

Recording Your Turnback

Agreement to Waive Liability, Assume Risk, and Indemnify

Please read carefully the “TAKEOFF ADVISOR PROJECT PARTICIPANT’S AGREEMENT TO WAIVE LIABILITY, ASSUME RISK AND INDEMNIFY” found at the end of this procedure in Appendix A.

By voluntarily taking the action to perform the test maneuvers detailed herein (in whole or in part), or accompanying the pilot performing the maneuvers, and/or submitting data for analysis by InFlight Metrics, and by performing the other steps provided herein, you are agreeing to the terms of the Agreement.

If you do not understand anything in this Agreement, or do not wish to be held to its terms, you should NOT perform the test-procedures specified in this document.

Flight Recording:

To record your flight, you will need a flight recording device.

Use one of the following to record your flight:

- ForeFlight with attached Sentry (Wi-Fi), Stratus (Wi-Fi), GDL 50 (Bluetooth), or a similar external device that provides GPS/AHRS data (see Foreflight manual).
- G1000 using an SD card to store the flight data (see G1000 manual).
- A similar device that will record GPS and AHRS data at a rate of 1 record per second.
- *NOTE: ForeFlight must be connected (via Wi-Fi or Bluetooth) to an external device to record the rapid turnbacks smoothly. It cannot be used alone without the external device connected for this exercise.*
- With ForeFlight, using Track Log, press Record (on Maps page) before the flight. You can also turn on breadcrumbs and save the breadcrumbs as a Track Log backup.
- After recording, go to More/Track Logs and find the recording. Send the KML file to Mail (to your email).

Preparation:

- **For safety, have one person fly the airplane and another person write down the information during the flight (time, altitude, speed, etc.).**
- **If you are uncomfortable performing the turnback maneuver, consider flying with a CFI who could demonstrate it.**
- Put these sheets in a clipboard to record data during the flight.
- Feel free to make extra copies of pages if multiple trials of the same maneuver are needed.
- Turn on flight recorder before taxiing.

Preflight Information:

| | |
|--|----------------------|
| Email address: | Name (optional) |
| Type Aircraft: | Engine Type / HP: |
| Constant-speed prop? <input type="checkbox"/> Yes <input type="checkbox"/> No | Type prop: |
| Gross weight for start of this test flight: | Max gross weight: |
| Tail number (optional): | Wing area (if known) |

Airport Information:

| | | |
|---------------|---------|-----------------------|
| Airport code: | Runway: | Field elevation (MSL) |
|---------------|---------|-----------------------|

Conditions:

| | |
|---|--------------------------------|
| Ground wind direction and speed (knots): | Density altitude: |
| Barometric Pressure (inHg): | Temperature (indicate C or F): |

Alternatively, take a **screenshot of the METAR** and send it in with the data packet.

Winds Aloft:

| | | |
|---|---------------|---------------|
| Airport code: | 3000 feet AGL | 6000 feet AGL |
| Airport near practice area (if different): | 3000 feet AGL | 6000 feet AGL |

Alternatively, take a **screenshot of the Winds Aloft** tab and send it in with the data packet.

Takeoff:

- Confirm the Track Log is recording. Leave on for entire flight.
- If you are at a towered airport, you can ask the tower for a winds report just before takeoff. This is the most accurate measure of the ground winds.
- Line up and wait on the runway – stop on the runway for just a moment to mark the beginning of the roll.
- During takeoff, write down the speed of your climb out when climb speed has been established (V_Y , V_X , or between. It is your choice. Use your typical climb out speed).
- Maintain heading until 1,000 feet AGL is reached (if possible).

| | |
|---------------------------------------|---------|
| Climb out IAS (indicate knots or mph) | Heading |
| | |

Measure Winds Aloft:

- Confirm Track Log is still recording.
- Maintain level flight at a safe altitude and hold heading (3,000 to 3,500 feet AGL)
- Write down start time of level flight, heading, and IAS. Hold heading, speed, and altitude for 1 minute.
- Turn 90 degrees and repeat.
- Turn 90 degrees and repeat.

| | Start Time | Heading | Speed (indicate knots or mph) |
|---------|------------|---------|----------------------------------|
| Trial 1 | | | |
| Trial 2 | | | |
| Trial 3 | | | |

Simulate Loss of Power, Turn Back, and Glide:

Protect your engine by using carburetor heat as needed, use slow power reductions to reduce thermal shock, and reset your constant-speed prop to comply with your manufacturer's recommendations.

KNOW YOUR STALL SPEED AT 45 DEGREE BANK.

DO NOT DECELERATE BELOW!

- Confirm Track Log is still recording.
- Go to a safe altitude (3,000 to 4,000 feet AGL). Check for aircraft in the area.
- Head the airplane either N/S or E/W to line up with fields and/or section lines below. This makes it easy to determine a 180-degree turn.
- Climb at takeoff speed (V_X or V_Y or what was used at takeoff) to at least 4,000 feet AGL.
- Pull the throttle to power off (slowly).
- Count to 4 (seconds) without moving the yoke. **DO NOT LET THE AIRPLANE STALL.**
- Bank to 45 degrees and pitch to best glide speed (V_G).
- Hold until a little past 180-degree turn (i.e., until a little past when the fields below are lined up)*.
- Straighten turn at 180-plus degrees and maintain pitch to best glide speed (V_G).
- Maintain heading until the altimeter falls 1,000 feet below the start of turn altitude.
- Apply power.
- Repeat as needed.

**Note: We only need to measure a 180-degree turn. The Takeoff Advisor will use the same descent angle around whatever turn is needed to line up with the runway.*

| | Start Time of Power Off | Heading During Stable Glide | Speed During Stable Glide (indicate knots or mph) | OAT (at approx. power out altitude) | Comments (bank angle, etc.) |
|---------|-------------------------|-----------------------------|---|-------------------------------------|-----------------------------|
| Trial 1 | | | | | |
| Trial 2 | | | | | |
| Trial 3 | | | | | |
| Trial 4 | | | | | |

After Landing

- Stop the recording. You should have a single recording of the entire flight.

Send Data to InFlight Metrics:

Send data to **RickM@InFlightMetrics.com**:

- Track Log from ForeFlight (KML File) or .csv file from other recording device.
- A copy of the written sheets above.
- Screenshots of the METAR and/or Winds Aloft if applicable.

To receive the 3D flight visualizations off the runways of your choice write down the airport code and runways you would wish to view. These can be different from the runway you took off from.

| Airport code: | Runway 1: | Runway 2: | Runway 3: |
|---------------|-----------|-----------|-----------|
| | | | |

Appendix A

TAKEOFF ADVISOR PROJECT PARTICIPANT'S AGREEMENT TO WAIVE LIABILITY, ASSUME RISK AND INDEMNIFY

In consideration for being offered the opportunity to participate in the Takeoff Advisor Project (the "Project"), which includes receiving instructions for measuring your turnback, submitting data, and receiving turnback information for supplemental and discussion purposes from Inflight Metrics ("InFlight"), I, as the individual executing the maneuvers in this Agreement and receiving the information, below, agree as follows:

I represent the following:

1. I am an experienced pilot and have adequate training in the aircraft that I will be operating for the Project so that I am prepared for challenges that might be presented by the aircraft and I am familiar with the aircraft's flying qualities. Or, I am an individual accompanying the pilot performing these test maneuvers for the purpose of observing or helping record the test maneuvers and am aware of the risks the test maneuvers entail.
2. I will not make any copies of the test procedure, analysis, reports, visualizations or plots provided to me as part of the Project other than copies for my own personal use. Copies of the procedure are permitted for the express purpose of performing the maneuvers by the pilot agreeing to the terms in the Agreement or the individual accompanying the pilot.

I am aware of and understand the following:

1. **Flying in aircraft and completing test maneuvers while operating an aircraft involves risks.** Serious injury or death can result from many causes, including without limitation aircraft crashes, pilot or ground crew error, engine or mechanical failure, defects in the aircraft or runways, negligent maintenance, interference by wildlife and other objects, difficult or inadequate emergency response, weather or terrain conditions, contaminated fuel, or hard or forced landings. **Some of these risks are increased with respect to test flights in amateur-built or experimental aircraft.** Injuries could be minor such as bruises and scratches, major such as eye injuries, broken bones and concussions, or catastrophic such as paralysis, severe burns or death.
2. The tools used to complete the analysis of the data collected from the flight recordings and to prepare the report, turnback visualization and flight plots are under development and, as such, **all information provided as part of the Project is provided for supplementary and discussion-related purposes only.** No representations are made as to the accuracy of the information that will be provided and the report, including the turnback visualization and flight plots, **should not be solely relied upon for aeronautical decision making.** Performance of any aircraft during an actual emergency may be significantly better or worse than what the report, visualization or plots provide due to many factors not considered as part of the analysis.

Assumption of Risk, Agreement to Waive Liability and Not to Sue. I (for myself, my spouse, heirs, family members, issue, personal representatives, executors, administrators and assigns) hereby: (1) assume all risks and full responsibility for the risks outlined herein related to the use of any documentation I received from either InFlight Metrics or Experimental Aircraft Association, Inc. related to the Project; and (2) fully release, discharge and agree not to sue: (a) InFlight Metrics; (b) Experimental Aircraft Association, Inc.; (c) EAA Aviation Foundation, Inc.; and/or (d) the officers, owners, directors, members, employees, agents, divisions, affiliates, insurers and volunteers of those entities (collectively, the "Releasees") for any and all claims, injury or death arising out of or related to the risks described herein. This release, discharge and agreement not to sue applies to all legal rights, including those resulting from any negligence of Releasees, other than those resulting from the gross negligence or willful misconduct of any of such Releasees.

Indemnification and Hold Harmless. I agree to indemnify and hold the Releasees harmless from and against, without limitation, any and all claims, actions, suits, proceedings, expenses, costs, damages, and liabilities, including actual attorney's fees, incurred, brought or threatened as a result of or arising out of my participation in the Project. This duty to indemnify and hold the Releasees harmless applies even if any of the Releasees is negligent; however, indemnification of any Releasee is not required if such Releasee is grossly negligent or has engaged in willful misconduct.

Consent and Fitness. I am at least 21 years old and know how to read and understand the English language sufficiently to fully understand this Agreement and appreciate its nature and consequences. I acknowledge that participation in the Project involves risks and I am voluntarily participating in the Project with full knowledge of those risks. I represent and warrant that I am sufficiently healthy and fit to participate in the Project and, to the best of my knowledge, I do not have any physical infirmity or chronic ailment or injury of any nature that would limit my ability to participate or render my participation in the Project unsafe.

Legal Advice; Right to Bargain. I know that I can talk to my legal advisor about this Agreement and I have either done so or have chosen not to. I understand that I have the right and have been given the opportunity to object to and bargain about the provisions of this Agreement.

IMPORTANT: BEFORE PERFORMING THE TEST-PROCEDURES SPECIFIED IN THIS DOUMENT.

By voluntarily taking the action to perform the test maneuvers detailed herein (in whole or in part), or accompanying the pilot performing the maneuvers, and/or submitting data for analysis by InFlight Metrics, and by performing the other steps provided herein, you are voluntarily giving up legal rights and providing unconditional release of all liability to the greatest extent allowed by the law. If any part of this agreement is held invalid, the rest of the provisions shall remain in effect. If you do not understand anything in this agreement, and/or do not wish to be held to its terms, you should NOT perform the test-procedures specified in this document.