



tailBeacon™ STC

Instructions for Continued Airworthiness and Maintenance Manual



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Patent uavionix.com/patents

1 Revision History

| Revision | Date | Comments |
|----------|-----------|--------------------------------------|
| A | 9/13/2019 | Initial release. |
| B | 4/13/2020 | Update ADS-B version check language. |

2 Warnings / Disclaimers

All device operational procedures must be learned on the ground.

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 Limited Warranty

uAvionix products are warranted to be free from defects in material and workmanship for two years from the installation of tailBeacon on the aircraft. For the duration of the warranty period, uAvionix, at its sole option, will repair or replace any product which fails in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost.

Restrictions: This warranty does not apply to cosmetic damage, consumable parts, damage caused by accident, abuse, misuse, water, fire or flood, theft, damage caused by unauthorized servicing, or product that has been modified or altered.

Disclaimer of Warranty: IN NO EVENT, SHALL UAVIONIX BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Warranty Service: Warranty repair service shall be provided directly by uAvionix. Proof of purchase for the product from uAvionix or authorized reseller is required to obtain and better expedite warrant service.

Please email or call uAvionix support with a description of the problem you are experiencing. Also, please provide the model, serial number, shipping address and a daytime contact number.

You will be promptly contacted with further troubleshooting steps or return instructions. It is recommended to use a shipping method with tracking and insurance.

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5 Introduction

This document provides Instructions for Continued Airworthiness (ICA) and Maintenance Manual (MM) for the tailBeacon UAT transmitter as installed under STC SA04427CH. This document satisfies the requirements for continued airworthiness as defined by 14 CFR Part 23.1529 and Appendix A. Information in this document is required to maintain the continued airworthiness of the tailBeacon UAT transmitter.

5.1 Publications

When performing tailBeacon system maintenance it is required the following documents are available.

| Part Number | uAvionix Document |
|-----------------------|--|
| UAV-1002185-001 Rev D | tailBeacon TSO User and Installation Guide |
| UAV-1002514-001 Rev B | tailBeacon STC Installation Manual |
| UAV-1002512-001 Rev A | tailBeacon Flight Manual Supplement |

Owner/operators may obtain these documents at www.uavionix.com or by contacting a uAvionix dealer.

5.2 Revision and Distribution

This document is required for maintaining the continued airworthiness of the aircraft. When this document is revised, every page will be revised to indicate current revision level.

Owner/operators may obtain the latest revision of this document at www.uavionix.com or by contacting a uAvionix dealer. They may also register for updates and support at www.uavionix.com.

5.3 Acronyms and Abbreviations

The following acronyms may be used in this document:

| | |
|-------|--|
| ADS-B | Automatic Dependent Surveillance Broadcast |
| AML | Approved Model List |
| ATC | Air Traffic Control |
| CFR | Code of Federal Regulations |
| FCC | Federal Communications Commission |
| FAA | Federal Aviation Administration |
| GPS | Global Positioning System |
| ICA | Instructions for Continued Airworthiness |
| ICAO | International Civil Aviation Organization |
| IFR | Instrument Flight Rules |
| LED | Light Emitting Diode |
| MM | Maintenance Manual |
| RTCA | Radio Technical Commission for Aeronautics |
| SBAS | Satellite Based Augmentation System |
| STC | Supplemental Type Certificate |
| TSO | Technical Standard Order |
| VFR | Visual Flight Rules |
| WAAS | Wide Area Augmentation System |
| UAT | Universal Access Transceiver |

6 System Description

6.1 Features and Installation

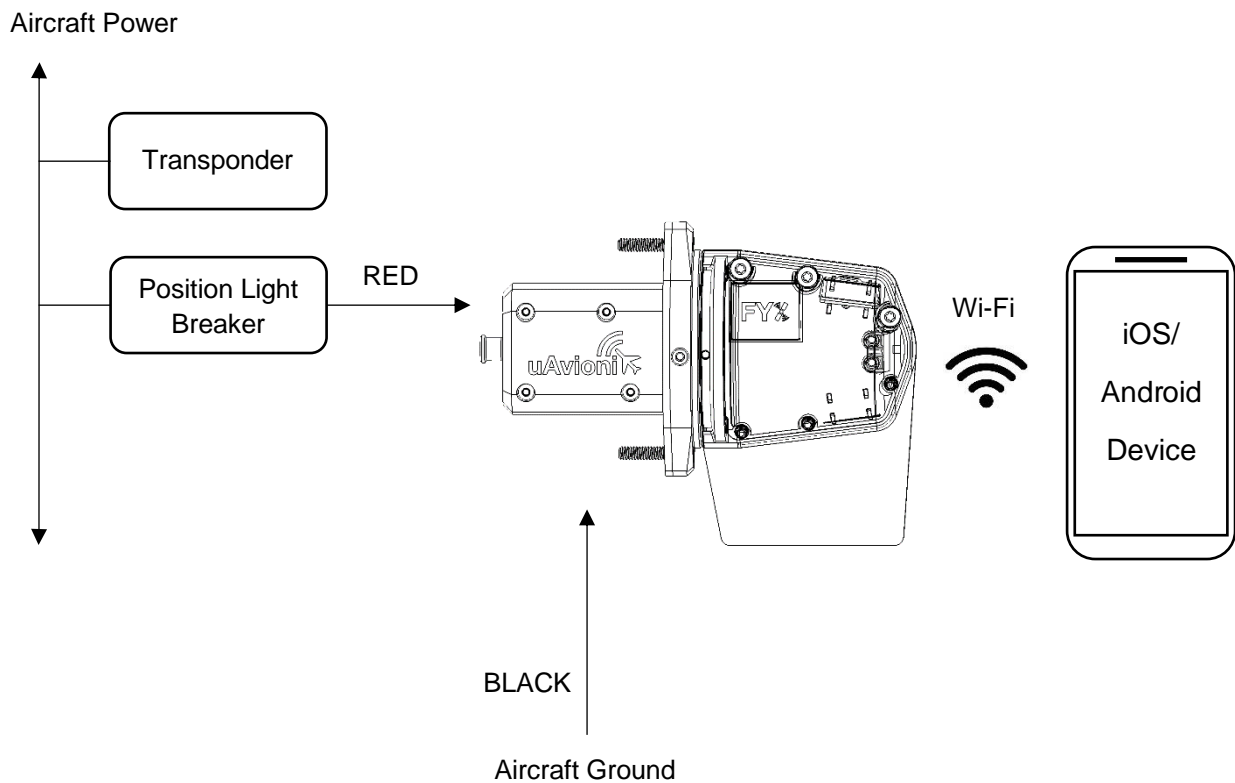
tailBeacon is a tail mounted unit that meets all of the requirements for compliance to 14 CFR Part 91.225 as follows:

- 978 MHz UAT transmitter
- Power line transcoder used to obtain installed Mode A/C transponder information including squawk code, IDENT, and altitude data
- GPS/SBAS receiver that provides the WAAS position source used for the ownship ADS-B data
- Barometric pressure sensor and altitude encoder that continuously calibrates itself to the Mode A/C transponder's installed altitude encoder
- LED white (rear) position light
- LED status light that provides indication of proper operation

This device transmits ownship Automatic Dependent Surveillance-Broadcast (ADS-B) data through the UAT data link.

tailBeacon replaces an existing rear (white) position light. It must be installed as shown in the *tailBeacon STC Installation Manual*.

6.2 Interfaces



7 Control and Operation

During normal operation, the pilot has no direct interface or control of the tailBeacon except for activating using the Position Light switch. Primary user interface controls are provided by the aircraft's existing transponder, including selection of Mode A squawk code and IDENT. tailBeacon also includes an annunciator LED that provides non-required information and is not visible in flight.

Refer to *tailBeacon Flight Manual Supplement* for control and operation information.

8 Instructions for Continued Airworthiness

This section provides Instructions for Continued Airworthiness of the tailBeacon system as installed under STC SA04427CH and satisfies the requirements for continued airworthiness as defined by 14 CFR Part 23.1529 and Part 23 Appendix A.

8.1 Airworthiness Limitations

The Airworthiness Limitations section is FAA-approved and specifies maintenance required under 14 CFR Part 43.16 and 14 CFR Part 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA-approved.

There are no new or additional airworthiness limitations associated with this equipment and/or installation.

8.2 Servicing Information

The tailBeacon unit maintenance is 'on condition' only. See TSO User and Installation Guide (reference Section 7) for equipment removal and installation. No component-level overhaul is required.

8.2.1 On-Condition Servicing

On Condition replacement and/or servicing may be required when conditions, symptoms, and/or servicing should take place only after the system is troubleshot based on guidance provided in this manual and per common avionics maintenance practices.

8.2.2 Special Tools

The following tools are needed to perform maintenance tasks.

- Ground power source (capable of supplying sufficient power to the aircraft systems and avionics)
- iOS or Android Mobile Device with "uAvionix skyBeacon Installer" App
- Dark glasses for viewing LEDs directly at close range
- Optional or as required: Transponder ramp test set (e.g. Sun UAT1)

8.3 Maintenance Intervals

Periodic checks of the tailBeacon system installed by the STC referenced in Section 5 are specified in Table 8-1 at specific intervals.

Table 8-1 Maintenance Intervals

| Item | Description/Procedure | Section No. | Interval |
|---|---|--|---|
| Equipment Removal and Replacement | Removal and installation of the tailBeacon unit | See <i>tailBeacon TSO User and Installation Guide</i> Section 7 | On Condition |
| Equipment Visual Inspection | Conduct a visual check of the tailBeacon unit, and associated wiring to ensure continued installation integrity | 8.4 | 12 Calendar Months |
| ADS-B Firmware Version | Confirm the ADS-B firmware version is current per Service Bulletins, update if not current | See <i>tailBeacon TSO User and Installation Guide</i> Section 10.4 | 12 Calendar Months |
| Lightning Strike – Actual or Suspected | Inspect the wired connections, tailBeacon unit, and surrounding areas. | 8.5 | On Condition |
| Testing | The tailBeacon must be tested and shown to comply with Title 14 CFR Part 91.227 | | Installation, software update, or replacement of tailBeacon |

| | | | |
|--|---|--|--|
| Altitude encoder testing, for VFR operations | Ensure a recent “Last Calibration” Date | See <i>tailBeacon TSO User and Installation Guide</i> Section 10.4 | 12 Calendar Months |
| Altitude encoder testing, for IFR operations in controlled airspace | Altitude encoder tested and found to comply with Part 43 Appendix E Section (c) | 8.6 | In accordance with 14 CFR Part 91.411 and Part 43 Appendix E Section (c) |

8.4 Visual Inspection

Perform a visual inspection as detailed in this section. Check tailBeacon system components for damage or other defects and replace as required. Inspection may require the temporary removal of a unit to gain access to connectors. Follow guidance in User and Installation Guide for equipment removal and replacement. Refer to model specific Aircraft Maintenance Manual for instructions on removing access panels or covers, as required.

8.4.1 tailBeacon Visual Inspection

- Inspect the tailBeacon unit and verify it is securely mounted.
- Inspect the unit fasteners and verify they are properly torqued and show no wear or damage. Additionally –
 - Verify unit support structure is in good condition and its integrity is not compromised.
 - Inspect for corrosion and treat as required.
- Inspect the condition of the wiring.
 - Verify that all wiring and cables are securely fastened.
 - Verify that the harness shows no signs of cracking, chafing, abrasion, melting, or any other form of damage.
 - Inspect the tailBeacon connectors for corrosion, evidence of moisture, or other defects.

8.4.2 Position Light Visual Inspection

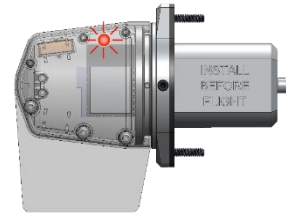
The rear position light is designed with 2 white LEDs. If any one LED fails, the unit must be repaired or replaced.

Note: Use dark glasses or cover the device to ensure eye safety during LED inspection.

8.4.3 Annunciator LED Visual Inspection

The LED annunciator is designed with a single red LED. If the LED fails, the unit must be repaired or replaced.

To confirm proper LED operation, momentary illumination may be observed immediately after the unit is powered on.



8.5 Post Lightning Strike Inspection

Inspection of the tailBeacon unit must be performed following a suspected or actual lightning strike. The tailBeacon and nearby aircraft structure and cabling must be inspected to verify no damage has occurred where lightning may have attached. A tailBeacon with visible signs of damage should be replaced. Grounding hardware and nearby aircraft structure supporting tailBeacon installation must be inspected for damage. Repair any damaged components.

8.6 Altitude Encoder Testing

The internal tailBeacon altitude encoder is designed to stay in Continuous Calibration™. For IFR operations in controlled airspace, the encoder must meet the requirements of 14 CFR Part 91.411, having been tested and inspected and found to comply with Part 43 Appendix E Section (c).

The difference between the reported pressure altitude and the altitude displayed on the Primary Flight Altimeter shall not exceed 125 feet. Continuous Calibration™ ensures the altitude reported by tailBeacon matches what is being reported by your transponder altitude encoder.

Note: If your transponder altitude encoder has been recently adjusted, a VFR flight may be necessary to achieve proper correspondence. Your Primary Flight Altimeter must have been previously tested as required by Part 43 Appendix E.

8.6.1 Altitude Encoder Correspondence Test

- Ensure transponder is turned OFF
- Set the primary flight altimeter to 29.92 inches of mercury
- Turn on the tailBeacon
- Open the “uAvionix skyBeacon Installer” as detailed in *tailBeacon TSO User and Installation Guide* Section 10
- Connect to tailBeacon
- Select the Monitor screen
- View the reported Pressure Altitude and ensure correspondence ± 125 feet of the Primary Flight Altimeter

9 Post-Installation Test Procedures

Procedures that must be completed when the tailBeacon is removed and re-installed or replaced with a new unit are detailed in this section.

Refer to *tailBeacon TSO User and Installation Guide* Section 10.3 for Post-Installation Checks.

If no other service is to be performed, continue to the return-to-service procedure in Section 10.

10 Troubleshooting

This section provides troubleshooting information to assist if problems occur after maintenance activities.

Table 10-1 Troubleshooting Actions

| Problem / Indication | Cause | Action |
|---|--|---|
| Unable to see Beacon-XXXX Wi-Fi network | <ul style="list-style-type: none">• Device not receiving power | <ul style="list-style-type: none">• Ensure circuit breaker is closed, navigation light switch is on and wiring is correct |

| | | |
|---|--|---|
| Position light not functioning | <ul style="list-style-type: none"> • Device not receiving power • Position light disabled in configuration • Voltage less than 11 volts | <ul style="list-style-type: none"> • Ensure circuit breaker is closed, navigation light switch is on and wiring to red and black wires are correct • Ensure position light is enabled in configuration • Ensure system voltage greater than 11 volts (may require the engine to be running) |
| Invalid configuration - Annunciator LED constant On and configuration error indicated in app | <ul style="list-style-type: none"> • Invalid ICAO address configuration • Transmit disabled | <ul style="list-style-type: none"> • Configure a valid ICAO address using the installer app • Ensure transmit is enabled in app configuration |
| Position fault - Annunciator LED blinking On/Off and no position shown in app | <ul style="list-style-type: none"> • No GPS position available | <ul style="list-style-type: none"> • Ensure device has a clear view of the sky • Allow GPS up to 15 minutes to obtain position |
| Other fault - Annunciator LED blinking or constant On and other error indicated in app | <ul style="list-style-type: none"> • Internal fault or other configuration issue | <ul style="list-style-type: none"> • Contact uAvionix |
| Annunciator LED does not momentarily illuminate on power-on | <ul style="list-style-type: none"> • Device not receiving power • Annunciator LED failure | <ul style="list-style-type: none"> • Ensure circuit breaker is closed, navigation light switch is on and wiring is correct • Confirm ability to connect to connect to device using app • If able to connect but no annunciator LED was visible during fault or power on conditions, contact uAvionix |

11 Return to Service Procedure

After removing and re-installing or replacing the tailBeacon, perform the system configuration procedures in the *tailBeacon TSO User and Installation Guide* Section 10.

11.1 Maintenance Records

After conducting the required return-to-service procedures in accordance with this document, the aircraft may be returned to service.

Record the following information in the appropriate aircraft maintenance logs.

- Part number and serial number of the unit that was replaced or re-installed.
- Any other applicable information related to the maintenance work performed on the aircraft.

Appendix A includes an installation record that should be completed and updated as appropriate with every maintenance action.

12 Support

For additional questions or support please visit:

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

Appendix A – Installation Record

A copy of this appendix must be used to record installation information and must be kept in the aircraft permanent records.

NOTE: A copy of this form must be sent to maintenance@uavionix.com.

tailBeacon Installation and Configuration Log

| | |
|--|---|
| Date: | By: |
| Aircraft Information | |
| Make: | Model: |
| Serial Number: | Registration Number: |
| tailBeacon Information | |
| Serial Number: | Wi-Fi SSID: |
| tailBeacon Configuration | |
| Transmit Enabled: <input type="checkbox"/> On <input type="checkbox"/> Off | Anonymous Mode: <input type="checkbox"/> On <input type="checkbox"/> Off |
| Call Sign: | ICAO Number (hex): |
| V _{SO} (knots): | ADS-B In Capability: <input type="checkbox"/> 978 <input type="checkbox"/> 1090 |
| Position Light: <input type="checkbox"/> On <input type="checkbox"/> Off | |
| Emitter Type: | Transponder Mon. Threshold: |
| Aircraft Length: | Aircraft Width: |
| GPS Antenna Offset (Lat): | GPS Antenna Offset (Lon): |
| Customer Information | |
| Name: | |
| Email: | |
| Telephone: | |
| Address: | |