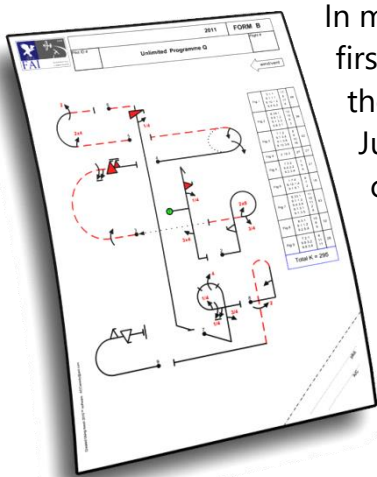# Processing Judges marks and CIVA's FairPlay System (FPS)

A thorough review of why a "system" is necessary in aerobatic competition judging, and what FPS does for us

Sports Results and Judging Systems

In most competitive sports selecting the winner is easy … it will be the first race-car past the finishing post, or the football team that scores the most goals, and so on. However some sports require experienced Judges to rank the artistic and technical skills on display, and competition aerobatics is one of many activities where it takes a trained expert to tell how well each performance has met the standard required. Where such complicated judgements are required it is normal to assume that the performance can theoretically be perfect, so we simply need to count the "errors" that are seen and calculate the mark for each item by subtracting the total of errors seen from a fixed number - the winner is the one with the highest remaining score after adjusting for complexity and other factors.

An unavoidable aspect of these subtractive marking processes is that skill variations between Judges can have a reversed effect. A less experienced Judge is unlikely to recognise as many errors as an 'expert' and will award higher marks in a relatively narrow range; this will influence the result more than an expert Judge with greater experience who will see more downgrades and give lower marks with a broader spread. It is very difficult for any Judge to prevent honest preferences and dislikes from affecting his or her decisions, whether these are applied consciously or not. At international events the influence of national characteristics is unusually hard to avoid and can significantly affect the result.

Practical aerobatic judging

At aerobatic events Judges use their skill and experience to cumulate the downgrades for each figure to the nearest half-mark, then subtract this total from the 'perfect' ten to give a mark ranging from a maximum of 10.0 down to 0.0 or numeric zero. If the figure flown is not the one specified on the Judges paperwork then an HZ is used to denote that a 'Hard Zero' has been applied. If any Judge has given an HZ then the Chief Judge must confer with the judging panel, if possible using a video recording to guide this process, to decide whether
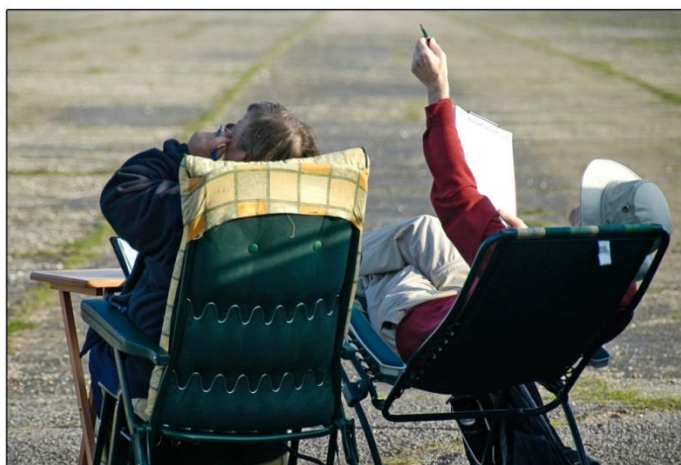
the HZ must be applied for all Judges. If majority agreement is not reached the HZ is rejected and the figure fully marked. A Judge who for any reason is genuinely unsure of the mark to award to a figure can ask for an "Average" mark to be provided by the system; this will be a simple average of the marks from the scoring Judges, to the nearest half mark.

Settling differences of opinion

Human opinions are subjective and unavoidably influenced by personal pressures and influences of one sort or another, whether consciously or otherwise. The usual way to handle potentially unreliable observations is to get as many opinions as possible and average them to minimise the influence of any ill-fitting or unusual elements. This is a valid strategy as long as we accept the disturbance that questionable judgments can still cause. Final aerobatic championship score differences between the leading pilots can be very small, and to accept every mark without question could easily lead to an influenced or even a wrong result. There should be a better way to identify marks that simply "don't fit" so that they can be given the attention that they deserve, and with FPS there certainly is.

Combining this into a plan …

All the "raw" information from the Judges is entered into the scoring computer. What we need now is:

- A preparation system to overcome the effect of differences in judging styles and ability.
- A way to detect 'unusual' marks compared to other Judges marks for the same figure.
- A practical test so that we can evaluate unusual marks as either "OK" or "Not OK", and …
- A method for substituting a more suitable mark where a "Not OK" decision requires it.
- All of this must be done in a completely open way that allows Pilots and Judges to see what has been done, and with enough supporting information for everyone to assess why any changes have been made.

Of course – the computer can not judge, but it can make very smart comparisons between the marks each Judge has awarded and, based on the reasonable assumption that the dominant panel view is the 'correct' one, it can painstakingly analyse every element and employ sound mathematical techniques to reach a result that treats each Judges' output in a fair and balanced way, and where necessary ensure this always errs in favour of the pilot.

How to Compute the Results?

Over the years we have moved away from plain raw marks and their unavoidable problems, briefly through 'Bauerising' where figure high and low

marks were ignored, and then for some years CIVA used a statistical solution called TBLP in which a table of the marks from all Judges for all pilots and all figures was used to compare all the marks together, substituting averages from the other Judges where a mark failed the SD based acceptance test. With TBLP however every mark from every pilot affected every other mark, and while it provided some benefits it was thought that Judges could adapt their marking style to get an artificially improved result …. Eventually the confidence of pilots was lost. Rather than risk a return to using raw marks, CIVA set out to create a better solution.

CIVA's FairPlay System

The process was developed during 2005 from a completely fresh approach that combined our comprehensive championship judging experiences with a number of robust statistical testing processes to meet the very high analytical standards required. The result has proved to be a reliable scoring system which has built a good level of trust among judges and competitors alike. It was revised in 2018 to include proportional assessment of any unusual marks, to smooth disturbances from repeated results calculations on the pilot rankings.

The system works within the following broad headings:

1. **Separate the Raw Marks into figure Groups**
   First the system assembles the Judges "raw" marks into groups on a figure-by-figure basis so that like is always compared to like and different opinions of the same thing can be precisely reviewed. For Free Known and Free Unknown sequences where figure composition is more flexible, special systems are used to group identical figures together to ensure that these comparisons are throughout on a like-for-like basis.

2. **Balance the Judges within each figure Group**
   An essential first step with each group is to re-balance the Judges marks so that every Judge has the same overall influence. The statistician's word for this balancing act is 'normalisation', and without it comparisons between the Judges would not be valid. In our normalisation each Judges complete set of non-zero marks is moved up or down and the scatter of the marks (based on their Standard Deviations) squeezed or expanded about their centre so each Judge's marks have the same overall effect as the panel average. This completely resolves the experienced / inexperienced Judge dilemma because the influence of every Judge is now equal. This is the move that changes the pilots' marks from simple whole and half numbers to many decimal places.

3. **Identify and resolve "Unusual" Marks**

   For each group of marks FPS calculates an idealised table of Fitted Value (FV) marks that is closely matched to each Judges own style. An SD (standard deviation) based statistical confidence test at 98.5% is now carried out to check the validity of each normalised mark against its corresponding FV. If the test meets this confidence requirement the mark is accepted and carried forward to the next stage; if the test fails then the mark is identified for further treatment. In this way every normalised mark is in turn either accepted and carried forward unchanged, or noted for adjustment. When processing of the

figure group is complete, any normalised mark identified for change is smoothly blended toward the calculated FV by an amount that depends on its SD or confidence value; this change starts at the 98.5% confidence level (SD=2.43) and by 95.0% confidence (SD=1.96) the normalised mark will have been completely replaced by the FV. These adjustments are shown 'boxed' on the Pilots check-sheets to indicate where they have been made. This final set of marks can now be multiplied by the figure K-factors to build a table of scores for each pilot from each judge, ready for the next step.

4. **Identify and settle any High and Low Biased Scores**
   In a final step the FairPlay System now uses the above table of scores as the basis for one more Normalisation and Fitted Values validation process that is very similar to that of the marks assessment procedure. Now however it is used to detect and resolve any unusual scores that may have survived; the confidence levels used here are more relaxed at 78.5% and 90%. Biased scores are possible because even though all unusual raw marks have been removed a Judge may still have given overall an under or over-stated assessment of a competitor, and the score can thus be unacceptably high or low when compared to the other Judges. Such bias can be the result of over-enthusiastic assessment of a home team pilot, or simply national likes and dislikes that have not been successfully kept in check. FPS as usual replaces any scores that fail their confidence test with the relevant Judges Fitted Value score, and once again such changes are clearly shown on the Pilots check-sheets.

5. **Handling Penalties**
   After the processing of marks and scores has been completed for all groups the penalties can be subtracted from the average of the Judges final scores, and the sequence results are now ready for publication.

6. **Create detailed feedback for the Judges**
   Now the FairPlay System can turn to its other great strength – a thorough review of judging performance. An individual analysis for each Judge shows how he/she compares to his/her colleagues, while for the Chief Judge the statistics for the whole panel are collated and ranked to show which Judge most closely matched the panel view and by how much the other Judges were out of step with all their colleagues. In this way FPS is able to provide a great deal of easily distributed feedback for the entire judging team, something not available until the advent of this system.

Publication of Results

After approval from the Chief Judge and the Jury, the printed paper and web results are published and the individual Judge sequence analyses made available so everyone can see in detail exactly how every member of the judging panel has performed.

The Judges Ranking Index (RI) and the CIVA JRP system

In an ideal world each Judge would rank the pilots in the same order as the final result based upon the views of the whole panel. Whilst minor differences would generally be of little concern, significant mis-ranking of pilots compared to the panel's final conclusion would be a clear indication that a Judge's views are not shared and so are less likely to be correct. To

measure this effect FPS creates a separate pilot ranking for each Judge from a specially prepared set of their normalised raw scores with any averages resolved. By comparing the judges' pilot rankings with the panel rankings it builds a personal Ranking Index (RI) that will be zero if the Judge pilot ranking is identical to the panel, or is increased by each rank and score difference combined. At a major championship an RI value below about 10 for each sequence would indicate pretty good agreement with the published result. Numbers above this level give increasing cause for concern, then a review of the Judges own analysis would then be the right place to identify where the discrepancies are appearing.

Besides the obvious advantage arising from the ease with which any Judge can now review their contest performance against the published result and see where they most need to target their personal development effort, experience shows that this system can now be used as a reliable and proven basis upon which to base the selection of Judges for international championship duty.

The Judge Rank Position (JRP)

Finally when all the year's championships are complete, a new table of judge performances based on all of their programme RI's can be created to guide selections for the next year's panels. Here the average RI of each judge from all programmes in each championship, excluding the Final Freestyle, is adjusted for panel size to eliminate differences and influences between the championships, and then numerically ranked lowest to highest to provide their Judge Rank Position (JRP) at that event. The overall season average of their JRP's can now be used during the judge selection process to guide panel selections for the following year.

An example of Raw Marks Normalisation

Each red or black dot shown here represents one mark given by the Judge at that value. The yellow circles below show the mean for each Judge, and the vertical yellow strips indicate the spread of the Judges marks (this is the 'standard deviation'). The pink and grey lines emphasize the style differences between each Judge – some Judges give higher marks than others, and some Judges spread their marks over a wider range than others.

During the Normalisation process each Judges block of marks is moved up or down so that their average is equal to the average for the all of the Judges, and the spread of each Judges marks has been squeezed or expanded to be equal to the average spread for all Judges – the lower green outlined result shows this effect. Because all the judges now have an identical style of marking it is possible to start comparing any Judge against the others in a meaningful way.
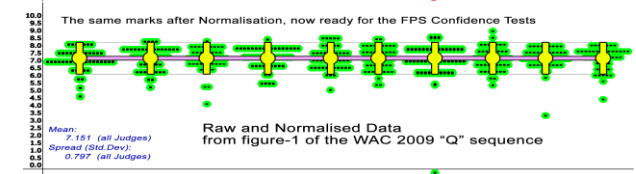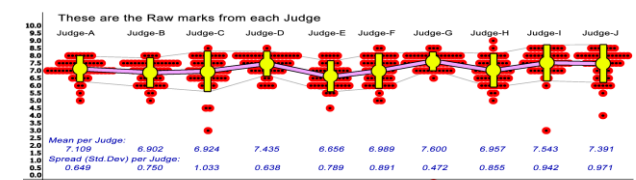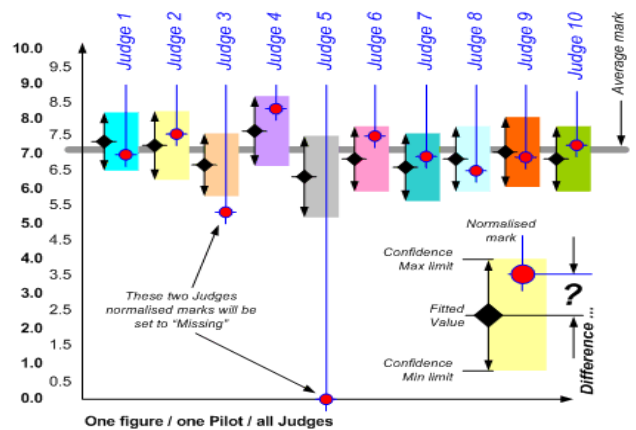
How does the FairPlay System confidence test work?

Taking each normalised mark in turn through a complete group, FPS carries out a statistical test on each one to get an 'Uncertainty' valuation for it. This is done by taking the numeric difference between the mark and the Fitted Value (FV) that FPS has calculated for it and dividing by the Residual Standard Deviation (SD) for the group. In the upper diagram above each judge's mark is shown as a red circle and the Fitted Value as a black diamond. The height of the black arrow indicates the 98.5% (2.43 SD) confidence range within which the mark can be accepted. Any that are outside this range are too different to the value we should expect the judge give, and they must be adjusted.

If the result of the confidence test is between 98.5% / 2.43 SD and 95.0% / 1.96 SD the mark is proportionately blended between its normalised value and the FV. Any that are beyond 95% are simply replaced by the Fitted Value.

To understand this look at the idealised distribution of marks shown in this diagram. During FPS the marks in the central 97.04% green area are accepted without change, while those in the left/right red areas between 1.96 and 2.43 SD are blended proportionately from their normalised value to the FV. The remainder with SD above 2.43 are directly replaced by the FV.
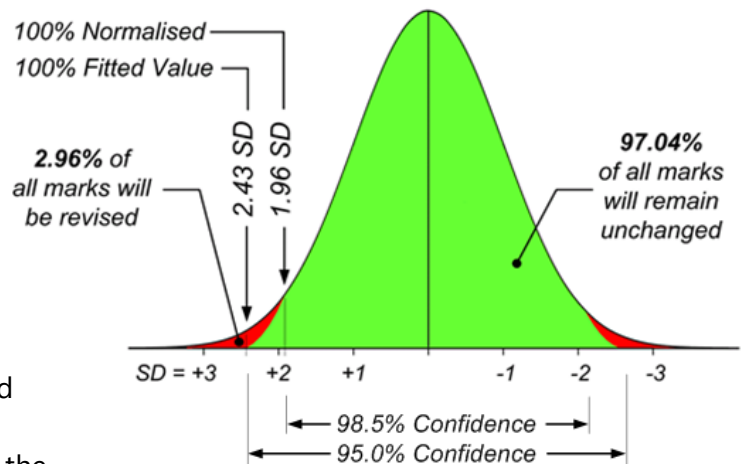
In response to feedback from pilots over many years regarding the individual pilot rank changes that are an inevitable feature of any system where results calculations are repeated as the number of pilots marks entered gradually increases, the FairPlay System was thoroughly reviewed and developed for the 2018 competition season to incorporate the above proportionate blending process in place of the single-step adjustment process that was previously used. In practice this mimics the subjective methodology that humans apply to these situations as confidence in a comparison slides from high to low. As a consequence the extent of minor rank changes has now been reduced by more than half.

NHB: Rev-3

The FairPlay System Process map

Raw Marks Sheets

All Pilots / complete sequence

Assemble the
Raw Marks for -
Group 1 … Group n

Next Group

Resolve HZ's

HZ Corrected
Raw Marks
{ Normalisation }

Fitted
Values

Confidence Test

"Idealised"
Marks

Blended resolution of
identified mark outliers

Scores per Judge
= Marks x K-factors
{ Normalisation }

Fitted
Values

Confidence Test

"Idealised"
Scores

Blended resolution
of detected score bias

Review Judge
Performances

Assemble
Final Scores

Deduct
Penalties

**Printed
Results
Output**

**Judging
Analysis**

**Online
Results
Output**

Example 1 – ACRO Pilots online FPS Score Sheet

Pilots FairPlay Marks Sheet

Ekaterina VOLKOVA (H/C) - Extra 330SC N580X

Unlimited - Power : Programme 2: Free Unknown #1

32nd FAI WAC 2024 at Mokre/Zamosc, POLAND, 15 to 25 August 2024

Contest Director: Jerzy MAKULA, Contest Chief Judge: Quintin HAWTHORNE (RSA)

Judges: 1 - Timo BARTHOLDI (FIN), 2 - Algis ORLICKAS (LTU), 3 - Galyna SUPRUNENKO (UKR), 4 - Gilles GUILLEMARD (FRA), 5 - Esteban MOULIN (BEL), 6 - Eladi LOZANO (ESP), 7 - Marty FLOURNOY (USA)

Fig No	K factor	J1	J2	J3	J4	J5	J6	J7	CHZ	Av'ge Mark	Equiv. Score
1	66	0,0	0,0	3,0	Hi 5,0	0,0	3,0	0,0	OK	1,57	103,71
		0,00	0,00	2,68	1,04	0,00	3,41	0,00		1,02	67,17
2	6	9,0	9,0	8,5	8,0	8,0	9,0	9,0	OK	8,64	51,86
		9,16	9,21	8,70	7,75	7,62	9,10	9,00		8,65	51,89
3	31	7,0	7,5	8,0	7,5	7,0	6,5	6,5	OK	7,14	221,43
		7,35	7,21	8,02	7,37	6,98	6,96	6,19		7,15	221,79
4	6	8,5	8,5	8,5	9,5	Lo 7,0	8,0	8,5	OK	8,36	50,14
		9,00	8,97	8,67	8,71	8,68	8,47	8,23		8,68	52,06
5	46	6,5	6,5	7,0	7,0	5,0	6,5	7,0	OK	6,50	299,00
		7,06	5,91	7,22	6,39	6,01	6,12	6,71		6,49	298,44
6	35	7,5	7,5	7,5	7,5	7,0	7,0	8,0	OK	7,43	260,00
		7,98	7,60	7,48	7,25	6,91	7,11	7,40		7,39	258,71
7	37	5,0	7,0	7,5	Lo 5,5	7,5	5,5	7,0	OK	6,43	237,86
		6,17	6,60	7,13	6,60	7,21	5,47	6,45		6,52	241,10
8	40	5,5	7,0	7,5	6,5	6,0	7,0	8,0	OK	6,79	271,43
		5,92	7,00	7,67	6,62	5,94	7,08	7,46		6,81	272,49
9	58	4,0	5,0	6,0	Lo 0,0	5,0	5,0	Hi 7,5	OK	4,64	269,29
		5,20	4,58	5,86	5,25	6,07	4,53	5,25		5,25	304,31
10	66	3,0	4,5	6,5	5,0	4,0	Lo 0,0	6,0	OK	4,14	273,43
		4,27	3,66	5,91	3,85	5,92	4,81	5,22		4,81	317,26
11	6	9,0	8,5	9,0	9,5	7,5	9,5	8,5	OK	8,79	52,71
		9,08	8,62	9,36	8,77	7,81	9,35	8,60		8,80	52,79
12	53	6,5	7,0	7,0	7,0	6,0	6,5	8,0	OK	6,86	363,43
		6,98	6,92	7,29	6,65	6,24	6,38	7,60		6,87	363,89
13	6	9,0	8,0	Lo 7,0	9,5	9,0	9,0	9,0	OK	8,64	51,86
		9,43	7,99	8,91	8,63	8,66	9,63	9,15		8,91	53,49
14	32	7,0	8,0	7,0	8,0	7,5	7,5	8,5	OK	7,64	244,57
		7,51	7,79	7,68	7,89	7,25	7,44	8,23		7,68	245,85
Posi	40	7,5	9,0	8,0	6,5	7,0	8,0	7,0	OK	7,57	302,86
		7,76	8,71	7,68	6,60	7,32	7,81	7,20		7,58	303,32

This sequence has been completed. FairPlay scores here are FINAL

FP anomalies			(High)					
Judge Scores	3027,19	2978,52	3475,42	3007,57	3036,91	3099,90	3107,33	
FP substitutes			3113,45					

Pilots score (max.poss = 5280,00)		3052,98

Penalties	No x Val	Deduct	
Too low	-	0.00	
Too high	-	0.00	
Interruptions	-	0.00	
Insertions	-	0.00	
Missed slot	-	0.00	
Training Violation	-	0.00	
Other penalty	-	0.00	
No penalties to deduct	**Final score**	**3052,98**	**57,822 %**

FairPlay System explanations

ACRO Version 5.2 Build: 16.08.24

Programme 2: Free Unknown #1
Free Unknown E
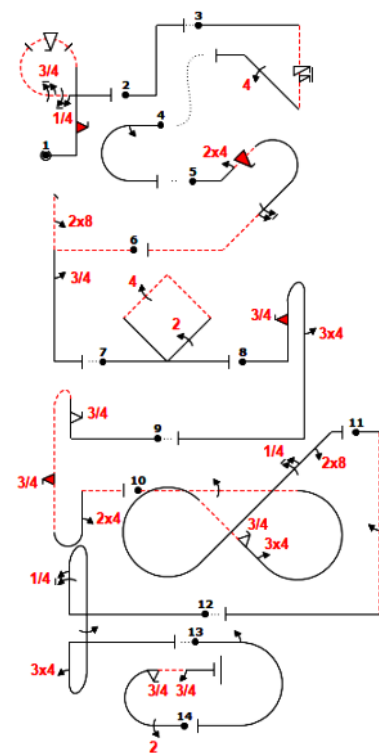
Example 2 – ACRO Chief Judges Overall FPS Analysis Report

Analysis Of Judges Combined Anomalies

Sequences: Seq01 Programme 1: Free Known, Seq02 Programme 2: Free Unknown #1 (INP), Seq03 Programme 3: Free Unknown #2 (INP), Seq04 Programme 4: Free Unknown #3

2nd FAI EIAC 2024
Clinceni Romania
5th-14th SEP 2024

Use of Marks:	All Judges No	%	UKR Galyna Suprunenko RI 5.77 [4]		LTU Vytautas Tautevicius RI 7.48 [4]		BEL Esteban Moulin RI 7.98 [4]		ROU Csaba Pakai RI 9.85 [4]		ITA Luca Andraghetti RI 13.05 [4]		GER Jurgen Leukefeld RI 13.41 [4]		ESP Eladi Lozano RI 18.75 [4]	
				1.5		1.2		2.2		1.6		1.8		2.8		1.7
HZ - Hard Zeros	135	1.9	16	0.0	13	0.0	23	0.0	17	0.0	19	0.0	29	0.0	18	0.0
Marks from 0.0 to 6.5	1870	25.7	289	27.8	207	19.9	295	28.3	261	25.1	254	24.4	254	24.4	310	29.8
Marks from 7.0 to 10.0	5280	72.5	736	70.7	821	78.9	723	69.5	763	73.3	767	73.7	758	72.8	712	68.4
AV - averages	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1	0.1
Total marks Pilots/Judge	7287		1041	76	1041	76	1041	76	1041	76	1041	76	1041	76	1041	76

Style Comparison:
Average and Style of Judges Raw Marks compared to normalised all-Judges average

Style ♡ 2 x Raw SD

Vertical axis scale: 1 mark = 112mm

		UKR	LTU	BEL	ROU	ITA	GER	ESP
Average:	1.75	1.73	1.78	1.73	1.76	1.75	1.75	1.77
Style:	0.57	0.54	0.48	0.61	0.65	0.57	0.53	0.57

Raw Marks Factors:

		UKR	LTU	BEL	ROU	ITA	GER	ESP
Average %:	100	− 1.51	+ 1.72	− 1.40	+ 0.65	− 0.27	− 0.25	+ 1.06
Style %:	100	− 4.19	− 15.10	+ 7.48	+ 15.64	+ 0.51	− 5.80	+ 1.47

Figure anomalies
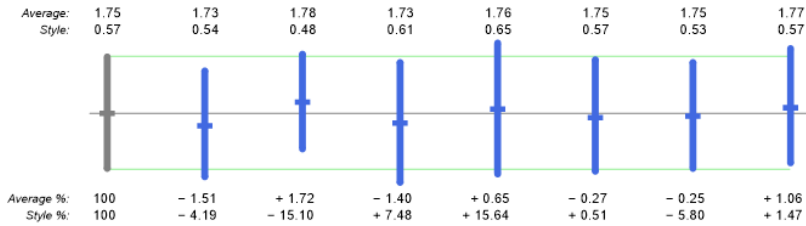
	All Judges	%	UKR	LTU	BEL	ROU	ITA	GER	ESP
HZ to fitted value	47	0.6	3	2	7	5	7	15	8
Mark to confirmed HZ	45	0.6	6	8	3	7	7	5	9
AV to confirmed HZ	0	0.0	-	-	-	-	-	-	-
AV to fitted value	2	0.0	-	-	-	-	1	-	1
Lo to fitted value	63	0.9	5	10	8	4	11	10	15
Hi to fitted value	25	0.3		3	3	4	5	5	5
The 60% Rule	0	0.0	-	-	-	-	-	-	-
Total figure anomalies	182		14	23	21	20	31	35	38

Sequence anomalies

Team		Pilots assessed in FPS pass-2		UKR		LTU		BEL		ROU		ITA		GER		ESP	
CZE	Czech Republic	8	2 Lo 3 Hi	-	-	-	-	-	-	1 Lo	1 Hi	-	-	1 Lo	1 Hi	-	1 Hi
HUN	Hungary	12	4 Lo 5 Hi	1 Lo	-	-	1 Hi	1 Lo	2 Hi	2 Lo	-	-	-	-	-	-	2 Hi
ITA	Italy	4	0 Lo 2 Hi	-	-	-	-	-	-	-	-	-	2 Hi	-	-	-	-
LTU	Lithuania	12	5 Lo 3 Hi	-	-	-	3 Hi	-	-	2 Lo	-	-	-	-	-	3 Lo	-
POL	Poland	8	2 Lo 2 Hi	-	-	-	-	-	-	-	-	1 Lo	-	-	1 Hi	1 Lo	1 Hi
ROU	Romania	24	6 Lo 2 Hi	-	-	-	1 Hi	1 Lo	-	-	-	2 Lo	-	1 Lo	1 Hi	2 Lo	-
SWE	Sweden	4	0 Lo 2 Hi	-	-	-	-	-	-	-	2 Hi	-	-	-	-	-	-
AUS	Australia	4	2 Lo 0 Hi	-	-	-	-	-	-	2 Lo	-	-	-	-	-	-	-
	Total sequence anomalies		21 Lo 19 Hi	1 Lo	-	-	5 Hi	2 Lo 2 Hi		7 Lo 3 Hi		3 Lo 2 Hi		2 Lo 3 Hi		6 Lo 4 Hi	

Cumulative RI contributions per Team

Galyna Suprunenko (UKR)
Judge: max country bias = 1.19   min = -1.15
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Vytautas Tautevicius (LTU)
Judge: max country bias = 3.01   min = -0.84
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Esteban Moulin (BEL)
Judge: max country bias = 2.29   min = -1.55
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Luca Andraghetti (ITA)
Judge: max country bias = 2.42   min = -2.19
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Jurgen Leukefeld (GER)
Judge: max country bias = 1.61   min = -1.46
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Eladi Lozano (ESP)
Judge: max country bias = 2.86   min = -5.14
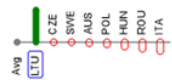Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Csaba Pakai (ROU)
Judge: max country bias = 1.16   min = -2.72
Panel: = 3.01   min = -5.14
Most favoured   Least favoured

Calculations by: FairPlay v2 (non-scoring CJ + CHZ Summary)
Aerobatic Contest Results Organiser, ACRO Version 5.2 Build: 09/09/24
This report created at 11:07 on Monday 16 September 2024

Example 3 – ACRO online Individual Judge FPS Analysis page

ACRO Sequence FPS Analysis for Judge 1: Galyna Suprunenko - UKR   **Ranking Index = 4.43**
2nd FAI EIAC 2024, Clinceni Romania, 5th-14th SEP 2024
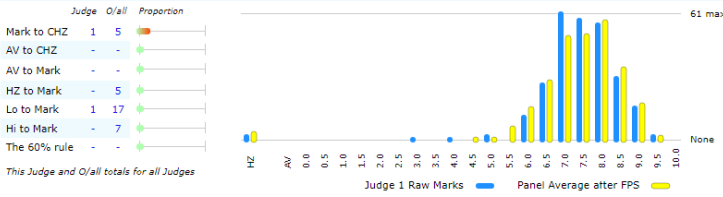**Intermediate - Power, Programme 3: Free Unknown #2**

Pilot NAT = Judge NAT   FPS High value   FPS Low value
HZ Anomalies   Set to Panel Avg

Raw and *normalised / FPS revised* Marks and Scores

FP Rank *before* penalties	Fig-1	Fig-2	Fig-3	Fig-4	Fig-5	Fig-6	Fig-7	Fig-8	Fig-9	Fig-10	Fig-11	Fig-12	Fig-13	Fig-14	Posi	No	Raw/FPS	J-rank	Diff
1 Andreea Bănesaru - ROU	8.5	9.0	8.0	8.0	8.0	8.5	9.0	7.0	8.0	8.0	7.5	8.5	8.0		8.5	0	2099.50	3	-2
Extra 330SC YR-EXD	*8.88*	*8.43*	*8.00*	*8.26*	*8.35*	*8.11*	*8.99*	*6.91*	*8.33*	*8.29*	*7.20*	*8.50*	*8.07*		*8.64*		*2075.60*		
2 Eduard Despescu - ROU	9.0	8.5	9.0	8.5	9.5	8.0	8.5	8.5	8.5	8.0	8.0	7.5	8.0	9.0	9.0	0	2192.27	1	+1
Extra 330SC YR-EXE	*9.39*	*8.52*	*8.43*	*8.27*	*9.44*	*8.07*	*8.77*	*8.80*	*8.83*	*8.35*	*7.87*	*7.77*	*7.35*	*7.58*	*9.22*		*2157.89*		
3 Sebastian Dan - ROU	7.5	7.0	9.5	8.5	9.0	7.5	8.5	8.0	8.0	8.0	8.5	8.0	9.0	9.0	9.0	0	2133.15	2	+1
Extra 330SC YR-EXE	*7.60*	*6.95*	*8.83*	*8.27*	*8.99*	*7.53*	*8.77*	*8.26*	*8.29*	*8.35*	*8.50*	*7.77*	*8.06*	*8.64*	*9.22*		*2103.96*		
4 Mădălin Gîrbea - ROU	8.0	8.5	7.5	7.5	7.5	8.5	7.5	7.5	8.5	8.5	8.0	9.0	8.0		8.5	0	2072.49	4	
Extra 300L YR-EWI	*8.24*	*8.04*	*7.48*	*7.71*	*7.65*	*8.11*	*7.67*	*7.34*	*8.77*	*8.83*	*7.73*	*9.13*	*8.07*		*8.64*		*2054.20*		
5 Lucian Drăguş - ROU	7.0	9.0	7.0	7.5	8.0	8.0	8.5	8.5	8.5	8.5	7.5	9.0	7.5		9.0	0	2068.09	5	
Extra 300L YR-EWF	*6.96*	*8.43*	*6.95*	*7.71*	*8.35*	*7.58*	*8.55*	*8.19*	*8.77*	*8.83*	*7.20*	*9.13*	*7.53*		*9.22*		*2049.97*		
6 Maksym Grabarczyk - POL	8.0	8.0	8.0	7.0	9.0	7.0	8.0	6.5	6.5	7.5	9.0	7.5	8.5	7.5	8.0	0	1942.18	8	-2
Extra 330SC SP-MTD	*8.24*	*8.00*	*7.64*	*6.66*	*8.99*	*7.00*	*8.11*	*7.51*	*6.69*	*7.65*	*9.13*	*7.34*	*8.77*	*7.05*	*8.06*		*1949.32*		
7 Octavian Stăvilă - ROU	7.5	7.0	8.5	8.0	8.5	8.5	8.0	7.5	7.5	8.0	8.5	7.0	8.5	8.0	7.5	0	1992.38	6	+1
Extra 330SC YR-EXD	*7.60*	*6.95*	*8.04*	*7.73*	*8.55*	*8.60*	*8.11*	*7.71*	*7.76*	*8.35*	*8.50*	*6.91*	*8.77*	*7.58*	*7.48*		*1979.22*		
8 Jason Tang - AUS	7.5	7.0	8.0	8.0	9.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.5	8.0	8.0	0	1990.12	7	+1
Extra 330SC D-EABX	*7.60*	*6.95*	*7.64*	*7.73*	*9.44*	*7.53*	*7.44*	*7.71*	*7.76*	*7.65*	*7.87*	*7.77*	*8.06*	*7.58*	*8.06*		*1976.77*		
9 János Sonkoly - HUN	7.0	7.0	7.0	7.5	9.0	8.0	7.5	7.5	7.5	8.0	7.0	6.5	8.5	8.0	8.0	0	1923.63	9	
Extra 300 D-EEXT	*6.96*	*6.95*	*6.84*	*7.20*	*8.99*	*8.07*	*7.44*	*7.71*	*7.76*	*8.35*	*6.62*	*6.49*	*8.77*	*7.58*	*8.06*		*1917.54*		
10 Patrycja Pacak - POL	7.0	7.0	7.0	7.0	7.5	6.5	8.0	7.5	7.0	Lo 3.0	6.5	7.0	6.0		7.0	1	1713.06	15	-5
Extra 200 SP-KYK	*6.96*	*6.95*	*6.84*	*6.96*	*7.67*	*6.46*	*8.11*	*7.71*	*6.52*	*7.24*	*8.16*	*6.12*	*6.65*	*6.06*	*6.89*		*1790.71*		
11 Luděk Prda - CZE	7.5	7.0	7.5	8.0	9.5	6.5	6.5	7.0	6.5	7.0	7.5	7.0	8.0	7.0	7.0	0	1860.55	10	+1
Extra 300L OK-XTR	*7.60*	*6.95*	*7.24*	*7.73*	*9.44*	*6.46*	*6.77*	*7.17*	*6.69*	*6.96*	*6.62*	*7.34*	*6.65*	*7.58*	*6.89*		*1859.33*		
12 Pierluigi Zito - ITA	7.5	7.0	7.0	7.0	7.0	7.0	6.5	6.0	7.5	7.0	8.0	6.0	8.0	7.0	7.0	0	1750.89	14	-2
CAP 231 D-EBDT	*7.24*	*6.95*	*6.66*	*7.17*	*7.00*	*7.23*	*6.27*	*5.46*	*7.44*	*7.22*	*7.87*	*6.06*	*8.06*	*6.96*	*6.89*		*1767.82*		
13 István Láng - HUN	7.5	7.5	6.5	8.0	7.0	7.0	7.0	7.0	7.0	7.5	7.5	6.5	7.5	6.5	7.5	0	1829.13	11	+2
Extra 300 D-EEXT	*7.60*	*7.48*	*6.45*	*7.73*	*7.23*	*7.00*	*6.77*	*7.17*	*7.22*	*7.65*	*7.24*	*6.49*	*7.35*	*5.99*	*7.48*		*1835.43*		
14 Paulius Židoveinis - LTU	HZ	6.5	7.0	7.0	8.5	7.0	7.5	7.5	8.0	8.0	7.5	7.0	8.5		8.5	0	1767.92	13	+1
Extra 300L G-EXII	*CHZ*	*7.23*	*6.43*	*6.66*	*8.77*	*7.00*	*7.60*	*7.71*	*7.58*	*7.87*	*7.76*	*6.84*	*9.04*		*8.64*		*1777.76*		
15 László Baku - HUN	7.5	7.0	7.5	7.0	7.5	6.0	7.0	6.5	8.0	8.0	7.5	HZ	8.0	6.5	8.0	0	1673.84	16	-1
Extra 300 D-EEXT	*7.60*	*6.95*	*7.24*	*6.66*	*7.67*	*5.93*	*6.77*	*6.22*	*8.29*	*8.35*	*7.24*	*CHZ*	*8.06*	*5.99*	*8.06*		*1701.08*		
16 Petras Janavičius - LTU	7.5	6.5	7.0	7.5	6.5	HZ	7.0	6.5	8.0	9.0	7.0	7.5	8.0		8.0	0	1811.39	12	+4
Extra 300L G-EXII	*7.34*	*8.99*	*6.95*	*7.20*	*6.10*	*CHZ*	*6.96*	*6.62*	*7.58*	*9.13*	*7.22*	*7.24*	*8.35*		*8.06*		*1713.29*		
17 Sanna Hedin - SWE	6.0	7.0	7.0	6.5	7.0	6.0	6.0	6.5	7.0	7.5	6.5	6.5	7.0		6.5	0	1657.44	17	
Extra 300L SE-XIZ	*6.06*	*7.23*	*6.95*	*6.12*	*6.77*	*5.93*	*5.67*	*6.62*	*6.52*	*7.24*	*6.69*	*6.45*	*6.96*		*6.31*		*1682.81*		
18 Albertas Maciulevičius - LTU	5.0	7.0	5.0	6.0	7.0	6.5	6.5	6.0	6.0	6.5	6.0	5.0	7.5		5.0	0	1519.10	19	-1
Extra 300L G-EXII	*5.21*	*7.23*	*4.87*	*6.12*	*6.77*	*6.46*	*6.08*	*5.46*	*5.99*	*6.15*	*5.26*	*7.65*			*5.73*		*1558.76*		
19 Tomas Králíček - CZE	7.5	7.5	7.0	7.0	HZ	6.0	7.0	6.0	6.5	7.5	7.0	6.5	6.5	4.0	5.0	1	1548.71	18	+1
CAP 231 OM-CAP	*7.60*	*7.48*	*6.84*	*6.96*	*CHZ*	*CHZ*	*6.77*	*6.08*	*5.99*	*7.24*	*7.22*	*6.12*	*5.94*	*4.35*	*4.57*		*1518.16*		
	0	0	0	0	0	1	0	0	0	0	1	0	0	0		2	0		26

Figure Anomalies Summary

	Judge	O/all	Proportion
Mark to CHZ	1	5	
AV to CHZ	-	-	
AV to Mark	-	-	
HZ to Mark	-	5	
Lo to Mark	1	17	
Hi to Mark	-	7	
The 60% rule	-	-	

This Judge and O/all totals for all Judges

Distribution of Raw Marks - Judge vs. Panel

61 max

None

Judge 1 Raw Marks   Panel Average after FPS

Review of Anomalies

Mark anomalies		Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Judge 7	Ch.Judge
Patrycja Pacak - POL	Fig-11	Lo 3.0	8.5	9.0	7.5	8.5	8.0	8.0	OK
Extra 200 SP-KYK		*8.16*	*8.20*	*8.64*	*7.70*	*8.15*	*7.75*	*8.52*	
Tomas Králíček - CZE	Fig-6	6.0	HZ	HZ	HZ	6.0	HZ	HZ	CHZ
CAP 231 OM-CAP		*HZ*	*HZ*	*HZ*	*HZ*	*HZ*	*HZ*	*HZ*	

Score anomalies (none)

Average and Spread of Marks

Judging style:

Judge — Judges average mark = 7.50, mean spread of marks (2xSD) = 1.68
Panel — Panel average mark = 7.46, mean spread of marks (2xSD) = 1.82

0.0   1.0   2.0   3.0   4.0   5.0   6.0   7.0   8.0   9.0   10.0
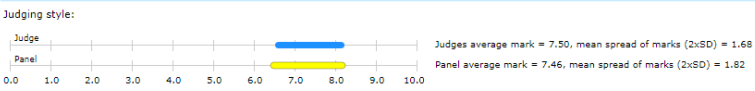
Review of RI Contributions per Pilot

Pilots not ranked correctly	Aeroplane	Judge FPS score	Bias Hi/Lo	Panel FPS score	Score difference	Judge FPS rank	Panel FPS rank	Rank diff'ce	RI value per pilot	Percent of total	RI contributions ranked by decreasing size
Petras Janavičius - LTU	Extra 300L	1713.29	-	1694.80	18.49	12	16	+ 4	1.44	32.60%	
Patrycja Pacak - POL	Extra 200	1790.71	-	1836.46	45.75	15	10	- 5	1.39	31.50%	
Maksym Grabarczyk - POL	Extra 330SC	1949.32	-	2007.26	57.94	8	6	- 2	0.37	8.40%	
Pierluigi Zito - ITA	CAP 231	1767.82	-	1827.31	59.49	14	12	- 2	0.33	7.50%	
Eduard Despescu - ROU	Extra 330SC	2157.89	-	2076.89	81.00	1	2	+ 1	0.17	3.80%	
Andreea Bănesaru - ROU	Extra 330SC	2075.60	-	2098.21	22.61	3	1	- 2	0.14	3.30%	
Tomas Králíček - CZE	CAP 231	1518.16	-	1554.79	36.63	18	19	+ 1	0.11	2.60%	
Sebastian Dan - ROU	Extra 330SC	2103.96	-	2055.87	48.09	2	3	+ 1	0.10	2.20%	
László Baku - HUN	Extra 300	1701.08	-	1727.12	26.04	16	15	- 1	0.08	1.80%	
Luděk Prda - CZE	Extra 300L	1859.33	-	1832.52	26.81	10	11	+ 1	0.08	1.70%	
István Láng - HUN	Extra 300	1835.43	-	1821.39	14.04	11	13	+ 2	0.07	1.50%	
Albertas Maciulevičius - LTU	Extra 300L	1558.76	-	1583.94	25.18	19	18	- 1	0.06	1.30%	
Octavian Stăvilă - ROU	Extra 330SC	1979.22	-	1991.10	11.88	6	7	+ 1	0.04	0.90%	
Paulius Židoveinis - LTU	Extra 300L	1777.76	-	1771.85	5.91	13	14	+ 1	0.02	0.60%	
Jason Tang - AUS	Extra 330SC	1976.77	-	1969.50	7.27	7	8	+ 1	0.01	0.20%	
									4.43		

Pilots ranked correctly		Judge FPS score		Panel FPS score	Score difference	Judge FPS rank	Panel FPS rank				
Mădălin Gîrbea - ROU	Extra 300L	2054.20		2049.99	4.21	4	4				
Lucian Drăguş - ROU	Extra 300L	2049.97		2017.67	32.30	5	5				
János Sonkoly - HUN	Extra 300	1917.54		1956.59	39.05	9	9				
Sanna Hedin - SWE	Extra 300L	1682.81		1651.87	30.94	17	17				

Summary of RI Contributions per Nation

Judge: Max nation bias = 1.41   Min = -1.77   Average = -0.18
Panel: = 2.48   = -3.62   = -0.57

Most favoured   Least favoured

Judge Avg

LTU x 3   CZE x 2   ROU x 6   AUS x 1   SWE x 1   HUN x 3   ITA x 1   POL x 2

Ranking Index totals per nation Using the +/- rank differences to show national bias from the most to the least favoured teams.

Calculations by: FairPlay v2 (non-scoring CJ + CHZ Summary)
Aerobatic Contest Results Organiser, ACRO Version 5.2 Build: 16/08/24