**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/DMAX 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/DMAX 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/DMAX 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/DMAX 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**

[ ] Enabled [ ] Dynon D10/D100

[ ] Disabled [ ] SkyView/Advanced

[ ] Garmin G5

[ ] Garmin G3X

[ ] Aerovonics

[ ] 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 knot 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**

[ ] Enabled

[ ] Disabled

**Over-G Audio Warning Aircraft Load Factor Limit**

[ ] Enabled [ ] Standard Category (+3.8 G)

[ ] Disabled [ ] Normal Category (+4.4 G)

[ ] Aerobatic Category (+6.0 G)

[ ] G Limit Test (+2.5 G)

**SD Card Logging** [ ] Enabled [ ] Disabled

**Serial Out Format Serial Out Port**

[ ] Garmin G3X [ ] None

[ ] OnSpeed [ ] Serial 3 (RS323 – Pin 12)

[ ] 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: \_\_\_\_\_\_\_\_\_\_

gxBias: \_\_\_\_\_\_\_\_\_\_

IMU

gyBias: \_\_\_\_\_\_\_\_\_\_

gzBias: \_\_\_\_\_\_\_\_\_\_

Pitch Bias \_\_\_\_\_\_\_\_\_\_ (Δ longitudinal axis/box axis)

Boresite

Measured Pitch \_\_\_\_\_\_\_\_\_\_

Corrected Pitch \_\_\_\_\_\_\_\_\_\_ (should = FRL angle ± 0.1o)

**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 “bianary” 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**

Alitimeter – 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/DMAX 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