

McMahon Pairing Protocols Standards

American Go Association

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This draft is posted for review and comment until July 15, 2008

A redraft based on commentary received will be available at the Congress.

A few proposals are not current standard, and we note them below for special consideration by reviewers.

At that time we will revise in consultation with the comments received by that date and republish for further comment.

This section deals only with the protocols for pairing. A separate document deals with procedure, interface and reporting requirements.

This document deals only with McMahon pairing. Other approaches will be dealt with in separate documents.

Ordering the players

Players are ordered by rating. If no AGA rating is available, the best available substitute shall be used. The TD may adjust according to the known or estimated differences between different rating systems. Note: Eventually, such adjustments may be made programmatically, however at this time there is no standard. Initial rating is the only ordering standard for pairing.

Band construction

Reviewers: Please consider the standards proposed here and comment.

Bands separate the players into groups by their assumed level of skill. Each band is assigned a starting score called the McMahon score. Each group is separated by at least one point.

Band construction works from the top down. The second band is normally offset from the first by one additional point. After that, the normal assignment of McMahon start band is the integer value of the band size divided by the number of rounds in the tournament: That is, Players/Rounds .

In special cases, the TD may adjust that ratio higher or lower, within the bounds of 1.67 to 2.5. That is, P/R must be between 1.67 and 2.5 where P = Number of players in band, and R = rounds in the tournament.

Programs will ideally be configurable to allow the TD to choose the ratio, which shall be not less than 1.67 nor more than 2.5. Default to be 2.0

Reviewers please comment:

Note: For the top band only, the current practice is to keep only a one point separation between top and next band. This was instituted in order to allow for the possibility of a person in the second band to win the tournament by winning all games. We believe this practice should be discontinued because the range of skill in the top band is now so great and field sizes so large, that it is unrealistic to believe a person in the next band could go so far. At minimum, the default value of $K = .67$ should be used. (This will keep the separation at 1 until the number of players is 3 times the number of rounds, a condition which commonly creates more top level ties than is tolerable.)

Setting the bar

The separation between the top band and all others is called the bar.

As noted above, this is treated as a special case, whereas there will be a standard rule for all other separations.

Example:

Top band has 19 players
second band has 14 players
Third band has 10 players
Fourth band has 11 players
Fifth band has 13 players

In a 6 round tournament

Assume standard practice where separation = Players divided by Rounds (Integer value only) ($K = 1$)
The Bar calculates as a separation of 3
2 – 3 calculates as 2
3 – 4 calculates as 1
4 – 5 calculates as 1
5 – 6 will be 2
Etc.

To promote more mixing, the TD may set the bar at a difference of only 2. Setting it to only 1 would likely lead to a multiple tie for first place in the end, and a many way tie for places next lower.

Setting the Bar is a TD responsibility, and in theory need not be announced ahead. In practice, it is determined and announced ahead of time, and is based on a rating equivalent to a rank, i.e. 7 Dan and above. Tds may allow lower rated players into the top band (above the bar) at their discretion regardless of rating. (Or adjust entry rating to accomplish the same thing.)

If ratings information is absent or unreliable for the players in question, the TD may wish to promote competition between bands. In this case

Assignment of starting bands

Reviewers: please consider the commentary below carefully, and comment.

We believe the zero up is the better approach and, after some trial by experience, should become standard. Note: This would still calculate band separation from the top down. It would then add appropriately to make the bottom zero.

Theoretically, the top band may be set at any value. In practice, it will either be zero or set at a point to make the bottom band be zero. Classic bands (as stated by Mr. McMahon himself) start with zero and go down. This approach leads to some difficulties in tie breaking, and in appropriately pairing players who start late, or drop rounds in the middle. It also leaves the bulk of players in a large tournament with minus scores at the end. Making zero the bottom starting point mitigates these issues. While the classic approach is still most common, the alternative should be allowed as an option.

Manual pairing

For a variety of reasons it may be desirable to force or prohibit specific pairings. This practice is to be kept to the barest minimum possible, but pairing programs must provide the opportunity for the TD to do this.

Creation of score groups

Programmers should not assume that the score of a score group will be an integer. The tournament director may choose to award fractional points for draws, etc, resulting in nonintegral McMahon scores, or in a team competition, equal results may occur

Before pairing any group, it must be defined such that it has an even number of players. If the group is odd at first examination, a player from the next lower group is “floated” up to make the group even. In the rare case that no player from the group below can be floated up such that a legal pairing can be made, a player from the next group up may be floated down (with the consequence that a player in the current group will have to float up to compensate and another float up from below to even the group.). If there is no lower group, a player is selected for a bye.

For example, consider the case of pairing a group having a MacMahon score of 2. If a float is required, the strongest available player from score group should be selected so that a valid pairing can be completed. If no appropriate float can be found from score group 1, the weakest available player from score group 3 is selected to allow a valid pairing.

If taking floats from directly adjacent score groups does not allow for a legal pairing, floats from successively more distant bands are selected, again with the preference of floating players up from lower bands.

Basic Pairing style

Within a score group, pairing is usually accomplished by one of two methods. For a score group with a total of n players (including floaters), the standard pairing methods are:

1. Split-and-shift: The top half of the score group is paired against the bottom half, with player 1 facing player $n/2$, player 2 facing player $n/2+1$, etc.
2. Sequential pairing: Player 1 faces player 2, player 3 faces player 4, etc.

Different pairing methods may be used within a single tournament.

When the pairing protocol in use yields a pairing that violates one or more of the pairing rules listed below, they should be maintained in the following order:

Note: the rule against same players playing twice is never violated.

No player shall be assigned a second bye. (A player may choose to skip more than one.)

A player shall not be floated twice in a row in the same direction. This rule may be abrogated in final round if last round is 5 or less, or last 2 rounds if more than 5 rounds.

The strongest available player in a score group below is floated up to make the score group above even. If floating down, the weakest available player is floated.

The same color shall not be assigned more than 50% of the rounds in a tournament in a row. (Assuming color assignment is on.) The pairing algorithm must allow for the possibility of no color assignment, in which case it has no information.

Players shall not be assigned the same color more than 3 times in a row. (There is no requirement that in an even number of rounds, any player must play the colors an equal number of times.)

Players shall be paired within their score group whenever possible without violating rules above.

Switching a player to obtain a legal pairing within the score group. (See definitions below.)

Transposing a player to obtain a legal pairing within the score group.

Additional permitted considerations

As a general principle, the considerations below should be applied only by switching and transposing. These considerations must be dropped from consideration in the last half of the tournament. (Round 4 in a 5 round or 6 round tournament. Round 3 in a 4 round tournament.)

Avoidance of pairing family members.

Avoidance of pairing players from the same chapter, city, or state.

Avoidance of pairing players who must be handicapped

It must be possible to turn off these criteria. Some TDs may not wish to have this impact the tournament, and they should always be turned off in the last half of a tournament.

Reviewers please note and comment:

The above may be achieved by assigning different weights (penalty values) to the criteria above and using those to define a “penalty function” to describe the (un)desirability of a specific pairing, and use that to calculate the optimal pairing for the group. (Least undesirable or most desirable – take your pick.) A complete definition for a standard Swiss tournament has been published in S. Olafsson, “Matching in Chess Tournaments”, J. Oper. Res. Soc., Vol. 41, No. 1, pp 17-24 (1990) that could be readily adapted to our own use. (Copy available on request to tournaments@usgo.org.)

This approach is dependent on the use of a computer, as the calculations though simple conceptually, are far beyond hand management. It is in current use in several programs in Europe and one here. It appears to be the direction of modern development. Should we make it optional, default, or required for this standard.

Pairing order

Score groups are paired from the top down. (Contrary to ordinary Swiss which pairs the middle group last having previously gone top down and bottom up.)

Handicapping

Reviewers: We welcome commentary as to whether this should be rating, or starting rank based. i.e. Should players A and B with ratings -4.7 and -8.1 be playing at 2 or 3. Also, if the difference is 2 stones, should the weaker player (playing black) get reverse komi or not. And if so, should the value of the komi be .5 as is usual in handicapped games, or the amount used for even games in the tournament. i.e. 6.5 for Japanese / Korean rules, 7.5 for Chinese or AGA.

Byes

A player who cannot be paired due to a field containing an odd number of players receives a forced or involuntary bye. This is treated as a victory for the purposes of pairing and the player's McMahon score is increased by one for the next round. Players who voluntarily request not to be paired for a round are given a voluntary bye, which does not change the McMahon score.

Tie breaking

Inevitably there are ties within the field of a McMahon tournament. A variety of tie breaking methods have been proposed, but the standard tie break procedure within the AGA uses four methods in order:

1. SOMS: The Sum of MacMahon Scores for all of a player's opponents.
2. SODOMS: The Sum of Defeated Opponents McMahon Scores.
3. Face to face result (if applicable)
4. Playoff (if possible)
5. Random draw

If a player involved in a tie break situation has received a forced bye, the bye is to be treated as a victory against a phantom player having the same initial McMahon and that posted a 50% score in the tournament.

In the case of a player involved in a tie break situation who had one or more opponents who received a voluntary bye, the SOMS and (when the relevant opponent was defeated) SODOMS scores are to be credited with 0.5 McMahon points per instance.

Tie breaks must never be based on the raw scores (number of wins) of a player.

Other approaches to tie breaking may be used. In all cases, the tie breaking method should be published prior to the start of play and the scores used must be McMahon.

Does tie breaking choice affect pairing?

The Swiss pairing approach is designed with the expectation that SOMS, SODOMS will be used, and the rules are specifically formulated to make those distinctions as significant as possible. Alternative methods may be desirable for many reasons, and are permitted. Manual pairing may be stimulated by the TD's understanding of the tie breaking system being used.

Definitions:

Float: a player moved from one score group to another in order to make an even number of players. Normally, all floats are up. Players who cannot be paired within their pair group may be floated down.

Score group: Those players with the same McMahon score or who have been floated from another score group to make the group even.

Section: Each score group is divided into two sections, top and bottom.

Transposition: Moving players within their score section.

Switch: Switching a player from one section to the other.