

<i>Subject:</i>	Proposal for Speed Skydiving Rule Change from Australia	Annex No. -	15.3.1
<i>Author:</i>	Gail Bradley, Delegate Australia	Agenda ref. -	15.3.1
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“FROM PRESSURE TO PRECISION”

Introduction:

From the discussions before, during and after the WPC in Australia, we wish to contribute in a positive way to the report from the IPC Speed Skydiving Committee which proposes to change the Speed SMDs from barometric pressure-measuring devices to GPS-measuring devices.

Based on our own data gathered from ...

- Over 1,000 FlySight and over 550 Protrack jumps gathered and examined
- Over 1,000 hours of deep analysis
- Over 100 test jumps using both Protracks and FlySights
- Over 100 jumps with up to 12 FlySights and seven Protracks attached to different parts of the flier's body at the same time
- The opinions of Monash University scientists who daily measure speed (wind/airflow) for commercial purposes in their huge horizontal wind tunnel
- Centuries of Newtonian knowledge of maths and physics, and
- Knowledge of what is and is not anatomically possible ...

... we applaud this move and support it.

We see it as a huge opportunity to overhaul some of the rules and align this discipline with our FAI Objectives too. Our Appendix 1 (sent to the Speed Committee) makes suggestions for some rule changes and hopes the Committee and the IPC agree with most of them.

The move to FlySights necessitates a change of scoring software. While Omniskore and Intime both are able to publish the results, the FlySight data must be analysed by software first. We include a comment on how this can be done rapidly, with the Australian open source software (already written) that manages the entire competition workflow with minimal human intervention required.

As a bonus, we offer to run a Test Event at the Australian Nationals in March 2019 and give feedback on the rules, devices and software. There is little else that needs to change as the Judging process is simplified.

We all want to ensure that by the Russian Mondial in 2020, we will truly be able to claim that our Speed event measures the *“the Fastest Person on Earth”*, and we will have harmony in our ranks again.

Yours sincerely,

Gail Bradley
IPC Delegate - Australia

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Why the change?

What is Speed? It is the Time to cover a Distance. That's it. That's all it can ever be. That's what a GPS device measures - the time to cover a distance – and the FlySight samples it five times per second. A barometric device, by contrast, measures pressure changes from altitude, but also measures pressure around the skydiver's body. It can and has returned strange results such as:

- Frequent accelerations of over 1g – This is not possible when the human body is propelled only by gravity
- Hips flying up to 260 meters apart!
- Hips finishing the race one or more seconds apart – not possible
- Hips crossing over each other mid-flight. Very bad for the skydiver's health!

A lot of testing has occurred in the past two years in Europe, UK, Australia and the USA, some calculations were added to the rules and the software, and an attempt was made to create a more equal competition, in the face of the limits imposed and exposed by using barometric pressure devices.

However, these attempts had to be artificial and manual. An example was that skydivers earned penalties for showing more than 30 or 60 k/h variances on each side of their bodies. This was pretty unfair on them because *that's what the devices showed*, not what the skydivers were actually doing. The devices produced invalid results, not the skydivers.

Anyway, the experts and the Committee have tested all this, known of it, discussed it and want to change it. This is a great move. In future, we will simply measure "speed", not pressure around a body which the data shows can be manipulated too.

If we want this discipline to retain integrity, be supported by our fastest skydivers, and truly seek, "the Fastest Person on Earth", we must change these devices and we hope you vote for that too.

Let's see what else can change as we improve this discipline to make it exciting, consumer-friendly, immediately-comprehensible, and attractive. It is an Olympic Sport–in-waiting.

Competition Principles

We skydivers have always bragged that we do the fastest sport on Earth without an engine. Now we want to take that further, and find the fastest of the fastest, in short the "Fastest Person on Earth".

And we want to look for what the Olympic movement and FAI tells us to offer, i.e.:

- Comprehensible events
- Excitement
- Suspense
- Media-friendly viewing
- Events easily understood by consumers of sport, with
- Immediate publication of results.

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SPEED CAN BE ALL OF THIS!

Think about the Long Jump, High Jump or Pole Vault. The result is immediately known, the best result is the winner, scores are not added or averaged, and the crowds are transfixed until the last jump. Or can you imagine a Discus or Javelin (the spear not the rig) or Shot Put event where the individual “throws” are averaged and added together to make a result? Yet we do that in Speed at the moment. So we ask to change it for all the right reasons.

Firstly then, here are some ideal competition principles.

Competition Principles:

- Simplicity – Should be able to explain to a layperson in one sentence – “The person with the fastest speed wins”
- Credibility – Should use a measuring device that cannot be manipulated, and one that is demonstrably capable of measuring speed to an accuracy that can reliably determine who is travelling faster than who.
- Transparency – Should ensure that competitors have free and public access to all the software code that calculates their scores, for their own personal use and understanding, and all the data from the competition is made available to all
- Safety
- Encourage people to push boundaries
- Keep the suspense in the competition to the last jump as much as possible – The corollary: Avoid making a predictable competition where the final results are obvious in the first couple of rounds
- We are the fastest sport in the world – the competition should take advantage of this, and own it
- We should consider that we have very little random variation in our event – we don’t have variety of skills like other skydiving disciplines, we have very few environmental conditions like winds that vary from jump to jump
- Never penalise the competitor for faults in measuring equipment provided by the competition, like the current rules do
- Our format should be as attractive as possible for future potential Olympic inclusion.

How to find the Fastest Person on Earth

1. Adopt GPS-based SMDs, like FlySights
2. Agree to use transparent Open Source software, transparent, available to all competitors and Judges, downloadable on any computer (Windows-Apple-Linux) , to analyse the data
3. Directly integrate with existing scoring systems such as Omniskore and Intime to publish the results, as required
4. Make appropriate rule modifications
5. Run a test event in 2019 to be ready for 2020 Mondial

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1. We, the IPC, need to discontinue the use of Protracks, and agree to use FlySights. We all need to agree to this change and the Judges Committee to approve FlySights for SP. See rule 4.3.1.

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2&3. We need to agree to use some new software that will automate and streamline the entire scoring process. Omniskore and Intime publish the scores but there is an analysis step to be made before it reaches them.

FlySight software currently available is Open Source and that is great but it is designed for personal use and would be manually intensive for competition in its current form. It would need to handle competition workflow, anomaly detection and checking for missing samples, exit height calculation, ground offset, compensation for inaccurate samples etc. We know that Ash Crick from Australia (who has written this code already in Open Source code) is wanting to work with a willing Michael Cooper to improve those things, so the software should be the best we can get when these two get their heads together.

You will be pleased to know that Open Source software is transparent, accessible by competitors, any approved person can make modifications to it, and, the best part - it's free.

4. Proposed Rule Modifications – see attached

The attached Appendix gives the context in green writing. It should be read to gain a complete understanding of the overhaul we propose for this discipline. Changes in blue and red indicate where changes need to be made, and we hope the Speed Committee accepts most of our work.

Highlights include:

- The objective of the event is to find the competitor(s) who achieves the highest maximum (not average or added) vertical speed through the course.
- The highest single speed from all completed rounds will be the competitor's score for the purpose of standings, and to determine the final placings.
- No throwaway rounds – seek the best speed at a single point in time in any one of eight attempts to declare the winner, (like Long Jump).
- No OB (Out of Bounds). Why give a skydiver a penalty when it is the fault of the barometric device? This rule becomes redundant.
- Create a separate Female Category as in FS, not just a classification for Female, consistent with our and FAI drives for diversity. Discard Junior events.
- Change the course to start from exit to 1700 metres. There is no need to create an artificial “window” before we start measuring, when the aim is to accelerate to the best possible speed at some point in the jump.
- Minimum number of rounds for a valid event is one not two.
- We have removed the previous proposal to add weight to rigs. *It was a minor point raised in Australia, but is considered too unsafe.*
- A strong technical definition of a suitable SMD and rigorous testing procedures should be included. It may be FlySights now, but we want to make sure in future that this doesn't happen

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again as technology changes, but equally allow new manufacturers to bring great new technology to our sport as it evolves.

- FlySights (only one is needed not two) can be affixed by the Judges on the lateral webbing, leg strap, either side of the container, or helmet. Actually, it doesn't matter where they are affixed, and mandatory helmet-mountings introduce additional costs while also making it harder to seal for the prevention of tampering. Little pouches worked in the 2018 Australian Nationals and were much more convenient and smaller to store in *parc fermé* than helmets or rigs. Therefore delete further technical descriptions and pictures.
- There will be no ties or co-medallists. The software simply calculates to the next decimal point to remove ties. This is cost-effective for the Organiser too.
- The turn of 90 degrees must be made in the first eight (8) seconds after exit for safety reasons. Making the turn at the end of the flight is problematic if not dangerous.
- Discard Diplomas – to be consistent with other disciplines.

Section 5, Rule 5.25 (3)

We also propose, in the interests of competition efficiency, to extend this rule so that any competitor entered in more than one event is only allowed a minimum of 30 minutes on the ground, full stop.

The cross-overs between CF2 and 4, FS 4 and 8, Speed and everything else almost broke the Australian WPC as far as completing all rounds. If we cannot get a 30 minute rule for the other events entered by Speed competitors entering other events, then they must be limited to entering only Speed.

5. Test Events

Australia will use its Nationals in 2019 to run a Test Event using FlySights. Results will be published world-wide, to all competitors, officials, IPC personnel, Judges, via social media and chat rooms. Rigorous analysis, discrepancies, rule tests will be conducted to iron out any kinks, and we will present the results to IPC in 2020.

In addition, we believe the UK 2019 Bid for Speed World Cup & European Championships will use FlySights.

With at least two test events run in an “off-year”, and who knows how many other NACs will add their Nationals to the trial, by 2020 Plenary we should be in a great position to be ready for Mondial 2020 in Tanay.

Summary:

Thank you for reading this far.

69th FAI/IPC PLENARY MEETING, LILLE, FRANCE, 26 - 27 JANUARY 2019

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The technology exists to help our sport find the “Fastest Person on Earth”. The move to GPS-based measuring devices, open source software and some changed rules allows us to pursue that goal. We can make Speed as exciting as it already is, if we embrace Competition Principles that seek to find him or her.

While I am not a Scientist, I have tried to learn about Speed and solve its problems, and will present it simply to you in Lille.

But what I am passionate about, same as you, is getting the right medals on the right people. We want our winners to be our fastest and we want all competitors to prosper on equal terms.

Thank you to the Speed Committee for your leadership on this path. We respect and support it.

Please all Delegates support these Proposals.

Yours sincerely,

Gail Bradley
IPC Delegate – Australia