TMS-110

VHF AM TRANSCEIVER

Installation and Operating Instructions

TiL Document No. 15RE532
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Firmware Front Panel Version 1.4.0
Firmware RF Module Version 1.5.0

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REVISION HISTORY
[15RE532]

For the most current revision of this document, please check the Technisonic website: www.til.ca

REV	PAGE	DESCRIPTION	DATE	EDITED BY
N/C	All	Original Document Release.	Jan. 8, 2016	SM
A	All	Updated to final installation and operation for production release.	May 24, 2018	SM
B	All	Updated for IC and FCC conformance.	Jun. 22, 2018	SM
C	All	Changed maximum power to 10 watts.	Sep. 24, 2018	SM
D	1	Added -1 and -2 part number information.	Apr. 09, 2019	SM
	18-20	Added USB stick programming instructions (Sections 3.5.1 to 3.5.4).		
	23-24	Renamed Sections 4.0 - 4.3 as 4.1 - 4.4.		AL
	All	Corrected spelling, grammar, and formatting throughout the document.		
E	25	Corrected TX Power max consumption to <80W	Jun. 8, 2020	AS
	23	Added new Software features: 1.) Manual TX Power Level Adjust 2.) Automatic TX Power Level Adjust		
	15	Added Mic Connector Pinout Table		
	24	Added Error Code Table		
	ALL	Corrected Typos		
F	6	Added Note	Jan 5, 2021	NK
G	ALL	Updating for new software release.	Jun 21, 2021	AS
H	ALL	Updating for new software release.	Nov 8, 2021	AS

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NOTES

ESD CAUTION

This unit contains static sensitive devices. Wear a grounded wrist strap and/or conductive gloves when handling printed circuit boards.

FCC COMPLIANCE INFORMATION

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: For compliance with FCC RF Exposure Requirements, the mobile transmitter antenna installation shall comply with the following two conditions:

1. The transmitter antenna gain shall not exceed 3 dBi.
2. The transmitter antenna is required to be located outside of a vehicle and kept at a separation distance of 115 cm or more between the transmitter antenna of this device and persons during operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

WARNING AND DISCLAIMER

Changes or modifications not expressly approved by Technisonic Industries could void the user's authority to operate the equipment.

This manual is designed to provide information about the TDAM-1000. Every effort has been made to make this manual as complete and accurate as possible.

WARRANTY INFORMATION

The Model TMS-110 is under warranty for one year from the date of purchase. Failed units caused by defective parts or workmanship should be returned to:

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SECTION 1: GENERAL DESCRIPTION

1.1. INTRODUCTION

This publication provides information on the installation and operation of the TMS-110 Transceiver System.

1.2 DESCRIPTION

The TMS-110 (TiL system number 180001) includes the TDAM-1000 VHF AM mobile transceiver [Product Marketing Name (PMN) TDAM-1000], operates in the aeronautical VHF AM band, and is designed for ground vehicle installation.

1.3 SYSTEM COMPONENTS

The following components make up the system:

COMPONENT	PART NUMBER
TDAM-1000 VHF AM Transceiver	151286-1 (standard 10 watts) 151286-2 (7 watt version)
Microphone Assembly	181298-1
Mounting Bracket	169676
Mobile Antenna Assembly	181299-1
Power Cord	183043-1
Installation Kit	189729

1.4 OPTIONAL COMPONENTS

COMPONENT	PART NUMBER
Environmental Hardened Accessory Connector	219857-1
Cross Mute Cable Assembly	213093-1

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SECTION 2: INSTALLATION INSTRUCTIONS

2.1 GENERAL

This section contains information and instructions for the correct installation of the TMS-110 VHF AM mobile transceiver system.

2.2 EQUIPMENT PACKING LOG

Unpack the equipment and check for any damage that may have occurred during transit. Save the original shipping container for returns due to damage or warranty claims. Check that each item on the packing slip has been shipped in the container.

2.3 TDAM-1000 INSTALLATION

The TDAM-1000 is designed to be used in land mobile applications. A mounting bracket, hand microphone, power cable, and antenna are supplied. The TDAM-1000 will operate on both standard 13.8 V_{DC} or 28 V_{DC} special purpose or military vehicle power without modification. The built-in speaker is sufficient for most installations; however, an external speaker output is supplied for high-noise environments.

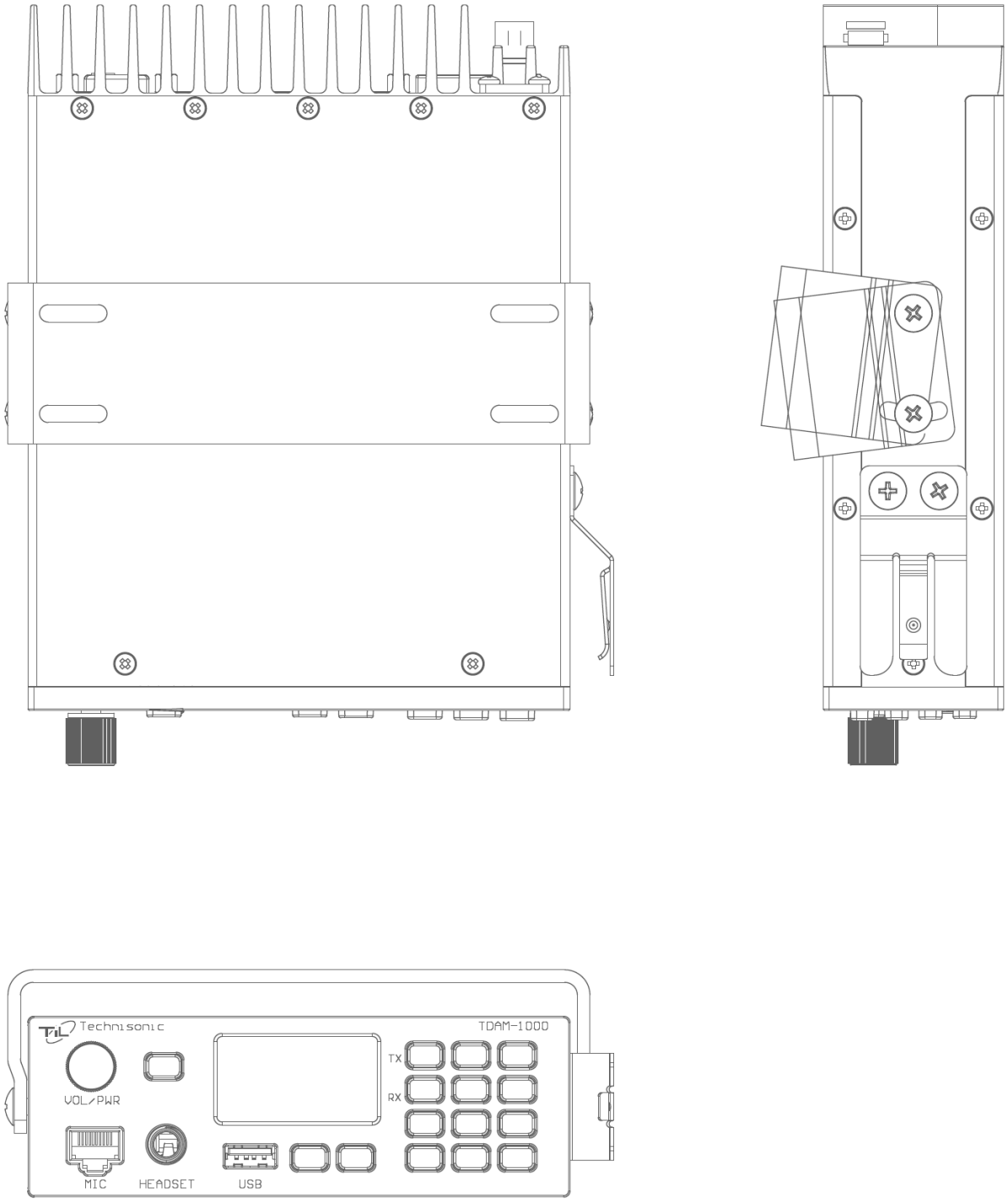


FIGURE 1: Outline Drawing for Model TDAM-1000 (Top / Front / Side)

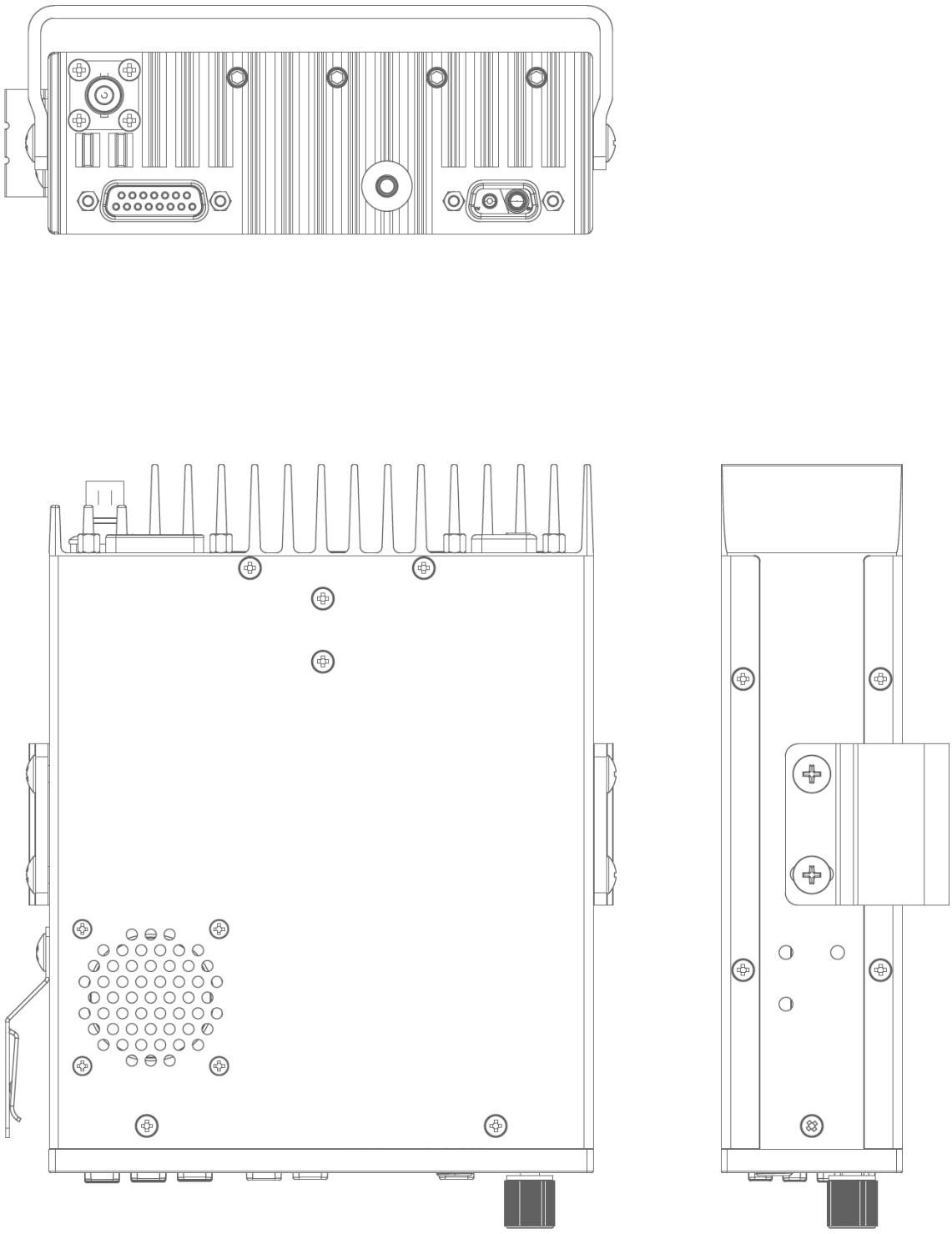


FIGURE 2: Outline Drawing for Model TDAM-1000 (Bottom / Rear / Side)

2.4 INSTALLATION – CONNECTIONS

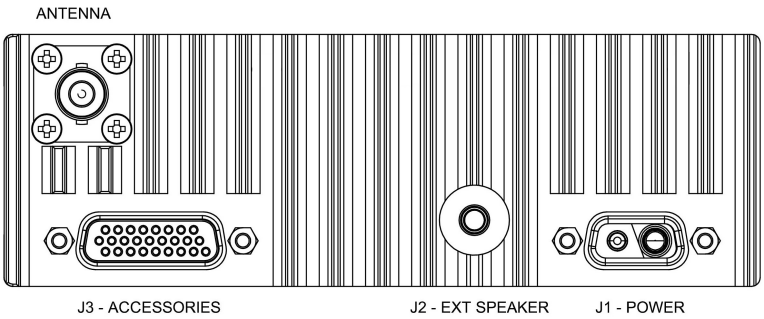


FIGURE 3: Rear Connector View – TDAM-1000

PIN #	DESCRIPTION
1	Power
2	Ground

TABLE 1: Power Connections – J1 (2-Pin D) Connections

PIN #	DESCRIPTION
1	RS232 Data Out
2	CAN H
3	SPI Clock
4	I2C SCLK
5	I/O 2
6	Remote Mic Audio
7	Cross Mute In
8	External Speaker Out +
9	External Speaker Out -
10	RS232 Data In
11	Ground
12	SPI CS1
13	SPI MISO
14	Ground
15	ADC In
16	Cross Mute Out
17	Ground
18	Remote PTT
19	CAN L
20	SPI CS0
21	SPI MOSI
22	I2C SDA
23	I/O 1
24	Squelch Out
25	Headset Audio
26	Monitor Audio

TABLE 2: Accessory Connections – J3 (26-Pin HDD) – Use MALE Connector

2.5 INSTALLATION – WIRING INSTRUCTIONS

For most installations, only the power cable connection and the antenna connection are required. However, an installation of two TDAM-1000 transceivers can take advantage of the 'Cross Mute' feature available on the 26-pin HD D-connector. The cross mute function will mute the other receiver whenever one of the radios is transmitting. A mating 26-pin HD D-connector is supplied in the installation kit. An optional cross mute cable can be ordered also (213093-1).

2.5.1 J1 PINS 1 AND 2 – MAIN POWER INPUT

Use the supplied power cable to connect to the vehicle accessory power source.

Note: On 12V installs the accessory source needs to be a 15A dedicated supply to the radio through a 15A breaker or fuse. If the accessory is not a 15A supply then a relay or solenoid is required for switching the supply from the battery also through a 15A breaker or fuse. The 15A Breaker or fuse should not be more than 18 inches from the battery, also try to keep ground lines less than 18 inches from the radio to a good chassis non painted clean metal ground.

Installs where power is limited the radio's TX output power can be turned down to reduce power consumption. At 10W setting the radio will draw around 4 to 5A average normally but worst case could draw up to 6A average (peak current with modulation could be 8 to 10A) at 13.8V.

2.5.2. J3 PINS 8 AND 9 – EXTERNAL SPEAKER OUTPUT + AND –

The speaker is output is capable of providing 10 watts of power into a nominal 8-ohm impedance, at 4-ohm max power will be 16W. The speaker output includes receive audio only or TX/RX audio. The Level is set by the volume control. The speaker output is also available on a 3.5mm phone jack (J2) on the back of the radio. The output amplifier is of a 'bridged' type, so both + and – must not be connected to ground.

2.5.3. J3 PIN 26 – MONITOR AUDIO

Line level audio output receive and sidetone (mic) audio are combined and are not affected by the volume control. Level can be set in Config menu.

2.5.4 J3 PIN 25 – HEADSET AUDIO

The headset audio is 0.5 watt at 600-ohm audio output and includes receive and sidetone (mic) audio. The level is set by the volume control. This can be used when a remote user position is required, leave unconnected otherwise.

2.5.5. J3 PIN 7 – CROSS MUTE INPUT

Receive audio will be muted on the speaker, headset, and monitor outputs when this input is at 10 volts. Connect to the cross mute output on the second radio.

2.5.6. J3 PIN 16 – CROSS MUTE OUTPUT

This is a 10-volt output during transmit and 0 volts during receive. Connect to the cross mute input of the second radio.

2.5.7. J3 PIN 6 – REMOTE MIC AUDIO

This is a microphone audio input. Mic DC bias voltage is supplied. This can be used when a remote user position is required, leave unconnected otherwise.

2.5.8. J3 PIN 18 – REMOTE PTT INPUT

This is a push-to-talk input. The radio will transmit when this line is brought to ground. This can be used when a remote user position is required, leave unconnected otherwise.

2.5.9. J3 PINS 11, 14 AND 17 – GROUND

This is connected to signal and chassis ground.

2.5.10 J3 PIN 24 – SQUELCH OUTPUT

This is an open collector output which goes to ground when squelch is open.

2.5.11 J3 PINS 1 TO 5, 10, 12, 13, 15, AND 19 TO 23 – BASE STATION INTERFACE

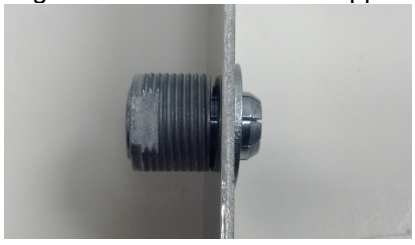
For base station applications only. Do not connect.

2.6. INSTALLATION – ANTENNA

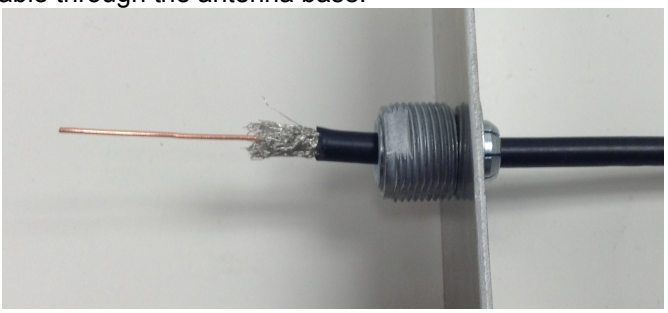
For best results, the antenna should be mounted as high as possible in the center of a flat metallic surface at least 52” in diameter. Where this may not always be possible, mounting the antenna in the center of the roof of most cars or trucks should give reasonable performance. The antenna should be at least 52” from any other antenna. The 181299-1 antenna supplied with the TMS-110 system can be assembled by the following procedure:

- Drill a 3/8” hole where the antenna is to be installed.
- Unpackage the antenna and disassemble the antenna base.

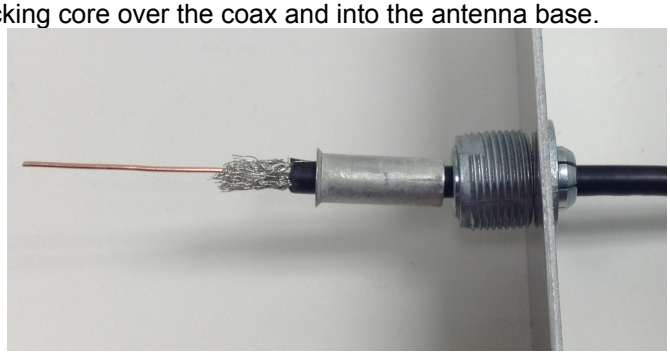
- Press antenna base through the 3/8” hole and the supplied washer.



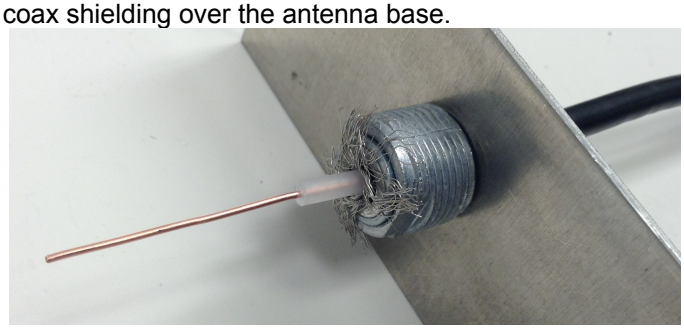
- Feed coax cable through the antenna base.



- Slide the locking core over the coax and into the antenna base.

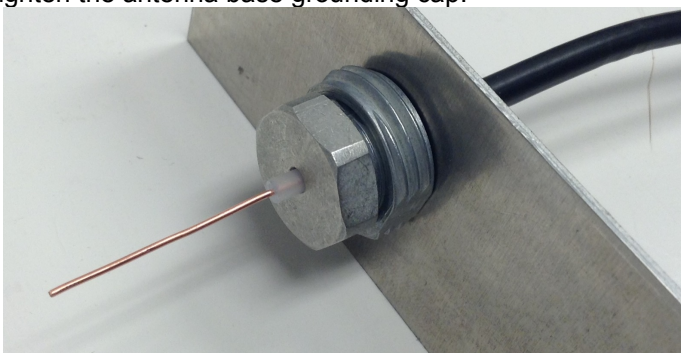


- Spread the coax shielding over the antenna base.

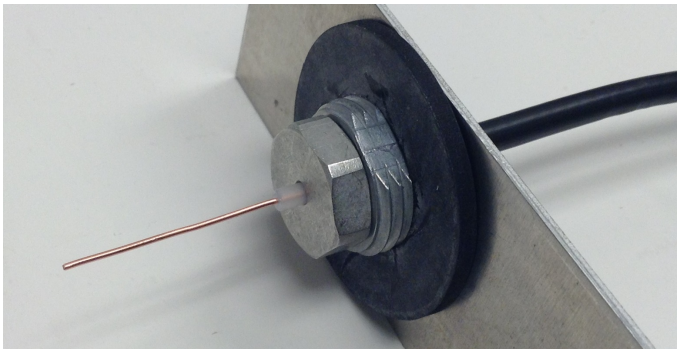


- Trim the shielding to allow the lock nut to be installed.
- Install and tighten the antenna base lock nut.

- Install and tighten the antenna base grounding cap.



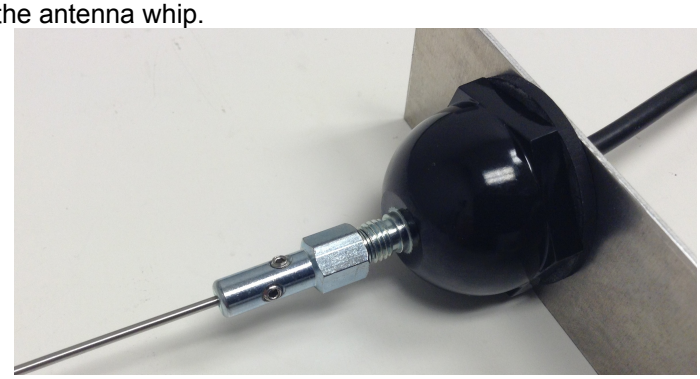
- Place the rubber seal around the antenna base.



- Screw on the antenna base insulator and tighten.

- Bend the center conductor over into one of the grooves.
- Cut off excess length.

- Screw on the antenna whip.



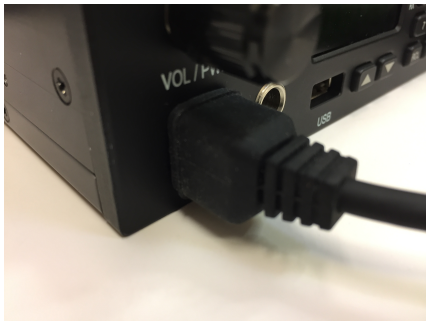
- Route the coax cable to the back of the radio.

2.7 INSTALLATION – MOUNTING BRACKET

Mount the bracket to the vehicle as required with the two #6 x ¾" self-tapping screws.
The radio may be mounted above or the below the bracket depending on the installation. Use the four 8-32 x 5/16" black screws to attach the radio to the bracket. The bracket has slots to allow the angle to be adjusted.

2.8 INSTALLATION – MICROPHONE

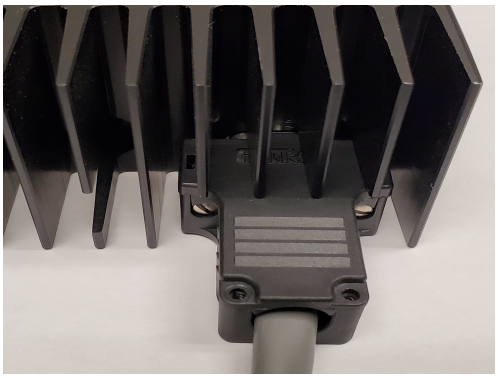
Connect the supplied microphone to the radio by plugging in the RJ-45 connector into the front panel underneath the knob until it clicks.



The mic clip can be installed on the radio or elsewhere in the vehicle. There are holes for vertical or horizontal mounting on either side of the radio using the two 6-32 x ¼" screws supplied.

2.9 INSTALLATION – POWER CORD

Plug the supplied power cord into power jack (J1) on the back of the radio and tighten both of the mating screws. Route the red wire to the accessories supply of the vehicle, cutting off any excess. Connect the black wire to the vehicle chassis ground.



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SECTION 3: OPERATING INSTRUCTIONS

3.1 GENERAL

This section contains information and instructions for the correct operation of the TDAM-1000 transceiver.

3.2 FEATURES

The TDAM-1000 supports the following features:

- 16-character LED alphanumeric display
- Backlit panel and keys
- USB port for loading and saving channel or configuration data.
- Continuous coverage from 117.975 to 138.000 MHz in 25 or 8.33 kHz steps. Extended range up to 156MHz available.
- 100 programmable channels
- Split frequency pairs
- Transmit DTMF keypad
- Scanning of selected channels
- High and Low power

3.3. FRONT PANEL

Refer to figure 3 below:

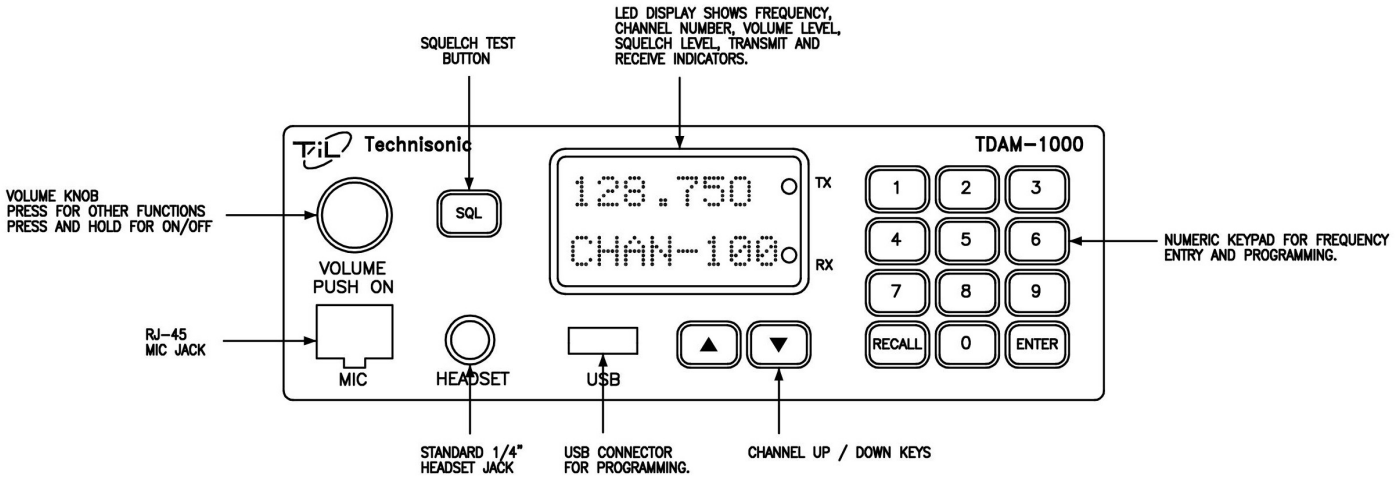


FIGURE 4: TDAM-1000 Front Panel Controls

3.3.1 VOLUME KNOB

The volume knob has a push-button built in which is used to turn the radio on and off as well as select other functions for the knob. To turn on the radio, press and hold the knob until the display lights up. To turn off the radio, press and hold the knob for approximately 3 seconds until the display shows 'OFF.' Quick presses of the knob during normal operation will toggle the knob function between volume, channel and squelch. The default mode for the knob is volume when the radio is turned on. The volume knob is speed sensitive turning the knob slow will fine adjust, Turning the knob fast will course adjust.

3.3.2 SQUELCH BUTTON

The squelch function mutes the receiver when no signal is present so the operator does not listen to continuous receiver noise. When the knob is in squelch mode, it adjusts the muting threshold from fully open to a level where only a strong signal can be heard. Pressing the squelch button will temporarily open the squelch for as long as the button is pressed. When released, the knob is put into squelch mode for 3 seconds with the squelch level shown on the bottom line of the display. The squelch level is saved when the radio is turned off by pressing and holding the VOL/PWR knob.

3.3.3 LED DISPLAY

The display is a 2 line 16 character green LED type. During normal operation the frequency, channel name and/or channel number may be displayed depending on settings in the configuration menu. The display is also used during programming and menu functions. There are two LED indicators on the right of the display for transmit and receive (squelch open).

3.3.4 KEYPAD

A numeric keypad is provided to allow quick entry of frequencies or program channels.

3.3.5 CHANNEL UP/DOWN KEYS

These keys are used to select the desired channel.

3.3.6 USB CONNECTOR

The USB connector can be used to upload or download a channel list, program the radio configuration or firmware updates. See 3.5 FUNCTION MENU for instructions.

3.3.7 MIC AND HEADSET JACKS

The supplied hand mic is plugged into the RJ-45 type jack. Headphones if desired can be plugged into the headset jack. The internal speaker and external speaker output can be disabled (default) when the headset jack is used depending on the settings in the configuration menu.

PIN #	DESCRIPTION
1	Channel Up (Not Used)
2	+8V
3	Chassis Ground
4	Push to Talk
5	MIC Ground
6	MIC Audio
7	Not Connected
8	Channel Down (Not Used)

TABLE 3: Microphone (RJ45) Connections

3.4 NORMAL OPERATION

Note: The TDAM-1000 transceiver can be configured to operate in one of two modes:

1. Frequency agile mode – Any frequency from 117.975 to 138.000 MHz (156MHz in WideBand Mode) can be selected or programmed into any of the 100 available channels.
2. Fixed mode – Only frequencies programmed into channels can be used.

NOTE: The operating mode can be set in the configuration menu. The following instructions assume frequency agile mode. Those marked with an asterisk (*) will not be available in fixed mode.

3.4.1 ENTERING A FREQUENCY

When in 25 kHz mode:
To enter a new frequency, type in the frequency (up to 5 digits) via the keypad and press enter. If enter is not pressed within 3 seconds or the mic is keyed, the radio will revert back to the previous frequency. For example, to enter 128.75 press:

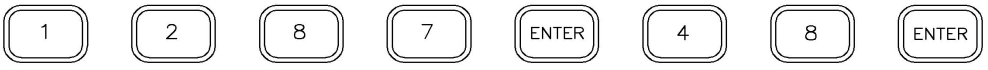
The new frequency is ready to use. The new frequency is not saved in a channel but will remain active until another frequency or channel is selected. When in Fixed mode only channels in the memory list can be typed in.

When in 25/8.33 kHz mode:
The TDAM-1000 supports both 25 kHz and 8.33 kHz channel spacing when enabled. The channel spacing used is determined by the frequency entered. See the ICAO frequency chart in section 3.7. To enter a new frequency, type in the frequency (up to 6 digits) via the keypad and press enter. If enter is not pressed within 3 seconds or the mic is keyed, the radio will revert back to the previous frequency. For example, to enter 128.75 press:

The new frequency is ready to use. The new frequency is not saved in a channel but will remain active until another frequency or channel is selected. When in Fixed mode only channels in the memory list can be typed in.

3.4.2 PROGRAMMING A CHANNEL*

When in 25 kHz mode:
To program a channel, type in the frequency (up to 5 digits) via the keypad and press enter; then, enter the channel number (1-100) and press enter again. For example, to program 128.75 into channel 48, press:



The channel is programmed and the radio is ready to use on the above frequency. If the second enter is not pressed or the mic is keyed within 3 seconds, the new frequency will not be saved in a channel.

When in 25/8.33 kHz mode:
To program a channel, type in the frequency (up to 6 digits) via the keypad and press enter; then, enter the channel number (1-100) and press enter again. For example, to program 128.75 into channel 48, press:

The channel is programmed and the radio is ready to use on the above frequency. If the second enter is not pressed or the mic is keyed within 3 seconds, the new frequency will not be saved in a channel.

3.4.3 RECALLING A CHANNEL

A channel can be recalled in one of 3 ways:

a) Rotating the volume knob while in channel mode.
b) Using the channel up/down keys.
c) Using the recall key and number keys.

3.4.4 RECALLING A CHANNEL WITH THE VOLUME KNOB

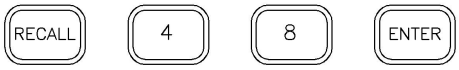
Press the volume knob until the lower line of the display shows CHAN. Rotate the volume knob until the desired channel is displayed. Only channels which have been programmed will be displayed.

3.4.5 RECALLING A CHANNEL WITH THE CHANNEL UP/DOWN KEYS

Press the up or down channel key until the desired channel is displayed. If the previous frequency was not in a channel, the channel number will start with the last channel used.

3.4.6 RECALLING A CHANNEL WITH THE RECALL FEATURE

Press the recall key followed by the channel number (1, 2, or 3 digits). Press enter within 3 seconds. For example, to recall channel 48, press:



The radio is ready to use on channel 48. If channel 48 was unprogrammed, the radio will stay at the channel it was on.

3.4.7 DELETING A CHANNEL*

Recall the desired channel using one of the above methods. Press 0 and enter. The lower line of the display will read ‘DELETE?’ Press enter again to confirm. For example, to delete channel 48, press:

The radio will then tune to the next lower channel number available.

3.5 FUNCTION MENU

The Function Menu is invoked by pressing the enter key. The display will respond with 'Menu #.' Press one of the following keys for the associated function:

1	Begin entry of transmit frequency. The current channel will be modified with the new transmit frequency and receive frequency will remain unchanged allowing for split frequency operation.
2	Enable or disable scanning for the currently selected channel.
3	Enable or disable transmit for the selected channel. This allows for receive only channels to be defined.
4	Edit the text name for the currently selected channel. Rotate the knob or use up/down keys to select the character under the cursor. Press the knob or ENT key to proceed to the next character. Text will be saved after the last character is set.
5	Toggle seek mode on or off. Channels enabled in function 2 will be scanned until an active channel is encountered (at which point the seek mode will set to off and normal operation will resume).
6	Toggle scan mode on or off. Channels enabled in function 2 will be scanned until an active channel is encountered. The radio will stay on that channel for a time programmed in the configuration menu. Transmit is possible during scanning, and the frequency depends on the mode programmed in the configuration menu. Scanning will continue indefinitely until function 6 is selected to toggle scan mode off.
7	Toggles transmit power low (1W) or high (10 watts, adjustable).
8	Copy current channel to a new specified channel. The radio will prompt you for the new channel number. The current channel will remain unchanged.
9	Adjust display and backlighting brightness. When selected, the knob becomes the brightness control.
0	Enter configuration menu. See **SECTION 3.6: CONFIGURATION MENU**.
▲	Read channel or configuration data from the USB storage device into the radio. See Section 3.5.1.
▼	Save the channel or the configuration data to the USB storage device from the radio. See Section 3.5.1.

TABLE 4: Function Menu Commands

3.5.1 PROGRAMMING WITH A USB STORAGE DEVICE

The USB port can be used to upload or download memory channels and radio configuration settings or update the main firmware of the radio to the latest version. The memory channels or radio configuration setting can be transferred from one radio to another with a USB stick or loaded onto a PC and edited by a spreadsheet editor such as Microsoft Excel or LibreOffice. These files are in CSV format.
Note: USB must be formatted FAT32

3.5.2 EDITING THE MEMORY CHANNEL FILE

To edit memory channels using a PC, use the following procedure:

- Plug a USB stick into the USB port on the TDAM-1000.
- Press  
- The display will show ‘memory?’
- Press  to confirm.
- The memory channels have now been copied onto the USB stick.
- Remove the USB stick from the TDAM-1000.
- Plug the USB stick into a PC that has a spreadsheet editor installed.
- Load the file on the USB stick called TDAM_MEM.CSV.
- The memory channels from the TDAM-1000 will be listed in the following format:

	A	B	C	D	E	F
1	TDAM-1000					
2	Memory	Name	Receive	Transmit	Scan	Rx Only
3	1	Sport AV	123400	123400	Yes	No
4	2	TwrSouth	118350	118350	Yes	No
5	3	TwrNorth	118700	118700	Yes	No
6	4	GndCentr	119100	119100	Yes	No
7	5	GndNorth	121650	121650	Yes	No
8	6	GndSouth	121900	121900	Yes	No
9	7	YYZ ATIS	120825	120825	No	Yes
10	8	YYZATIS2	133100	133100	No	Yes
11	9	YYZ ICE1	130875	130875	Yes	No
12	10	YYZ ICE2	131175	131175	Yes	No
13	11	YYZ ICE3	131950	131950	Yes	No
14	12	YYZ ICE4	131375	131375	Yes	No
15	13	YYZ ICE5	129625	129625	Yes	No
16	14	SouthApr	122075	122075	Yes	No
17	15	NorthApr	122275	122275	Yes	No
18	16	AprCoord	122875	122875	Yes	No
19	17	Arrive 1	132800	132800	Yes	No
20	18	Depart 1	127575	127575	Yes	No
21	19	Depart 2	128800	128800	Yes	No
22	20	Test 1	118000	118000	Yes	No

Memory – Memory/Channel Number (1 to 100)
Name – Channel Name (8 Characters Max)
Receive – RX Frequency (6 digits, 128075 is 128.075MHz)
Transmit – TX Frequency (6 digits, 128075 is 128.075MHz)
Scan – Channel in scan list (Yes or No)
Rx Only – RX only channel, TX disabled (Yes or No)

- Frequencies must conform to the ICAO standard for 25 kHz or 25/8.33 kHz channel spacing as listed in Section 3.7 and must be within the tuning range of the TDAM-1000.

- When editing is complete, click save and exit. You may save different files under different file names on your PC but when saving to the USB stick, the file name must be TDAM_MEM.CSV or the TDAM-1000 will not recognize it. It also must be saved to the root directory of the USB stick.

- Remove the USB stick from the PC and plug it into the TDAM-1000.

- Press ENTER ▲

- The display will show ‘memory?’

- Press ENTER to confirm.

NOTE: Only the channels in the list will be overwritten in the radio. If it is desired to have the radio wiped clean of any previously programmed channels and only load the new channels, the file must contain the word ‘Purge’ in box B1:

	A	B	
1	TDAM-1000	Purge	
2	Memory	Name	Rec
3	1	Sport AV	1

If you only want to remove 1 or 2 memory channels from the radio, this can be achieved by putting a minus sign (-) ahead of the channel to be removed:

11	9	YYZ ICE1	1308
12	-10	YYZ ICE2	1311
13	11	YYZ ICE3	1319
14	12	YYZ ICE4	1313

3.5.3 EDITING THE RADIO CONFIGURATION FILE

To edit the radio configuration file using a PC, please use the following procedure:

- Plug the supplied USB stick into the USB port on the TDAM-1000.

- Press ENTER ▼

- The display will show ‘memory?’

- Press ▼ again to toggle the display to show ‘config?’

- Press ENTER to confirm.

- The radio configuration has now been copied onto the USB stick.

- Remove the USB stick from the TDAM-1000.

- Plug the USB stick into a PC that has a spreadsheet editor installed.

- Load the file on the USB stick called TDAM_CFG.CSV.
- The configuration settings from the TDAM-1000 will be listed in the following format:

	A	B	C
1	TDAM-1000		
2	Config	Setting	
3	Mem Disp	Freq-#	
4	MenuMode	Password	
5	MenuPswd	1234	
6	AlwaysOn	No	
7	Comp Lvl	800	
8	Ext Spkr	Rx Only	
9	Ext Vol	IntSpkr=	
10	FrqAgile	Yes	
11	HdstMute	BothSpkr	
12	Mod Lvl	2891	
13	Mon Vol	50	
14	Scan Mon	5	
15	ScanRply	5	
16	ScanRvrt	Contactd	
17	Tx Timer	90 sec	
18	Pwr Lvl	7	
19	WideBand	No	
20	MenuPerm	Delete	No
21	MenuPerm	Freq	Yes
22	MenuPerm	Recall	Yes
23	MenuPerm	Funct	Yes
24	MenuPerm	Config	No
25	MenuPerm	Tx Freq	No
26	MenuPerm	Scan En	No
27	MenuPerm	Rx Only	No
28	MenuPerm	EditTxt	No
29	MenuPerm	Seek	No
30	MenuPerm	Scan	No
31	MenuPerm	Power	Yes
32	MenuPerm	Save	No
33	MenuPerm	Baklite	Yes
34	MenuPerm	USB Rd	No
35	MenuPerm	USB Wr	No

- Only settings or values that are available in the radio can be used. See Section 3.6. *Do not edit column A.*
- When editing is complete, click save and exit. You may save different files under different file names on your PC but when saving to the USB stick, the file name must be TDAM_CFG.CSV or the TDAM-1000 will not recognize it.
- Remove the USB stick from the PC and plug it into the TDAM-1000.
- Press 

- The display will show ‘memory?’
- Press 

again to toggle the display to show ‘config?’
- Press 

to confirm.

3.5.4 UPDATING THE RADIO FIRMWARE

To update the radio to the latest firmware version, use the following procedure:

- Insert a blank USB stick into an available port on your PC.
- Copy the software update file or files into the root directory of the USB stick.
- Remove the USB stick from the PC and plug it into the TDAM-1000 USB port.
- The display will show ‘USB Mem Inserted’ and then show ‘Update Radio?’
- Press 

to confirm.
- The display will show ‘Updating’ with a rotating icon.
- When the process is complete, the display will show ‘Restart Radio.’
- Remove the USB stick.
- Press and hold the knob until the radio turns off.
- Turn back on the radio and press ‘ENT’ Then ‘SQL’ this will display both firmware versions (Front panel and RF Module/Main). Make sure both versions are correct.
- The TDAM-1000 is updated and ready for use.

***Note – Both Front Panel and Main Firmware can be updated at the same time, just put both files on the USB stick. Only one version of each can be on the USB stick at a time. USB must be formatted FAT32**

3.6 CONFIGURATION MENU

The Configuration Menu is invoked by pressing the 0 key in the function menu. The display will respond with 'Config.' Turn the knob to select the desired item and press the knob to edit the item, Then ENT, ENT to save. Configuration menu items include:

<table>
<tr><td>Mem Disp</td><td>Allows the format of the display for programmed channels to be selected:
<table>
<tr><td>Freq</td><td>Displays the frequency on the top line only.</td></tr>
<tr><td>Freq-#</td><td>Displays the frequency on the top line and the channel number on the bottom line.</td></tr>
<tr><td>FreqName</td><td>Displays the frequency on the top line and the name of the channel on the bottom line.</td></tr>
<tr><td>Name-#</td><td>Displays the channel name on the top line and the channel number on the bottom line.</td></tr>
</table></td></tr>
<tr><td>MenuMode</td><td>Menu Permission Mode (See 3.6.1 for more details)
<table>
<tr><td>Password</td><td>All Features unlocked by password.</td></tr>
<tr><td>PassFile</td><td>All Features unlocked by password or a USB config file</td></tr>
<tr><td>Cfg File</td><td>All Features unlocked by a USB Config File.</td></tr>
<tr><td>Jumper</td><td>All Features Unlocked with an internal jumper.</td></tr>
</table></td></tr>
<tr><td>MenuPerm</td><td>Menu Feature Permissions enable/disable (See 3.6.1 for more details)
<table>
<tr><td>*Delete</td><td>Enables or disables deleting a channel from the memory list</td></tr>
<tr><td>Freq</td><td>Enables or disables typing a Freq with the # keypad</td></tr>
<tr><td>Recall</td><td>Enables or disables recall function</td></tr>
<tr><td>Funct</td><td>Enables or disables function menu (this will disable everything the ENT Key will be disabled)</td></tr>
<tr><td>*Config</td><td>Enables or disables config menu</td></tr>
<tr><td>*TX Freq</td><td>Enables or disables spilt freq</td></tr>
<tr><td>*Scan En</td><td>Enables or disables adding channel to scan list</td></tr>
<tr><td>*Rx Only</td><td>Enables or disables RX only mode</td></tr>
<tr><td>*EditTxt</td><td>Enables or disables channel name editing</td></tr>
<tr><td>Seek</td><td>Enables or disables seek mode</td></tr>
<tr><td>Scan</td><td>Enables or disables scan mode</td></tr>
<tr><td>Power</td><td>Enables or disables low/high power setting</td></tr>
<tr><td>*Save</td><td>Enables or disables saving new channels to the memory list</td></tr>
<tr><td>Baklite</td><td>Enables or disables backlight adjustment</td></tr>
<tr><td>USB Rd</td><td>Enables or disables USB read</td></tr>
<tr><td>*USB Wr</td><td>Enables or disables USB write</td></tr>
</table>
* Features most users will want disabled.</td></tr>
<tr><td>MenuPswd</td><td>Sets the permission password. Up to 8 Characters (See 3.6.1 for more details)</td></tr>
<tr><td>AlwaysOn</td><td>Power switch configuration:
<table>
<tr><td>No</td><td>Knob must be used to turn the radio on and off.</td></tr>
<tr><td>Yes</td><td>Radio is always on when power is applied.</td></tr>
</table></td></tr>
<tr><td>Comp Lvl</td><td>Microphone compression level. Turning the knob will adjust (range 0 – 1023) the maximum gain of the microphone input. Default is 800.</td></tr>
</table>

<table>
<tr><td>Ext Spkr</td><td>External speaker operating mode:<table>
<tr><td>Off</td><td>External speaker output is off at all times.</td></tr>
<tr><td>Rx Only</td><td>External speaker outputs receive audio only.</td></tr>
<tr><td>Rx & Tx</td><td>External speaker outputs receive and transmit audio.</td></tr>
<tr><td>Base Stn</td><td>Disables internal speaker, External receive audio only</td></tr>
</table></td></tr>
<tr><td>Ext Vol</td><td>External speaker volume mode:<table>
<tr><td>IntSpkr=</td><td>External speaker volume is equal to the internal speaker.</td></tr>
<tr><td>Separate</td><td>External speaker volume is separately adjustable.</td></tr>
</table></td></tr>
<tr><td>FrqAgile</td><td>Frequency agile mode:<table>
<tr><td>No</td><td>Only programmed channels can be selected.</td></tr>
<tr><td>Yes</td><td>Programming and direct frequency entry is allowed.</td></tr>
</table></td></tr>
<tr><td>HdstMute</td><td>Headset mute mode:<table>
<tr><td>No Spkr</td><td>Neither speaker is muted when the headset plug inserted.</td></tr>
<tr><td>Int Spkr</td><td>Only the internal speaker is muted when the headset plug is inserted.</td></tr>
<tr><td>Ext Spkr</td><td>Only the external speaker output is muted when the headset plug is inserted.</td></tr>
<tr><td>BothSpkr</td><td>Both internal and external speakers are muted when the headset plug is inserted.</td></tr>
</table></td></tr>
<tr><td>Mod Lvl</td><td>Modulation level. Adjusts the transmit modulation level (range 0 – 4095). Most radios are between 2800 and 3200 for 80% modulation depth which is what is set at the factory</td></tr>
<tr><td>Mon Vol</td><td>Monitor volume. Adjusts the level of the monitor output (range 0 – 100).</td></tr>
<tr><td>Scan Mon</td><td>Scan monitor time. Adjusts the number of seconds (0 – 90) the radio will remain on an open frequency during scanning.</td></tr>
<tr><td>ScanRply</td><td>Scan reply time. Adjust the number of seconds (0 – 90) the radio will stay on a frequency after the squelch has closed before resuming scanning.</td></tr>
<tr><td>ScanRvrt</td><td>Scan revert mode:<table>
<tr><td>Selected</td><td>All replies are transmitted on the frequency selected before scanning was enabled.</td></tr>
<tr><td>Contacted</td><td>All replies are transmitted on the frequency of the last channel received.</td></tr>
</table></td></tr>
<tr><td>Tx Timer</td><td>Transmit timer. Selects the transmit timeout timer between Off, 30, 60, or 90 seconds.</td></tr>
<tr><td>Pwr Lvl</td><td>TX High Power level adjustment, Low power setting is always 1W:
Level 1- 2W (will vary slightly from unit to unit)
Level 2- 3.25W (will vary slightly from unit to unit)
Level 3- 4.25W (will vary slightly from unit to unit)
Level 4- 5.25W (will vary slightly from unit to unit)
Level 5- 6.5W (will vary slightly from unit to unit)
Level 6- 8W (will vary slightly from unit to unit)
Level 7- 10W (calibrated to 9.6W across the band at the factory)
*Unit will automatically turn TX power level down if input power supply cannot supply enough current or if PA is above rated temperature.</td></tr>
</table>

TABLE 5: Configuration Menu Commands

3.6.1 MENU PERMISSIONS (Firmware 1.4/1.5 and higher)

MenuMode (Menu Lockout Mode)

This selects how the radio will be unlocked by the technician if changes are needed.

- **Password** – Unlocks all features with a password. If a feature that is disabled is trying to be accessed the radio will display Passwrd?. Typing in the proper password set in the MenuPswd will unlock that feature and any other disable feature. Typing an incorrect password or pressing ENT the radio will display Command Disabled and go back to the main screen. Once password is typing in all features will be unlocked until power is cycled. If Password is forgotten the radio can be unlocked and password reset by using the jumper method.

- **PassFile** – Unlocks with a password same as above. Also will unlock with a USB see Cfg File below.

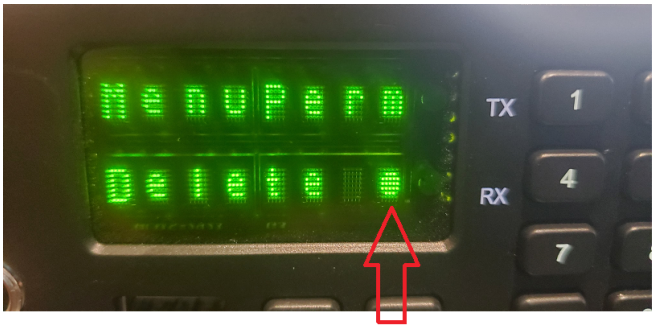
- **Cfg File** – Unlocks the radio with a config file on a USB. Config File must contain the proper password. Example if the password was set to 1234, File must contain 1234 in the MenuPswd field.

	A	B	C
1	TDAM-1000		
2	Config	Setting	
3	Mem Disp	Freq-#	
4	MenuMode	Password	
5	MenuPswd	1234	
6	AlwaysOn	No	

- **Jumper** – No password, only way to unlock all features is with shorting TP33 inside the Radio. For instructions see Jumper Unlock Below.

MenuPerm (Menu Permissions)

This Selects what features will be disabled and which ones will be enabled. It's done by scrolling with the knob to each feature and pressing the up/dn keys. There is a circle beside each feature, solid is enabled and an empty circle is disabled. Once all is set press ENT twice to save.



Feature enabled

Feature Disabled

MenuPswd (Menu Password)

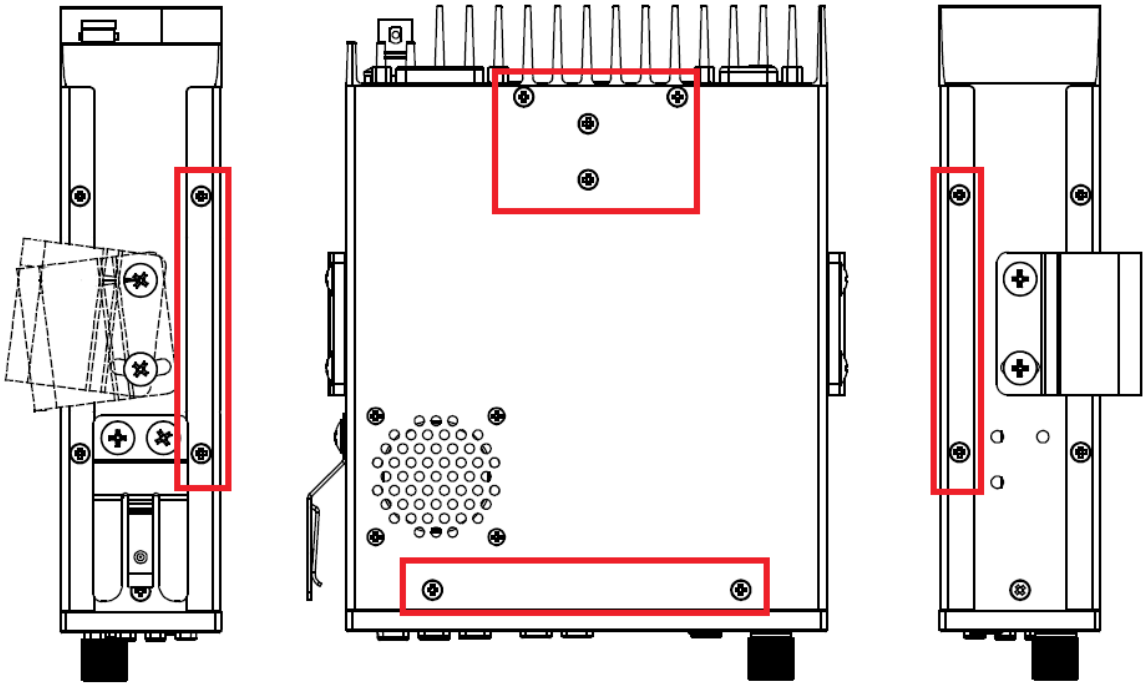
This sets the password Up to 8 Characters. Default is set to "0" if no password was entered.

Config CSV File

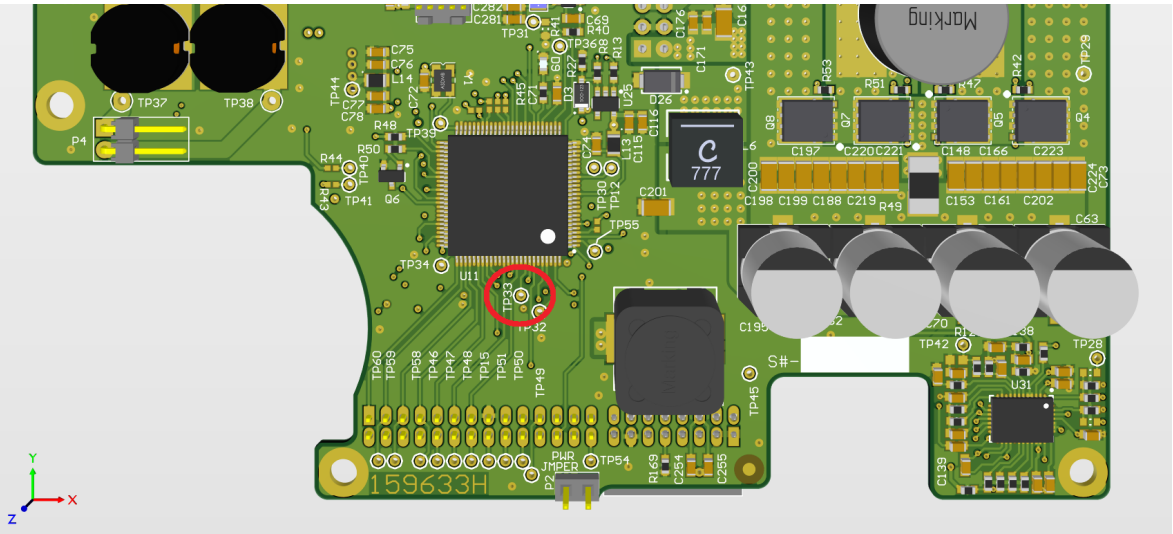
All the menu permissions as well as the password can also be configured with the Config CSV file. The file can be read from any unit or written to any unit. Editing can be done on a spreadsheet editor.

Jumper Unlock

1. Remove screws (10) on bottom lid (the side with speaker).



2. Carefully/Slowly lift Bottom Lid, unplug speaker cable and set Lid to the side
3. Ground TP33, While turning on the radio. Once radio has fully booted up TP33 no longer needs to be Grounded.



4. Radio will now be fully unlocked to allow the needed changes, or resetting a forgotten password in the config menu.
5. Once changes are complete turn off radio. Remove ground from TP33 if it is still grounded.
6. Plugin in Speaker cable, and put bottom lid back on the radio.
7. Install all 10 screws.
8. Radio is now ready for use.

3.7 25 kHz CHANNEL SPACING MODE (DEFAULT)

The TDAM-1000 by default will be set the 25kHz only mode, Selecting the desired channel is achieved during the frequency entry procedure (5 digit entry). For the CSV memory list the 6 digit actual frequency must be typed in.

FREQUENCY ENTERED	ACTUAL FREQUENCY	CHANNEL SPACING
118.00	118.000 MHz	25 kHz
118.02	118.025 MHz	25 kHz
118.05	118.05 MHz	25 kHz
118.07	118.075 MHz	25 kHz
118.10	118.100 MHz	25 kHz
Etc.	Etc.	Etc.

TABLE 6: 25 kHz Channel Spacing

3.8 25 kHz AND 8.33 kHz CHANNEL SPACING MODE

The TDAM-1000 is capable of both 25 and 8.33 kHz channel spacing. Contact TiL for instructions to enable 8.33KHz channels. Selecting the desired channel spacing is achieved during the frequency entry procedure (6 digit entry). The TDAM-1000 uses the ICAO standard where 5, 10, or 15 kHz is added to the 25 kHz channel frequencies to represent the additional 8.33 kHz channel steps:

FREQUENCY ENTERED	ACTUAL FREQUENCY	CHANNEL SPACING
118.000	118.000 MHz	25 kHz
118.005	118.000 MHz	8.33 kHz
118.010	118.00833 MHz	8.33 kHz
118.015	118.01666 MHz	8.33 kHz
118.025	118.025 MHz	25 kHz
118.030	118.025 MHz	8.33 kHz
118.035	118.03333 MHz	8.33 kHz
118.040	118.04166 MHz	8.33 kHz
118.050	118.050 MHz	25 kHz
118.055	118.050 MHz	8.33 kHz
118.060	118.05833 MHz	8.33 kHz
Etc.	Etc.	Etc.

TABLE 7: ICAO 25 kHz and 8.33 kHz Channel Spacing

3.9 ERROR CODES

CODE	DESCRIPTION
001	Input Power Fault – Over Voltage >44V
002	Input Voltage fault – Large Input power supply oscillations. Current Limiting
004	Low Input Voltage – 10V or less
008	TX PA Over temperature – PA measuring at 100C or more
010	Antenna SWR fault
020	PLL Unlocked – Tx or Rx not locked on selected Frequency

TABLE 8: Error codes

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SECTION 4: SPECIFICATIONS

4.1 DIMENSIONS

Width	5.4 inches (137 mm)
Height	1.8 inches (46 mm)
Depth	7.7 inches (196 mm)
Weight	2.8 lbs (1.27 kg)

4.2 GENERAL SPECIFICATIONS

Frequency Band	117.975 – 138.000 MHz
Modulation	AM (A3E)
Channel Spacing	25 kHz and 8.33 kHz
Frequency Stability	+/- 1 ppm (0.0001%)
Operating Temperature	-20 to +55 °C
Storage Temperature	-40 to +70 °C
Power Consumption Transmit High Power (10W) Receive (Max Volume) Standby	 < 80 watts < 15 watts < 10 watts

4.3 RECEIVER SPECIFICATIONS

Sensitivity	< 1.5 µV for 12 dB SINAD
Selectivity 25 kHz Channel Spacing 8.33 kHz Channel Spacing	 > 65 dB @ ±25 kHz, < 6 dB @ ±8.5 kHz > 60 dB @ ±8.33 kHz, < 6 dB @ ±2.5 kHz
Adjacent Channel Rejection	> 60 dB
Spurious Attenuation	> 70 dB
Blocking for 1 MHz Frequency Offset	> 80 dB
Signal to Noise Ratio	< 45 dB
Frequency Stability	1 ppm (0.0001%)
Intermodulation Immunity	> 65 dB
Image Frequency Rejection	> 100 dB
Intermediate Frequency Rejection	> 95 dB
Conducted Spurious	< -70 dB
Cross Modulation Rejection	> 70 dB @ 100 kHz Frequency Offset
Squelch	Adjustable 0 to 25 µV
Scanning	20 Channels per Second
Audio Response 25 kHz Channel Spacing 8.33 kHz Channel Spacing	 300 to 3400 Hz, +1 dB, -2 dB 350 to 2500 Hz, +1 dB, -2 dB
Audio Distortion	< 5% THD
Audio Output Power	10 watts 8ohm External 16 watts 4ohm External < 5 watts Internal

4.4 TRANSMITTER SPECIFICATIONS

RF Output Power	Selectable 1 to 10 watts
Modulation Depth	Up to 95%
VSWR	1:Infinity
Hum and Noise	> 40 dB @ 90% Modulation
Distortion	< 5% @ 90% Modulation
Frequency Stability	±1 ppm (0.0001%)
Intermodulation Attenuation	40 dB @ 150 kHz Offset
Keying Time	< 20 ms
Release Time	< 10 ms
Speech Processor	35 dB Dynamic Range

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IMPORTANT
WARRANTY

All communication equipment manufactured by Technisonic Industries Limited is warranted to be free of defects in Material or Workmanship under normal use for a period of one year from Date of Purchase by the end user.

Warranty will only apply to equipment installed by a factory approved and/or authorized facility in accordance with Technisonic published installation instructions. Equipment falling under the following is not covered by warranty:

- Equipment that has been repaired or altered in any way as to affect performance,
- Equipment that has been subject to improper installation,
- Equipment that has been used for purposes other than intended,
- Equipment that has been involved in any accident, fire, flood, immersion, or subject to any other abuse.

Expressly excluded from this warranty are changes or charges relating to the removal and re-installation of equipment from the vehicle. Technisonic will repair or replace (at Technisonic's discretion) any defective transceiver (or part thereof) found to be faulty during the Warranty Period.

Faulty equipment must be returned to Technisonic (or its authorized Warranty Depot) with transportation charges prepaid. Repaired (or replacement) equipment will be returned to the customer with collect freight charges. If the failure of a transceiver occurs within the first 30 days of service, Technisonic will return the repaired or replacement equipment prepaid.

Technisonic reserves the right to make changes in design, or additions to, or improvements in its products without obligation to install such additions and improvements in equipment previously manufactured. This Warranty is in lieu of any and all other warranties express or implied, including any warranty of merchantability or fitness, and of all other obligations or liabilities on the part of Technisonic.

This Warranty shall not be transferable or assignable to any other persons, firms, or corporations.

For warranty registration, please complete the online Warranty Registration Form found at www.til.ca.