



Product Manual


ASW-289
ALTO PN 106511-289-4A0001

Aircraft Cabin Subwoofer

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REVISIONS					
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1.0 GENERAL INFORMATION

1.1 Introduction

This manual contains information for the installation and operation of Model ASW-289, P/N 106511-289-4A0001, Aircraft Cabin Subwoofer.

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

1.2 Purpose of Equipment

The ASW-289 is a lightweight, high power, bass reflex subwoofer module designed for placement in most luxury seat bases, divans, bulkheads, sidewalls, or cabinets. The high excursion 4” 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 configured based on aircraft type and cabin configuration to provide the finest audio available.

1.3 Design Features

The ASW-289 is designed to be as small and lightweight as possible without sacrificing audio performance. It is only 2.75 deep. The small package allows for easy installation. The speaker has a maximum power rating of 50 Watt RMS (40Hz – 200Hz).

The bass reflex design allows for lower frequency bass roll off. The integrated grills protect speakers during installation. The speaker has a high efficiency driver with low magnetic leakage precisely matched to the enclosure.

The Subwoofer is Integral part of the Alto Aviation Entertainment System (AES).


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Figure 1: ASW-289 Image

1.4 Technical Specifications

Drivers 4" high excursion, low magnetic leakage, high force design

Frequency Response: 40Hz - 200Hz

Impedance 4 Ohm nominal ALTO PN 106511-289-4A0001

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)]XXXXXXXXBXXXXXXXX[XXXXX]XXXX


Connector

Mating connector Molex

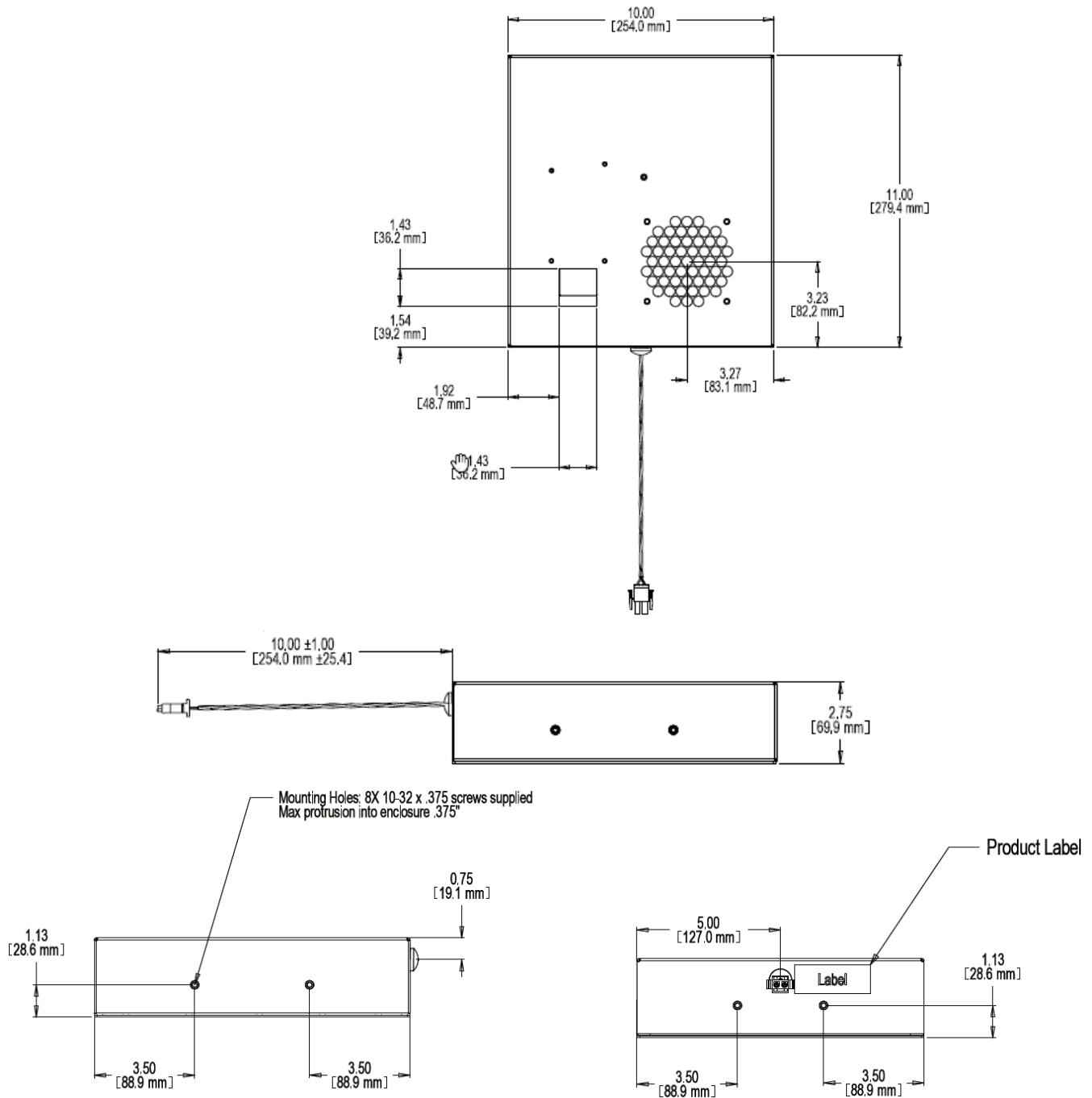
Physical Specifications

Weight < 3.0 lbs / (1.4 kg)

Dimensions 10.0"W X 11.0"H X 2.75D (254.0mm W X 279.4mm H X 69.9mm D)


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1.5 Outline Drawing



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

Figure 2: ASW-289 Outline Drawing

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2.0 INSTALLATION

2.1 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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800.814.0123

Fax: 978.466.5996

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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.

2.2 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.

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2.3 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.

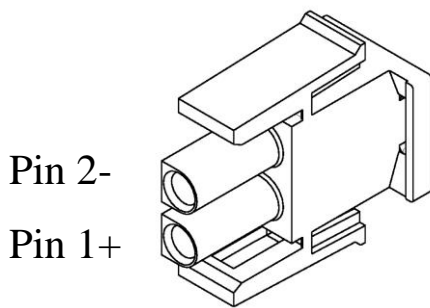
Wire size, type, and installation should comply with all industry regulations pertaining to the actual installation.

2.4 Loudspeaker Placement

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

2.5 Connector Pinouts


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



Mating Connector
Amp PN 350778-1

Mating Pin
Amp PN 350550-1

Figure 3: Connector Pinouts

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2.6 Mounting Hardware

Max intrusion into enclosure = .375"

(8) 10-32 x .375" screws included with product

Note: The screws must always be installed whether utilized for mounting or not. They are required to complete the acoustic sealing of the enclosure.

3.0 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

3.1 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.

4.0 TROUBLESHOOTING

4.1 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 loudspeaker Ensure continuity between amplifier and loudspeaker on both terminals
Distorted Sound	Audio output from source unit is distorted Loudspeaker Membrane Damage	Verify that the source unit output has a clean undistorted signal Inspect 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 adjusted Speakers are improperly installed	Adjust controls on audio source unit for desired sound Verify 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 4: Basic Troubleshooting

5.0 ENVIRONMENTAL CATEGORIES

<i>Environmental Tests</i>	<i>RTCA/DO-160G Section</i>	<i>Conducted Test Category</i>
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 5: Environmental Categories