TMS-110
VHF AM TRANSCEIVER

Installation and Operating Instructions

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Firmware Version 2.1.0

Technisonic Industries Limited
240 Traders Boulevard, Mississauga, Ontario L4Z 1W7
Tel: (905) 890-2113 Fax: (905) 890-5338
www.til.ca

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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

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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:

Technisonic Industries Limited
240 Traders Boulevard
Mississauga, Ontario, L4Z 1W7

Tel: (905) 890-2113
Fax: (905) 890-5338

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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

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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, a 10-watt external speaker output is supplied for high-noise environments.

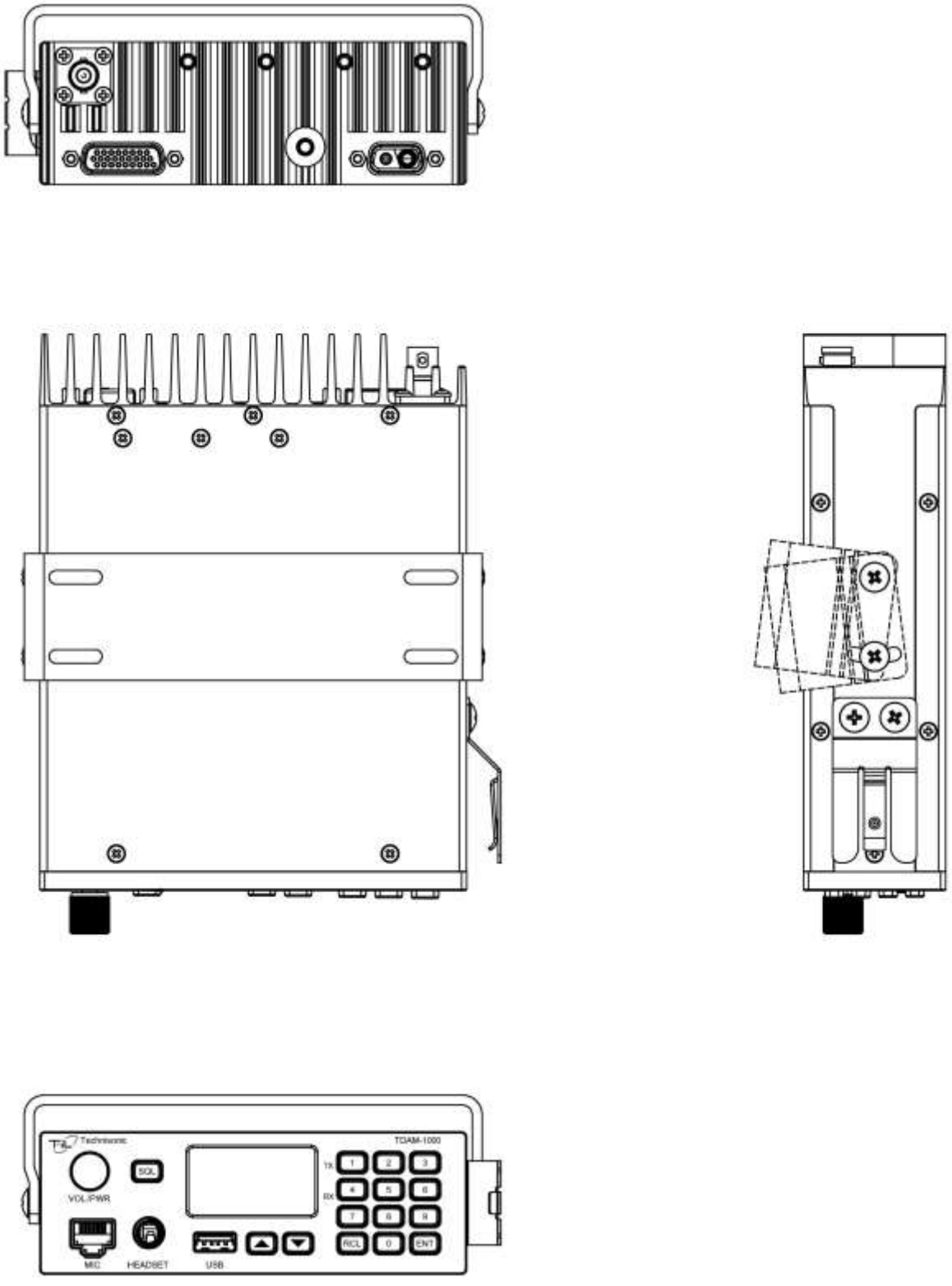


FIGURE 1: Outline Drawing for Model TDAM-1000

2.4 INSTALLATION – CONNECTIONS

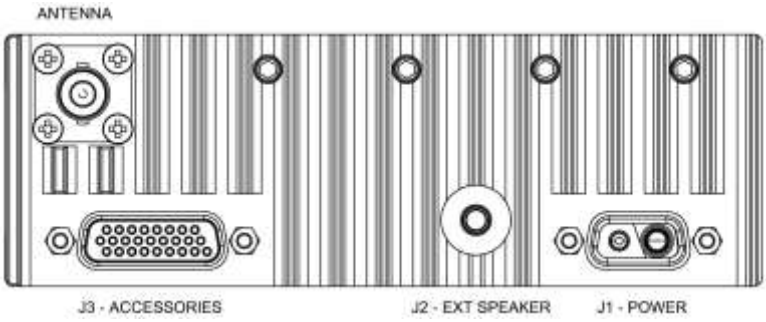


FIGURE 2: Rear Connector View – TDAM-1000

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.

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 in transmit mode 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 13.75V.

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. The speaker output includes receive audio only. The Level is set by the volume control. The speaker output is also available on a 1/8" 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.

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:

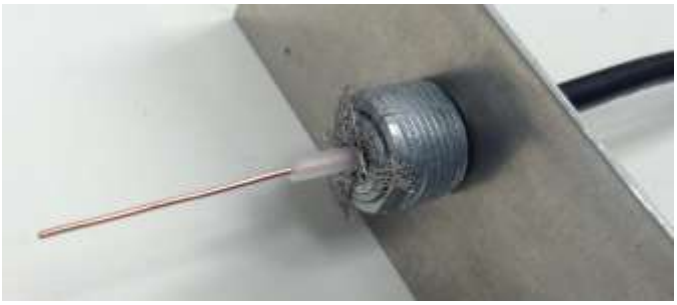
- Drill a 3/8” hole where the antenna is to be installed.
- Unpackage the antenna and disassemble the antenna base.

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

- Feed coax cable through the antenna base.

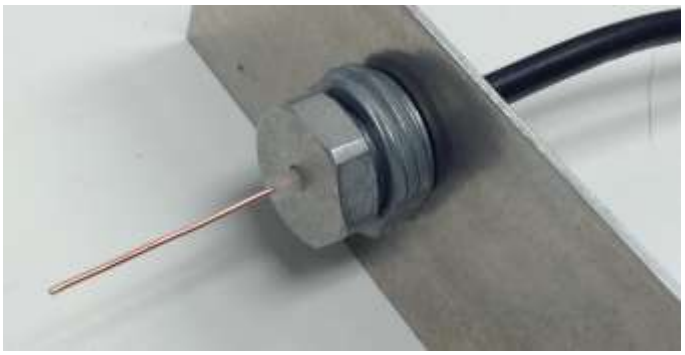
- Slide the locking core over the coax and into the antenna base.

- Spread the coax shielding over the antenna base.

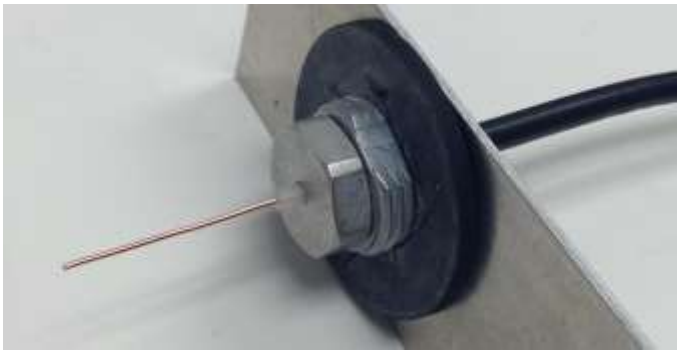


- Trim the shielding to allow the lock nut to be installed.
- Install and tighten the antenna base lock nut.

- 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 position.

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.
- 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:

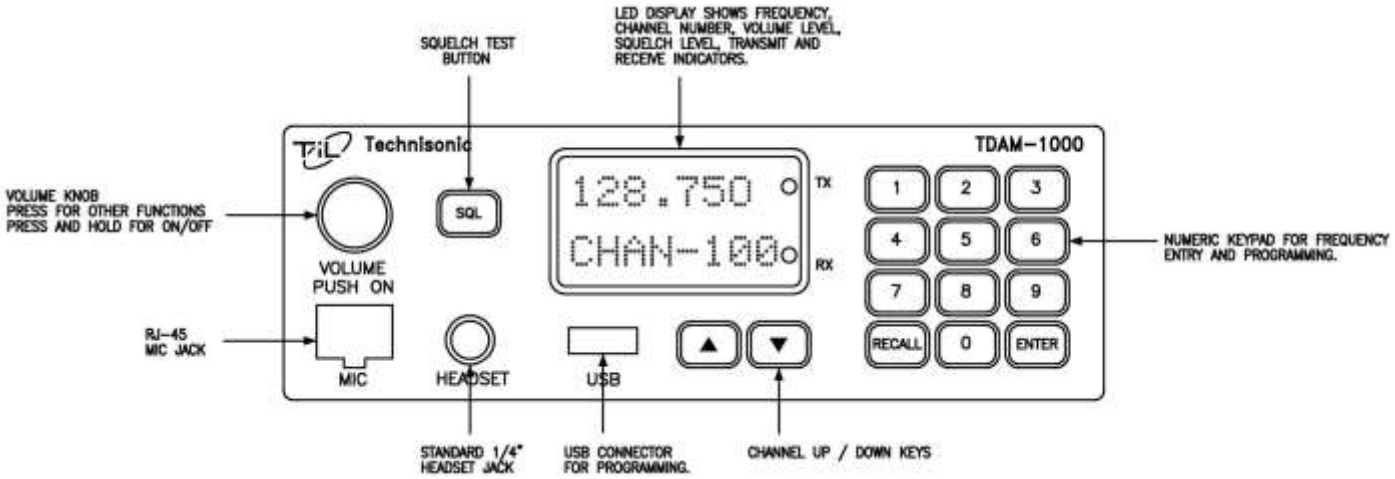


FIGURE 3: TDAM-1000 Front Panel Controls

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, squelch, and brightness modes. The default mode for the knob is volume when the radio is turned on.

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 or program the radio configuration. 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
2	+8V
3	Chassis Ground
4	Push to Talk
5	MIC Ground
6	MIC Audio
7	Not Connected
8	Channel Down

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 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*

The TDAM-1000 supports both 25 kHz and 8.33 kHz channel spacing. 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.

3.4.2 PROGRAMMING A CHANNEL*

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:

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.

Enable or disable scanning for the currently selected channel.

Enable or disable transmit for the selected channel. This allows for receive only channels to be defined.

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.

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).

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.

Toggles transmit power low or high (1 watt or 10 watts).

Copy current channel to a new specified channel. The radio will prompt you for the new channel number. The current channel will remain unchanged.

Adjust display and backlighting brightness. When selected, the knob becomes the brightness control.

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.

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. These files are in .CSV format.

3.5.2 EDITING THE MEMORY CHANNEL FILE

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

- Plug the supplied 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	123400000	123400000	No	No
4	2	TwrSouth	118350000	118350000	No	No
5	3	TwrNorth	118700000	118700000	No	No
6	4	GndCentr	119100000	119100000	No	No
7	5	GndNorth	121650000	121650000	No	No
8	6	GndSouth	121900000	121900000	No	No
9	7	YYZ ATIS	120825000	120825000	No	No
10	8	YYZATIS2	133100000	133100000	No	No
11	9	YYZ ICE1	130875000	130875000	No	No
12	10	YYZ ICE2	131175000	131175000	No	No
13	11	YYZ ICE3	131950000	131950000	No	No
14	12	YYZ ICE4	131375000	131375000	No	No
15	13	YYZ ICE5	129625000	129625000	No	No
16	14	SouthApr	122075000	122075000	No	No
17	15	NorthApr	122275000	122275000	No	No
18	16	AprCoord	122875000	122875000	No	No
19	17	Arrive 1	132800000	132800000	No	No
20	18	Depart 1	127575000	127575000	No	No
21	19	Depart 2	128800000	128800000	No	No

- The memory number, channel name, TX/RX frequency (in Hz), scan status, and receive only status will be listed for only the programmed channels in the radio. Blank channels will not appear.
- Frequencies must conform to the ICAO standard for 25 kHz and 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 or under a folder called TDAM1000.

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

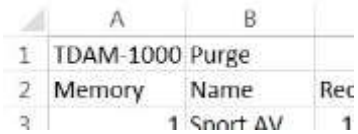
- Press 

- The display will show ‘memory?’

- Press 

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

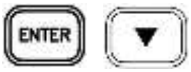
If you only want to remove 1 or 2 memory channels from the radio, this can be achieved by putting a minus sign (-) ahead of the channel to be removed:

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

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 

- The display will show ‘memory?’

- Press 

again to toggle the display to show ‘config?’

- Press 

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
1	TDAM-1000	
2	Config	Setting
3	Mem Disp	Freq
4	AlwaysOn	No
5	Comp Lvl	928
6	Ext Spkr	Off
7	Ext Vol	IntSpkr=
8	FrqAgile	Yes
9	HdstMute	Int Spkr
10	Mod Lvl	2800
11	Mon Vol	25
12	Scan Mon	3
13	ScanRply	3
14	ScanRvrt	Contactd
15	Tx Timer	60 sec

- The settings in column B can be edited. 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 main’ 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 resets.
- The TDAM-1000 is updated and ready for use.

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. Configuration menu items include:

Mem Disp	Allows the format of the display for programmed channels to be selected: Freq — Displays the frequency on the top line only. Freq-# — Displays the frequency on the top line and the channel number on the bottom line. Freq-Name — Displays the frequency on the top line and the name of the channel on the bottom line. Name-# — Displays the channel name on the top line and the channel number on the bottom line.
AlwaysOn	Power switch configuration: No — Knob must be used to turn the radio on and off. Yes — Radio is always on when power is applied.
Comp Lvl	Microphone compression level. Turning the knob will adjust (range 0 – 1023) the maximum gain of the microphone input.
Ext Spkr	External speaker operating mode: Off — External speaker output is off at all times. Rx Only — External speaker outputs receive audio only. Rx & Tx — External speaker outputs receive and transmit audio. Base Stn — Disables internal speaker, External receive audio only
Ext Vol	External speaker volume mode: IntSpkr= — External speaker volume is equal to the internal speaker. Separate — External speaker volume is separately adjustable.
FrqAgile	Frequency agile mode: No — Only programmed channels can be selected. Yes — Programming and direct frequency entry is allowed.
HdstMute	Headset mute mode: No Spkr — Neither speaker is muted when the headset plug inserted. Int Spkr — Only the internal speaker is muted when the headset plug is inserted. Ext Spkr — Only the external speaker output is muted when the headset plug is inserted. BothSpkr — Both internal and external speakers are muted when the headset plug is inserted.
Mod Lvl	Modulation level. Adjusts the transmit modulation level (range 0 – 4095).
Mon Vol	Monitor volume. Adjusts the level of the monitor output (range 0 – 100).
Scan Mon	Scan monitor time. Adjusts the number of seconds (0 – 90) the radio will remain on an open frequency during scanning.
ScanRply	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.
ScanRvrt	Scan revert mode: Selected — All replies are transmitted on the frequency selected before scanning was enabled. Contacted — All replies are transmitted on the frequency of the last channel received.
Tx Timer	Transmit timer. Selects the transmit timeout timer between Off, 30, 60, or 90 seconds.

Pwr Lvl	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.

TABLE 4: Configuration Menu Commands

3.7 25 AND 8.33 kHz CHANNEL SPACING

The TDAM-1000 is capable of both 25 and 8.33 kHz channel spacing. Selecting the desired channel spacing is achieved during the frequency entry procedure. 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 5: ICAO 25 kHz and 8.33 kHz Channel Spacing

3.8 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 6: Error codes

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 External < 5 watts Internal

4.4 TRANSMITTER SPECIFICATIONS

RF Output Power	Selectable 1 or 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

Technisonic Industries Limited
240 Traders Blvd., Mississauga, ON Canada L4Z 1W7
Tel: (905) 890-2113 Fax: (905) 890-5338

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.