

**A790**

**AIRBORNE PA CONTROLLER**



# INSTALLATION INSTRUCTIONS

**TiL Document: 09RE410**

**Rev. A**

**Issue 7**

**JULY 2010**

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<b>REVISION HISTORY</b> [ 09RE410 ]				
REV	SECTION - PAGE -	DESCRIPTION	DATE	EDITED BY
N/C	All	Original Document Release.	Oct. 19, 2009	SM
Issue 1	N/A* 1	Corrected typo in Table of Contents in Table 1. Added Section 1.3: Installation Kit Contents.	Dec. 15, 2009	FM
A	6	Audio Output was listed as a single-ended output at Pin 13 on the airframe connector. Corrected to be a differential pair: "PA Audio Out +" on Pin 13 and "PA Audio Out -" on Pin 12.	Jul. 28, 2010	FM
	4 & 6	All occurrences of Pin 12 as ground removed and replaced with Pin 12 being "PA Audio Out -" (including tables and diagrams).		
	4 & 6	All occurrences of Pin 13 as Audio Out removed and replaced with Pin 13 being "PA Audio Out +" (including tables and diagrams).		
	ii	Added "Edited By" column in Revision History Page. Added Warranty Page.		
A Issue 1	N/A*	Removed PA system from wiring diagram parts list and added Configuration Instructions.	Dec. 21, 2010	SM
A Issue 2	7 & 8	Figures 3 & 4: Standard and special wiring diagrams were labeled incorrectly.	Jan. 12, 2011	SM
A Issue 3	1	Section 1.3: Changed mating connector to Positronics tool free V lock assembly.	Jan. 28, 2011	SM
A Issue 4	7 & 8	Figures 3 & 4: Removed duplicate Pin 12 from ground, which appeared in Rev. A Issue 1.	Oct. 03, 2011	FM
A Issue 5	10	Section 3.3: Clarified description of "AMP TEST" Configuration Option.	Feb. 06, 2012	AM
A Issue 6	All	Separated information into sections for clarity. Created Sections 2, 3, 4, and Appendices.	Sep. 10, 2014	AM / AL
	Section 2	Clarified installation configurations. Expanded signal descriptions.		

*\* The items affected have since been removed or changed in recent revisions.*

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<b>REVISION HISTORY</b> [ 09RE410 ]				
REV	SECTION - PAGE -	DESCRIPTION	DATE	EDITED BY
A Issue 6	Section 3	Expanded description of firmware configuration mode operation.	Oct. 07, 2014	AM / AL
	Section 4	Expanded description of post-installation tests.		
	Appendices	Gathered table data into appendices for easier reference.		
	All	Re-formatted entire document to new standard. Corrected spelling & grammar throughout document.		
A Issue 7	i	Revised date to match the Revision / Issue update format.	Jun. 06, 2016	AL

## INFORMATION NOTES

### A790 Loud Hailer PA Controller, TiL #081250-1

#### **ESD CAUTION**



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

#### **WARNING**

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 A790. Every effort has been made to make this manual as complete and accurate as possible.

#### **INSTALLATION APPROVAL NOTE**

Presently, no TSO standard exists for airborne FM transceivers. To make it easier for installation agencies to provide their customers with an approved installation supported by an effective Airworthiness Approval, Technisonic has secured Supplemental Type Certificate (STC) approval. The above referenced DO-160G test data is also on file and available from Technisonic to support approval requirements in airframes for which Technisonic does not possess an STC.

Approved aircraft types are listed in the attachments to the formal STC documents. These STCs are the exclusive property of Technisonic and require the written authority of Technisonic for their use. To assist Factory Authorized Technisonic Dealers in the certification process, we have placed copies of our Canadian and US STCs on our website along with a letter of authorization for their use. These documents may be downloaded and used as support for the technical submission to FAA or Transport Canada. Only authorized factory dealers/installers are permitted to download and make use of these documents on behalf of their customers (end users) in support of regulatory agency approval. Please refer to the Technisonic website [www.til.ca](http://www.til.ca) for the latest issue of available STCs and letter of authorization for use.

## TABLE OF CONTENTS

SECTION	TITLE	PAGE
	Table of Contents .....	v
	List of Figures .....	vi
	List of Tables .....	vi
<b>SECTION 1 INTRODUCTION</b>		
1.1	Equipment Packing Log .....	1
1.2	Model Variation.....	1
1.3	Installation Kit – Contents.....	1
1.4	Installation Configurations .....	2
1.4.1	Configuration 1 .....	2
1.4.2	Configuration 2 .....	3
<b>SECTION 2 INSTALLATION</b>		
2.1	A790 25-Pin Connector Pinouts (J1) .....	4
2.1.1	+28 VDC – Pins 1 & 14 – Input .....	5
2.1.2	Ground – Pins 9, 11, 19, 22, 23 & 25 .....	5
2.1.3	Backlight – Pin 17 – Input .....	5
2.1.4	Microphone Audio In – Pin 3 – Input .....	5
2.1.5	Microphone Audio Out – Pin 10 – Output .....	5
2.1.6	Auxiliary Audio In – Pins 4 & 16 – Input .....	5
2.1.7	PA Audio Out – Pins 12 & 13 – Output .....	6
2.1.8	Sidetone Audio Out – Pin 24 – Output .....	6
2.1.9	PTT In – Pin 18 – Input .....	6
2.1.10	PTT Out – Pin 6 – Output .....	6
2.1.11	PA Power Control – Pins 2 & 15 – Dry Contact .....	6
2.1.12	PA Power Level Monitor – Pin 5 – Input .....	6
2.1.13	Serial Data – Pins 8 & 21 .....	6
2.1.14	Control Input / Output – Pins 7 & 20 .....	6
2.2	Mechanical Installation .....	9
<b>SECTION 3 CONFIGURATION</b>		
3.1	Invoking Configuration Mode .....	10
3.2	Select Backlight Voltage – (SIREN) .....	10
3.3	Select PA Amplifier Test – (TRILL) .....	10
3.4	Set Sidetone Level – (PLAY) .....	11
3.5	Select WAV File Loader – (PA) (Factory Use Only) .....	11
3.6	Exit Configuration Mode – (REC) .....	11
<b>SECTION 4 POST-INSTALLATION TESTS</b>		
4.1	Initial Configuration .....	12
4.2	External Audio Operation .....	12
4.2.1	Main Mic Audio .....	12
4.2.2	AUX Audio .....	13
4.3	Internally Generated Audio Operation .....	13
<b>SECTION 5 APPENDICES</b>		
	Appendix A – Technical Characteristics .....	14
	Appendix B – Certification Summary .....	15
	Warranty .....	16

## LIST OF FIGURES

FIGURE	TITLE	PAGE
1	Configuration 1 – A790 Installed After Audio Controller .....	2
2	Configuration 2 – A790 Installed After Audio Controller .....	3
3	A790 Wiring – Configuration 1 .....	7
4	A790 Wiring – Configuration 2 .....	8
5	A790 Outline Drawing .....	9

## LIST OF TABLES

TABLE	TITLE	PAGE
1	A790 Main Connector Pin Out (By Signal Type) .....	4
2	A790 – General Characteristics .....	14
3	A790 – Operational Characteristics .....	14
4	Summary of DO-160G Environmental Testing .....	15

## SECTION 1: INTRODUCTION

This section contains information and instructions for the correct installation of the A790 Loud Hailer PA Controller (Part Number 081250-1).

This document provides Installation Instructions for the A790 PA Controller only; it **does not** include product Operating Instructions. For Operating Instructions, please see Technisonic document 09RE409, which is shipped with the unit.

### **!! CAUTION !!**

The A790 drives PA systems that can generate dangerously loud levels of audio. Do not operate in an enclosed space and ensure all personnel have adequate hearing protection when testing.

#### **1.1 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. Verify that the equipment option configuration is the same as ordered.

#### **1.2 MODEL VARIATION**

There is only one version of the Model A790, P/N 081250-1. All units support both 5 and 28 volt DC backlighting and all are NVG compatible.

There are currently two options that can be selected when the unit is ordered; these select the audio input configuration for the AUX audio channel:

- Option 1 – Configure AUX input for Music.
- Option 2 – Configure AUX input for Microphone.

The option is marked on an Option Label on the unit.

#### **1.3 INSTALLATION KIT – CONTENTS**

The A790 is shipped with an installation kit (P/N 099968-1), which consists of:

One (1) Positronics one hand, tool free, V-lock type 25 pin D connector (female) complete with crimp pins and hood.

1.4 INSTALLATION CONFIGURATIONS

The A790 can be installed in one of two configurations: as part of the standard audio controller network (Configuration 1) or separate from the rest of the system audio (Configuration 2).

1.4.1 CONFIGURATION 1

In this configuration, the A790 is connected to one of the COM positions on the aircraft audio panel. Any of the operators connected to the audio panel can use the PA system. This is the recommended configuration shown in Figure 1.

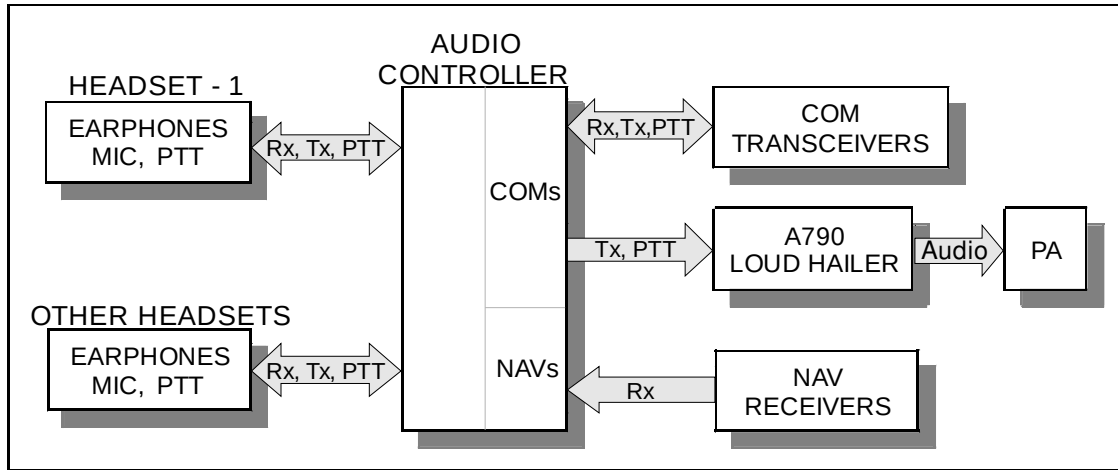


Figure 1: Configuration 1 – A790 Installed After Audio Controller



1.4.2 CONFIGURATION 2

This type of installation is used only where there are no positions available on the audio panel. The operator's microphone and PTT are connected directly to the A790. Controls on the A790 allow the operator to select the PA or the aircraft audio panel. This is shown in Figure 2.

In Configuration 2, the audio panel is automatically selected in the case of a failure or power loss to the A790. Only one operator can be connected to the A790 in this configuration.

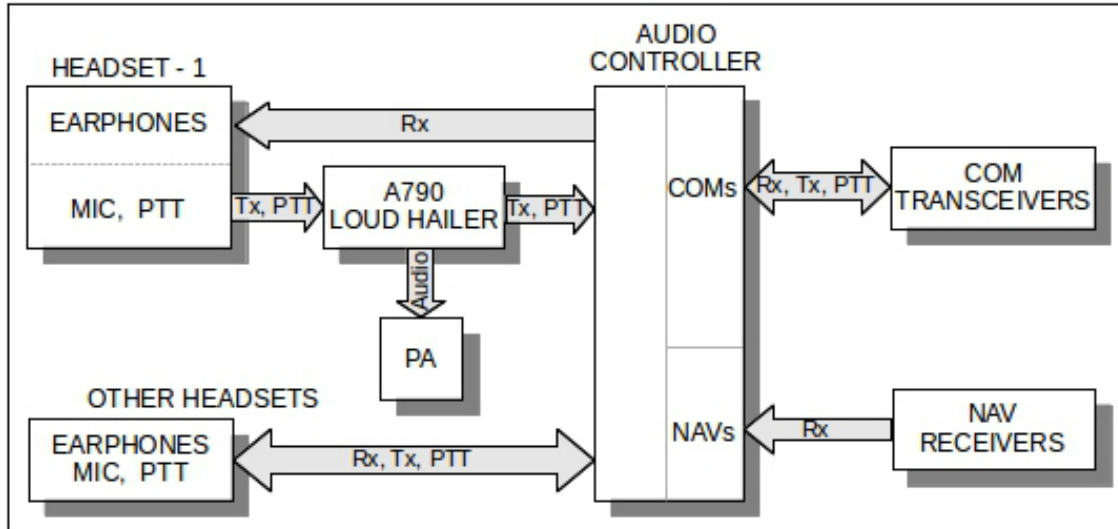


Figure 2: Configuration 2 – A790 Installed Before Audio Controller

**SECTION 2: INSTALLATION**

This section describes both the wiring details and the requirements for physically mounting the A790 PA controller.

**2.1 A790 25-PIN CONNECTOR PINOUTS (J1)**

Table 1 gives a summary of the 25-pin Main connector (J1) and the function of each pin. Detailed pin descriptions follow:

Pin(s)	Type	Signal	I/O	Level	Notes
1, 14	Power	Main Power	Input	+28 VDC (24-32 VDC)	
9, 11, 19	Ground	Airframe Ground			
22, 23, 25					
17	Power	Backlight Control	Input	0-5 VDC (350uA max) or 0-28 VDC (3mA max)	Airframe Lighting Bus
3	Audio	Mic In	Input	400 mV <sub>PP</sub> max	Typical Electret type Mic Levels
10	Audio	Mic Out	Output	From Mic In – via Internal Relay Contact	Connected if F/P 'MIC' Switch = 'RADIO' or if POWER OFF/FAIL
4	Audio	Aux In R	Input	400 mV <sub>PP</sub> max	3.5 mm Connector 'Tip'
16	Audio	Aux In L	Input	400 mV <sub>PP</sub> max	3.5 mm Connector 'Ring'
12	Audio	PA Audio Out -	Output	10 V <sub>PP</sub> max	Differential Drive out to PA
13	Audio	PA Audio Out +	Output	10 V <sub>PP</sub> max	
24	Audio	Sidetone	Output	1 V <sub>PP</sub> max	Level Set by Configuration Function
18	Control	PTT In	Input	Floating / Ground	Dry Contact to GND Only – DO NOT TIE to ANY VOLTAGE
6	Control	PTT Out	Output	From PTT In – via Internal Relay Contact	Connected if F/P 'MIC' Switch = 'RADIO' or if POWER OFF / FAIL
2 & 15	Control	PA Power	Output	Contacts: 1A @ 30 VDC	Dry Contact, Pins 2 & 15 close on POWER ON
5	Control	Power Monitor	Input	3.3 VDC max	Use with PowerSonix Amp Only
8	Data	Serial Data	Input	RS-232	Factory Use Only
21	Data	Serial Data	Output	RS-232	
7	Reserved	N/A	Output	N/A	Not Implemented
20	Reserved	N/A	Input	N/A	

**Table 1: A790 Main Connector Pin Out (By Signal Type)**

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### 2.1.1 +28 VDC – PINS 1 & 14 – INPUT

All Configurations: These are the main power pins to the A790. Both pins should be connected to +28 VDC.

### 2.1.2 GROUND – PINS 9, 11, 19, 22, 23 & 25

All Configurations: Connect to aircraft ground.

### 2.1.3 BACKLIGHT – PIN 17 – INPUT

All Configurations: Backlighting input.

Backlight operation can be configured for 0-5 VDC or 0-28 VDC dimmer bus operation (selecting the wrong voltage will not result in damage).

### 2.1.4 MICROPHONE AUDIO IN – PIN 3 – INPUT

Configuration 1: This pin is connected to the mic signal output from the audio panel.

Configuration 2: The operator's microphone audio is connected directly to this pin.

Signal Level: 400 mV<sub>PP</sub> max.

### 2.1.5 MICROPHONE AUDIO OUT – PIN 10 – OUTPUT

Configuration 1: Leave unconnected.

Configuration 2: This output is connected directly to the microphone input on the audio panel.

### 2.1.6 AUXILIARY AUDIO IN – PINS 4 & 16 – INPUT

These pins are internally connected in parallel to the 3.5 mm stereo aux input jack on the front of the A790 as follows:

Pin 4 is connected to the 3.5 mm jack tip, which is the right channel.

Pin 16 is connected to the 3.5 mm jack ring, which is the left channel.

This input channel is configured depending upon the order option as follows:

Option 1: Set for music player audio levels in.

Option 2: Set for microphone level audio in. Signal Level: 400 mV<sub>PP</sub> max.

All installations: Optional – These inputs can be used as another audio source for the PA.

**NOTE:** Left and right channels are summed internally as the PA controller only supports mono operation; thus, for microphone operation, only one channel connection is required.

**2.1.7 PA AUDIO OUT – PINS 12 & 13 – OUTPUT**

PA Audio Output is a differential pair (+ and -), pin 13 is positive, and pin 12 is negative.  
All Configurations: Connect to the audio input of the PA system.  
Signal Level: 10 V<sub>PP</sub> max.

**2.1.8 SIDETONE AUDIO OUT – PIN 24 – OUTPUT**

All Configurations: This pin provides the sidetone audio out. Setting this level is described in Section 3.  
Signal Level: 1 V<sub>PP</sub> max.

**2.1.9 PA AUDIO OUT – PINS 18 – INPUT**

The PTT signal is active low (GND). In the inactive state, it should not be connected to any level but be left floating. The signal is internally pulled to inactive within the A790. This must be activated only by a dry contact to ground.

Configuration 1: The PTT output from the audio panel is connected to this pin.  
**NOTE**: If the audio controller output is not a dry contact or floating output when inactive, then this signal must be converted externally to the A790 to meet these requirements.

Configuration 2: The operator's PTT is connected here.

**2.1.10 PTT OUT – PIN 6 – OUTPUT**

Configuration 1: Leave unconnected in the standard installation.  
Configuration 2: This output is connected to the PTT input on the audio panel.

**2.1.11 PA POWER CONTROL – PINS 2 & 15 – DRY CONTACT**

All Configurations: Both pins are connected together through a dry relay contact when the A790 is switched on. These pins can be used to power up the PA system with either a control input on the amplifier (if supplied) or through another relay controlling the main power to the PA amplifier.

**2.1.12 PA POWER LEVEL MONITOR – PINS 5 – INPUT**

All Configurations: This input is specifically intended to be used as part of the power up test on the Powersonix PA systems. The pin should be left unconnected otherwise.

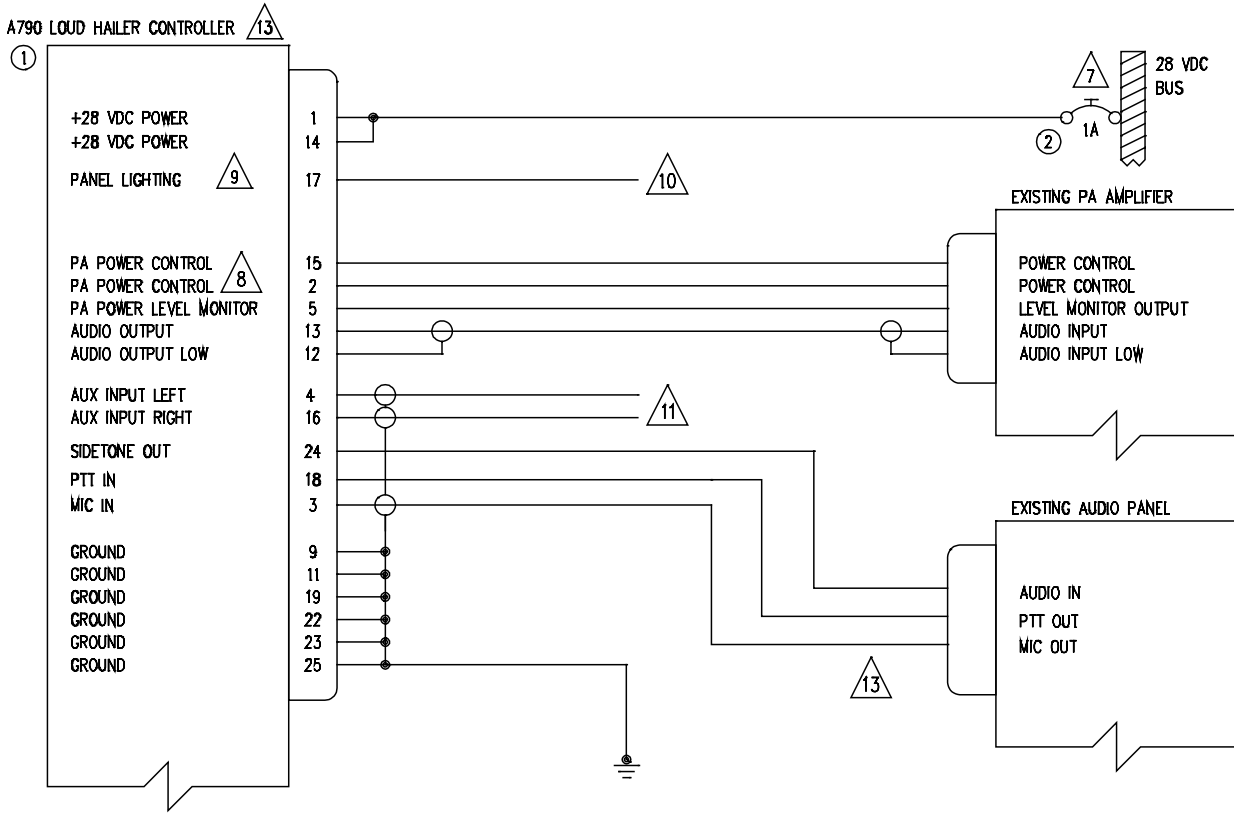
**2.1.13 SERIAL DATA – PINS 8 & 21**

Do not connect. For factory use only.

**2.1.14 CONTROL INPUT / OUTPUT – PINS 7 & 20**

Reserved. Do not connect. For factory use only.

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QTY	ITEM	PART NUMBER	DESCRIPTION	SPEC	MATERIAL
1	1	A790	LOUD HAILER CONTROLLER	TECHNISONIC INDUSTRIES LIMITED	
1	2	7274-11-1	CIRCUIT BREAKER, 1 AMP	KLIXON	

**NOTES:**

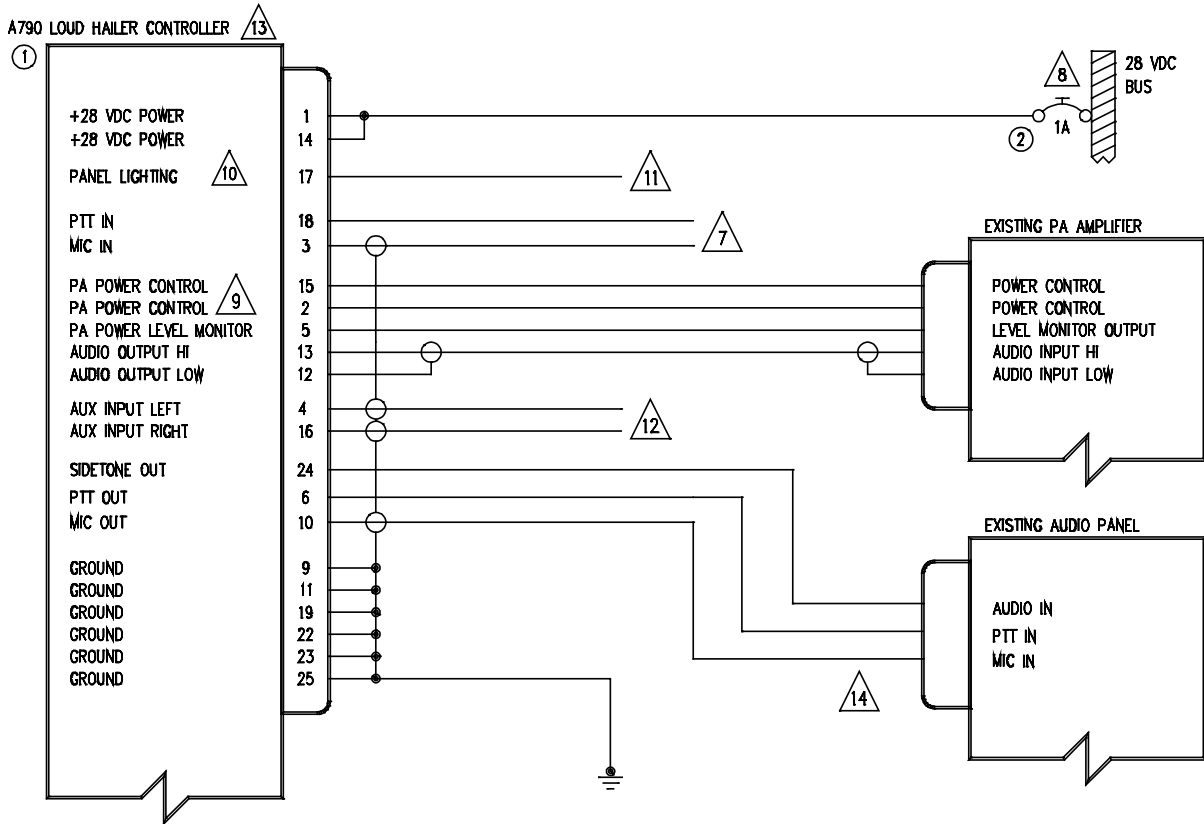
- 1) ALL WIRE IAW MIL-W-22759 UNLESS OTHERWISE SPECIFIED.
- 2) ALL CABLE IAW MIL-C-27500 UNLESS OTHERWISE SPECIFIED.
- 3) COAXIAL CABLE IAW MIL-C-17 UNLESS OTHERWISE SPECIFIED. DO NOT USE COAX WITH PVC INSULATION.
- 4) FABRICATION & INSTALLATION OF WIRING HARNESS IAW AC 43.13-1A CHAPTER 11, SECTION 3, PARA 445 TO 462 AND SECTION 7.
- 5) GROUNDING AND BONDING IAW AC 43.13-1A CHAPTER 11, SECTION 3, PARA 452.
- 6) ALL SINGLE WIRE TO BE #22 AWG MINIMUM AND ALL SHIELDED WIRE TO BE #24 AWG MINIMUM, UNLESS OTHERWISE SPECIFIED.

- 7) AN EQUIVALENT CIRCUIT BREAKER OR FUSE MAY BE USED.
- 8) THESE PINS CONNECT TOGETHER WHEN THE A790 IS SWITCHED ON AND ARE FLOATING WHEN THE A790 IS OFF.
- 9) THE A790 IS AVAILABLE WITH 28V OR 5V PANEL LIGHTING. SET THE CONFIGURATION FOR THE CORRECT VOLTAGE.
- 10) CONNECT TO THE APPROPRIATE AIRCRAFT DIMMING BUSS.
- 11) OPTIONAL AUXILIARY INPUTS CAN BE CONNECTED TO ANOTHER AUDIO SOURCE.
- 12) INSTALLATION OF A790 IAW AC 43.13-1A CHAPTER 2, SECTION 3 AND AC 43.13-2A, CHAPTER 2. PR 3 1/2 DZUS RAIL OR EQUIVALENT MAY BE USED.
- 13) CONNECT TO AN APPROPRIATE SPARE INPUT ON THE EXISTING AUDIO PANEL.

14) REFER TO THE AIRCRAFT STRUCTURAL REPAIR MANUAL AND THE MAINTENANCE MANUAL FOR INSTRUCTIONS AND INFORMATION PERTINENT TO THIS INSTALLATION.

**Figure 3: A790 Wiring – Configuration 1**

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QTY	ITEM	PART NUMBER	DESCRIPTION	SPEC	MATERIAL
1	1	A790	LOUD HAILER CONTROLLER	TECHNISONIC INDUSTRIES LIMITED	
1	2	7274-11-1	CIRCUIT BREAKER, 1 AMP	KLIXON	

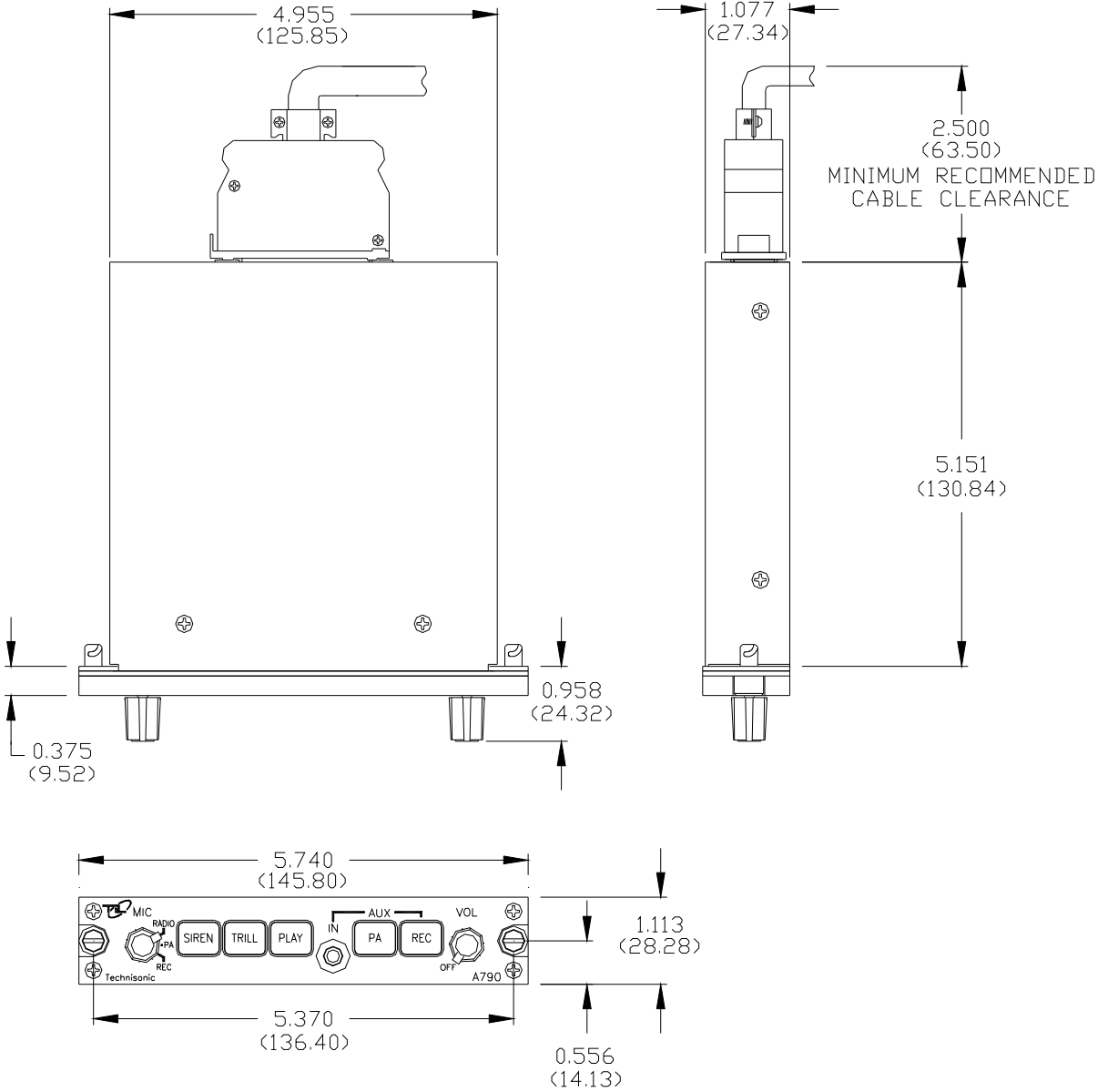
**NOTES:**

- 1) ALL WIRE IAW MIL-W-22759 UNLESS OTHERWISE SPECIFIED.
  - 2) ALL CABLE IAW MIL-C-27500 UNLESS OTHERWISE SPECIFIED.
  - 3) COAXIAL CABLE IAW MIL-C-17 UNLESS OTHERWISE SPECIFIED. DO NOT USE COAX WITH PVC INSULATION.
  - 4) FABRICATION & INSTALLATION OF WIRING HARNESS IAW AC 43.13-1A CHAPTER 11, SECTION 3, PARA 445 TO 462 AND SECTION 7.
  - 5) GROUNDING AND BONDING IAW AC 43.13-1A CHAPTER 11, SECTION 3, PARA 452.
  - 6) ALL SINGLE WIRE TO BE #22 AWG MINIMUM AND ALL SHIELDED WIRE TO BE #24 AWG MINIMUM, UNLESS OTHERWISE SPECIFIED.
- 7) CONNECT TO OPERATORS HEADSET MIC AND PTT.
- 8) AN EQUIVALENT CIRCUIT BREAKER OR FUSE MAY BE USED.
- 9) THESE PINS CONNECT TOGETHER WHEN THE A790 IS SWITCHED ON AND ARE FLOATING WHEN THE A790 IS OFF.
- 10) THE A790 IS AVAILABLE WITH 28V OR 5V PANEL LIGHTING. SET THE CONFIGURATION FOR THE CORRECT VOLTAGE.
- 11) CONNECT TO THE APPROPRIATE AIRCRAFT DIMMING BUSS.
- 12) OPTIONAL AUXILIARY INPUTS CAN BE CONNECTED TO ANOTHER AUDIO SOURCE.
- 13) INSTALLATION OF A790 IAW AC 43.13-1A CHAPTER 2, SECTION 3 AND AC 43.13-2A, CHAPTER 2. PR 3 1/2 DZUS RAIL OR EQUIVALENT MAY BE USED.
- 14) CONNECT TO AN APPROPRIATE SPARE INPUT ON THE EXISTING AUDIO PANEL.
- 15) REFER TO THE AIRCRAFT STRUCTURAL REPAIR MANUAL AND THE MAINTENANCE MANUAL FOR INSTRUCTIONS AND INFORMATION PERTINENT TO THIS INSTALLATION.

**Figure 4: A790 Wiring – Configuration 2**

2.2 MECHANICAL INSTALLATION

The A790 is designed to mount in a standard 5.75" DZUS rail rack. See Figure 5 for physical dimensions. Ensure sufficient room for connector and cable clearance.



DIMENSIONS: INCHES  
(mm)

Figure 5: A790 Outline Drawing

## SECTION 3: CONFIGURATION

The A790 PA controller has several parameters that may be set to tailor the system for the specific installation. These may be performed on the bench before installation or in-situ after the installation.

The A790 can be placed into configuration mode allowing four different system features to be configured as follows:

1. **Backlight Voltage Select:** The backlighting voltage can be set for either a 5 VDC or 28 VDC lighting bus.
2. **Amplifier Test:** The A790 can be set to provide a 3 second test tone to the PA amplifier, read back an output level, and temporarily display the results whenever the A790 is switched on.
3. **Side Tone Level:** The side tone audio level (audio level fed to the user headset when they are talking) can be set by the volume knob and the setting can then be stored in memory.
4. **Load SIREN & TRILL wav Files:** This is a factory use function. No harm will occur if you accidentally invoke this function. To exit this feature, simply power off the unit and start again.

### 3.1 INVOKING CONFIGURATION MODE

To invoke the configuration mode, begin with the unit OFF, press and hold the SIREN, TRILL and PLAY keys simultaneously, turn on the A790, and then release the keys.

In configuration mode, the front panel buttons are re-mapped to activate different configuration functions.

### 3.2 SELECT BACKLIGHT VOLTAGE – (SIREN)

When in configuration mode, the SIREN button is re-mapped to toggle the Backlight Voltage: 5 VDC or 28 VDC. The button is ON for 28V and OFF for 5V.  
Factory default: 28V.

For backlight operation, please see Section \_\_\_ of the A790 Operating Instructions (Technisonic document 09RE409).

### 3.3 SELECT PA AMPLIFIER TEST – (TRILL)

When in configuration mode, the TRILL button is re-mapped to toggle the PA Test Tone: enabled or disabled. The button is lit for enabled and unlit for disabled. Factory default: disabled.

When enabled, the unit will produce a three second test tone each time the unit is powered up.

When the Amp Test is running, the relative power is indicated by a simple 'bar graph' created by controlling the button lighting. The indicator runs from left to right and each button lit corresponds to 0.25V at the Amp Test input.

As of this writing, only the PowerSonix PA systems provide the input needed to implement this feature. The PowerSonix PA systems indicate power output of 300W for each 250mV generated. See the PowerSonix documentation for your PA system for current information.



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**NOTE:** If you configured Amp Test to be enabled, it will run every time the unit is powered up. Additionally, if you exit via the “REC” button, the Amp Test will immediately begin.

**CAUTION:** Depending on the pass band of the speakers used, the test tone may be LOUD – ensure all affected personnel have adequate hearing protection. Do not operate in an enclosed space.

### 3.4 SET SIDETONE LEVEL – (PLAY)

When in configuration mode, the PLAY button is re-mapped to select or store the sidetone level set by the volume knob. When the button is lit, the level can be set. When the button is toggled to unlit, the setting will be stored in memory.

Turn the unit off when complete and turn on again for normal use.

### 3.5 SELECT WAV FILE LOADER – (PA) (FACTORY USE ONLY)

When in configuration mode, the PA button is re-mapped to start the wav file loader. The button is lit when the wav file loader is running.

All functions of the wave file loader are controlled via an externally connected computer; thus, no harm will occur if you accidentally invoke this function. To exit this feature, simply power off the unit and start again.

**NOTE:** This is NOT a user function.

### 3.6 EXIT CONFIGURATION MODE – (REC)

You can exit configuration mode at any time by turning off the power to the unit.

When in configuration mode, the REC button is re-mapped to exit the configuration mode. Pressing the REC button will exit the configuration mode immediately.

**CAUTION:** If you configured Amp Test to 'enabled' and you exit configuration mode via the 'REC' button, it will immediately begin the Amp Test.

## SECTION 4: POST-INSTALLATION TESTS

These tests are run to check that each feature of the A790 is functioning properly, and to confirm there is no interference from or to other equipment in the aircraft. Ensure you have a copy of the Operating Instructions for reference.

**CAUTION:** Do Not Operate in Enclosed Areas. Ensure that all affected personnel have adequate hearing protection.

### 4.1 INITIAL CONFIGURATION

If the unit has been pre-configured on the bench before installation, then skip this step; otherwise, enter configuration mode.

Refer to section 3 for details and configure:

- **Backlight Voltage** for 5 VDC or 28 VDC lighting bus as applicable. Vary lighting bus across the full range to ensure operation as follows:

At low voltage (approx. 0), the lighting should be full ON (daylight mode) (MOD2 and higher).

At some point just above 0V, the lighting should turn off and then track the lighting bus voltage up to maximum.

- **Sidetone Level** set as required for installation.

- **Select Amplifier Test** as required for installation.

Exit the Configuration Mode

**NOTE:** If you have set the Amplifier Test to ENABLED, it will immediately begin if you use the “REC” button to exit. The Amplifier Test will not run if you power off the device but will run at the next power on.

If you are unaware of the response of your system to the test tone, then ensure that all affected personnel have adequate hearing protection before running the Amplifier Test.

### 4.2 EXTERNAL AUDIO OPERATION

Check to be sure externally generated audio (main and aux) operation is correct – according to the operating instructions - including all routing and PTT control.

#### 4.2.1 MAIN MIC AUDIO

For each setting of the front panel 'MIC' switch, check that audio is routed as expected and that sidetone audio is operating as expected.

Check that audio may be recorded and played back as expected.

#### **4.2.2 AUX AUDIO**

If AUX audio is to be used, whether microphone audio or some other audio device, check to ensure that audio is routed accordingly as expected from the front panel AUX input.

Check that audio may be recorded and played back as expected.

#### **4.3 INTERNALLY GENERATED AUDIO OPERATION**

Check to be sure internally generated audio (SIREN and TRILL) operation is correct including all routing and PTT cancelling of the function.

**SECTION 5: APPENDICES**

**APPENDIX A – TECHNICAL CHARACTERISTICS**

Characteristic	Specification
Dimensions (W x H x D)	Approx. 5.75 x 1.11 x 5.15 inches 136.5 x 28.3 x 130.8 mm
Weight	Approx. 0.85 lbs 0.375 kg
Mounting	Panel Mount via DZUS fasteners
Display Color	Green (NVG compatible)
Temperature Range: Operating Storage	-45° C to +70° C -55° C to +85° C

**Table 2: A790 – General Characteristics**

Parameter	Value			Unit
	Min.	Typ.	Max.	
<b>Power Input</b>				
Voltage	12	28	36	VDC
Current	70	140	200	mA
<b>Audio Input</b>				
Main Mic	100mV	1.5V	4.5V	V <sub>PP</sub>
Aux <sup>1</sup> Mic	450mV	1.5V	4.0V	V <sub>PP</sub>
Aux <sup>1</sup> Music	150mV	1.5V	3.0V	V <sub>PP</sub>
<b>Audio Outputs</b>				
PA: Pre-Recorded (SIREN, TRILL)	45mV	500mV	2.00V	V <sub>PP</sub>
PA: User Recorded Level	45mV	500mV	2.00V	V <sub>PP</sub>
PA: Mic Audio	60mV	550mV	2.15V	V <sub>PP</sub>
SIDETONE Level	50mV	4.0V	9.00V	V <sub>PP</sub>
RADIO Level	60mV	1.5V	4.30V	V <sub>PP</sub>

<b>Backlight Operation</b>			
Bus Voltage	Full On	Variable	Unit
28	0 - 0.25	0.25 - 28	VDC
5	0 - 0.25	0.25 - 5	VDC

**Table 3: A790 – Operational Characteristics**

<sup>1</sup> Aux input levels for Mic or Music are dependent upon Option selected (see Section 1.2).

**TECHNISONIC INDUSTRIES LIMITED**

**APPENDIX B – CERTIFICATION SUMMARY**

The following table gives a summary of DO-160G environmental testing for the Technisonic Model A790, Lout Hailer PA controller.

<b>Conditions</b>	<b>Section</b>	<b>Category</b>	<b>Comments</b>
Temperature and Altitude	4.0	B2, D1	
Low Temp Survival	4.5.1		-55° C
Low Temp Operating			-45° C
High Temp Survival	4.5.2		+85° C
High Temp Short Time Operating			+70° C
High Temp Operating	4.5.3		+70° C
Altitude	4.6.1		50,000 feet
Decompression	4.6.2		50,000 feet
Overpressure	4.6.3		-15,000 feet
Temperature Variation	5.0	B	+/- 5° C/minute
Operational Shocks and Crash Safety	7.0		Tested for Standard Operational Shocks and Crash Safety. Test number 2 series was performed using static weights
Vibration	8.0		Equipment tested without shock mounts
		B	Random Vibration – Curve B
		M	Sinusoidal Vibration – Curve M
		N	Sinusoidal Vibration – Curve N
Magnetic Effect	15.0	Z	Distance result: 0.07m
Power Input	16.0	B	Testing included subparagraph 16.5.2.3b: Requirement for Equipment with Digital Circuits
Voltage Spike	17.0	B	
Audio Frequency Conducted Susceptibility	18.0	B	
Induced Signal Susceptibility	19.0	A	
RF Emission	21.0	Z	

**Table 4:** Summary of DO-160G Environmental Testing

## TECHNISONIC INDUSTRIES LIMITED

### **Technisonic Industries Limited**

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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 aircraft. 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 on-line  
Warranty Registration Form found at [www.til.ca](http://www.til.ca).**