

Product Manual

**ASW-524**

**ALTO PN 106511-524-4A0001**

Aircraft Cabin Subwoofer

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| **REVISIONS** |
| **REV #** | **ECN #** | **Description of Change** | **Approved** | **Quality** | **Date** |
| 1 | NDI | Initial Release | KSS | DCG |  |
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**Service Bulletin List**

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1. General Information
	1. Introduction

This manual contains information for the installation and operation of Model ASW-524, P/N 106511-524-4A0001, Aircraft Cabin Subwoofer.

This document includes product information such as mechanical, acoustic, and electrical characteristics.

* 1. Purpose of Equipment

The ASW-524 is a lightweight, high power, bass reflex subwoofer module designed for placement where availability of cross-sectional area between the subwoofer mounting location and the cabin is minimal, such as in cabinets, under divans, or beds. The enclosure combines direct radiating woofer energy and bass-reflex port energy into a single aperture, allowing for very low-profile coupling to the cabin listening space. The high excursion 5.25” driver is precisely matched to the acoustically tuned enclosure resulting in high output and lower frequency bass roll off. The motor structure of the driver is designed to be lightweight and have low magnetic leakage compared to conventional designs. This subwoofer is an integral part of the ALTO Aviation Entertainment System (AES), a complete audio system in which the amplifiers and speakers are customized and matched to the acoustics of the aircraft to provide the finest audio available.

* 1. Design Features

The ASW-524 is designed to be inherently protected by internal mounting. It is 4.1 inches deep with an aperture profile of 1” x 6”. It has an aluminum enclosure with welded seams. The speaker has a maximum power rating of 50 Watt RMS (40Hz – 200Hz).





Figure : ASW-524 Image

* 1. Technical Specifications

Product Code 106511-524-4AXXXX

(4 Ohm) (Standard connector type A)

Drivers 5.25” high excursion, low magnetic leakage,

high force design

Frequency Response: 40Hz - 200Hz

Impedance 4 Ohm

Continuous Power Rating 25 Watt RMS

Max. Power Rating 50 Watt RMS

Sensitivity 88 dBSPL @ 1W/1m

DO-160G Env. Cat. [A2X]CAB[(SC)(HR)]XXXXXXBXXXXXX[XXXXX]XXXX

**Connector**

 Mating connector 2 pin Amp Universal MATE-N-LOK

**Physical Specifications**

 Weight 3.8 lbs / (1.72 kg )

 Dimensions 12.0”W X 9.0”H X 4.1”D (304.8mm W X 228.6mm H X 104.14mm D)

* 1. Outline Drawing







Note: Dimensions are for reference only. See DA (Delivered Assembly) drawing for exact dimensions.

Figure : ASW-524 Outline Drawing

1. Installation
	1. General

The information in this section assists the installer of the unit. Conformity to the electrical wiring and mechanical mounting guidelines will help to ensure proper operation of the unit.

Review all information in this section before proceeding with the installation of the unit.

For assistance during installation please contact Alto using the following contact information:

Alto Aviation

 86 Leominster Rd

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When connecting this unit to another manufacturer’s product, consult the manufacturer’s specifications and installation instructions pertaining to their equipment.

The conditions and tests for TSO approval of this article are minimum performance standards. Those installing this article, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. The article may be installed only following 14 CFR part 43 or the applicable airworthiness requirements.

* 1. Unpacking and Inspection

Carefully open the packaging and remove the product. Visually inspect the unit for evidence of physical damage during shipment. Retain the packing materials and all documentation received with the unit. Verify that all components on the packing list have been received.

If the unit has been damaged during shipment, call Alto at 800.814.0123. A claim must be filed with Alto immediately after unpacking. Alto will assign a RMA Number (Returned Material Authorization) and give instructions for shipment. Please use the original carton and packing materials for shipping back to Alto.

* 1. Wiring Requirements

Loudspeaker wiring should use twisted pair or twisted shielded pair wire. If twisted shielded pair is used, the shield should be grounded at the amplifier end only.

Speaker wires that are too small will attenuate the signal to the speakers. The maximum harness resistance between the unit and each speaker should be < .25 ohm. Harness resistance can be measured by:

* Disconnect the amplifier and speaker.
* Short the harness pins together at the speaker end.
* Measure resistance across the speaker output pins at the amplifier end of the harness.

Avoid parallel runs or installation of audio signal cables in close proximity of transmitter coax cables, high current DC power wiring, AC power wiring, or other high current wiring.

Avoid installation in close proximity to any device with a strong alternating magnetic field such as an inverter or electrical motor.

Wire size, type, and installation should comply with all industry regulations pertaining to the actual installation.

* 1. Loudspeaker Placement

Please contact Alto Aviation for additional guidance on speaker placement and alternate solutions.

* 1. Connector Pinouts

The mating connector is: 2 pin Amp Universal MATE-N-LOK



Mating Connector

Amp PN 350778-1

 Mating Pin

 Pin 2- Amp PN 350550-1

 Pin 1+

Figure : Connector Pinouts

* 1. Mounting Hardware

Max intrusion into enclosure = .385”

(8) 10 x .375" screws included with product

1. Instructions for continued airworthiness
	1. Periodic Maintenance

**No** periodic scheduled maintenance or calibration is required for continued airworthiness of this product. If the unit fails to perform to specifications, it must be removed and serviced by a qualified service facility.

1. Troubleshooting
	1. Basic Troubleshooting

|  |  |  |
| --- | --- | --- |
| **Problem** | **Possible Cause** | **Possible Solution** |
| No Sound | No output from Audio Amplifier  Wiring / connection problem  | Ensure Audio amplifier is providing audio signal to loudspeakerEnsure continuity between amplifier and loudspeaker on both terminals |
| Distorted Sound | Audio output from source unit is distortedLoudspeaker Membrane Damage  | Verify that the source unit output has a clean undistorted signalInspect the Loudspeaker membrane to insure there is no damage and no debris is lodged in front of the membrane |
| Poor Audio Quality | Audio source unit controls are improperly adjustedSpeakers are improperly installed  | Adjust controls on audio source unit for desired soundVerify installation of speakers to manufacturer specifications |
| Noise in Audio System | Vibration in aircraft fixture, grill, or panel | Use Alto Test CD to play sweep tones through the system.Identify loose panel or hardware that might be rattling and secure. |

Figure : Basic Troubleshooting

1. Environmental Categories

| ***Environmental Tests*** |  ***RTCA/DO-160G Section*** | ***Conducted Test Category*** |
| --- | --- | --- |
| Temperature and Altitude | 4 |   |
| Low Temperature | 4.5.1 & 4.5.2 | Qualified by similarity to Category **A2** |
| High Temperature | 4.5.3 & 4.5.4 | Qualified by similarity to Category  **A2** |
| In-Flight Loss of Cooling | 4.5.5 | Identified as Category **X** Not applicable, cooling not required |
| Altitude | 4.6.1 | Identified as Category **X** no test performed |
| Decompression | 4.6.2 | Qualified by similarity to Category **A2** |
| Overpressure | 4.6.3 | Identified as Category  **X** , no test performed |
| Temperature Variation | 5 | Qualified by similarity to Category **C** |
| Humidity | 6 | Qualified by similarity to Category **A** |
| Operational Shocks & Crash Safety | 7 | Qualified by similarity to Category **B** |
| Vibration | 8 | Qualified by similarity to Category **S**  , **H**, Curve(s) **C, R** |
| Explosion Proofness | 9 | Identified as Category  **X** , no test performed |
| Waterproofness | 10 | Identified as Category **X** , no test performed |
| Fluids Susceptibility | 11 | Identified as Category **X** , no test performed |
| Sand and Dust | 12 | Identified as Category **X** , no test performed |
| Fungus Resistance | 13 | Identified as Category  **X** , no test performed |
| Salt Spray | 14 | Identified as Category **X** , no test performed |
| Magnetic Effects | 15 | Qualified by similarity to Category **B** |
| Power Input | 16 | Identified as Category  **X** , no test performed |
| Voltage Spike | 17 | Identified as Category  **X** , no test performed |
| Audio Frequency Conducted Susceptibility | 18 | Identified as Category  **X** , no test performed |
| Induced Signal Susceptibility | 19 | Identified as Category  **X** , no test performed |
| Radio Frequency Susceptibility | 20 | Identified as Category  **XX** , no test performed |
| Emission of Radio Frequency Energy | 21 | Identified as Category  **X** , no test performed |
| Lightning Induced Transient Susceptibility | 22 | Identified as Category  **XXXXX** , no test performed  |
| Lightning Direct Effects | 23 | Identified as Category **X** , no test performed |
| Icing | 24 | Identified as Category **X** , no test performed |
| Electrostatic Discharge | 25 | Identified as Category  **X** , no test performed |
| Fire, Flammability | 26 | Identified as Category **X**, no test performed, Complies with FAR part 25, Appendix F |

Figure : Environmental Categories