



FAI Sporting Code

*Fédération
Aéronautique
Internationale*

Section 7D – Records & Badges

HANG GLIDERS and PARAGLIDERS RECORDS AND BADGES CLASSES I / II / III / IV / V

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FEDERATION AERONAUTIQUE INTERNATIONALE

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¹ FAI Statutes, Chapter 1, para. 1.6
² FAI Sporting Code, Gen. Section, Chapter 3, para 3.1.3.
³ FAI Statutes, Chapter 1, para 1.8.1
⁴ FAI Statutes, Chapter 2, para 2.1.1; 2.4.2; 2.5.2 and 2.7.2
⁵ FAI By-Laws, Chapter 1, para 1.2.1
⁶ FAI Statutes, Chapter 2, para 2.4.2.2.5
⁷ FAI By-Laws, Chapter 1, paras 1.2.2 to 1.2.5
⁸ FAI Statutes, Chapter 5, paras 5.1.1, 5.2, 5.2.3 and 5.2.3.3
⁹ FAI Sporting Code, Gen. Section, Chapter 3, para 3.1.7
¹⁰ FAI Sporting Code, Gen. Section, Chapter 1, paras 1.2. and 1.4
¹¹ FAI Statutes, Chapter 5, para 5.2.3.3.7
¹² FAI Statutes, Chapter 6, para 6.1.2.1.3

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1 INTRODUCTION

1.1 Description

Section 7 of the Sporting Code deals with records, proficiency badges, world and continental championships for hang gliders and paragliders in all classes.

1.2 Conjunction

Section 7 is to be used in conjunction with the General Section (GS) of the Sporting Code. In the event of ambiguity the General Section takes precedence. For ease of reading and to allow the various disciplines covered by Section 7 to develop individually it is split into four sub-sections:

- A - Hang Gliding (Classes 1, 2, 4 & 5, including short course speed events and aerobatics)
- B - Paragliding (Class 3 excluding Paragliding Accuracy but including aerobatics)
- C - Paragliding Accuracy
- D - Records and Badges (all Classes)

Note: Separate sub-sections may be created in future for sub-disciplines such as aerobatics and speed gliding if a regular and viable sequence of Category 1 events develops.

1.3 General Section

The following subjects are detailed in the General Section.

FAI authority - responsibilities	(Chapter 1)
Definitions	(Chapter 2)
Penalties - protests	(Chapter 5)
Sporting Licences	(Chapter 8)
Appeals before FAI	(Chapter 9)

The General Section also contains the general principles for the following:

Sporting Events	(3)
Observers and Officials	(4)
World Records	(6)
Flight Measurement and Control	(7)

This Section 7-D deals with details of these subjects, which are specific to hang gliders and paragliders.

1.4 General Requirements for Hang Gliders

1.4.1 Definitions of hang gliders, as per General section.

A glider capable of being carried, foot launched and landed solely by the use of the pilot's legs.

1.4.1.1 Hang glider classes

Class 1: Hang gliders having a rigid primary structure with pilot weight-shift as the sole method of control, and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions. Subsidiary controls affecting trim and/or drag are permitted, but only if they operate symmetrically.

Class 2: Hang gliders having a rigid primary structure with movable aerodynamic surfaces as the primary method of control, and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions.

Class 3: Hang gliders having no rigid primary structure (paragliders), and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions.

Note: Paraglider Line Strength Requirements are set out in chapter 17.

Class 4: Hang gliders that are unable to demonstrate consistent ability to safely take-off and/or land in nil-wind conditions, but otherwise are capable of being launched and landed by the use of the pilots legs.

Class 5: Hang gliders having a rigid primary structure with movable aerodynamic surfaces as the primary method of control in the role axis and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions. No pilot fairings are permitted. No pilot surrounding structures are permitted, apart from a harness and control frame.

Note: Pilot fairings are defined in 10.3.

Note: For the purposes of demonstration, "nil-wind" shall mean a headwind of less than 1 m/s (3.6 km/h; 2.2 mph).

1.4.1.3 For record purposes there are five classes: 1, 2, 3, 4 and 5. Class 5 gliders may set records in both Class 2 and Class 5.

1.4.2 Start of hang glider flight

A hang glider flight shall start by foot launch from a hill or by means of mechanical equipment (aero-tow, winch launch, etc.) except that:

1.4.3.1. For competitions where launching is by tow, wheels, including those which are dropped immediately after take-off, may be permitted by the organisers provided it can be demonstrated that the hang glider complies with 1.4.1.

1.4.3.2 Wheels or similar aids to take-off and landing are permitted for permanently disabled pilots, provided that non-disabled pilots can fly the glider without them.

1.4.3 Powered hang gliders.

1.4.4.1 A powered hang glider or paraglider may be used to obtain Delta or Eagle badges provided it complies with 1.4.1 and there is proof that the power source was not operated during the qualifying part of the flight performance.

1.4.4.2 A powered hang glider or paraglider may be used to claim national and world hang gliding records provided that it complies with 1.4.1 and there is proof that the power source was stopped prior to the departure point and was not capable of being restarted in flight.

1.5 Flight Definitions

The word "hang glider" covers all classes. These definitions take precedence over the ones given in the General Section.

1.5.1 A flight

A flight by a hang glider starting at take-off (1.5.7.1) and ending with the landing (1.5.12.1) .

1.5.2 Free flight

That part of a flight, in which the hang glider is not towed, carried or assisted by another aircraft or separate external or jettisonable power source.

1.5.3 Flight performance

The achievement attained during free flight.

1.5.4 Uncompleted flight

A flight is deemed to be uncompleted if:

- An accident occurs during the flight resulting in the death of any member of the crew within 48 hours, or;
- Any part of the hang glider or its equipment is shed or jettisoned other than permitted jettisonable equipment, ballast or fuel declared in advance.

1.5.5 Types of flight

1.5.5.1 Distance flight:

A flight measured for straight-line distance between either a take-off place (1.5.7.2) or a departure point (1.6.7.3) and a finish point (1.5.12.3).

1.5.5.2 Goal flight:

A flight from a departure point to a finish point specified in writing before take-off. A goal flight may be measured for distance and/or speed.

1.5.5.3 Duration flight:

A flight timed from take-off to landing. Note: FAI does not recognise duration as a category for hang glider records

1.5.5.4 Height flight:

A flight measured for height achieved or maintained. Height is defined as the vertical distance from the take-off place or release from tow. Note: FAI does not recognise height flight as a category for hang glider records

1.5.5.5 Altitude flight:

A flight measured for altitude achieved or maintained. Altitude is defined as the vertical distance from mean sea level. Note: FAI does not recognise altitude flight as a category for hang glider records

1.5.5.6 Gain of height flight:

A flight measured for gain of height between any low height and the subsequent greatest height during free flight.

1.5.5.7 Speed flight:

A flight timed for speed between a departure point and a finish point, possibly around one or more turnpoints.

1.5.5.8 Free Distance Flight

The way point(s) of free distance record flight performances may be declared post flight. The free distance record types are:

- Free distance: a flight from a start point to a finish point with no turn points.
- Free out and return distance: a closed course flight having one turn point.
- Free distance using up to 3 turn points: a flight from a start point via up to 3 turn points to a finish point. The turn points must be at least 10 kilometres apart and may be claimed only once.
- Free distance around a triangle:
 - a closed course flight via three turn points independent of the position of the start/finish point. The official distance is given by the sum of the legs of the triangle formed by the turn points.
 - a closed course via two turn points.
 - the start and finish points are not turn points unless specifically declared as such.

Claims and records publication

3D track-logs in IGC format must be submitted with all claims. They will be published on the FAI/CIVL website along with the claims. All records will be published along with their track-logs.

To be homologated, the Free Distance record must exceed the corresponding "non free" record by the value defined in 3.4.

1.5.6 Courses

A course consists of the straight line(s) between a departure point and a finish point via any turn or control points in the designated or pre-declared sequence. A closed course may involve one, two, or three intermediate turn points

1.5.6.1 Declared Course:

A course declared in advance in writing by the pilot.

1.5.6.2 Closed circuit course:

- Out-and-return Flight: A flight to a turn point with return along the reciprocal course to the departure point.
- Triangular Course: A flight around 2 turn points with return to the departure point. For badges, there are no constraints on the shape of the triangle, but for records there are. See 3.6
- Polygon Course: A flight around a course with 3 or more turn or control points and with return to the departure point. Note: FAI does not recognise the polygon course as a category for hang glider records, but they may be used for badges where verified by OLC rules.

1.5.6.3 Lap:

A single completed flight around a closed circuit course. A flight may include more than one lap of a course.

1.5.7 Start of a flight**1.5.7.1 Launch/Take-off:**

The point and/or time at which all parts of the hang glider or its crew cease to be in contact with or connected to the ground or water.

1.5.7.2 Take-off place:

The point from which the take-off is made. If operating from an airfield, the point may be taken as the centre of the airfield.

1.5.7.3 Start Point/Departure point:

The take-off place; or the point of release of tow; or the crossing of a start line; or departure from a cylinder observation zone recorded by a GPS or an approved flight recorder.

1.5.7.4 Start time:

The time of the hang glider at the departure point or the time of crossing the start line.

1.5.7.5 Start altitude:

The altitude of the hang glider above sea level at the departure point.

1.5.7.6 Point of Release.

The place vertically below the hang glider when it releases from a tow.

1.5.7.7 Start line:

A gateway of a designated width and height, the base being specified on the surface.

1.5.7.8 Ground Signal:

A ground signal may be used to indicate the start of a task or section of a task. A ground signal may be a departure point or a control point.

1.5.7.9 Types of start:

- Flying Start. The hang glider is in free flight when crossing the start line or departure point
- Standing Start. A start by a stationary hang glider timed from the giving of a "go" signal.

1.5.7.10 Start Sector:

A designated sector, marked either by physical features on the ground, or a specified shape and size which is oriented around a physical feature on the ground, or a specified shape and size which is orientated around GPS co-ordinates (or a set of GPS co-ordinates). Sectors are only used optionally when flight data recorders are used for flight verification.

1.5.8 Turn point**1.5.8.1 Definition of a Turn Point**

A clearly defined feature on the surface, or GPS coordinates, which are precisely specified before take-off.

1.5.8.2 Rounding the turn point:

A turn point is rounded when the entire hang glider is observed to pass outside the vertical projection of the turn point feature or when it is proved that the designated observation zone has been entered. See 1.5.13.

1.5.9 Control point

A control point is a point, which the hang glider is required to over-fly or to land at during a flight along a course.

1.5.10 Designated sequence

The order in which the turn or control points shall be flown.

1.5.11 Position check point

A position checkpoint is a point, which the pilot proves to have over-flown during a flight of which the route has not been declared in advance.

1.5.12 Finish of flight**1.5.12.1 The Landing**

The point and/or time at which any part of the hang glider or its crew

- First touches the ground.
- Comes to rest after landing.

1.5.12.2 Landing place:

Either the centre of the airfield or the precise place at which the landing is made.

1.5.12.3 Finish point:

Either:

- The landing place
- The entry of an observation zone (or optionally a sector, if a flight data recorder is used instead of a GPS).

- For distance flights (1.5.5.1) the furthest point flown, measured from the take off/departure point.

1.5.12.4 Finish time:

The time at which the glider reaches the finish point.

1.5.13 Observation Zone

The zone which it must be proved that the glider entered in order to validate a start point, turn point or finish point. These may be either the FAI Observation Zones (FAI sectors) specified in A.13.1 or A.13.2 of the General Section or:

1.5.13.1 Turn Point Cylinder

A cylinder of 400m radius around a set of GPS co-ordinates.

1.5.13.2 Start or Finish Cylinder

A cylinder of 400m radius around a set of GPS co-ordinates. Larger radii might be used in competitions; see Section 7A and 7B.

1.5.13.3 Observation Zones

If the flight performance is validated by GPS, a cylindrical observation zone shall be used. If an approved IGC flight data recorder is used, a cylindrical observation zone is preferred, but an FAI sector, as defined in 1.2.9 of Section 3 (Gliders) of the Sporting Code, as reproduced below in 1.5.13.3.3, may be used.

1.5.13.3.1 Cylindrical observation zones

A turn point cylinder may be specified by GPS coordinates and radius. The record or badge distance will be the minimum distance it is possible to fly by entering the specified observation zones. For badges and records, the radius of the turn point shall be 400m equally all around the turn point coordinates.

1.5.13.3.2 FAI sector observation zones

A sector observation zone is the airspace above a 90-degree sector of a cylinder with its apex at the waypoint. This sector is:

- a) For a turn point: symmetrical to and remote from the bisector of the inbound and outbound legs of the turn point,
- b) For a start point: symmetrical to and remote from the outbound leg,
- c) For a finish point: symmetrical to and remote from the inbound leg.

1.5.13.3.3 Section 3 observation zone

This observation zone is the airspace above a 90-degree sector with its apex at the waypoint. This sector is:

- a) For a turn point, symmetrical to and remote from the bisector of the inbound and outbound legs of the turn point,
- b) For a start point, symmetrical to and remote from the outbound leg,
- c) For a finish point, symmetrical to and remote from the inbound leg.

2 FAI PROFICIENCY BADGES

2.1 Description

FAI proficiency badges are standards of achievement, which do not require to be renewed. They are intended to provide a graduated scale of difficulty to measure and encourage the development of a pilot's flying skill, particularly in cross-country flying.

The Bronze badge should be achievable by most pilots within the first year of active flying, with the silver following in the next year or two. The gold badge should be achievable for most pilots within the first five years of cross country flying. The diamond badge should be achievable by perhaps half of all pilots within ten years of flying."

"In any one year, we would expect that for advanced-rated (IPPI 4 or 5) pilots, the bronze badge distance would be flown by 100% of them, the silver badge distance would be flown by more than 75%, the gold badge distance would be flown by 50%, and the diamond badge distance would be flown by perhaps 15-25%. Results may vary from one nation to another, however the qualifications are the same in every country. Delta badges are for pilots flying hang gliders in classes 1, 2 4 and 5. Eagle badges are for class 3.

2.2 Requirements

Any type of open or closed course may be used for the distance requirement of the Delta and Eagle Bronze, Silver and Gold badge. Any type of open or closed course may be used for the distance requirement of the Delta and Eagle Bronze badge and Gold badge. For the Delta and Eagle Diamond badge, the open course may be either straight distance or distance via 3 turn points. The closed course may be out-return, or triangle of any shape.

2.2.1 Delta Bronze Badge

	O-1	O-2,5	O-4
Distance	15 km	15 km	30 km
Or Duration	1 hour	1 hour	1 hour
Or Gain of Height	500 m	500 m	500 m

2.2.2 Delta Silver Badge

	O-1	O-2,5	O-4
Distance	50 km	60 km	60 km
and Duration	3 hours	3 hours	3 hours
and Gain of Height	1000 m	1000 m	1000 m

2.2.3 Delta Gold Badge

	O-1	O-2,5	O-4
Distance	100 km	125 km	150 km
and Duration	5 hours	5 hours	5 hours
and Gain of Height	2000 m	2000 m	2000 m

2.2.4 Delta Diamonds

There are three separate Delta Diamonds, which may be obtained independently from each other

	O-1	O-2,5	O-4
Diamond Open Course:	150 km	200 km	300 km.
Diamond Gain of Height	3000 m	3000 m	3000 m
Diamond Closed Course:	150 km	200 km	300 km.

2.2.5 Eagle Bronze Badge

Distance	15 km
Or Duration	1 hour
Or Gain of Height	500 m

2.2.6 Eagle Silver Badge

Distance	30 km
And Duration	3 hours
And Gain of Height	1000 m

2.2.7 Eagle Gold Badge

Distance	75 km
And Duration	5 hours
And Gain of Height	2000 m

2.2.8 Eagle Diamonds

There are three separate Eagle Diamonds, which may be obtained independently from each other:

Diamond Open Course	125 km
Diamond Gain of Height	3000 m
Diamond Closed Course	125 km

2.3 Special Conditions

- The pilot shall be alone on the hang glider.
- The flights may be completed in any order and any flight may count for any badge for which it fulfils the requirements.

2.4 Issue of Badges

- Badges shall be issued by the appropriate NAC, which shall keep a register of pilots' names and dates of completion of the badge flights.
- The FAI shall issue the first 50 Delta and Eagle Gold badges to be claimed, which shall be numbered.

2.5 Sporting Licence Requirements for Badge Flights

A sporting licence is not required for badge flights. An official observer is recommended, but is not required provided an acceptable validation method is used (e.g. OLC).

3 WORLD, CONTINENTAL AND NATIONAL RECORDS

3.1 General rules

3.1.1 General Section

See Sporting Code General Section, reference Chapter 6.

3.1.2 Fees

The FAI Secretariat charges NACs an administration fee for processing record applications, see <http://www.fai.org/records/checklist> for details of current charges.

3.2 Permitted Records

3.2.1 Types of Record

The following types of flight performance may be recognised as hang gliding and paragliding records:

- Straight distance
- Straight distance to a declared goal
- Declared out-and-return distance
- Free out-and-return distance
- Distance around a declared triangular course
- Free distance around a triangular course
- Free distance using up to 3 turn points
- Speed around triangular courses of 25, 50, 100, 150, and all multiples of 100 km
- Speed over out-and-return courses of 100 and all multiples of 100 km
- Gain of height

3.2.2 Minimum Increase in Flight Performance

To be recognised as a new record all distance flights must exceed the previous record by a minimum of one kilometre, speed flights must better the previous record flight performance by 1% the gain of height record must show an improvement of 3% or a minimum of 100m. In addition, free distance records must exceed the corresponding pre-declared record by one kilometre.

3.2.3 Classification of Records

Records listed in 3.2.1 may be claimed in the following categories:

3.2.2.1 General category - The best performance achieved by a solo pilot.

3.2.2.2 Multiplace category - For the best performance in this category, the age of each occupant other than the designated pilot-in-command shall not be less than 14 years. Only the pilot in command need hold an FAI Sporting Licence but only holders of FAI Sporting Licences can be co-holders of a record.

3.2.2.3 Feminine category - The best performance achieved by a woman.

3.2.4 Classes of Hang Glider

Refer to Rule 1.5

3.3 Special Requirements

3.3.1 Advance notice.

No advance notice or permit is required for a record attempt provided that the necessary official observers are present and proper arrangements have been made to control the attempt. Only a single declaration may be made for a record attempt, except that straight distance and distance to a declared goal may be declared together. [Where a declaration for a distance record has been made and the existing associated speed and/or free-distance record is bettered in that flight no separate declaration is required.](#)

3.3.2 Exceptions.

Except as stated in 3.5.2.1, a GPS or flight data recorders that comply with the IGC (sporting code section 3) standards, and optionally a barograph, shall be used on all record attempts. It must show that no intermediate landing was made and generally substantiate the flight.

3.5.2.1 In FAI First Category events a barograph is not required for record and badge flights made during closed circuit tasks, which contribute to the final scores, provided the organisers agree to provide the necessary flight documentation.

3.3.3 Breaking records

Any record(s) may be broken on any flight for which the requirements are met, except that:

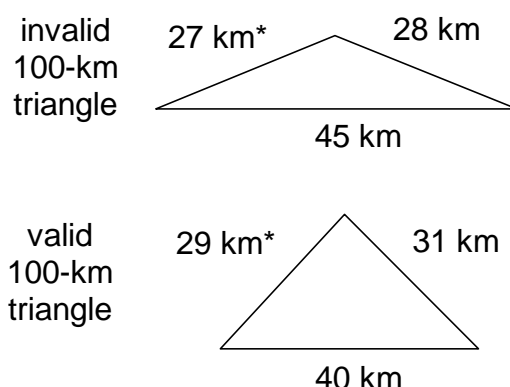
- On a speed flight over a triangular or out-and-return course only the record distance immediately less than the distance flown will count for a record (e.g. a flight of 207 km may break only the 200 km record).
- On completion of a flight to goal, it is permitted to continue on for straight Distance, the distance being measured from the Departure Point to Landing.

3.3.4 Task Declaration

For records, an official observer is required. When a record flight is to be validated by use of a GPS or flight data recorder, the task declaration must state the type of start, turn and finish points to be used e.g. FAI Sector or cylinder. If a GPS is being used to validate the flight, a paper copy of the task declaration must be filled out, signed and presented to the official observer prior to the start of the flight; additionally, the pilot shall enter the course into the GPS' route table. If an IGC flight data recorder is being used, the declaration needs to be made solely in the instrument itself.

3.4 Triangle Courses

For a record no side of a triangular course may have a length of less than 28% of the total distance of the course.



3.4.1 Remote take-off and/or landing point

A pilot may take-off from a point remote from the departure point and/or land at a point remote from the finish point of the flight provided that the departure and finish points are declared and the pilot is properly controlled over-flying these points. Any distance flown before the departure point or after the finish point is not counted towards the course distance.

3.4.2 Altitude differential in record and badge flights

The loss of height permitted between the start altitude and the finish point, regardless of method of launch, is limited as follows:

3.4.2.1 Speed and Distance flights

Speed and/or Distance flights up to and including 125 km. The loss of height must not exceed 2% of the distance flown. No claims will be accepted for flights that do not satisfy this requirement.

3.4.2.2 Speed and Distance

Speed and distance flights exceeding 125km: no time or distance penalty is applied for height differential. Where tow-launch or powered launch of any type is used, release or engine off height must not exceed 1,000m above the ground level of the place of launch.

3.5 Continental Records

3.5.1 Administration

Record homologation is to be carried out by the FAI Secretariat and fees should be set by the Secretariat in line with those currently charged for world records. The claim process for Continental Records shall be the same as the current procedure for claiming World Records.

3.5.2 Principles

- The time limits, process and proofs required for record claims shall be the same as is currently the case for World Records.
- Continental Records shall be available for the same categories and types of flight performance as currently exist for world records.
- The appeals process for dealing with record disputes should be the same as for World Records.
- Continental Records shall only be permitted for the continental regions specified in the General Section 3.5.4 (3.5.4.1 through to 3.5.4.6).
- The first date on which continental records may be set is 1st May 2009.

3.5.3 Eligibility

Only pilots who have an FAI Sporting Licence issued by a nation which is a part of a particular continental region may set a Continental Record for that continental region.

3.5.4 Qualifying Flights

3.5.4.1 Where Flown

Continental Records may only be claimed for flights which start within the continental region for which the record is claimed and the majority of the flight is made within that continental region.

3.5.4.2 Flight Performance

Minimum flight performance for the initial continental record in any category or type shall be:

- i. Where a world record has been previously homologated in any continental region by a pilot from that region the minimum flight performance for any subsequent record must exceed that of the previously homologated world record.
- ii. Above the flight performance level of any existing national record set in that continent before the introduction of continental records and notified to the FAI Secretariat by 1st April 2009. These are published on the FAI/CIVL website.
- iii. Where no performance is recorded for a given record category and type, the CIVL Bureau may set a minimum level and these are also published on the FAI/CIVL website.

4 TABLE OF CERTIFICATES AND PROOFS

THE FOLLOWING CERTIFICATES, PROOFS AND INFORMATION ARE REQUIRED FOR RECORDS AND FAI SILVER AND GOLD BADGES AND DIAMONDS

Information required	Claim Statement	Evidence of take-off and start	Declaration of goal and turn points	Evidence of reaching each turn point	Evidence of landing or arrival at goal	Barogram or printout of GPS altitude plot	Barogram Calibration	GPS or Flight Recorder
Date of flight	X	X	X	X	X	X		
Name of pilot and address	X	X	X	X	X	X		
Nationality	X							
Type, category and class of record or badge	X	X	X	X	X			
Performance claimed	X							
No. & expiry of FAI licence	X							
Type & Number of glider	X	X	X	X	X	X		
Type & Number of barograph/GPS						X	X	X
Calibration certificate (2)							X	
No intermediate landing						X	X	X
Take-off place	X	X						
Departure point	X	X	X					
Start altitude		X						
Start time	X	X						
Type of launch or tow	X	X						
Certificate of aero tow release		X						
Goal and turn points	X		X	X	X			
Time of declaration of above				X				
Time of landing at goal, or finish time	X							
Landing place, if not a goal	X					X		
Altitude at finish point	X					X		
Distance	X							
Distance penalty (if any)	X							
Date & signature of pilot	X		X					
Date & signature of calibration laboratory official (2)							X	
Date & signature of official Observer	X	X	X	X	X	X		
Name & sex of passenger(s)		X	X					
Age declaration signed by passenger(s)	X							
Tracklog in IGC format								X

(1) Altitude (record claims only)

(2) Not required for GPS or IGC flight data recorder

Signature of Official Observer with declaration of freedom of interest in the claim.

5 CONTROL AND MEASUREMENT OF FLIGHTS

GS references: chapter 4 - Observers - Officials, chapter 7 - Measurement Requirements

5.1 Special Rules for Hang Gliders

Control of flights shall be effected by official observers except that aero tow pilots may certify the altitude, time and point of release from tow. Official observers are required for all record attempts, and are recommended for badge flights.

Evidence of the landing place shall be taken from the GPS or IGC flight data record track-log, and optionally additionally by witness statement if that witness is an FAI Observer.

5.2 Measurement

The following requirements apply to all flights for records and proficiency badges:

5.2.1 Measurement of distance

For all records and for badge flights, distances shall be measured by GPS or approved flight data recorder. In this case, the GPS datum used shall be WGS84 and the earth model shall be the WGS84 Ellipsoid. See General Section 7.3.1.1.

5.2.2 Measurement of speed.

The average speed of the flight is the total minimum course distance divided by the elapsed time from the departure point to the finish point. See 5.2.4.

5.2.3 Measurement of altitude

Altitude and altitude gain shall be by barograph, or by a GPS or flight data recorder with (satellite or barometric) altitude encoding in the tracklog (3D). A tracklog recording interval not exceeding 30 seconds shall be used.

5.2.4 Measurement of time

Where a GPS or approved flight data recorder is used to validate a flight and the track-log has 2 points either side of the start or goal line (or cylinder circumference) at most 30 seconds apart, then the start or finish time is interpolated from these points (constant speed being assumed).

5.2.5 Validation Using Start, Turn or Finish Cylinders

The record or badge distance shall be calculated as the minimum distance it is possible to fly by entering the cylinder observation zones. See 1.5.13.3.3.1. The minimum distance is defined as the straight-line distance between each pair of turn points, less 400m for each observation zone radius.

5.3 Altitude Distance Relationship

For allowable height loss during record and badge flights see item 3.6.2

5.4 GPS, Flight Recorders and Barographs

A serviceable GPS or approved IGC flight recorder, and optionally a barograph must be used for all badge and record flights. No instrumentation is required for duration flights made locally and under continuous surveillance. The GPS or flight recorder must record altitude in the track-log (i.e. the track-log is 3D); alternatively, a non-altitude-encoding GPS (i.e. a 2D track-log) may be used if supplemented by a barograph; however, no barograph is required with a 2D GPS for the bronze badge.

5.4.1 The GPS

A GPS track-log with altitude encoding (3D) may be used to validate a claim for a badge or record flight providing the track-log is nearly continuous and provides unequivocal evidence that no intermediate landing was made and it generally substantiates the flight. Interruptions in the track-log will not invalidate the flight provided the gaps do not bring into question the continuity of the flight. Generally speaking, gaps of less than 10 min. are acceptable. GPS units without altitude encoding (2D) may be used alone only for bronze badges; for silver and higher badges, and records, 2D GPS may only be used in combination with a barograph.

- The GPS data (for record attempts) shall be downloaded by the Official Observer using flight verification software (see 5.4.2 below) that reads the GPS directly, produces an IGC formatted file and incorporates a security feature to identify tampering.

- The Official Observer must clear the active GPS track-log before the start of the flight. The GPS memory should contain the start point, any turn points and the declared finish point (in addition to any other points) before the start of the flight. The route, if any, should be activated in the GPS and so observed by the Official Observer at the start of the flight.
- The recording interval of the GPS, if adjustable, should be set to an interval as short as feasible, taking into account the memory capacity of the GPS and the intended length of flight, but in any event less than one minute.

5.4.1.1 GPS Data

The pilot must provide an unambiguous track-log that shows without doubt that the data was collected;

- By the pilot of the hang glider on the flight in question.
- Of the declared turn point co-ordinates from the correct location in the correct sequence.
- Between the takeoff and landing.
- With all relevant information being present on the track-log.

5.4.1.2 Essential Data

The track-log must show for any start, finish or turn point that the pilot was in the relevant observation zone i.e. one of the following:

- A point within the normal FAI sector or cylinder.
- A pair of consecutive points not more than 30 seconds apart for which a straight line drawn from the first point to the second point passes through the allowable sector, plus the allowable sector additions for possible GPS error

5.4.2 GPS and Flight Data Recorder Verification Software

The verification software must confirm that all points used to verify the flight occurred at reasonable times (e.g. on the day in question, between the start of the task and the end of the task, and showing the correct chronology of start and turn points). It must also have an integral security feature (often known as the G Security Record) which will indicate if a track-log has been tampered with at any point since recording. It is the responsibility of the NAC controlling the record attempt to provide evidence of this security to the FAI, that is, an electronic copy of the secured track-log, in FAI/IGC format.

5.4.2.1 GPS Verification procedures

- Pre-flight procedures are outlined in 5.4.2.
- Post-flight, the Official observer shall take control of the instrument and download, or observe being downloaded, the track-log and the declared turn points. It is recommended to use a purpose-built program like GPSDump or MaxPunkte for this purpose. The observer should then observe the pilot add personal information like name, birth date, start location, glider type, and save the file in a .igc format, ensuring that the G Security record is added.
- The official observer should then test the integrity of the data file with the appropriate validation program (often available with a name similar to vali.exe).
- The observer should now confirm that the pilot entered the observation zone for each turn point. This can be done by simply observing whether the closest track log point is within 400m of the turn point. Alternatively, open the track-log data file with a flight planning and analysis program like CompeGPS, SeeYou or StrePla. The observer should then add waypoints for the task (by downloading them from the instrument), and confirm that the pilot's flight course passed within the observation zones.
- Now the task distance can be calculated, by taking the distance between turn points and subtracting 400m for each observation zone radius. For a speed flight, the elapsed time en route is divided by this task distance.
- Altitude calibration is not required for GPS or flight recorders.

5.4.3 The barograph

If used, the barogram produced by the barograph should endeavour to show that no intermediate landing was made and must generally substantiate the flight. A barogram by itself may not be used to validate a distance measurement.

- It must not be possible to adjust the recording function of the barograph in any way without breaking the seal or the possibility of this being apparent to the Observer
- The barograph must be sealed and opened only by an Official Observer who must observe the print out taking place on electronic barographs
- The barograph must be calibrated not more than 12 months before or one month after the record attempt.
- Calibration is not required for badge flights.

5.4.4 Flight data recorders

GPS units are the preferred instrumentation. However, flight data recorders that comply with the IGC (sporting code section 3) standards may be used. In that case, the pilot should consult Section 3 for further guidance on procedures, since they are slightly different than those for GPS.

5.4.5 Aero tow launches.

To aid determination of the start altitude, the glider pilot (and the tug pilot when a barograph is on board) must ensure that a low point or "notch" is indicated on the barogram immediately following release.

6 HANG GLIDERS FITTED WITH A POWER SOURCE

6.1 Principle of Use

A hang gliding record may only be obtained if the power source, after being stopped, CANNOT be restarted in flight. This causes the pilot to fly as a genuine glider pilot with all the disciplines involved. If the engine is merely stopped but can be restarted during the flight in order to get out of trouble, the pilot is not subject to the disciplines of flying a glider and therefore has an advantage.

6.1.1 Records and Badges

For records and badges, the use of a motorised hang glider for FAI gliding record flights may be claimed provided there is proof that the power source prior to take-off was made incapable of being restarted in flight and that requirements, below, are fulfilled.

- Distance, speed and goal flights. No record or badge may be claimed unless the start line is crossed with the power source stopped.
- Height flights. No record or badge may be claimed unless a GPS, or flight data recorder or barograph, is carried and there is proof that the power source was stopped prior to the start of the height gain.

6.1.2 Power source recorder

Many flight data recorders or barographs are or can be fitted with a recorder to indicate when the power source is being operate; however for record attempts, flight data recorders that comply with the IGC (sporting code section 3) standards will be used.

7 TASK DECLARATION FORM

TASK DECLARATION FORM

Photocopy this form onto A3 or 11" x 17" paper. If using a GPS or flight data recorder, also record the course in the instrument itself prior to flight.

Task:

Class (O-1,2,3,4,5); Category (G, F, M); Description (e.g. 25 km △)

Date & Time:

Time of declaration must be before the flight start (for records only; badge flights need not be pre-declared)

Pilot:

Name & signature

Glider:

Class, make, model and serial number

Departure Pt.:

Description & Coordinates: (e.g. FAI Start Point or Cylinder)

Turn Pt. 1:

(If applicable, description & Coordinates: (e.g. FAI Turn Point or Cylinder with 400m radius))

Turn Pt. 2:

(If applicable, description & Coordinates: (e.g. FAI Turn Point or Cylinder))

Finish Pt.:

(If applicable, description & Coordinates: (e.g. FAI Finish Point or Cylinder with 400m radius))

Official Observer:

Name, date & signature (O.O. is required for record flights, and is recommended for badge flights)



Fédération Aéronautique Internationale

Application Form for Badge & Record Claims

Please print clearly!

Name, Nationality _____ Sex _____

Pilot's Address _____

National Aero Club _____

NAC member N° _____ FAI Sporting Lic. N° _____

Class O- _____ (1,2,3,4) Category: _____ (Gen., Fem., Multi.)

READ THIS NOW!

NOTES & INSTRUCTIONS

READ THIS NOW!

General: The current FAI Sporting Code (General Section and Section 7) defines all requirements for badges & records in hang gliders Class 1,2,3,4, & 5 and should be read in conjunction with current publications from your national aero club (NAC).

Evidence: While it is desirable that all evidence be completed on this form, separate pieces of paper are acceptable if they contain all relevant information and are certified by the Official Observer (O.O.).

OFFICIAL OBSERVER CERTIFICATE (For additional observers, use a separate sheet of paper).

Name of chief controlling official observer (please print) _____

O.O. N° _____ O.O. Address _____

I certify I am satisfied with the veracity and completeness of the pilot's documentation, and request that the NAC and/or FAI process the record or badge claim. O.O. Signature _____

FLIGHT DETAILS (Required for all flights).

Date of flight _____ Place of take-off _____

Type of take-off (foot, aerotow, winch tow, vehicle tow, other) _____

Glider type & serial N° _____

PASSENGER CERTIFICATE (Only required for multiplace records).

I certify that the passenger is at least 14 years old. Pilot signature _____

Passenger Name, Age, Sex _____

Passenger Address _____

Passenger Signature _____

AEROTOW/WINCH RELEASE/ENGINE-OFF CERTIFICATE (Required if foot-launch takeoff not used.)

I certify the glider was released at: (exact position) _____

at _____ hours at _____ metres AMSL / AGL. O.O. signature _____

Tow pilot/driver name (print) _____ Tow vehicle registration _____

Tow pilot/driver signature _____

BAROGRAPH CERTIFICATE (Required only if barograph was used).

I certify that I inspected the barograph and observed it function before flight. O.O. Signature _____

Barograph Model, Serial N° _____ Flight Recording N° (if applicable) _____

I certify I inspected the barograph after flight; it appeared un-tampered with. O.O. Signature _____

GPS CERTIFICATE (Required if GPS was used).

I certify that I inspected the GPS and observed it function before flight. O.O. Signature _____

GPS (Make & Model) _____ Serial N° _____

I certify I inspected the GPS after flight; it appeared un-tampered with. O.O. Signature _____

I certify that I was present when the flight tracklog was downloaded using _____ (name of tracklog verification program) and that it fully supported the claimed flight. O.O. Signature _____

DIFFERENCE of HEIGHT CERTIFICATE (Required for all speed and distance flights).

I certify that the altitude of the pilot at the departure point was _____ metres AMSL.

I certify that the altitude of the finish point is _____ metres AMSL, providing a difference of _____ m.

The distance flown was _____ km. The ratio of distance (in metres) to difference in height is _____

(Determine altitude of pilot at departure point through observation or preferably by inspection of barogram, with barograph clock synchronised to O.O.'s clock, and with pilot communicating to O.O. the time of crossing the departure point.)

ALTITUDE CLAIM (Required for all claims involving gain of height).

Type of claim (Silver 1 km, Gold 2 km, Diamond 3 km, Record, Other) _____

Initial low point of flight _____ m AMSL. Subsequent high pt. _____ m AMSL. Difference: _____ m.

For barographs only (not GPS): I certify I have examined and found correct the barogram calibration trace made on (date) _____

O.O. signature _____

DISTANCE or SPEED CLAIMS (Required for all flights over open or closed courses).

Claim is made for (check off or circle applicable category or categories):

Free flight (p) 72 0.72 ref 4 hes).

8 OFFICIAL OBSERVERS

8.1 Authority

Official Observers are appointed by a NAC (or its delegated National Association). They are empowered to control and certificate flights for FAI Records, Badges, Championships and Competitions in their own country and in another country if its NAC gives permission.

8.2 Register

The NAC or its National Association is responsible for keeping a register of its Official Observers, for providing briefing or instruction and ensuring that access to changes to the Sporting Code is available to them. The national register should be reviewed and updated at intervals of not more than 5 years.

8.3 Qualifications

Official Observers must know the Sporting Code General Section and Section 7 and have the integrity to control and certificate flights without favour.

Official Observers may not act as such for any flight in which they are pilot or passenger or have a personal, financial or business interest. (Owning or part owning the hang glider is not of itself considered financial interest.).

8.4 Control

Control means observing of Take-off, Departure, Finish and Landing; checking GPS, flight recorders, barographs, cameras; downloading and print-out of barographs or GPS track logs, and the signing of all certificates covering the evidence concerned for the flight. The observer must also confirm that he has identified the pilot as the individual claiming the record and that he is flying a glider of the appropriate class.

8.5 Certification

Official Observers may only certificate an event at which they were present, except that they may certificate an outlanding if they arrive soon afterwards and there is no doubt about the position of the landing.

Air Traffic Controllers on duty are considered Official Observers for observation of take-off, start and finish lines, turn and control points and landing.

Aero tow pilots may certificate the altitude, time and point of release from aero tow.

Championship officials are considered as Official Observers for a record or badge flight made during the event and for which the documentation is data used for scoring a valid task.

Independent Witnesses may certificate an outlanding in the absence of an Official Observer. They must give their names, addresses, telephone numbers and e-mail addresses (if any) and state precisely the place and time of landing.

All certificates by people other than registered Official Observers must be countersigned as correct by the Official Observers controlling the flight. If an Official Observer considers he may not be entirely free of interest in the claim he must obtain the countersignature of an independent Official Observer.

8.6 Suspension or Cancellation of Authority

The NAC may suspend or cancel the authority of an Official Observer for negligent certification or wilful misrepresentation.

9	DISTANCE CALCULATION
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The preferred method of distance calculation is the GPS or approved flight data recorder, set to use the WGS84 datum and the WGS84 Ellipsoid. However, if the pilot does not have such an instrument, and the flight is less than 100 km, he may use the following calculation method as an alternative.

Either scale the distance off the map directly using a ruler, or else locate the coordinates of the two points of interest. Find a navigational software program that will calculate the distance for you, for example the one available from the USDA at: <http://www.wcrl.ars.usda.gov/cec/java/lat-long.htm>

10 GUIDELINES FOR CLASS II & V DETERMINATION

These guidelines are intended to provide procedures for manufacturers and the CIVL Classification Technical Committee (hereafter referred to as the *Committee*).

10.1 Background

The definition of Class 2 and Class 5 hang gliders includes the requirement that it be capable of being foot launched and landed consistently in nil wind (Refer to 1.4). The reason for this requirement is to preserve the lightweight and simple nature of the class. Weight is the ultimate factor limiting performance, so this requirement helps create a level playing field while allowing reasonable design development. In order for a glider to be classified as Class 2 or Class 5 by the Committee it must be observed to be launched and landed repeatedly in nil wind. Hang gliders with aerodynamic controls that cannot pass this requirement are Class 4 gliders.

10.2 Classification Procedures

To be eligible for Class 5 records gliders must have met the classification requirements detailed in Section 7-A (Hang Gliders).

10.3 Fairings

Fairings are not allowed on Class 5 gliders. For the purposes of this document a pilot fairing is a streamlined structure rigidly attached to the glider frame, partially or fully enclosing that pilot and as much as practical the surrounding structures. The shape of the fairing is designed to minimise the contribution to the total parasitic drag of the glider, the pilot and the pilot surrounding structures. Windscreens fairing the pilot's head that are not directly attached to a helmet are not allowed.

GLOSSARY OF TERMS AND ABBREVIATIONS

This section amplifies a number of terms which are used in the main text and gives some generally accepted definitions and abbreviations relevant to air sports

Alphabetical

2D GPS	GPS model whose track log does not include altitude coding.
3D GPS	GPS model whose track log includes altitude coding.
Altitude	The vertical distance from mean sea level (MSL). See also 'QNH', and 'Height'.
AMSL	Above Mean Sea Level
AUW	All Up Weight / Mass
Barogram	Record of atmospheric pressure measured by a barograph or similar instrument
Barograph	A self-recording aneroid barometer
C	(Temperature) - Celsius
CASI	Commission d'Aeronautique Sportive Internationale (the Air Sport General Commission)
Certification	The signature on and preparation of certificates and other documents concerned with the process of flight verification with a view to validation of an FAI Flight Performance
CIVL	Commission Internationale de Vol Libre, the International Hang Gliding Commission
C of A	Certificate of Airworthiness
CP	Control Point
Ellipsoid	A three-dimensional ellipse, commonly used as an Earth model. See under WGS84 ellipsoid
FAI	Fédération Aéronautique Internationale, the world air sports organisation, with its headquarters in Lausanne
FAI Sphere	This has a radius of 6371km exactly, and has a similar volume to that of the WGS84 ellipsoid. Where this is used for distance calculation, the distance for FAI purposes shall be the length of the arc of the great circle joining given points defined by their geographical coordinates, using the same Geodetic Datum for each set of coordinates. A short paper titled "FAI Distance Calculations" giving the appropriate formulas and methodology, is available from the FAI Secretariat. Also, a small PC based distance calculation programme is available by email from the FAI Office.
g	Acceleration due to gravity (9.81 m/sec ²)
G	Multiple of gravity force on an aircraft under acceleration
Galileo	The future European GNSS system, equivalent to the Russian GLONASS and the US GPS satellite navigation systems
Geodesic	This describes the shortest distance between two points on the surface of an ellipsoidal world model. It is the ellipsoid equivalent to a Great Circle on a sphere. Once accurate lat/longs are available based on the same geodetic datum, the ellipsoid /geodesic distance between them can be calculated using one of a number of freeware computer programs that are commonly available. For FAI distance calculation purposes, the WGS84 ellipsoid is used (GS 7.3.1.1). A small PC-based distance calculation program for the WGS84 ellipsoid is available by email from the FAI office.
Geodetic Datum	- The mathematical model of the earth (and its orientation to the earth) which is used in laying out the positional reference system (lat/long, kilometre grid, etc) before the map projection process is used to transform the three-dimensional surface of the earth model (including topographical features and the reference grid) into a flat map sheet. Some 200 Geodetic Datums (GD) are in current use and generally were chosen for the 'best fit' of their particular mathematical model to the shape of the earth over the map area concerned. Lat/long figures, to be unambiguous, should quote the GD used which is normally given in the data at the edge of each map. The WGS 84 Datum is generally accepted as the best simple mathematical model for the <u>overall</u> shape of the earth, and is an ellipsoid with an equatorial radius of 6378.1370 km and a polar radius of 6356.7523 km, and is centred on the earth's centre and orientated to the spin axis. PC-based transformation programmes are available which convert latitudes and longitudes from those relevant to one Geodetic Datum, to WGS 84 or other Datums. Differences vary from a few metres to a few kilometres. These differences are not errors, each lat/long figure is perfectly correct, it is only the different GD (world mathematical model) which changes the lat/long figures for a given point on the earth's surface. Therefore, for distance calculations to be accurate, the lat/longs of points at the beginning and end of the leg concerned must be with respect to the same G (see para 7.3.1.1). The calculations themselves use these standardised lat/longs, applied to a distance calculation formula based on the FAI earth model given in para 7.3.1.1. The WGS 84 Datum can be used in deriving lat/longs for long distance calculations and is used by ICAO and national aviation agencies in defining highly accurate standardised runway datums for the future use of GPS as a runway approach aid.
GLONASS	Global Orbital Navigation Satellite System, the Russian GNSS system similar to the US GPS
GNSS	Global Navigation Satellite System (Generic term for all systems such as the Russian GLONASS and the US GPS)
GPS	Global Positioning System (US GNSS System presently managed by the Department of Defense)

GPS (2D)	GPS model whose track log does not include altitude coding.
GPS (3D)	GPS model whose track log includes altitude coding.
GS	The General Section of the FAI Sporting Code
Height	The vertical distance from a given height datum such as the take-off place. See also 'QFE', and 'Altitude'.
HG	Hang Glider
Homologation	The validation of a Flight Performance by an NAC or FAI for record purposes
hPa	Hecto Pascal (Pressure unit, equal to a millibar)
IAS	Indicated Airspeed
ICAO	International Civil Aviation Organisation (HQ in Montreal, Canada)
IGC	International Gliding Commission, an Air Sport Commission of the FAI
ISA	International Standard Atmosphere
May	See under wording
Min	Minute, unit of time (UT), compared to 'arcmin' which is 1 minute of angle
m/s	Metres per Second
MSL	Mean Sea Level
Must	See under wording
NAC	National Airsport Control
O	(FAI Class) - Hang Gliders and Paragliders
O&R or OR	Out and Return
Obligations	(such as to FAI) Obligations of NACs to the FAI are listed in the FAI Statutes, search for the word "obligations".
OO	Official Observer
OZ	Observation zone, the segment of airspace that a glider must enter to verify flight to a waypoint
PA	Paragliding Accuracy
PG	Paraglider
PHG	Powered Hang Glider
PPG	Powered Paraglider
Proficiency Badges	- Badges issued by the FAI for meeting specified flight performance standards
QFE	Pressure Setting which indicates zero altitude when at airfield height
QNH	Pressure Setting which indicates height above sea level
Record(s)	Validated flight performance greater than other validated performances
Shall	See under 'Wording'
Should	See under 'Wording'
Soaring	The utilisation of the vertical component of movements of air in the atmosphere for the purpose of sustaining flight, without the use of thrust from a means of propulsion
Sporting Licence	- A licence issued by the FAI and mandatory for entrants to international competitions and world or continental record attempts
S7	Section 7 of the FAI Sporting Code i.e. this section. Also sub-sections 7A to 7C.
Sphere	See FAI Sphere
TAS	True Air Speed
TL	Team Leader
TP	Turn Point, also see WP, Waypoint
Track-log	The record of a flight produced by a GPS
Track-log point	The individual components of a track-log
UT	UTC to the local hour convention
UTC	Universal Time Co-ordinated (ex-GMT)
Validation	An act of ratification or official approval. In FAI terms, the act of approving a Flight Performance (or an element of one such as reaching a Turn Point) for FAI purposes.
Verification	The process of checking and assembling evidence with a view to validating a Flight Performance
Vs	Stalling Speed
WADA	World Anti Doping Agency
WAG	World Air Games. An international sporting event involving several FAI air sports at the same time, see GS
WP, Waypoint	A generic term for either a start, turn or finish point claimed as part of a flight performance.
WGS 84	See under 'Geodetic Datum'
WGS 84 Ellipsoid	- This is an ellipsoidal earth model with an equatorial radius of 6378,1370 km and a polar radius of 6356,7523 km. It is centred on the earth's centre and orientated to the spin axis. It is generally accepted as the best simple mathematical model for the overall shape of the earth and is used as the Geodetic Datum in many aeronautical maps. See also under "Geodesic" and "Geodetic Datum". For distance calculations using the WGS84 ellipsoid, a small PC-based program is available by email from the FAI Office.

Wording	The use of “shall” and “must” implies that the aspect concerned is mandatory; the use of “should” implies a non-mandatory recommendation; “may” indicates what is permitted and “will” indicates what is going to happen. Words of masculine gender should be taken as including the feminine gender unless the context indicates otherwise. <i>Italics are used for explanatory notes.</i>
WPRS	World Pilot Ranking Scheme. A CIVL designed and administered system of ranking pilots from FAI sanctioned competition results.



PRELIMINARY NOTIFICATION OF A NEW WORLD RECORD ATTEMPT

Important ! The National Airports Control Organization (NAC) or the Official Observer controlling the attempt **must** notify FAI of the record claim **within 7 days** of the completion of the flight. To ensure quick circulation of the information, we recommend that you send by fax this page to FAI at the following number : +41 21 345 1077 or by Email to <record@fai.org>

Pilot's Name: _____

Nationality : _____

Class : O (Hang Gliders)

Sub-class: _____ (1, 2, 3, 4, 5)

Passenger's Name : _____

Category : _____ (M, F, T)

Nationality : _____

Hang Glider Make & Model: _____

	Type of records claimed (speed to goal, distance, triangle, height gain)	Performance claimed	Date of the attempt
1°)			
Place/Course :			
		(km, km/h, m)	
2°)			
Place/Course :			
		(km, km/h, m)	
3°)			
Place/Course :			
		(km, km/h, m)	

Name and title of the Official
who prepared this claim form : _____

Signature : _____

Seal/Stamp (if any) : _____