


HOW TO SET A WORLD RECORD

This flight analysis accompanies the feature in the Dec 16/Jan 17 issue of S&G, by Belgian pilot Johan Luyckx, on the Namibian flight that set a new world speed record for the 15m Class 1,000km triangle

The flight duration was six hours 45 minutes and 35 seconds over a distance of 1007.6km, which resulted in a speed of 149.06km/h. The existing world record of 144.95km/h was realised in 2002 and is thus after 13 years improved by more than 4km/h. This flight is claimed to the FAI as a world record (see below) and an Africa continental record. The flight is also a 15m and Open Class Belgian record.



FAI

PRELIMINARY NOTIFICATION OF A NEW WORLD RECORD ATTEMPT + AFRICA CONTINENTAL

Important! The National Airport Control (NAC), the Official Observer controlling the attempt, the Sport Event Organiser or the claimant **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 this page by e-mail to record@fai.org or by fax to FAI at the following number: +41 21 345 10 77. Some classes suggest in the sporting code the use of special forms.

Pilot/Parachutist's Name : JOHAN LUYCKX

Sportinglicence issued by : BELGIAN AERoclUB

Co-pilot's Name : /

Sportinglicence issued by : /

Details of the performance claimed (complete as applicable)

Class : D 15 G Sub-class: _____

Category : GLIDING 15m GENERAL Group : _____

Type of Aircraft : VENTUS 2CM-15m

	Type of records claimed	Performance claimed	Date of the attempt
1)	SPEED OVER TRIANGULAR COURSE OF 1000 km	149,06 km/h	05/12/2015
Place/Course :	POKWENI, NAMIBIA, AFRICA	(speed in km/h - altitude in meters)	(dd mm yyyy)
2)	/	/	/
Place/Course :	/	/	/
3)	/	/	/
Place/Course :	/	/	/

Name and title of the Official who prepared this claim form : AXEL NUR NIE 969

Signature : /

Seal/Stamp (if any) :

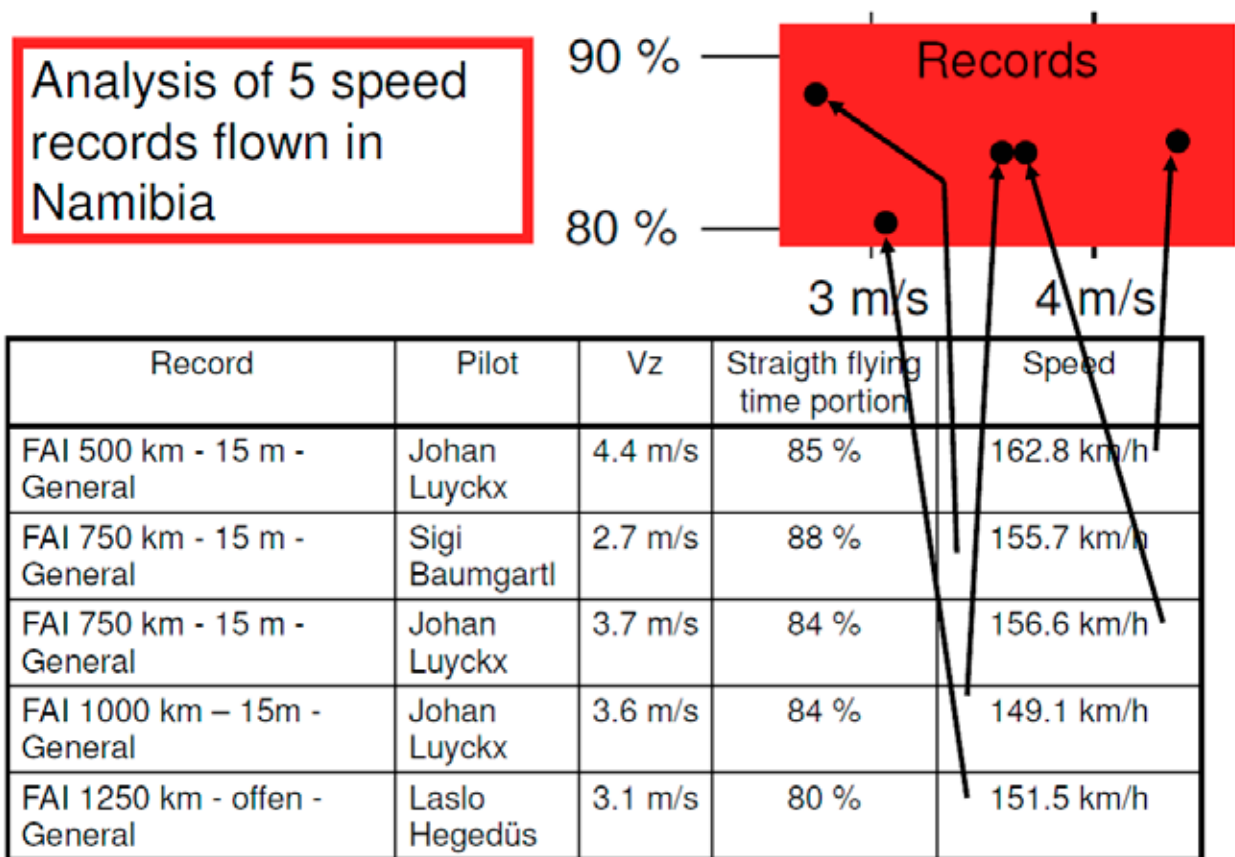
Preliminary world record claim submitted to the FAI

What are the most important success factors of this flight? A lot of pilots will say: "It was super weather." Many pilots confirmed the good meteo, but it was not a super day. The super days have cloudbases up to 6,000m and climb rates between 5-7m/s. These super days are rather seldom and a typical feature is the low air humidity resulting in cloud formation after 12:30. The first flying hours are without clouds and at lower cross-country speeds. The advantage of early cloud formation with cloudbases up to 4,500m and good climb rates is that you are fast from the start, which is a success factor of this flight.

The first success factor is the good meteo with cloudbases that increased from 4,400-5,000m during the day, but more important is the task selection. The way points are defined in alignment with the weather pattern, ie start of the task towards the east and use of the not overdeveloped west side of Namibia during the second part of the day. The task selection is an important contributor to the success of this record flight.

Another success factor is the consequently applied flying style. The selection of strong climbs and fast transits with limited height loss are well known contributors for a high cross-country speed. Many experienced pilots apply both rules, but you also need to do this when you get somewhat low, have to pass a shower, or fly towards a turn point with no cloud development. The consequence of this flying style is some risk and many pilots prefer to reduce transit speed and select less strong climbs to limit the risk of an outlanding or engine start. One weaker climb can reduce your task speed so much that you will not make it (look to the latest 2.3m/s climb).

The flight analysis results in an average climb of 3.6m/s and a straight flying time portion of 84 per cent. The figure below shows five speed records flown in Namibia in a diagram, with the average climb on the horizontal axis and the straight flying time portion on the vertical axis. All these records are in a rectangle with 2.7 and 4.4m/s average climb and between 80-88 per cent straight flying time portion. The new 1,000km speed record is in the middle of this rectangle.



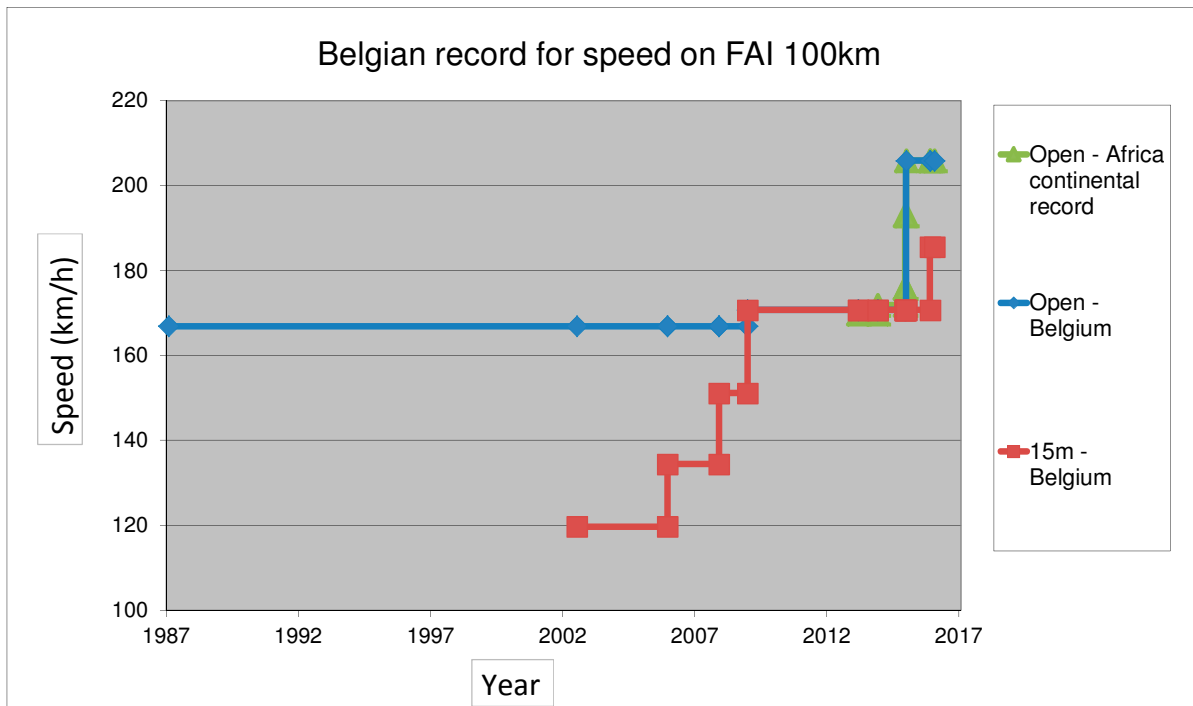
Analysis of speed records flown in Namibia

Realising a world record is a challenging task and this will also require a certain amount of good luck. On the other hand, you can control somewhat the good luck. It is no coincidence that the name of the same pilots appear at the top in competition results and record lists. Knowhow and motivation are required to realise this. You can develop your flying skills by extensive flying and analysis of your flights and those of others. Motivation is a psychological competence and has nothing to do with good luck.

Another success factor is that the three difficult stages of the flight (low start, 2nd turn point with only one cloud and shower development) have been overcome without relevant time loss. The successful completion of a difficult flight phase requires the build-up of experience and confidence. Using a strong climb at limited height at the start of a flying day works in Europe and Africa. If you try this later in the day, then you have the risk of outlanding or engine start. The areas south of Zuurberg have been explored many times and the position of the thermal lines are known. The selection of a flying route to cross a shower area requires some trials before you become familiar with the basic rules to fly at the front side of the shower and over areas radiated by the sun. We end up again with the conclusion that increasing your flying experiences is the way forward to make progress.

Analysis of Belgian records

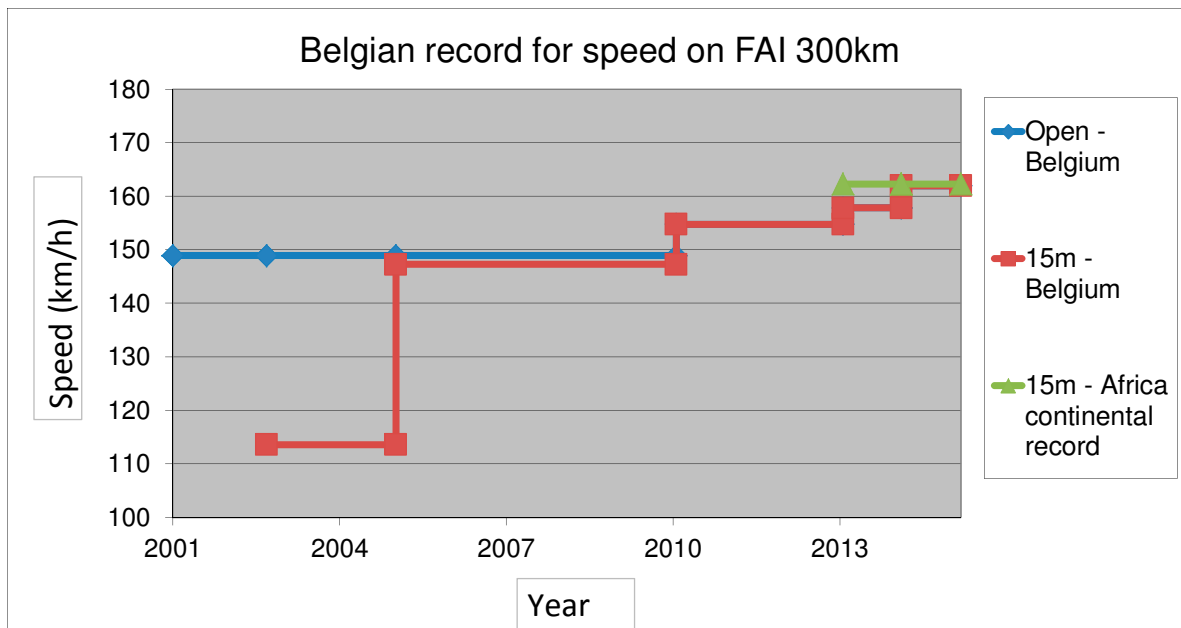
The time evolution of some Belgian records will be analysed in the following paragraph. The figure on the next page represents the speed of the FAI 100km triangle for the Open Class (blue), 15m Class (red) and the Africa continental record for the Open Class (green).



Speed of FAI 100km triangle as function of time

The speed has increased in the 15m Class, since 2002, from 120km/h towards 186km/h in 2015. The speed record in the Open Class from 2009 until 2014 was flown by a 15m glider. The Open Class record is flown by Tijl and Bert Sr Schmelzer, who in December 2014 realised a speed over 200km/h, which is also certified as an Africa continental record.

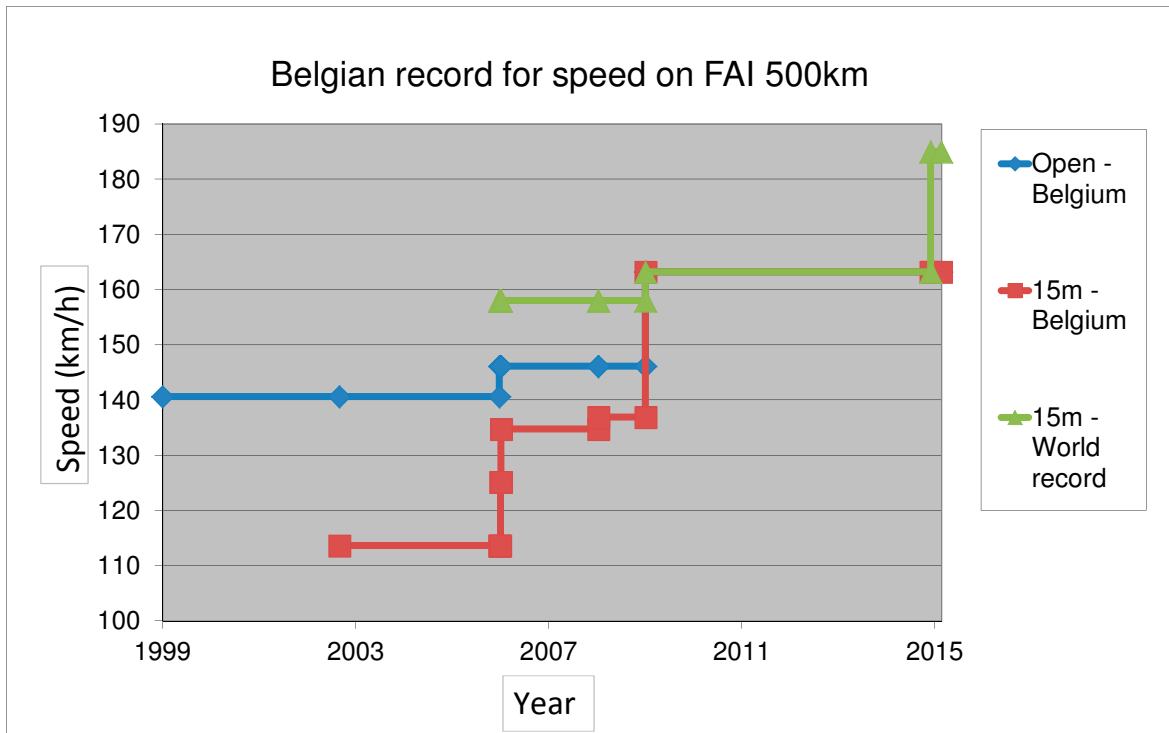
The next figure shows the speed for the FAI 300km triangle for the Open Class (blue), the 15m Class (red) and the Africa continental class for the 15m Class (green).



Speed of FAI 300km triangle as function of time

The speed in the 15m Class has increased since 2003 from 114km/h towards 162km/h in 2014. The speed record in the Open Class has, since 2010, been flown by a 15m glider. The speed of 162km/h is only 0.3km/h below the Africa continental record of 162.3km/h.

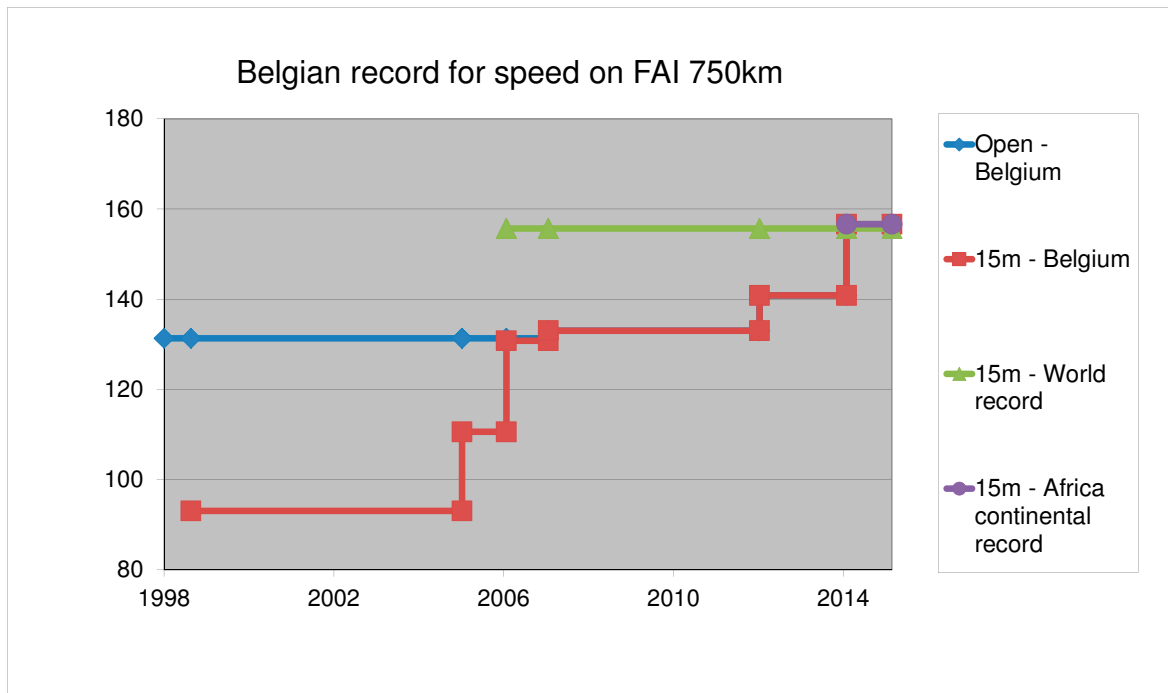
The figure on the next page represents the speed for the FAI 500km triangle for the Open Class (blue), the 15m Class (red) and the world record for the 15m Class (green).



Speed of FAI 500km triangle as function of time

The speed in the 15m Class has increased since 2003 from 114km/h towards 163km/h in 2009. The speed record in the Open Class since 2009 has been flown by a 15m glider. The speed of 163km/h was a world record from December 2009 and in November 2015 was improved by T Delore.

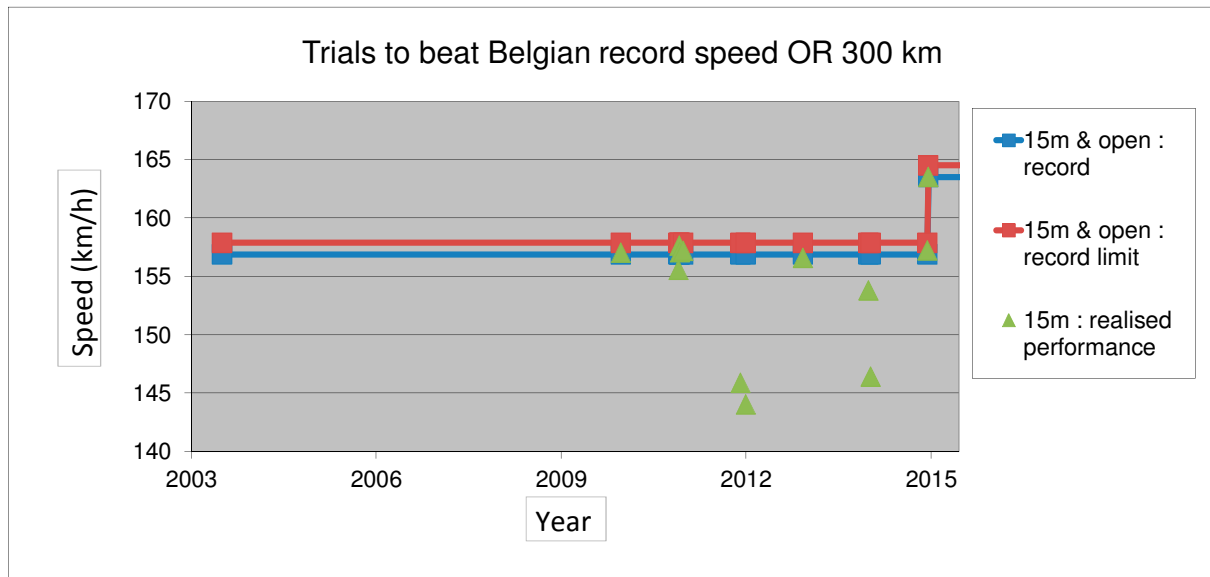
The figure below shows the speed for the FAI 750km triangle for the Open Class (blue), the 15m Class (red), the world (green) and Africa continental (purple) records for the 15m Class.



Speed of FAI 750km triangle as function of time

The speed in the 15m Class has increased since 1999 from 99km/h towards 156.66km/h in 2015. The speed record in the Open Class since 2007 has been flown by a 15m glider. Since January 2015, the speed of 156.66km/h has been the Africa continental record and is 0.96km/h above the actual certified world record of 155.7km/h, flown by Dr Siegfried Baumgartl in December 2006.

The green triangles on the figure below represent the many attempts to beat the Belgian record on an out-and-return 300km (there is no FAI record). Before the previous record was passed in December 2014, there were four flights with a task speed within the margin of 1km/h and thus not valid. This is a nice example of “persistence pays off”.



Attempts to beat the Belgian speed record on an out-and-return 300km (156.9km/h, B. Litt, 05/07/2003)

The final purpose of these figures is not to bother you, but to ask the question “What is driving these pilots of record flights?”. The answer to this question is, in fact, a process where the question develops from “What’s your performance limit?” towards “Why is it a performance limit?” and ending with the positive mindset “How can I improve my performance (limit)?”.

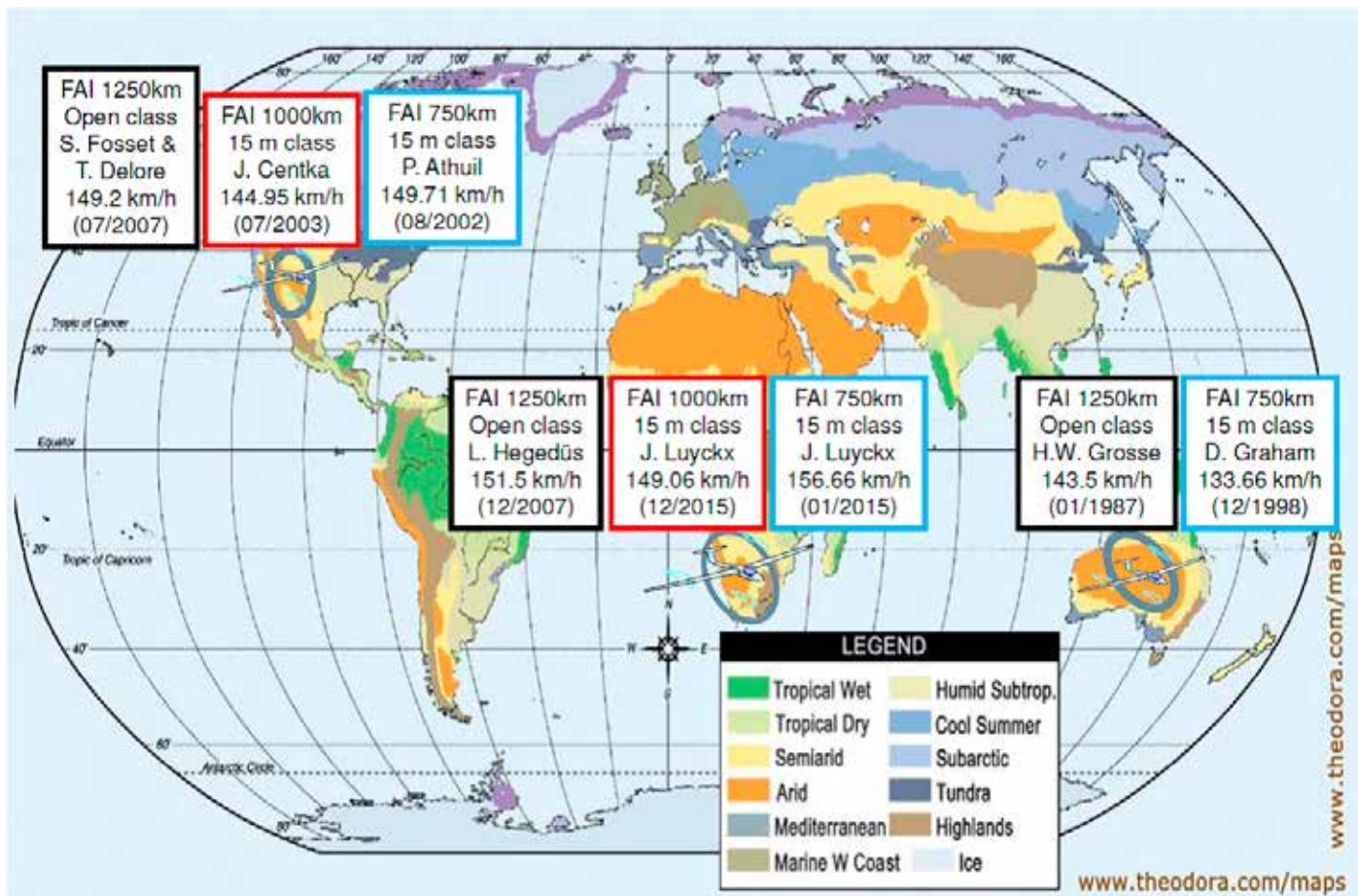
This last question has a large range of answers, where the most important are development of flying competences, optimising the glider, analysing and understanding the weather forecast, task selection, developing a good time schedule, mental and physical condition. This package of answers also contains several personal elements specific to every pilot. It requires a process where you ask yourself questions and define steps for further development. It may be that you have to look for the proper coach to guide you in this process.

An unsuccessful flight is not always due to the glider or the weather development. It is essential to analyse your flight rather than being critical, and to come to the correct conclusions to define the way forward and develop your flying skills. This approach is valid for a record attempt, but is also relevant for your first 300km flight.

The realisation of a national record is a nice achievement, but it should not be the end point. The application of the above process explained here resulted in continuously improving my performance limit until I ended up with continental and world records. This storyline is reflected in the previous graphs.

I started gliding in 1984 and have more than 4,000hrs and 260,000km cross-country flying. A total of 60 Belgian record claims have been approved, of which 26 are actual Belgian records as of July 2016. There are also three Africa continental records, many limit values for Africa continental records and two world records realised. Gliding is such a splendid sport that, even with wide experience, you still can make progress and find new challenges.

Over 90 per cent of the records were flown in Africa. A comparison of the speed records for 750km and 1,000km FAI triangles in the 15m Class and the 1,250km FAI triangle in the Open Class for each continent (data from www.fai.org), reveals that Africa is the place to be for the speed records of large FAI triangles (see figure on next page).



Comparison speed records of FAI triangles flown in America (left), Africa (middle) and Australia (right) based on data from www.fai.org

Much gliding fun and many happy landings,

Johan Luyckx



Johan Luyckx started gliding in 1984. He has over 4,000hrs and 260,000km cross-country flying. He has flown a number of Belgian records, three of them in Spain, but fell in love with Africa in 2005. This is Johan's second world record, having set a world speed record for 500km triangle in Namibia in 2009