



WCF Ranking Regulations

Version 1.4
Effective Date
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1. Introduction

1.1 Definitions

- 1.1.1 AC Association Croquet
- 1.1.2 ACGS AC Grading System
- 1.1.3 ARO Assistant Ranking Officer
- 1.1.4 CGB Croquet Governing Body, which includes WCF Members and Recognised Croquet Organisations
- 1.1.5 GC Golf Croquet
- 1.1.6 GCGS GC Grading System
- 1.1.7 MC WCF Management Committee
- 1.1.8 NRO National Ranking Officer
- 1.1.9 RO Ranking Officer
- 1.1.10 ROC WCF Rankings Operation Committee

1.2 These Regulations govern the operation of the ACGS and GCGS which are used to generate ranking lists of individual players and teams in relation to AC and GC respectively.

1.3 The ranking lists are published on the internet and may be found at <https://worldcroquet.org/wcf-world-rankings/>.

See Appendices 1 and 2 for screenshots of the front-ends.

1.4 Implementation of these Regulations is the responsibility of the ROC which is appointed by the MC (see paragraph 2).

1.5 The ACGS and GCGS are each to be operated on a day-to-day basis in accordance with these Regulations by a RO and, when appropriate, by one or more AROs appointed by the MC on the recommendation of the ROC (see paragraph 3).

1.6 The principal operating provisions of these Regulations are:

- 1.6.1 the eligibility criteria that determine which competitive game results may be included in the ACGS or GCGS (see paragraph 4);
- 1.6.2 the publication criteria for individual and team ranking lists (see paragraph 5);
- 1.6.3 the allocation of start grades to previously ungraded players (see paragraph 6); and
- 1.6.4 the Calculation Algorithms which convert wins and losses into grade changes (see Appendices 4 (ACGS) and 5 (GCGS)).



2. WCF Rankings Operations Committee

- 2.1. The ROC shall consist of five members all of whom shall have a vote.
 - 2.1.1 Three members shall be appointed by the MC for a term of four years of which one shall be a member of the MC. These members are eligible to serve two terms.
 - 2.1.2 The other two members are the AC and GC ROs who shall be *ex officio* members.
- 2.2 The ROC will appoint its chairman from among its members and is expected to conduct its business principally by email and conference calls.
- 2.3 The main tasks of ROC shall be to:
 - 2.3.1 ensure that both grading systems are operated in accordance with these Regulations;
 - 2.3.2 ensure that the grading systems are updated in a timely manner;
 - 2.3.3 ensure safety of historical data and the continuity of grading system operations;
 - 2.3.4 facilitate further development of the grading systems to increase their functionality.
- 2.4. Reporting
 - 2.4.1 The ROC shall prepare an annual report to the MC about the operation of the ACGS and/or GCGS and any proposed changes to them or to these Regulations.
 - 2.4.2 The ROC shall undertake a formal review of each of the ACGS and GCGS every four years to ensure that they are operating as intended. The first such reviews will take place in 2023 (for the ACGS) and 2025 (for the GCGS).

3. Ranking Officers

- 3.1 A RO and, when appropriate, AROs shall be appointed for each grading system by the MC on the recommendation of the ROC. The names of the ROs and any AROs shall be published on the WCF website.
- 3.2 A CGB that wishes to submit results of games to be used in the grading systems may appoint a NRO and provide the ROC with their name and email address. A NRO shall ensure that the results of games from their domain are provided in accordance with to the eligibility criteria set out in paragraph 4.
- 3.3 The main tasks of the ROs shall be to:
 - 3.3.1 ensure the ongoing functioning of the respective grading systems;
 - 3.3.2 participate in ROC endeavours to improve the functionality of the grading systems;
 - 3.3.3 actively liaise with AROs and NROs to ensure the quality of input data, observance of the eligibility criteria and the updating of the database within 14 days of the receipt of Eligible Results.
 - 3.3.4 Recommend to the ROC any manual start grade adjustment required for an AC Returner or AC Fast Improver and, if approved, then implement the adjustment accordingly.



4. Eligibility criteria

4.1 Competitive nature

4.1.1 The results of all level-play singles games are Eligible Results and thereby eligible for inclusion in the relevant grading system provided that they are played in an Eligible Event and are not disqualified under paragraphs 4.2 or 4.3. A game whose result is an Eligible Result is known as a Ranked Game.

4.1.2 An event is an Eligible Event if:

- (a) it is a WCF Event or it is recognised by the CGB of the domain in which it is held or by another CGB providing that the CGB of the domain in which it is held has been informed at least 28 days before the event; and
- (b) it appears in a tournament calendar published by the recognising CGB or by any regional body recognised by the CGB (e.g. an Association, Federation or State) and is not indicated to be an “unranked event”; and
- (c) it is not disqualified under paragraphs 4.4 or 4.5.

4.1.3 Other events will be treated as Eligible Events only if so certified to the relevant RO in writing or email by an appropriate officer of the relevant CGB and endorsed by the RO prior to the start of the event.

4.2 Minimum length of game

4.2.1 The result of a game is not an Eligible Result if it is subject to a time limit of less than 120 minutes in AC, or 40 minutes in GC, unless it is part of a “best of x” match.

4.2.2 The result of a game is not an Eligible Result if:

- (a) in AC, the winner could win the game by scoring less than 26 points if it was not subject to a time limit; or
- (b) in GC, the game is a contest for less than the best of 13 points.

4.3 Court size

4.3.1 Subject to paragraph 4.3.2, the result of a game is not an Eligible Result unless it is played on a court which:

- (a) in AC, is a full-size court subject only to the tolerances set in the current AC Laws or is accepted as such by the organising body; or
- (b) in GC, has a length unit of at least 6 yards.

4.3.2 Paragraph 4.3.1 does not apply to games in events where the average grade of the competing players is less than 1600.

4.4 High proportion of ungraded players

An event is not an Eligible Event if more than 75% of the players do not have a relevant grade unless the relevant RO:

- (a) has received the handicaps (if any) or suggested start grades for all players without a relevant grade in accordance with paragraph 6; and
- (b) exercises their discretion to deem the event to be an Eligible Event.

4.5 Open nature of event

An event is not an Eligible Event if more than 75% of the places are reserved for members of one club.



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4.6 Communication standard

- 4.6.1 In order to ensure the prompt inclusion of Eligible Results in the relevant grading system, such results should be communicated to the relevant RO or ARO within 14 days from the end of the event. Eligible Results submitted after that time may be excluded at the discretion of the RO.
- 4.6.2 Communication of Eligible Results to the relevant RO or ARO shall be sent either by:
 - (a) any relevant NRO; or
 - (b) the event manager or other authorised reporter with a copy to any relevant NRO.
- 4.6.3 The results shall be communicated in accordance with the technical standard set by the relevant RO (see Appendix 6 for the ACGS and Appendix 7 for the GCGS).
- 4.6.4 The communication of results to the relevant RO and the meeting of the technical standard will be deemed to be met by posting the results using surnames and forenames (but not initials) on the CroquetScores website (croquetscores.com).
- 4.6.5 An NRO or CGB may withdraw results sent by a reporter of their country within 30 days if eligibility issues are discovered.
- 4.7 The RO is entitled to require evidence from the relevant NRO or CGB to support the eligibility of an event or its results if doubts arise about whether it is an Eligible Event or has produced Eligible Results.

5. Publication criteria

5.1 Eligible Player

5.1.1 Only players defined as Eligible Players in paragraph 5.1.2 appear in the official ranking lists described in paragraphs 5.2 and 5.4. Other players can appear in unofficial customised ranking lists referred to in paragraph 5.3.

5.1.2 An Eligible Player is a player who has played at least 5 Ranked Games (AC) or 10 Ranked Games (GC) in the 12 months ending on the publication date of the relevant official ranking list.

5.2 Official Individual ranking lists

5.2.1 Dynamic Grade ranking list

The Dynamic Grade (DG) ranking list is the official individual ranking list for AC and GC. It is based on the latest DG calculated for each Eligible Player in the relevant code.

5.3 Unofficial individual ranking lists

Customised unofficial individual ranking lists for AC or GC can be generated at any time based on user-specific criteria according to the functionality of the relevant grading system as displayed on the webpage of that system (see 'The Ranking Systems Explained' document for more information about grade types).



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5.3 Country ranking lists

- 5.3.1 Country ranking lists are published for both AC and GC using DGs calculated using Eligible Results for the period ending on the last day of each calendar quarter (31 March, 30 June, 30 September and 31 December (a “Calculation Date”).
- 5.3.2 Countries are ranked in descending order of the average grade of the top six Eligible Players of each country;
- 5.3.3 Countries that have less than six Eligible Players are listed in descending order of the number of their Eligible Players;
- 5.3.4 If two or more countries have the same number of Eligible Players, those countries are ranked in descending order of the average grade of those players.
- 5.3.5 Country ranking lists will be published as soon as the relevant RO believes that they have received all relevant Eligible Results and, in any case, no later than the end of the month following the relevant Calculation Date.

6. Allocation of start grades for previously ungraded players

- 6.1 A start grade may be allocated to an ungraded AC or GC player by the relevant RO or ARO using any of the methods set out in 6.2 to 6.4 below.
 - 6.1.1 AC: Such a grade is provisional until the player has played 30 ranked games and may be adjusted by the AC RO at any time beforehand.
 - 6.1.2 GC: Such a grade is subject to Automatic Start Grade Adjustment (“ASGA”) by the GC grading program after a player has played their 20th ranked game.
- 6.2 Handicap: a start grade may be allocated to an ungraded player who has an official handicap using the table set out in Appendix 3.
- 6.3 Judgement: a start grade may be allocated to an ungraded player based on the judgement of the RO or NRO or of a trusted third party who has observed the play of the unranked player in an Eligible Event. For this purpose, a trusted third party is a player of the relevant code who, in the opinion of the RO, is sufficiently experienced to be able to offer reliable advice.
- 6.4 Performance Grade: a start grade based on an Adjusted Performance Grade calculation (see Appendix 5, paragraph 1.8) may be allocated to an ungraded player who has played at least 10 games in total in one or more Eligible Events.
- 6.5 The ACRO may alternatively decide to withhold results involving an ungraded player until the ungraded player has played at least 10 games in total in one or more Eligible Events. Then a start grade may be allocated to the player in accordance with 6.1 above and all the results involving that player will then be added to the AC rankings database.



7. Allocation of Gender Identity¹ in the Ranking Databases

7.1 Against the name of each player recorded in the WCF Ranking Databases is shown a Gender Identity which is either male or female.

7.2 When a player first appears in the rankings, the WCF Ranking Officers will allocate the Gender Identity to the player as they understand it to be on the information available to them and may amend this at any time on receipt of further information. However, it is the responsibility of all players to ensure that the database is set to their preferred Gender Identity.

7.3 If a player wishes to change their gender identity in the WCF Ranking Database, they should email the WCF Secretary-General who will notify the relevant Ranking Officer(s).

7.4 How a person's gender identity is recorded in the database does not impact their eligibility to play in WCF gender specific events.

8. Returners (GC only)

8.1 A Returner is a player who returns to competitive play after a gap of at least five years in which they did not play a ranked game.

8.2 As soon as a Returner plays more than 19 post-gap ranked games, the Adjusted Performance Grade (see Appendix 5, paragraph 1) for their first N post-gap ranked games (where $20 \leq N \leq 30$) is automatically calculated and, in the final calculation process, used as the pre-game DG for their first post-gap ranked game. Earlier games are not affected.

9. Fast Improvers (GC only)

9.1 A Fast Improver is a player who, having already played at least 10 ranked games, then wins at least 12 out of 30 consecutive ranked games (the "reference games") for which the Average Opponent Grade (see Appendix 5, paragraph 1) is at least 200 points higher than the player's DG before the first such game.

9.2 A report is generated automatically by the GC Grading System which lists all the players who have met this criterion together with each player's Adjusted Performance Grade for the reference games (the "reference APG"). The RO will review the reference games for each player and decide whether the player merits being "activated". This involves subjectivity and relies on the skill and judgement of the RO who will consider the quality of opponents played (the

¹ Gender Identity is the personal sense of one's own gender. Gender Identity can correlate with a person's assigned sex at birth or can differ from it.



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higher the better), the type of tournaments entered (the stronger the better) and the time period over which the improvement has occurred (the shorter the better). If the RO judges that a player should be “activated”, they will make a recommendation to the ROC.

- 9.3 If the ROC approves the RO recommendation and agrees that activation of a particular Fast Improver is warranted, the RO will set a flag in the Player table for that player. This will cause the system to use the reference APG that was calculated when the player met the required AWR/AOG criterion as a new start grade which, in the final calculation process, will be used as the pre-game DG for the player’s first reference game. The first reference game will be set as the first game in the tournament during which the fast improvement period began. Grades arising from earlier games will not be affected.

End of WCF Ranking Regulations

Revisions

Version 1.0 [7 June 2021]	Original
Version 1.1 [18 June 2022]	Clause 4.5 amended from 50% to 75%
Version 1.2 [19 December 2022]	Appendix 5 GC Algorithm updated
Version 1.3 [8 June 2024]	Clause 3.34 AC Fast Improvers and Returners; clause 5 publication criteria; new clauses 7 and 8 Fast Improvers and Returners.
Version 1.4 [4 August 2025]	Addition of new clause 7 Allocation of Gender Identity in the Ranking Databases



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Appendix 1: Current functionality of ACGS

Croquet Grading System

Ranking List

Year Min Games Min Grade (1 to 3000) Country

Ranking order Dynamic Grade RDynamic Grade Grade Index Idx20 Max DG (12m) Win%age Tps All Time Tps

Show Peeling Information False True

Show Grip Type False True

Women Only False True

Show State/Prov False True

Show Main Country Only False True

Event List

Year Country

Order Date order Latest first

Event By Name

Name

Order Date order Latest first

List Events By Event Name

Event Name (not case sensitive) Country

Order Date order Latest first

Player Full Record

Firstname surname

(Lists a player's year by year record)

Player List

Order Alphabetical Code Order

[Full Stats By Year](#)

[Highest Grade/Index/Percentage Wins etc](#)

[Oldest deceased players](#)



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Appendix 2: Current functionality of GCGS

Golf Croquet Grading System

Ranking List

Year Min Games Min Grade (1 to 3000) Country

Ranking order Dynamic Grade Max DG (12m) Grade Win%age

Women Only False True

Show Main Country Only False True

Event List

Year Country

Order Normal Reverse

List Events By Event Name

Event Name (not case sensitive) Country

Order Date order Latest first

Player Full Record

Firstname surname

(Lists a player's year by year record)

Player List

Listing order Alphabetical Code Order

[Full Stats By Year](#)

[Highest Grade/Index/Percentage Wins etc](#)



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Appendix 3: Handicap conversion tables

Association Croquet

Handicap	Grade	Handicap	Grade	Handicap	Grade
0	2000	4	1600	11	1200
0.5	1950	4.5	1550	12	1150
1	1900	5	1500	14	1100
1.5	1850	6	1450	16	1050
2	1800	7	1400	18	1000
2.5	1750	8	1350	20	950
3	1700	9	1300	22	900
3.5	1650	10	1250	24	850

Golf Croquet

Handicap	Grade	Handicap	Grade	Handicap	Grade
-3	2350	3	1700	9	1250
-2	2200	4	1600	10	1200
-1	2100	5	1500	11	1150
0	2000	6	1400	12	1100
1	1900	7	1350	13	1050
2	1800	8	1300	14	1000

Association Croquet handicap to Golf Croquet start grade and handicap

AC handicap	GC start grade	GC h'cap	AC handicap	GC start grade	GC h'cap	AC handicap	GC start grade	GC h'cap
-3 to -2.5	2350	-3	0 to 0.5	2000	0	3.5 to 5	1700	3
-2 to -1.5	2200	-2	1 to 1.5	1900	1	6 to 7	1600	4
-1 to -0.5	2100	-1	2 to 3	1800	2	8 to 9	1500	5



Appendix 4: ACGS algorithm

1. Introduction

- 1.1 The ACGS grading method is known as “Dynamic Grading” or “DG”.
- 1.2 DG adjusts the grade of a player after each eligible game that they play by an adaption of the classical grading formulae:

$$\text{newGrade}(W) = \text{oldGrade}(W) + \text{modulator} \times (\text{loser's win probability})$$

and

$$\text{newGrade}(L) = \text{oldGrade}(L) - \text{modulator} \times (\text{loser's win probability})$$

The modulator is able to vary between limits ($16.0 \leq \text{Mod} \leq 35.2$).

- 1.3 The modulator of a player who has played at their expected form over their last 37 games will be 16, the lower limit of the range. If they have played above or below their expected form, the modulator will be greater than 16 with an upper limit of 35.2.

The comparison of a player's actual form with their expected form over the last 37 games is expressed by their Performance Deviation Trend (“PDT”).

2. Dynamic Grading

- 2.1 In the development of Dynamic Grading, the idea (seen implicitly in Bayesian Grading (“BG”)) of a variable modulator (M) was retained. However, the classification of players for this purpose (based on periods of inactivity only in BG) is replaced in Dynamic Grading by a refined process which derives the size of M from the recent performance history of the player. It uses the extent to which observed performance deviated from expected performance, as reflected by the PDT. The underlying idea of Dynamic Grading is that small performance deviation calls for small grade adjustments while large performance deviation calls for large adjustments - to bring the outdated grades back in line more quickly.
- 2.2 The Dynamic Grading system is defined to have post-game updates that coincide with those of I₂₄ (a system with a fixed modulator of 24) for a player's first 30 games. From then on, the updates are calculated much as for systems I_M, i.e.

$$\text{newDG}(W) = \text{oldDG}(W) + M_W \times \text{WP}(L,W)$$

$$\text{newDG}(L) = \text{oldDG}(L) - M_L \times \text{WP}(L,W)$$

where the modulators M_W and M_L are dynamically determined for each game by PDT_W and PDT_L (the PDT of winner and loser respectively) as follows:

$$M_W = f(\text{PDT}_W) \text{ and } M_L = f(\text{PDT}_L), \text{ where } f(x) = 16 + 19.2 \times x^2 / (1 + x^2).$$

This means that the change of grade for the winner and loser will be different, and therefore (unlike a simple grading system) DG is not zero sum in grade adjustments.

The function f has a minimum value of 16 when $x = 0$. Since $x^2 = (-x)^2$, it is symmetric about the point $x = 0$ and increases smoothly as x^2 increases. Since $x^2 / (1 + x^2) < 1$ for all x , it follows that every modulator M always satisfies

$$16 \leq M < 16 + 19.2 = 35.2.$$

- 2.3 For a new player, the first PDT value to be calculated is PDT₃₀: the average of RPD₂₃ through RPD₃₀. Those early RPD are calculated in terms of the available game results. It is not ideal but better than nothing. From game 37 onwards, the system is in full stride.



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- 2.4 A player who plays steadily according to grade, with $PDT = 0.2$ (say), will have $M = 16.74$, so such a player will get relatively small post-game adjustments, approximately like those of an I_{16} system (a system with a fixed modulator of 16). On the other hand, a rapid improver will have $PDT > 2.2$ and thus a $M > D(2.2) = 31.9$. This player will get larger post-game adjustments. A rapid slider with $PDT < -2.2$ will also have $M > 31.9$. However, M never exceeds 35.2. It is tempting to let M be determined by the RPD -value instead of the PDT -value. That simplifies the algorithm, but causes prohibitive loss of grade difference accuracy. Every streak of 30 games in a row can be expected to include about 10 upset results. So, the fluctuation in the RPD -values is not surprising. That fluctuation creates the need for a smoothed version of the RPD -values, namely the PDT . It is also tempting to define M recursively. That too simplifies the algorithm with prohibitive loss of accuracy.
- 2.5 Here, for purposes of illustration, follows a Top 25 Dynamic Grading ranking list as of 31 December 2020. It shows the pdt , PDT and M at that time. Since these statistics change gradually rather than abruptly they give an idea of what to expect for the next game.

Rank	Player	DG	pdt	GIP	WIP	PDT	M
1	Robert Fletcher	2767	-128	28	22	-1.39	28.66
2	Robert Fulford	2713	103	24	21	1.12	26.68
3	Reg Bamford	2674	3	34	26	0.03	16.02
4	Paddy Chapman	2631	159	56	41	1.73	30.38
5	Matthew Essick	2581	19	69	56	0.21	16.79
6	Malcolm Fletcher	2570	9	19	15	0.10	16.18
7	Samir Patel	2544	173	53	40	1.88	30.97
8	Jose Riva	2539	-49	29	18	-0.53	20.24
9	Edward Wilson	2539	135	35	27	1.47	29.11
10	Stephen Mulliner	2535	51	53	36	0.55	20.51
11	Simon Hockey	2528	-18	26	18	-0.20	16.71
12	Jamie Burch	2515	-113	28	17	-1.23	27.55
13	David Maugham	2501	85	48	33	0.92	24.84
14	Jenny Clarke	2492	182	20	13	1.98	31.29
15	Ben Rothman	2491	-92	19	13	-1.00	25.60
16	Harry Fisher	2478	157	50	36	1.71	30.29
17	James Death	2474	-9	79	49	-0.10	16.18
18	Aaron Westerby	2454	-88	10	7	-0.96	25.17
19	Christian Carter	2448	-51	26	11	-0.55	20.51
20	Toby Garrison	2437	-83	12	9	-0.90	24.62
21	Greg Bryant	2437	-119	52	37	-1.29	28.02
22	Mark Suter	2436	-48	13	6	-0.52	20.11
23	Andrew Johnston	2423	43	5	3	0.47	19.44
24	Aiken Hakes	2423	-19	48	35	-0.21	16.79
25	Mark Avery	2416	-175	70	42	-1.90	31.04



Appendix 5: GCGS algorithm

1. Introduction

1.1 The GCGS grading method is known as “Dynamic Rating with Event Class Factors” or “DRE”.

1.2 DRE adjusts the grade of a player after each eligible game that they play by an adaption of the classical grading formulae:

$$\text{newGrade}(W) = \text{oldGrade}(W) + \text{modulator} \times (\text{loser's win probability})$$

and

$$\text{newGrade}(L) = \text{oldGrade}(L) - \text{modulator} \times (\text{loser's win probability})$$

1.3 These formulae use a modulator that is able to take one of two basic values, namely 18.8 or, for a “mobile” player, the term used to describe a player undergoing a rapid change in form, 23.2. It is therefore possible for the two players in a game to be subject to different modulators.

1.4 Modulator adjustment

$$\text{modulator} = \text{basic modulator} \times \text{class factor} / (1 + 10^{\frac{DG_W - DG_L}{\text{denom}}})$$

where DG_W and DG_L are the winner's and loser's grades before the game.

1.5 Class factors

All games are allocated to class 1, 2 or 3 and attract the modulator multiplier shown below in parentheses.

Class 1 (1.16): games in the KO stages of the most prestigious events

Class 2 (1.00): games in events other than Class 1 and 3

Class 3 (0.76): consolation events (other than those of regional, national or international championships) and B and C-level events.

1.6 Denominator adjustment

13 point games: denom = 500

19 point games: denom = 450

This means that winning a 19-point game generates fewer grade points for a higher-graded winner than a 13-point game against the same opponent because the win was more probable.

1.7 DRE determines whether a player is mobile by comparing their DG calculated after game N with their “adjusted performance grade” (“APG”) for their last 30 games (see 1.8). If the difference between their DG and APG exceeds 51 grade points, the player is treated as mobile and their games after game N will be subject to the higher modulator until they cease to be mobile.

1.8 Adjusted Performance Grade (“APG”)

$$\text{APG} = \text{AOG} + 500 \times \log_{10}(\text{AWR}/(1 - \text{AWR}))$$

where:

AOG = Average Opponent Grade

AWR = Adjusted Win Ratio (cannot be less than 0.1 or more than 0.9)

Example 1: Player A wins 20 games out of 30 against opponents with an average grade of 2,000. Their Win Ratio and Adjusted Win Ratio are therefore both $20/30 = 0.67$.

$$\text{PG} = 2,000 + 500 \times \log_{10}(0.67/(1 - 0.67)) = 2,000 + 151 = 2,151$$

Example 2: Player A wins 30 games out of 30 against opponents with an average grade of 1,600. Their Win Ratio is $30/30 = 1$ but their Adjusted Win Ratio is 0.9.

$$\text{PG} = 1,600 + 500 \times \log_{10}(0.9/(1 - 0.9)) = 1,500 + 477 = 1,977$$



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Example 3: Player A wins zero games out of 30 against opponents with an average grade of 2,300. Their Win Ratio is $0/30 = 0$ but their Adjusted Win Ratio is 0.1.

$$PG = 2,300 + 500 \times \log_{10}(0.1/(1 - 0.1)) = 2,300 - 477 = 1,823$$

2. Automatic Start Grade Adjustment (“ASGA”)

- 2.1 The DRE calculation process has three stages each of which involve looping through all the games in the database from 1998.
- 2.2 Stage 1 counts the number of games played by each player since they were first added to the database.
- 2.3 Stage 2 begins by performing a full DRE calculation run based on each player’s Original Start Grade (“OSG”), taking into account mobility. Each player with at least 20 games in the database is subject to a start grade review process when they reach their personal threshold number of games. For players who have played between 20 and 29 games, the threshold is the number of games they have played. For players with at least 30 games, the threshold is 30 games.
- 2.4 When the threshold game (N) is played, the difference between their DG after game N and the APG for their first N games is compared. If the difference exceeds the value of $51 \times (2 - (N/30))$, the player’s OSG is replaced by a “revised start grade” (“RSG”) which is equal to their APG. It will be noted that a player who progresses from 19 ranked games to 30 ranked games over one grading session (typically one event) will experience at most one start grade adjustment on reaching 30 games. Conversely, a player who achieves the same progress over more than one grading session (typically because two or more events well separated in time are involved) may experience more than one start grade adjustment and their published grade may exhibit some volatility as a result until they reach 30 games. Once a player reaches 30 games, their revised start grade is fixed and their grades will only be changed by the application of the classical grading formula.
- 2.5 The absolute differences between all the players’ OSGs and RSGs (if any) are summed and, if at the end of the first Stage 2 run, the total exceeds 1, a further run is performed with OSGs replaced by RSGs. If this run also generates a total difference greater than 1, the process is repeated again and until the total difference becomes less than 1. When starting from the OSGs, it takes about 8 iterations to reach a total difference of less than 1 and the system is then said to have reached convergence. In practice, the start grade for each player reached after the achievement of convergence in one grade input session is stored and used as the OSG for those players in the next grade input session together with the allocated OSGs for all players who have not yet played 20 ranked games. This approach usually means that only one or two iterations are required in order to reach convergence at the start of each new grade input session.
- 2.6 In order to mitigate the impact of grade deflation, whenever a player wins a game in their first 20 to 30 games, the calculation of their RSG is adjusted by treating the grade of every player that they beat as the higher of (a) the opponent’s actual DG and (b) 1,500. Grade deflation is the name given to the tendency of the grades of active players to decrease over time because they encounter improving players whose grades usually lag their playing strength. This means that the active player gains fewer points or loses more points than they should when they respectively beat or lose to an improving player.
- 2.7 ASGA can have second-order effects on other players’ grades. If player A has a start grade of 1500 but improves quickly so that their start grade needs to be adjusted to 1800, all player A’s opponents will gain grade points after the adjustment is made. This is because a win or loss



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against a 1800 opponent earns more grade points (for a win) or loses fewer grade points (for a loss) than a win or loss against a 1500 opponent.

- 2.8 Stage 3 consists of a full calculation run based on final RSGs and taking mobility into account. As a further mitigation of grade deflation, the calculation of the increment for both winner and loser of each game is modified by treating the DG of the opponent as being the higher of (a) the opponent's actual DG or (b) 1,500. This calculation run produces the substantive grades from which the latest ranking lists are generated.



Appendix 6: AC results reporting requirement

1. General

- 1.1 The grade for each player is recalculated after every game. Therefore, in order to achieve maximum accuracy and to ensure that a list of games for an individual player is in the correct order, the games **must be supplied in the order in which they were played**.
- 1.2 The date of the event is required so the event can be placed in the correct order in relation to other events.
- 1.3 Results can be sent to the ACRO either by using Croquetscores or by email. The use of Croquetscores is encouraged because the results can be downloaded by the ACRO in a format that allows easy incorporation into the rankings.
- 1.4 Results sent by email should be sent to `acresults@worldcroquet.org` which forwards a copy to all the ACRO's email addresses. They must follow the standard template set out in paragraph 2 so that they can be parsed and read into the system automatically, i.e. there is no need for the ACRO to type them in again. They may be recorded out in plain text in the body of the email (best) or by attaching a Word or Excel file.
- 1.5 If using Excel, each event should be submitted in a separate worksheet and it should be stated in the covering email that this has been done. Results which are handwritten or sent in other formats (e.g. AppleMac, PDF) will not be accepted.

2. Standard ACGS results template

The syntax of the header is

Event <event name>

Date <d1-d2.m.yy | d1.m1-d2.m2.yy>

Winner <name>

Type <single|match>

Order <firstname|surname>

Within the game list games can be listed as

<n> A beat B

or

<n> B lost to A

Example 1: event with single games

Event Little Snodgrass Open

Date 25-28.7.21

Winner Fred Bloggs

Type single

Order firstname

Games 7

1 Fred Bloggs beat John Doe +26

2 Bruce Smith beat Percy Picacity +7

3 John Smith beat Jock McTavish +10

4 Fred Bloggs beat Bruce Smith +4

5 John Doe beat John Smith +17tp

6 Fred Bloggs lost to Jock McTavish -3



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7 Percy Picacity beat Jock McTavish +26tp
End

Example 2: event with best-of-three matches

Event Little Snodgrass Open KO

Date 29.7-3.8.21

Winner Fred Bloggs

Type match

Order firstname

1 Fred Bloggs beat Jock McTavish +16, -3, +26tp

2 John Doe beat Bruce Smith -6, +17, +17tp

3 John Smith lost to John Doe -26tp, +26tp, -26tp

End

Notes

Event name: The country (and state if necessary) should be stated first, e.g. 'Event AUS NSW Open Championship' or 'Event NZ SI Men's Championship'. Examples can be found in existing event lists.

Date: There are no leading zeroes and the year is in the two digit form, e.g. Date 29.7-3.8.21 or Date 23-28.7.21

Winner: State the winner's name in the form 'Winner Fred Bloggs'

Type: "Type single" or "Type match" (for best-of-n matches)

Order: 'Order firstname' means names are given as "Joe Bloggs", whilst 'Order surname' means names are given as "Bloggs Joe".

Games: State the number of games in an event consisting of only single games in the form 'Games 7'. This does not apply to events with best-of-n matches.

Results: These can be reported as either winner first ('Fred Bloggs beat John Doe +26') or loser first ('John Doe lost to Fred Bloggs -26').

Single games: These can be reported using either the full score format (e.g. '26-9' or '9-26') or the difference format (e.g. '+17' or '-17').

Match scores: These must be reported using the difference format because the parsing program looks for the + and - characters. All games won by the first named player must have + and all games won by the second named must have -. So a 'beat' should have more pluses and 'lost to' should have more - characters.

Event format: If the event is played as a block stage followed by a knock-out stage, the block stage and the knock-out stage must be reported as separate events. The final should be the last game in the list.

Event types: Consolation or plate events should be reported separately from the main event.

New players: If there are any players new to the system, please list their first names, handicaps and country (and state/province if relevant and known). Names of all the players currently in the system can be found in the Interactive Rankings.

Point scores: These are preferred but not essential but any peeling information should be supplied for the purpose of the peeling statistics.



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Appendix 7: GC results reporting requirement

1. General

- 1.1 The grade for each player is recalculated after every game. Therefore, in order to achieve maximum accuracy and to ensure that a list of games for an individual player is in the correct order, the games **must be supplied in the order in which they were played**.
- 1.2 The date of the event is required so the event can be placed in the correct order in relation to other events.
- 1.3 Results can be sent to the GCRO and GCAROs either by using Croquetscores or by email. The use of Croquetscores is encouraged because the results can be downloaded by the RO or ARO in a format that allows easy incorporation into the rankings.
- 1.4 Results sent by email should be sent to gcreults @ worldcroquet dot org which forwards a copy to the RO and AROs' email addresses. **They must be submitted as an Excel spreadsheet** in the format of the standard template show below so that they can be easily incorporated into the rankings. Any other format will not be accepted.
- 1.5 If an event includes ungraded players or players who wish to be known by a preferred forename (e.g. Mike instead of Michael), reporters are encouraged to email the handicaps of ungraded players (to assist with start grade estimation) and any preferred forename information to gcreults @ worldcroquet dot org.

2. Standard GCGS results template

Tournament/match: [Blankshire Open]/[Club A v Club B]
 Match result: Club A beat Club B 5-2 [leave blank for a tournament]
 Start date End date
 Date(s): _____ _____

Game no.	Game detail	Winner			Loser		Points	
		SURNAME	Forename		SURNAME	Forename	Winner	Loser
1	Block A	SMITH	John	beat	BROWN	Edward	7	4
2	Block A	WHITE	Mary	beat	BROWN	Edward	7	6
3	Block A	SMITH	John	beat	WHITE	Mary	7	6
4	Block B	GREEN	Jane	beat	COLLIER	Anne	7	5
5	Block B	JOHNSON	Gordon	beat	COLLIER	Anne	7	4
6	Block B	GREEN	Jane	beat	JOHNSON	Gordon	7	6
7	S-final	SMITH	John	beat	WHITE	Mary	7	5
8	S-final	GREEN	Jane	beat	JOHNSON	Gordon	7	6
9	Final	GREEN	Jane	beat	SMITH	John	7	6
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Ungraded players

SURNAME	Forename	Preferred forename	Handicap
JOHNSON	Gordon	Gordon	5
BROWN	Edward	Ted	7
SMITH	John	Jim	6

Preferred name notification

SURNAME	Full forename	Preferred forename
MATTHEWS	Margaret	Maggie

Notes

1. SURNAMES should be in UPPER CASE (i.e. SMITH not Smith)
2. Forenames should be in Proper Case (i.e. John not JOHN)
3. Please check that winners and losers are the right way round (winners on the left, losers on the right) and that the winner's score is higher than the loser's score.
4. Tied games (e.g. 6-6) should be omitted.
5. There is no need to indicate that a game was won on time.
6. Walkovers should either be omitted or indicated by "7wo" in the winner's points column.
7. The inclusion of game details (e.g. 'Block A' or 'play-off' or 'Q-final' or '3/4th' is encouraged.)