

uAvionix
tailBeacon X Flight Test Process



REV A

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1 Introduction

The purpose of this document is to outline the process and procedures for thoroughly performing a flight test for a uAvionix tailBeacon X. This document will include instructions on each of the following steps in the testing procedure.

- Pre-flight planning and equipment
- Test setup and configuration
- Pre-Departure checks
- Flight test procedure
- Post flight check
- Data procurement
- Flight and data submission

Throughout the entire test process, it is highly recommended to utilize the uAvionix “TBX Flight Test Notes” document to use as a checklist and record any test data.

2 Pre-Flight Planning and Equipment

2.1 Flight Plan

Specify the planned flight route. Be as detailed as possible with the flight plan. Make notes of any differences to the flight plan from previous flight plans. Details that should be included in a flight plan are as followed.

- Flight date and time of departure and arrival
- Estimated flight duration
- Departure and arrival locations
- Mid-flight location(s). (Be specific)
- Altitude, speed, and specified maneuvers
- Geo reference intersections
- Changes made to any equipment mid-flight (ex: squawk code)

****ALL tailBeacon X test flights must be****

- **A minimum of 1 hour in duration**
- **Flown at an altitude greater than 7000 feet MSL.**

2.2 Equipment

Ensure that all the necessary tools, devices, and equipment are procured that will enable the tester to install, configure, test, troubleshoot, and acquire data for the flight test. Ensure that any equipment being used is configured correctly and fully operational before test. For some equipment, it may be necessary to record the serial number and, if applicable, calibration status and certificate number.

A “1090 Sentry Logger” must be used for all test flights. The test administrator must be familiar on how to operate the “1090 Sentry Logger” See the section below on how to operate the “1090 Sentry Logger.”

2.2.1 1090 Sentry Logger Operation

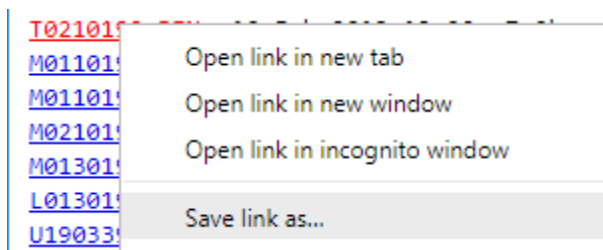
Flight Instructions

1. Install the Sentry Data Logger in your aircraft, preferably by using the included suction cup mount.
2. Turn on the Sentry Data Logger by holding down the power button until the LED indicators turn on.
3. Note the time, date and duration of the flight operation.
4. Power on the aircraft and perform the flight.
5. Complete the flight and power down the aircraft.
6. Turn off the Sentry Data Logger by holding down the power button until the LED indicators turn off.

Data Retrieval

The flight data log must be retrieved and shared with uAvionix.

1. Turn on the Sentry Data Logger by holding down the power button until the LED indicators turn on.
2. From a Windows or Mac computer, connect to the Sentry Data Logger Wi-Fi. The SSID will be Sentry_XXXX where XXXX is a unique ID. There is no passphrase required.
3. Using a web browser (preferably Chrome or Safari), access the following URL:
<http://192.168.4.1/data/>
4. A list of files will be presented. The file names are in the form EmmddyX.bin where:
mm - Two digit month
dd - Two digit day of month
yy - Two digit year
X - Incremental file number for duplicate dates. Max of 10 files.
5. Locate the file appropriate for the date flown. Times and dates are presented in UTC.
6. Save the appropriate file to your computer by right clicking on the file and selecting "Save link as...". Note where the file was saved to, for example your Downloads folder or Desktop.



7. Turn off the Sentry Data Logger by holding down the power button until the LED indicators turn off.

8. Attach the log file with the “Submit a Flight” form.

2.3 Test Article

The test article must be correctly configured for the proposed test. Notes and photographs must be made regarding the hardware configuration, firmware configuration, and mechanical configuration of the test article. Record any changes that were made from existing or previous test articles, if any.

3 Test Setup and Configuration

This section outlines the proper processes and required data records for the installation, configuration, and test setup. It is highly suggested to use the uAvionix “TBX Flight Test Notes” document to record any configuration details regarding the test setup.

3.1 Test Article Installation and Configuration

The test article must be installed to the specifications supplied by uAvionix. See the “tailBeaconX_EXP Installation Manual” (UAV-1003387-001). The test article must be configured correctly to reflect the test application and the test vehicle by standards specified by uAvionix. Installation and configuration details must be recorded, and records of any changes that were made from previous test articles must be made.

3.2 Test Vehicle

The Test Vehicle is the aircraft that the test article is installed on and will be the primary interaction point for the test. The test vehicle must be identified, and details pertaining to the vehicle itself regarding make, model, and any applicable standard equipment used on the test vehicle must be recorded. Configuration details that pertain to the test vehicle that directly relates to the test must be recorded. Standard equipment that will not be utilized for testing purposes can be omitted from the test report. Except for the installation of the test article, any changes made to the configuration of the test vehicle from a standard configuration or from previous tests must be recorded. Any and all maintenance actions for the test vehicle must be current.

3.3 Third-Party Device

Any device that will be used to interact with the test article during the flight test not manufactured by uAvionix is considered a “Third-Party Device.” This device must be correctly configured and operational for the entire duration of the testing process. Details pertaining to the make, model, serial number, and certificate number must be recorded. The purpose of the interaction of the device with the test article must be specified. The third-party device should be tested for proper operation before testing commences. Any and all maintenance actions for the device must be current.

3.4 Photos

Photos must be taken to document and show the following.

- Test article installation
- Test article configuration
- Test vehicle configuration
- Third Party Devices

Ensure that photographs are saved on a reliable device before proceeding.

4 Pre-Departure Checks

Pre-Departure Checks ensures that all the equipment used in the test is operating correctly. It is highly suggested to use the uAvionix “TBX Flight Test Notes” document to record any configuration details regarding the Pre-Departure checks.

4.1 Pre-Departure Equipment Check

Verify, using proper test equipment, that the test article, test vehicle, and any third-party device is operating correctly. Ensure that any data recording devices such as the “1090 Sentry Logger” are operational and recording data. Record any environmental or pre-departure data at this time. Environmental data can include but is not limited to altimeter settings, outside air temperature, cloud ceiling, etc. At this time, any statistics regarding the performance of the test article must be recorded. This data can include but is not limited to; GPS metrics, NIC, NAC, signal strength, barometric altitude, etc. Any data that is being observed from third-party devices should be checked for correct operation at this time and any necessary values recorded. **The time of departure must also be noted.** It is highly suggested to use the uAvionix “TBX Flight Test Notes” document as a checklist and to record any details regarding the Pre-Departure Checks.

****The existing transponder in the aircraft must be powered off, disabled, or inoperative**
before proceeding with TailBeacon X flight testing**

5 Flight Test Procedure

The following procedure outlines all the necessary requirements for performing the flying portion of the test. It is highly suggested to use the uAvionix “TBX Flight Test Notes” document as a checklist and to record any details regarding the flight test.

5.1 Planned Flight Procedure

To the best of the test administrators’ ability, the flight must follow the specified flight plan. Any deviations to the flight plan must be recorded with a brief explanation to the reason for deviation.

****ALL tailBeacon X test flights must be****

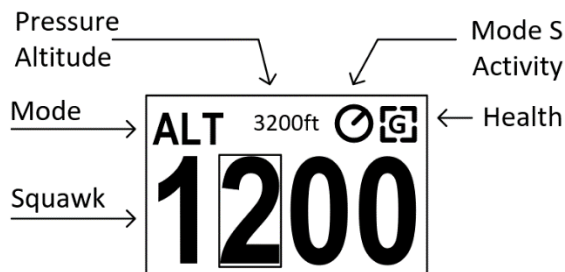
- **A minimum of 1 hour in duration.**
- **Flown at an altitude greater than 7000 feet MSL.**

5.2 Flight Data recording

During the flight test, the test administrator must record, with as much detail as possible, any and all observations that would pertain to the test. Suggested data to record is as followed:

- Flight altitudes
- Flight speeds
- Flight maneuvers
- Geo references
- Times of highlighted events
- Changes made to equipment during testing
- Any equipment failure or malfunction

It is important to use as much detail as possible for better data analyzing. It is the duty of the test administrator to frequently check the operation of the test article by observing the status symbols on the tailBeacon X control head (see UAV-1003387-001 or image below).



Standard rate maneuvers are recommended for testing. To the best of the test administrators' ability, avoid the following maneuvers:

- Bank angles exceeding 30 degrees
- Pitch angles exceeding 20 degrees
- Power on and power off stalls
- Slips or cross-controlled flight
- High pitched slow flight

6 Post Flight Check

Any devices used for recording data during the flight should be stopped and powered off at this time. **The time and location of arrival must be recorded.** The configuration and the installation of the test article must be checked upon return to verify no unprompted changes were made during the test flight.

7 Data Procurement

All data, photos, and notes from the flight must be gathered and promptly submitted along with the "Submit a Flight" form to uAvionix. See section **2.2.1 1090 Sentry Logger Operation** for instructions on how to pull and submit the "1090 Sentry Logger" files. Complete and submit the online "Submit a Flight" form with all the required information from the flight. Submit photos and "1090 Sentry Logger" files along with the form. Submit flight data, results, and observations through the tailBeaconX Beta Program Portal <https://uavionix.com/test-pilot/>.

For additional support contact betateam@uAvionix.com