Ladder Rules

20th Board

E.S.H. Da Vinci

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Introduction

The **Ladder** Competition (**Ladder**) for which this document presents the rules is a long standing tradition at E.S.H. Da Vinci. Often **Score**s are shot in small groups, offering opportunities for socializing and for
5 new members to get to know people who have been shooting for a long time. The intent of the **Ladder** is to provide a competitive element to normal trainings. Everyone can compete with other archers at their own level, within their rung, as well as reference their own level by the level of the best archers in the association. The **Ladder** is a cross-discipline and cross-generational way for archers to compete with one another.

10 The rules of the **Ladder** are designed to accomodate this. The rules as presented in this document were first implemented by the 16th board of E.S.H. Da Vinci. Many implementation details were worked out by Jan Ebbers, Chairman of the 15th Board, and Jesse Pasterkamp, Secretary of the 18th Board and member of the CommunicaCie. These details were worked out so the rules could be implemented in
15 the **Ladder App**, an application intended to make it easier to maintain the Ladder. The source code of this **Ladder App**, which is implemented in Python and Flask for the tech-savvy readers, is available upon request from the CommunicaCie. The rules should change on a semi-regular basis, reflecting the current wants and needs of the association. The latest update of this document has been done by the 20th Board.

20 For anyone who just wants to see the results of the Ladder, just go to the appropriate page on the association's website to see an up-to-date standing. Results are processed as quickly as possible to encourage competition even within rounds.

25 The most important goal of the **Ladder** is to provide a fun way to get into competition shooting, so don't forget to enjoy the shooting!

- The Boards of E.S.H. Da Vinci

Ladder Rules
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Contents

1   Practical Regulations

This section explains practical regulations for participation in the **Ladder**, such as what **Score**s are accepted for entry. These are important for everyone who wishes to participate.

1.1   Participation

1. Participation to the **Ladder** is open for every Member at E.S.H. Da Vinci who has been either 1) determined to be qualified to shoot by the Board or 2) has finished the Beginners' Course.

2. The following disciplines are recognized in the **Ladder**: Recurve, Barebow, Traditional and Compound. Any archer shooting outside of the usual qualifiers for such disciplines should ask the **Competition Manager** on how to submit entries.

3. **Score**s of all disciplines are entered for the same **Ladder**. Participants are allowed to shoot different **Score**s with different disciplines.

4. Participation is automatic at the hand-in of an accepted **Score** to the **Competition Manager**. This is done both through a new digital entry system, which is being tested in the 2023-2024 edition of the **Ladder**, and on paper. The paper score always takes precedence.

1.2   Competition

1. The **Ladder** consists of multiple rounds. Each **Round** is governed by a **Ruleset**, which are described in detail Section 2.

2. Each **Round** spans at least two calendar weeks where **Score**s can be shot during training or at least 16 hours of **Shooting Time**, whichever results in a shorter **Round**.

3. Every **Round** is announced by the **Competition Manager** at least one week in advance of the start of the **Round**, unless special permission is given by a Board member to make an exception to this rule.

4. For each **Round** every participating archer must hand in a score. Not handing in a **Score** for a **Round** has consequences described by the **Round**'s **Ruleset**.

5. Only a single **Score** can be entered for the **Ladder** per continuous **Shooting Time** period, except when the **Ruleset** specifies otherwise. In the case a **Score** is declared invalid, entering a second **Score** is not allowed for that period. In the case a **Score** is declared void, the **Score** is retroactively considered to never have been recorded.

6. A **Score** may only be recorded for the **Ladder** in the presence of a **Verifier**, who themselves are allowed to participate in the **Ladder** and are neither the archer nor the opponent.

7. The **Verifier** checks the **Score** shot by the archer according to the rules applicable at archery competitions.

8. The intent of the archer, and optionally their opponent, to shoot a **Score** to be entered into the **Ladder** must be announced to the **Verifier** before they shoot any arrows recorded in that **Score**. After the declaration of intent all subsequently shot arrows up until the number set forth in the **Ruleset** of the **Round** during which the **Score** is shot must be recorded in the **Score**.

9. If any participating party takes a **Break** during the shooting of the **Score**, the score is declared invalid. In the case of a **Score** with an opponent, the **Ruleset** defines the consequences.

10. If any participating party is forced to stop shooting a **Score** due to material failure or a different factor outside of their control, the **Competition Manager** decides whether the **Score** is declared or invalid or whether it is declared void.

11. **Ruleset**s may define special consequences for invalid **Score**s.

1.3   Scores

Scores are accepted for entry in the **Ladder** if and only if they comply with the following regulations.

1. **Score**s must be written on a special scoring card, which are made available by the Board. The original scoring card must be handed in to the **Competition Manager** or, if they are not available during **Shooting Time**, to a Board Member. A picture of a **Score** written on a special scoring card, such as for an **External Competition**, may be accepted by the **Competition Manager** in place of a physical copy of the **Score**.

2. A second version of the **Score** has to be entered in the **C.ompetitions** app. These **Score**s have to be verified by the **Verifier** in the system before they are admissible.

   (a) For the trial period of the digital scoring system, **Score**s must be handed in both on paper, and in the digital system. In the case of a discrepancy between the two scoring systems, the paper **Score** will take precedence.

3. The format in which a **Score** must be recorded is set forth in the **Ruleset** of the **Round**.

4. Unless special permission for the whole duration of a **Round** is given by the **Competition Manager**, **Score**s may only be entered if they are shot in an indoor setting, at a shooting distance of 18m and on a target face with a size of 40cm. With permission, **Score**s may also be entered if they are shot in an outdoor setting.

   (a) **Score**s shot within the Compound discipline must be shot on a three spot target (Dutch Target Face or Vegas Face) in cases for which a 40cm Target Face is required.

5. For **Score**s shot in an outdoor setting, the following target face sizes are acceptable:

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Distance [m]	Target Face Size [cm]
18	40
30	80
50	80
70	122
90	122

6. All **Score**s entered must at least list the following information:

   (a) **Identifiable name**

   (b) Depending on the **Ruleset**: **Identifiable Name** of the opponent

   (c) Date

   (d) Discipline (One of: Recurve, Barebow, Traditional, Compound)

   (e) Signature of the archer

   (f) Signature of a **Verifier**

   (g) A value indicating the impact of each shot arrow on the result of the **Score**

7. The date of the shot **Score** must fall inside of the time span of the **Round**.

8. If a **Score** is shot in an outdoor setting, the following additional information must be listed on the **Score** paper:

   (a) Distance to the target

   (b) Target face size

9. Additional rules apply to the acceptance of **Score**s shot for an **External Competition** into the **Ladder** as described in Section 1.4.

10. Additional rules for the scores may be specified by the **Ruleset**.

11. In the case of incomplete or incorrect information on an entered score, the information may only be added to the **Score** in the presence of the **Competition Manager** or a Board Member, if they deem it acceptable to do so.

12. The **Competition Manager** is allowed to reject scores, even when previously accepted by Board Members, if they do not comply with the Regulations set forth in this Section.

13. **Score**s must be handed in before the end of the **Round** during which they are shot. In case **Score**s are handed in to a Board Member and they cannot deliver the **Score**s to the **Competition Manager** before the end of the **Round**, the **Competition Manager** must accept these **Score**s up until the end of the succeeding **Round**.

1.4 External Competition Scores

Scores shot and accepted for entry in an **External Competition** are accepted for the **Ladder** subject to the following regulations:

1. The setting of the **External Competition** must comply with the regulations set out in 1.3.

2. **Score**s shot at **External Competition**s are exempt from the requirement stated in 1.2.6 and 1.2.8.

3. **Ruleset**s may add additional requirements for **Score**s shot at **External Competition**s or exclude them entirely.

4. In such a case that for an **External Competition** a **Score** consists of a number of arrows larger than the number of arrows specified by the **Ruleset**, the highest scoring contiguous selection of arrows from the **Score** will be accepted, subject to number of arrows required being a divisor of the starting index of the contiguous selection. In practical terms, this means that for a 60-arrow score of an external competition, the highest scoring of either the first or the last 30 arrows are transferred to a score for the Ladder.

5. For an **External Competition** the digital score must be handed in with the presence of a board member or **Competition Manager**. A **Verifier** is still needed to hand in the score, the present board member or **Competition Manager** may be the **Verifier**. The same rules for being a **Verifier** apply, except for having the **Verifier** being present at the scoring round. However, it is appreciated if there is a valid **Verifier** present at the **External Competition** who can verify the **Score**.

1.5 General

1. The Regulations in this document may be amended by the **Competition Manager** after discussion with the Board and public announcement in the **Info App** and to go into effect at the start of the next **Round**.

2. Upon request from any participant, the **Competition Manager** will supply the participant with all data required to verify whether the **Ladder** results have been determined correctly.

3. In such an event that **Competition Manager** is no longer able to carry out the tasks set forth in these regulations, a new **Competition Manager** is to be appointed by the Board before the start of the next **Round** or two weeks after the Board is given notice, whichever is a longer period of time.

2 Rulesets

2.1 Normal Round

2.1.1 Score Requirements

1. **Score**s must be shot by individual archers in the format of 10 **End**s of 3 arrows each, for a total of 30 arrows.

2. Each arrow has points assigned on a 0-10 scale, with a miss being marked as 'M' and an X being marked as 'X'.

   (a) **Score**s shot within the Compound discipline must be denoted differently then normal Compound scores. Whereas both the 'X' and 10-rings count as a 10 for other disciplines, for the Compound discipline only the 'X'-ring counts as a 10. In order to differentiate between a '9' and '10', **Score**s shot within the Compound discipline should denote arrows within the 'X'-ring as X and arrows shot within the 10-ring as 10. This is the same notation as a Recurve archer would use.

   (b) The **Competition Manager** may exempt a **Score** from these rules if the notation of the **Score** is wrong in a consistent manner and a replacement **Score** can be formulated while in the presence of the **Competition Manager**, such that the replacement **Score** accurately reflects the **Score** shot by the archer.

2.1.2 Ladder Calculation Steps

1. Find the highest **Score** for each participant entered within the time frame of the round and discard all others.

2. If this is the first round:

   (a) Place all participants in the Ladder, from the highest-scoring first to the lowest-scoring last.

   (b) Apply tie breaks by considering shoot-off scores.

3. If this is not the first round:

   (a) Apply demotion rules. For each participant, starting from the bottom of the Ladder, that did not enter a valid **Score** for this round:

      i. If this is the first consecutive round for which they did not enter a valid score, drop the participant to the bottom of the rung below the one they are currently in.

      ii. If this is the second consecutive round for which they did not enter a valid score, drop the participant to the bottom of the Ladder.

      iii. If this is the third consecutive round for which they did not enter a valid score, remove the participant from the Ladder.

(b) Insert participants for which there is no entry in the **Ladder** yet at the bottom of the Ladder, the highest-scoring first and the lowest-scoring last.

(c) Sort each rung by the **Score**s of the respective participants within the rungs. The highest-scoring participant comes in at the first place in the rung, the second-highest second and so on.

(d) Apply tie breaks by considering shoot-off scores.

(e) Promote, starting from the bottom of the Ladder, participants that are in the first place of their respective rung that have a higher **Score** than the lowest-scoring participant in the rung above them:

    i. The promotion is done by swapping the promoting participant with the participant in the last place of the rung above.

    ii. If the participant that was demoted did not enter a **Score** for the round, the demoted participant is placed at the bottom of their new rung.

2.2 Setsystem Round

For the **Ladder** year 2023-2024 the setsystem and chaos rounds have not been included. We are currently looking into changing these rounds to better align with our values and ideas of how the **Ladder** should function. The rules have been kept here to compare any future changes to.

The setsystem round is intended to add a direct competitive element by allowing Archers to shoot direct setsystem matches against one another. For the first one-third of the timespan of the round, only matches between participants within the same rung are considered. For the second part, any match is considered, as long as the difference between the two participants is no more than three spaces. If the lower-placed participant wins the match, the two participants swap positions. At the end of the round, all archers who have not shot a **Score** are demoted following the same procedure as for the Normal Round **Ruleset**, as described in **??**.3a.

2.3 Chaos Round

For the **Ladder** year 2023-2024 the setsystem and chaos rounds have not been included. We are currently looking into changing these rounds to better align with our values and ideas of how the **Ladder** should function. The rules have been kept here to compare any future changes to.

The chaos round is instated to promote the shooting of setsystem matches while also allowing archers to shoot normal scores of 30 arrows to maintain the level of participation. It is defined as a combination of the Sixteenth' Board Normal Ruleset and the Sixteenth' Board Setsystem Ruleset with some Eighteenth Board tweaks thrown in for a true chaos effect.

2.3.1 Wordy Description

Archers are allowed to shoot one score of 30 arrows per evening, as usual. The highest score counts at the end of the Round. The normal rules are applied *at the end of the round*.

In addition to this, during the Round, archers are allowed to challenge archers that are up to one rung above them. If the challenger wins, the archers are switched. If the challenger loses, the challengee has a cumulative one percent-point multiplier applied to their score, *after* any discipline multipliers have already been applied.

Setsystem scores are, as in the Setsystem Round, applied in order and during the course of the Round itself. The Normal Ruleset is only applied after the Round is over and all scores, setsystem and normal, are in.

2.4 Score Corrections

The total number of points accumulated by a **Score** is corrected based upon the discipline within which the **Score** was shot. Details of how the scores are corrected are given in Section 3. For this **Ruleset**, the following Discipline-Scorer map applies:

Discipline	Scorer
Recurve	Default
Barebow	Corrected Barebow Scorer
Traditional	Corrected Barebow Scorer
Compound	Corrected Compound Scorer

3 Scorers

3.1 Default Scorer

The default scorer performs normal accumulation of the points scored by each arrow. X's and misses are recorded separately.

3.2 Corrected Barebow & Traditional Scorers

Barebow and Traditional discipline archers tend to score lower than their Recurve-shooting counterparts. Hence the **Score**s shot within these two disciplines are boosted by this scorer. This is done according to the formula:

$$P_{\text{assigned}} = \max\left\{\min\left\{\max\left[\min\left[1 + F\left(1 - \frac{P_{\text{accumulated}} - P_{\text{low}}}{P_{\text{high}} - P_{\text{low}}}\right), 1 + F\right], 1\right] \cdot P_{\text{accumulated}}, P_{\text{maximum}} - 1\right\}, P_{\text{accumulated}}\right\}$$

Table 1: Parameters for Corrected Barebow & Traditional Scorers

Parameter	Barebow	Traditional
F	0.15	0.20
P_{low}	150	200
P_{high}	340	300
P_{maximum}	300	300

Where P_{assigned} is the number of points assigned for the **Score**, $P_{\text{accumulated}}$ is the number of points calculated by the Default Scorer, with F being the correction factor. P_{high} and P_{low} are parameters chosen to obtain the desired correction curve.

P_{low} is effectively the boundary at which the multiplier starts to linearly reduce, and P_{high} is effectively the number of points that would have to be accumulated in order to make the multiplier be reduced to unity.

The parameters of the Corrected Barebow & Traditional Scorers according to the **Ruleset** update by the 20'th Board are given in Table 1. An overview of the score mapping is given in Table ??

3.3   Corrected Compound Scorer

This applies only to scores shot within the Compound discipline on three spot targets. The following point map applies:

Ring on Target (Notation)	Points Scored Ladder	Ladder Notation
X	10	X
10	9	10
9	8.5	9
8	8	8
7	7	7
6	6	6

1. Any number of points below 6 is a miss, as three spot targets do not have rings for 5 or below.

2. For the changed multiplier rules there are currently two versions working side by side. These versions will be evaluated until a decision can be made on which multiplier we will use for the rest of the **Ladder**.

   (a) The first version uses the points scored following the point map above.

   (b) The second version applies a negative multiplier similar to the Barebow multiplier. This is done by using the formula:

$$P_{\text{assigned}} = P_{\text{accumulated}} \cdot (1 - min[0.05 - 0.000833 \cdot max[(P_{\text{accumulated}} - \frac{4}{5} \cdot (N_{\text{arrows shot}} \cdot 10)), 0], 0.05])$$

3. By using Recurve notation for Compound scores and adjusting them later, Compound archers will see higher scores then they would normally shoot with proper Compound notation.

4 Definitions

Break

An **End** where an archer does not participate in.

Competition Manager

The person assigned by the Board to execute the **Ladder** and maintain the documentation.

C.ompetitions

The online scoring system for the ladder made by the CommunicaCie. This system is currently in the trial phase. If you encounter issues with the app, please contact the CommunicaCie.

End A single round of shooting. For indoor this normally consists of a round where three arrows are shot.

External Competition

Any competition that is not the **Ladder**.

Identifiable Name

A name with which an archer can be uniquely identified within the E.S.H. Da Vinci association by the **Competition Manager**. Specifically, at least the first name is recorded, as well as the initials of the last name in case multiple members within the assocation carry the same first name as the archer in question.

Info App

The WhatsApp group created by the Board for announcements.

Ladder

Ladder is short-hand for Ladder Competition, the name for the internal competition for which the rules are described in this document.

Ladder App

The application developed by the CommunicaCie to make the administration of the **Ladder** easier.

Round

A Round is a period in the execution of the **Ladder** for which **Score**s can be entered and a single **Ruleset** is applied.

Ruleset

Rulesets govern how archers are moved up and down within the ranking of the **Ladder** based on their submitted scores.

Score

Either a physical or a digital representation of the number of points accumulated by a set number of arrows.

305

Shooting Time

Time during which archers are allowed to shoot at the E.S.H. Da Vinci accomodation. This includes Free Training and Training with Trainer.

Verifier

310 A member that is allowed to compete in the **Ladder** and is not the archer or (optionally) the opponent shooting the **Score**.

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Table 2: Mapping from base to corrected scores

Base	BB	Trad.	Base	BB	Trad.	Base	BB	Trad.	Base	BB	Trad.	Base	BB	Trad.	Base	BB	Trad.
0	0	0	50	57	60	100	115	120	150	172	180	200	222	240	250	268	275
1	1	1	51	59	61	101	116	121	151	174	181	201	223	241	251	269	276
2	2	2	52	60	62	102	117	122	152	175	182	202	224	242	252	270	276
3	3	4	53	61	64	103	118	124	153	176	184	203	225	242	253	270	277
4	5	5	54	62	65	104	120	125	154	177	185	204	226	243	254	271	277
5	6	6	55	63	66	105	121	126	155	178	186	205	227	244	255	272	278
6	7	7	56	64	67	106	122	127	156	179	187	206	228	245	256	273	279
7	8	8	57	66	68	107	123	128	157	180	188	207	229	246	257	274	279
8	9	10	58	67	70	108	124	130	158	181	190	208	230	246	258	275	280
9	10	11	59	68	71	109	125	131	159	182	191	209	231	247	259	276	280
10	12	12	60	69	72	110	126	132	160	183	192	210	232	248	260	276	281
11	13	13	61	70	73	111	128	133	161	184	193	211	232	249	261	277	281
12	14	14	62	71	74	112	129	134	162	185	194	212	233	249	262	278	282
13	15	16	63	72	76	113	130	136	163	186	196	213	234	250	263	279	282
14	16	17	64	74	77	114	131	137	164	187	197	214	235	251	264	280	283
15	17	18	65	75	78	115	132	138	165	188	198	215	236	252	265	281	284
16	18	19	66	76	79	116	133	139	166	189	199	216	237	252	266	282	284
17	20	20	67	77	80	117	135	140	167	190	200	217	238	253	267	282	285
18	21	22	68	78	82	118	136	142	168	191	202	218	239	254	268	283	285
19	22	23	69	79	83	119	137	143	169	192	203	219	240	254	269	284	286
2O	23	24	70	80	84	12O	138	144	170	193	204	220	241	255	270	285	286
21	24	25	71	82	85	121	139	145	171	194	205	221	242	256	271	286	287
22	25	26	72	83	86	122	140	146	172	195	206	222	243	257	272	287	287
23	26	28	73	84	88	123	141	148	173	196	208	223	244	257	273	287	288
24	28	29	74	85	89	124	143	149	174	197	209	224	245	258	274	288	288
25	29	30	75	86	90	125	144	150	175	198	210	225	245	259	275	289	289
26	30	31	76	87	91	126	145	151	176	199	211	226	246	259	276	290	289
27	31	32	77	89	92	127	146	152	177	200	212	227	247	260	277	291	290
28	32	34	78	90	94	128	147	154	178	201	214	228	248	261	278	292	290
29	33	35	79	91	95	129	148	155	179	202	215	229	249	262	279	292	291
30	34	36	80	92	96	130	150	156	180	203	216	230	250	262	280	293	291
31	36	37	81	93	97	131	151	157	181	204	217	231	251	263	281	294	292
32	37	38	82	94	98	132	152	158	182	205	218	232	252	264	282	295	292
33	38	4O	83	95	100	133	153	160	183	206	220	233	253	264	283	296	293
34	39	41	84	97	101	134	154	161	184	207	221	234	254	265	284	297	293
35	40	42	85	98	102	135	155	162	185	208	222	235	254	266	285	297	294
36	41	43	86	99	103	136	156	163	186	209	223	236	255	266	286	298	294
37	43	44	87	100	104	137	158	164	187	210	224	237	256	267	287	299	294
38	44	46	88	101	106	138	159	166	188	211	226	238	257	268	288	299	295
39	45	47	89	102	107	139	160	167	189	212	227	239	258	268	289	299	295
4O	46	48	90	103	108	14O	161	168	190	212	228	240	259	269	290	299	296
41	47	109	91	105	109	141	162	169	191	213	229	241	260	269	291	299	296
42	48	50	92	106	110	142	163	170	192	214	230	242	261	270	292	299	297
43	49	52	93	107	112	143	164	172	193	215	232	243	262	271	293	299	297
44	51	53	94	108	113	144	166	173	194	216	233	244	262	271	294	299	298
45	52	54	95	109	114	145	167	174	195	217	234	245	263	272	295	299	298
46	53	55	96	110	115	146	168	175	196	218	235	246	264	273	296	299	298
47	54	56	97	112	116	147	169	176	197	219	236	247	265	273	297	299	299
48	55	58	98	113	118	148	170	178	198	220	238	248	266	274	298	299	299
49	56	59	99	114	119	149	171	179	199	221	239	249	267	274	299	299	299
50	57	60	100	115	12O	150	172	180	2OO	222	240	250	268	275	3OO	3OO	300