) saves the operational file currently in PC Programmer. This is the same as using the "Save" menu item at paragraph 3-4.1.1.3

Figure 3-19. "Save File" Speed Bar Icon

3-4.2.4 CLOSE FILE

Clicking on this icon (Figure 3-20) closes the operational file currently in PC Programmer. This is the same as using the "Close" menu item at paragraph 3-4.1.1.5

Figure 3-20. "Close File" Speed Bar Icon

3-4.2.5 UPLOAD FILE

Clicking on this icon (Figure 3-21) uploads an operational file from an attached radio into PC Programmer. This is the same as using the "Upload" menu item at paragraph 3-4.1.1.6

Figure 3-21. "Upload File" Speed Bar Icon

3-4.2.6 DOWNLOAD FILE

Clicking on this icon (Figure 3-22) downloads the active operational file into an attached radio from PC Programmer. This is the same as using the "Download" menu item at paragraph 3-4.1.1.7

Figure 3-22. "Download File" Speed Bar Icon

3-4.2.7 PRINT

Clicking on this icon (Figure 3-23) sends the operational file to an attached printer. This is the same as using the "Print" menu item at paragraph 3-4.1.1.8

Figure 3-23. "Print" Speed Bar Icon.

3-4.2.8 PRINT PREVIEW

Clicking on this icon (Figure 3-24) allows the user to preview the print file. This is the same as using the Print Preview Menu item at paragraph 3-4.1.1.9

Figure 3-24. "Print Preview" Speed bar Icon.

3-4.2.9 ABOUT

Clicking on this icon (Figure 3-25) brings up a dialog box that displays the version of the installed PC Programmer.

Figure 3-25. "About" Speed Bar Icon.

3-4.3 SPEED MENU

The Speed Menu, also known as a context menu, is a floating menu with context sensitive menu items (a menu contains different items depending on the current selected action). Selecting a speed menu item performs the same function as selecting that same item from the standard menu bar.

3-4.3.1 ACTIVATING SPEED MENU

To activate the Speed Menu, place the arrow cursor on the currently selected item and press the right mouse button. Because the speed menu uses the currently selected item to calculate the context, it is important to select the item before activating the speed menu.

3-4.3.2 EDIT

Activates the dialog box for the currently selected item.

3-4.3.3 DELETE

Causes the selected item to be deleted. Can also be done by pressing the delete key on the computer keyboard.

3-4.4 STATUS BAR

The Status Bar (Figure 3-26) shows context-sensitive textual information regarding the current state of the application. This information includes current communications (COM) port settings, baud rate, current working path and the configuration file being used. A "MODIFED" label will appear on the status bar if the file currently in PC Programmer has been modified since the last time it was saved.

Figure 3-26. Status Bar

4 - DEFINITIONS

Table 4-1 lists the definitions for radio parameters used in Chapter 3.

Table 4-1. Definitions

TERM	DEFINITION
Amplitude Modulation (AM)	The voice signature is imprinted into the amplitude (sine wave) of the transmission – the transmission frequency does not change
Audio Tone Level	Determines the volume of radio alerts and pip tones. The MBITR alerts include: critical error alert (synthesizer out-of-lock, high temperature), low battery alert, clear text/clear text override alert, pre-transmit timeout alert (5 seconds until transmit timeout), transmit timeout shutdown alert (transmit timeout reached and transmission terminated). The lowest volume level (0) will blank out everything except the pip tones.
Backlight Timeout	Automatically turns off the backlight after a pre-determined length of time with no keypad activity.
Channel Name	A seven character alphanumeric label that may be assigned to a certain channel. Channels will be identified by their channel number (00 to 99) if no name has been programmed.
Cryptographic Key	A number or number string used to encrypt/decrypt transmitted and received data or voice messages.
Data Rate	Transmission rate for data traffic between the radio and a Data Terminal Device. (Requires SINCGARS optional software upgrade and is not implemented at this time)
Fade Bridging	A method to maintain encryption synchronization during momentary signal loss.
Fade Delay	The amount of time that Fade Bridging will be used to retain encryption synchronization during signal loss.

TERM	DEFINITION
Frequency Modulation (FM)	The voice signature is converted to a frequency deviation that is added to the frequency of the transmission - the transmission amplitude does not change.
Global Parameters	Programmable radio parameters that apply to all channels.
Group	A named collection of one or more channels that are mapped to the channel select switch. The radio can store up to ten groups. Each group can contain up to sixteen channels and any channel can belong to any group or all groups. The groups can be assigned names of up to 3 characters. The user can select only one group at any given time for radio operations. Any channels not assigned to groups are automatically skipped by the radio during normal operation. Groups are dynamically linked to Scan Plans
Group Name	A three character alphanumeric label that may be assigned to a group. Groups will be identified by their group number (GR0 to GR9) if no name has been programmed.
Channel/Radio Type	Type of radio operations to be programmed into a channel. Operating modes are Basic (30-512 MHz, NB, AM or FM), SINCGARS (30-88 MHz, FM, Frequency Hopping), HAVEQUICK I/II (225-400 MHz, AM, Frequency Hopping) or ANDVT. The range of parameters to be programmed in a channel will depend on the channel type.
Priority Channel	A channel that will be checked before and after every other channel; when the radio is scanning. For example if a scan plan has channels 1 through 9, and 3 and 4 are priority channels, the scanned channels will be 3, 4, 1, 3, 4, 2, 3, 4, 3, 3, 4, 4, 3, 4, 5, 3, 4, 6, 3, 4, 7, 3, 4, 8, 3, 4, 9, and so on.
Receive CTCSS Tone	A standard Continuous Tone Controlled Squelch System (CTCSS) tone which must be superimposed over a signal for the radio to be able to receive the transmission.

TERM	DEFINITION
Receive Frequency	The receive frequency of the radio's channels. The receive frequency for each of the 100 channels must be programmed separately.
Repeater Delay	A delay that can be programmed into the radio when it is used with a tactical repeater. The delay is intended to prevent the radio from receiving its own transmission from the repeater.
RF Bandwidth	A small range of frequencies around a transmit or receive frequency in which the message can go out or be received. For example, if a receive frequency is 174 MHz and the Bandwidth is 25 kHz, messages with frequencies between 173.9875 MHz and 174.0125 MHz can be received (12.5 kHz below and 12.5 kHz above the frequency).
RF Power	Transmit power levels. The lower levels extend battery life but limit transmission range. The higher levels increase transmission range but reduce battery life.
Scan	The radio will cycle through all channels programmed in the current Scan Plan, checking for traffic that can either break squelch or contains the appropriate CTCSS tones.
Scan Plan	A "grouping" of channels to be checked during scan operations. The Scan Plan can be programmed to include a limited subset of the channels in a group and can designate priority channels. A Scan Plan consists of up to 16 channels with up to two being allocated as priority channels. Scan Plans are dynamically linked to Groups.
Scan Plan Name	A three character alphanumeric label that may be assigned to a scan plan. Scan Plans will be identified by their plan number (SP0 to SP9) if no name has been programmed.

TERM	DEFINITION
Squelch Level	A value, in dB, that determines the received signal strength required to "break squelch" (the radio recognizes that traffic is being received). Higher values (12-16 dB) should be used in high traffic density areas where the desired traffic is broadcast over short ranges (# 1 mile). Lower values (off or 6-10 dB) should be used where there is limited traffic and the desired traffic is broadcast at the limits of effective range. This squelch value is only used when CTCSS tones are set to OFF.
Synchronization Delay	The length of the cryptographic preamble to be transmitted.
Time Delay	The time between the transmit carrier going active without modulation and the carrier having modulation applied
Traffic Rate	Transmission rates for radio operation. When operating in secure mode, this rate determines the interoperability of the radio. 12 kilobits per second (kbps) is selected for FED-STD-1023 compatible operation, and 16 kbps is selected for VINSON compatible operation.
Training Frames	Additional bytes of preamble reversals preceding valid voice or data (ANDVT only).
Transmit CTCSS Tone	A standard CTCSS tone superimposed on the transmit signal. The signal can be received only by other radios programmed to receive traffic with that tone (or set to “No Tone”). The CTCSS tone can be used to reduce interference and background electric noise.
Transmit Frequency	The transmit frequency of the radio’s channels. The transmit frequency for each of the 100 channels must be programmed separately.
Transmit Timeout	A feature that automatically ends transmission after a pre-determined length of time in transmit mode. This prevents inadvertent or prolonged operation in transmit mode which can significantly shorten battery life.

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