

# Programming Guide

LBI-38540

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The Future of Mobile Radio



## MASTR® IIe/III Utility Program

TQS0619

# **PERSONAL COMPUTER PROGRAMMING**

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## **INTRODUCTION**

M/A-COM, Inc. welcomes you to the world of mobile communications. We believe there is no equal to M/A-COM products and have made a commitment to our customers to ensure that product satisfaction and reliable service is our number one priority.

The MASTR® IIe/III Utility Program provides a simple means of accessing a subset of the MASTR IIe/III Station diagnostics and programming capabilities.

This manual is organized to support you in computer aided diagnostics of the MASTR IIe/III Control Station and will discuss:

- Utility Configuration
- Serial Functions
- Potentiometer Settings
- Metering
- Station Configuration
- Software/Firmware Information
- Programmable Timers
- Remote Diagnostics
- Serial Port Access
- Modem Configuration
- Serial Request Timeout
- Phone Directory
- Station Diagnostics
- Station Status
- Tone Diagnostics
- Parallel I/O
- Switches/Inputs

# CHAPTER 1

## BEFORE YOU BEGIN

### ABOUT THIS MANUAL

This manual is designed to present you with information necessary to connect a MASTR IIe/III Control Station to the computer and to make operational adjustments to the Station through the computer keyboard.

**Chapter 1** - provides you with some basic information to be aware of prior to running the software. It explains screen functionality, keyboard layout, and some commonly used terms.

**Chapter 2** - contains a list of the contents of this package and instructions for installing the MASTR IIe/III Utility Program Software.

**Chapter 3** - will instruct you in software operation such as activating screens, adjusting potentiometers, identifying software, and monitoring station performance.

Screen diagrams are used throughout this manual to help clarify section discussions. Please pay particular attention to NOTES as they contain pertinent information that you should be aware of.

### IMPORTANT TERMS

**Field** - Refers to the area of the screen that allows data entry. This area is readily identifiable by a reverse video bar when moving the cursor across the screen. Since direct data entry is prohibited (only modifiable by cursor keys, etc.), incorrect data cannot be entered.

**Help** - Pressing [F1] activates a Help Screen associated with any given field. In the Potentiometer Screen pressing [F1] causes a Help Screen to appear in the center of the screen indicating which keys are operational in the Potentiometer Screen.

**Personality** - Refers to information that is stored in a station by a field programmer to make it perform differently than other stations. The information can then be modified or deleted and is stored on a disk for later reference.

**Screen** - The term Screen is used throughout the MASTR IIc/III Utility Program Manual. Each screen is divided into two areas: (1) screen title, and (2) screen area. The screen title describes the screen area functionality. The screen area displays pertinent information or allows programming alternatives.

## SCREEN LAYOUT

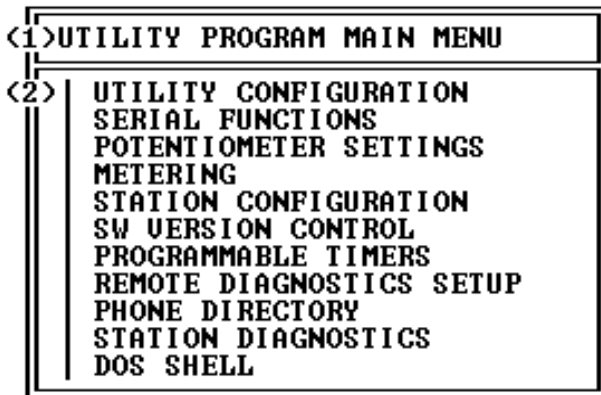


Figure 1-1 - Screen Layout

- (1) Screen Heading - describes area functionality
- (2) Screen Area - displays programming alternatives

The Screen Layout, shown in Figure 1-1, indicates the overall layout of the utility program. Highlighting a field and pressing the **<enter>** key will cause that field to appear as a screen or enable its functionality. Each screen is discussed in further detail in Chapter 3.



## USING THE KEYBOARD



Figure 1-2 - 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 Utility Program Software package there are a limited number of operational keys residing in the following categories:

- **Function**
- **Editing**
- **Movement**

The following sections give an overview of which keys are included in these categories and their functions. In many screens, only the use of cursor keys will be necessary.

**Function Keys**

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
----	----	----	----	----	----	----	----	----	-----

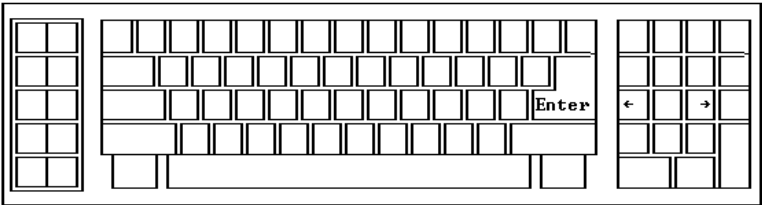
OR:

F1	F2
F3	F4
F5	F6
F7	F8

The purpose of a specific function key is dependent on the screen being accessed. The **F1** function key activates a Help screen from any area you are in. Other function keys perform a specific function pertaining to the screen that is currently activated. Be sure that you fully understand the purpose for any function key prior to pressing it.

There are two types of function keys: Active and Inactive. Active function keys cause the software to execute the action delegated to that particular key. Inactive function keys have no operational capabilities.

**Editing Keys**



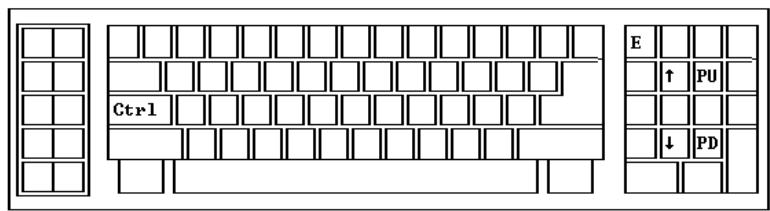
Editing keys manipulate data within a field. These keys are:

**Right Arrow:** Will either toggle field values or cause the highlighted field to begin its designated operation.

**Left Arrow:** Will either toggle field values or cause the highlighted field to terminate operation.

**Enter:** Causes the highlighted field to become active.

**Movement Keys**



These keys enable cursor positioning in a screen.

**Up and Down Arrows:** Each time one of these arrows is pressed it moves the cursor, as a highlighted bar, over a field. The Up Arrow will move the cursor to the field above its current position. The Down Arrow will move the cursor to the field below its current position.

**Page Up and Ctrl Page Up:** Used to scroll through a list to the top field in a screen.

**Page Down and Ctrl Page Down:** Used to scroll through a list to the bottom field in a screen.

**Escape:** Used to exit out of the current screen.

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## **CHAPTER 2**

# **INSTALLATION**

### **SOFTWARE REQUIREMENTS**

The following hardware and software is required to perform diagnostics on a MASTR IIe/III Control Station:

- A. IBM PC/XT/AT or any true compatible with MS-DOS version 3.0 or later, and having the following minimum configuration:
  - 1. Single CD-ROM drive, or fixed (hard) disk drive system.
  - 2. 640K Internal RAM.
  - 3. Serial Port.
- B. Standard RS-232 cable (TQ3356).
- C. MASTR IIe/III Utility Program Software (TQS0619).

### **MAKING BACKUPS**

The MASTR IIe/III Utility Program Software is provided to you on a CD-ROM.

We recommend that, upon receipt of your CD-ROM, you copy the original Utility Program Software CD-ROM to another CD-ROM or a fixed disk and store the original in a safe place. This ensures the availability of an accurate program should a copy fail during program application.

### **SYSTEM HOOK-UP**

Connect all peripheral equipment to your computer prior to configuring the Utility Program 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 the 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. One standard is a 25 pin RS-232 output that has a DB-25 male connector at the computer. The other standard is a DB-9 male connector at the computer (used on the IBM-AT and many portable laptop computers).

Please note at this point that the Utility Program Software only communicates with the unit and its interface on one of 4 COM ports. 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.

The other end of the RS-232 cable should now be connected into the computer receptacle (J6) on the MASTR IIe/III Control Station. 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 Utility Program Software to fail.

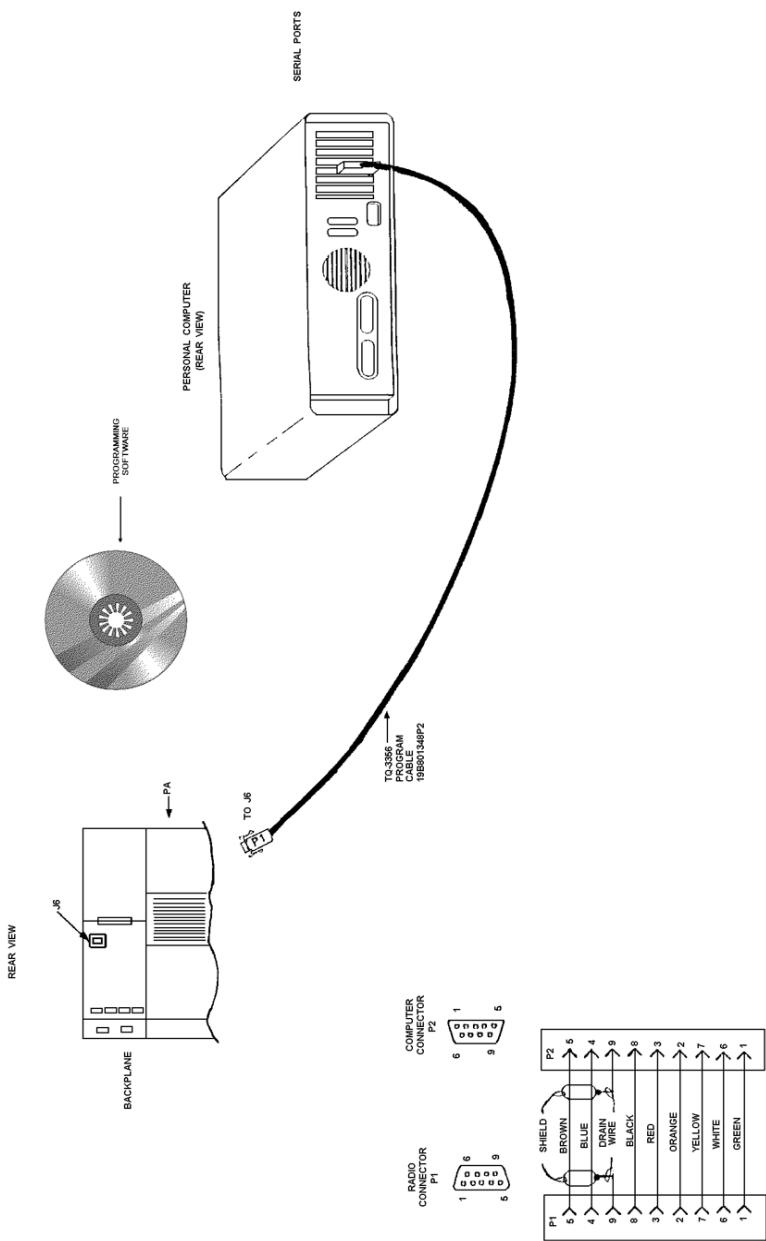


Figure 2-1 - Programming System Hook-Up

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## **CHAPTER 3**

# **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 Utility Program Software.

MASTRutl is installed with MASTR IIe/III Programmer installation. Refer to MASTR IIe/III Programmer Software Release Notes, MS24771-0001, for instructions.

Open the MASTRUtl application by either:

- selecting it from the menu

or

- typing in "mastrutl" at the command prompt

## MAIN MENU FOR THE UTILITY PROGRAM

UTILITY PROGRAM MAIN MENU		<1>
UTILITY CONFIGURATION		<2>
SERIAL FUNCTIONS		<3>
POTENTIOMETER SETTINGS		<4>
METERING		<5>
STATION CONFIGURATION		<6>
SW VERSION CONTROL		<7>
PROGRAMMABLE TIMERS		<8>
REMOTE DIAGNOSTICS SETUP		<9>
PHONE DIRECTORY		<10>
STATION DIAGNOSTICS		<11>
DOS SHELL		<12>

Figure 3-1 - Utility Program Main Menu Screen

- |                             |                                   |
|-----------------------------|-----------------------------------|
| (1) Screen Title            | - utility program main menu       |
| (2) Utility Configuration   | - modify configuration parameters |
| (3) Serial Functions        | - MASTR IIe/III perform change    |
| (4) Potentiometer Settings  | - adjust potentiometer settings   |
| (5) Metering                | - various DC voltage settings     |
| (6) Station Configuration   | - current system configuration    |
| (7) SW Version Control      | - lists some soft/firmware info   |
| (8) Programmable Timers     | - adjusts various timers          |
| (9) Remote Diagnostic Setup | - sets up access through modems   |
| (10) Phone Directory        | - access phone entries            |
| (11) Station Diagnostics    | - displays various status screens |
| (12) DOS Shell              | - gain DOS access                 |

The Utility Program Main Menu Screen, shown in Figure 3-1, displays the main screen for programming a MASTR IIe/III Control Station. Each field allows access into individual screens where control station defaults can be established.

From any field, pressing **F1 Help** will display a help screen for that particular field. Pressing **<esc>** will normally exit a screen and return you to the previous one.

**UTILITY CONFIGURATION** (2) The **UTILITY CONFIGURATION** field allows you to access a screen where modification of some MASTR IIe/III program configuration parameters can be made.

To make a program configuration modification, use the **Up/Down** Arrow keys to highlight the **UTILITY CONFIGURATION** field and press **<enter>**.

**SERIAL FUNCTIONS** (3) The **SERIAL FUNCTIONS** field allows you to access a screen where a temporary change can be made to the performance of the MASTR IIe/III Control Station.

To make a serial function change, use the **Up/Down** Arrow keys to highlight the **SERIAL FUNCTIONS** field and press **<enter>**.

**POTENTIOMETER SETTINGS** (4) The **POTENTIOMETER SETTINGS** field allows you to access a screen where adjustments to various MASTR IIe/III Control Station potentiometer settings can be made.

To adjust station potentiometer settings, use the **Up/Down** Arrow keys to highlight the **POTENTIOMETER SETTINGS** field and press **<enter>**.

**METERING** (5) The **METERING** field allows you to access a screen displaying specific MASTR IIe/III Control Station DC voltages.

To view DC voltages, use the **Up/Down** Arrow keys to highlight the **METERING** field and press **<enter>**.

**STATION CONFIGURATION** (6) The **STATION CONFIGURATION** field allows you to access a screen displaying the system configuration for the MASTR IIe/III Control Station.

STATION CONFIGURATION	(6)
SW VERSION CONTROL	(7)
PROGRAMMABLE TIMERS	(8)
REMOTE DIAGNOSTICS SETUP	(9)
PHONE DIRECTORY	(10)
STATION DIAGNOSTICS	(11)
DOS SHELL	(12)

STATION (6) To view the current system configuration, use the **Up/Down** Arrow keys to highlight the STATION CONFIGURATION field and press **<enter>**.

SW (7) The **SW VERSION CONTROL** field allows you to access a screen displaying a list of various Software and Firmware version information.

To display the SW version control list, use the **Up/Down** Arrow keys to highlight the SW VERSION CONTROL field and press **<enter>**.

PROGRAM- (8) The **PROGRAMMABLE TIMERS** field allows you to access a screen where various time related aspects of station performance can be set.

To adjust timers use the **Up/Down** Arrow keys to highlight the PROGRAMMABLE TIMERS field and press **<enter>**.

REMOTE (9) The **REMOTE DIAGNOSTICS SETUP** field allows you to access a screen where you can transmit keyboard characters across an active com port, set various modem parameters, and set the response wait time that occurs after making a serial request.

To access the screen to make the above changes, use the **Up/Down** Arrow keys to highlight the REMOTE DIAGNOSTICS SETUP field and press **<enter>**.

**PHONE DIRECTORY** (10) The **PHONE DIRECTORY** field allows you to access a screen where you can add, modify, or delete phone entries. Once these entries are entered, you can dial these numbers by selecting one of them. An option is also available to dial a number manually without using one of the previously entered phone numbers. In addition, the capability to hang up the phone is also present.

To add, modify, delete, dial, or hang up any phone entry use the **Up/Down** Arrow keys to highlight the **PHONE DIRECTORY** field and press **<enter>**.

**STATION DIAGNOSTICS** (11) The **STATION DIAGNOSTICS** field allows you to access various diagnostic screens pertaining to the MASTR IIe/III Control Station.

- **MIII STATION STATUS:**  
Shows information only pertaining to MASTR III base stations. Information includes the following:
  - Fault status of the different modules.
  - Values of the receive, transmit, and reference frequencies.
  - Setting of the Power Amplifier potentiometer.
  - Circulator status.
- **TONE DIAGNOSTICS:**  
Shows any control tones the station is receiving and acting on.
- **PARALLEL I/O:**  
Shows the status of the inputs and outputs that interface with the microprocessor via the Programmable Peripheral Interface chip (U34) on the System Board.

STATION CONFIGURATION	<6>
SW VERSION CONTROL	<7>
PROGRAMMABLE TIMERS	<8>
REMOTE DIAGNOSTICS SETUP	<9>
PHONE DIRECTORY	<10>
STATION DIAGNOSTICS	<11>
DOS SHELL	<12>

STATION (11) – SWITCHES/INPUTS:

DIAGNOS- Shows the status of the following:

TICS

Cont'd

- The three switches on the front of the System Module along with the attached System Module inputs (REMOTE PTT and CG MON).
- The System Module inputs called CAS, LOCAL PTT, and BATT STDBY (battery standby).
- The DC control current.
- FUNCTIONS/MISC:  
Shows the status of various functions and other miscellaneous information.
- BASIC INFORMATION:  
Shows the following information:
  - The currently active channel.
  - The way audio is being routed through the System Module.
  - Status of Channel Guard.
  - What, if anything, is keying the station.
  - Status of the transmitter control lines.

To display the DIAGNOSTICS screen, use the **Up/Down** Arrow keys to highlight the STATION DIAGNOSTICS field, press **<enter>**.

DOS  
SHELL

- (12) The **DOS SHELL** field allows you to suspend MASTRUTL to get a DOS prompt. To run MASTRUTL again, type in "**exit**" at the DOS prompt.

To suspend MASTRUTL to get a DOS prompt, use the **Up/Down** Arrow keys to highlight the DOS Shell field and press **<enter>**.

## UTILITY CONFIGURATION

<1> PROGRAM CONFIGURATION			
MOUSE SUPPORT XXX	<3>	<2>	<4>
COM PORT	→1	BAUD RATE	
	2		300
	3		1200
	4		2400
			4800
			9600
			→19200
Esc=Exit			

Figure 3-2 - Program Configuration Screen

- |                   |                             |
|-------------------|-----------------------------|
| (1) Screen Title  | - program configuration     |
| (2) Mouse Support | - enables mouse support     |
| (3) Com Port      | - select communication port |
| (4) Baud Rate     | - select baud rate          |

The Program Configuration Screen, shown in Figure 3-2, allows you to modify some MASTRUTL configuration parameters for a MASTR IIe/III Control Station.

- |               |     |   |
|---------------|-----|---|
| MOUSE SUPPORT | (2) | The <b>MOUSE SUPPORT</b> field is a toggle field which enables or disables mouse support. |
|---------------|-----|---|

To change the Mouse Support setting, use the **Up/Down** arrow keys to select the field, press **<enter>** to gain access into the field. Using the **Left/Right** arrow keys select "YES" to enable mouse support or "NO" to disable mouse support.

```
MOUSE SUPPORT XXX <2>
<3>
COM PORT      +1      BAUD RATE      | 300
              2       | 1200
              3       | 2400
              4       | 4800
                  +19200
```

COM PORT (3) The **COM PORT** field indicates the selected communications port for the MASTR IIe/III Control Station.

To change the Com Port setting, use the **Up/Down** arrow keys to select the desired setting and press **<enter>** to make a selection.

BAUD RATE (4) The **BAUD RATE** fields indicates the selected Baud Rate for the MASTR IIe/III Control Station.

To change the \_\_\_\_\_ rate setting, use the **Up/Down** arrow keys to select the desired setting and press **<enter>** to make a selection.

**NOTE**

The control station defaults to 9600

**SERIAL FUNCTIONS**

```
<1> SERIAL FUNCTIONS

→ START  STOP

Serial Function Select:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX <2>

Esc=Exit
```

Figure 3-3 - Serial Functions Screen



- (1) Screen Title - serial functions
- (2) Serial Function Select - displays list of functions available

The Serial Functions Screen, shown in Figure 3-3, allows you to temporarily change the performance of the MASTR IIe/III Control Station.

- SERIAL FUNCTION SELECT (2) The **Serial Function Select** field is used to display a list of functions which, if enabled, will temporarily change the performance of the MASTR IIe/III Control Station. If Logic Standby is not enabled, cycling power or performing a system reset at any time will cause the system to return to its default EEPROM settings.

To display the list of functions, press **<enter>**. Use **Up/Down**, **Page Up/Page Down**, and **Control Page Up/Control Page Down** arrow keys to scroll through the list. Use the **Right/Left** arrow keys to start/stop the highlighted function.

Possible selections are:

- Repeat Disable:  
START - disables repeater function.  
STOP - restores original EEPROM setting.
- Tx Disable:  
START - disables the transmitter.  
STOP - restores original EEPROM setting.
- Channel Guard Encode Disable:  
START - disables the Channel Guard encode.  
STOP - restores original EEPROM setting.
- Channel Guard Decode Disable  
START - disables the Channel Guard decode.

→ START      STOP	
<b>Serial Function Select:</b> XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX (2)	
<b>Esc=Exit</b>	

SERIAL FUNCTION SELECT Cont'd	(2)	STOP - restores original EEPROM setting.
		<ul style="list-style-type: none"><li>- RUS Mute: START - disables the main receiver. STOP - restores original EEPROM setting.</li><li>- Channel Guard Monitor: START - enables Channel Guard monitor function. STOP - restores original EEPROM setting.</li><li>- Remote PTT: START - keys the remote push-to-talk. STOP - unkeys the remote push-to-talk.</li><li>- Local PTT: START - keys the local push-to-talk. STOP - unkeys the local push-to-talk.</li><li>- External PTT: START - keys the external push-to-talk. STOP - unkeys the external push-to-talk.</li><li>- Morse Code: START - sends Morse Code ID when programmed. (If no ID is present, Start has no effect. STOP disables the Morse Code ID function. (If the stop function is selected while the station is transmitting an ID, the ID transmission terminates.)</li><li>- Battery Alarm Disable: START - disables the battery alarm tone.</li></ul>

STOP - restores the original EEPROM setting.

- Test Tone:  
START - begins sending test tone. (The test tone default frequency is 1000 Hertz.)  
STOP - ends test tone.
- System Reset:  
START - reinitializes system software.  
STOP - has no effect on this function.
- Carrier Control Timer Disable:  
START - disables the carrier control timer.  
STOP - restores the original EEPROM setting.
- RUS Disable:  
START - disables receiver unsquelch PTT function.  
STOP - restores the original EEPROM setting.
- Scan Enable:  
START - enables the scan function if the station is programmed to scan.  
STOP - restores the original EEPROM setting.
- Scan Disable:  
START - disables the scan function.  
STOP - restores the original EEPROM setting.
- Main Rx Enable:  
START - enables the main receiver.  
STOP - restores the original EEPROM setting.
- Main Rx Disable:  
START - disables the main receiver.  
STOP - restores the original EEPROM setting.

	→	START	STOP
<b>Serial Function Select:</b>			
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX (2)			
<b>Esc=Exit</b>			

- SERIAL (2) – Aux Rx Enable:  
FUNCTION START - enables aux receiver and tog-  
SELECT gles Aux Rx Mute.  
Cont'd STOP - has no effect.
- Aux Rx Disable:  
START - disables aux receiver and tog-  
gles Aux Rx Mute.  
STOP - has no effect.
- Aux Control 1 On:  
START - activates auxiliary 1 output if  
the station is programmed with AUX1  
control.  
STOP - restores the original EEPROM  
setting.
- Aux Control 1 Off:  
START - deactivates auxiliary 1 output if  
the station is programmed with AUX1  
control.  
STOP - restores the original EEPROM  
setting.
- Priority Scan Disable:  
START - disables the priority scan func-  
tion.  
STOP - restores the original EEPROM  
setting.
- Scan Inhibit:  
START - suspends scan operation (if  
enabled).  
STOP - restores the original EEPROM  
setting.

- Voting Tone Enable:  
START - enables the voting tone if the station is programmed to output a voting tone.  
STOP - disables the voting tone.

## POTENTIOMETER SETTINGS

<MASTR III ONLY>		
<1> STATION POT SETTINGS		
POT ADJUSTMENT	CHANNEL SELECT X	(2)
	XXXXXX	(3)
+increment pot	XXX.X% XXX Line Out	(4)
+decrement pot	XXX.X% XXX Transmit	(5)
[F5] 1X	XXX.X% XXX Line In	(6)
[F6] 10X	XXX.X% XXX Channel Guard	(7)
[F7] 100X	XXX.X% XXX DSP Line Cancellation	(8)
[F8] 1000X	XXX.X% XXX DSP Line In	(9)
CH SELECT [F9]	XXX.X% XXXX DSP Compressor Gain	(10)
	XXX.X% XXX Voting Tone Gain	(11)
	XXX.X% XXXX Compressor Threshold	(12)
	XXX.X% XX Morse ID Transmit	(13)
	XXX.X% XX PA Power	(14)
SQUELCH SELECT [F4]:MANUAL	XXX.X% XXXX Repeater Gain	(15)
CAS OFF	XXX.X% XX Digital Squelch	(16)
Esc=Exit		

Figure 3-4 - Station Pot Settings Screen

- |                           |  |
|---------------------------|--|
| (1) Screen Title          | - station pot settings                 |
| (2) Channel Select        | - designates selected channel          |
| (3) Pot Adjust Factor     | - displays pot adjustment factor       |
| (4) Line Out              | - indicates line out level             |
| (5) Transmit              | - indicates transmitter deviation      |
| (6) Line In               | - indicates gain on line input         |
| (7) Channel Guard         | - indicates CG deviation level         |
| (8) DSP Line Cancellation | - sets shelf line output audio gain    |
| (9) DSP Line In           | - adjusts signal level entering DSP    |
| (10) DSP Compressor Gain  | - adjusts gain on DSP line input       |
| (11) Voting Tone Gain     | - indicates level of voting tone       |
| (12) Compressor Threshold | - max signal at compressor output      |
| (13) Morse ID Transmit    | - indicates transmit pot morse code ID |
| (14) PA Power             | - sets PA power output                 |
| (15) Repeater Gain        | - sets transmitter deviation           |
| (16) Digital Squelch      | - controls adjustment of squelch pot   |
| (17) Squelch Select       | - chooses squelch type                 |

The Station Pot Settings Screen, shown in Figure 3-4, allows you to adjust potentiometer settings to ensure optimum station performance.

POT ADJUSTMENT	CHANNEL SELECT X	(2)
	XXXXXX	(3)
→increment pot	XXX.X% XXX Line Out	(4)
←decrement pot	XXX.X% XXX Transmit	(5)
[F5] 1X	XXX.X% XXX Line In	(6)

CHANNEL (2) The **Channel Select** field indicates the  
SELECT current channel selection.

To enable a channel, select CH SELECT [F9]. A portal will appear displaying available channels. Using the **Up/Down** arrow keys select the desired channel and press **<enter>**. **<ESC>** will exit the Select New Channel Screen and return you to the Station Pot Settings Screen.

POT (3) The **Potentiometer Adjustment Factor**  
ADJUST field displays the currently selected poten-  
FACTOR tiometer adjustment factor.

The potentiometer adjustment factor can be changed by pressing one of four function keys. Pressing [F5] will cause the pot adjust factor to be set at 1X. Pressing [F6] will cause the pot adjust factor to be set at 10X. Pressing [F7] will cause the pot adjust factor to be set at 100X. Pressing [F8] will cause the pot adjust factor to be set at 1000X.

LINE OUT (4) The **Line Out Potentiometer** field indi-  
cates the line out level.

To change the Line Out setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low line out level. A high value corresponds to a high line out level.

– MASTR IIe/III:

In non-remote systems the Line Out level is normally set to zero. In remote systems this field is set so that 3 kHz of unsquelched receiver audio results in 0 dBm of line output audio.

TRANSMIT (5) The **Transmit Audio Potentiometer** field is used to set a MASTR IIe Control Station transmitter deviation or to set the MASTR III Control Station transmitter deviation limit.

To change the Transmit setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low deviation. A high value corresponds to a high deviation.

– MASTR IIe:

In systems that repeat, this field is normally set so that 3 kHz of unsquelched receiver audio results in 3 kHz of transmitter audio. In other systems it is necessary to send nominal audio into a fixed-gain input path like the local microphone. This potentiometer is then used to set the desired nominal transmitter deviation.

– MASTR III:

This field is normally set so that maximum input results in 4.5 kHz of transmitter audio.

LINE IN (6) The **Line In Potentiometer** field is used to adjust the gain on the line input.

To change the Line In setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low gain. A high value corresponds to a high gain.

	[F5] 1X	XXX.X%	XXX Line In	<6>
	[F6] 10X	XXX.X%	XXX Channel Guard	<7>
	[F7] 100X	XXX.X%	XXX DSP Line Cancellation	<8>
	[F8] 1000X	XXX.X%	XXX DSP Line In	<9>

- LINE IN (6) – MASTR IIe:  
Cont'd In DC Remote systems with the DSP Compression field (in the Remote Options Screen of the PC Program) set to "Disabled", this field is normally set so that nominal line input audio results in output audio which is at 3 kHz deviation. In other systems, this field is set to zero because the line audio is either non-existent or is processed through a different DSP board path.
- MASTR III:  
This field is normally set to zero because the line audio is either non-existent or it is processed through a different DSP board path.
- CHANNEL (7) The **Channel Guard Potentiometer** field  
GUARD is used to set the Channel Guard deviation level.
- To change the Channel Guard deviation level, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low deviation level. A high value corresponds to a high deviation level.
- MASTR IIe/III:  
The value entered in this field will be the Channel Guard potentiometer setting while this channel is active.
- DSP LINE (8) The **DSP Line Cancellation Potentiometer**  
CANCELLA-**ter** field is used to cancel the Control Sta-  
TION tion's line output audio from the line input audio. This potentiometer is used only in



2-wire systems. Before being subtracted from the contended 2-wire line, the line output audio is attenuated according to the value entered here.

To change the DSP Line Cancellation setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low gain. A high value corresponds to a high gain.

- MASTR IIe:  
In any system that does not use a DSP compressor (all tone remote systems use a DSP compressor), this pot is never used and should be set to zero.
- MASTR III:  
For 2-wire tone remote systems, set this field to 75. Otherwise, set it to zero.

DSP  
LINE IN

- (9) The **DSP Line In Potentiometer** field is used to adjust the signal level entering the DSP.

To change the DSP Line In setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 255 are valid. A low value corresponds to a low gain on the line input. A high value corresponds to a high gain on the line input.

- MASTR IIe:  
In non-remote systems, and in DC Remote systems having the DSP Compressor field (in the Remote Options Screen of the PC Program) set to "Disabled", this field should be set to zero. Otherwise, this field should be set so that under all operating conditions this level will not over drive the analog-to- digital converter on the DSP board (U5).

[F8] 1000%	XXX.X%	XXX DSP Line In	<9>
CH SELECT [F9]	XXX.X%	XXXXX DSP Compressor Gain	<10>
	XXX.X%	XXX Voting Tone Gain	<11>
	XXX.X%	XXXXX Compressor Threshold	<12>
	XXX.X%	XX Morse ID Transmit	<13>
	<17>	XXX.X%	XX PA Power

DSP (9) – MASTR III:  
LINE IN In non-remote systems, this field should  
Cont'd be set to zero. Otherwise, this field  
should be set so that under all operating  
conditions, this level will not over drive  
the analog-to-digital converter on the  
DSP board (U5).

DSP (10) The **DSP Compressor Gain** field is used  
COMPRESS to adjust the gain on the DSP line input.  
GAIN This pot is a gain on the linear region of  
the DSP compressor which determines the  
level of line input voltage which leads to  
compression.

To change the DSP Compressor setting,  
use the **Left/Right** arrow keys to decre-  
ment/increment the current value. Num-  
bers between 0 and 32767 are valid. A low  
value corresponds to a low gain. A high  
value corresponds to a high gain.

– MASTR IIe/III:  
For remote systems using the DSP Com-  
pressor (all tone remote systems use the  
DSP Compressor), this field should be  
set so that nominal line input audio re-  
sults in output audio which is at 3 kHz  
deviation. For other systems, this field  
should be set to zero.

VOTING (11) The **Voting Tone Gain** field is used to  
TONE GAIN indicate the voting tone level.

To change the Voting Tone Gain, use the  
**Left/Right** arrow keys to decrement/incre-

ment the current value. Numbers between 0 and 127 are valid. A low value corresponds to a low level. A high value corresponds to a high level.

COMPRES- (12) The **Compressor Threshold** field is used  
SOR THRES- to adjust the maximum signal level ap-  
HOLD pearing at the output of the compressor.

To change the Compressor Threshold setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 32767 are valid. To disable the compressor, enter 32767.

MORSE ID (13) The **Morse Code Identification Trans-**  
TRANSMIT **mission Potentiometer** field is used to indicate the value to be loaded into the Tx Pot during Morse Code ID transmission when the Tx Pot field for the active channel is set to "Yes" (in the PC program).

To change the Morse ID Transmit setting, use the **Left/Right** Arrow keys to decrement/increment the current value.

- The value entered in this field is only valid for System Module Firmware Version 6.00 and above.

PA POWER (14) The **PA Power** field is used to set the PA power output setting for a MASTR III Control Station.

To change the PA Power setting, use the **Left/Right** Arrow keys to decrement/increment the current value. Numbers between 0 and 99 are valid. A level of 99 corresponds to full power.

- This field value pertains only to the MASTR III Control Station.

<17>		XXX.X%	XX	PA Power	<14>
SQUELCH SELECT	IF41:MANUAL	XXX.X%	XXXXX	Repeater Gain	<15>
	CAS OFF	XXX.X%	XX	Digital Squelch	<16>
Esc=Exit					

REPEATER (15) The **Repeater Gain** field is used to set the transmitter deviation setting for a MASTR III Control Station.

To change the Repeater Gain setting, use the **Left/Right** arrow keys to decrement/increment the current value. Numbers between 0 and 32767 are valid. A low value corresponds to a low deviation. A high value corresponds to a high deviation.

In systems that repeat, this field is normally set so that 3 kHz of unsquelched receiver audio results in 3 kHz of transmitter audio. In other systems, it is necessary to send nominal audio into a fixed-gain input path line like the local microphone. This field is then used to set the desired nominal transmitter deviation.

- This field value pertains only to the MASTR III Control Station.

DIGITAL (16) The **Digital Squelch** setting controls the adjustment of the squelch potentiometer on MASTR III base stations. The adjustment value entered here is applicable only when SQUELCH SELECT is set to "Digital".

To change the Digital Squelch setting, use the **Left/Right** Arrow keys to decrement/increment the current value. Numbers between 0 and 99 are valid.

- This field value pertains only to the MASTR III Control Station.

SQUELCH (17) The **Squelch Select** field determines the  
SELECT squelch potentiometer adjustment control.

To change the Squelch Select setting, use [F4] to toggle between "Manual" (local) and "Digital" (remote) control.

**NOTE**

The station must be reset after changing the squelch type.

- This field pertains only to the MASTR III Control Station.

METERING

(1) METERING			
(2)	(3)		(4)
PWR	X.XX	Volts	XXX
RX	X.XX	Volts	XXX
TX	X.XX	Volts	XXX
EXT	X.XX	Volts	XXX
Esc=Exit			

Figure 3-5 - Metering Screen

- |                  |                                   |
|------------------|-----------------------------------|
| (1) Screen Title | - Metering                        |
| (2) DC Voltages  | - indicates DC voltages displayed |
| (3) Voltage      | - displays voltage readings       |
| (4) Digital      | - displays digital readings       |

The Metering Screen, shown in Figure 3-5, displays DC voltage readings associated with a MASTR IIe/III Control Station. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

(2) The DC Voltages field is used to label the DC voltages being displayed.

Application:

	Mastr IIe	Mastr III	Range
PWR	Not Used	Circulator Power Sensor	0-5V
RX	RX Meter	RSSI,Receiver Sensitivity	0-5V
TX	TX Meter	External Metering Point	0-5V
EXT	Not Used	External Metering Point	0-10V

The RX Meter and TX Meter functions in the MASTR IIe are used with the Meter Switching Kit, 19B226293G1. See LBI-4848.

(3)In the MASTR III, PWR returns a voltage proportional to the reflected power in the circulator. RX is the RSSI line from the IF module. TX and EXT are external metering points on the MASTR III and are brought to a header on the MASTR III backplane for use in special functions. Otherwise, they are available for the operator to use in various metering applications.

(4)The digital reading, which is used to calculate the voltage, is also displayed. Digital readings vary from 0 (minimum) to 255 (maximum). Voltage will vary from 0 to 5 volts for all but EXT. The EXT voltage range is 0 to 10 volts. The sampling rate is fixed at one second intervals.

## STATION CONFIGURATION

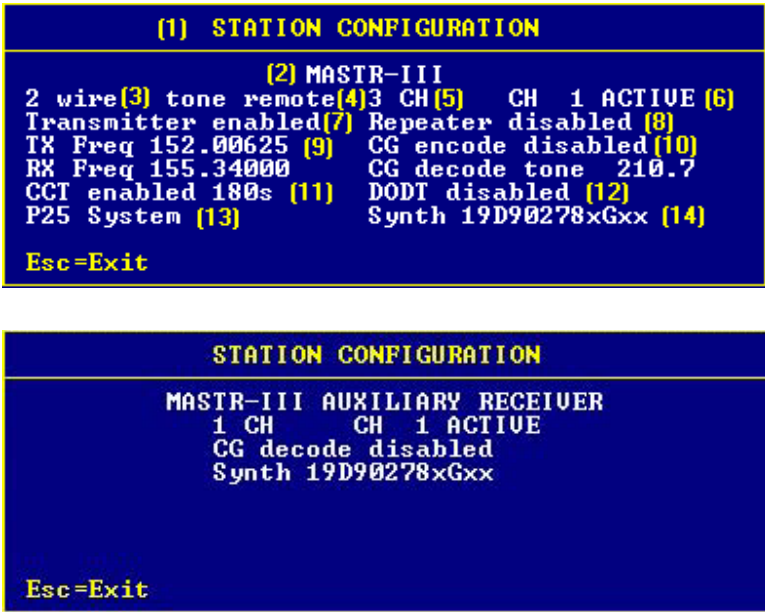


Figure 3-6 - Station Configuration Screen

- |                    |  |
|--------------------|--|
| (1) Screen Title   | - station configuration  |
| (2) Station        | - specifies current control station  |
| (3) Wires          | - specifies how many wires   |
| (4) Station Type   | - specifies type of station  |
| (5) Channels       | - indicates number of channels   |
| (6) Active Channel | - specifies which channel is active  |
| (7) Transmitter    | - indicates transmitter status   |
| (8) Repeater       | - indicates repeater status  |
| (9) ICOM           | - specifies ICOM selection   |
| (10) CG            | - indicates Channel Guard status   |
| (11) CCT           | - carrier control timer status   |
| (12) DODT          | - specifies DODT status  |
| (13) P25           | - specifies if P25 field is displayed<br>if P25 is turned on in personality. |
| (14) Synthesizer   | - specifies synthesizer type   |

The Station Configuration Screen, shown in Figure 3-6, allows you to view station information. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

- |                           |      |   |
|---------------------------|------|---|
| STATION                   | (2)  | The <b>Station</b> field will display either MASTR IIe or MASTR III as the current Control Station.   |
| WIRES                     | (3)  | The <b>Wires</b> field displays either 2 or 4 wires.  |
| STATION<br>TYPE           | (4)  | The <b>Station Type</b> field will display the currently selected type of station (e.g. DC Remote).   |
| CHANNELS                  | (5)  | The <b>Channels</b> field displays the number of channels available.  |
| ACTIVE<br>CHANNEL         | (6)  | The <b>Active Channel</b> field displays the channel currently selected.  |
| TRANS-<br>MITTER          | (7)  | The <b>Transmitter</b> field will display the current transmitter status as "ENABLED" or "DISABLED".  |
| REPEATER                  | (8)  | The <b>Repeater</b> field is will display the current repeater status as "ENABLED" or "DISABLED".   |
| ICOM/<br>SYNTHE-<br>SIZER | (9)  | When MASTR IIe is the selected Control Station the <b>ICOM</b> fields will the display TX and RX ICOM status as a previously determined value.<br><br>When MASTR III is the selected Control Station, the <b>Synthesizer</b> fields display TX and RX Synthesizer frequencies as previously determined. |
| CG                        | (10) | The <b>CG</b> fields display the Control Station Channel Guard encode tone and decode tone status either "ENABLED" or "DISABLED" as the value previously determined.  |
| CCT                       | (11) | The <b>CCT</b> field displays the current status of the carrier control timer.  |



- |              |  |
|--------------|--|
| DODT         | (12) The <b>DODT</b> field displays current DODT status.                   |
| P25          | (13) The <b>P25</b> field is displayed if P25 is turned on in personality. |
| SYNTHE-SIZER | (14) The <b>S</b> field displays the current synthesizer.                  |

## SW VERSION CONTROL

(1) SW VERSION CONTROL	
	FIELD PROGRAM DATE (2)
	FACTORY PROGRAM DATE(3)
	SW SERIAL NUMBER (4)
	EEPROM SOFTWARE ID (5)
	DSP SOFTWARE ID (6)
	EPROM SOFTWARE ID (7)
	EPROM CHECKSUM (8)

Figure 3-7 - SW Version Control Screen

- |                          |                                     |
|--------------------------|-------------------------------------|
| (1) Screen Title         | - sw version control                |
| (2) Field Program Date   | - PC program software version       |
| (3) Factory Program Date | - date personality factory modified |
| (4) SW Serial Number     | - file name given to control shelf  |
| (5) EEPROM Software ID   | - original loaded ROMdefault vers   |
| (6) DSP Software ID      | - software version of DSP in sys    |
| (7) EPROM Software ID    | - current firmware version ID       |
| (8) EPROM Checksum       | - display of checksum of EPROM      |

The SW Version Control Screen, shown in Figure 3-7, provides software control information. Each field allows access into individual screens. Use the **Up/Down** Arrow keys to highlight the desired field and press **<enter>**. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

- |                      |     |  |
|----------------------|-----|--|
| FIELD PROGRAM DATE   | (2) | The <b>FIELD PROGRAM DATE</b> screen is used to indicate the current PC version, date and time.  |
| FACTORY PROGRAM DATE | (3) | The <b>FACTORY PROGRAM DATE</b> screen is used to indicate the latest date that the personality has been modified at the factory.  |
| SW SERIAL NUMBER     | (4) | The <b>SW SERIAL NUMBER</b> screen is used to indicate the file name given to the control shelf by the PC Programmer. This name is typically used to form a link between a file which resides on a PC and the current control shelf personality. |
| EEPROM SOFTWARE ID   | (5) | The <b>EEPROM SOFTWARE ID</b> screen is used to indicate the version of ROM that originally loaded defaults into the EEPROM. The version, date, time, and number will be displayed.  |
| DSP SOFTWARE ID      | (6) | The <b>DSP SOFTWARE ID</b> screen is used to indicate the software version of the Digital Signal Processor in the system. The version, date, time, and number will be displayed.   |
| EPROM SOFTWARE ID    | (7) | The <b>EPROM SOFTWARE ID</b> screen is used to indicate the current firmware version identification. The version, date, time, and number will be displayed.  |
| EPROM CHECKSUM       | (8) | The <b>EPROM CHECKSUM</b> screen is used to display the checksum of the EPROM. The value indicated here should match that of the EPROM label.  |

## PROGRAMMABLE TIMERS

(1)Programmable Timers		
DTMF Time Out	(1=100ms) 50 (2)	2175 Debounce (1=10ms) 20(6)
CAS On Debounce	(1=2ms) 1 (3)	Repeat Delay (1=10ms) 20(7)
CAS Off Debounce	(1=2ms) 5 (4)	STE Output Time (1=10ms) 15(8)
DC Debounce	(1=10ms) 15 (5)	
Esc=Exit	WRITE [F5]	READ [F6]

Figure 3-8 - Programmable Timers Screen

- |                      |                                   |
|----------------------|-----------------------------------|
| (1) Screen Title     | - programmable timers             |
| (2) DTMF Time Out    | - max time between DTMF digits    |
| (3) CAS on Debounce  | - wait time determine CAS present |
| (4) CAS off Debounce | - wait time determine CAS absent  |
| (5) DC Debounce      | - wait time to act on remote DC   |
| (6) 2175 Debounce    | - sampling time for 2175 Hz tone  |
| (7) Repeat Delay     | - delay time to repeag audio      |
| (8) STE Output Time  | - length of STE transmission      |

The Programmable Timers Screen, shown in Figure 3-8, allows you to define timer values. Press **[F6]** to read in values from the Control Shelf.

- DTMF (2) The **DTMF TIMEOUT** field is used to adjust the maximum time between DTMF digits. A larger setting allows more time between each digit before the Control Shelf resets the DTMF receive buffer.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 100 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

<1>Programmable Timers			
DTMF Time Out	<1=100ms>	50	<2>
CAS On Debounce	<1=2ms>	1	<3>
CAS Off Debounce	<1=2ms>	5	<4>
DC Debounce	<1=10ms>	15	<5>
2175 Debounce		<1=10ms>	20<6>
Repeat Delay		<1=10ms>	20<7>
STE Output Time		<1=10ms>	15<8>
Esc=Exit		WRITE [F5]	READ [F6]

CAS ON (3) The **CAS ON DEBOUNCE** field is used  
DEBOUNCE to indicate the delay between the time CAS is detected by the System Module and when it is acted on. The debounce is used to ignore any glitches on the CAS line.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 2 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

CAS OFF (4) The **CAS OFF DEBOUNCE** field is used  
DEBOUNCE to indicate the delay between the time the System Module detects that CAS has gone away and the time it operates as if there is no CAS. The debounce is used to ignore any glitches that may occur on the CAS line.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 2 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

DC (5) The **DC DEBOUNCE** field is used to indi-  
DEBOUNCE cate the delay between the time a change in the DC Remote control current is detected and the time the System Module acts on that control current. This debounce is used to ignore momentary changes of the control current.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 10 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

- 2175 (6) The **2175 DEBOUNCE** field is used to  
DEBOUNCE indicate the delay between the time the System Module detects that a 2175 Hz tone has gone away and the time the station executes the 2175 Off function list.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 10 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

- REPEAT (7) The **REPEAT DELAY** field is used to indi-  
DELAY cate the delay between the time RUS is detected and the audio is repeated. This delay, used mostly in voting systems, gives the voter time to do a remote push-to-talk.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 10 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

- This field will only operate when Repeat Delay is enabled. Repeat Delay is usually only enabled in voting systems.

- STE (8) The **STE OUTPUT TIME** field is used to  
OUTPUT TIME indicate the amount of time squelch tail elimination (STE) is transmitted. STE is a signal from the station to a mobile or port-

able unit indicating that the transmitter is about to go off. In systems using tone Channel Guards, the station will shift the phase of the Channel Guard to signal the end of transmission. In systems using Digital Channel Guards, the station outputs a square wave until the transmitter is turned off. The time entered in this field sets the delay between the time the signal is transmitted and the time the transmitter shuts off.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 14 to 20. Each unit corresponds to 10 milliseconds. To exit the field press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

## **REMOTE DIAGNOSTICS SETUP**

<b>MODEM ACCESS</b>		<b>&lt;1&gt;</b>
	<b>SERIAL PORT ACCESS</b>	<b>&lt;2&gt;</b>
	<b>MODEM CONFIGURATION</b>	<b>&lt;3&gt;</b>
	<b>SERIAL REQUEST TIMEOUT</b>	<b>&lt;4&gt;</b>

Figure 3-9 - Modem Access Screen

- |                            |                                    |
|----------------------------|------------------------------------|
| (1) Screen Title           | - modem access                     |
| (2) Serial Port Access     | - sends characters across com port |
| (3) Modem Configuration    | - sets various modem parameters    |
| (4) Serial Request Timeout | - sets wait time for response      |

The Modem Access Screen, shown in Figure 3-9, allows you to fine tune a modem, modify a subset of modem parameters, and set data request program wait time.

**SERIAL PORT ACCESS** (2) The **SERIAL PORT ACCESS** field allows you to access a screen where keyboard characters can be transmitted across the active com port. Since the Modem Configuration option is limited, this function allows further fine tuning of a modem. Modem settings applied here are NOT saved to a file.

To send a keyboard character across the active com port, use the **Up/Down** Arrow keys to highlight this field and press **<enter>**.

**MODEM CONFIGURATION** (3) The **MODEM CONFIGURATION** field allows you to access a screen where a subset of modem parameters can be modified. You may also save the settings to a file. If the modified settings are NOT saved, then the old settings will be in force when using the modem.

To modify the modem parameters, use the **Up/Down** Arrow keys to highlight this field and press **<enter>**.

**SERIAL REQUEST TIME OUT** (4) The **SERIAL REQUEST TIME OUT** field allows you to access a screen where you can set the amount of time that the program will wait for a response after sending a data request. Once the timer expires, an error message will appear.

To modify the wait time, use the **Up/Down** Arrow keys to highlight this field and press **<enter>**.

## SERIAL PORT ACCESS

ENTER ASCII STRING:	<1>
---------------------	-----

<2>
-----

Figure 3-10 - Serial Port Access Screen

- (1) Enter ASCII String     - characters to send across com port
- (2) Echo Window            - characters sent will be echoed here

The Serial Port Access Screen, shown in Figure 3-10, allows keyboard characters to be transmitted across the active communication port. Since the Modem Configuration option is limited, this function allows further fine tuning of a modem.

To send keyboard characters across the active communication port, enter the characters in the ENTER ASCII STRING field and press **<enter>**. The characters sent will echo in the ECHO WINDOW.

Modem settings applied here are NOT saved to a file.



## MODEM CONFIGURATION

MODEM PARAMETERS (1)			
Modem Delay Type: Wait For OK	(2)	Tone Timing:	70 (7)
Modem Intercommand Delay:	2 (3)	Wait For Dial Tone:	2 (8)
Dialing Type:	TOUCH TONE (4)	Wait For Carrier:	12 (9)
Modem Speaker Status:	1 (5)	Recognize Carrier:	6 (10)
Comma Pause Time:	1 (6)	Carrier Dropout:	7 (11)
Esc=Exit		WRITE [F5]	

Figure 3-11 - Modem Parameters Screen

- |                          |                                    |
|--------------------------|------------------------------------|
| (1) Screen Title         | - modem parameters                 |
| (2) Modem Delay Type     | - wait mode                        |
| (3) Modem Intercom Delay | - time between "AT" commands       |
| (4) Dialing Type         | - touch tone/pulse                 |
| (5) Modem Speaker Status | - tells if speaker is on/off       |
| (6) Comma Pause Time     | - wait time after comma detected   |
| (7) Tone Timing          | - time between DTMF/duration digit |
| (8) Wait for Dial Tone   | - wait time before dialing         |
| (9) Wait for Carrier     | - wait time before aborting call   |
| (10) Recognize Carrier   | - time before carrier recognized   |
| (11) Carrier Dropout     | - wait time before disconnecting   |

The Modem Parameters Screen, shown in Figure 3-11, allows you to modify a subset of modem parameters.

- MODEM (2) The **MODEM DELAY TYPE** field is used to permit Hayes compatible modems to accept "AT" type commands with or without a pause between them. To change this field, press **<enter>** to gain field entry. Press the **Left/Right** Arrow keys to toggle between "Wait for OK" and "Fixed Delay". "Wait for OK" will wait for the modem to return to a predefined string.

MODEM PARAMETERS <1>			
Modem Delay Type: Wait For OK	<2>	Tone Timing:	70 <7>
Modem Intercommand Delay:	2 <3>	Wait For Dial Tone:	2 <8>
Dialing Type: TOUCH TONE	<4>	Wait For Carrier:	12 <9>
Modem Speaker Status:	1 <5>	Recognize Carrier:	6 <10>
Comma Pause Time:	1 <6>	Carrier Dropout:	7 <11>
Esc=Exit		WRITE [F5]	

MODEM (2) "Fixed Delay" will wait a fixed period of  
DELAY time between each "AT" command. To exit  
TYPE the field, press **<enter>**, **<esc>**, or  
Cont'd **Up/Down** Arrow keys. Press **[F5]** to write  
changes to the Control Shelf.

MODEM (3) The **MODEM INTERCOMMAND DE-**  
INTER- **LAY** field is used to indicate the amount of  
COMMAND time to wait between "AT" commands. If the  
DELAY MODEM DELAY TYPE is "Wait for OK"  
this field will specify the amount of ticks to  
wait for the modem to respond. If the  
MODEM DELAY TYPE is "Fixed Delay"  
this field will specify the amount of ticks to  
wait between each "AT" command.

To change this field, press **<enter>** to gain  
field entry. Enter a value in the range of 0  
to 255 ticks. Each unit (tick) corresponds to  
1/18th second. To exit the field press **<en-**  
**ter>**, **<esc>**, or **Up/Down** Arrow keys.  
Press **[F5]** to write changes to the Control  
Shelf.

DIALING (4) The **DIALING TYPE** field allows you to  
TYPE dial in either "Pulse" or "Touch Tone" mode.

To change this field, press **<enter>** to gain  
field entry. Press the **Left/Right** Arrow keys  
to toggle between "Pulse" and "Touch Tone"  
mode. To exit the field press **<en-**  
**ter>**, **<esc>**, or **Up/Down** Arrow keys.  
Press **[F5]** to write changes to the Control  
Shelf.

- |                            |   |
|----------------------------|---|
| MODEM<br>SPEAKER<br>STATUS | (5) The <b>MODEM SPEAKER STATUS</b> field allows you to select the modem speaker status.<br><br>To change this field, press <b>&lt;enter&gt;</b> to gain field entry. Enter either "0", "1", or "2". "0" sends modem command ATM0, turning the modem speaker off. "1" sends modem command ATM1, turning modem speaker on until carrier is enabled. "2" sends modem command ATM2, turning the modem speaker on continuously. To exit the field, press <b>&lt;enter&gt;</b> , <b>&lt;esc&gt;</b> , or <b>Up/Down</b> Arrow keys. Press <b>[F5]</b> to write changes to the Control Shelf. |
| COMMA<br>PAUSE<br>TIME     | (6) The <b>COMMA PAUSE TIME</b> field is used to set modem register S8 to the specified value. S8 contains the number of seconds to pause when a comma is found in the dialed digits screen.<br><br>To change this field, press <b>&lt;enter&gt;</b> to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 1 second. To exit the field, press <b>&lt;enter&gt;</b> , <b>&lt;esc&gt;</b> , or <b>Up/Down</b> Arrow keys. Press <b>[F5]</b> to write changes to the Control Shelf.  |
| TONE<br>TIMING             | (7) The <b>TONE TIMING</b> field is used to specify the number of milliseconds each digit is toned out and the number of milliseconds between each digit. To change this field, press <b>&lt;enter&gt;</b> to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 1 millisecond. To exit the field, press <b>&lt;enter&gt;</b> , <b>&lt;esc&gt;</b> , or <b>Up/Down</b> Arrow keys. Press <b>[F5]</b> to write changes to the Control Shelf.   |
| WAIT FOR<br>DIAL TONE      | (8) The <b>WAIT FOR DIAL TONE</b> field is used to set modem register S6 to the specified value. The modem will wait the indicated amount of time after going off hook before dialing begins.   |

MODEM PARAMETERS <1>			
Modem Delay Type: Wait For OK	<2>	Tone Timing:	70 <7>
Modem Intercommand Delay:	2 <3>	Wait For Dial Tone:	2 <8>
Dialing Type: TOUCH TONE	<4>	Wait For Carrier:	12 <9>
Modem Speaker Status:	1 <5>	Recognize Carrier:	6 <10>
Comma Pause Time:	1 <6>	Carrier Dropout:	7 <11>
Esc=Exit		WRITE [F5]	

WAIT FOR (8) To change this field, press <enter> to gain  
DIAL TONE field entry. Enter a value in the range of 0  
Cont'd to 255. Each unit corresponds to 1 second.  
To exit the field, press <enter>, <esc>, or  
**Up/Down** Arrow keys. Press **[F5]** to write  
changes to the Control Shelf.

WAIT FOR (9) The **WAIT FOR CARRIER** field is used to  
CARRIER set modem register S6 to the specified  
value. The modem will wait the specified  
number of seconds after after dialing is  
complete before aborting the call.

To change this field, press <enter> to gain  
field entry. Enter a value in the range of 0  
to 255. Each unit corresponds to 1 second.  
To exit the field, press <enter>, <esc>, or  
**Up/Down** Arrow keys. Press **[F5]** to write  
changes to the Control Shelf.

RECOG- (10) The **RECOGNIZE CARRIER** field is used  
NIZE to specify the amount of time to wait after  
CARRIER the carrier is present before it is recognized.

To change this field, press <enter> to gain  
field entry. Enter a value in the range of 0  
to 255. Each unit corresponds to 100 mil-  
liseconds. To exit the field, press <enter>,  
<esc>, or **Up/Down** Arrow keys. Press **[F5]**  
to write changes to the Control Shelf.

CARRIER (11) The **CARRIER DROPOUT** field is used to  
DROPOUT specify the amount of time the modem will  
wait after losing the carrier before discon-

necting. This field sets modem register S10 to the specified value.

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 0 to 255. Each unit corresponds to 100 milliseconds. To exit the field, press **<enter>**, **<esc>**, or **Up/Down** Arrow keys. Press **[F5]** to write changes to the Control Shelf.

## SERIAL REQUEST TIMEOUT

<b>SERIAL PORT TIMEOUT &lt;1&gt;</b>
<b>Enter Timeout Value &lt;3 to 99 sec&gt; 3 &lt;2&gt;</b>
<b>Esc=Exit</b>

Figure 3-12 - Serial Port Timeout Screen

- (1) Screen Title - serial port timeout
- (2) Enter Timeout Value - wait time in seconds

The Serial Port Timeout Screen, shown in Figure 3-12, allows you to set the time out time for the serial port.

- ENTER (2) The **ENTER TIMEOUT VALUE** field is used to specify the amount of time the program will wait for a response once a data request has been sent. When this timer expires, the following error message appears: **SERIAL LINK NOT RESPONDING. PLEASE CHECK CONNECTIONS.**

To change this field, press **<enter>** to gain field entry. Enter a value in the range of 3 to 99 seconds. When the timer expires, an error message will appear. To exit the field, press **<enter>**, **<esc>**, or the **Up/Down Arrow** keys.

## PHONE DIRECTORY LIST

NAME<1>	NUMBER<2>	<3>BAUD	PORT<4>
Clark Kent	1-800-555-1515	9600	COM1

[F5] DIAL HIGHLIGHT<5>

[F6] DIAL MANUAL <6>

[F7] HANG UP <7>

[INSERT] ADD DIRECTORY ENTRY <8>

[F3] REVISE HIGHLIGHT ENTRY<9>

[DELETE] DELETE HIGHLIGHT ENTRY<10>

Esc=Exit

Figure 3-13 - Phone Directory List Screen

- |                             |                                   |
|-----------------------------|-----------------------------------|
| (1) Name                    | - entry identifier                |
| (2) Number                  | - phone number                    |
| (3) Baud                    | - baud rate to be used            |
| (4) Port                    | - communication port to use       |
| (5) Dial Highlight          | - dials selected number           |
| (6) Dial Manual             | - allows manual number dial       |
| (7) Hang Up                 | - disconnects call                |
| (8) Add Directory Entry     | - inserts new phone entry in list |
| (9) Revise Highlight Entry  | - modifies selected number        |
| (10) Delete Highlight Entry | - deletes selected phone entry    |

The Phone Directory List Screen, shown in Figure 3-13, provides a phone directory displaying a list of phone numbers unique to the specific needs of the control shelf user.

- NAME      (1) The **Name** field is used as the entry identifier. This field can consist of up to 22 alphabetic characters. Entries are shown according to the order they are added. Newest entries will appear at the bottom of

the list. Oldest entries are at the top. Modifying and saving an entry will cause it to be placed at the end of the list as though it were a new entry.

You can add, modify, or delete an entry through the Phone Directory List Screen. To add an entry, press **Insert**. To Delete an entry, use the **Up/Down** Arrow keys to highlight the entry and press **Delete**. To modify an existing entry, use the **Up/Down** Arrow keys to highlight the entry and press **[F3]**.

You can easily place a call using the Phone Directory List. Use the **Up/Down** Arrow keys to highlight the entry and press **[F5]** to automatically dial the number, or press **[F6]** to manually dial the number. Once a call is complete, press **[F7]** to disconnect the call.

- NUMBER (2) The **Number** field is used to indicate the phone number associated with the entry identifier shown in the Name field. This field can consist of up to 20 digits. Numerals, hyphens, parenthesis, and commas are acceptable characters. The use of commas slow modem dialing speed. Entries are shown according to the order they are added. Newest entries will appear at the bottom of the list. Oldest entries are at the top. Modifying and saving a number in an entry will cause it to be placed at the end of the list as though it were a new entry.

You can add, modify, or delete a number through the Phone Directory List. To add a number, press **Insert**. To Delete a number, use the **Up/Down** Arrow keys to highlight the entry and press **Delete**. To modify an existing number, use the **Up/Down** Arrow keys to highlight the entry and press **[F3]**.

- BAUD            (3)    The **Baud Rate** field is used to indicate the selected baud rate for this call. Supported baud rates are 300, 1200, 2400, 4800, 9600 and 19200. Entries are shown according to the order they are added. Newest entries will appear at the bottom of the list. Oldest entries are at the top. Modifying and saving the baud rate in an entry will cause it to be placed at the end of the list as though it were a new entry.

You can add, modify, or delete an entry through the Phone Directory List. To add an entry, press **Insert**. To Delete an entry, use the **Up/Down** Arrow keys to highlight the entry and press **Delete**. To modify an existing entry, use the **Up/Down** Arrow keys to highlight the entry and press **[F3]**.

- PORT            (4)    The **Communication Port** field is used to indicate the selected communication port for this call. Supported communication ports are 1, 2, 3, or 4. Entries are shown according to the order they are added.

Newest entries will appear at the bottom of the list. Oldest entries are at the top. Modifying and saving a communication port setting in an entry will cause it to be placed at the end of the list as though it were a new entry.

You can add, modify, or delete an entry through the Phone Directory List. To add an entry, press **Insert**. To Delete an entry, use the **Up/Down** Arrow keys to highlight the entry and press **Delete**. To modify an existing entry, use the **Up/Down** Arrow keys to highlight the entry and press **[F3]**.



## PHONE DIRECTORY SETTINGS

PHONE DIRECTORY <1>	
NAME:	<2>
NUMBER:	<3>
BAUD RATE: 300	<4>
COM PORT: COM 1	<5>
Esc=Exit	WRITE [F2]

Figure 3-14 - Phone Directory Screen

- (1) Screen Title - phone directory
- (2) Name - entry identifier
- (3) Number - phone number
- (4) Baud Rate - baud rate setting
- (5) Com Port - communication port setting

The Phone Directory Screen, shown in Figure 3-14, allows you to define the settings displayed in the Phone Directory List.

- NAME (2) The **Name** field is used to indicate the name to be displayed as the entry identifier in the Phone Directory List.

To define the Name field, type in the desired characters. To be valid, this field can consist of up to 22 alphabetic characters. To exit the field press the **Up/Down** arrow keys, or **<esc>**. Pressing **[F2]** will save the selection(s) made in this screen.

- NUMBER (3) The **Number** field is used to indicate the number to be displayed as the phone number in the Phone Directory List.

PHONE DIRECTORY <1>	
NAME:	<2>
NUMBER:	<3>
BAUD RATE: 300	<4>
COM PORT: COM 1	<5>
Esc=Exit	WRITE [F2]

NUMBER (3) To define the Number field, type in the  
Cont'd desired phone number to be used in asso-  
ciation with the above defined name. The  
Number field can consist of up to 20 char-  
acters. To be valid, characters can be nu-  
meric, hyphens, parenthesis, or commas.  
However, commas will slow modem dialing  
speed. To exit the field press the **Up/Down**  
arrow keys, or **<esc>**. Pressing **[F2]** will  
save the selection(s) made in this screen.

BAUD (4) The **Baud Rate** field is used to select the  
RATE baud rate for the entry defined above.

To define the Baud Rate field, press **<en-  
ter>** to bring up the Baud Rate Selection  
Menu. Use the **Up/Down** Arrow keys to  
highlight the desired baud rate. Press **<en-  
ter>** to select the setting and return to the  
Phone Directory List Screen. To exit the  
Baud Rate field press the **Up/Down** arrow  
keys. Pressing **[F2]** will save the selection(s)  
made in this screen.

COM (5) The **Communication Port** field is used to  
PORT select the communication port for the entry  
defined above.

To define the Com Port field, use the  
**Left/Right** Arrow keys to scroll through the  
list. Press **<enter>** to select the setting. To  
exit the Com Port field press the **Up/Down**  
arrow keys. Pressing **[F2]** will save the selec-  
tion(s) made in this screen.

STATION DIAGNOSTICS

DIAGNOSTICS		(1)
MASTR III STATION STATUS		(2)
TONE DIAGNOSTIC		(3)
PARALLEL I/O		(4)
SWITCHES/INPUTS		(5)
FUNCTIONS/MISC		(6)
BASIC INFORMATION		(7)

Figure 3-15 - Diagnostics Screen

- |                              |                                       |
|------------------------------|---------------------------------------|
| (1) Screen Title             | - diagnostics                         |
| (2) MASTR III Station Status | - displays MASTR III station info     |
| (3) Tone Diagnostic          | - helps define tones station receives |
| (4) Parallel I/O             | - system input/output voltage levels  |
| (5) Switches Inputs          | - shows System Module input list      |
| (6) Functions/Misc           | - status of various functions/ misc   |
| (7) Basic Information        | - assists in defining station actions |

The Diagnostics Screen, shown in Figure 3-15, provides access into screens where station diagnostics can be performed.

- |                                |   |
|--------------------------------|---|
| MASTR III<br>STATION<br>STATUS | (2) The <b>MASTR III Station Status</b> field provides access to a screen displaying the MASTR III station module fault status, frequency values, circulator status, and the power amplifier potentiometer setting. |
|--------------------------------|---|

To access the screen, use the **Up/Down** Arrow keys to highlight the MASTR III STATION STATUS field and press **<enter>**.

DIAGNOSTICS		<1>
MASTR III STATION STATUS	<2>	
TONE DIAGNOSTIC	<3>	
PARALLEL I/O	<4>	
SWITCHES/INPUTS	<5>	
FUNCTIONS/MISC	<6>	
BASIC INFORMATION	<7>	

MASTR III (2) • Pertains to MASTR III Stations ONLY.  
STATION If this station is a MASTR IIe the follow-  
STATUS ing screen appears:  
Cont'd

Warning	
Station is programmed as a Mastr IIe	

TONE (3) The **Tone Diagnostics** field provides access  
DIAG- to a screen which displays control tones that  
NOSTIC the station receives and acts on.

To access the screen, use the **Up/Down**  
Arrow keys to highlight the TONE DIAG-  
NOSTIC field and press **<enter>**.

PARAL- (4) The **Parallel I/O** field provides the status  
LEL I/O of the inputs and outputs that interface with  
the microprocessor via the Programmable  
Peripheral Interface chip (U34) on the Sys-  
tem Board.

To access the screen, use the **Up/Down**  
Arrow keys to highlight the PARALLEL I/O  
field and press **<enter>**.

SWITCHES/(5) The **Switches /Inputs** field provides the  
INPUTS status of the System Module inputs (RE-  
MOTE PTT, CG MON, CAS, LOCAL PTT,  
and BATT STDBY), three switches on front  
of the System Module, and the DC Control  
Current.

To access the screen, use the **Up/Down** Arrow keys to highlight the SWITCHES/INPUTS field and press **<enter>**.

FUNC-  
TIONS/  
MISC

- (6) The **Functions/Miscellaneous** field provides access to a screen which displays the status of several functions and other miscellaneous information such as whether or not scan is active, repeats are enabled, and transmits are enabled.

To access the screen, use the **Up/Down** Arrow keys to highlight the FUNC-TIONS/MISC field and press **<enter>**.

BASIC  
INFORMA-  
TION

- (7) The **Basic Information** field displays the status of the currently active channel, how audio is routed through the System Module, the status of Channel Guard, status of the transmitter control lines, and what is keying the station.

To access the screen, use the **Up/Down** Arrow keys to highlight the BASIC INFORMATION field and press **<enter>**.

# MASTR III STATION STATUS

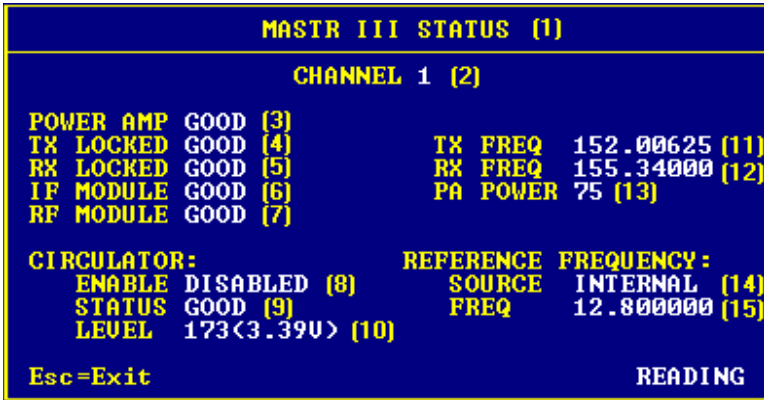


Figure 3-16 - MASTR III Status Screen

- |                       |  |
|-----------------------|--|
| (1) Screen Title      | - MASTR III status                           |
| (2) Channel           | - displays currently active channel          |
| (3) Power Amp         | - displays power amplifier status            |
| (4) Tx Locked         | - displays transmit synthesizer status       |
| (5) Rx Locked         | - displays receive synthesizer status        |
| (6) IF Module         | - displays IF module status                  |
| (7) RF Module         | - displays receiver front end status         |
| (8) Circulator Enable | - displays enable status of circulator fault |
| (9) Circulator Status | - displays status of circulator fault        |
| (10) Circulator Level | - displays level of circulator fault         |
| (11) Tx Freq          | - displays transmit frequency                |
| (12) Rx Freq          | - displays receive frequency                 |
| (13) PA Power         | - displays power amplifier pot setting       |
| (14) Ref Freq Source  | - displays type of reference frequency       |
| (15) Ref Freq Freq    | - displays frequency of reference freq       |

The MASTR III Status Screen, shown in Figure 3-16, allows you to view data pertaining only to MASTR III stations. If access into this screen is attempted from a station other than MASTR III a warning will appear preventing screen entry. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

- CHANNEL (2) The **Channel** field displays the MASTR III station's currently active channel.

- |              |  |
|--------------|--|
| POWER<br>AMP | (3) The <b>Power Amplifier</b> field displays the status of the Power Amplifier. This information is only useful when the station is transmitting.   |
|              | When the station is transmitting and the power amplifier has problems, the field will read "FAULT". When the station is not trying to transmit, the field will read "GOOD".  |
| TX<br>LOCKED | (4) The <b>TX Locked</b> field displays the status of the transmit synthesizer. This information is only useful when the station is transmitting.  |
|              | When the transmit synthesizer is in the station, this field will display "GOOD" until a transmission is attempted. If the synthesizer locks on a frequency, the field will continue to display "GOOD". If the transmit synthesizer does not lock at transmission, the field will read "FAULT". |
| RX<br>LOCKED | (5) The <b>Rx Locked</b> field displays the status of the receive synthesizer.   |
|              | When the receiver is in the station, and when it locks on the programmed frequency, the field will display "GOOD". When the receive synthesizer does not lock onto the programmed frequency, the field will read "FAULT".  |
| IF<br>MODULE | (6) The <b>IF Module</b> field displays the status of the IF module.   |
|              | When the IF module fault indicator is lit, the field will display "FAULT". When the IF module fault indicator is not lit, the field will display "GOOD".   |
| RF<br>MODULE | (7) The <b>RF Module</b> field displays the status of the receiver front end.  |

RF MODULE GOOD (7)			
CIRCULATOR:		REFERENCE FREQUENCY:	
ENABLE	DISABLED (8)	SOURCE	INTERNAL (14)
STATUS	GOOD (9)	FREQ	12.800000 (15)
LEVEL	173(3.39V) (10)		
Esc=Exit		READING	

- RF  
MODULE  
Cont'd
- (7) When the front end's fault indicator is lit, the field will display "FAULT". When the front end's fault indicator is not lit, the field will display "GOOD".

NOTE

When any of the above four modules (transmit synthesizer, receive synthesizer, IF module, or RF module) are not present in the station, the associated field will show "FAULT" if Interface Board is Rev. A or later. The display will show "GOOD" if the Interface Board is not Rev. A or later.

- CIRCU-  
LATOR  
ENABLE
- (8) The **Circulator Enable** field displays whether or not the station has been programmed to detect circulator faults.

When the station has been programmed to detect circulator faults, the field will display "ENABLED". When the station has not been programmed to detect circulator faults the field will display "DISABLED".

To detect a circulator fault, an output of the circulator is connected to the Interface Board. This voltage determines the voltage on the input to the System Board power sensor. This voltage is then converted to a number between 0 (for 0 volts) and 255 (for 5 volts). This number is then compared with the number displayed in the LEVEL field. When the number reaches or exceeds the LEVEL field value the station detects a



circulator fault. The transmitter will then be disabled and the PA Alarm LED on the front of the station will flash. The circulator fault state will remain until the voltage is lowered and a reset is done on the station.

CIRCU-  
LATOR  
STATUS

- (9) The **Circulator Status** field displays whether or not the station detects a circulator fault.

When the Circulator Enable field displays "ENABLED" this field will display "FAULT" when a circulator fault occurs. This field will display "GOOD" when no circulator fault is detected. When the Circulator Enable field displays "DISABLED", the Circulator Status field will never display "FAULT".

CIRCU-  
LATOR  
LEVEL

- (10) The **Circulator Level** field displays the level that will cause a circulator fault.

TX FREQ

- (11) The **TX Freq** field displays the transmit frequency for the current channel. Frequencies are displayed in Mhz.

RX FREQ

- (12) The **RX Freq** field displays the receive frequency for the current channel. Frequencies are displayed in Mhz.

PA  
POWER

- (13) The **PA Power** field displays the setting of the power amplifier potentiometer on the Interface Board.

REF  
FREQ  
SOURCE

- (14) The **Reference Frequency Source** field displays whether an internal or external reference frequency is being used.

When an internal reference frequency is being used the Source field will display "INTERNAL". When an external reference frequency is used the Source field will display "EXTERNAL".

- REF
- (15) The **Reference Frequency Freq** field displays the actual frequency in Mhz of the reference frequency.
- FREQ
- FREQ

TONE DIAGNOSTICS

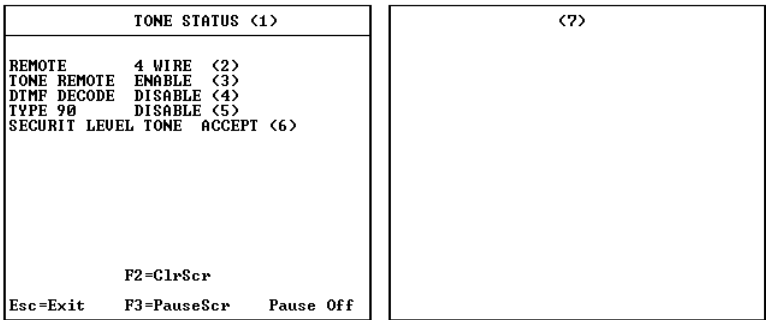


Figure 3-17 - Tone Status Screen

- (1) Screen Title
- tone status
- (2) Remote
- indicates #-wire remote
- (3) Tone Remote
- displays tone remote setting
- (4) DTMF Decode
- displays DTMF decode setting
- (5) Type 90
- displays type 90 tone setting
- (6) Securit Level Tone
- indicates whether secur-it level function tones are accepted
- (7) Tones
- shows tones detected by station

The Tone Status Screen, shown in Figure 3-17, displays information on how the station is programmed and what tones are detected by the station. All fields are "DISPLAY ONLY" and cannot be modified.

- REMOTE
- (2) The **Remote** field displays whether the station is programmed to work with a four-wire remote or a two-wire remote.

This field will display "2 WIRE" unless the station has been programmed to work with a four-wire remote. When programmed to work with a four-wire remote the field will display "4 WIRE".

- |                          |     |   |
|--------------------------|-----|---|
| TONE<br>REMOTE           | (3) | <p>The <b>Tone Remote</b> field displays whether or not the station is programmed to work with a tone remote.</p> <p>When the station is programmed to work with a tone remote, this field will display "ENABLE". Otherwise the field will display "DISABLE".</p>   |
| DTMF<br>DECODE           | (4) | <p>The <b>DTMF Decode</b> field displays whether or not the station is programmed to decode DTMF.</p> <p>When the station is programmed to decode DTMF, this field will display "ENABLE". Otherwise the field will display "DISABLE".</p>   |
| TYPE 90                  | (5) | <p>The <b>Type 90</b> field displays whether or not the station is programmed to detect type 90 tones.</p> <p>When the station is programmed to detect type 90 tones, this field will display "ENABLE". Otherwise the field will display "DISABLE".</p>   |
| SECURIT<br>LEVEL<br>TONE | (6) | <p>The <b>Securit Level Tone</b> field displays how function tones near the same level as the Secur-it tone will be treated. On tone remote systems, the level of the function tone that comes after the Secur-it tone is usually 10 dB below the level of the Secur-it tone.</p> <p>When the station is programmed to not enforce the 10 dB level difference this field will display "ACCEPT". Function tones that are higher than 10 dB below the Secur-it are processed. When the station is programmed to enforce the 10 dB level difference, this field will display</p> |

TONE STATUS <1>		<7>	
REMOTE	4 WIRE <2>		
TONE REMOTE	ENABLE <3>		
DTMF DECODE	DISABLE <4>		
TYPE 99	DISABLE <5>		
SECURIT LEVEL TONE	ACCEPT <6>		
F2=ClrScr			
Esc=Exit	F3=PauseScr	Pause Off	

"IGNORE". Function tones higher than 10 dB under the Secur-it are ignored.

TONE (7) The **Tone** field, or right side of the Tone Status Screen, displays any tones that are detected by the station.

– Tone Remote:

The Tone Remote field must be enabled for the station to detect tone remote tones.

When the station detects a tone remote tone, the message "TONE REMOTE" will appear in the screen. The frequency of the tone and a level indicator will also appear. If the tone is 2175 Hz, the tone will show a Secur-it, Function, or Hold level. If the incoming tone does not have a frequency of 2175 Hz, the level indicated will be either Secur-it or Function. When the station detects that the tones have gone away the message "TONE REMOTE NO TONE" will appear. No message for a function tone will appear unless that function tone has been programmed to do something.

– DTMF:

The DTMF Decode field must be enabled for the station to detect DTMF tones.

When a DTMF tone is detected by the station, "DTMF" will appear with the value of the DTMF digit received. When the tone goes away, a "NO TONE" message will appear.

- TYPE 90:  
The Type 90 field must be enabled for the station to detect Type 90 tones. When detected, the words "TYPE 90" appear with the frequency displayed also. When the tone goes away a "NO TONE" message will appear.

Messages can be cleared at any time by pressing **[F2]**. The display of messages can be stopped at any time by pressing **[F3]**. When messages are stopped, "PAUSE ON" will be displayed. During the pause, all messages that would have been displayed are discarded.

# PARALLEL I/O

<MASTR IIE>

PARALLEL I/O <1>		
GETC OUT <2>	GETC IN <3>	ICOMS <4>
		/MIII Control
	HIGH COMB PTT	OPEN Rxf4/AUX2
	HIGH TX CG Dis	OPEN Rxf3/AUX1
GND Rx Mute	HIGH Delay PTT	GND Rxf2
OPEN Comb PTT	LOW RUS in	OPEN Rxf1
OPEN Rem PTT	HIGH 1950 Dis	OPEN Txf4/UG guard
OPEN CG Mon	HIGH Detect Dis	OPEN Txf3/UG clear
OPEN UG PTT	HIGH Repeat PTT	OPEN Txf2
OPEN Rep PTT	HIGH UG Sq Dis	GND Txf1
Esc=Exit		READING

<MASTR III>

PARALLEL I/O <1>		
GETC OUT <2>	GETC IN <3>	ICOMS <4>
		/MIII Control
	HIGH COMB PTT	X Rxf4/AUX2
	LOW TX CG Dis	OPEN Rxf3/AUX1
GND Rx Mute	HIGH Delay PTT	X Rxf2
OPEN Comb PTT	HIGH RUS in	X Rxf1
OPEN Rem PTT	HIGH 1950 Dis	OPEN Txf4/UG guard
OPEN CG Mon	LOW Detect Dis	OPEN Txf3/UG clear
OPEN UG PTT	HIGH Repeat PTT	X Txf2
OPEN Rep PTT	HIGH UG Sq Dis	X Txf1
Esc=Exit		UPDATE

Figure 3-18 - Parallel I/O Screen

- (1) Screen Title - parallel I/O
- (2) GETC Out - outputs coming from Port A
- (3) GETC In - inputs going to Port B of chip U34
- (4) ICOMS/MIII Control - outputs coming from Port C

The Parallel I/O Screens, shown in Figure 3-18, displays inputs and outputs of the System Module. The screen is repetitively updated with the voltage level of these inputs and outputs. All fields in the screen are "DISPLAY ONLY" and cannot be modified.

- GETC OUT (2) The **GETC Out** column displays outputs coming from Port A of chip U34 on the System Board. Most outputs are GETC control lines.

GETC Out entries reflect the status of corresponding outputs. If an entry reads "GND", the output is at 0 volts at the backplane. If an entry reads "OPEN", the corresponding output will be open, and a pull-up resistor must be used to set the voltage of the outputs.

- GETC IN (3) The **GETC In** column displays inputs eventually going to Port B of chip U34 on the System Board. Most inputs are GETC control lines.

GETC In entries reflect the voltage at the corresponding inputs. If these voltages are at a low logic level (around 0 volts), the field will read "LOW". Otherwise, the voltages are at high logic levels (around 5 volts), and the field will read "HIGH".

- ICOMS/M III CONTROL (4) The **ICOMS/MIII Control** column displays the status of the outputs coming from Port C of chip U34 on the System Board. These outputs control the transmit and receive ICOMS on MASTR IIe stations. On MASTR III stations, some of the lines are used to communicate with the Interface Board.

ICOM/MIII Control entries reflect the status of corresponding outputs. If an entry reads "GND", the output is at 0 volts at the backplane. If an entry reads "OPEN", the corresponding output will be open, and a pull-up resistor must be used to set the voltage of the outputs. However, if the station being read is a MASTR III station, those lines that are used to communicate

with the Interface Board will always have an "X" beside them. The "X" is placed there because those lines change much faster than the screen can be updated.

# SWITCHES/INPUTS

SWITCHES/INPUTS (1)			
OFF (HIGH)	Rem PTT	(2)	
OFF (HIGH)	Tx Dis	(3)	
OFF (HIGH)	CG Mon	(4)	
OFF (HIGH)	Batt Stdby	(5)	
	-11 DC mA	(6)	
OFF (HIGH)	Local PTT	(7)	
OFF (GND)	CAS	(8)	
Esc=Exit		READING	

Figure 3-19 - Switches/Inputs Screen

- |                  |   |
|------------------|---|
| (1) Screen Title | - switches/inputs                       |
| (2) Rem PTT      | - displays status of remote ptt         |
| (3) Tx Dis       | - displays status of transmit disable   |
| (4) CG Mon       | - displays Channel Guard monitor status |
| (5) Batt Stdby   | - displays status of battery standby    |
| (6) DC mA        | - interpretation of DC control input    |
| (7) Local PTT    | - displays status of local ptt          |
| (8) CAS          | - displays status of CAS                |

The Switches/Inputs Screen, shown in Figure 3-19, displays a list of System Module inputs. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

- REM PTT (2) The **Rem PTT** field displays the status of the System Module REMOTE PTT IN input. This input is grounded when the System Module REM PTT switch is in the up position.



This field will display "ON (GND)" when the REM PTT switch is up. When the REM PTT switch is down, the field will indicate the status of the REMOTE PTT IN line. If this line is ground, the field will display "ON (GND)". If this line is at a high logic level, this field will display "OFF (HIGH)".

- TX DIS      (3) The **Tx Dis** field displays the status of the transmit disable switch on the front of the System Module.

This field will display "ON (GND)" when the switch is up. The input to chip U25 is set to GND when this switch is up. The field will display "OFF (HIGH)" when the switch is down. The input is at a high logic level when this switch is down.

- CG MON      (4) The **CG Mon** field displays the status of the System Module CG Monitor input.

This field will display "ON (GND)" when the CG Monitor switch is up. When the switch is down, the field will indicate the status of the CG MON line. If this line is at ground, the field will display "ON (GND)". If this line is at a high logic level, this field will display "OFF (HIGH)".

- BATT  
STDBY      (5) The **Battery Standby** field displays how the station is being powered.

This field will display "ON (GND)" when the station is powered by the battery backup and the Batt Stdbby input is driven to GND. Otherwise the BATT STDBY field will display "OFF (HIGH)".

- DC MA      (6) The **DC mA** field displays an interpretation of the DC control inputs.

This field will display a value representing the control current in milliamps present at Line In.

- LOCAL PTT
- (7) The **Local Push-To-Talk** field displays whether the voltage at the Local PTT input is near GND or at a high logic level.

This field will display "ON (GND)" when a local microphone keys the station and the voltage at the Local PTT input is close to GND. The field will display "OFF (HIGH)" when the input is at a high logic level.

- CAS
- (8) The **CAS** field is used to indicate when a carrier is detected at the station.

This field will display "ON (HIGH)" whenever a carrier is detected at the station and the voltage at the CAS input is driven to a high logic level. Otherwise the field will display "OFF (GND)".

**FUNCTIONS/MISCELLANEOUS**

FUNCTIONS/MISC (1)	
FUNCTIONS (2)	MISC (3)
OFF Local PTT	OFF UG CLEAR
OFF Remote PTT	OFF UG GUARD
OFF RUS PTT	OFF Vote Tone
OFF External PTT	NO Scan Active
OFF RUS Mute	YES Rep Enable
	OFF CG Mon Latch
	YES Tx Enable
Esc=Exit	UPDATE

Figure 3-20 - Functions/Misc Screen

(1) Screen Title - functions/misc

- |               |   |
|---------------|---|
| (2) Functions | - displays station function information |
| (3) Misc      | - displays misc station information     |

The Functions/Misc Screen, shown in Figure 3-20, displays station function information and some miscellaneous information pertinent to station operation. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

- |            |   |
|------------|---|
| FUNC-TIONS | (2) The <b>Functions</b> column displays the status of several station functions. |
|------------|---|

This column displays "ON" beside a field indicating when a function has been started, or "OFF" indicating the function is not operating.

- |      |  |
|------|--|
| MISC | (3) The <b>Miscellaneous</b> column displays miscellaneous station data. |
|------|--|

- VG Clear:  
This field pertains only to stations having Voice Guard.  
This field will display "ON" when the station Voice Guard is in Clear mode. Otherwise the field will display "OFF".
- VG Guard:  
This field pertains only to stations having Voice Guard.  
This field will display "ON" when the station Voice Guard is in Guarded mode. Otherwise the field will display "OFF".
- Vote Tone:  
This field displays "ON" when the micro-processor on the System Board instructs the DSP board to output a voting tone. This does not necessarily mean that the voting tone is output from the station. The field displays "OFF" when no voting tone is output from the DSP board.
- Scan Active:

This field displays "YES" when the microprocessor on the System Board scans receiver channels. This field displays "NO" when receiver channels are not scanned.

- Rep Ena:  
This field displays "YES" when repeats are enabled. Otherwise the field will display "NO".
- CG Mon Latch:  
This field displays "ON" when a remote, having a Channel Guard On-Off button, starts the Channel Guard monitor latch to prevent Channel Guard decoding. This field displays "OFF" when the Channel Guard monitor latch is disabled.
- Tx Enable:  
This field will display "YES" when transmits are enabled. Otherwise the field will display "NO".

**BASIC INFORMATION**

BASIC INFORMATION (1)			
Channel 1 (2)			
AUDIO (3)	CH GUARD (4)	KEYS (5)	TX (6)
LO AGND	OFF Encode	UNKEY Active	OFF (HIGH) ANT RLY
TX AGND	OFF Decode	OFF LOC	OFF (GND) OSC CTRL
LS DSP Line Tx	YES Found	OFF REM	NO Active
	OFF Monitor	OFF RUS	
		OFF MCD	
Repeater State	IDLE (7)	OFF EXT	
CAS Input	OFF (8)		
Esc=Exit			UPDATE

Figure 3-21 - Basic Information Screen

(1) Screen Title                      - basic information

- |                    |                                       |
|--------------------|---------------------------------------|
| (2) Channel        | - displays currently active channel   |
| (3) Audio          | - shows how audio is routed           |
| (4) Ch Guard       | - displays Channel Guard information  |
| (5) Keys           | - indicates push-to-talks occurring   |
| (6) Tx             | - displays transmitter information    |
| (7) Repeater State | - indicates base station state        |
| (8) CAS            | - station detects carrier on receiver |

The Basic Information Screen, shown in Figure 3-21, provides information pertaining to station performance. All fields in this screen are "DISPLAY ONLY" and cannot be modified.

CHANNEL (2) The **Channel** field displays the currently active channel.

AUDIO (3) The **Audio** column displays three fields which indicate how audio is routed through the station. These fields correspond to the three analog multiplexers on the System Module. The multiplexers control the audio to LO (Line Out), TX (Transmitter), and LS (Local Speaker).

The following list indicates possible entries beside LO, TX, and LS:

- Line In  
Line In audio.
- Local Mic  
Local Microphone audio.
- VSQ  
Receiver audio (Volume/Squelch).
- AUX Rcvr  
Auxilliary (2nd) Receiver audio.
- Simul Monitor  
Simultaneous Monitor. This is the sum of the Main Receiver audio (VSQ) and Auxillary Receiver audio.

BASIC INFORMATION <1>									
Channel 1 <2>									
AUDIO <3>		CH GUARD <4>		KEYS <5>		TX <6>			
LO AGND	OFF	Encode	UNKEY	Active	OFF	<HIGH>	ANT	RLY	
TX AGND	OFF	Decode	OFF	LOC	OFF	<GND>	OSC	CTRL	
LS DSP Line Tx	YES	Found	OFF	REM	NO	Active			
	OFF	Monitor	OFF	RUS					
			OFF	MCD					
Repeater State	IDLE	<7>	OFF	EXT					
CAS Input	OFF	<8>							
Esc=Exit									UPDATE

- AUDIO (3) – DSP Line Tx  
Cont'd Audio on DSP Line/Tx Aud. This is an output of the DSP Board.
- DSP Tx  
Audio on DSP Tx Aud. This is an output of the DSP Board.
- Modem Tx  
Modem Line Transmit (MDM Line TXD). (This selection is rarely used).
- Ext HS Data  
External Highspeed Data (EXT HSD).
- OPEN  
Selects a resistor connected to GND. This is selected when only the audio coming from the BATT ALRM line should go to Line Out. Test tone, battery alarm tone, and morse code are put on BATT ALRM.
- AGND  
Selects Analog GND. Selected when no audio should go to Line Out.

- CH (4) The **Channel Guard** column displays fields  
GUARD containing information pertaining to Channel Guard.
- Encode:  
Displays "ON" when the station is transmitting and encoding Channel Guard. Otherwise this field will display "OFF".

- Decode:  
Displays "ON" when the station is decoding Channel Guard. Otherwise this field will display "OFF".
- Found:  
Displays "YES" when the station is not decoding Channel Guard or when the station is decoding Channel Guard and the programmed Channel Guard has been detected. Otherwise this field will display "NO".
- Monitor:  
Displays "ON" when the station is performing Channel Guard Monitor. Otherwise this field will display "OFF".

**KEYS**

- (5) The **Keys** column displays any push-to-talks (PTTs) occurring.
- The Active field will display the highest priority PTT.
  - The LOC field will display "ON" when Local PTT occurs.
  - The REM field will display "ON" when Remote PTT occurs.
  - The RUS field will display "ON" when RUS PTT occurs.
  - The MDC field will display "ON" when Morse Code is being transmitted.
  - The EXT field will display "ON" when External PTT occurs.

**TX**

- (6) The **TX** column displays transmitter information.

This field displays "NO" when the transmitter is off. The ANT RLY field will display "OFF".

BASIC INFORMATION <1>				
Channel 1 <2>				
AUDIO <3>	CH GUARD <4>	KEYS <5>	TX <6>	
LO AGND	OFF Encode	UNKEY Active	OFF <HIGH>	ANT RLY
TX AGND	OFF Decode	OFF LOC	OFF <GND>	OSC CTRL
LS DSP Line Tx	YES Found	OFF REM	NO Active	
	OFF Monitor	OFF RUS		
		OFF MCD		
Repeater State	IDLE <?>	OFF EXT		
CAS Input	OFF <8>			
Esc=Exit			UPDATE	

- TX  
Cont'd
- (6) (HIGH)" indicating the ANT RLY line is set to a high logic voltage level. The OSC CTRL field will display "OFF (GND)" indicating the entry will be at GND.

This field displays "YES" when the micro-processor tries to turn the transmitter on. The ANT RLY will display "ON (GND)" indicating the line is set at GND. The OSC CTRL field will display "ON (HIGH)" indicating a high logic voltage level.

On MASTR III stations, the OSC CTRL will not turn on if the Tx Synthesizer does not lock onto the programmed frequency.

- REPEAT-  
ER STATE
- (7) The **Repeater State** field indicates the state of the base station.

Four displays may appear in this field:

- IDLE  
There are no push-to-talks and the transmitter is off.
- PTT  
A push-to-talk is occurring.
- DODT  
A drop out delay is being performed.
- STE  
Squelch tail elimination is being transmitted.



**CAS  
INPUT**

- (8) The **CAS Input** field indicates the station detects a carrier on the receiver (CAS).

This field displays "ON" when the station thinks it detects a carrier and acts on it. Otherwise the field displays "OFF".

Sometimes the station will detect CAS and ignore it. For example, on simplex stations any CAS detected could be the result of a previous transmission. Therefore, the station will ignore any detected CAS for a predetermined time to allow CAS from a previous transmission to decay. During this delay the hardware CAS line is active but the CAS input entry on the screen indicates "OFF".

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# APPENDIX A

## ACCEPTABLE VALUES

<u>INPUT FIELD</u>	<u>ACCEPTABLE VALUES</u>	<u>DEFAULT VALUE</u>
<b>Program Configuration</b>		
Mouse Support	Yes or No	No
Com Port	1, 2, 3, 4	1
Baud Rate	300, 1200, 2400, 4800, 9600, 19200	9600
<b>Modem Parameters</b>		
Modem Delay Type	Wait for OK or Fixed Delay	Fixed Delay
Modem Intercommand Delay	0 to 255	9
Dialing Type	Pulse or Touch Tone	Touch Tone
Modem Speaker Status	0, 1, 2	1
Comma Pause Time	0 to 255	1
Tone Timing	0 to 255	70
Wait for Dial Tone	0 to 255	2
Wait for Carrier	0 to 255	12
Recognize Carrier	0 to 255	6
Carrier Dropout	0 to 255	7
<b>Serial Request Timeout</b>		
Enter Timeout Value	3 to 99 seconds	3
<b>Phone Directory List</b>		
Name	Up to 22 alphabetic characters	blank
Number	Up to 20 numerals, hyphens, parenthesis, or commas	blank
Baud Rate	300, 1200, 2400, 4800, 9600 or 19200	blank
Port	1, 2, 3, 4	blank

# **LBI-38540, Rev. J**

<u>INPUT FIELD</u>	<u>ACCEPTABLE VALUES</u>	<u>DEFAULT VALUE</u>
<b>Phone Directory Settings</b>		
Name	Up to 22 alphabetic characters	blank
Number	Up to 20 numerals, hyphens, parenthesis, or commas	blank
Baud Rate	300, 1200, 2400, 4800, 9600 or 19200	300
Com Port	1, 2, 3, 4	1

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