# TS-120-MPM1

## Multi-Format ANI Encoder with Lone Worker

**Manual Revision: 2011-10-10**

**Covers Software Revisions:**
**VS-1XXX**: 01.50.00 & Higher

**This manual supports the following radios:**

**North America:** CDM-750, CDM-1250, CDM-1550-LS+
**EMEA Region:** GM-140, GM-160, GM-340, GM-360, GM-380, GM-640, GM-660, GM-1280
**Asia:** GM-328, GM-338, GM-338-LS, GM-339, GM-398, GM-399, MCX-720, MCX-760, MCX-780
**Latin America:** PRO-3100, PRO-5100, PRO-7100, PRO-7200

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## HARDWARE SPECIFICATIONS

| | |
|---|---|
| Operating Voltage | 4.75-8.2 VDC |
| Operating Current | |
| Power Save Mode (COR Operation) | 2.5 mA typical |
| Power Save Mode (VOX Operation) | 10 mA typical |
| Normal Operation | 17.5 mA typical |
| Average w/COR Power Save (80-10-10 cycle) | <5 mA |
| Average w/COR Power Save (90-5-5 cycle) | <4 mA |
| Operating Temperature | -30 - +60 C |
| Frequency Response | 300-3000 Hz |
| Input Impedance | >45 kΩ |
| Input Level (TX) | 0.05-2.5 VPP |
| Input Level (RX) | 0.05-2.5 VPP |
| Audio Output Impedance | < 1200 Ohm |

## INSTALLATION OVERVIEW

1. Test the radio for functionality.

2. Program the radio per the Radio Programming Section of this manual.

3. Install the unit into the radio per the Hardware Installation Section of this manual.

4. Program the unit per the Product Programming Section of this manual.

Note: Midian is not responsible for any damage/loss resulting from the use of Midian's products.

## GENERAL INFORMATION

Midian's TS-120 Series products encode ANI and Emergency ANI to display on ANI display decoder to identify which field unit is being keyed. The following is a list of benefits provided by ANI systems:

- Allows dispatchers to know who he or she is talking to.
- Identify system abusers.
- Identify emergency conditions.
- Assign calls fairly.

The TS-120 offers ANI & Emergency ANI in Motorola's MDC-1200, Kenwood's FleetSync, Harris' G-Star (aka GE-Star), DTMF and 5-tone. The TS-120 can be used with Midian's ADD, CAD, DDU and TRC Series products for monitoring ANI and ENI transmissions.

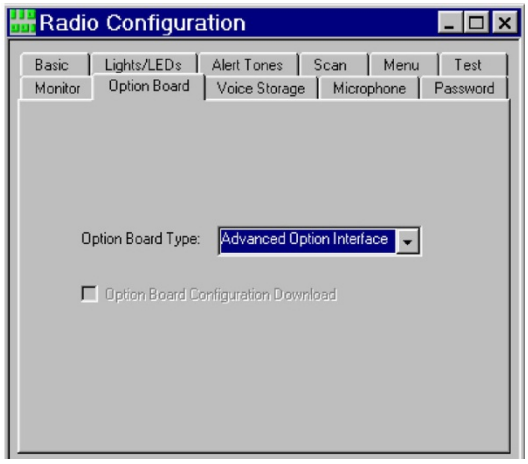
The TS-120 also offers a Lone Worker feature for man-down applications. If the unit does not receive any user interaction (PTT or Lone Worker Reset button) for a programmable period of time the unit can key the radio and send the Emergency ANI.

## RADIO PROGRAMMING

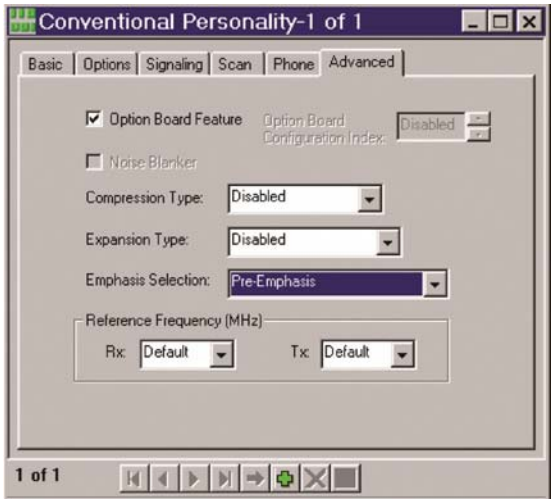
**MOT-TVS-2-PRO-M & MOT-VPU-15-PRO-M for Motorola MDC-1200 capable mobile radios**
**CDM-750, CDM-1250, GM-140, GM-160, GM-328, GM-338, GM-398, PRO-3100, PRO-5100, PRO-7100 Programming Instructions**

It is necessary to program the radio before installing the unit. This is because the **Option Board Feature** of the radio must be enabled in order to program the unit using the Motorola RIB box and cable or RIB-less cable and to hear confirmation beeps from the radio after programming the unit.

1. In the Radio Configuration Window under the Option Board Tab, select Advanced Option Interface as the Option Board Type. Do not check the Option Board Configuration Download box.




2. When programming the "Conventional Personality", check the **Option Board Feature** box for <u>all</u> channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.

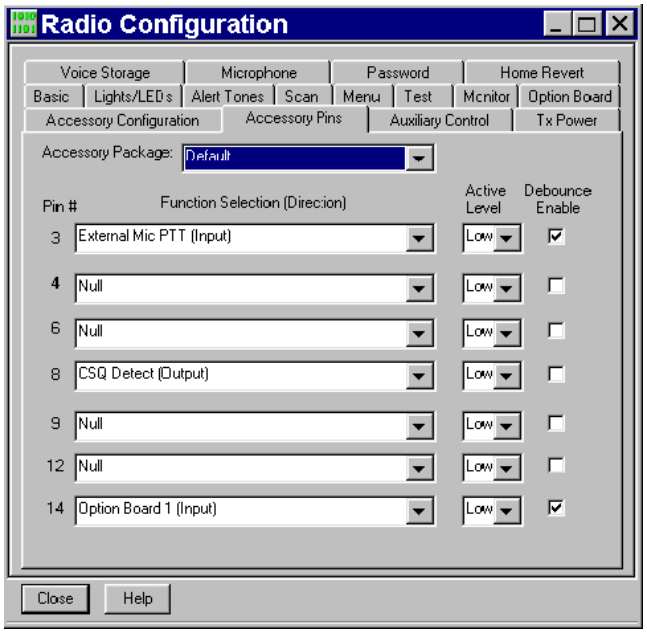


**The following two steps apply to the accessory connector and may be skipped by most users.**

3. An accessory pin may be used to control the Lone Worker on/off. This is useful in remote control applications. To enable this feature, one of the radio accessory pins must be assigned to **Option Board 1 (Input)** via the CPS programmer.

4. An accessory pin may be used to initiate an emergency ANI. This allows for an external emergency foot switch or button, and frees-up one of the radio front buttons. To enable this feature, one of the radio accessory pins must be assigned to **Option Board 2 (Input)** via the CPS programmer. The switch must be held in the active state for about 2 seconds before an emergency ANI will be sent.

Note: Accessory pin features do not require any special unit programming.

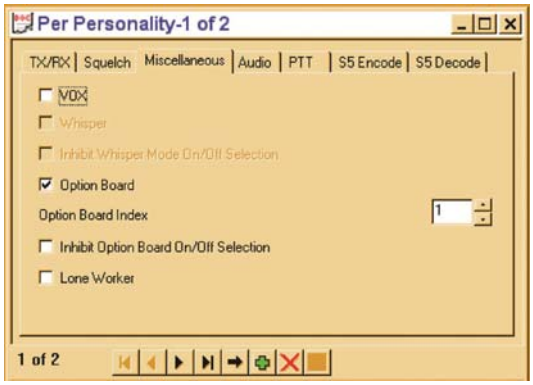


**MOT-TVS-2-PRO-M & MOT-VPU-15-PRO-M**
**GM-339, GM-340, GM-360, GM-380, GM-399, PRO-7200 Programming Instructions**

It is necessary to program the radio before installing the unit. This is because the **Option Board Feature** of the radio must be enabled in order to program the unit using the Motorola RIB box and cable or RIB-less cable and to hear confirmation beeps from the radio after programming the unit.

1. In the Per Radio Miscellaneous Window under the Global Tab, select “Advanced” as the “Option Board Type” and set the RX Audio (Accessory Connector) to “Filtered Squelched”. Note: The Accessory Connector is the rear accessory connector, but this setting also affects the audio going to the options connector.


2. For each personality, under the Miscellaneous tab, the “Option Board” must be enabled. Check the Option Board box for all channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.

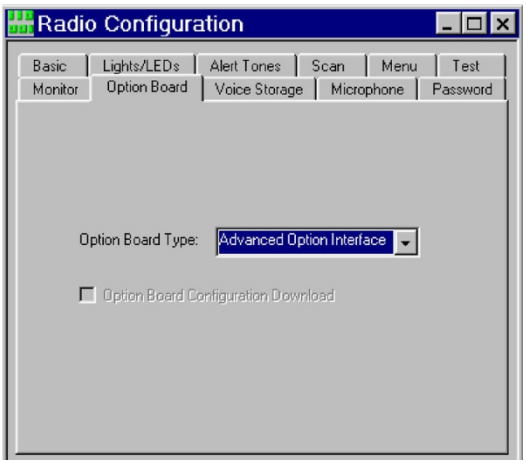


**MOT-TVS-2-PRO-M MOD-1306 & MOT-VPU-15-PRO-M MOD-1306**
**CDM-1550-LS+, GM-338-LS Programming Instructions**

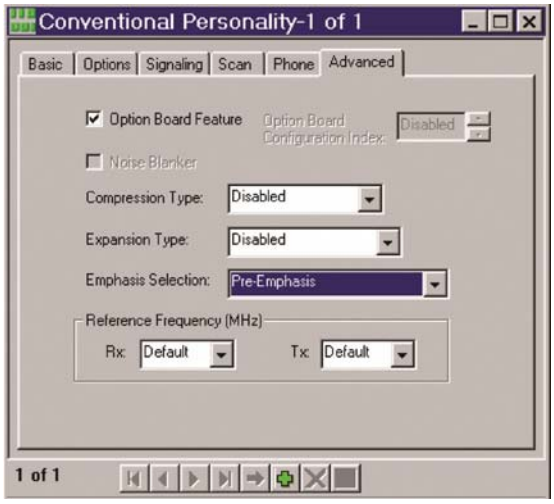
It is necessary to program the radio before installing the unit. This is because the **Option Board Feature** of the radio must be enabled in order to program the unit using the Motorola RIB box and cable or RIB-less cable and to hear confirmation beeps from the radio after programming the unit.

**Conventional Programming:**

1. In the Radio Configuration Window under the Option Board Tab, select Advanced Option Interface as the Option Board Type. Do not check the Option Board Configuration Download box.




2. When programming the "Conventional Personality", check the **Option Board Feature** box for <u>all</u> channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.



**LTR Programming:**

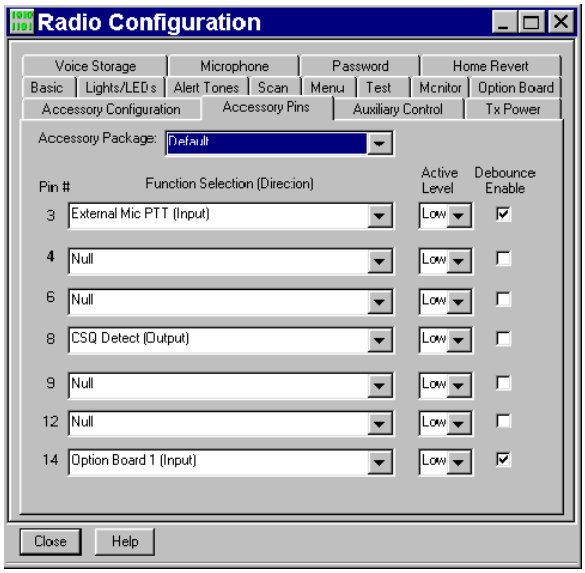
1. In the LS Trunking Personality window, check the Option Board Feature box for each personality. Check the **Option Board Feature** box for all channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.


**The following two steps apply to the accessory connector and may be skipped by most users.**

1. An accessory pin may be used to control the transmit mode of the unit between Lone Worker on/off. This is useful in remote control applications. To enable this feature, one of the radio accessory pins must be assigned to **Option Board 1 (Input)** via the CPS programmer.

2. An accessory pin may be used to initiate an emergency ANI. This allows for an external emergency foot switch or button, and frees-up one of the radio front buttons. To enable this feature, one of the radio accessory pins must be assigned to **Option Board 2 (Input)** via the CPS programmer. The switch must be held in the active state for about 2 seconds before an emergency ANI will be sent.

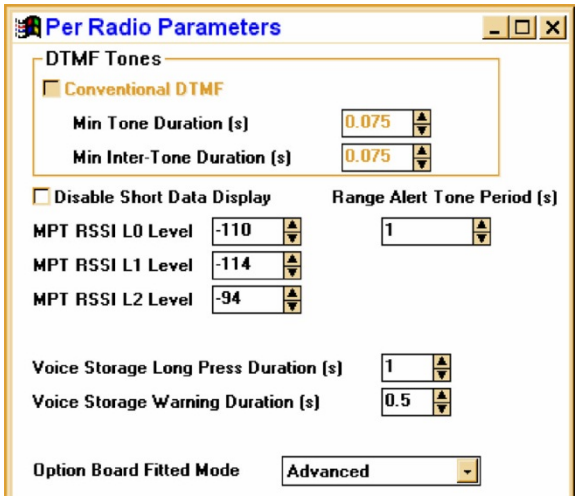
Note: Accessory pin features do not require any special unit programming.



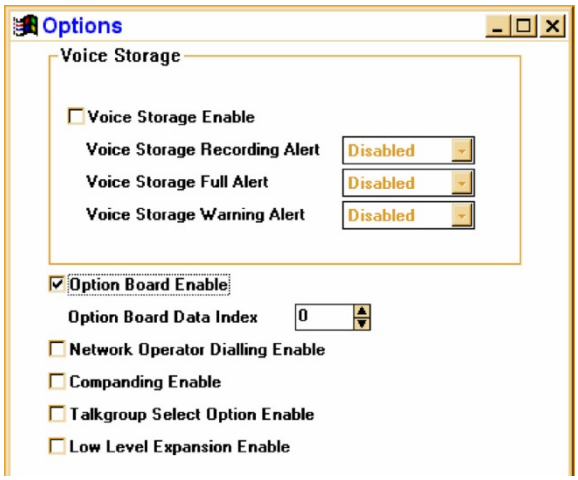
**MOT-TVS-2-PRO-M MOD-1331 & MOT-VPU-15-PRO-M MOD-1331 for MPT-1327 Trunking Radios GM-640, GM-660, GM-1280, MCX-720, MCX-760, MCX-780 Programming Instructions**

It is necessary to program the radio before installing the unit. This is because the **Option Board Feature** of the radio must be enabled in order to program the unit using the Motorola RIB box and cable or RIB-less cable and to hear confirmation beeps from the radio after programming the unit.

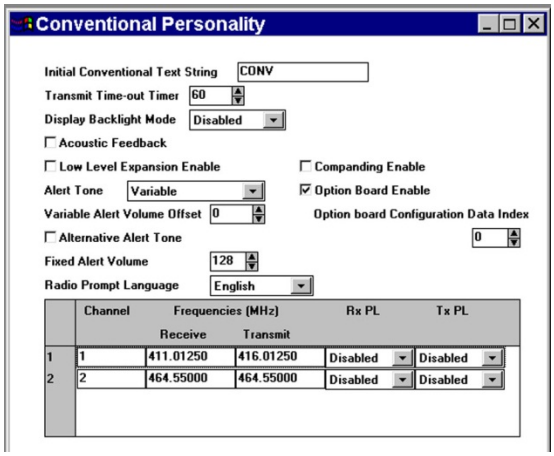
1. In the Per Radio Parameters Window set the “Option Board Fitted Mode” as “Advanced”.




2. Edit the ‘MPT Personality’. In the “Options” window, check the “Option Board Enable” box. Check Option Board Enable for <u>all</u> channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.



3. If using conventional channels, edit the ‘Conventional Personality Data’. In the “Conventional Personality” window, check the “Option Board Enable” box. Check Option Board Enable for <u>all</u> channels if using a button to control the mode of the unit. If doing ANI or Lone Worker on a per channel basis, then check Option Board Feature only for ANI/Lone Worker channels. It will be necessary to check the Power Up with Lone Worker On box for per channel Lone Worker.



## HARDWARE INSTALLATION

Be certain to follow standard anti-static procedures when handling any of Midian's products.

**Radio Firmware:** For the mobile radios listed, it is necessary to have radio firmware version R05.00.00 or higher. If the radio has an older firmware version, it is necessary to upgrade to the newest firmware.

Verifying the firmware version can be done several ways. On most radios, this information is on a label on the bottom of the radio. For display radios, selecting the SoftwareVer# option from the utility menu will report the version. Consult Motorola if you cannot determine the firmware version.

**Disassembling the Radio:**

Additional disassembly instructions are also available in Motorola's Basic Service Manual.

1. Disconnect power.

2. Remove plastic cover from the radio chassis by prying the sides away and lifting up.

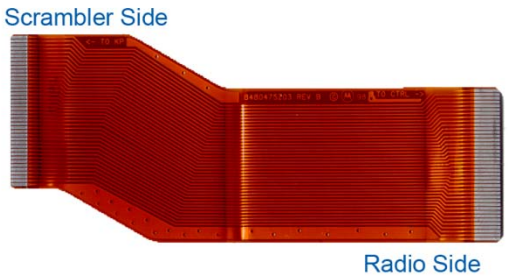
3. Remove the 6 retaining bolts from the metal lid using a Torx™ size 20 screwdriver. Carefully begin removing the lid. If there is already an option board installed such as a voice storage board, disconnect it by gently lifting the latch holding the 40-pin flex cable in place.

4. Remove the lid completely. Unscrew the three bolts holding the option board frame to the lid if one is present.

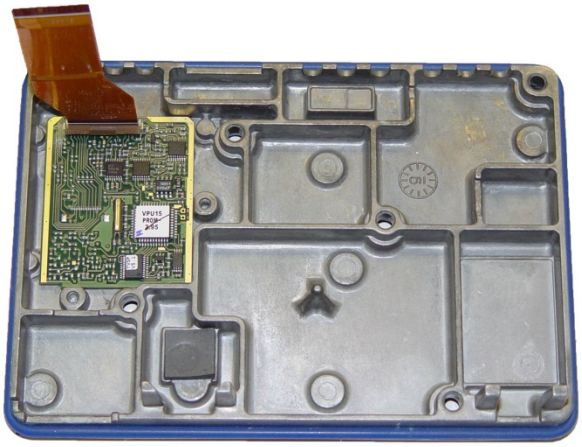
Note: It is not recommended to use the radio for transmitting while disassembled, as some model radios require the lid to be installed for RF power.

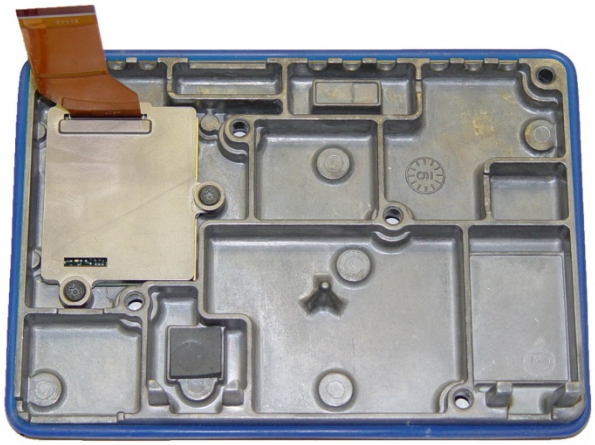
**Installing the Unit:**

1. Insert the 40-pin flex cable into the 40-pin flex connector on the unit, making certain it is seated properly, then close the latch. The silver foil side of the flex should face the edge of the board.



2. The unit is then mounted into the metal lid of the radio using the option board mounting kit. See pictures below. The mounting kit is ordered from Midian as PRO Option B or from Motorola as RLN4823B. The mounting kit includes the 40-pin flex cable, the mounting frame and 3 mounting screws.





**Reassembling the Radio:**

Additional assembly instructions are also available in Motorola's Basic Service Manual.

1. Once unit is installed in the lid, insert the other side of the 40-pin flex cable into the 40-pin flex connector on the radio's main board. The shiny side of the flex should face down.

2. Reinstall the metal lid making sure the flex bends toward the back of the radio, otherwise it will be pinched by the lid. Tighten the screws down in number sequence shown on the lid to 17 in lbs (1.9 NM) torque. Repeat to verify torque is correct after completing the sequence.

3. Snap on plastic cover.

## PRODUCT PROGRAMMING

Install the Midian programming software if you have not done so already. The units are programmed through the radio using the Motorola RIB box and cable or RIBless cable and Midian's programming software.

Start the Midian programming software. From the product selection screen in the software, locate and select the desired unit model and click OK.

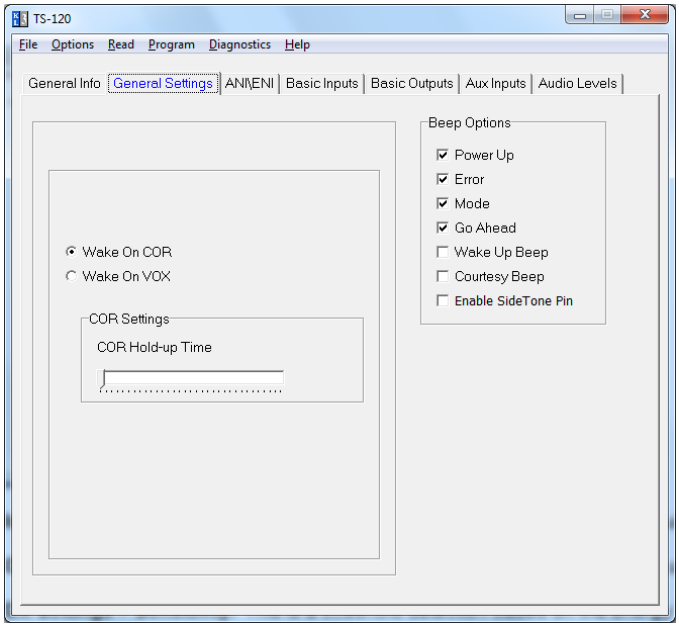
Configure the programming software by selecting File->Preferences and make certain there is a check mark next to 'Rib Box Enable' by clicking on it. Also select the appropriate COM port.

Set the parameters of the software to fit the application. If any clarifications on a feature are required, move the mouse cursor over the feature name until the question mark appears and right click, an on-line help for that feature will be shown. The programming software always defaults to "MDC Portable" as the radio type. On the basic settings tab it is necessary to select the proper radio type.

After entering the parameters, save the file by going to File - Save As. Enter the file name in the File Name block and click Save. Saving the file will allow for quick and easy reprogramming of units. Turn power on to the radio and then the RIB. Click ProgramUnit! in the software. You will hear 1-3 beeps from the radio if programmed successfully.

To read the parameters from the unit, Click on ReadUnit!.

The radio and RIB should be powered down for 3 seconds after reading or programming.




**Wake on COR/Wake on VOX:** Select the appropriate method that the unit should use to come out of power save.

**COR Hold-Up Time** This is the amount of time after loss of COR/VOX that the unit considers COR/VOX dropped.

**VOX Settings > Sensitivity:** This is a threshold detection based on the energy level in the audio.

**VOX Settings > Attack Time:** This sets the minimum time before the unit will detect VOX based on the sensitivity setting.

**VOX Settings > Decay Time**: This sets the time before the unit will drop the VOX detection. Be certain to set this long enough so that you do not have drop outs between words or on brief pauses.

**Beep Options > Power Up:** Enables a short beep sequence that takes place immediately after power-up.

**Beep Options > Error:** This beep may be triggered by any input event if programmed to do so. For example, if a long press on the Mode Input is not assigned to a function, it may be configured to generate the error beep.

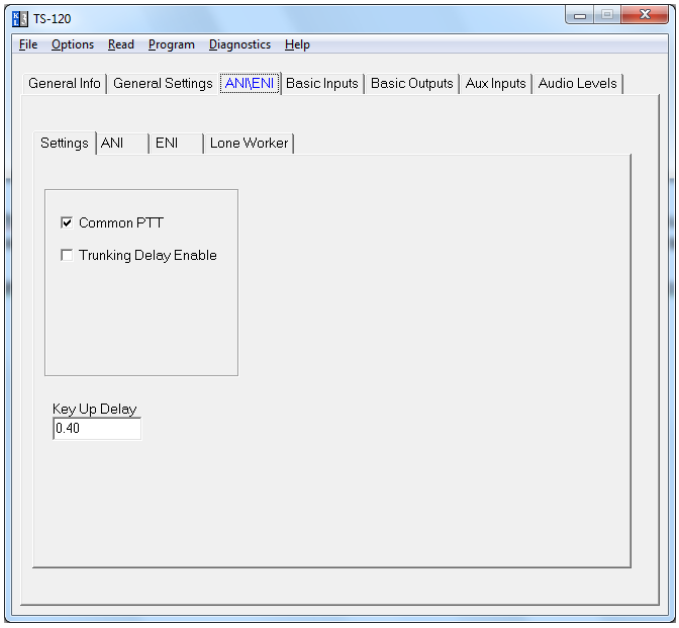
**Beep Options > Mode:** This is used to indicate to the user when the mode has been enabled/disabled (i.e..

**Beep Options > Go Ahead:** This is a local beep out the speaker to indicate to the user that ANI has been sent and it is okay to talk.

**Beep Options > Wake Up Beep:** Enables a short beep to be sent over the air immediately after PTT is pressed. Enabling this beep is recommended when the 'Wake on VOX' feature is used.

**Beep Options > Courtesy Beep:** If selected, once the unit is unkeyed it will generate a courtesy tone to let others know it is done transmitting.

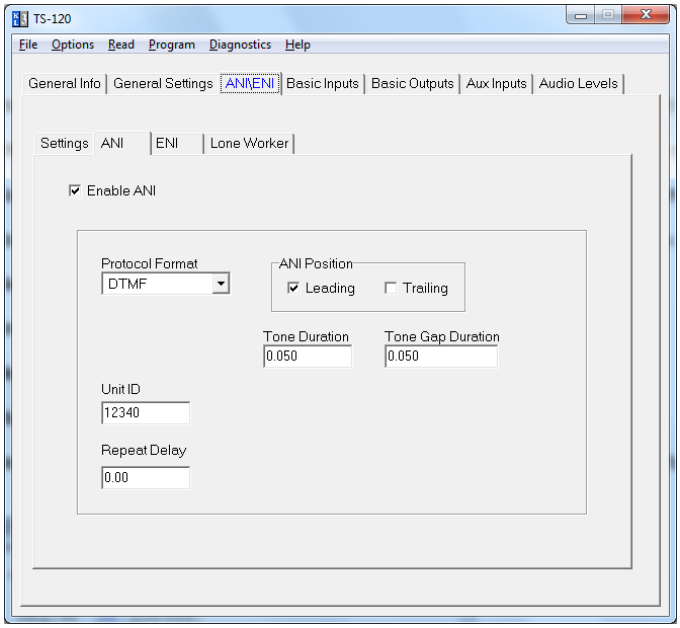
**Beep Options > Enable Side Tone Pin:** Future Use.




**Common PTT:** If PTT in and out are connected to the same point, check this box.

**Trunking Delay Enable:** Check this box if using a trunking system. This will cause the unit to hold off transmitting the ANI until it has received a channel acquisition acknowledgement from the radio.

**Key-Up Delay:** This sets the amount of time the unit waits after keying the radio before it transmitting the ANI.




**Protocol Format:** Select the desired signaling format in which the ANI and ENI will be transmitted.

**ANI Position:** This can be set for the beginning of transmission (leading), end of transmission (trailing) or both.

**Tone Duration:** This field only applies to DTMF and 5-Tone formats and sets the length of each tone.

**Tone Gap Duration:** This field only applies to DTMF and sets the length of the gap between tones.

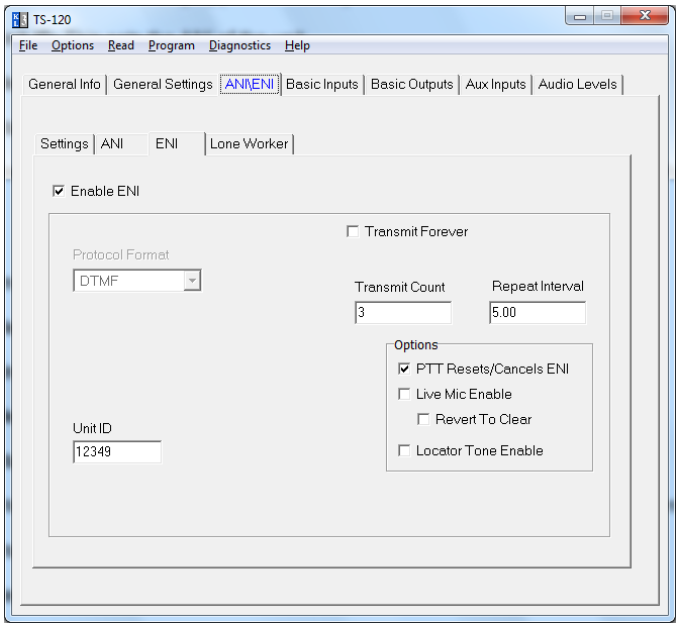
**Fleet ID:** This field only applies to FleetSync and sets the Fleet ID of the unit.

**Unit ID:** This sets the ANI of the unit.

**Message:** This field only applies to G-Star.

**Status:** This field only applies to G-Star.

**Repeat Delay:** This sets the time after sending an ANI that the unit will wait before sending another ANI.




**Protocol Format:** This displays the format selected on the ANI tab.

**Fleet ID:** This field only applies to FleetSync and sets the Fleet ID for the ENI.

**Unit ID:** This sets the Emergency ANI of the unit.

**Message:** This field only applies to G-Star.

**Status:** This field only applies to G-Star.

**Transmit Forever:** If selected the ENI will transmit continuously at the repeat interval until canceled.

**Transmit Count:** This sets the number of times the ENI will be sent.

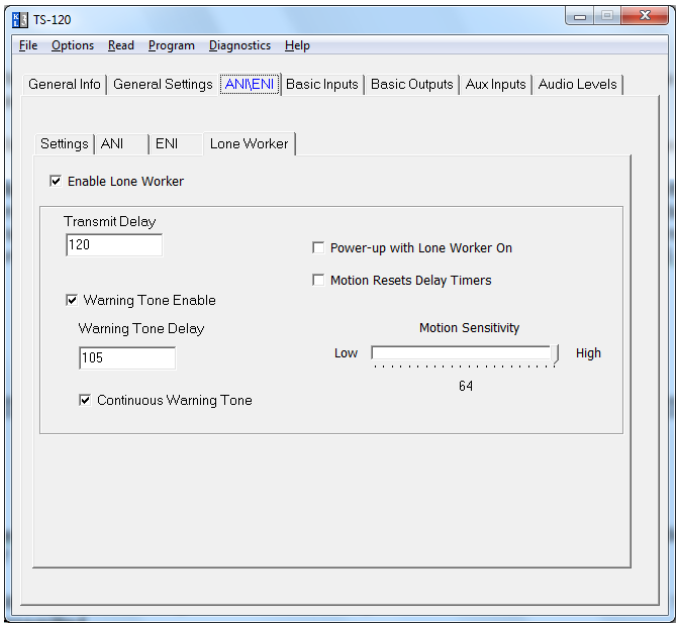
**Repeat Interval:** This sets the time between ENI transmissions.

**PTT Resets/Cancels ENI:** If selected, pressing the PTT button will either reset the Lone Worker's Transmit Delay time or cancel the transmission of the ENI.

**Live Mic Enable:** If selected the unit will enable the mic of the radio to transmit mic audio to the dispatcher.

**Revert to Clear:** Currently not used.

**Locator Tone Enable:** If selected the unit will emit tones out the radio's speaker.




**Transmit Delay:** In Lone Worker mode, if the user does not interact with the radio before this amount of time passes, the ENI sequence will be transmitted. This time is in seconds.

**Warning Tone Enable:** This will generate a tone sequence to alert the user the ENI is about to be transmitted.

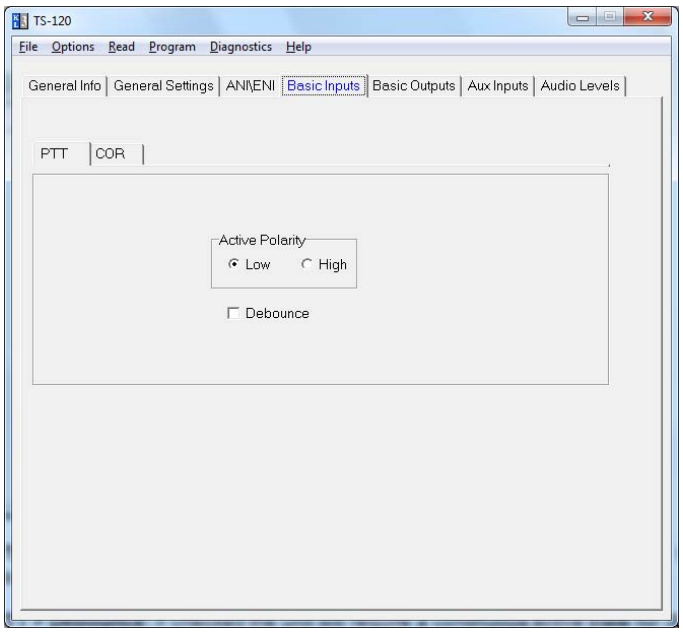
**Warning Tone Delay:** In Lone Worker mode, if the user does not interact with the radio before this amount of time passes, the emergency warning tone will be sounded. This amount of time must be less than that of the Transmit Delay for the warning tone to be sounded. Also, the Warning Tone Enable box must be checked for the tone to be sounded. For example, based on the screen shown above after 105 seconds of no activity the unit will generate warning tones. The user then has 15 seconds to interact with the radio to keep the Transmit Delay time of 120 seconds expiring and the ENI being transmitted.

**Continuous Warning Enable:** This will generate a constant tone to alert the user the ENI is about to be transmitted.

**Power-up with Lone Worker on:** If checked the unit will be in Lone Worker mode when the radio is turned on. This eliminates the need for the user to use the mode input to turn the Lone Worker mode on.

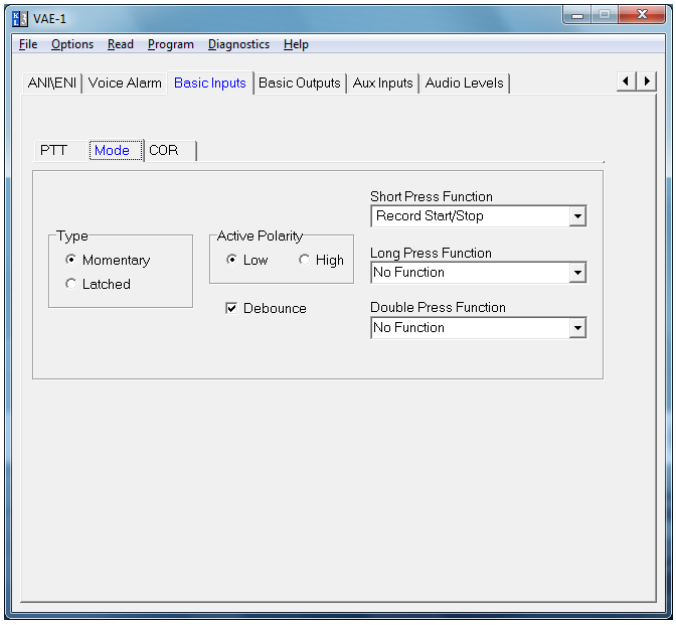
**Motion Resets Delay Timers:** This is a future feature that is currently not available in this module. This field requires the unit be equipped with an accelerometer. The unit can then use the accelerometer to detect motion based on the Motion Sensitivity setting to determine if the user is in distress in addition to requiring interaction with the radio.

**Motion Sensitivity:** This is a future feature that is currently not available in this module. This field requires the unit be equipped with an accelerometer. This sets a level of motion required to reset the Transmit Delay timer. Some work environments may have an inherent level of motion that would be detected by lower settings of the accelerometer, so a higher level of sensitivity might be needed. Midian recommends experimenting to determine the best sensitivity setting for the work environment.




**PTT > Active Polarity:** This sets whether the unit looks for an active low or active high to send the ANI.

**PTT > Debounce:** If checked the unit will require a continuous active state for 30 msec before accepting the PTT.

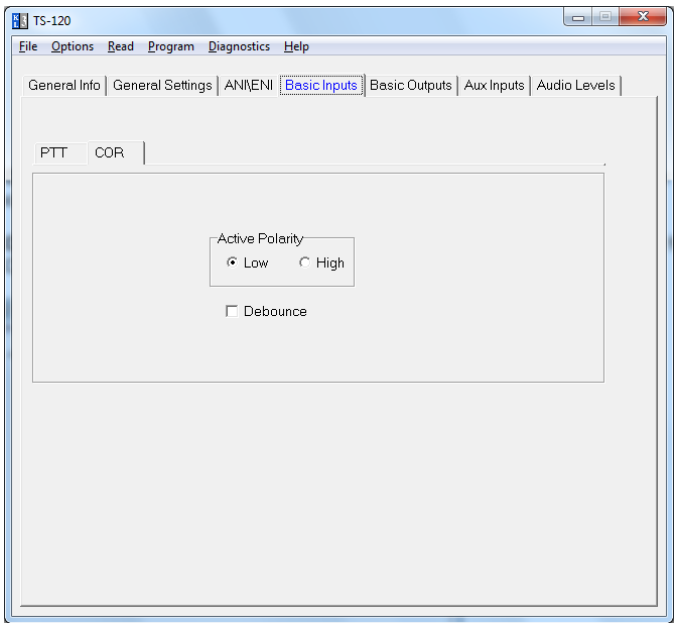



**Mode > Type:** Select whether the switch is Momentary or Latched for Lone Worker on/off and reset.

**Mode > Active Polarity:** Select the active polarity of the mode switch.

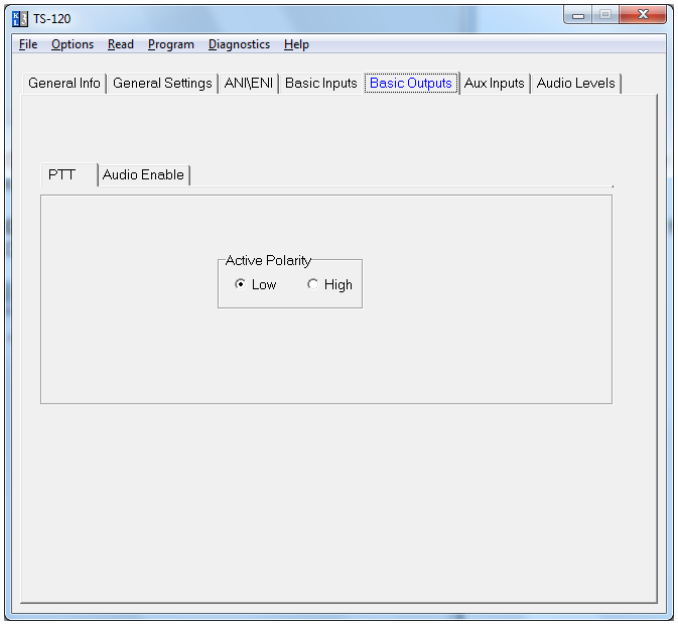
**Mode > Debounce:** If checked the unit will require a continuous active state for 30 msec before accepting the mode change.

The remaining fields set how the switch is used (short press, long press or double press) and for which function (Lone Worker enable or Lone Worker Reset).

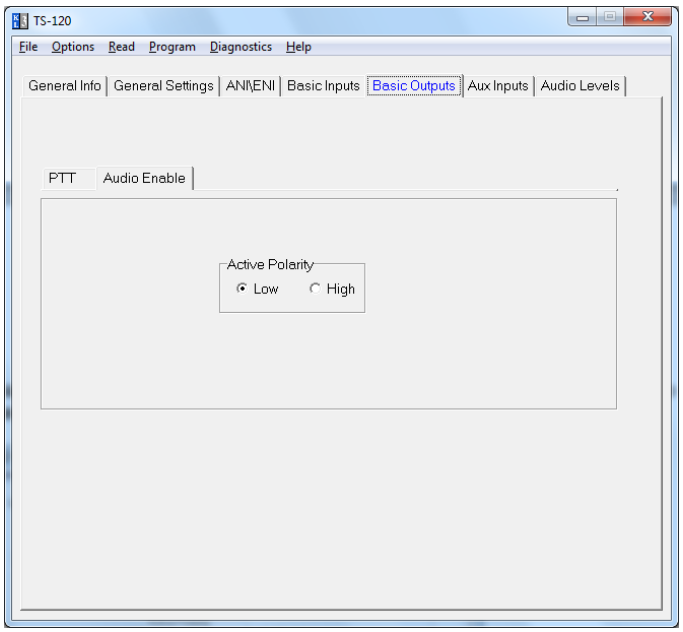



**COR > Active Polarity:** This sets whether the unit looks for an active low or active high for powersave.

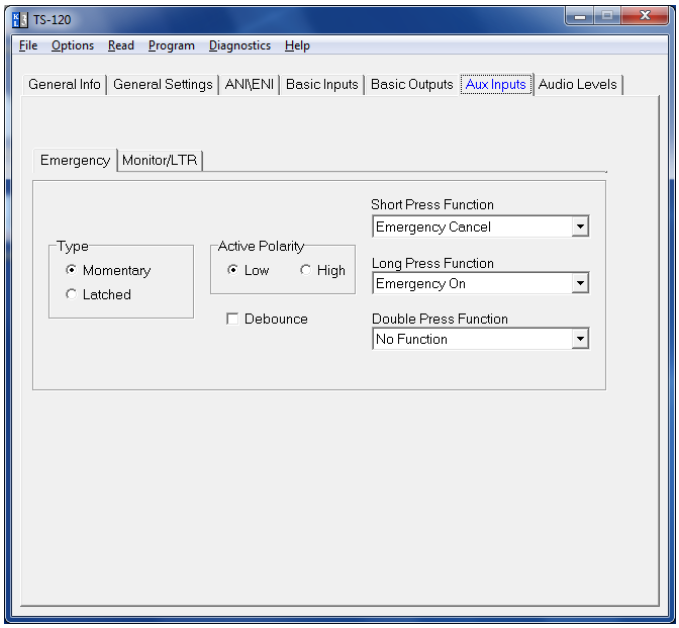
**COR > Debounce:** If checked the unit will require a continuous active state for 30 msec before accepting the COR.




**PTT > Active Polarity:** This sets the polarity necessary for the unit's PTT output to key the radio.




**Audio Enable > Active Polarity:** This sets the polarity necessary for the unit to enable the speaker of the radio to pass beeps.

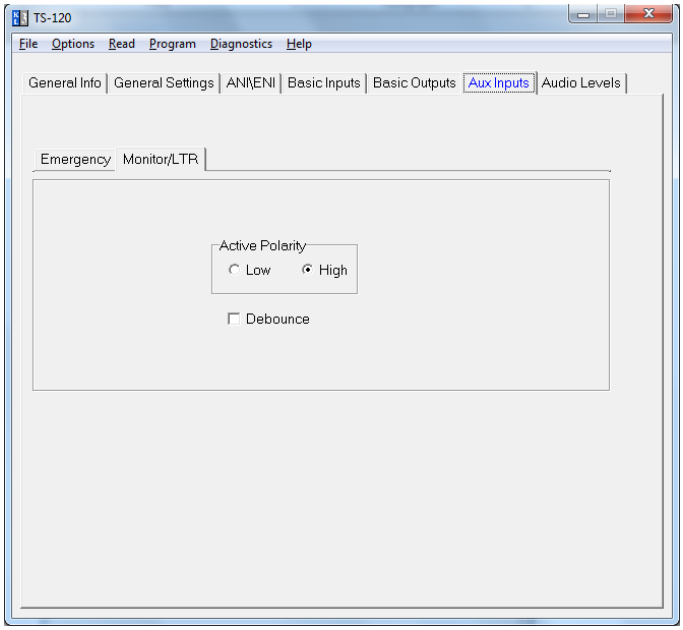



**Emergency > Type:** This sets whether the emergency input is connected to a momentary or latched switch.

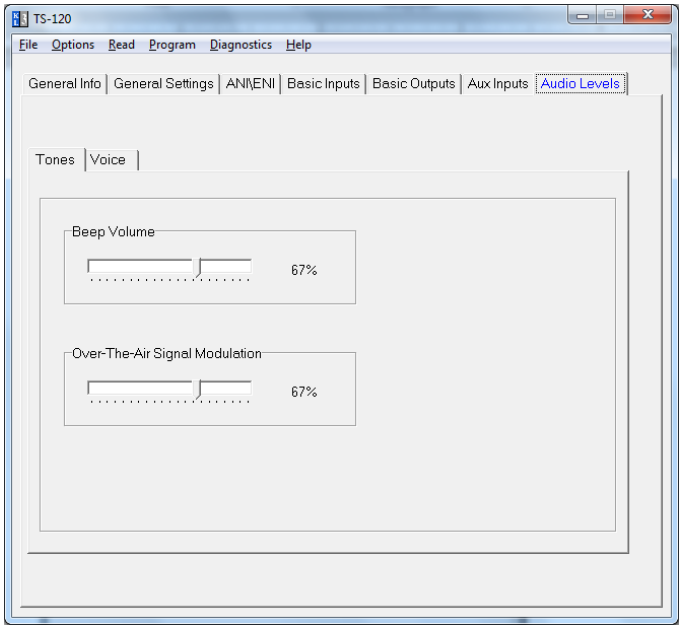
**Emergency > Active Polarity:** This sets whether the unit looks for an active low or active high to trigger an emergency ANI.

**Emergency > Debounce:** If checked the unit will require a continuous active state for 30 msec before accepting the Emergency input activation.

The remaining fields set how the switch is used (Momentary Type: short press, long press or double press) (Latched Type: on function and off function) and for which function (Emergency On, Emergency Cancel, Lone Worker enable or Lone Worker Reset).

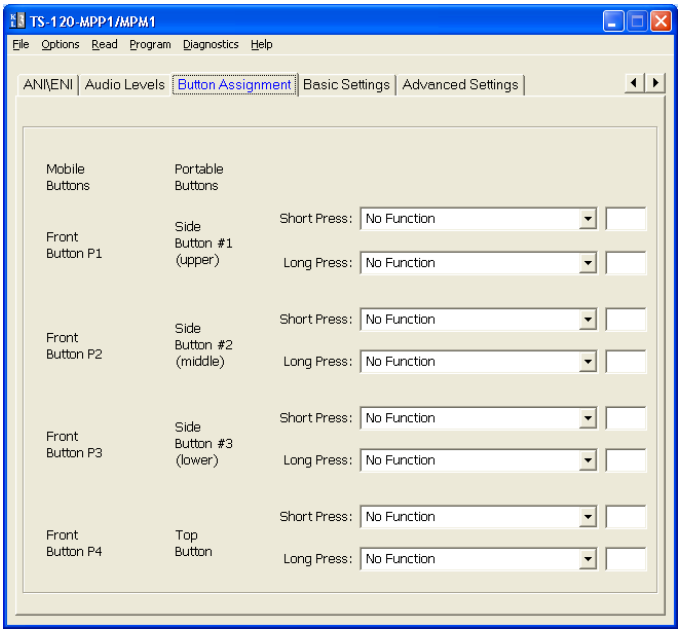



**Trunking Delay Input > Active Polarity:** This sets whether the unit needs an active low or active high indication from the radio to indicate a trunked channel has been established.




**Tones > Beep Volume:** Adjust the slider for the desired beep volume. This level is expressed as a percentage of max voice audio level.

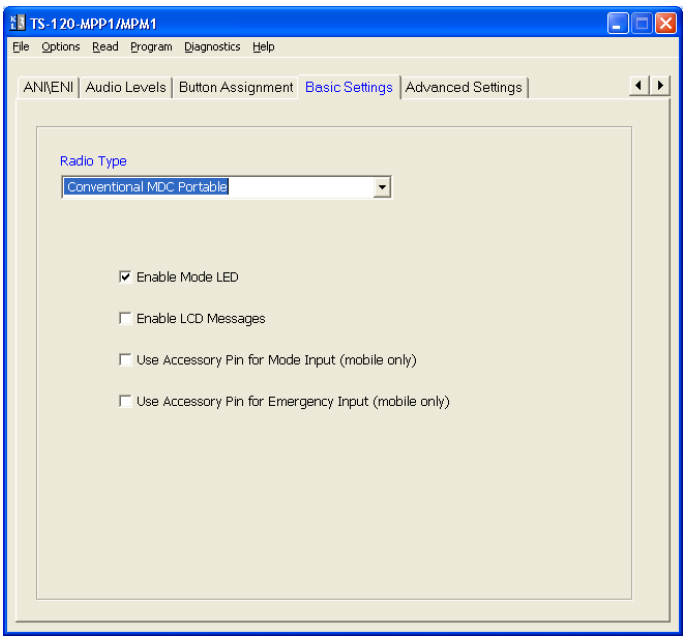
**Tones > Over-The-Air-Signal Modulation:** Adjust the slider for the desired beep volume. This level is expressed as a percentage of max voice audio level.




**Button > Short Press:** This is a press and immediate release press.

**Button > Long Press:** This is a press, hold until beeps are heard and release press.

The buttons can be programmed for Emergency ANI, Lone Worker On/Off, etc.



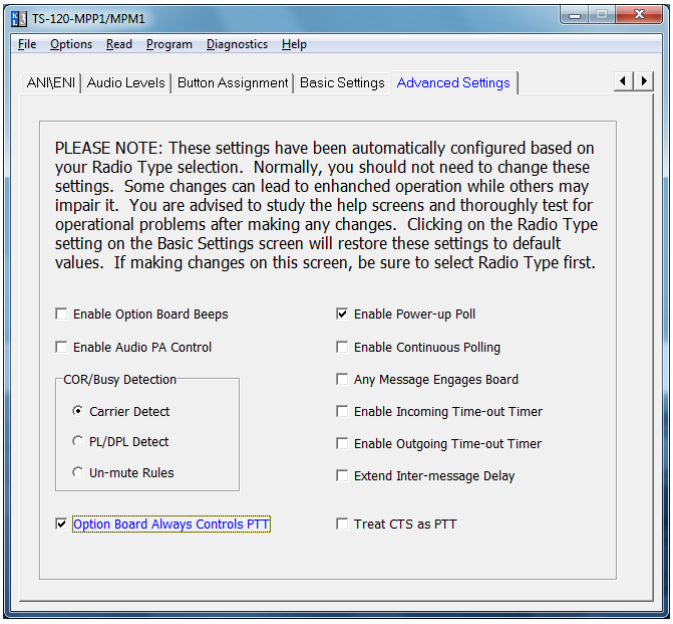

**Radio Type:** Select from the list the Radio Type that matches your radio. For example if the radio is an HT-750 or GP-140 you would select Conventional MDC Portable or if the radio is a PTX-760, GP-680 or PRO-7450 you would select MPT Portable.

**Enable Mode LED:** Future Use.

**Enable LCD Messages:** Future Use.

**Use Accessory Pin for Mode Input (mobile only):** If desired the unit can be enabled/disabled using an input from the rear accessory connector of the mobile radio.

**Use Accessory Pin for Emergency Input (mobile only):** Future Use.




The “Option Board Always Controls PTT” box must be checked. Otherwise please only adjust the parameters of this screen when advised to by Midian.

## AUDIO LEVELS ALIGNMENT

This section describes how to determine and set the audio levels.

**Audio Levels Overview:**

To ensure the best audio quality, the unit must be configured to match the audio levels used by the radio. The unit uses programmable gain amplifiers to accomplish this. Determining the gain settings for these amplifiers is an involved process, so Midian simplified this process by developing an algorithm that requires the technician to make only four voltage measurements. From these four measurements, all of the many internal settings are determined.

Still, getting the best audio quality will likely require a bit of trial and error. The unit only has control of audio voltage levels, not input and output impedances. These impedances can dramatically influence the levels.

**The Four Voltage Measurements:**

An oscilloscope and a communications test set/service monitor are required for the measurements. It is recommended that the measurements be recorded in units of mV peak-to-peak. Each measurement must be taken with system modulation at either 60% or 100%, but Midian recommends using 60%

These measurements must be taken within 15 seconds of powering the unit on. This is because the unit will enter power saving mode after that time. Measurements made while the unit is in power saving mode will not be valid.

**TX Alignment Set-Up:** A method for controlling transmit modulation is required for accurate measurements in the TX mode. A small speaker held in place near the microphone by a rubber band can serve this purpose in most cases. Use a sine-wave generator to inject a 1000 Hz tone into the speaker. Adjust the output of the sine wave generator so that the transmitter produces 60% of rated modulation while PTT is pressed. Note that if the audio source (such as a speaker) is moved even slightly, the TX modulation may change significantly. Care must be taken to avoid changing the TX modulation while taking the measurements.

**RX Alignment Set-Up:** Using a service monitor send a fully quieting signal (-50 dBm) to the receiver with a 1000 Hz tone at 60% modulation, adjust the volume of the receiver to a comfortable listening level and measure the audio level at the speaker using an AC coupled oscilloscope. Once the volume is adjusted and the measurement taken do not adjust the volume control during the remainder of the alignment.

1. **TX Input:** The goal of this procedure is to determine the audio level that the unit board will see at the TX audio pickup point after it is installed. The unit must be installed and powered-on while making this measurement. Use the TX Alignment Set-Up procedure and measure the audio level at TP1 on the unit.

2. **RX Input:** The goal of this procedure is to determine the audio level that the unit board will see at the RX audio pickup point after it is installed. The unit must be installed and powered-on while making this measurement. Use the TX Alignment Set-Up procedure and measure the audio level at TP2 on the unit.

3. In the programming software under audio levels set the TX In to the same level as measured in step 1 and for a preliminary adjustment set the TX Out for the same level. Set the RX In to the same level as measured in step 2 and for a preliminary adjustment set the RX Out for the same level. Program the unit.

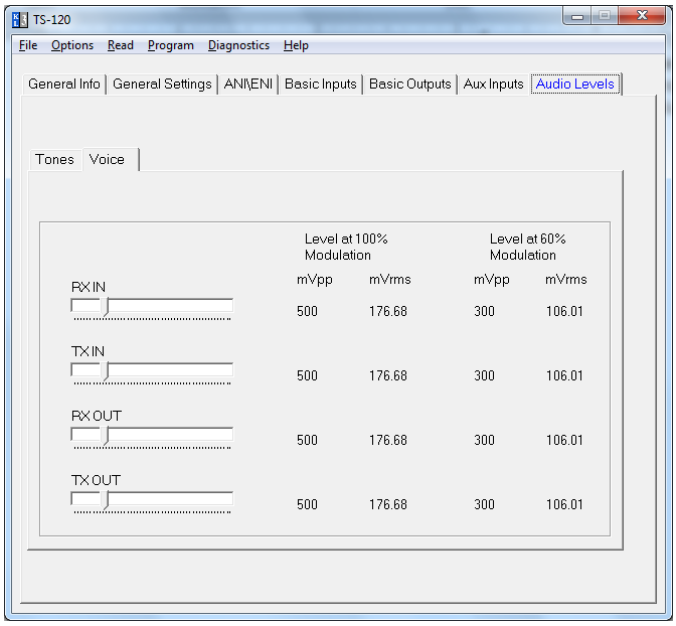
4. **RX Output:** The goal of this procedure is to determine the audio level that would normally appear at the RX audio insertion point in an unmodified radio. Using the same RX Alignment Set-Up procedure verify the audio level at the speaker is still at the same level measured initially in the RX Alignment Set-Up procedure. If not adjust the RX Out level accordingly.

5. **TX Output:** The goal of this procedure is to determine the audio level that would normally appear at the TX audio insertion point in an unmodified radio. Using the same TX Alignment Set-Up procedure verify the modulation is still at 60%, if not adjust the TX Out level accordingly.

**Programming the Audio Levels:**

After determining the audio levels at the audio hookup points, it will be necessary to program the unit to match these levels. In the programming software, there is a slider control on the Audio Levels Screen for each of the of four audio hookup points. Locate the column that corresponds to the modulation and units of measurement for each of the audio hookup points. Adjust the slider bar such that the value appearing in the appropriate column matches what was measured as closely as possible.

| Radio Model | RX In | TX In | RX Out | TX Out |
|---|---|---|---|---|
| CDM-750, CDM-1250, GM-140, GM-160, GM-328, GM-338, GM-398, PRO-3100, PRO-5100, PRO-7100 | 888 | 210 | 186 | 210 |
| GM-340, GM-360, GM-380, GM-339, GM-399, PRO-7200 | 1044 | 228 | 240 | 216 |
| GM-338-LS, CDM-1550-LS+ | 888 | 270 | 186 | 252 |
| GM-640, GM-660, GM-1280, MCX-720, MCX-760, MCX-780 | | | | |



## OPERATION

**ANI Encode:** When the PTT button is pressed, the unit will assert the PTT Output and send the programmed ANI tones out the TX Tone Output.

**ENI Encode:** When the Emergency input is activated, the unit will assert the PTT Output and send the programmed Emergency ANI tones out the TX Tone Output.

**Lone Worker Enable:** The Lone Worker feature can be enabled upon power up or using the Mode Input or Emergency Input.

**Lone Worker Reset:** If the Lone Worker feature is being used, pressing the PTT or pressing the button assigned to Lone Worker Reset will reset the Transmit Delay timer. If the Warning Tone Delay time expires the unit will generate warning tones to indicate to the user that the Lone Worker feature is about to send an ENI if the unit does not see PTT or Lone Worker Reset activity. If the Transmit Delay time then expires the unit will send the ENI.

## TECHNICAL NOTES

**Radio Compatibility:** Midian has taken the utmost care to ensure the option board integrates into the radio with minimal impact to the features of the radio. However, some features may not be available in the radio when an option board is used. If a feature is not available, please contact Midian to see if the feature can be added.

**Radio Firmware:** Midian recommends installing the module into the radio with the existing firmware of the radio provided the firmware is at least R05.00.00. If the radio has a firmware version older than R05.00.00, it *must* be upgraded. If there are any issues with the firmware then the firmware should be upgraded to the latest. However, it should be noted that occasionally firmware updates may cause a conflict with proper option board/radio communications. This may appear that the unit is not working properly, but it is a conflict in the serial communication between the option board and radio. Please note that firmware versions between the EMEA region and the Asia and America regions might be different.

**Accessory Pin Features:** Upon power-up, the radio does not always report the state of the accessory pins to the option board. It may be necessary to toggle the state of these inputs once after power-up to ensure correct operation.

**Option Board Feature:** Enabling the option board feature tells the radio to report events such as button press, PTT press, carrier detect, etc. to the option board. This feature enables communication between the option board and the radio. On display models, the following icon appears on the LCD when option board mode is on:

**Known Issues:** The radio must be off for a full 3 seconds prior to being turned on or the unit cannot reset properly resulting in malfunction. The "Enable LCD Message" option in the KL-3 software should not be enabled due to problems in the radio. If problems are experienced when reading the unit from the RIB box, use the KL-3 cable.

## MIDIAN CONTACT INFORMATION

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