

# SSA BADGE & RECORD PROCEDURES GUIDE 2009

Including Changes effective 1 October 2009

## I. Planning

- ✓ **Take advantage of online resources.**
  - At [SSA.org](http://SSA.org), use links to “Soaring Achievement”, “Soaring Badges”, “US & State Records”, “Badge Info”, and “Forms” to access -
    - Badge & Record FAQ
    - SSA Official Observer’s Checklist
    - SSA Declaration Forms
    - Current and historical badge lists
    - State & National record listings
    - Complete Sporting Code Section 3 (“SC3”)
    - SC3 Summary for Badge pilots
    - Rules for various SSA awards programs
  - At [FAI.org/gliding](http://FAI.org/gliding), use links to “Documents”, “Technology” and “Gliding Sport” to access -
    - World Record application forms
    - Flight Recorder information including Approval Documents issued by the International Gliding Commission (“IGC”)
    - Current and historical World Record listings
- ✓ **Plan your flight with an Official Observer (“OO”):**
  - For *FAI Badges, State and US National Records*, the OO must be an SSA member who (1) holds at least an SSA “B” badge; or is (2) the airport manager at the airport of takeoff or landing; or (3) is appointed by SSA
  - For *World Records*, the OO must meet the above requirements **AND** be SSA approved in writing to serve as an OO for World Records.
  - In all cases, the OO must be familiar with proper pre- and post-flight handling of the data recording equipment used, and accurate analysis of flight documentation

## II. Badge & Record Overview

- ✓ FAI Badges may be earned in one or more flights:
  - **Silver Badge:** 1,000 meter (3281 foot) Altitude Gain; 5 hour duration flight; cross country distance flight of 50 km (31.1 sm)
  - **Gold Badge:** 3,000 meter (9843 foot) Altitude Gain; 5 hour duration (if no Silver Badge); cross country distance flight of 300 km (186.5 sm)
  - **Diamond Badge:** 5,000 meter (16405 foot) Altitude Gain; 300 km (186.5 sm) closed course goal flight; 500 km (310.7 sm) distance flight
- ✓ FAI Diplomes are awarded for individual distance flights of 750 km (466.03 sm) or more, at 250-km increments.
- ✓ In various combinations of pilot Category, aircraft Class and performance Type, almost 500 different records exist at State, US National and World levels.

## III. Documentation & Procedures Overview

- ✓ **Required for US National and World Records**  
-- AND BEGINNING 1 OCTOBER 2009 --  
**ALL Diamond Goal claims and any Diamond Distance using one or more declared Way Points**

A **Flight Recorder** (“FR”) is an electronic instrument approved by FAI’s International Gliding Commission for recording pressure data, GPS position data, and - in the case of motor gliders - engine noise level.

- Before flight, an OO inspects the FR installation, noting its model and serial number. The pilot attempting a cross country flight will generally enter a pre-flight declaration listing the “waypoints” planned.
- The FR records position and altitude at regular intervals in flight; as soon as possible after landing, an OO re-checks the FR installation and downloads the flight data file. The OO then uses computer software to evaluate the flight data.
- Independent evidence is required to verify FR claims and this may take the form of soaring site flight logs or statements from witnesses regarding take-off and landing times and locations.

- ✓ **Permitted for other records & awards:**

A **barograph** tracks both elapsed time and barometric pressure; the latter is used to determine in-flight altitudes. A barograph is the only recording device required for any badge distance claimed from release to landing.

- An OO prepares the barograph for flight, and secures it in the glider in a location inaccessible to the pilot in flight.
- An OO takes charge of the barograph as soon as possible after landing. The pilot may remove it from the glider before a ground or aero retrieve, but only the OO may unseal it.

### **FOR FLIGHTS BEFORE 1 OCTOBER 2009**

In combination with a barograph, a **camera** (film, not digital) proves the cross country pilot reached one or more “waypoints” declared before flight

In general, waypoints must be achieved by Observation Zone Sector. See required procedures in SC3 4.6.3 a & b

### **BEGINNING 1 OCTOBER 2009**

In combination with a barograph, an SSA-approved GPS Position Recorder proves the cross country pilot reached one or more “waypoints” declared before flight.

See required procedures in SC3 effective 1 October 2009

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### IV. Data Analysis: General Procedures

#### ✓ Basics for all claims

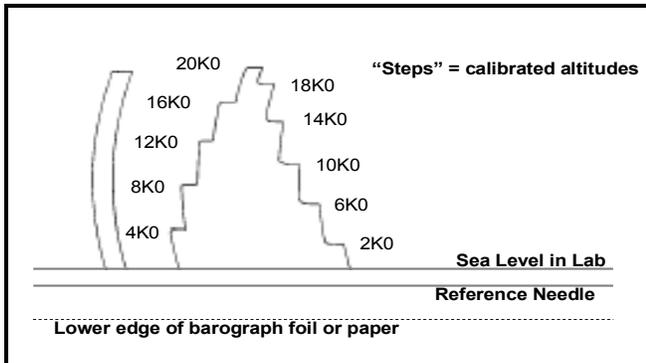
- A landing after sunset is disqualifying (SC3 4.5.4), as is "Unsporting Behaviour," including airspace violations. (SC General Section 5.2.2.3; SC3 5.3.2a)
- There must be no question an intermediate landing or motor glider engine run could *not* have occurred during the soaring performance. (See SC3 4.3.4; 4.3.2)
- Ideally, recorded altitude data shows a clear "notch" - a loss of altitude - after release or, for an FR claim, a turn radius which, in an overhead view of position data, is clearly indicative of thermalling in free flight. An FR-recorded motor glider's engine stop *must also* be reflected in an Engine Noise Level consistent with soaring flight.
- In the absence of a "notch," the tow pilot may certify the location of tow release or a ground-based Observer may certify release time. For barograph claims, determining release altitude based on time data will require the post-flight procedures described in SC3 Annex C, item 14.6.

### V. Data Analysis: Altitude

#### ✓ Mechanical barographs use Graphic calibration

The calibration for a mechanical barograph (e.g.: Winter, Replogle) shows needle deflections at lab-induced pressure altitudes. For all FAI badges and most records, this calibration is required either within the 12 months preceding the flight or within 1 month following the flight.

**Figure 1:** A double needle barograph calibration



A single-needle barograph calibration differs from the above only in that it includes no "reference needle" line.

For ANY mechanical barograph, a graph must be constructed to show needle deflection *between* calibrated "steps," each of which has been plotted above a reference line common to the calibration barograph and every flight barograph.

On a *double needle* barograph, the common reference line is scribed by the fixed or REFERENCE NEEDLE

On a *single needle* barograph, the common reference line is the LOWER EDGE OF THE BAROGRAM

#### ✓ To make a graph for a mechanical barograph...

... you'll need calipers, a right-angle guide to determine true vertical and graph paper with 10 squares per inch. (Check drafting supply stores!)

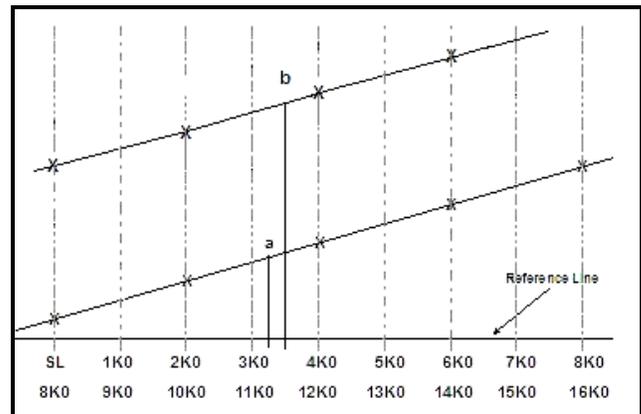
Draw a horizontal line an inch above the bottom of the graph paper. This represents the *lower edge of the barogram* for a single-needle barograph; it represents the *reference needle line* for a double-needle barograph.

Just below the reference line you drew, label a vertical grid line near the left margin "Sea Level." At the vertical grid line 10 graph squares to the right, write "1K0" for 1,000' MSL; use the same scale to label grid lines at 1000-foot intervals increasing from left to right.

Multiple rows help keep the graph a manageable size, as shown in Figure 2, but remember to begin each new row with the *same* measured "step" that ended the last row!

- Place a guide over the calibration barograph to determine true vertical. Place one caliper point on the appropriate reference line and adjust the caliper so the other point is on the Sea Level "step," with both caliper points touching the vertical guide.
- Transfer the caliper measurement to the graph paper, placing one point on the graph's reference line, at "SL." Place the other caliper point on the same vertical grid line and make a small "X" at this location.
- Use the same method to transfer measurements for each Calibration "Step" to the graph. Use a flexible guide to draw a smooth line through all the "Xs."

**Figure 2:** Using the calibration graph.



Needle deflection at "a", measured from the flight barograph, shows a calibrated altitude of 3,200' MSL, "b" shows a calibrated altitude of 11,500' MSL.

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### ✓ **Correcting barograph data for instrument error**

Place a vertical guide on the flight barogram and use calipers to measure needle deflection from the proper reference line to the point to be evaluated. Transfer this measurement to the graph and read calibrated altitude from the values written along the graph's reference line.

- jot down the values for pre- and post-flight baselines and each in-flight event evaluated.
- keep track of which events took place nearer take off time and which were closer to landing time.

### ✓ **Correcting FR data for instrument error**

For all badges and most records, electronic barographs and Flight Recorders must be calibrated either within the 24 months before flight or within 2 months afterward. The calibration consists of columns of figures such as these:

<u>Lab Altitude</u>	<u>Recorder Altitude</u>
0	98
2000	2100
4000	4133
6000	6102

Interpolation is used to correct for instrument error between known values. In the example below, **492** is the post-flight pressure altitude recorded at the landing site and **"X"** is the calibrated altitude to be determined:

<u>Calibrated Altitude</u>	<u>Indicated Altitude</u>
0	98
"X"	492
2000	2100

Now, a spreadsheet comes in handy!

$$X = 2000 - ((2100 - 492) * ((2000 - 0) / (2100 - 98)))$$

$$X = 393.6 \text{ feet}$$

- Jot down interpolated values for pre- and post-flight data points and each in-flight event evaluated.
- Keep track of which events took place nearer take off time and which were closer to landing time.

### ✓ **The final step: Correct for non-standard pressure**

- SUBTRACT* the calibrated altitude at the *pre-flight baseline (or data point)* from field elevation at the *take off site*. (A negative number may result.)
- SUBTRACT* the calibrated altitude of the *post-flight baseline (or data point)* from field elevation at the *landing site*. (A negative number may result.)
- For any event near take off time, *ADD* the number found in (a) to the calibrated altitude for that event.
- For any event near landing time, *ADD* the number found in (b) to the calibrated altitude for that event.

*These calculations yield altitude corrected for both instrument error and non-standard pressure.*

*(Too much math? The sample 492-foot pressure altitude was recorded at a soaring site at 798' MSL. If not corrected for instrument error and non-standard pressure, a high point recorded shortly before landing would appear to be about 400 feet lower than it really was!)*

## VI. Cross Country Task Planning

### ✓ **General requirements**

- A pre-flight declaration per SC3 4.2.1 is required for ALL cross country badge and record flights. For "Free" records, the declaration need not list waypoints.
- Where Turn Points are claimed or distance is to be measured from any Start other than release to any Finish other than landing, position data must prove -
  - the glider crossed a Start and/or Finish Lines; or
  - at each Turn Point and any Start and/or any Finish not achieved by line crossing, the glider entered the Observation Zone ("OZ") Sector or Cylinder.

*At least one data point must be recorded at waypoint coordinates or in the OZ; or a straight line drawn between two consecutive data points must pass through the OZ.*

Beginning 1 October 2009, Cylinder OZs are an option at Turn Points only

### ✓ **FAI recognized task options**

- "Free" tasks of four types (SC3 1.4.3; 1.4.7 & 8) are available for records *only*. Items listed at SC3 4.2.1 a through d *must* be declared before flight. The task may be claimed *afterward*, based on the recorded data points most advantageous to the pilot.
- "Distance Using Up to 3 Turn Points" (SC3 1.4.4b; 1.4.5) is a popular option for badges and records. All intended waypoints including a maximum of three Turn Points, each at least 10 km from any other, *must* be declared before the flight. Then...

... If the declared Start Point is skipped, not properly achieved or results in a lesser distance, release <sup>(1)</sup> is used as the Start Point.

... Each Turn Point may be used once, in any order, or not at all.

... If a declared Finish Point is skipped, not achieved properly or yields a lesser distance, landing is used as the Finish Point. Beginning 1 October 2009, a Finish may also be claimed at any data point recorded before landing or an earlier engine start (if any), whichever occurs first.

<sup>(1)</sup> "Release" (SC3 1.1.6; 1.2.6) is where the glider releases from tow or ceases to use any means of propulsion.

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- Straight Distance, badges only (SC3 1.4.5; 1.4.3)

Distance is measured from release to landing, or for motor gliders, from release to engine start or landing, whichever occurs first. Beginning 1 October 2009, any pilot may claim a Finish at a data point recorded before landing or an earlier engine start (if any).

If a Start Point was declared before flight and the pilot exits its OZ Sector *anywhere*, distance may be measured from the declared Start Point.

- Straight Distance to a Goal, for both badges and records. (SC3 1.4.4[a]; 1.4.4 for records only )

The pre-flight declaration *must* list a Finish Point, achieved as provided in SC3 4.3.3; 1.3.2 for Goal flights\*. Distance is measured from release\* or the Start Point to the declared Finish Point.

- Out & Return or Triangle, for both badges and records (1.4.6). These closed courses are the *only options for Diamond Goal and speed records*. A Start/Finish point and one, two or three Turn Points *must* be declared before flight, and -

- The glider *must* start per SC3 4.3.3 1.3.1 for Goal Flights\* and Turn Points *must* be used in the declared sequence

- the Finish Point *must* be achieved as provided in SC3 4.3.3; 1.3.1 for Goal Flights\*

... Out & Return or 2-Turnpoint Triangle distance is measured Start to Finish, via declared Turn Point(s).

... distance around a completed 3-turn point triangle is measured from Turn Point 1 to Turn Point 2 to Turn Point 3 and *back to Turn Point 1*.

... for record triangles *only*, the length of each "leg" *must* be a certain percentage of the Official Distance for the course (See SC3 1.4.3d iii; 1.4.6b)

\*Beginning 1 October 2009, ALL goal and closed courses require (1) Start Line crossing or exit from a Start OZ Sector 1000 meters in radius; and (2) *at or before landing*, Finish Line crossing or entry into a Finish OZ Sector 1000 meters in radius.

### VII. Data Analysis: Duration & Distance

#### ✓ **Determine the Loss of Height ("LOH")**

- The simplest LOH calculation for badges: subtract Finish Point elevation from release altitude MSL. (SC3 1.4.7); *deleted 1 October 2009*

- For FR claims, SC3 provides as many as 20 *more* options, depending on the task type and the Start and Finish Points credited. In each case, Finish Altitude MSL is subtracted from Start Altitude MSL as listed in the following table of possibilities.

<u>Start Altitude</u>	<u>Finish Altitude</u>
Release	*Finish Line crossing
*Start Line crossing	*Finish OZ entry
*Start OZ exit	Highest in Finish OZ
Lowest in Start OZ	Motor glider MoP Start Landing site elevation
<i>*Interpolated at the Line or OZ boundary</i>	

Beginning 1 October 2009, Finish Altitude for certain tasks may also be based on a Finish "fix" selected post-flight

Loss of Height penalties, Per SC3 4.4.2; 4.4.3

- For speed and duration claims, an LOH in excess of 1,000 meters (3281 feet) invalidates the claim.

- For distance flights where sum of course "leg" distances is 100 km (62.14 sm) or less, the claim is invalid if LOH exceeds of 1% of that distance

- For longer distance flights, each 100-foot increment of LOH in excess of 1,000 meters (3281 feet) results in a 1.894-mile distance penalty.

#### ✓ **For cross country flights, check position data for course completion and proper use of all OZs**

- If any Turn Point is achieved only by Cylinder, *ALL* Turn Points must be achieved by Cylinder, each resulting in a 1-km Cylinder Correction penalty.

If a Start other than release is claimed and the Start Line was not crossed, an additional ½ km Cylinder Correction applies; if a Finish other than landing is claimed and the Finish Line was not crossed, another ½ km Cylinder Correction applies.

Beginning 1 October 2009, OZ Cylinders cannot be used at Start & Finish Points, so Cylinder Correction penalties apply only at Turn Points.

#### ✓ **Distance calculations**

- For both badge and record claims -

(1) Use the World Distance Calculator (at [SSA.org](http://SSA.org), through Soaring Achievement & Badge Info links) to determine task leg distances. Set the calculator to use the WGS 84 (ellipsoid) earth model.

(2) "Official Distance" for the course is the sum of task leg lengths, less applicable penalties for Loss of Height ("LOH") and Cylinder "corrections" (SC3 1.2.13; 1.3.7)

- For triangle distance and speed records, subtract the Cylinder Correction for each "leg" from the leg distance calculated in (1) above; check compliance with leg length limits at SC3 1.4.3(d) iii; 1.4.6b by comparing each corrected leg length to Official Distance for the course, as defined in (2) above.

# SSA BADGE & RECORD EVALUATION & APPEAL POLICIES

## **I. SSA AWARD EVALUATION POLICIES**

1. The completed application for any badge claim must be received at SSA headquarters within 6 months after the flight. Shorter deadlines apply to record and other award programs, as specified in the appropriate rule documents posted at SSA.org, through “Soaring Achievement”, “Badge Info” and “Forms” links. The following items must accompany any application form:

1.1. the pilot’s statement of the means used to access any airspace requiring an ATC authorization

1.2. the pre-flight declaration, if required and made in writing

1.3. for barograph-documented claims, the *original* flight barogram and, where altitude gain or Loss of Height is within 300’ of an FAI maximum or minimum, *original (not photocopied)* current calibration materials. For barograph claims including film, negatives (preferably uncut) are required; prints with place name and coordinates OO-certified on the reverse are appreciated.

1.4. for all FR-documented claims, a copy of the current calibration and a disk, CD, memory stick or memory card containing a copy of the data file downloaded and retained by the OO.

1.5. Fees, as assessed for -

- Any Pilot who is not a current SSA member
- Certain SSA award programs
- NAA review of...
  - ... US National or World Record claim(s)
  - ... NAA and FAI assignment of US and International Diamond or Diplome number(s)

2. The omission of one or more required item(s) will result in the claim being placed on hold. The pilot will be notified by mail or e-mail; if the deficiency is not remedied within 6 months of the flight date, the claim will be considered withdrawn.

3. Claims in non-compliance with Sporting Code requirements and/or applicable award or record rules will be denied. The pilot will receive a denial notice by mail or e-mail and may appeal this finding as provided below.

## **II. SUMMARY OF APPEAL PROCEDURES**

*In this summary, the “Data Analyst” is the SSA FAI Awards Coordinator or, for a State Record not also submitted as a badge claim, the State Record Keeper.*

*“Letter” is understood to apply equally to “e-mail,” and “Postmark date” is equivalent to “e-mail send date.” Any and all electronic communications from the pilot shall be sent to [thebadgelady@ssa.org](mailto:thebadgelady@ssa.org).*

## **Review of Data Analyst Findings**

- When a claim is denied, the Data Analyst will notify the pilot by letter. If the pilot chooses to contest the denial, the pilot’s written appeal must be postmarked to the SSA within 30 days of the postmark date of the Data Analyst’s denial letter.

- The pilot’s Appeal must include the reason(s) for seeking review. The pilot may also provide supporting documents and statements signed by one or more Official Observers or other witnesses familiar with the circumstances of the flight in question. After this submission, no further evidence will be accepted or considered. The pilot’s appeal must be sent to the SSA clearly marked ATTN: FLIGHT CLAIM APPEAL.

- De-identified appeals are forwarded to the SSA FAI Badge & Record Committee. The committee will render a decision within 60 days of the of the postmark date of the Data Analyst’s letter of denial.

## **Further Review of Committee Findings**

- Consistent with FAI Sporting Code General Section Chapter 9, the Committee decision is the “announcement” of claim denial.

- If the pilot wishes to contest the Committee decision, the pilot must notify the SSA by letter postmarked within 15 days of the postmark date on the letter announcing the SSA FAI Badge and Record Committee’s decision. This appeal should be addressed to the SSA Board of Directors. The SSA Board of Directors (or appointees acting on their behalf) will review the issue within 60 days of the postmark date of the pilot’s appeal to the Board. If no decision is forthcoming after 60 days, the decision of the FAI Badge & Record Committee shall be considered final.

- For SSA Flight Awards, State and National Record claims, the Board’s ruling is final

- For FAI Badge or World Record claims, the Board will decide whether to pursue the FAI appeal process outlined in FAI Sporting Code General Section, Chapter 9, and:

- If the Board decides not to pursue an appeal to FAI, that decision is final.

- If the Board decides to pursue an appeal to FAI, coordination with the NAA is required (9.1); a monetary deposit is required (9.2) and FAI-calculated Tribunal fees may be assessed (9.4.2). The Board may hold the pilot responsible to pay some or all of the FAI-levied appeal costs and fees.