

A Proposal to Modify the Ranking Calculation in US Team Selection

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Summary

The SSA US Team Selection Policyⁱ is based on a pilot ranking scheme. A fundamental element in the ranking calculation is the “Competition Fractional Score” (CFS), which is the ratio of a pilot’s score to the winner’s score in National and International competitions.

Because of the difference in scoring formulas between US and international contests, the CFS associated with international competitions is undervalued with respect to the CFS associated with US competitions. Comparing the two is not valid.

This document describes the problem and suggests a way to “boost” the international CFS to make it more legitimately comparable to the US National CFS.

Background

Recently, IGC has dropped Pilot Option Speed and Prescribed Area Distance Tasks. This makes the set of tasks used internationally more comparable to the set used in the US.

Scoring formulas used in US National competitions are published by SSA.ⁱⁱ The formulas used in international competitions are published by FAI in SC3A.ⁱⁱⁱ

Both sets of rules contain formulas for awarding a daily score to each pilot. In both cases a pilot’s score depends principally on his performance with respect to that of the day’s winner. However, the weighting of relative performances differs greatly in the two sets of rules.

Example

At the last WGC, an STAA task (equivalent to our TAT) was called on Day 8. The winner was credited with 121.1 kph, and our pilot (VW) flew 93.6% as fast (113.4 kph). The US rules would have given VW a score of 936. In fact, VW received 873 points.

This example is not contrived to make a point. It is a typical illustration of the disparity between the two scoring formulas.

Explanation

In the US rules, a finisher’s score is the winner’s score multiplied by the ratio of his speed to the winner’s speed. All points are “speed points.”

In the international rules, competitors are awarded both “speed points” and “distance points.” In the above example, all finishers got 333 distance points, and the winner got 667 speed points.

VW got 333 distance points and 81% of the winner's 667 speed points (540 points), for a total of 873 points. Note that VW did not get 93.6% of the winner's speed points. In the international rules, you must go at least 2/3 as fast as the winner to get any speed points at all. This has the effect of increasing the point spread among finishers.

The Problem

Both scoring systems are fair. Each system will yield the same daily and cumulative pilot rankings, and the same contest winner. The problem occurs when the two systems are compared with each other, or used in the same way in a ranking system, such as the SSA US Team Selection Policy.

The Competition Fractional Score (CFS) is a pilot's overall score divided by the winner's overall score. Here is a table of the CFS earned by each US pilot in the last WGC, and the CFS that each pilot would have earned had the contest been scored using US rules.

	CG	PV	VW	VV	ZQ	YY
Actual CFS	0.9088	0.9259	0.8453	0.8962	0.8055	0.9154
CFS using US scoring rules	0.9829	0.9939	0.9048	0.9775	0.8391	0.9628

(In the preparation of this table, a penalty was removed, and certain assumptions were made about how to deal with landouts and devaluations. These assumptions are available from the author upon request).

It is clear from the table that the CFS figures based on international competitions are significantly lower than those based on US rules. This is not surprising, given the difference in scoring formulas.

The effect of this on the calculations used to rank pilots for selection to the US Team is that *performances at international competitions are undervalued*. The question that remains is what to do about it.

Proposal

Methods for resolving the discrepancy fall into three categories:

1. Re-score US National contests using international scoring formulas for the purpose of calculating CFS;
2. Re-score international competitions using US scoring formulas for the purpose of calculating CFS; and
3. Find a rule-of-thumb that will have the effect of condensing the international point spreads to something similar to the US point spreads.

The first two methods are mirror-images of each other. They share the characteristic of requiring the investment of a lot of effort in resolving differences in tasking, penalties, the several types of devaluation, and the consequences of landing out and the completion ratio.

However, it must be said that there are supporters of this approach. In fact, there are those who say that we should be using the international formulas to score US contests in the first place. (This is an interesting topic, far beyond the scope of this paper).

The third method, proposed here, is to use arithmetic to distort the international CFS so that it becomes comparable to the US CFS. Such a mathematical operation would augment the CFS in a non-linear fashion, affecting low-scoring pilots more than the near-winners, having the effect of bunching the scores at the top, US-style.

A function that does this is the square root. Here is the CFS table again, with a third row added:

	CG	PV	VW	VV	ZQ	YY
Actual CFS	0.9088	0.9259	0.8453	0.8962	0.8055	0.9154
CFS using US scoring rules	0.9829	0.9939	0.9048	0.9775	0.8391	0.9628
Square root of Actual CFS	0.9533	0.9762	0.9194	0.9467	0.8975	0.9568

The square root “boosts” the CFS to a number that is often, but not always, closer to the CFS that would have been the result of US scoring. This scheme is not foolproof, and it failed to work in the case of ZQ, who is an exception because he scored zero points one day at the WGC.

Obviously, an entire spectrum of algorithms for adjusting CFS is available. The “square root method” is imperfect, but has the virtue of simplicity. It is therefore proposed that there be a modification to the ranking calculation used in US Team selection:

In the case of international competitions, instead of using CFS,
use its square root.

Conclusion

The SSA US Team Selection Policy allows pilots to substitute WGC and pre-WGC performances for performances at US National competitions. Because of the difference in scoring formulas, performances at international contests are undervalued with respect to performances at US contests.

There are many good reasons to encourage US Team pilots to enter pre-WGCs. We should remove one of the disincentives by ceasing to devalue their performances at these contests.

References:

ⁱ [http://www.ssa.org/UsTeam/adobe pdf/710 USTC Team Selection Ver 2 Final 021004.pdf](http://www.ssa.org/UsTeam/adobe%20pdf/710%20USTC%20Team%20Selection%20Ver%20Final%20021004.pdf)

ⁱⁱ <http://www.sailplane-racing.org/rules.htm>

ⁱⁱⁱ http://www.fai.org/sporting_code/sc3a.pdf