tailBeacon^{TM} STC

Installation Manual

FAA APPROVED

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AIR-702

CHICAGO ACO BRANCH
C & A DIVISION

UAV-1002514-001
Rev B

1 Revision History

Revision	Date	Comments
A	7/7/2019	Initial release
B	8/28/2019	Update ADS-B version to v1.4.0 and note installation kit

2 Warnings / Disclaimers

uAvionix is not liable for damages arising from the use or misuse of this product.

This equipment is classified by the United States Department of Commerce's Bureau of Industry and Security (BIS) as Export Control Classification Number (ECCN) 7A994.

These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

3 Table of Contents

4 System Information

4.1 Certification

This installation manual provides mechanical and electrical information necessary to install tailBeacon. The content of this manual assumes use by competent and qualified personnel using standard maintenance procedures in accordance with Title 14 of the Code of Federal Regulation and other related accepted procedures.

Those installing this article on an aircraft listed on the Approved Models List shall verify the compatibility of existing STCs with this STC prior to returning the aircraft to service.

4.2 TSO Authorization

Function	TSO/RTCA/SAE	Class/Type
Airborne Navigation Sensor Using the Global Position System (GPS) Augmented by the Satellite Based Augmentation System (SBAS)	TSO-C145e INCOMP RTCA/DO-229E	Beta 1
Universal Access Transmitter (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on Frequency of 978MHz	TSO-C154c RTCA/DO-260B	B1S
Position Light (White)	TSO-C30c SAE/AS8037	Type III
Automatic Pressure Altitude Reporting Code-Generating Equipment	TSO-C88b SAE/AS8003	

4.3 System Limitations

Installation

This article meets the minimum performance and quality control standards required by a technical standard order (TSO) and when installed on aircraft approved on the AML can be approved for return to service after installation.

If you are installing this article on or in a specific type or class of aircraft, not listed on the AML you must obtain separate approval for installation.

TCAS/ACAS System

tailBeacon does not support installation on aircraft with an active Airborne Collision Avoidance System (ACAS) with Resolution Advisory capability, such as TCAS II or ACAS X.

SatCom

The tailBeacon GPS has not been demonstrated as compatible with SatCom equipment and should not be installed on SatCom equipped aircraft.

Transponder

A companion altitude-reporting transponder is required to be installed for 14 CFR 91.225 and 91.227 compliance, unless installed on an aircraft excepted from the requirements of 14 CFR 91.215 and 91.225.

The transponder's altitude source must comply with TSO-C10(), TSO-C106() or TSO-C88() and meet the requirements of 14 CFR 91.217.

Transponder antenna
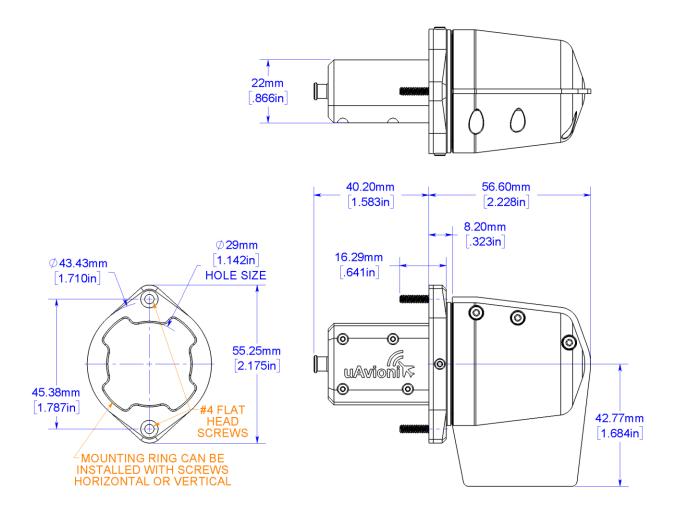
tailBeacon must be installed at least 3 feet from any operating transponder antenna.

5 System Specifications

5.1 Physical Specifications
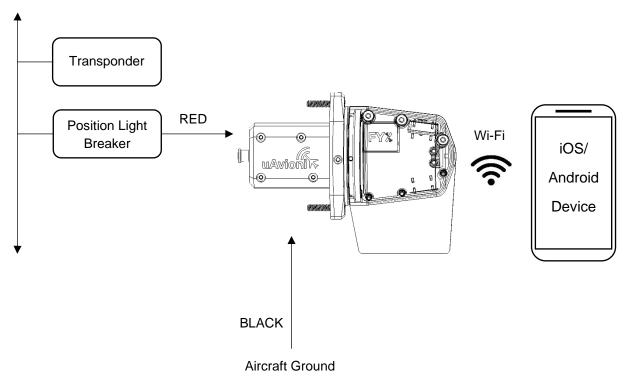
Characteristics	Specifications
Width	1.71 in (44mm)
Height	2.63 in (67 mm)
Depth	3.82 in (97 mm)
Weight	3.0 oz (85 g)
Operating Temperature Range	-45°C to +70°C
Maximum Pressure Altitude [1]	18,000 ft
Input Voltage Range	9 to 33 VDC
14V Current	0.5A Max
28V Current	0.25A Max

[1] UAT usage is restricted to below 18,000 feet MSL (§91.225).

5.2 System Interfaces

⚠ WARNING: Do not connect the power wire to a Xenon strobe power pack. This can damage the light and voids the warranty.

6 Installation

6.1 Unpacking and Inspecting

Carefully unpack the device and make a visual inspection of the unit for evidence of any damage incurred during shipment. If the unit is damaged, notify the shippi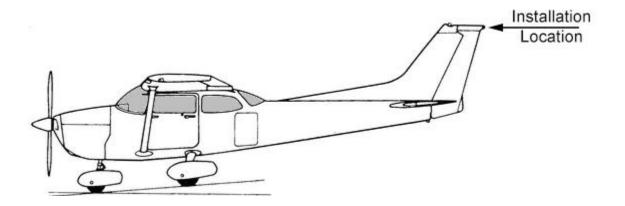ng company to file a claim for the damage. To justify your claim, save the original shipping container and all packing materials.

6.2 Mounting

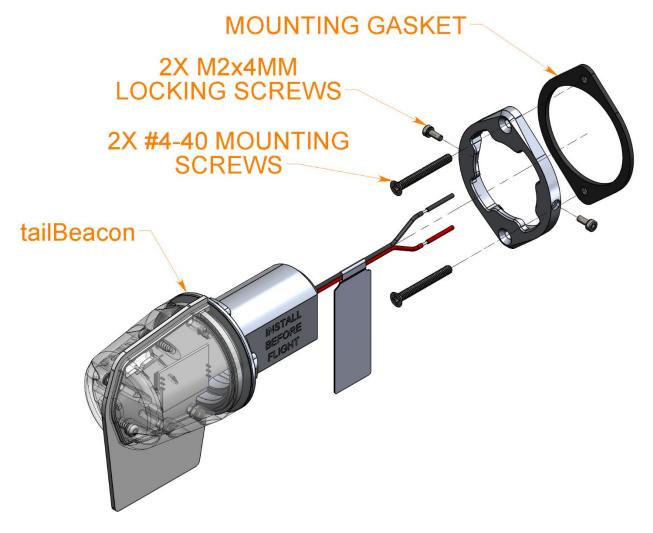tailBeacon is a rear, aft position light. Ensure that when mounted, the downward facing fin and top of the assembly are free from obstructions. tailBeacon requires a clear view of the sky for optimal GPS performance. It may not be suitable for installation on aircraft where aircraft elevators or other structures would block visibility to the sky.

Note: Installation of the tailBeacon must be in accordance with AC 43-13.2B, Chapter 1
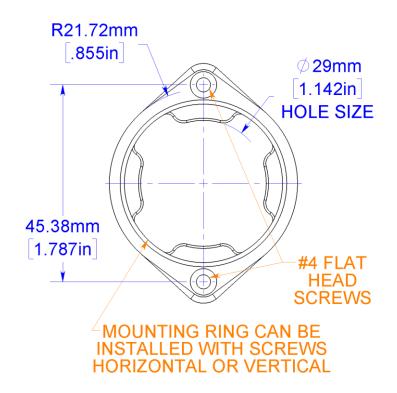
6.3 Unit Installation Overview

tailBeacon is mounted with two #4-40 flat head screws to the existing holes and nut plates used to secure a traditional Grimes style aft position light. The mounting bracket can be positioned with the screws in 2 orientations, either vertical or horizontal to be compatible with existing mounting patterns (See Section 6.4 for details).

MOUNTING GASKET

2X M2x4MM
LOCKING SCREWS

2X #4-40 MOUNTING
SCREWS

tailBeacon

INSTALL
BEFORE
FLIGHT

6.4 Mounting Dimensions

R21.72mm [.855in]

∅29mm [1.142in] HOLE SIZE

45.38mm [1.787in]

#4 FLAT HEAD SCREWS

MOUNTING RING CAN BE INSTALLED WITH SCREWS HORIZONTAL OR VERTICAL
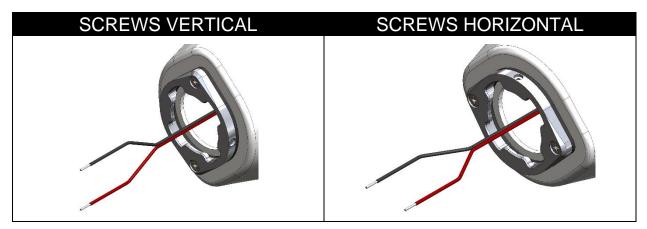
Determine if your aft position light is mounted vertical or horizontal.

You will also need to determine if your aft position light is mounted to a fixed surface or a moving control surface. **If installed on a moving control surface, specific attention must be paid to proper balance. Refer to the Manufacturer's Service Manual to determine if balancing is required and for balancing instructions.**

SCREWS VERTICAL	SCREWS HORIZONTAL

6.5 Mounting Procedure

Follow the procedures below to mount the tailBeacon to the aircraft.

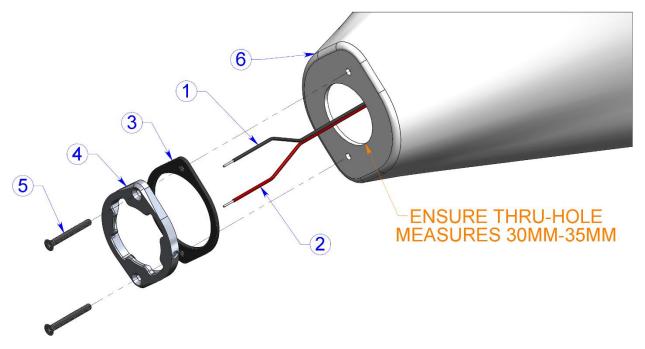1) Remove the existing aft position light screws.
2) Access wiring to disconnect the existing position light. Prepare the aircraft wire ends (Items 1, 2) per AC 43-13 for crimp type wire splices.
3) Ensure that the thru-hole for the wiring is between 30-35mm in diameter and is free of burrs, to allow the tailBeacon to fit.
   a) Be sure to protect the existing wiring if enlarging the hole is required.
   b) Any modifications should be made per AC 43-13.
4) Prepare the existing aircraft wiring (1) & (2) and ensure the wires are clean, unbroken and ready for a new electrical connection.
5) Attach the Mounting Gasket (3) to the Mounting Plate (4) by peeling the protective material from the gasket to expose the adhesive. Be sure the holes are aligned when installing the gasket.
6) Attach the Mounting plate with Gasket to the aircraft using the existing #4-40 nut plates, new #4-40 x 1" Flat Head Screws (5), and a Philips screwdriver. Tighten the screws until snug. Apply thread locking compound if required.
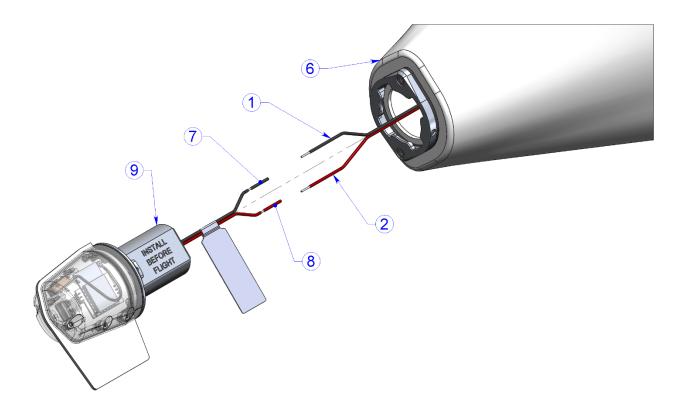

ENSURE THRU-HOLE MEASURES 30MM-35MM

Item	Description	Qty	P/N
1	Aircraft Ground Wire	Ref	
2	Aircraft Power Wire 14/28V	Ref	
3	Mounting Gasket [1]	1	UAV-1001756-001
4	Mounting Plate [1]	1	UAV-1001383-001
5	#4-40 Flat Head Philips Screws, SS [1]	2	UAV-1002184-001
6	Aircraft Tail Cone	Ref	
7	Nav Light Ground Wire (Black)	Ref	
8	Nav Light Power (Red) 14/28V	Ref	
9	tailBeacon TSO	1	UAV-1002183-001
10	SHCS, M2x5mm, SS [1]	2	UAV-1002820-001
11	Hex L Wrench, 1.5mm [1]	1	UAV-1002817-001 or equivalent
12	Insulated Environmental Butt Splice, 22awg [1]	2	UAV-1001487-001 or equivalent
13	tailBeacon ADS-B 1.4.0 Software (not shown) [2]	N/A	UAV-1001759-006

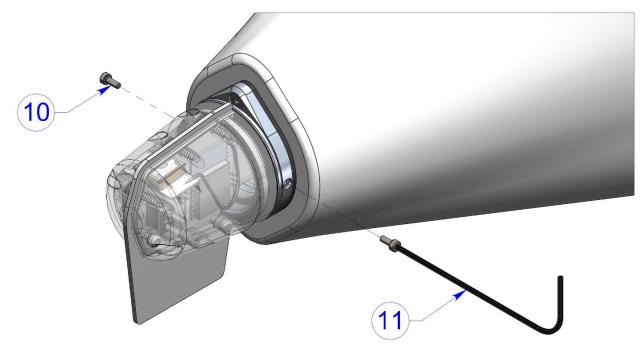[1] Included with tailBeacon TSO Installation Kit UAV-1003202-001
[2] Available for download at https://uavionix.com/support/

7) Remove the stripped insulation from the end of both tailBeacon wires.
8) Connect the aircraft Ground wire (1) to the tailBeacon Ground (7) wire using the provided (or equivalent) 22awg butt splice (12).
   a) NOTE: Be sure to utilize a crimper designed for use with an insulated terminal butt splice, and shrink the integrated tubing with an appropriate heat source to ensure an environmental seal after crimping.
9) Repeat Step 8 to connect the aircraft Power wire (2) to the tailBeacon Power wire (8).

10) With the tailBeacon at a slight angle to align the mounting tabs, Install the tailBeacon into the Mounting plate and rotate clockwise to engage the tabs. The rotation should stop when the blade of the tailBeacon is vertical.

11) Ensure the blade shape of the tailBeacon is pointing down towards the ground and the top of the tailBeacon has an unobstructed view of the sky.

12) Use the included (11), or equivalent 1.5mm Hex L wrench to tighten the M2 x 5mm locking screws (10) on each side of the tailBeacon.

13) Apply power to the tailBeacon and confirm position light operation.
14) Install placard as defined in tailBeacon Flight Manual Supplement UAV-1002512-001 Section 2.2.
15) Go to Section 6.6 for tailBeacon Configuration.

6.6 tailBeacon System Configuration

6.6.1 Verify Software Version

Before configuring the tailBeacon, verify that the version of software installed on the tailBeacon matches the software version identified in Table 6-1 Software Part Numbers and Versions.

Item / Part	Version	CRC
ADS-B (skyBeacon PF007 Operating Program Firmware) UAV-1001759-006	1.4.0	0x4957C6B8

Table 6-1 Software Part Numbers and Versions

If your tailBeacon is marked with UAV-1002183-001 MOD 1, it already contains this software version; proceed to Section 6.6.2 Configure Device. The current software version may also be verified by procedure. To do so, either:

- Use the "skyBeacon Installer Application" on iOS or Android, and navigate to the "Monitor" tab.
- Use the "Beacon Firmware Update Tool" on Windows.

6.6.2 Configure Device

Follow instructions provided in the "tailBeacon TSO User and Installation Guide" UAV-1002185-001 Section 10 to configure the system and perform post-installation checks.

6.7 Flight Checks

If the owner desires to further confirm the tailBeacon was installed and configured properly, perform a flight within ADS-B airspace coverage and request a FAA flight test compliance report.

To perform an ADS-B Out flight check requires flying in airspace where ADS-B coverage exists. In some areas in the country, you may need to be at a higher altitude to ensure coverage. Use of a portable ADS-B In receiver with an EFB (or equivalent) can provide the pilot an indication that the airplane is within ADS-B coverage.

If a dedicated flight is desired, perform a take-off, climb, simple maneuvers (standard rate turns around a point for example), descend and land. **Do not perform any aerobatic maneuvers.** Further guidance for flight test procedures can be found in AC 20-165B**.**

Upon completion of the flight, request an ADS-B Aircraft Operation Compliance Report (ACR) at the Public ADS-B Performance Report Request Internet site:

https://adsbperformance.faa.gov/PAPRRequest.aspx

7 Support

For additional questions or support please visit:

http://www.uavionix.com/support/