# IJRU Competition Rules

## Technical Manual

IJRU
INTERNATIONAL
JUMP ROPE UNION

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**Version: 4.1.0**

# Technical Manual

The Technical Manual (TM) contains detailed technical specifications of concepts like scoring and results.

*Last updated on **22 Oct 2024***

Version: 4.1.0

# Score calculations and results

The goal of this chapter is to be easily understood by the wider community of our sport as well as being clear and accurate as to leave no questions on how the calculations will be implemented. To meet both goals, some sections will be accompanied by an expansion panel containing examples and simplified explanations using less math formulas.

## Averaging

If there are two judges of a type, the two scores are averaged.

▼ ⓘ **EXAMPLE**

| Judge | Score |
|---|---|
| Judge 1 | 112 |
| Judge 2 | 114 |

Gives an average of $\frac{112+114}{2} = 113$

If there are three judges of a type, the two closest scores are averaged, if the scores are equally spaced the benefit goes to the athlete and the two higher scores are averaged.

▼ ⓘ **EXAMPLE**

| Judge | Score |
|---|---|
| Judge 1 | 112 |
| Judge 2 | 114 |
| Judge 3 | 118 |

Since judges 1 and 2 are closer (2 clicks) than judges 2 and 3 (4 clicks), scores from judges 1 and 2 are averaged for a total score of 113.

A similar situation:

| Judge | Score |
|---|---|
| Judge 1 | 112 |
| Judge 2 | 115 |
| Judge 3 | 118 |

Since judges 1 and 2 are apart by 3 clicks and judges 2 and 3 are also apart by 3 clicks, the higher pair of scores (judges 2 and 3) are used. Those two scores are averaged for a score of 116.5.

If there are four or more judges of a type the highest and lowest scores are dropped, and the remaining scores are averaged.

$$\frac{\text{Judge}_1 + \text{Judge}_2 + \text{Judge}_3 + \text{Judge}_4 - \text{Judge}_{max} - \text{Judge}_{min}}{4 - 2}$$

▼ ⓘ **EXAMPLE**

| Judge | Score |
|---|---|
| Judge 1 | ~~112~~ |
| Judge 2 | 115 |
| Judge 3 | 118 |
| Judge 4 | 119 |
| Judge 4 | ~~121~~ |

Judge 1 and Judge 5 who has the lowest and highest scores are dropped leaving judge 2, 3 and 4 which are then averaged $\frac{115+118+119}{3} = 117.33$

# Rounding

All variables are calculated without applied rounding, except for Capital Letter Variables and functions (such as $R$, $D$, $P$, $M$, $F_p$, $L(x)$) which is rounded to two decimal places

Example, If the variable is $R$, then $R = \frac{\lfloor R*100 \rceil}{100}$

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating speed and multiples scores

Scores are collected from each judge and averaged according to the averaging rules.

This average is called $a$

False starts and false switches cause a deduction of 10 clicks for each instance in all events except DDC speed. For DDC speed, the deduction for a false start and obstructions is 5 clicks per instance. The final score is the average of the two closest judge scores minus the deductions.

The amount of false starts and false switches (false starts and obstructions for DDC) as reported by the head judge are summed up and multiplied by ten (five for DDC), this is called $m$. ($m = (\text{starts} + \text{switches}) \times 10$ or $m = (\text{starts} + \text{obstructions}) \times 5$) The result, called $R$, is obtained by subtracting the deductions ($m$) from the average score ($a$). ($R = a - m$)

*Last updated on **22 Oct 2024***

Version: 4.1.0

# Calculating freestyle event scores

There are several types of freestyles, all with differing scoring methods. You can explore them in the pages linked below.

## 📄 Calculating Single Rope freestyle scores

Single Rope freestyle scores are based on a cumulative difficulty model where presentation, required el...

## 📄 Calculating Double Dutch freestyle scores

Double Dutch freestyle scores are based on an average routine difficulty level where presentation, requ...

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Show Freestyle scores are based on a cumulative Difficulty model where Presentation, Required Elemen...

## 📄 Calculating DDC freestyle scores

Every judge's base score is calculated the same basic way regardless of the judge type.

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating Single Rope freestyle scores

Single Rope freestyle scores are based on a cumulative difficulty model where presentation, required elements, and deductions can affect the score.

Difficulty ($D$) is calculated by adding the points from each skill performed. There is no limit on the total difficulty score.

Presentation ($P$) increases the score by a percentage of the difficulty score calculated from the presentation marks (+, and -).

Required elements ($Q$) will take off a percentage from the total score.

Deductions ($M$) take off a percentage for misses, breaks, and time and space violations.

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), the required elements score ($Q$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times Q \times M$$

The calculation for each of these scores is described in the following sections.

## Difficulty

There is no maximum difficulty score. The difficulty score is the average of the sum of skills per difficulty judge type.

The points per level can be calculated with the following formulas where $x$ is the level of the skill $L\left(x\right) = 0.1 \times 1.5^{x}$ rounded to two decimal places. However, a level 0 skill is always worth 0 points.

> ▼ ⓘ **EXAMPLE**
>
> The point values per level 0-8 skill are:

| Level | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Points per skill | 0.00 | 0.12 | 0.15 | 0.23 | 0.34 | 0.51 | 0.76 | 1.14 | 1.71 | 2.56 |

The score of every difficulty judge is calculated by multiplying the amount of skills recorded at that level by that judge (called $n_x$, where $x$ is the level) with $L\left(x\right)$ for each level, and adding the results (called $s_x$) for each level together, (the resulting sum is called $d_{t,j}$ , where $j$ is the judge number and $t$ is the judge type, P, M, or R. This means multiples judge 1 is called $d_M, 1$, rope manipulation judge 2 is called $d_R, 2$, etc.)

**EXAMPLE**

$$s_1 = L(1) \times n_1$$
$$s_2 = L(2) \times n_2$$
$$d_{M,1} = \sum_{n=1}^{x} = s_1 + s_2 + ... + s_x$$

All difficulty judge' scores for each type of difficulty judge are then averaged together according to the averaging rules, the result for each judge type is called $d_t$ where $t$ is the judge type, P, M, or R.

After this, $d_P$, $D_M$, and $d_R$ is averaged together to get the difficulty result $D$:

$$D = \frac{d_P + d_M + d_R}{3}$$

# Presentation

The presentation score may impact the difficulty score by a total factor of $F_p = 60\% = 0.60$

The scores from the first step for each of the five categories (Musicality, Form/Execution, Creativity, Entertainment, and Variety/Repetitiveness) are collected from each judge and for each category the number of plus marks (called $n_{t,j,\text{plus}}$) is added to 12 after which the number of minus marks (called $n_{t,j,\text{minus}}$) and misses recorded by that judge (called $m_j$) are subtracted, the result (called $j_{t,j}$ where $j$ is the judge number and $t$ is the category) is rounded to an integer larger or equal to 0 and smaller or equal to 24. For example:

$$j_{M,1} = \begin{cases} 0 & 12 + n_{M,1,\text{plus}} - n_{M,1,\text{minus}} - m_j \leq 0 \\ 24 & 12 + n_{M,1,\text{plus}} - n_{M,1,\text{minus}} - m_j \geq 24 \\ \lfloor 12 + n_{M,1,\text{plus}} - n_{M,1,\text{minus}} - m_j \rceil & \text{otherwise} \end{cases}$$

After this, the number of (integer) steps the judge want to adjust the preliminary category score (called $a_{t,j}$ which is a positive or negative integer) is added to $j_{t,j}$ and clamped again. The result of this is called $p_{t,j}$. For example:

$$p_{M,1} = \begin{cases} 0 & j_{M,1} + a_{M,1} \leq 0 \\ 24 & j_{M,1} + a_{M,1} \geq 24 \\ \lfloor j_{M,1} + a_{M,1} \rceil & \text{otherwise} \end{cases}$$

Each of the category scores are then multiplied by the following factors and summed together for each judge to get a total score between 0 and 24, the result of which is called $p_j$.

- Entertainment: $0.25$
- Form/Execution: $0.25$
- Musicality: $0.20$
- Creativity: $0.15$
- Variety/Repetitiveness: $0.15$

All the judges' $p$ scores are then averaged according to the averaging rules and scaled to a number between $0$ and $2F_p$ by multiplying it by $\frac{2F_p}{24} = 0.05$, the result is the final presentation score called $P$.

# Required elements

Each missed required element may impact the score by a factor of $F_q = 2.5\% = 0.025$

For each difficulty judge, the number of missing required elements for their judge type is calculated by subtracting the number of skills performed at a level 3 or higher (called $n_{3+}$), and 0.5 times the number of skills performed at a level 2 or lower (called $n_{2-}$) from the number of required elements for that judge type (called $N_{q,t}$ where $t$ is the judge type), with a minimum result of 0. This number is called $a_{q,t}$ where $t$ is the judge type, P, M, or R. For example

$$a_{q,M} = max\left(N_{q,M} - n_{3+} - 0.5n_{2-}, 0\right)$$

For competition events with pairs interactions, the number of missing required elements are calculated by subtraction the number of marks recorded by each technical judge (with

difficulty level playing no part) (called $n$) from the number of required pairs interactions (called $N_{q,t}$ where $t$ is I for interactions), with a minimum of 0. The number is called $a_{q,t}$ where $t$ is the required element type: I. For example

$$a_{q,I} = max\left(N_{q,I} - n, 0\right)$$

For each judge type/required element, the $a_{q,t}$ scores are then averaged according to the averaging rules, and rounded to a whole number. The result is called $q_t$.

All the q-scores are summed and multiplied by $F_q$, the result of which is subtracted from 1 to be converted into a factor, the result is called $Q$ ($Q = 1 - F_q \times (q_M + q_P + q_R)$ or $Q = 1 - F_q \times (q_M + q_P + q_R + q_I)$).

# Deductions

Time and space violations will impact the score by a factor of $F_v = 5\% = 0.05$ each.
Breaks will impact the score by a factor of $F_b = 5\% = 0.05$.
The first miss will impact the score by a factor of $F_{m,1} = 5\% = 0.05$, the second miss by a factor of $F_{m,2} = 7.5\% = 0.075$ and the third miss and onward will impact the score by a factor of $F_m = 10\% = 0.1$.

The average number of misses recorded by all judges counting misses are calculated according to the averaging rules. This average is called $a_m$ and is rounded to a whole number. $a_m$ is then turned into the miss score $m$ as follows: if $a_m$ is 0 then $m$ is $0$, if $a_m = 1$ then $m = F_{m,1}$, if $a_m = 2$ then $m = F_{m,1} + F_{m,2}$, if $a_m > 2$ then $m = F_{m,1} + F_{m,2} + (a_m - 2) \times F_m$.

Or, in one formula:

$$\begin{aligned} m = &\left(F_{m,1} \times max\left(a_m, 1\right)\right) \\ &+ \left(F_{m,2} \times clamp\left(a_m - 1, 0, 1\right)\right) \\ &+ \left(F_m \times min\left(a_m - 2, 0\right)\right) \end{aligned}$$

The average number of breaks are calculated and called $a_b$ this average is also rounded to a whole number, the factor $F_b$ is then multiplied with $a_b$, the result is called $b$. ($b = F_b \times \lfloor a_b \rceil$)

The average number of additional violations (time and space) are calculated and called $a_v$ this average is also rounded to a whole number, the factor $F_v$ is then multiplied with $a_v$, the result is called $v$. ($v = F_v \times \lfloor a_v \rceil$)

The misses ($m$), breaks ($b$) and violations ($v$) are summed together and subtracted from 1, the result is called $M$ and cannot be lower than 0. ($M = 1 - (m + b + v)$)

# Result

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), the required elements score ($Q$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times Q \times M$$

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating Double Dutch freestyle scores

Double Dutch freestyle scores are based on an average routine difficulty level where presentation, required elements, and deductions can affect the score.

Difficult ($D$) is calculated as two separate components, the jumper difficulty and the turner difficulty. The turner difficulty is the average skill level of the 20 most difficult turner skills of the routine. The jumper difficulty is the average difficulty of all the skill sequences in the routine. These are added together with a little higher weight given to the jumper score.

Presentation ($P$) increases the score by a percentage of the difficulty score calculated from the presentation marks (+, and -).

Deductions ($M$) take off a percentage for misses, and time and space violations.

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times M$$

The calculation for each of these scores is described in the following sections.

# Difficulty

The difficulty score is the average of the average of skills per difficulty judge type.

The points per level can be calculated with the following formulas where $x$ is the level of the skill $L\left(x\right) = 1.5^{x}$ rounded to two decimal places.[1] However, a level 0 skill is always worth 0 points.

A "plus"-level (such as level 3+) is calculated as the level plus 0.5 (for example $L\left(3 + 0.5\right) = L\left(3.5\right)$), whereas a "minus"-level is calculated as the level minus 0.25 (for example $L\left(3 - 0.25\right) = L\left(2.75\right)$).

## Jumper Difficulty

The score for each Jumper Difficulty judge is calculated by first converting all plus- and minus-level marks into their numeric representation (for example, Level 3+ becomes level 3.5, level 2- becomes level 1.75, etc.). Break marks are counted as level 0 marks.

The amount of marks for each level (0, 0.75, 1, 1.5, 1.75, 2, 2.5, etc., called $n_x$, where $x$ is the level) is then multiplied by $L\left(x\right)$. The sum of all the points per level is then divided by the total number of marks to get the average difficulty level, called $d_{J,j}$ where $j$ is the judge number.

All the Jumper Difficulty judges' scores are then averaged together according to the averaging rules, the result is called $D_J$.

## Turner Difficulty

The score for each Turner Difficulty judge is calculated by first converting all plus- and minus-level marks into their numeric representation (for example, Level 3+ becomes level 3.5, level 2- becomes level 1.75, etc.), then all the level marks are ordered from highest to lowest level, and the highest 20 marks are taken into consideration for the next step. If there are less than 20 marks the list of marks are filled with Break (Level 0) marks until there are 20 level marks.

Each of these 20 marks are then converted into their point value using $L\left(x\right)$, their point value is summed together and divided by 20 to get the average difficulty level, called $d_{T,j}$ where $j$ is the judge number.

> ▼ ⓘ **EXAMPLE**
>
> Given these marks:
>
> 1. 1
> 2. 1
> 3. 2
> 4. 2+ = 2.5
> 5. 3
> 6. 2- = 1.75
> 7. 3
> 8. 3
> 9. 5
> 10. 5+ = 5.5
> 11. 5+ = 5.5

12. 4- = 3.75
13. 3
14. 3+ = 3.5
15. 4- = 3.75
16. 3
17. 3
18. 4- = 3.75
19. 3
20. 3
21. 4
22. 3
23. 4

They would be ordered and converted into points as follows, with the lower marks beyond the highest 20 removed

1. 5.5 = 9.3
2. 5.5 = 9.3
3. 5 = 7.6
4. 4 = 5.06
5. 4 = 5.06
6. 3.75 = 4.57
7. 3.75 = 4.57
8. 3.75 = 4.57
9. 3.5 = 4.13
10. 3 = 3.38
11. 3 = 3.38
12. 3 = 3.38
13. 3 = 3.38
14. 3 = 3.38
15. 3 = 3.38
16. 3 = 3.38
17. 3 = 3.38
18. 3 = 3.38
19. 2.5 = 2.76
20. 2 = 2.25

> Which would then be averaged into a score of 4.48

All the Turner Difficulty judges' scores are then averaged together according to the averaging rules, the result is called $D_T$.

### Total Difficulty

With the aim of making the jumper score have an impact of 35 % of the total score, and the turner score have an impact of 25 % of the total score, the jumper difficulty score $D_S$ is multiplied by a factor of $\frac{35}{25} = 1.4$ before the turner difficulty score and the jumper difficulty scores are summed together to get the difficulty result $D$:

$$D = (D_J * 1.4) + D_T$$

Because of the averaging, the total difficulty score is between 0 and $L\left(5.5\right) + \left(1.4 \times L\left(5.5\right)\right) = 22.32$

## Presentation

The presentation score is calculated in the same way as the Single Rope Presentation score, but with the factor the presentation score may impact the score being $F_p = 40\% = 0.40$, which means the scaling factor to get the final score is $\frac{2F_p}{24} = 0.03\overline{3}$

## Deductions

The deductions score is calculated similar to the Single Rope Deduction score with that no deduction is given for breaks.

## Result

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times M$$

### Footnotes

1. Note that compared to Single Rope the points per level **is not** multiplied by $0.1$. ↩

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating Wheel freestyle scores

Wheel freestyle scores are based on a cumulative difficulty model where presentation, required elements, and deductions can affect the score.

Difficulty ($D$) is calculated by adding the points from each skill performed. There is no limit on the total difficulty score.

Presentation ($P$) increases the score by a percentage of the difficulty score calculated from the presentation marks (+, and -).

Required elements ($Q$) will take off a percentage from the total score.

Deductions ($M$) take off a percentage for misses, breaks, and time and space violations.

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), the required elements score ($Q$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times Q \times M$$

The calculation for each of these scores is described in the following sections.

## Difficulty

The difficulty score is calculated similar to the Single Rope Difficulty score with the difference that instead of three judge types there are two judge types, $D_A$ and $D_B$.

## Presentation

The presentation score is calculated in the same way as the Single Rope Presentation score.

## Required Elements

The presentation score is calculated in the same way as the Single Rope Required Elements score with the difference that skills are credited as a whole completed required element regardless of skill level, and that the marks are collected from the Technical Judge, similar to how pairs interactions are calculated for Single Rope.

# Deductions

The deductions score is calculated similar to the Single Rope Deduction score.

# Result

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score plus 1 ($P$), the required elements score ($Q$), and the deduction score ($M$). The result cannot be lower than 0.

$$R = D \times (1 + P) \times Q \times M$$

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating Show Freestyle scores

Show Freestyle scores are based on a cumulative Difficulty model where Presentation, Required Elements, and Deductions can affect the score.

Difficulty is calculated by adding the points from each skill performed. There is no limit on the total difficulty score.

Presentation increases or decreases the score by a percentage calculated from the presentation marks (+, ✓, or -).

Deductions take off a percentage for misses, and time violations.

Each missed required element will also take off a percentage from the total score.

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score ($P$), the deduction score ($M$), and the required elements score ($Q$). The result cannot be lower than 0.

$$R = D \times P \times M \times Q$$

The calculation for each of these scores is described in the following sections.

## Difficulty

There is no maximum difficulty score. The difficulty score is the sum of the total points for each skill performed in a routine. Every time a skill is successfully performed, the value of that skill is added to the difficulty score.

The points per level can be calculated with the following formulas where $x$ is the level of the skill $L\left(x\right) = 0.1 \times 1.5^{x}$ rounded to two decimal places. However, a level 0 skill is always worth 0 points.

> ▼ ⓘ **EXAMPLE**
>
> The point values per level 0-8 skill are:

| Level | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Points per skill | 0.00 | 0.12 | 0.15 | 0.23 | 0.34 | 0.51 | 0.76 | 1.14 | 1.71 | 2.56 |

The score of every difficulty judge is calculated by multiplying the amount of skills recorded at that level by that judge (called $n_x$, where $x$ is the level) with $L\left(x\right)$ for each level, and adding the results (called $s_x$) for each level together, (the resulting sum is called $d_j$ , where $j$ is the judge number. This means judge 1 is called $d_1$, judge 2 is called $d_2$, etc.) For example:

$$
\begin{aligned}
s_1 &= L(1) \times n_1 \\
s_2 &= L(2) \times n_2 \\
d_1 &= \sum_{n=1}^{x} = s_1 + s_2 + ... + s_x
\end{aligned}
$$

All difficulty judges' scores are then averaged together according to the averaging rules, the result is called $D$

# Presentation

The presentation score may impact the difficulty score by a factor of $F_p = 50\% = 0.50$
Where the Form and Execution category may impact the score by a factor of $F_{p,F} = \frac{1}{4}F_p$,
the Style category may impact the score by a factor of $F_{p,S} = \frac{1}{4}F_p$,
the Entertainment category may impact the score by a factor of $F_{p,W} = \frac{1}{4}F_p$,
the Musicality category may impact the score by a factor of $F_{p,M} = \frac{1}{4}F_p$

The total presentation score may be outside $1 \pm F_p$

The scores of each category (Form and Execution, Style, Entertainment, Musicality) for each judge is calculated on a scale from −3 to 3 as $j_F$, $j_S$, $j_E$, $j_M$ by averaging the marks the judge has given in that category where "–" is worth -1, (the amount of negative marks given by a judge for a specific category is called $n_{\mathrm{x,minus}}$ where $x$ is $F$, $S$, $E$ or $M$, for the category) "✓" is worth 0 (despite this, the marks are important as they are part of the average and brings the score closer to the average; the amount of checkmarks given by a judge is called $n_{\mathrm{x,check}}$) and "+" is worth 1. (the amount of positive marks given by a judge is called $n_{\mathrm{x,plus}}$)

$$
j_x = \frac{-1 \times n_{\mathrm{x,minus}} + 0 \times n_{\mathrm{x,check}} + 1 \times n_{\mathrm{x,plus}}}{n_{\mathrm{x,minus}} + n_{\mathrm{x,check}} + n_{\mathrm{x,plus}}} = \frac{n_{\mathrm{x,plus}} - n_{\mathrm{x,minus}}}{n_{\mathrm{x,minus}} + n_{\mathrm{x,check}} + n_{\mathrm{x,plus}}}
$$

The averages of all judges' scores for each category is then averaged as $a_F$, $a_S$, $a_E$ and $a_M$ by averaging $j_x$ according to the averaging rules for all judges who judged that category.

To calculate the multiplication factor that will be used to calculate the final score, the averages $a_x$ are multiplied by their respective factor $F_{p,x}$ and added to 1, this is called $P$.

$$P = 1 + (a_F \times F_{p,F} + a_S \times F_{p,S} + a_E \times F_{p,E} + a_M \times F_{p,M})$$

# Required disciplines

Each missed required discipline may impact the score by a factor of $F_q = 5\% = 0.05$

The average number of missing required disciplines recorded by the required disciplines judges are calculated and called $a_q$ this average is rounded to a whole number, the factor $F_q$ is then multiplied by $a_q$, the result is called $q$. ($q = F_q \times \lfloor a_q \rceil$)

> **NOTE**
>
> A required discipline is either not performed or performed and a score of either performed (1) or not performed (0) can be obtained per required discipline.

The required elements ($q$) are subtracted from 1 to be converted into a factor, the result is called $Q$ ($Q = 1 - q$)

# Deductions

Each deduction (miss, time violation, space violation) may impact the score with a factor of $F_d = 2.5\% = 0.025$

The average number of misses recorded by the Required Disciplines judges are calculated according to the averaging rules. This average is called $a_m$ and is rounded to a whole number, the factor $F_d$ is then multiplied with $a_m$, the result is called $m$. ($m = F_d \times \lfloor a_m \rceil$)

The average number of time violations recorded by the required disciplines judges are calculated and called $a_v$ this average is also rounded to a whole number, the factor $F_d$ is then multiplied with $a_v$, the result is called $v$. ($v = F_d \times \lfloor a_v \rceil$)

The misses ($m$) and violations ($v$) are summed together and subtracted from 1, the result is called $M$ and cannot be lower than 0. ($M = 1 - (m + v)$)

# Result

The result/routine score (called $R$) is obtained by multiplying the difficulty score ($D$) with the presentation score ($P$), the deduction score ($M$), and the required elements score ($Q$). The result cannot be lower than 0.

$$R = D \times P \times M \times Q$$

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating DDC freestyle scores

Every judge's base score is calculated the same basic way regardless of the judge type.

## Base score

For each judge, their main score, a whole number no lower than 0 and no higher than 10, is collected as the base score called $S_j$ where $j$ is the judge number (1-10).

## Surprise bonus

Each judge determines if they want to give a surprise bonus point or not; the number of judges that chose to give a surprise bonus point becomes the surprise bonus score $B_s$.

## Mistakes and no mistake bonus

The median[1] number of mistakes counted by 7 of the judges randomly selected before the event (all judges still count mistakes). This number of mistakes is then converted into the mistake deduction ($M$) as follows:

| Number of mistakes | Deduction |
|---|---|
| 0 | 0 points |
| 1 | 1 points |
| 2 | 2 points |
| 3 | 4 points |
| 4 | 6 points |
| 5 | 9 points |

| Number of mistakes | Deduction |
|---|---|
| 6 | 12 points |
| 7 or more | 15 points |

If the median number of mistakes is 0, the no mistakes bonus score $B_m$ is 5, otherwise it'll be 0.

# Result

The result/routine score is the sum of all the judges' base scores $S$ plus the surprise bonus score $B_s$, plus the no mistakes bonus score $B_m$, minus the mistake deduction $M$.

The score will be an integer value between 0 and 115 points.

$$R = \left( \sum_{j=0}^{10} S_j \right) + B_s + B_m - M$$

## Footnotes

1. if the seven scores are ranked from lowest to highest, the median score is the fourth score in order. For example with the scores 1, 2, 3, 4, 5, 6 and 7 the median would be 4. ↩

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Calculating the ranking

## Speed events

The entry with the highest result ($R$) is ranked first (rank 1). The entry with the second highest result is ranked second, (rank 2) and so on.

In the case of a tie, where a number of entries ($m$) have the same result ($R$) which would result in the rank ($n$). All those entries are awarded the same rank ($n$). The next best result ($R$) is ranked with rank plus the number of entries in the tie ($n + m$). For example, if 3 entries ($m = 3$) have the same speed score and rank 4th, they all get ranked fourth (rank 4). The entry with the next score gets ranked seventh, (rank 7) since $n$ is 4 and $m$ is 3 their sum is 7 ($4 + 3 = 7$).

## Freestyle events

The entry with the highest result ($R$) is ranked first (rank 1). The entry with the second highest result is ranked second, (rank 2) and so on.

In case of a tie, where multiple entries have the same result ($R$), the entries will be further compared based on their deduction score ($M$). The entry with fewer deductions is ranked first.

If this does not resolve the tie, the entries with the same result, and deduction score will be further compared based on their Required Elements score ($Q$). The entry with fewer missed required elements are ranked first.

If this does not resolve the tie, the entries with the same result, deduction score, and required elements score will be further compared based on their presentation score ($P$). The entry with the higher presentation score is ranked first.

If this does not resolve the tie, the entries with the same result, deduction score, required elements score and presentation score will be further compared based on their difficulty score ($D$). The entry with the higher difficulty score is ranked first.

If this does not resolve the tie and there are $m$ entries with the same result, deduction-, required elements-, presentation-, and difficulty score, which would result in the same rank $n$, all those entries are awarded rank $n$. The next best result ($R$) is ranked with rank $n + m$.

# DDC performance events

The entry with the highest result ($R$) is ranked first (rank 1). The entry with the second highest result is ranked second, (rank 2) and so on.

In the case of a tie, where a number of entries ($m$) have the same result ($R$) which would result in the rank ($n$) it will be resolved differently based on the rank where the tie appears.

For entries ranking 4th or lower (5th, 6th, etc.), all those entries are awarded the same rank ($n$). The next best result ($R$) is ranked with rank plus the number of entries in the tie ($n + m$ ).

For entries ranking 1st to 3rd the entries in the tie will be compared as follows:

1. The entry with the higher surprise bonus score ($B_s$) will place higher.
2. If the above does not resolve the tie, the average base score $S$ for each for each judging category (Jumper, Turner, Expression, and Staging) is calculated (using a "plain average", not the IJRU averaging rule) so that 4 scores between 0 and 10, one for each category is obtained. Looking at the highest of these scores for all entries in the tie the one that has the best highest score in any category will rank highest.
3. If the above does not resolve the tie, the entry that has the highest score calculated in point 2 in the most categories will rank highest.
4. If the above does not resolve the tie, looking at the second highest of the scores calculated in point 2 for all entries in the tie the one that has the best second highest score in any category will rank highest.
5. If the above does not resolve the tie, the entry that has the second highest score calculated in point 2 in the most categories will rank highest.
6. If the above does not resolve the tie, the entry point 4 and point 5's second will be considered as third and fourth.
7. If the above does not resolve the tie, the judges will vote and the team with more votes will place higher
8. If the above does not resolve the tie, the team the head judge voted on will place higher
9. If the above does not resolve the tie, the judges will have a discussion and make a final decision

> ▼ ⓘ **EXAMPLE**
>
> If 4 entries have the same number of surprise, jumper, turner, expression, staging, and mistake deduction points, then the entry placement cannot be determined up through 6. If the vote results in 7. are 3, 3, 3, 1, then according to 8., only the highest placing entry would be determined.

> Example where two entries where the surprise bonus score is the same:
>
> **Entry A:**
> Jumper scores: 9, 9 => 18 points
> Turner scores: 9, 8 => 17 points
> Expression scores: 9, 9, 9 => 27 points
> Staging scores: 8, 8, 7 => 23 points
>
> Each component score is scaled to a score between 0 - 10:
>
> Jumper score: 9
> Turner score: 8.5
> Expression score: 9
> Staging score: 7.67
>
> The entry's highest score is 9, and the number of 9's received was 2.
>
> **Entry B:**
> Jumper scores: 9, 9 => 18 points
> Turner scores: 9, 8 => 17 points
> Expression scores: 9, 9, 8 => 26 points
> Staging scores: 9, 8, 7 => 24 points
>
> Each component score is scaled to a score between 0 - 10:
>
> Jumper score: 9
> Turner score: 8.5
> Expression score: 8.67
> Staging score: 8
>
> The entry's highest score is 9, and the number of 9's received was 1.
>
> The tie cannot be resolved through (2), but through point (3) entry A will place higher.

# Overall results

The winner of the overall competitions is determined by the sum of their ranks in each event. The winner will have the lowest rank sum. For example, if an athlete places rank 1, rank 2, rank 3 in their three events, the sum of their ranks is 6 ($1 + 2 + 3 = 6$). (the rank sum is called $T$)

When calculating the ranks for the component events of an overall, only entries competing in the overall should be taken into account.

In the Individual Overall Competition, the rank for the Single Rope Individual Freestyle get multiplied by 2 before adding it to the rank sum.

In case of a tie, the scores for each event are recalculated into a normalised score to preserve the differences between the scores while still making the events play an equal role in the result.

The highest score in an event gets a score of 100, the lowest score gets a score of 1.

To convert a result ($R$) into a normalised score, the highest score of the competitors in that event entered into the Overall is called $R_{max}$, the lowest score is called $R_{min}$, the normalised score is called $N$ and the following operation is performed for each entry:

$$N = \frac{(100 - 1)\,(R - R_{min})}{R_{max} - R_{min}} + 1$$

In the Individual Overall Competition $N$ for Single Rope Individual Freestyle is multiplied by 2 to give freestyle a simulated equal impact as speed.

The normalized scores for all the events are then summarized into a total normalized score, the tie breaker (called $B$) The athlete/team with the highest total normalized score is ranked first in the tie, the second best total normalized score is ranked second and so on.

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# The results

All published results must be accompanied with details identifying the event(s), and athlete(s) or team(s). Each athlete/team should have a unique id, name/team name, country/club, and, for team events, names of the athletes competing the event published with their results.

Scores that are used as multiplication factors should preferably be written as a percentage and not as a factor, it is advised to write for example $-10\%$ rather than $0.9$ and $+17\%$ rather than $1.17$.

## Unofficial results

Prior to results being verified and authorized, some results may be published as unofficial scores. These are unofficial scores and not finalized until results are officially published and announced. It is not required to publish unofficial results and all variables are optional.

For speed events, the result ($R$) and rank ($S$) may be published.

For freestyle events, the result ($R$), difficulty score ($D$), presentation score ($P$), required elements/disciplines score ($Q$) (when used), deduction score ($M$), and rank ($S$) may be published.

For overall, the result for each component event ($R$), normalised score for each event ($N$), total normalised score ($B$), rank for each component event ($S$), rank sum ($T$), and total rank ($S$) may be published.

## Official results

After all verifications have been made, the results can be published. These should include everything listed under unofficial results with the difference that only $N$ and $B$ are optional (they must be published if a tie had to be resolved in that Overall category)

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Specifications

Specific information regarding the timing, tones and call outs are detailed in Specifications.

*Last updated on **22 Oct 2024***

**Version: 4.1.0**

# Signals, sounds and call outs

## Timing

All time durations in this specification are measured relative to the start of the `start-BEEP`/`ddc-GO` in the beginning of the time track and is measured until the start of another sound.

## Tones

`start-BEEP`
Defined as a square wave at 578.3 Hz, this correlates do a $D_5$ in standard tuning (A = 440 Hz) playing for 0.350 seconds.

`switch-BEEP`
Defined as a square wave at 493.9 Hz, this correlates to a $B_4$ in standard tuning (A = 440 Hz) playing for 0.350 seconds.

`soft-BEEP`
Defined as a sine wave at 578.3 Hz for 0.350 seconds.

`ddc-GO`
Defined as the spoken word "Go!"

`ddc-BUZZ`
Defined as a buzzing sound

## Start

All speed time tracks except DDC should start as follows:

> `<Event Name> <Event Time> <1.000 seconds silence> Judges Ready? <0.500 seconds silence> Athletes Ready? <0.500 seconds silence> Set <0.500 seconds silence> <start-BEEP>`

Where `<Event Time>` is defined as `[<N> by] <Time>` seconds" where `[<N> times]` is only required if the event is performed in a relay fashion. (For example: "four by thirty seconds" or "one hundred eighty seconds") All time definitions in the event presentation come in seconds.

The `<Event Name>` is stated as defined in the competition manual.

DDC speed time tracks start as follows:

> `Double Dutch Contest. Speed. Judges ready? Jumpers ready? On your mark. Get set. <ddc-GO>`

For freestyle events, after the athlete has been introduced, their music will begin after a short pause.

# Switch

When the defined amount of time has elapsed since the beginning of the previous `start-BEEP`/`switch-BEEP` and another athlete's part of a relay fashion event should commence a `switch-BEEP` should sound.

# Stop

When the defined amount of time has elapsed since the beginning of the previous `start-BEEP`/`switch-BEEP` and the event should stop a `start-BEEP` should sound.

For DDC the `ddc-BUZZ` should sound instead.

# Time call outs

For speed and multiple events where each section of the event is shorter than or equal to 60 seconds in duration there should be time call outs every 10 seconds in the form of `<Seconds>` where `<Seconds>` is the number of seconds elapsed since the previous `start-BEEP`/`switch-BEEP`.

For DDC speed events the time call outs are made as a count-down rather than a count up. The time call outs should be in the form `<Seconds Left>` where `<Seconds Left>` is the number of seconds left until the next `ddc-BUZZ`. Time call outs should be made 10, 5, 4, 3, 2, and 1 second before the `ddc-BUZZ`.

For speed and multiple events where each section of the event is longer than 60 seconds in duration there should be time call outs every 60 seconds in the form of `<Minutes> minute(s)` where `<Minutes>` is defined as the number of minutes elapsed since the last `start-BEEP`/`switch-BEEP`. In addition to this there should be call-outs every 15 seconds in the form of `<Seconds>` where `<Seconds>` is the number of seconds elapsed since the previous `start-BEEP`/`switch-BEEP` or minute call-out.

*Last updated on **22 Oct 2024***