

ONSPEED V3 Prep and Flight Test Checklist Version 1.7

Software Preparation: Finder > Documents > Arduino > OnSpeedTeensy

Confirm default configuration file settings via Arduino tab

OnSpeedTeensy: ASYMMETRIC_GYRO_LIMIT: _____ deg/sec

Note: Any change in OnSpeedTeensy Arduino requires software reload.

OnSpeedTeensy Software Version: _____

WiFi Firmware Version: _____

Set-up: Connect via WiFi and Open ONSPEED.LOCAL in browser

SETTINGS > AOA CONFIGURATION

AOA Smoothing _____

Pressure Smoothing _____

Data Source ☐ Sensors

☐ Test Potentiometer

☐ Range Sweep

☐ Replay Log File

Flap Curve 1

Flap Position: _____ Sensor Position: _____

L/D_{MAX} AOA: _____

OnSpeed Fast AOA: _____

OnSpeed Slow AOA: _____

Stall Warning AOA: _____

AOA Curve Type ☐ Polynomial

☐ Logarithmic

☐ Exponential

Algorithm: _____

Flap Curve 2

Flap Position: _____ Sensor Position: _____

L/D_{MAX} AOA: _____

OnSpeed Fast AOA: _____

OnSpeed Slow AOA: _____

Stall Warning AOA: _____

AOA Curve Type ☐ Polynomial

☐ Logarithmic

☐ Exponential

Algorithm: _____

Flap Curve 3

Flap Position: _____ Sensor Position: _____

L/D_{MAX} AOA: _____

OnSpeed Fast AOA: _____

OnSpeed Slow AOA: _____

Stall Warning AOA: _____

AOA Curve Type ☐ Polynomial

☐ Logarithmic

☐ Exponential

Algorithm: _____

Use **ADD NEW FLAP POSITION** button, as required

Flap Curve 4

Flap Position: _____ Sensor Position: _____

L/D_{MAX} AOA: _____

OnSpeed Fast AOA: _____

OnSpeed Slow AOA: _____

Stall Warning AOA: _____

AOA Curve Type ☐ Polynomial

☐ Logarithmic

☐ Exponential

Algorithm: _____

Test Boom Data ☐ Enabled

☐ Disabled

Boom Alpha Curve: .0264x – 105.837

Boom Beta Curve: .0242x – 95.7504

Boom Static Curve: .12207x – 199.951

Boom Dynamic Curve: .015259x – 124.994

CAS Curve: _____

Pressure Ports Orientation ☐ Up
☐ Down
☐ Left
☐ Right
☐ Forward
☐ Aft

Box Top Orientation ☐ Up
 ☐ Down
 ☐ Left
 ☐ Right
 ☐ Forward
 ☐ Aft

| | |
|-----------------------------------|---|
| Serial EFIS Data | EFIS Type |
| <input type="checkbox"/> Enabled | <input type="checkbox"/> Dynon D10/D100 |
| <input type="checkbox"/> Disabled | <input type="checkbox"/> SkyView/Advanced |
| | <input type="checkbox"/> Garmin G5 |
| | <input type="checkbox"/> Garmin G3X |
| | <input type="checkbox"/> Aerovonics |
| | <input type="checkbox"/> MGL iEFIS |

Potentiometer Volume Control

☐ Enabled
☐ Disabled

Audio Test (Confirm proper stereo operation, required for 3D audio)
“ONSPEED SPEAKER LEFT/RIGHT” in appropriate earpiece.

Garmin ICS BIT: Press/hold inner right knob and turn radio on to enter configuration mode. Turn large knob to HEADSET TEST. Use small knob to select LEFT or RIGHT test.

Low Vol Value (Turn volume knob all the way down, press READ button):

High Vol Value (Turn volume knob all the way up, press READ button):

| | |
|--|-----------------------------------|
| Mute Audio Under IAS (kts): _____ | 3D Audio |
| | <input type="checkbox"/> Enabled |
| | <input type="checkbox"/> Disabled |

| | |
|-----------------------------------|--|
| Over-G Audio Warning | Aircraft Load Factor Limit |
| <input type="checkbox"/> Enabled | <input type="checkbox"/> Standard Category (+3.8 G) |
| <input type="checkbox"/> Disabled | <input type="checkbox"/> Normal Category (+4.4 G) |
| | <input type="checkbox"/> Aerobatic Category (+6.0 G) |
| | <input type="checkbox"/> G Limit Test (+2.5 G) |

SD Card Logging ☐ Enabled ☐ Disabled

| | |
|-------------------------------------|--|
| Serial Out Format | Serial Out Port |
| <input type="checkbox"/> Garmin G3X | <input type="checkbox"/> None |
| <input type="checkbox"/> OnSpeed | <input type="checkbox"/> Serial 3 (RS323 – Pin 12) |
| | <input type="checkbox"/> Serial 5 (TTL – Pin 9) |

SAVE as required. Confirm “Configuration Saved.” *Failure to save will result in settings defaulting to previous.*

SETTINGS > SENSOR CONFIGURATION

-Be sure box orientation is correct in AOA CONFIGURATION settings.
-Aircraft should be in a hangar (if practical) to perform sensor bias. Do not disturb aircraft during sensor calibration (do not sit in aircraft—use WiFi). Use an electronic level to measure FRL angle (FRL in weight and balance instructions/builder’s manual).

Enter aircraft (FRL angle) in degrees: _____
(zero if aircraft leveled, else angle of the FRL with aircraft on its wheels)

Select **CONFIGURE SENSORS**. New parameters will display.

Current sensor configuration:

| | | | |
|----------|---|-----------------------|--------------------------------|
| Pressure | { | PfwdBias: _____ | |
| | | P45Bias: _____ | |
| IMU | { | gxBias: _____ | |
| | | gyBias: _____ | |
| | | gzBias: _____ | |
| Boresite | { | Pitch Bias _____ | (Δ longitudinal axis/box axis) |
| | | Measured Pitch _____ | |
| | | Corrected Pitch _____ | (should = FRL angle ± 0.1°) |

Note: When you change a configuration setting and/or configure sensors, a new onspeed.cfg file is created. **TOOLS > LOG FILES** to access. Copy into OnSpeedTeensy Arduino file—**write over <CONFIG> to <CONFIG> lines, there may be additional top or bottom lines in code. Save and reload OnSpeedTeensy.**

Cameras

All: fully charged, blank SD card inserted and **formatted**. Use camera to format card.

Oblique: MED FOV if boom installed, else WIDE

Forward: MED FOV all flights. Audio harness connected. **ENSURE HARNESS IS PLUGGED INTO CAMERA.** If Gen 1 recording required, install additional patch cable. Adjust ONSPEED volume to 11 O'clock MINIMUM to ensure sufficient thru-put to camera for post-flight edit.

Hero 4 max battery time 1+50 minutes to fail off. Spare batteries as required.

Boom

Secure: six #6 screws + 2 x thru bolts with locking hardware. **BATTERY FACES COCKPIT.**

Battery Installed, positive end forward (check battery log for time remaining. Maximum cumulative flight use: 6 hours).

Note: Boom wifi connection is powered via ONSPEED box (Radio Switch). Boom may be disabled in flight by pulling ONSPEED CB. Boom LED visible from cockpit when powered on. LED indicates transmit and receive.

Software

Doc's Box: Stand-alone software. Clear log as required. Must use cable and terminal software to download. Powered by MASTER switch.

ONSPEED Box: Can power up with cable and battery pack (enables wifi capability). LED on panel lit when powered up. Breathes to indicate normal operation. Download via wifi or terminal program. STOP! LIST! FORMAT!, as required. Always STOP! prior to log download (WiFi download automatically sends STOP command). To interface with Arduino software, must hook up computer directly with cable.

WiFi Firmware update to ONSPEED Box: Unzip file. Folder contains three files. The OnSpeedWifi.ino.pico32.bin file is a "binary" file that contains firmware. Establish wifi connection, and open ONSPEED.LOCAL: TOOLS > UPGRADE WIFI MODULE. Select new .bin file and upload (Note .bin file icon shows as zip file on Mac). Process can be slow. Perform hard reboot and verify correct firmware version is displayed.

AFTER START

Radio Switch – ON

Comm Radio – ON

ICS – CHECK

Gen 1 box: ON + RESET (Right or Both, A/R), Turn off after test.

Gen 2 - ADJUST VOLUME / LED ON (Breathing)

Boom – LED BRIGHT FLASH

Cameras – ON LEDs CHECKED

Verify audio hook-up for FWD camera

TAKEOFF

Monitor Gen 2 for proper operation at 25 KIAS

TEST AREA

Altimeter – SET AS REQ FOR TEST (QNH or 29.92)

Confirm all LEDs

Gen 2

Camera

Boom

Confirm VOLUME SET

Confirm Gen 1 ON (as desired)

Heartbeat tone normal if powered up in flight prior to slowing to L/D_{MAX} first time

ABNORMALS

Gen 2 LED not breathing: RESET 1 AMP CB to hard boot

Remove boom power: Pull 1 AMP ONSPEED CB (also disables Gen 2 syst

ADJUST SET POINTS IN-FLIGHT (iPhone Only)

Turn off DATA

Open browser: ONSPEED.LOCAL

SETTINGS > AOA CONFIGURATION

[] Establish desired AOA/IAS condition

[] STABLE

[] Press USE LIVE AOA

Process takes a few seconds

[] Scroll to bottom of page and SAVE

[] Confirm proper setpoint operation

To restore settings: LOAD DEFAULT CONFIG + SAVE at bottom of page