



ASM-BAA01-001

Bluetooth Audio Accessory



INSTALLATION AND OPERATION MANUAL

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Section 1.0 Description

1.1 Introduction

Information in this section consists of product description, design features and specifications for the BAA01-001 Bluetooth® Audio Accessory, herein subsequently referred to as the BAA01.

Review all notes, warnings, and cautions.

1.2 Product Description

The BAA01 Bluetooth Audio Accessory is a panel mount unit which adds a Bluetooth wireless audio connection to an existing avionics, audio, PA or loudspeaker system. The BAA01 supports music/call audio using the built-in Bluetooth audio profiles. The power, pairing and link status is provided by built-in front panel LED annunciators. Control and volume of the Bluetooth audio playback can be adjusted using the BAA01's built in front panel volume knobs. Figure 1: BAA01 Product Photo shows the front of the BAA01 and the front facing user controls that are applicable to each Bluetooth user.

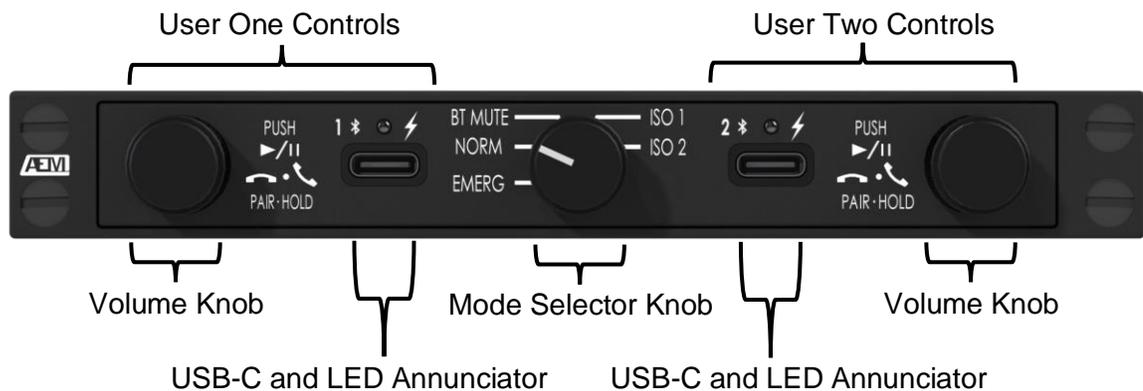


Figure 1: BAA01 Product Photo

1.3 Design Features

The BAA01 is able to accommodate two simultaneous Bluetooth users with each user having individual paired devices and volume control. Each Bluetooth user's phones output is factory configured to use stereo audio but can be individually configured in the field to utilize mono audio. The volume knob can be used to adjust the volume of a Bluetooth user, answer/end phone calls, start/stop audio playback, control a virtual assistant (Siri®, Google®, Alexa®, etc..) and connect to a Bluetooth device. The status of each Bluetooth user is shown by a dedicated multicolour LED annunciator that is integrated into the front panel.

By using the mode selector knob in the center of the BAA01, the BAA01 can be placed into 5 different modes of operation: EMERG, NORM, BT MUTE, ISO 1, ISO 2. Using these modes, the audio from the Bluetooth users can be set to mute audio, isolate call audio from the audio controller or alter the audio routing to bypass the BAA01 circuitry.

The BAA01 can be connected to compatible audio controllers or peripheral controllers.

To support various installation configurations, the BAA01 is equipped with the following audio features:

- a) Factory configured stereo headphone output and configurable for mono operation.
- b) Mono microphone input with built in microphone bias and a buffered microphone output. This supports passthrough of cabin microphone audio.
- c) Mono phones input that is summed with the configurable sidetone and Bluetooth audio which is presented on the phone output.
- d) Field accessible maintenance mode to adjust audio levels and select mono/stereo headphones output.
- e) Two front facing USB-C ports and one rear USB connection (must be manually wired) for device charging.
- f) All legends on the BAA01 are backlight with IPL white. Brightness control is achieved by varying the voltage on the appropriate lights input (5V or 28V).
- g) Dedicated artificial sidetone key for each Bluetooth user to provide sidetone when the audio controller does not provide sidetone.

1.4 Specifications

1.4.1 Electrical Specifications

1.4.1.1 Power Requirements:

Idle:	0.4 A Max. @ +28.0 Vdc
Maximum:	2.6 A Max. @ +28.0 Vdc
Lighting:	10 mA Max. @ +28.0 Vdc
	10 mA Max @ +5.0 Vdc

1.4.1.2 Input Operating Voltage:

Normal Operating Conditions

Maximum Operating Voltage:	+30.3 Vdc
Nominal Operating Voltage:	+28.0 Vdc
Minimum Operating Voltage:	+22.0 Vdc
Emergency Operating Voltage:	+18.0 Vdc

Abnormal Operating Conditions

Maximum Operating Voltage:	+32.2 Vdc
Nominal Operating Voltage:	+28.0 Vdc
Minimum Operating Voltage:	+20.5 Vdc

1.4.1.3 Frequency Range:

Microphone Outputs	≤ 3 dB roll-off from 300 to 6000 Hz
Phones Output:	≤ 3 dB roll-off from 300 to 6000 Hz

1.4.1.4 Input Signals:

Microphone Input:	Quantity:	2
	Mic Type:	Amplified dynamic/electret
	Circuit Type:	Single-ended
	Rated Level:	250 mVrms
	Impedance:	150 Ω ± 10%
	Mic Bias:	+12Vdc min
Phones Input:	Quantity:	2
	Rated Level:	6.12 Vrms ± 10 %
	Circuit Type:	Single-ended
	Impedance:	1 kΩ ± 10 %

Discrete Inputs

Maintenance Mode Input:	Quantity:	1
	Trigger Level:	Ground (active low), 1 Vdc max
	Current In:	≤ 5 mA
ART S/T Key:	Quantity:	2
	Trigger Level:	Ground (active low), 1 Vdc max
	Current In:	≤ 5 mA

Note: If artificial sidetone is not available from the audio controller, utilize the BAA01 keyline (ART S/T Key) to produce sidetone back to the user's headset. Only use (ART S/T Key) when speaking on a cellular call.

1.4.1.5 Output Signals:

Microphone Output:	Quantity:	2
	Circuit Type:	Single-ended
	Rated Level:	250 mVrms ± 15%
	Rated Load:	150 Ω ± 10 %

Phones Output:	Quantity:	2
	Circuitry Type:	Single-ended, stereo or dual mono (configurable)
	Rated Level:	6.12 Vrms \pm 10 %
	Load Impedance:	150 Ω \pm 10 %

Discrete Outputs

Rear USB Annunciator Output :	Quantity:	1 (User 1 only)
	Trigger Level:	Ground (active low)
	Output Active:	\leq 1 Vdc
	Current Out:	350 mA maximum

USB

Charging USB Type C:	Quantity:	2 (User 1 & 2, front panel)
Charging USB 2.0:	Quantity:	1 (Wired from rear connector)

1.4.2 Physical Specifications

Mounting Attitude:	Any
Mounting Method:	Narrow Dzus blade mount with four fasteners.
Faceplate:	Type VII per SAE AS7788, laser engraved acrylic, IPL white colour.
Length:	5.45 in (138 mm) Max. (behind panel, not including connector)
Width:	4.90 in (125 mm) Max. (behind panel)
Height:	0.750 in (19.1 mm) Max.
Weight:	1.0 lb (0.45 kg) Max.
Connectors:	Male 62 pin high density D-subminiature with V5 locking tabs.
Material/Finish:	Chassis and cover are 5052-H32 brushed aluminium with clear coating finish MIL-DTL-5541 Type II Class 3.
Bonding Resistance:	\leq 2.5 m Ω from the rear connector metal housing to any part of the BAA01 metal enclosure.

1.4.3 Environmental Parameter - RTCA/DO-160G

Temperature:	-20 to +70 °C (Operating) -55 to +85 °C (Survival) -40 to 70 °C (Short Time Operating)
Altitude:	+35,000 ft (+10,700 m)
Humidity:	95% RH for 48 hrs
Operational Shocks:	6 g for 11 ms in all axes
Crash Safety:	20 g for 11 ms (impulse), 20 g for 3 s (sustained)
Vibration:	Cat. U2 Profiles F & F1
Magnetic Effect:	Deflection of 1°: 0 < D ≤ 0.3m

Qualification of the BAA01-001 Bluetooth Audio Accessory was completed in accordance with:

DO-160G Env. Cat [C4]-[S2]AB[U2]XXXXXXXXZ[BXX]AB[ACX]XM¹XXXAX²

1.5 Product Approval/Certification

Qualification to the Radio Technical Commission for Aeronautics (RTCA) documents DO-214A and DO-160G, as applicable.

The Bluetooth module BM64C2 (BM64SPKS1MC2 Class 2) which is used in the BAA01 has received regulatory approval for the following:

- Notes:**
1. The BAA01 currently only possess label markings from FCC and ISED on the product.
 2. While the BM64C2 Bluetooth module has received regulatory approval for the following, the BAA01-001, has not been tested for the following regulatory approvals.

BT SIG/QDID:	110148
United States/FCC ID:	A8TBM64S2
Canada/ISED:	IC:12246A-BM64S2 HVIN: BM64SPKS1MC2
Europe/CE	CE
Japan/MIC:	005-101205

¹ BAA01 is not qualified to Sec 21.5 Radiated RF, only Sec 21.4 Conducted RF.

² BAA01 is compliant with the requirements of Fire Protection 14 CFR FAR 23.853.

Korea/KCC: MSIP-CRM-mcp-BM64SPKS1MC2
 Taiwan/NCC No: CCAN16LP0280T8
 China/SRRC: CMIIT ID: 2016DJ2356
 Brazil/ANATEL: 03822-18-08759

As per regulatory requirements, the statements in section 1.5.1- 1.5.8 have been included in this manual.

1.5.1 United States - FCC

Contains FCC ID: A8TBM64S2 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.

1.5.1.1 Approved Antenna Information

Parameter	Values
Frequency	2400 MHz to 2480 MHz
Peak Gain	1.927 dBi
Efficiency	73.41%

Table 1: BM64 PCB Antenna Characteristics

Parameter	Values
Frequency	2.402 GHz to 2.480 GHz
Receiver Sensitivity	-90 dBm (2 Mbps EDR)
Output Power	+2 dBm typical

Table 2: RF/Analog Characteristics

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

1.5.2 Canada - ISED

This device contains license-exempt transmitters)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS (s). Operation is subject to the following two conditions:

- This device may not cause interference;
- This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- L'appareil ne doit pas produire de brouillage;
- L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter [IC: 12246A-BM62S2, IC: 12246A-BM64S1 and IC: 12246A-BM64S2] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed in § 1.5.1.1 Approved Antenna Information with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio [IC: 12246A-BM62S2, IC: 12246A-BM64S1 and IC: 12246A-BM64S2] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés § 1.5.1.1 Approved Antenna Information et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

1.5.3 Europe - CE

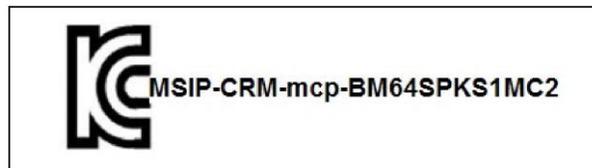
Certification	Standards	Article
Safety	EN 62368	3.1a
Health	EN 62311	
Electro Magnetic Compatibility (EMC)	EN 301 489-1	3.1b
	EN 301 489-17	
Radio	EN 300 328	3.2

Table 3: European Compliance

1.5.4 Japan - MIC



1.5.5 Korea - KCC



1.5.6 Taiwan - NCC



注意！

依據 低功率電波輻射性電機管理？法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

1.5.7 China - SRRC

This device contains SRRC approved Radio module CMIIT ID 2016DJ2356

CMIIT ID: 2016DJ2356

1.5.8 Brazil - ANATEL



Este producto contém a placa Modelo BM64SPKS1MC2 código de homologação ANATEL 03822-18-08759.

1.6 Product Limitations

- a) As per FCC regulations stated in Title 47 CRF § 22.925 Prohibition on airborne operation of cellular telephones:

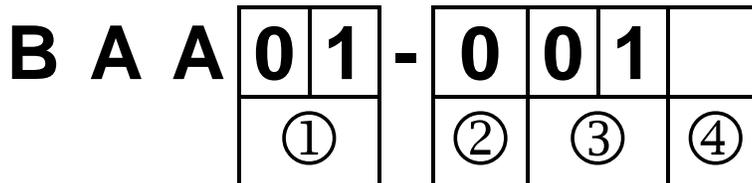
Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones on board that aircraft must be turned off. The following notice must be posted on or near each cellular telephone installed in any aircraft:

“The use of cellular telephones while this aircraft is airborne is prohibited by FCC rules, and the violation of this rule could result in suspension of service and/or a fine. The use of cellular telephones while this aircraft is on the ground is subject to FAA regulations.”

- b) Maximum recommended cable length between BAA01 rear charging pins and connected chargeable device is 4.9 ft [1.5 m].
c) Maximum recommended cable length between BAA01 front panel charging ports and connected chargeable device is 3.3 ft [1.0 m].

1.7 Product Identifier Description

The product part number is defined as follows:



- ① System Identifier [0-99]:
01: Base System
- ② Major Derivative Identifier [0-9]:
0 = Base System
- ③ Minor Derivative Identifier [0-99]:
00: Base System with all functionality enabled.
01: VOX functionality and I/O pins for remote control are unavailable.
- ④ Feature Character:
N: NVIS Compatible Lighting.
Blank: No additional features.

End of Section 1.0

Section 2.0 Installation

2.1 Introduction

Information in this section consists of unpacking and inspection procedures, installation procedures, post-installation checks, and installation drawings.

2.2 Unpacking and Inspection

Unpack the equipment carefully. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each unit should have the following:

- a) BAA01-001
- b) Acceptance Test Report
- c) Certificate of Conformity or Release Certification

Verify that all items are present before proceeding and report any shortage immediately to your supplier.

2.3 Installation Configurations

The BAA01 can be interfaced with several audio devices; this document will only reference common installation use cases between the BAA01 and an audio controller. These installation cases for section 2.3.1 and 2.3.2. are shown in the interconnect drawing at the end of this section.

The behaviour of the BAA01 listed in this section is applicable when the BAA01 is in the Normal mode of operation. For further information specifying the operation of the BAA01 in different modes of operation, reference Section 3.3 Modes of Operation.

2.3.1 BAA01 In-Line between the Headset and Audio Controller

This use case is best suited to be able to select the BAA01 audio directly via the BAA01 while maintaining headset audio with the audio controller. In this configuration the BAA01 controls the summed audio of the audio controller and the connected Bluetooth device. Figure 2: BAA01 In-Line between the Headset and Audio Controller shows the basic audio routing path in this installation configuration.

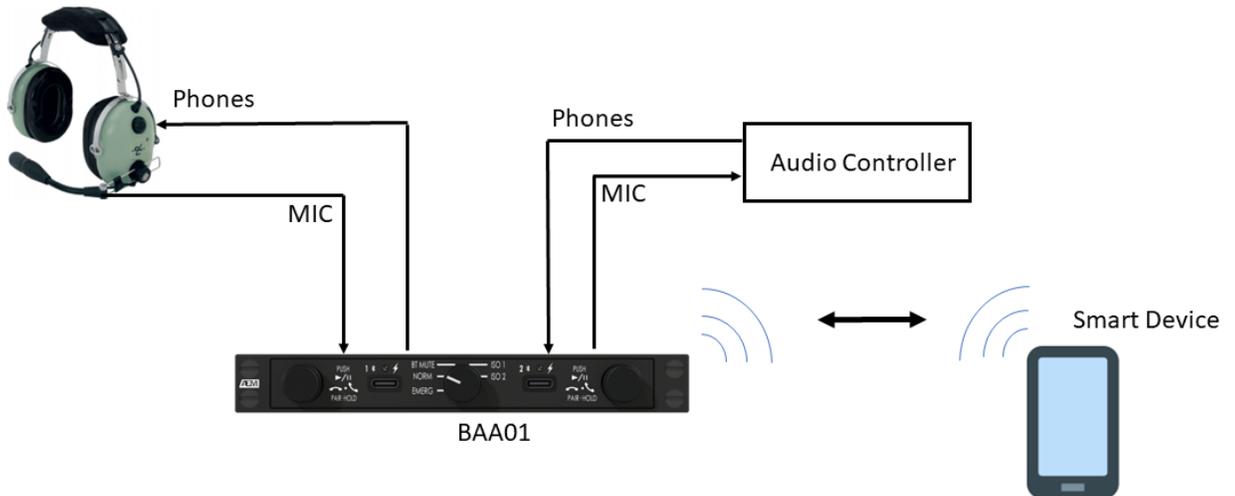


Figure 2: BAA01 In-Line between the Headset and Audio Controller

The following statements apply when the BAA01 is installed in this configuration:

- a) The BAA01 Bluetooth audio is mixed with the audio from the audio controller and presented on the headphones.
- b) Cellular calls from the connected smart device can be made and accepted.
- c) If the audio controller does not have ICS sidetone (artificial sidetone) to the headsets, the user must use the ART Sidetone Key when speaking on the smart device phone to hear themselves during cellular calls.

2.3.2 BAA01 Installation in a Transceiver Position of the Audio Controller

This use case is best suited when it's desired to force the selection of a transceiver position on the audio controller to use the smart device. In this configuration the Bluetooth audio can only be heard on the headphones if the audio controller is set to route the Bluetooth audio to the headphones. This can be accomplished with the transceiver selection or a switched receive selection for listen only. This use case is best suited when the smart device audio must be controlled by the audio controller. Each BAA01 user requires a transceiver position. Figure 3: BAA01 in a Transceiver Position shows the audio routing path in this installation configuration.

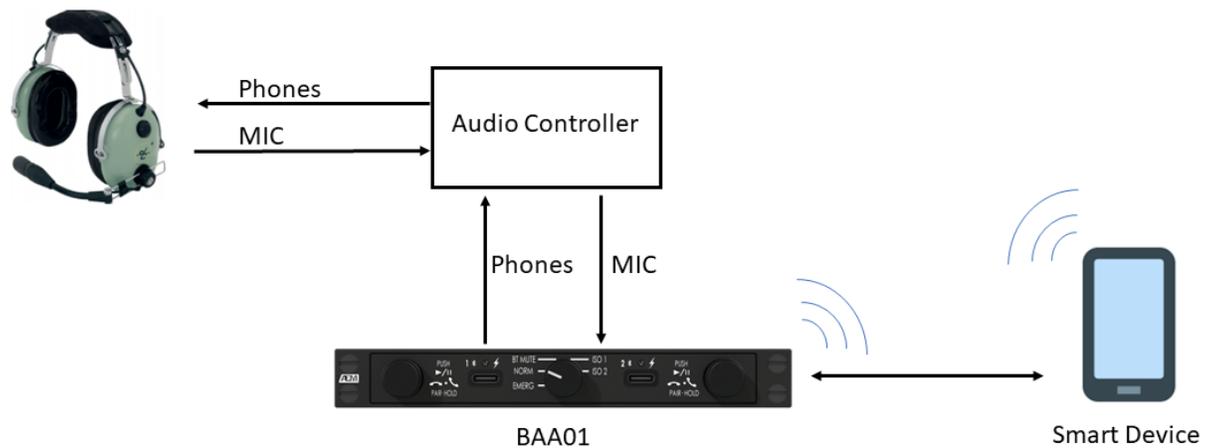


Figure 3: BAA01 in a Transceiver Position

The following statements apply when the BAA01 is installed in this configuration:

- Bluetooth audio is routed to the audio controller.
- The BAA01 must have a designated position on the audio controller's selector for each Bluetooth user.
- Cellular calls from the connected smart device can be made and accepted.
- If the audio controller does not have ICS sidetone (artificial sidetone) to the headsets the user must use the ART Sidetone Key when speaking on the smart device phone to hear themselves during cellular calls.

2.3.3 BAA01 Multi-Unit Installation

When three or more Bluetooth users are required in an aircraft, it is possible to utilize the in-line between headset and audio controller interface for as many headsets as the audio controller can support. Figure 4: Multiple BAA01 to Audio Controller shows the installation configuration where cockpit and cabin headphone users are separated by using dedicated BAA01 devices.

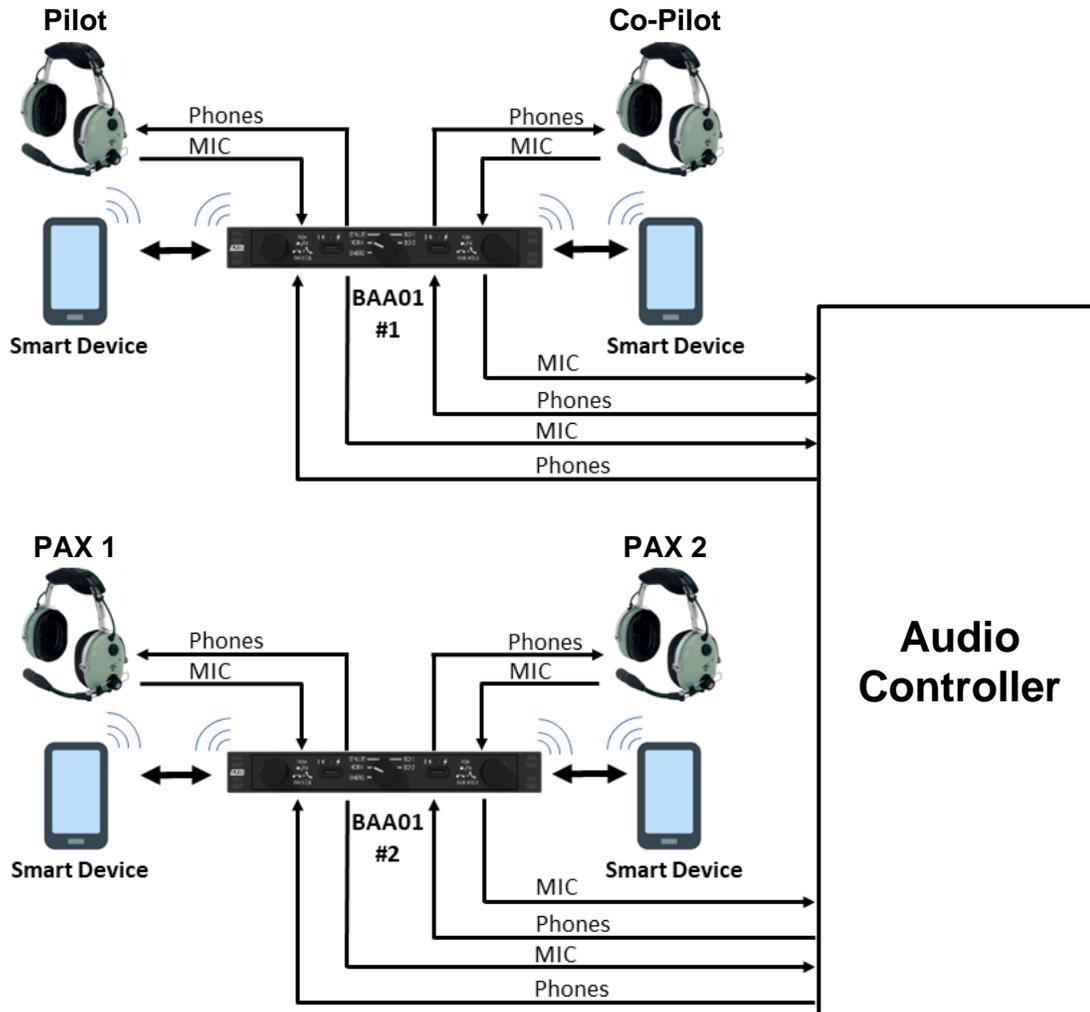


Figure 4: Multiple BAA01 to Audio Controller

2.4 Warranty

Please refer to the standard product warranty conditions available on our website, www.aem-corp.com

2.5 Installation Procedure

2.5.1 Warnings

WARNING:

High volume settings can cause hearing damage. Set the headset volume control to the minimum volume setting prior to conducting tests, and slowly increase the headset volume to a comfortable listening level.

2.5.2 Cautions

CAUTION:

Verify all airframe connections are checked against the Interconnect drawing listed in Section 2.10 Installation Drawings

2.5.3 Cabling and Wiring

All wire shall be selected in accordance with the original aircraft manufacturer's Maintenance Instructions or AC43.13-1B Change 1, Paragraphs 11-76 through 11-78. Unshielded wire types shall qualify to MIL-W-22759 as specified in AC43.13-1B Change 1, Paragraphs 11-85, 11-86, and listed in Table 11-11. For shielded wire applications, use Tefzel MIL-C-27500 shielded wire with solder sleeves (for shield terminations) to make the most compact and easily terminated interconnect. Follow the Interconnect drawing in Section 2.10 Installation Drawings as required.

Allow 3" from the end of the shielded wiring to the shield termination to allow the connector hood to be easily installed. Refer to the Interconnect drawing in Section 2.10 Installation Drawings for shield termination details. Aircraft harnessing shall permit the unit to be removed for easy access to all adjustments.

Maintain wire segregation and route wiring in accordance with the original aircraft manufacturers maintenance instructions.

Unless otherwise noted, all wiring shall be a minimum of 24 AWG, except power and ground lines, which shall be a minimum of 22 AWG. Reference the Interconnect drawing in Section 2.10 Installation Drawings for additional specifications. Check that the ground connection is clean and well secured, and that it shares no path with any electrically noisy aircraft accessories such as blowers, turn and bank instruments or similar loads.

Power to this unit must be supplied from a separate circuit breaker or fuse (fast blow), and not attached to any other circuit breaker without additional protection. Verify that the selected circuit breaker size and wire gauge are adequate for the installation using the techniques specified in AC43.13-1B Change 1, Paragraphs 11-47 through 11-51 and 11-66 through 11-69.

2.5.4 Pre-Installation Checks

Do not connect the BAA01 to the wiring harness until the following conditions are met.

Referencing the Interconnect drawing in Section 2.10 Installation Drawings, check the following:

- a) Check P100 pins 20 or 42 for specific lighting bus voltage relative to lights ground P100 pin 19 or 41.
- b) Check P100 pins 21 for +28 Vdc relative to power ground P100 pins 19, 41.
- c) Check P100 pins 19 and 41 for continuity to ground (less than 0.5 Ω).
- d) Check all other connections to ensure that there are no unintended shorts or opens.

2.5.5 Bonding

If required, bonding is normally achievable through the mounting points during installation of the product using conductive hardware. If the hardware and/or mounting location/surface is non-conductive, then the use of a bonding strap to an airframe ground point is required. The bonding strap should be as short as possible. If the product finish is non-conductive, it is recommended to remove the finish around one of the mounting points. Treat the exposed metal areas with a protective, conductive coating.

The use of a milli-ohmmeter is recommended to verify bonding. Reference AC43.13-1B Change 1, Section 15 for additional information.

Refer to section 1.4.2 Physical Specifications for the maximum allowed resistance and the measuring points.

2.5.6 Post-Installation Checks

Ensure all connectors are tight and the mechanical installation is sound. Power up the aircraft's systems and confirm normal operation of all functions of the BAA01. Refer to Section 3 Operation for specific operational details.

- a) With the mode selector knob set to NORM, ensure the audio controller and headset audio pass through in both directions without Bluetooth on.
- b) Ensure both Bluetooth users volume adjustments, play/pause, and phone connection are operational.
- c) Ensure full backlighting adjustability.
- d) Ensure operation of the automatic emergency mode by pulling the breaker connected to the BAA01 to simulate emergency aircraft voltage. Ensure the Phones IN and MIC Out is routed from the audio controller to the headset.
- e) Ensure operation of the manual Emergency mode by adjusting the mode selector knob to EMERG. Ensure the Phones IN and MIC Out is routed from the audio controller to the headset.
- f) Ensure the rear USB connection can charge a USB device (if wired).

Note: Unusual buzzes, hums or other background audio are symptomatic of multiple grounds, or noisy external systems such as blowers or pumps sharing wiring with the audio system.

Upon satisfactory completion of all performance checks, make all required logbook entries, electrical load, weight and balance amendments and other documentation as required by your local regulatory agency before releasing the aircraft for service.

2.6 Adjustments and Connections

The BAA01 is shipped from the factory with all internal adjustments set to the normal audio levels. Some audio levels can be adjusted using the maintenance mode. Further information exists in section 3.5 Maintenance Mode.

2.7 Accessories Required but Not Supplied

Installation kit BAA01-IKC (crimp) is required to complete the installation. The kit consists of the following:

Qty	Description	Manufacturer	Mfr Part #	AEM Part #
1	D-Sub, Socket, 62 Crimp Housing	CONEC	164x11979x	120-21-005
62	Contact, Female, HD	ITT	031-1147-000	20-26-703
1	Hood, Metal	CONEC	165X11689X	20-28-005
1	D-Sub, Clamp	CONEC	160X1189XE	20-27-008
2	Shorting Block, 2-Pin, 0.100" Spacing	TE Connectivity	881545-1	120-48-002*

* Not required for installation unless maintenance mode function changes are needed. See section 3.5 Maintenance Mode. Only one shorting block is required to perform this function, a second is supplied as a courtesy. A similar part may also be used.

2.8 Airworthiness Approval

Airworthiness approval of the BAA01-001 may require completion of a TCCA Major Modification Report per CAR STD (AWM) 571 Appendix L, or a FAA Form 337. The sample wording for a description of the work is provided to assist the Installing Agency in preparing Instructions for Continued Airworthiness (ICA) when installing an Anodyne Electronics Manufacturing Corp BAA01-001 Bluetooth® Audio Accessory. This sample may be modified appropriately for new installations. It is the installer's responsibility to determine the applicability of the method used. Installations performed outside Canada must follow the applicable aviation authority's regulations.

Sample Wording:

Installing an Anodyne Electronics Manufacturing Corp BAA01-001 Bluetooth® Audio Accessory in [aircraft location].

Installed in accordance with this BAA01-001 Operation and Installation Manual, Revision [], and AC 43.13-2, Chapters 2, and 3.

The BAA01-001 interfaces with existing aircraft systems per the instructions in this Installation and Operation Manual.

This BAA01-001 Installation and Operation Manual provides detailed installation instructions and wiring diagrams (Section 2.10).

Power is supplied to the BAA01-001 through an []-Amp circuit breaker.

Aircraft equipment list, weights and balance amended. Compass compensation checked and found to conform to applicable regulations.

2.9 Instructions for Continued Airworthiness

Maintenance of the BAA01 is 'on condition' only. Periodic maintenance of this product is not required. The following sample Instructions for Continued Airworthiness (ICA) provides assistance in preparing ICA for the Anodyne Electronics Manufacturing Corp BAA01-001 unit installation as part of a Type Certificate (TC) or Supplemental Type Certificate (STC) project to comply with CAR STD (AWM) 523/527/525/529.1529 or FAR 23/25/27/29.1529 "Instructions for Continued Airworthiness". Items that may vary by aircraft make and model are shown in brackets ("[]") and should be filled in as appropriate. Some of the checklist items do not apply, in which case they should be marked "N/A" (Not Applicable).

Section	Item	Description
1	Introduction	<p>[Aircraft that has been altered: Registration number, Make, Model and Serial Number]</p> <p><u>Content, Scope, Purpose and Arrangement:</u> This document identifies the Instructions for Continued Airworthiness for an Anodyne Electronics Manufacturing Corp BAA01-001 installed in an [aircraft make and model].</p> <p><u>Applicability:</u> Applies to an Anodyne Electronics Manufacturing Corp BAA01-001 installed in an [aircraft make and model].</p> <p><u>Definitions/Abbreviations:</u> None, N/A.</p> <p><u>Precautions:</u> None, N/A.</p> <p><u>Units of Measurement:</u> None, N/A.</p> <p><u>Referenced Publications:</u> BAA01-001 Installation and Operating Manual STC/TC # [applicable STC/TC number for the specific aircraft installation]</p> <p><u>Distribution:</u> This document should be a permanent aircraft record.</p>
2	Description of the System/ Alteration	Anodyne Electronics Manufacturing Corp BAA01-001 Bluetooth® Audio Accessory which adds a Bluetooth wireless audio connection to an existing avionics system [include equipment/systems as appropriate]. Refer to Section 2.10 of this manual for interconnect information. Refer to aircraft manufacturer approved interconnect for actual installation.
3	Control, Operation Information	Refer to Section 3 of this manual.
4	Servicing Information	N/A
5	Maintenance Instructions	Maintenance of the BAA01-001 is 'on condition' only. Periodic maintenance is not required.
6	Troubleshooting Information	Refer to the Section 3.2.2.

Section	Item	Description
7	Removal and Replacement Information	Refer to Section 2 of this manual - the BAA01-001 Installation and Operating Manual. If the unit is removed and reinstalled, a functional check of the equipment should be conducted.
8	Diagrams	Refer to Section 2.10 of this manual – the BAA01-001 Installation and Operating Manual - for installation drawings and interconnect examples.
9	Special Inspection Requirements	N/A
10	Application of Protective Treatments	N/A
11	Data: Relative to Structural Fasteners	N/A
12	Special Tools	N/A
13	For Commuter Category Aircraft Only	A. <u>Electrical loads</u> : Refer to Section 1 of this manual - the BAA01-001 Installation and Operating Manual B. <u>Methods of balancing flight controls</u> : N/A. C. <u>Identification of primary & secondary structures</u> : N/A. D. <u>Special repair methods applicable to the airplane</u> : N/A.
14	Overhaul Period	No additional overhaul time limitations.
15	Airworthiness Limitation Section	N/A.
16	Revision	To be determined by installer.

2.10 Installation Drawings

DOCUMENT	REV	TYPE	SERIAL#
BAA01-001-403-0	1.10	Interconnect Drawing	91901+
BAA01-001-405-0	1.10	Connector Map	91901+
BAA01-000-922-0	1.00	Mechanical Installation	91901+

Section 2.0 Ends Following Above Documents

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.10	ECO1158: ALTERNATE AUDIO CONTROLLER INSTALLATION ADDED	24-Jul-2023	SK/LAC

BAA01-001 INSTALLATION NOTES

NOTES:

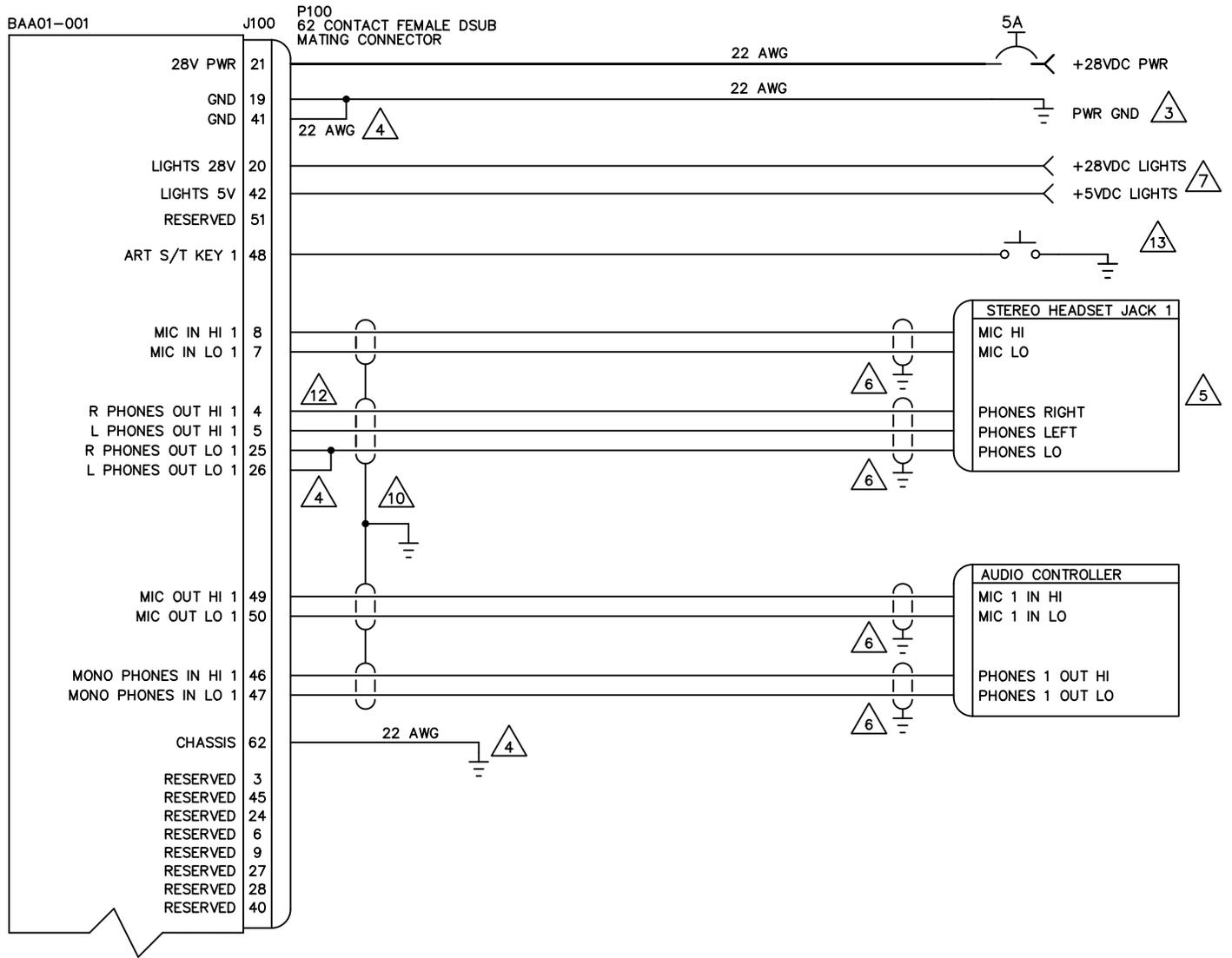
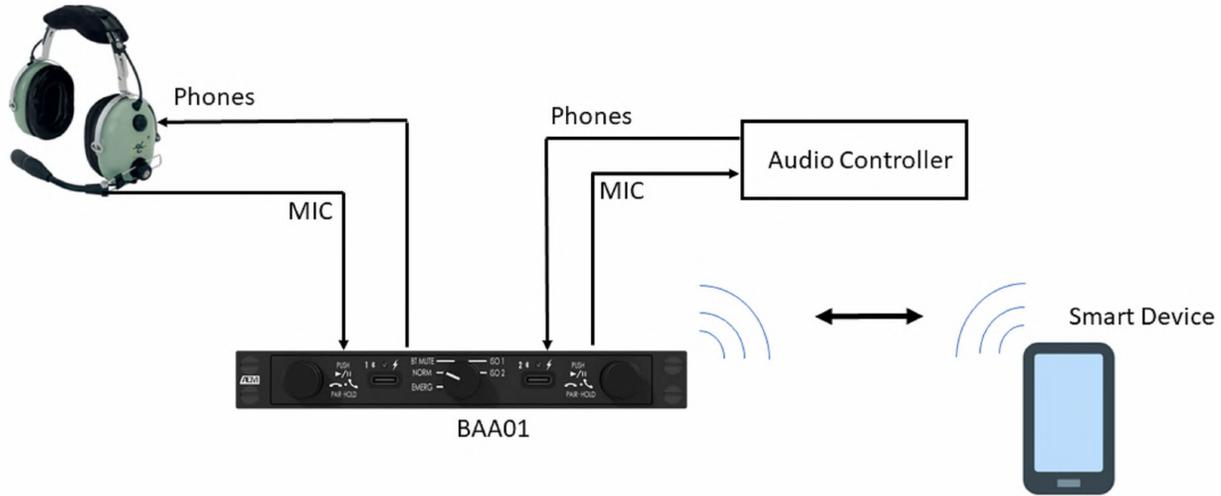
1. ALL WIRES SHOULD BE 24 AWG UNLESS OTHERWISE SPECIFIED. ALL UNSHIELDED WIRE SHALL BE SELECTED IN ACCORDANCE WITH AC43.13-1B CHANGE 1, PARAGRAPHS 11-76 THROUGH 11-78. WIRE TYPES SHOULD BE TO MIL-W-22759 AS SPECIFIED IN AC43.13-1B CHANGE 1, PARAGRAPHS 11-85, 11-86 AND LISTED IN TABLE 11-11. ALL SHIELDED WIRE/CABLE SHOULD BE IN ACCORDANCE WITH MIL-C-27500.
2. CABLE LENGTH NOT TO EXCEED 17 FT [5.18 M], UNLESS OTHERWISE SPECIFIED.
3. CABLE LENGTH NOT TO EXCEED 3.3 FT [1.0 M].
4. CABLE LENGTH NOT TO EXCEED 20 INCHES [0.5 M].
5. SYSTEM CROSSTALK MAY BE EFFECTED BY STYLE OF HEADSET AND JACK. CHECK SPECIFICATIONS AND SYSTEM REQUIREMENTS BEFORE SELECTING AND INSTALLING.
6. SHIELDS SHOULD BE GROUNDED TO LOCAL AIRFRAME GROUND, UNLESS OTHERWISE SPECIFIED. SHIELD TERMINATION LENGTH NOT TO EXCEED 1 FT [0.3 M].
7. ONLY +28VDC LIGHTS OR +5VDC LIGHTS MAY BE USED AT ONE TIME.
8. CABLE LENGTH NOT TO EXCEED 5 FT [1.5 M].
9. RECOMMEND CABLE AEROSPACE USB 2.0 STYLE PART NUMBER: RCN8800-24D-22P-H
10. TERMINATE SHIELDS TO METAL CONNECTOR HOOD. CONNECT TO GND WITH CABLE LENGTH NOT TO EXCEED 4 INCHES [0.1 M].
11. SWITCHED TO POWER GROUND WHEN ACTIVE.
12. USE R PHONES OUT HI AND LO FOR MONO INSTALLATIONS. SEE SHEET 5 FOR DETAILS.
13. ART S/T KEY ONLY CONNECTED IF AUDIO CONTROLLER DOES NOT HAVE ARTIFICIAL SIDETONE.

DEFINITIONS:

- N/C: NO CONNECTION. THE PIN IS NOT CONNECTED TO ANYTHING INTERNALLY, AND THEREFORE SHALL HAVE NO CONNECTION EXTERNALLY.
- N/C SPARE: NO CONNECTION INTERNALLY, BUT A SPARE WIRE SHALL BE INSTALLED IN THE WIRE HARNESS.
- RESERVED: MAY BE CONNECTED AND USED IN THE FUTURE. THE CIRCUITRY MAY BE PRESENT OR ADDED TO ACTIVATE THE FUNCTION. THE PIN MAY BE USED FOR TEST PURPOSES. THERE IS NO EXTERNAL CONNECTION.
- RESERVED SPARE: (RSV SP) RESERVED, BUT INSTRUCTIONS SHALL BE FOLLOWED TO ACTIVATE THE CIRCUITRY. A SPARE WIRE SHALL BE INSTALLED IN THE WIRE HARNESS.

NAME		DATE	UNLESS OTHERWISE SPECIFIED:			KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM			
DRAWN	SK	MAR 31/23	DIMENSIONS ARE IN INCHES [MM] TOLERANCES: FRACTIONAL _____ ±0.0625" ANGULAR _____ ±0.5° TWO DECIMAL PLACE _____ ±0.010" THREE DECIMAL PLACE _____ ±0.005"			TITLE: BLUETOOTH AUDIO ACCESSORY INTERCONNECT			
CHECKED			MATERIAL:	PAPER SIZE: A		CAGE CODE: L9015	PART No.: BAA01-001	REVISION: 1.10	
APPROVED			FINISH:	SCALE: A		DO NOT SCALE DRAWING		DRAWING No.: 403-0	SHEET: 1 OF 5
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BAA IN-LINE BETWEEN THE HEADSET AND AUDIO CONTROLLER



NAME	DATE	UNLESS OTHERWISE SPECIFIED:
DRAWN SK	MAR 31/23	DIMENSIONS ARE IN INCHES [MM] TOLERANCES: FRACTIONAL ±0.0625" ANGULAR ±0.5° TWO DECIMAL PLACE ±0.010" THREE DECIMAL PLACE ±0.005"
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APPROVED		
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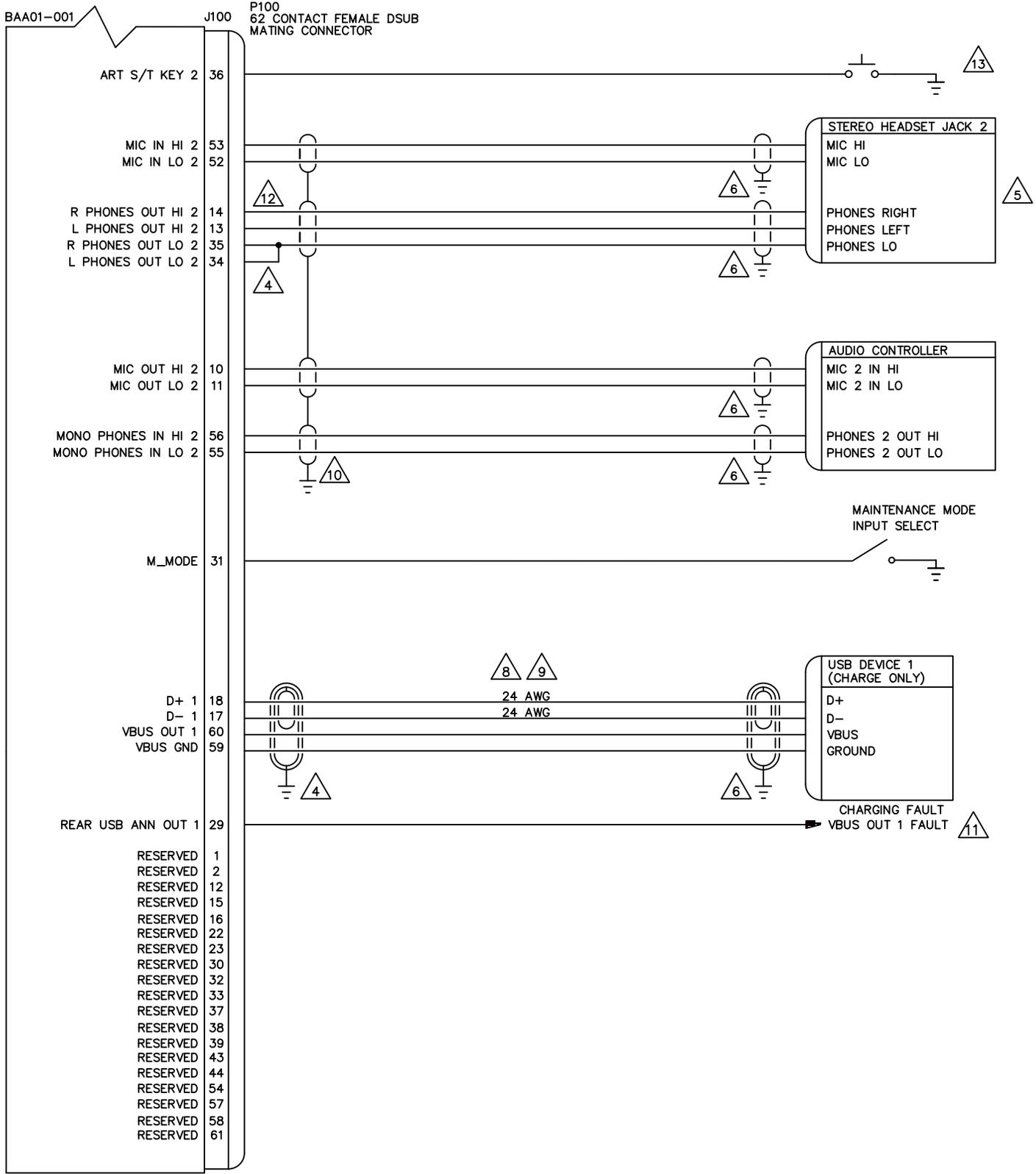


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NAME	DATE	UNLESS OTHERWISE SPECIFIED:
DRAWN SK	MAR 31/23	DIMENSIONS ARE IN INCHES [MM] TOLERANCES: FRACTIONAL _____ ±0.0625" ANGULAR _____ ±0.5° TWO DECIMAL PLACE _____ ±0.010" THREE DECIMAL PLACE _____ ±0.005"
CHECKED		
APPROVED		



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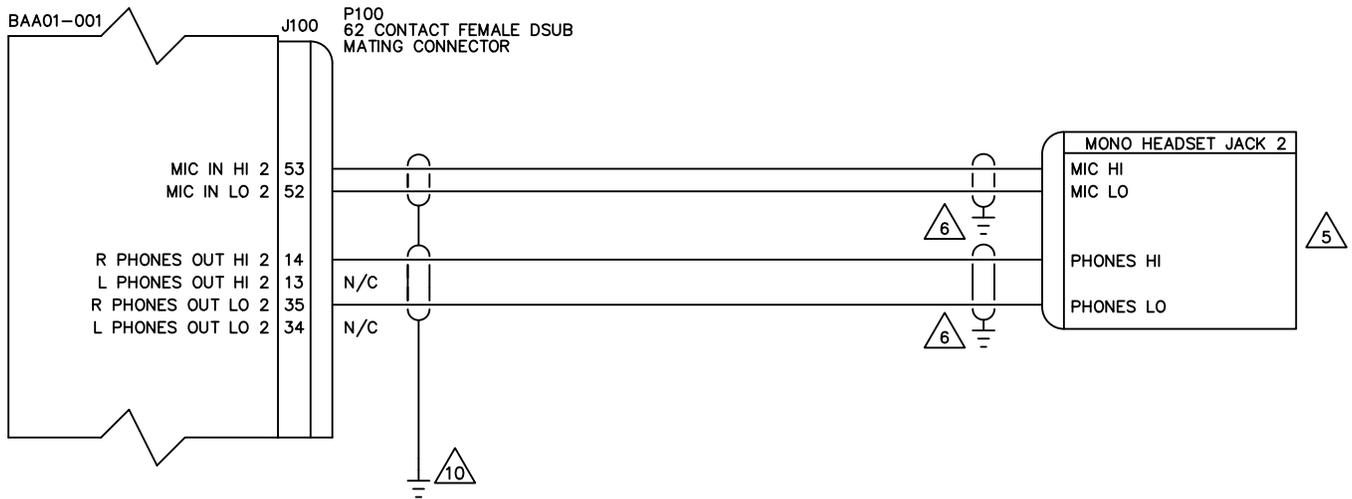
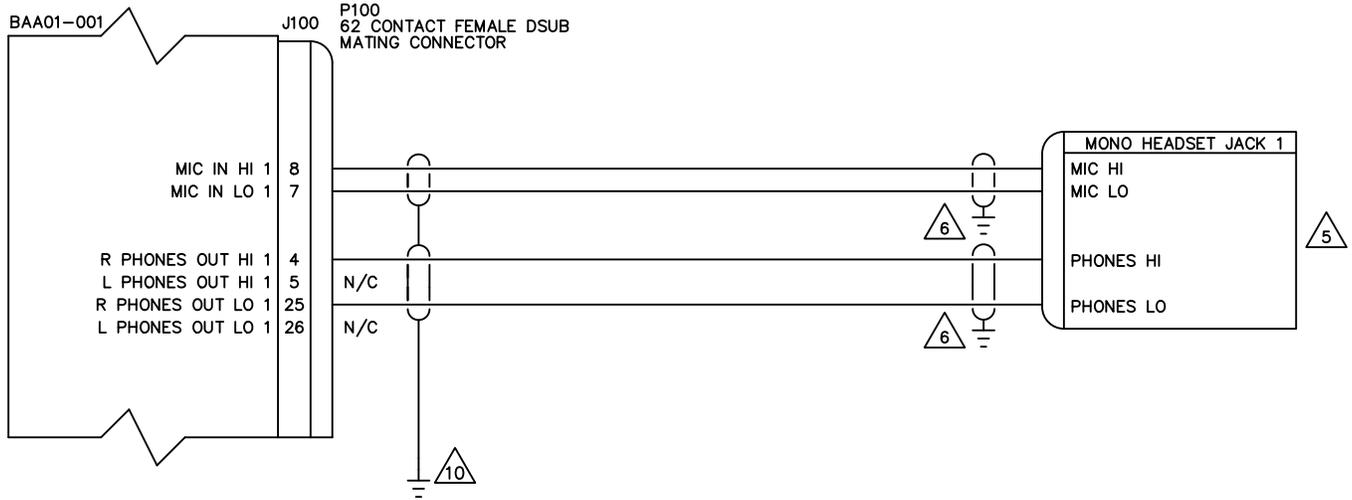
TITLE: **BLUETOOTH AUDIO ACCESSORY INTERCONNECT**

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FINISH: N/A

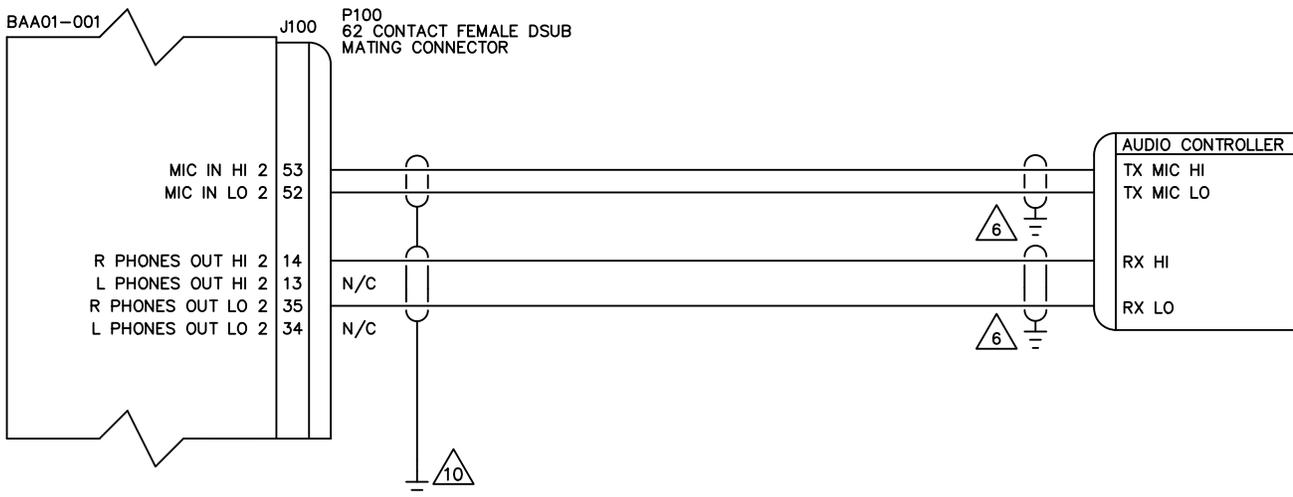
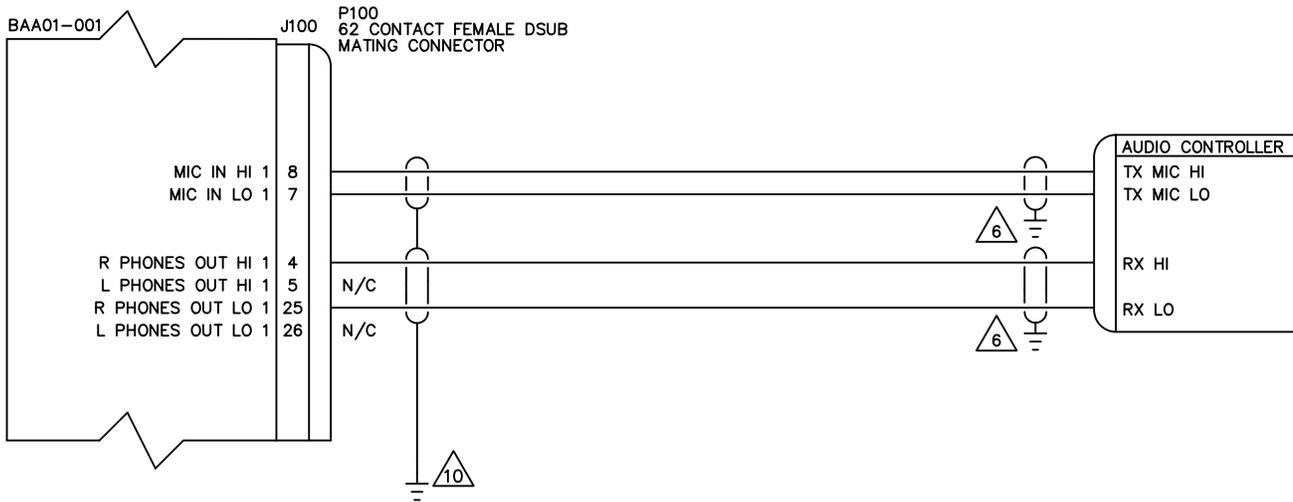
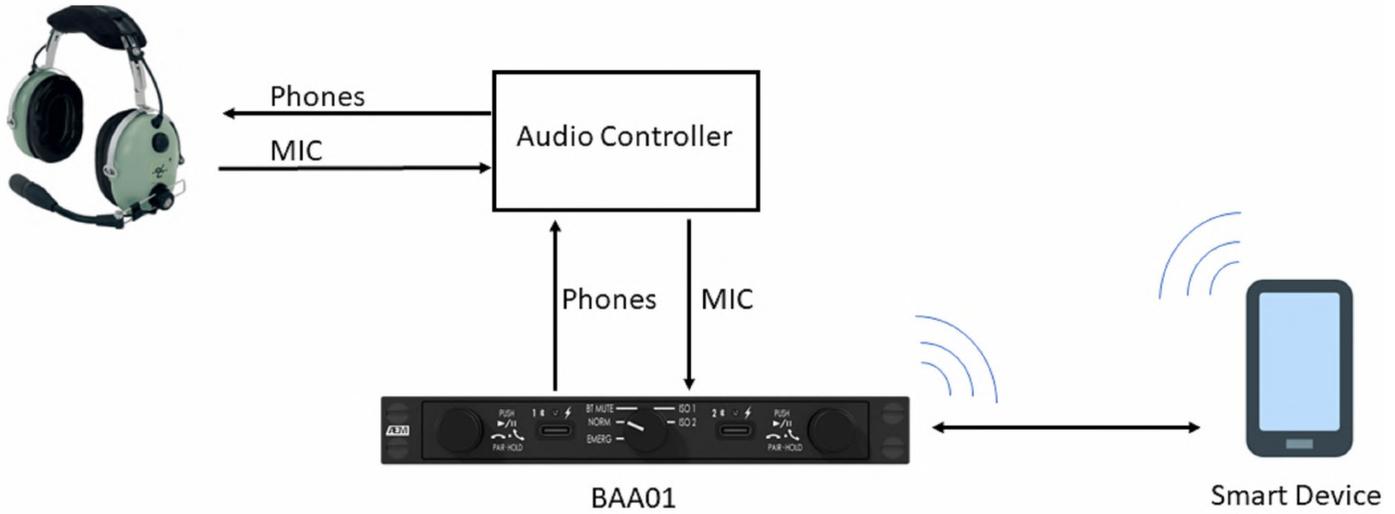
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SCALE: DO NOT SCALE DRAWING	DRAWING No.: 403-0		SHEET: 3 OF 5

ALTERNATE MONO INSTALLATION



	NAME	DATE	UNLESS OTHERWISE SPECIFIED:	AEM	ANODYNE ELECTRONICS MANUFACTURING CORP.	KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM
DRAWN	SK	MAR 31/23	DIMENSIONS ARE IN INCHES [MM] TOLERANCES:	TITLE: BLUETOOTH AUDIO ACCESSORY INTERCONNECT		
CHECKED			FRACTIONAL _____ ±0.0625"			
APPROVED			ANGULAR _____ ±0.5° TWO DECIMAL PLACE _____ ±0.010" THREE DECIMAL PLACE _____ ±0.005"			
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			FINISH:			

BAA01 INSTALLATION IN A TRANSCEIVER POSITION OF THE AUDIO CONTROLLER



NAME	DATE	UNLESS OTHERWISE SPECIFIED:
DRAWN SK	MAR 31/23	DIMENSIONS ARE IN INCHES [MM]
CHECKED		TOLERANCES:
APPROVED		FRACTIONAL ±0.0625"
		ANGULAR ±0.5°
		TWO DECIMAL PLACE ±0.010"
		THREE DECIMAL PLACE ±0.005"
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		FINISH: N/A



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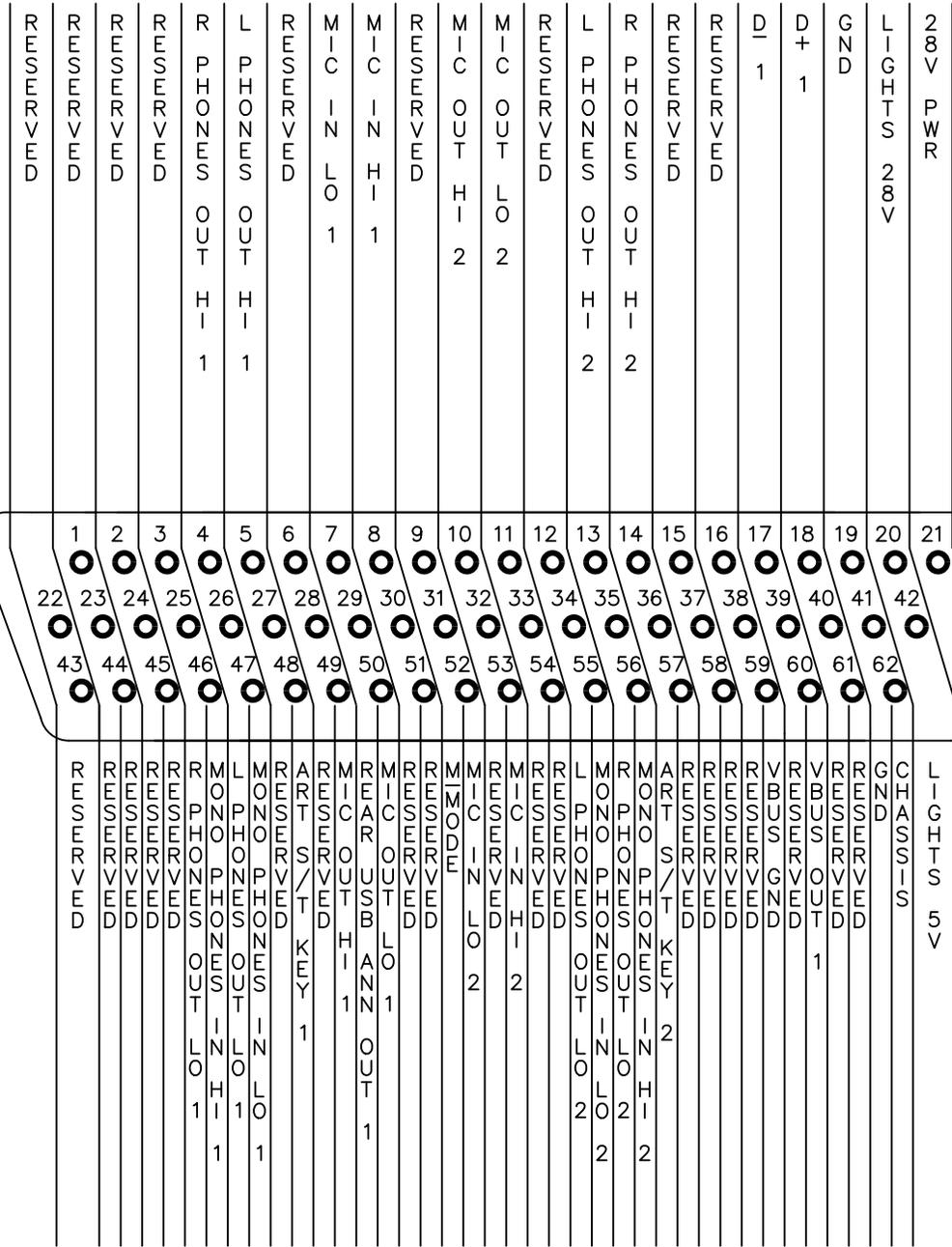
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TITLE: **BLUETOOTH AUDIO ACCESSORY INTERCONNECT**

PAPER SIZE: A	CAGE CODE: L9015	PART No.: BAA01-001	REVISION: 1.10
SCALE:	DO NOT SCALE DRAWING	DRAWING No.: 403-0	SHEET: 5 OF 5

REVISIONS

REV	DESCRIPTION	DATE	BY
1.10	ECO1158: PINS 29, 36, AND 48 RENAMED.	27-Jul-2023	LAC



P100

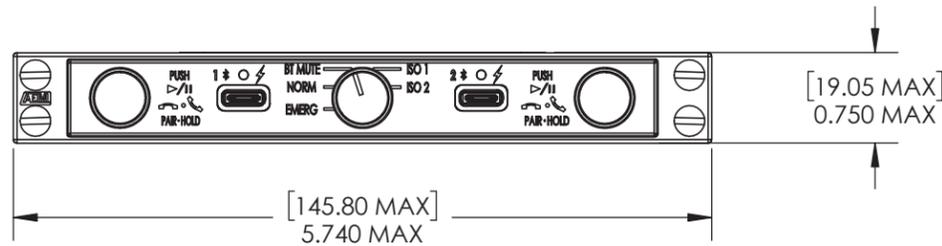
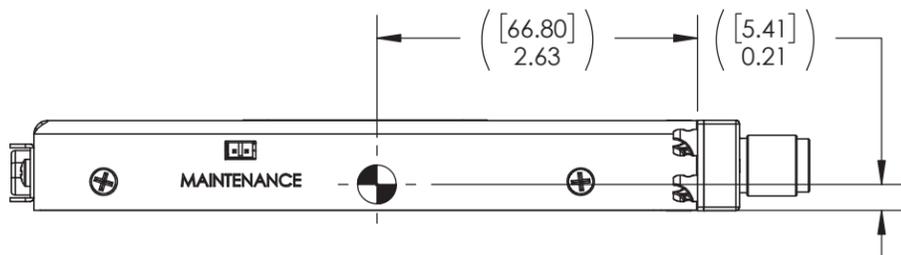
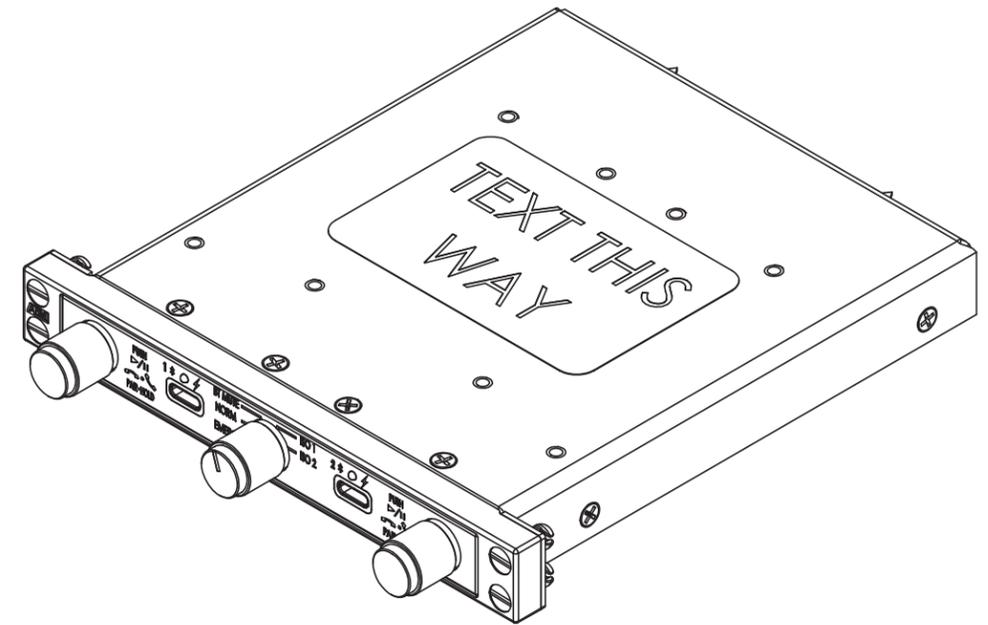
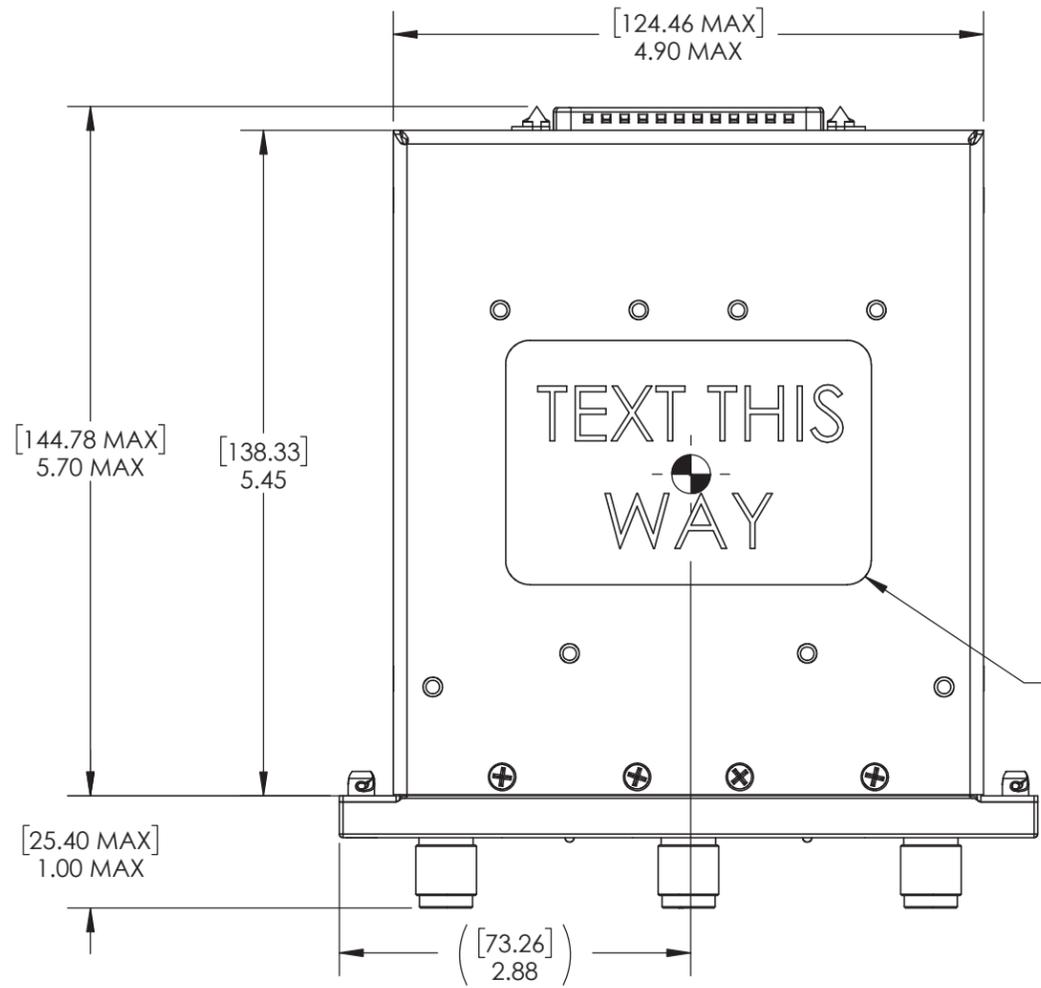
62 PIN HIGH DENSITY
FEMALE DMIN
MATING CONNECTOR

VIEW IS FROM REAR OF AIRFRAME CONNECTOR

NAME	DATE	UNLESS OTHERWISE SPECIFIED:		KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM
DRAWN	LAC/LN	13-Sep-2022		
CHECKED			TITLE: <h2 style="text-align: center;">BLUETOOTH AUDIO ACCESSORY CONNECTOR MAP</h2>	REVISION <h1 style="text-align: center;">1.10</h1>
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NOTES:

- 1. MASS: 1.0 lb [kg] MAX
- 2.  APPROXIMATE CENTER OF GRAVITY.
- 3.  PRODUCT LABEL



	NAME	DATE	UNLESS OTHERWISE SPECIFIED:
DRAWN	RWN	13-Jan-22	DIMENSIONS ARE IN INCHES [MM]
CHECKED		Jan 13, 2022	TOLERANCES:
APPROVED		13-Jan-22	ANGULAR: ±0.5°
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			ONE DECIMAL PLACE: ±0.100"
			TWO DECIMAL PLACE: ±0.030"
			THREE DECIMAL PLACE: ±0.010"
			MATERIAL: N/A
			FINISH: N/A

 ANODYNE ELECTRONICS MANUFACTURING CORP.			15-1925 KIRSCHNER RD. KELOWNA BC V1Y 4N7 (250)-763-1088 WWW.AEM-CORP.COM	
TITLE: BLUETOOTH AUDIO ACCESSORY MECHANICAL INSTALLATION				
PAPER SIZE: B	CAGE CODE: L9015	PART No. : BAA01-000	REVISION: 1.00	
SCALE: 2:3		DO NOT SCALE DRAWING		DRAWING No. : 922-0
SHEET: 1 OF 1				

Section 3.0 Operation

3.1 Introduction

Information in this section consists of functional and operational procedures for the BAA01 Bluetooth Audio Accessory.

3.2 General

The BAA01 Wireless Bluetooth Accessory controls the call and audio stream for up to two Bluetooth connected smart devices and features five operating modes.

3.2.1 Connecting a Bluetooth Device

3.2.1.1 Bluetooth Pairing

To pair the BAA01 with a Bluetooth device the following steps must be followed:

- a) The maintenance mode must be deactivated, and the status annunciator of the desired Bluetooth user must be green.
- b) Long press the volume knob of the desired Bluetooth user. The annunciator of the Bluetooth module will blink the colour blue and a message stating “Pairing mode enabled” will be heard.
- c) On the device to be paired select AEM_BAA01_1 to connect to Bluetooth user one or select AEM_BAA01_2 to connect to Bluetooth user two. Once connected, the BAA01 will play a message stating “Device connected”. The device is now ready for use.

Note: Each BAA01 Bluetooth user can have up to 4 listed Bluetooth devices. If this number is exceeded, previously paired devices will be forgotten. The paired devices list can be cleared by entering the pairing mode (indicated by a slow blue blinking annunciator) and double pressing the volume knob of the desired Bluetooth user. See Table 4: Normal Mode Volume Knob Functionality for more information.

3.2.1.2 Connecting to Bluetooth Device

The BAA01 will automatically attempt to reconnect to the last connected Bluetooth device at power up. If the BAA01 cannot connect automatically to the last connected device, a manual connection can be achieved by pressing the volume knob that is associated with the desired Bluetooth user.

3.2.2 Bluetooth Troubleshooting

- a) If a Bluetooth user is unable to connect to the Bluetooth device and the annunciator is rapidly flashing blue, double press the Bluetooth user's volume knob. This will cancel the connection attempt to the Bluetooth device. It is advised to then clear the pairing list and attempt to pair again. To clear the pairing list, enter the pairing mode (indicated by a slow blue blinking annunciator) and double press the volume knob of the desired Bluetooth user. See Table 4: Normal Mode Volume Knob Functionality for more information.
- b) If the operational state of the unit is not known by the user, a system reset can be simulated by cycling between EMERG and NORM mode on the mode selector knob.
- c) Pairing device operation is dependant on the installed software of the connected smart device. Reference the operation manual of the controlling Bluetooth device for additional troubleshooting steps.
- d) Applications used to make calls on a connected smart device must support standard Bluetooth profiles.
- e) If an internal Bluetooth module fails to communicate to the internal microprocessor a fault is raised. This is indicated by a flashing blue & yellow annunciator for the Bluetooth user whose module has failed. The operator should cycle between EMERG and NORM mode to simulate reset of the BAA01. If the fault persists or is not automatically cleared, operate without BT connection in Normal mode or if annunciation is distracting, operate in EMERG Mode. Contact AEM for servicing.
- f) If an internal Bluetooth module fails to communicate to the internal microprocessor because of low operating temperatures, a fault is raised. This is indicated by a teal annunciator for the Bluetooth user whose module has failed. This fault is automatically cleared once the internal temperature is within the operating temperature of the BAA01.
- g) If it is determined the BAA01 requires servicing, the BAA01 is to be left in EMERG mode (using the mode selector knob) until a loaner unit is supplied for removal. Pull the relevant electrical breaker to ensure no inadvertent activation.

3.2.3 Virtual Assistant Operation (Siri, Google, Alexa, etc..)

The BAA01 is compatible with most major virtual assistants. The virtual assistant can easily be accessed while connected to a smart device by double pressing the volume knob of the desired Bluetooth user. Once pressed, the virtual assistant will automatically begin listening through the headset microphone.

3.3 Modes of Operation

The EMERG, NORM, BT MUTE, ISO 1, ISO 2 modes of operation can be selected using the mode selector knob. The selected mode of operation is applied to both Bluetooth users 1 and 2. Each Bluetooth user continues to work independently of the other Bluetooth user in every mode. Figure 5: Mode Selector Knob shows a closeup view of the mode selector knob.



Figure 5: Mode Selector Knob

3.3.1 Emergency Mode (EMERG)

The Emergency mode can be manually accessed by setting the mode selector knob to EMERG or automatically if Emergency Aircraft Voltage levels are detected by the BAA01. If the mode selector knob is deselected from EMERG or normal power is restored, the BAA01 will automatically restore itself to the last mode of operation. Figure 6: Emergency Audio Routing shows the routing of the audio paths during the Emergency mode of operation.

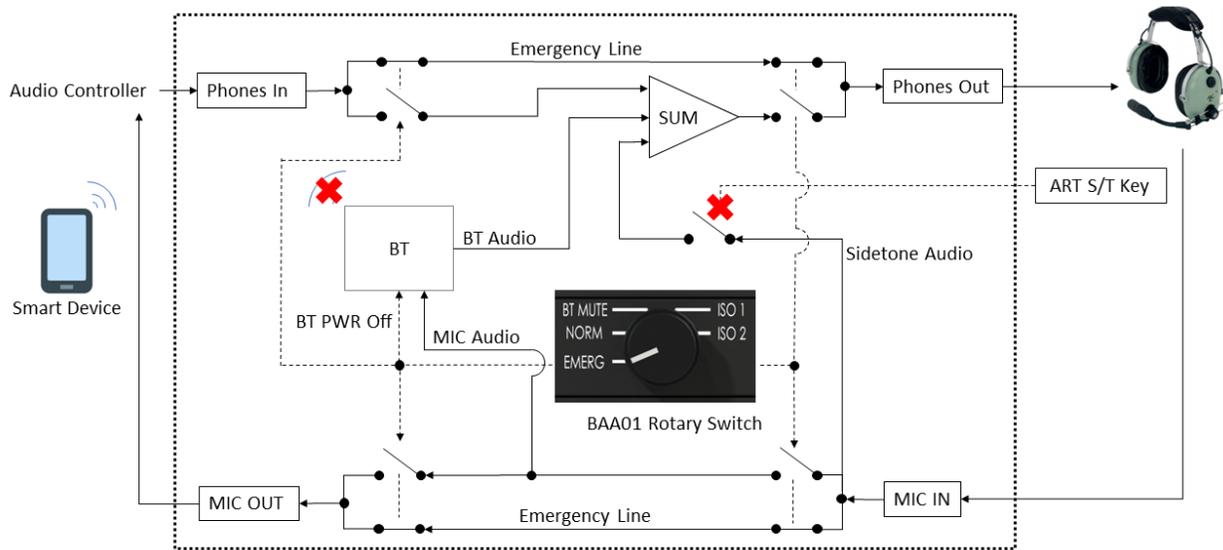


Figure 6: Emergency Audio Routing

When the BAA01 is in Emergency mode the following operating parameters are implemented:

- The microphone and phone inputs are directly routed to the audio controller.
- The internal Bluetooth modules, internal microcontroller, lighting control circuits and charging ports are powered off.
- The manual Emergency mode selected by the mode selector knob will cause a fixed non-dimmable back lighting level to be applied.
- The automatic Emergency mode will cause all annunciators to be off.
- ART S/T Key is disabled.
- Streaming Bluetooth audio or cellular call audio is disconnected.

Note: Returning to Normal Mode after EMERG Mode will automatically attempt Bluetooth reconnection with the Smart Device. Audio steaming must be manually restarted.

3.3.2 Normal Mode (NORM)

Normal mode is the standard operating mode for the BAA01. In this mode the audio of the connected Bluetooth device and the audio controller can be heard simultaneously. Figure 7: Normal Audio Routing shows the routing of the audio path during the Normal mode of operation.

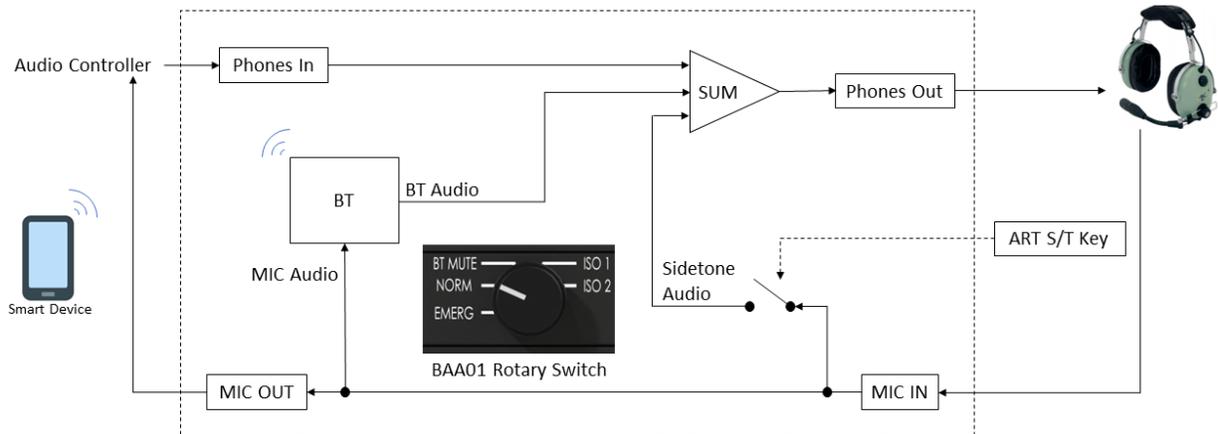


Figure 7: Normal Audio Routing

When the mode selector knob is switched to the NORM (Normal) position, the following operating parameters are implemented:

- The phones input audio is summed with the Bluetooth (BT) audio.
- The summed audio is presented on the stereo/mono phones output.
- If artificial sidetone is not available from the audio controller, utilize the BAA01 keyline (ART S/T Key) to produce sidetone back to the user's headset. This is only necessary when speaking on a cellular call.

Note: Microphone audio is always routed to the internal Bluetooth module. The smart device connection type (Call, Music etc.) determines if the microphone audio is communicated to the connected smart device.

3.3.3 Bluetooth Mute (BT MUTE)

Bluetooth Mute mode is used to isolate the audio controller and the users from the smart device. In this mode only audio from the audio controller can be heard on the user one and user two headset. Bluetooth audio for both user one and user two is muted. Figure 8: Bluetooth Mute Audio Routing shows the routing of the audio path during the Bluetooth mute mode of operation.

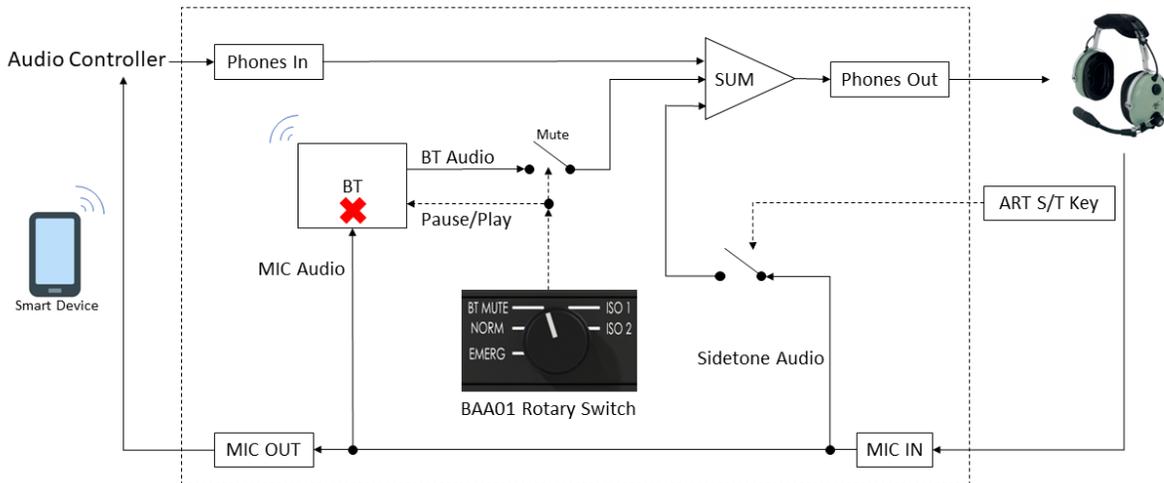


Figure 8: Bluetooth Mute Audio Routing

When the mode selector knob is switched to the BT MUTE position, the following operating parameters are implemented:

- All Bluetooth audio to and from the smart devices is muted for the audio controller and the users.
- The Bluetooth wireless transceiver remains connected to the paired smart device.
- Streaming Bluetooth audio and virtual assistant are paused.

- Note:**
- Bluetooth audio is automatically unmuted once BT MUTE mode is exited.
 - Audio playback must be manually restarted when BT MUTE mode is exited.

3.3.4 Cellular Call Isolate (ISO)

Cellular Call Isolate (ISO) mode is used to reduce the Phones In audio level from the audio controller and stops the routing of the microphone output to the audio controller. This allows for private communication where the Bluetooth audio is easier to hear. The Bluetooth module also creates artificial sidetone by routing the microphone input to the phones output. This results in the ART S/T Key not having to be triggered to hear sidetone.

The BAA01 has two ISO modes that can be selected by the mode selector knob. These modes are identical in function except for the Bluetooth user to which it is applied. When the mode selector knob is set to ISO1, the user one headphones will hear Bluetooth audio at the normal volume and the audio from the audio controller at a reduced volume. Bluetooth user two is automatically placed in the Normal mode of operation, as would be selected by the mode selector knob. When the mode selector knob is set to ISO2, user two is isolated and user one is in Normal mode. Figure 9: Isolate Audio Routing shows the routing of the audio path during the Cellular Call Isolate mode of operation.

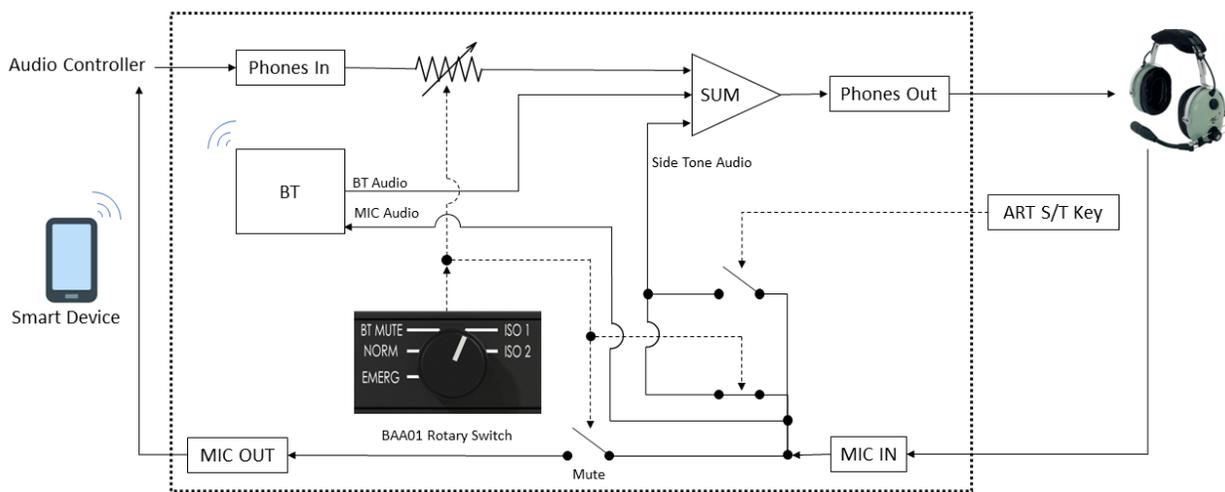


Figure 9: Isolate Audio Routing

When the mode selector knob is switched to the ISO1 or ISO2 position, the following operating parameters are implemented:

- The volume of the phones input from the connected audio controller is reduced.
- The microphone input audio is summed with the phones output audio to automatically generate artificial sidetone. (ART S/T Key does not have to be keyed)
- The microphone output audio to the audio controller is muted to make the communication private.
- The other Bluetooth user is automatically placed in Normal mode.

3.4 Controls and Indicators

3.4.1 Volume Knob

A front panel volume knob, shown in Figure 10: Front Panel Volume Knob, with a built-in push button provides volume control of the Bluetooth audio, input control for pairing smart devices, playing/pausing the audio stream, and answering or ending voice calls. Each Bluetooth user has a dedicated volume knob. The push button is multifunctional with unique functions that vary based on the operating mode of the BAA01. Table 4 - Table 6 list the different functions of the volume knob in each mode of operation.



Figure 10: Front Panel Volume Knob

- Notes:**
1. Volume knob push button actions require pressing and releasing the push button.
 2. A rotation of the volume knob is two rotational “clicks” on the physical knob.
 3. The long press action requires the push button to be held for greater than 5 seconds followed by releasing the push button.
 4. A double press is two rapid and sequential single presses.

BAA01 Normal Mode		
Volume Knob Action	Annunciator Colour	BAA01 Response Action
No Bluetooth Pair - Idle		
	Green	
Single Press Momentary		Connect to last paired device
Double Press Momentary		Cancel connection attempt to last paired device
Long Press Momentary		Enter pairing mode
No Bluetooth Pair - Pairing Mode		
	Blue (Slow Flashing)	
Double Press Momentary		Clear memory of all paired devices pairing mode is exited
Long Press Momentary		Exit pairing mode
Bluetooth Paired – No Active Call		
	Blue	
Single Press Momentary		Play/Pause (Audio Streaming)
Double Press Momentary		Start/End Voice Assistant (Siri, Google, Etc.)
Long Press Momentary		Disconnect from paired device
Press & Hold Push Button - Rotate CW		Track Forward (Audio Streaming)
Press & Hold Push Button - Rotate CCW		Track Backward (Audio Streaming)
Rotate CW		Bluetooth Device Volume + Audible Beep is played when max volume reached
Rotate CCW		Bluetooth Device Volume – Audible Beep is played when min volume reached.
Bluetooth Paired – Active Call		
	Blue	
Single Press Momentary		Answer/End Call
Long Press Momentary		Disconnect from paired device
Rotate CW		Bluetooth Device Volume +
Rotate CCW		Bluetooth Device Volume -

Table 4: Normal Mode Volume Knob Functionality

BAA01 Bluetooth Mute Mode		
Volume Knob Action	Annunciator Colour	BAA01 Response Action
No Bluetooth Pair - IDLE	Green	
Long Press Momentary		Enter/Exit Non-connectable Mode All Bluetooth connections are disconnected in this mode. (Factory feature not intended for field use)
No Bluetooth Pair - Pairing Mode	Blue (Slow Flashing)	
Double Press Momentary		Clear memory of all paired devices and Pairing mode is exited
Long Press Momentary		Exit Pairing Mode
Bluetooth Paired – No Active Call	Blue	
Single Press Momentary		Play/Pause (Audio Streaming)
Long Press Momentary		Disconnect from paired device
Press & Hold Push Button - Rotate CW		Track Forward (Audio Streaming)
Press & Hold Push Button - Rotate CCW		Track Backward (Audio Streaming)
Rotate CW		Bluetooth Device Volume + Audible Beep is played when max volume reached.
Rotate CCW		Bluetooth Device Volume – Audible Beep is played when min volume reached.
Bluetooth Paired – Active Call	Blue	
Single Press Momentary		Answer/End Call
Long Press Momentary		Disconnect from paired device
Rotate CW		Bluetooth Device Volume +
Rotate CCW		Bluetooth Device Volume -

Table 5: Mute Mode Volume Knob Functionality

BAA01 Bluetooth Call Isolate Mode		
Volume Knob Action	Annunciator Colour	BAA01 Response Action
No Bluetooth Pair – IDLE		
	Green	
Single Press Momentary		Connect to last Paired Device
Double Press Momentary		Cancel connection attempt to last paired device
Long Press Momentary		Enter Pairing Mode
No Bluetooth Pair - Pairing Mode		
	Blue (Slow Flashing)	
Double Press Momentary		Clear memory of all paired devices Pairing mode is exited
Long Press Momentary		Exit Pairing Mode
Bluetooth Paired – No Active Call		
	Blue	
Single Press Momentary		Play/Pause (Audio Streaming)
Double Press Momentary		Start/End Voice Assistant (Siri, Google, Etc.)
Long Press Momentary		Disconnect from paired device
Press & Hold Push Button - Rotate CW		Track Forward (Audio Streaming)
Press & Hold Push Button - Rotate CCW		Track Backward (Audio Streaming)
Rotate CW		Bluetooth Device Volume + Audible Beep is played when max volume reached.
Rotate CCW		Bluetooth Device Volume – Audible Beep is played when min volume reached.
Bluetooth Paired – Active Call		
	Blue	
Single Press Momentary		Answer/End Call
Long Press Momentary		Disconnect from paired device
Rotate CW		Bluetooth Device Volume +
Rotate CCW		Bluetooth Device Volume -

Table 6: Call Isolate Volume Knob Functionality

3.4.2 Multicolour LED Annunciator

The front panel LED annunciators provides multicolour status indication of the BAA01 functions and state. Each Bluetooth user has an individually dedicated annunciator. Figure 11: Multicolour LED Annunciator shows a closeup view of the front facing annunciator.

Multicolour LED Annunciator



Figure 11: Multicolour LED Annunciator

Table 7 below defines the meaning of each annunciator colour. Operations applicable to either user one or two, are listed as user. Operations that are not user specific are listed as Both.

Colour	User	Both	Description
No Illumination	-	X	Emergency mode, or no DC power.
Green	X	-	Power good, no Bluetooth connection.
Flashing Blue & Green	X	-	Power good, Bluetooth starting.
Flashing Blue (Slow)	X	-	Bluetooth pairing mode enabled.
Flashing Blue (Fast)	X	-	Attempting to Create Bluetooth Connection to Last Paired Device.
Blue	X	-	Bluetooth connected and paired.
Flashing Blue & Yellow	X	-	Bluetooth module failed to communicate or is not responding internally. Status repeated on button press.
Teal	X	-	Bluetooth Module Failed to Communicate Internally. Internal Temperature Below Bluetooth Operating Temp.
Yellow	-	X	USB Charger (+5V) Over Temp.
Orange	X	-	USB Charger Port Fault Type C.
White	X	-	Bluetooth Non-connectable Mode. Reference Table 5 to enter/Exit this mode.
Magenta	-	X	Maintenance Mode Accessed. Reference section 3.5 for more information.
Flashing Magenta	X	-	Maintenance Mode Enabled. (Applicable to both Bluetooth users but only the annunciator from Bluetooth user one will illuminate)

Table 7: Multicolour Annunciator Colour Definitions

3.4.3 Audible Annunciations

The BAA01 provides audible feedback to the user by using the audible annunciations shown in Table 8.

Action	Audible Annunciation
Bluetooth Enabled	Message: "Bluetooth ON"
Pairing Mode Enabled	Message: "Pairing Mode Enabled"
Bluetooth Device Connected	Message: "Device Connected"
Failed to pair	Tone: 500/400/300/200 Hz (single burst)
Incoming Call	Tone: 300/400 Hz (repeating until call answered)
Reject Call	Tone: 400/300 Hz (single burst)
End Call	Tone: 500/400/300/200 Hz (single burst)
Volume Max	Tone: 500 Hz (double beep)
Volume min	Tone: 200 Hz (double beep)

Table 8: Audible Annunciations

3.5 Maintenance Mode

The field adjustable maintenance mode is accessible to qualified personnel in the field. The BAA01 features non-volatile software configurable settings that can be used to adjust the volume outputs.

Maintenance mode can be accessed by inserting a two pin shorting block see (section 2.7) into the side accessible maintenance mode port (see Figure 12) or grounding the maintenance mode discrete input pin (Pin 31 M_Mode).



Figure 12: Maintenance Mode Port

The jumper and pin can be used to access or exit the maintenance mode at any time. When the maintenance mode is accessed, the BAA01's status indicator annunciators will turn magenta, and all USB charging functionality will be disabled. Once the maintenance mode is accessed, it must be enabled.

The maintenance mode is enabled by a long press on the user one volume knob. When the maintenance mode is enabled the user one annunciator will flash the colour magenta.

The audio parameters are individually adjustable for each Bluetooth user. The annunciator of the selected Bluetooth user will be flashing magenta when entering maintenance mode and can be switched between users by rotating the user one volume knob. The user is selected by pressing the user one volume knob. Once a Bluetooth user has been selected, four audio settings are available for adjustment: Phones in to Out Level, Phones in to Out Attenuate Level, Mic Sidetone Level and Mono/Stereo selection. Once the setting is selected, the corresponding user's annunciator will have a solid colour. The brightness of the annunciator will correspond to the increase or decrease of the settings value. It will take multiple complete rotations of the user one volume knob until a visible difference can be observed in the brightness of the annunciator. Figure 13: Field Adjustable Maintenance Mode Flowchart shows the navigation through the maintenance mode as described above in pictorial form.

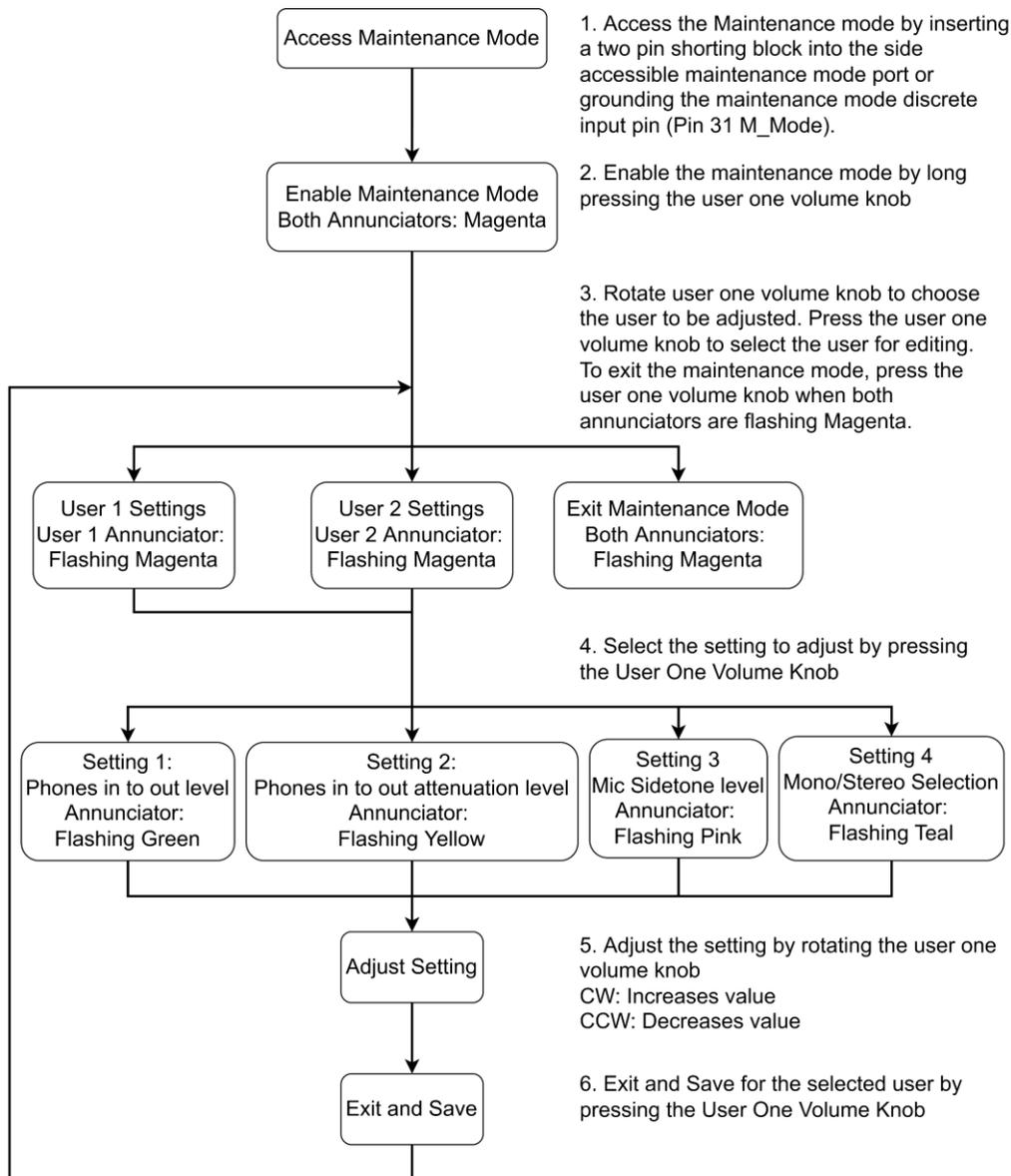


Figure 13: Field Adjustable Maintenance Mode Flowchart

- Notes:**
1. Volume knob push button actions require pressing and releasing the push button.
 2. A rotation of the volume knob is two rotational “clicks” on the physical knob.
 3. The long press action requires the push button to be held for greater than 5 seconds followed by releasing the push button.
 4. A double press is two rapid and sequential single presses.

Table 9 below defines the meaning of each annunciator colour. Operations applicable to either user one or two are listed as User. Operations that are not user specific are listed as Both. Operations that are listed as both will have both annunciators illuminated. Rotating the user one volume knob cycles through the options shown in Table 9. Pressing the user one volume knob selects the maintenance mode setting. Rotating the user one volume knob clockwise will increase the value of the selected setting. A momentary short press on the user one volume pushbutton accepts the new setting.

Colour	User	Both	Description
No Illumination	-	X	Emergency mode, or no DC power
Green	-	X	Accepted the Selection/Saved the Selection
Orange	-	X	Failed to Save Selection/Operation Timeout
Magenta	-	X	Maintenance Mode Accessed
Flashing Magenta	-	X	Disable Maintenance Mode
Flashing Magenta	X	-	Select user
Flashing Green	X	-	Select Phones In to Out Level
Green (Brightness = Level)	X	-	Adjust Phones In to Out Level
Flashing Yellow	X	-	Select Phones In to Out Attenuate Level
Yellow (Brightness = Level)	X	-	Adjust Phones In to Out Attenuate Level
Flashing Pink	X	-	Select Mic Sidetone Level
Pink (Brightness = Level)	X	-	Adjust Mic Sidetone Level
Flashing Teal	X	-	Select Mono/Stereo Audio.
Teal	X	-	Stereo Audio is Selected.
White	X	-	Mono Audio is Selected.

Table 9: Maintenance Mode Annunciator Colour Definition

The BAA01 will automatically disable the maintenance mode if no parameters are adjusted for 30 seconds. This is indicated by the annunciators briefly turning orange. To exit the maintenance mode the side accessible maintenance mode jumper must be removed, and the maintenance mode discrete input pin must not be grounded.

3.6 Panel Backlighting & Annunciators

The BAA01 faceplate legends are backlit with IPL white whenever the BAA01 is powered. The backlighting intensity is 1 ± 0.5 fL at full brightness.

The LED annunciator brightness is >150 fL in normal operation and off in the manual and automatic emergency mode of operation.

Both the faceplate legends and the annunciator brightness levels are dimmable as specified by a dimming curve. The dimming curve is controlled using an analog input on one of the backlighting pins (5V or 28V). Both pins cannot be used at the same time and the BAA01 will automatically detect which backlighting pin is connected. Adjustments or configurations are not required by the installer for this feature.

3.7 Charging Ports

The two front USB-C and the rear USB pin set are only equipped to charge connected devices. No ability exists to transfer data or audio between the BAA01 and a connected device through USB. USB charging and Bluetooth operations are independent functions. A fault in one function will not hinder the operation of the other function.

The charging current from the BAA01 charging port is dynamically allocated internally to each available charging port. The total current available on each charging port is dependent on the number of devices charging simultaneously, total charging current being delivered, temperature of the environment and temperature of the BAA01 internal power supply.

3.7.1 Front USB-C Charging Port

Each of the two front USB-C charging ports support up to 3.0A (15W) of charging current when the BAA01 is powered. The BAA01 USB-C connectors act as charging ports for any connected devices. Figure 14: Front Panel USB Type C Port shows a closeup view of the USB-C port.



Figure 14: Front Panel USB Type C Port

If either of the front USB-C charging ports experience a fault, the port will automatically stop all charging capabilities for that port. This is indicated by an orange annunciator for the applicable user. The fault and annunciator can be cleared by removing the attached USB-C cable/device. If the fault persists without a connected cable/device, internal damage may have occurred. Operate without a connected cable/device to that port and if annunciation is distracting, operate in EMERG Mode. Contact AEM for servicing.

3.7.2 Rear Connector Charging Port

A USB 2.0 connector charging port pin-set is provided on the rear P100 connector. This charging port supports a maximum of 2.4A (12W) of charging current.

The BAA01 provides an open collector discrete output (Pin 29 Rear USB Annunciator Output) to indicate when the rear USB connection has encountered a fault. The output is pulled to GND when a fault is present. The fault output is automatically released if the fault is cleared. If the fault persists without a connected cable/device, internal damage may have occurred. Operate without a connected cable/device to that port and if annunciation is distracting, operate in EMERG mode. Contact AEM for servicing.

3.7.3 Charging Protection

All charging ports on the BAA01 include overtemperature protection. If the BAA01 exceeds its internal over temperature limit, charging on all charging ports will stop and the front panel multicolour annunciators will illuminate yellow. The BAA01 will wait until a lower temperature threshold is achieved before attempting to re-enable device charging. If the fault persists without a connected cable/device, internal damage may have occurred. Operate without a connected cable/device to that port and if annunciation is distracting, operate in EMERG Mode. Contact AEM for servicing.

3.7.4 Charging Priority

The current allocation for each charging port is dynamically controlled based on the current required by the charging device and the internal BAA01 temperatures. The port charging priority is defined in the table below with priority one being the highest priority:

Priority	Port
1	Rear
2	Front Port 1
3	Front Port 2

Table 10: Charging Port Priority

End of Section 3.0
