86th FIDE Congress 2015 in Abu Dhabi
Systems of Pairings and Programs Commission

Agenda for the meetings

1. **Approval of the endorsement procedure (section C.04.4)**
   The draft is contained in the Tromso Congress minutes. A full text will be presented to the Congress.
2. **Discussion of the current draft of the new wording for C.04 FIDE Swiss rules to be finalized at the 87th Congress in Baku 2016**
   Annex-1 is the above mentioned draft at its current state. It contains all the amendments suggested by Congresses in 2012, 2013, 2014, and some necessary clarification (besides a few cosmetic adjustments).
3. **Experiences with the Dutch wording**
   A collection of the most meaningful topics brought to the attention of the Commission will be presented at the Congress.
4. **Proposed amendments to the Dutch Swiss Rules**
   There are still some gray areas in the Dutch Swiss Rules (floating precedence, management of byes and more) that the Commission wishes to present to the Congress.
5. **New candidates for the endorsement**
   Some programs are currently under testing. It is still uncertain whether their authors will formally ask for endorsement. If needed, a report will be given at the Congress.
   The endorsement period for all the programs implementing the Dutch Rules will end when the new wording comes into force in 2017. A decision is pending on how to deal with possible endorsement requests in the meantime.
6. **Deadline for compulsory use of an endorsed program for tournaments valid for FIDE titles and norms**
   At Tromso Congress, the Commission proposed July 1st 2019 as the deadline to have all FIDE norm tournaments run by an endorsed program or verified by the Pairings Checker of an endorsed program.
   This issue should now be brought to the attention of other commissions (Qualification, Arbiters) and, more importantly, of the Central Board.
7. **Proposal for a FIDE Pairing Server (FPS) to help organizers comply with deadline requirements**
   Annex-2 is the above mentioned proposal.
8. **Discussion of accelerated systems**
   The findings for commonly used acceleration methods will be presented at the Congress.
9. **Miscellaneous items**

Christian Krause

(Chairman)

C.04 FIDE Swiss rules

C.04.1 Basic rules for Swiss Systems

The following rules are valid for each Swiss system unless explicitly stated otherwise.

a The number of rounds to be played is declared beforehand.

b Two players shall not play against each other more than once.

c Should the total number of players be (or become) odd, one player is unpaired. This player receives a left-out bye: no opponent, no colour and as many points as are rewarded for a win, unless the rules of the tournament state otherwise.

d A player who, for whatever reason, has received half or more points without playing, shall not receive the left-out bye.

e In general, players are paired to others with the same score.

f For each player the difference between the number of black and the number of white games shall not be greater than 2 or less than –2.

Each system may have exceptions to this rule in the last round of a tournament.

g No player shall receive the same colour three times in a row.

Each system may have exceptions to this rule in the last round of a tournament.

h
1. In general, a player is given a colour as many times as he is given the other colour.
2. In general, a player is given the colour other than that he was given the previous round.

i The pairing rules must be such transparent that the person who is in charge for the pairing can explain them.

C.04.2 General handling rules for Swiss Tournaments

A Pairing Systems

1 The pairing system used for a FIDE rated tournament shall be either one of the published FIDE Swiss Systems or a detailed written description of the rules shall be explicitly presented to the participants.

2 While reporting a tournament to FIDE, the Arbiter shall declare which of the official FIDE Swiss systems was used. If another system was used, the Arbiter shall submit the rules of this system for checking by the Systems of Pairings and Programs Commission.

3 Accelerated methods are acceptable if they were announced in advance by the organizer and are not biased in favour of any player.

4 The FIDE Swiss Rules pair the players in an objective and impartial way, and different arbiters or software programs following the pairing rules should arrive at identical pairings.

5 It is not allowed to alter the correct pairings in favour of any player.
Where it can be shown that modifications of the original pairings were made to help a player achieve a norm, a report may be submitted to the Qualification Commission to initiate disciplinary measures through the Ethics Commission.

B Initial Order

1 Before the start of the tournament, a measure of the player's strength is assigned to each player. The strength is usually represented by rating lists of the players. If one rating list is available for all participating players, then this rating list should be used.

It is advisable to check all ratings supplied by players. If no reliable rating is known for a player, the arbiters should make an estimation of it as accurately as possible.

2 Before the first round the players are ranked in order of, respectively

[a] Strength (rating)

[b] FIDE-title (GM-IM- WGM-FM-WIM-CM-WFM-WCM-no title)

[c] alphabetically (unless it has been previously stated that this criterion has been replaced by another one)

3 This ranking is used to determine the pairing numbers; the highest one gets #1 etc.

C Late Entries

1 According to FIDE Tournament Rules, any prospective participant who has not arrived at the venue of a FIDE competition before the time scheduled for the drawing of lots shall be excluded from the tournament as long as he does not show up at the venue in time before a pairing of another round.

An exception may be made in the case of a registered participant who has given written notice in advance that he will be unavoidably late.

2 Where the Chief Arbiter decides to admit a Late Entrant,

- if the player's notified time of arrival is in time for the start of the first round, the player is given a pairing number and paired in the usual way.
- if the player's notified time of arrival is in time only for the start of the second (or third) round, then the player is not paired for the rounds which he cannot play. Instead, he receives no points for unplayed rounds (unless the rules of the tournament say otherwise), and is given an appropriate pairing number and paired only when he actually arrives.

3 In these circumstances, the Pairing Numbers that were given at the start of the tournament are considered provisional. The definitive Pairing Numbers are given only when the List of Participants is closed, and

corrections made accordingly in the results charts.

D Pairing, colour and publishing rules

1 Adjourned games are considered draws for pairing purposes only.

2 A player who is absent without notifying the arbiter will be considered as withdrawn, unless the absence is explained with acceptable arguments before the next pairing is published.

3 Players who withdraw from the tournament will no longer be paired.

4 Players known in advance not to play in a particular round are not paired in that round and score zero (unless the rules of the tournament say otherwise).

5 Only played games count in situations where the colour sequence is meaningful. So, for instance, a player with a colour history of BWB=W (i.e. no valid game in round-4) will be treated as if his colour history was =BWBW. WB=WB will count as =WBWB, BWW=B=W as ==BWWBW and so on.

6 Two paired players, who did not play their game, may meet in a future round.

7 The results of a round shall be published at the usual place of communication at announced time due to the schedule of the tournament.

8 If either

- a result was written down incorrectly, or
- a game was played with the wrong colours, or
- a player's rating has to be corrected (and playing numbers possibly recomputed as in C.3),

and a player communicates this to the arbiter within a given deadline after publication of results, the new information shall be used for the standings and the pairings of the round to come. The deadline shall be fixed in advance according to the timetable of the tournament.

If the error notification is made after the pairing but before the end of the next round, it will affect the next pairing to be done.

If the error notification is made after the end of the next round, the correction will be made after the tournament for submission to rating evaluation only.

9 After a pairing is complete, sort the pairs before publishing them.

The sorting criteria are (with descending priority)

- the score of the higher player of the involved pair;
- the sum of the scores of both players of the involved pair;
- the rank according to the Initial Order (C.04.2.B) of the higher ranked player of the involved pair.

10 Once published, the pairings shall not be changed unless two players have to play a second time.

C.04.3 Swiss Systems officially recognized by FIDE

C.04.3.1. Dutch System

Version to be presented at the 87th FIDE Congress in Baku 2016

A **Introductory Remarks and Definitions**

A.1 **Initial ranking list**

See C.04.2.B (General Handling Rules - Initial order)

A.2 **Order**

For pairings purposes only, the players are ranked in order of, respectively

a. score
b. pairing numbers assigned to the players accordingly to the initial ranking list and subsequent modifications depending on possible late entries

A.3 **Score brackets**

Players with equal scores constitute a homogeneous score bracket. Players who remain unpaired after the pairing of a score bracket will be moved down to the next score bracket, which will therefore be heterogeneous. When pairing a heterogeneous score bracket, these moved down players are always paired first whenever possible, giving rise to a remainder score bracket which is always treated as a homogeneous one.

A.4 **Floats**

By pairing a heterogeneous score bracket, players with unequal scores will be paired. To ensure that this will not happen to the same players again in the next two rounds, this is written down on the pairing card. The higher ranked player (called downfloater) receives a downfloat , the lower one (upfloater) an upfloat.
A player who, for whatever reason, receives half or more points without playing, is also a downfloater.

A.5 **Byes**

See C.04.1.c (*Should the total number of players be (or become) odd, one player is unpaired. This player receives a left-out bye: no opponent, no colour and as many points as are rewarded for a win, unless the regulations of the tournament state otherwise*).

A.6 **Definition of P0, M0**

a P0 is the maximum number of pairs that can be produced in each score bracket.
Note: P0 is usually equal to the number of players divided by two and rounded downwards, unless the number of moved-down players is higher than the number of resident players. In this latter case, P0 is equal to the number of resident players.

b M0 is the number of players moved down from the previous score bracket (it may be zero).

A.7 **Colour differences and colour preferences**

The colour difference of a player is the number of games played with white minus the number of games played with black by this player.
After a round the colour preference can be determined for each player who has played at least one game.

a An absolute colour preference occurs when a player's colour difference is greater than +1 or less than -1, or when a player had the same colour in the two latest rounds he played. The preference is white when the colour difference is less than -1 or when the last two games were played with black. The preference is black when the colour difference is greater than +1, or when the last two games were played with white.

b A strong colour preference occurs when a player's colour difference is +1 or -1.
The strong colour preference is white when the colour difference is -1, black otherwise.

c A mild colour preference occurs when a player's colour difference is zero, the preference being to alternate the colour with respect to the previous game.

d Players who did not play the first rounds have no colour preference (the preference of their opponents is granted).

A.8 Definition of X1, Z1

Provided that, in a given score bracket, P0 (see A6.a) pairs are possible:

a the minimum number of pairs which must be made in the score bracket, not fulfilling all colour preferences, is represented by the symbol X1.

b the minimum number of pairs which must be made in the score bracket, not fulfilling all strong colour preferences, is represented by the symbol Z1.

X1 and Z1 can be calculated as follows:

w number of players having a mild colour preference for white
b number of players having a mild colour preference for black
W number of players having a strong or absolute colour preference for white
B number of players having a strong or absolute colour preference for black
a number of players who have not played a game yet

X1	*If B+b > W+w then*	*X1 = P0 – W – w - a,*
	else	*X1 = P0 – B – b - a.*
	If X1 < 0 then	*X1 = 0.*
Z1	*If B > W then*	*Z1 = P0 - W - b - w - a,*
	else	*Z1 = P0 - B - b - w - a.*
	If Z1 < 0 then	*Z1 = 0.*

A.9 Subgroups, transpositions and exchanges

To make the pairing, each score bracket will be divided into two subgroups, to be called S1 and S2. S1 initially contains the first P0 players, S2 all the others. S1 players are tentatively paired with S2 players, the first one from S1 with the first one from S2, the second one from S1 with the second one from S2 and so on.

a In order to make a sound pairing, it is often necessary to change the order in S2. The rules to

make such a change, called a transposition, are in D1.

b In a homogeneous score bracket it may be necessary to exchange players from S1 to S2. Rules for exchanges are found under D2.
In a heterogeneous score bracket, when not all moved-down players can be paired, it may be necessary to change the moved-down players to be paired. Rules for this kind of exchanges are found under D3.
After each exchange, both S1 and S2 are to be ordered according to A2.

A.10 Definitions: Topscorers, Backtracking

Topscorers are players who have a score of over 50% of the maximum possible score when pairing the last round.
Backtracking means to undo the pairing of a higher score bracket to find another set of floaters to the given score bracket.

A.11 Quality of Pairings

To obtain the best possible pairing for a score bracket, comply as much as possible with the following requirements, given in descending priority:

a no pairing shall violate the absolute criteria B.1, B.2 or B.3.

b maximize the number of pairs *(equivalent to: minimize the number of downfloaters).*

c minimize the score differences in the pairing (see D.4 on how to compute them).

d choose the set of downfloaters in order to maximize the number of pairs and minimize the score differences in the following bracket *(just in the following bracket).*

e minimize the number of topscorers or topscorers' opponents who get (in order of priority):

1 a colour difference higher than +2 or lower than -2.

2 the same colour three times in a row.

f minimize the number of players who do not get (in order of priority):

1 their colour preference.

2 their strong colour preference.

g minimize the number of players who receive (in order of priority):

1 the same downfloat as the last round.

2 the same downfloat as two rounds before.

3 the same upfloat as the last round.

4 the same upfloat as two rounds before.

For these players, minimize the score differences between them and their opponents.

A.9 describes the first tentative pairing and how to get to the next tentative pairing. The first one which fulfills all the above requirements is accepted.

Section C describes an iteration algorithm to find the best possible pairing within a score bracket.

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Systems of Pairings and Programs Commission
Annex-1

B Pairing Criteria

Absolute Criteria
(These shall not be violated. If needed, players will be moved down to a lower score bracket).

B.1 See C.04.1.b *(Two players shall not play against each other more than once)*.

B.2 See C.04.1.d *(A player who, for whatever reason, has received half or more points without playing, shall not receive the left-out bye)*.

B.3 Non-topscorers (see A.10) with the same absolute colour preference (see A7.a) shall not meet *(see C.04.1.f and C.04.1.g)*.

Relative Criteria
(These are in descending priority. They shall be fulfilled as much as possible. To comply with these criteria, transpositions or even exchanges may be applied, but no player shall be moved down to a lower score bracket).

B.4 The difference of the scores of two players paired against each other shall be as small as possible and ideally zero *(note: see section D.4 regarding how to use this criterion when the bracket contains players with different scores)*.

B.5 The colour difference of neither a topscorer nor a topscorer's opponent shall become higher than +2 or lower than -2 *(see C.04.1.f)*.

B.6 Neither a topscorer nor a topscorer's opponent shall receive the same colour three times in a row *(see C.04.1.g)*.

B.7 As many players as possible shall receive their colour preference.

B.8 As many players as possible shall receive their strong colour preference.

B.9 No player shall receive a downfloat in two consecutive rounds.

B.10 No player who had a downfloat two rounds before shall receive a downfloat.

B.11 No player shall receive an upfloat in two consecutive rounds.

B.12 No player who had an upfloat two rounds before shall receive an upfloat.

Note: if any of the floater conditions (B9-B12) is dropped for a player, the score difference between he and his opponent shall be as small as possible.

C Pairing Procedures

Starting with the highest score bracket, apply the following procedures to all score brackets until an acceptable pairing is obtained. The colour allocation rules (E) are used to determine which players will play with white.

C.1 **Determine P0, P1, M0, M1, X1, Z1**

a Determine P0 according to A6.a. Set P1 = P0.
Determine M0 according to A6.b. Set M1= minimum(M0, P1).

b Determine X1 according to A8.a.
Determine Z1 according to A8.b.

C.2 **Set requirements P, S0, B5/B6, X, Z, B9/B10/B11/B12**

a In a homogeneous score bracket set P = P1.

In a heterogeneous score bracket set P = M1 and store the highest P players in S0.

b (topscorers - see A.10) reset B5.

c (topscorers - see A.10) reset B6.

d Set X = X1.
Set Z = Z1.

e (bracket produces downfloaters) reset B9.

f (bracket produces downfloaters) reset B10.

g (heterogeneous score brackets) reset B11.

h (heterogeneous score brackets) reset B12.

C.3 Establish subgroups

In a heterogeneous bracket, put the players stored in S0 into S1.
In a homogeneous bracket, put the highest P players into S1.
Put all other players into S2.

C.4 Order the players in S1 and S2

According to A2.

C.5 Try to find the pairing

Pair the highest player of S1 against the highest one of S2, the second highest one of S1 against the second highest one of S2, and so on. If now P pairs are obtained, which comply with the current requirements:

- in case of a homogeneous or remainder score bracket: the pairing of this score bracket is considered complete, and the remaining players are moved down to the next score bracket. With this score bracket, restart at C1.
- in case of a heterogeneous score bracket: only M1 moved down players were paired so far. Mark the current transposition and the value of P (it may be useful later).
  Redefine P = P1 – M1
  Continue at C3 with the remainder score bracket.

C.6 Transposition

Apply a new transposition of S2 according to D1, and restart at C5.

C.7 Exchange

a In case of a homogeneous (remainder) score bracket: apply a new exchange between S1 and S2 according to D2, and restart at C4.

b In case of a heterogeneous score bracket: if M1 is less than M0, choose, according to D3, another set of M1 players with the same weight as the current set, to be put into S1, and restart at C4.

C.8 Go back to the heterogeneous score bracket (only remainder score bracket)

Terminate the pairing of the homogeneous remainder score bracket. Go back to the transposition marked at C5 (in the heterogeneous part of the bracket) and restart from C6 with a new transposition.

C.9 Lowering requirements

a (heterogeneous score brackets)
Drop B12 and restart from C.3.

b (heterogeneous score brackets)
Drop B11 and restart from C.2.h.

c (bracket produces downfloaters)
Drop B10 and restart from C.2.g.

d (bracket produces downfloaters)
Drop B9 and restart from C.2.f.

e If Z < X, increase Z by 1 and restart from C.2.e.
If Z = X and X < P1, increase X by 1, reset Z=Z1 and restart from C.2.e.

f (topscorers - see A.10)
Drop B6 and restart from C.2.d.

g (top-scorers - see A.10)
Drop B5 and restart from C.2.c.

Any criterion shall be dropped only for the minimum number of players in the score bracket.

C.10 Backtrack to previous Score bracket

If there are moved down players: backtrack to the previous score bracket. If, in this previous score bracket, a pairing can be made whereby another set of players of the same size and with the same scores will be moved down to the current one, and this now allows P1 pairs to be made, then this pairing in the previous score bracket will be accepted.
Backtracking is disallowed when already backtracking from a lower score bracket.

C.11 Increasing the weight of pairable moved-down players

In case of a heterogeneous score bracket: if M1 is less than M0, choose, according to D3, another set of M1 players, put them in S0 and restart at C.2.b.
Note: the new set of M1 players has a higher weight than the previous set because all the sets with the same weight were exhausted in C.7.b.

C.12 Reduction of pairable moved-down players

If the bracket produces downfloaters, and it is heterogeneous, and the pairing procedure has never got to the remainder score bracket *(i.e. it was not possible to pair M1 moved-down players)*: reduce M1 by 1 *(i.e. one more moved-down player is going to float again)*. Now, if M1 is greater than 0, restart from C.2.a. Otherwise, as no moved-down player can be paired, manage the bracket as homogeneous, set P1=P0 and restart from C1.b.

C.13 Lowest Score Bracket

When pairing the lowest score bracket (LSB): backtrack to the penultimate score bracket (PSB). Try to find another pairing in the PSB which will allows a pairing in the LSB. This means adding a special requirement (to be checked in C.5):

- for a homogeneous or a remainder score bracket, the floaters must allow a pairing in the LSB;
- for a heterogeneous score bracket, the remainder score bracketmust allow a pairing in the LSB.

If, under the above conditions, no pairing can be found, then the two lowest score brackets are joined

into a new LSB. Such a merged score bracket shall be treated as a heterogeneous score bracket. Its moved-down players are all and only the players coming from the old PSB. Now the PSB is a different one. Thus, if the pairing of the new LSB fails again, C13 can be repeated until an acceptable pairing is obtained.

C.14 Decrease P1, X1, Z1

As long as P1 is greater than zero, decrease P1 by 1.
If P1 equals zero the entire score bracket is moved down to the next one. With this score bracket, start at C1.
Otherwise, as long as X1 is greater than zero, decrease X1 by 1 and, as long as Z1 is greater than zero, decrease Z1 by 1.
Restart from C2.a.

D Procedural rules

D.1 Transpositions

D1.1 Homogeneous or remainder score brackets

Example: S1 contains 5 players 1, 2, 3, 4, 5 (in this sequence).
S2 contains 6 players 6, 7, 8, 9, 10, 11 (in this sequence).

Transpositions within S2 should start with the lowest player, with descending priority

0. 6 – 7 – 8 – 9 – 10 – 11
1. 6 – 7 – 8 – 9 – 11 – 10
2. 6 – 7 – 8 – 10 – 9 – 11
3. 6 – 7 – 8 – 10 – 11 – 9
4. 6 – 7 - 8 – 11 – 9 – 10
5. 6 – 7 – 8 – 11 – 10 – 9
6. 6 – 7 – 9 – 8 – 10 – 11
7. 6 – 7 – 9 – 8 – 11 – 10
8. 6 – 7 – 9 – 10 – 8 – 11
9. 6 – 7 – 9 – 10 – 11 – 8
10. 6 – 7 – 9 – 11 – 8 – 10
11. 6 – 7 – 9 – 11 – 10 – 8
12. 6 – 7 – 10 – 8 – 9 – 11
13. 6 – 7 – 10 – 8 – 11 – 9
14. 6 – 7 – 10 – 9 – 8 – 11
15. 6 – 7 – 10 – 9 – 11 – 8
16. 6 – 7 – 10 – 11 – 8 – 9
17. 6 – 7 – 10 – 11 – 9 – 8
18. 6 – 7 – 11 – 8 – 9 – 10
19. 6 – 7 – 11 – 8 – 10 – 9
20. 6 – 7 – 11 – 9 – 8 – 10
21. 6 – 7 – 11 – 9 – 10 – 8
22: 6 – 7 – 11 – 10 – 8 – 9
23. 6 – 7 – 11 – 10 – 9 – 8
24. 6 – 8 – 7 - …..

To be continued. (at all 720 figures)
719. 11 – 10 – 9 – 8 – 7 – 6

D1.2 **Heterogeneous score brackets**

The algorithm is in principle the same as for homogeneous score brackets (See D1.1), especially when S1 = S2.
If S1 < S2 the algorithm must be adapted to the difference of players in S1 and S2.

Example: S1 contains 2 players 1, 2, (in this sequence).
S2 contains 6 players 3, 4, 5, 6, 7, 8 (in this sequence).

The transpositions within S2 are the same as in D1.1. But only the S1 first listed players of a transposition may be paired with S1. The other S2 – S1 players remain unpaired in this attempt.

D.2 **Exchange of players (homogeneous or remainder score bracket only)**

When applying an exchange between S1 and S2 the difference between the numbers exchanged should be as small as possible. When differences of various options are equal, take the one concerning the lowest player of S1. Then take the one concerning the highest player of S2.

General procedure:

- Sort the groups of players of S1 which may be exchanged, in decreasing lexicographic order as shown below in the examples (List of S1 exchanges).
- Sort the groups of players of S2 which may be exchanged, in increasing lexicographic order as shown below in the examples (List of S2 exchanges).
- The difference of numbers of players involved in an exchange is: (Sum of numbers of players in S2) – (Sum of numbers of players in S1).
  This difference shall be as small as possible.
- When differences of various options are equal:
  - Take at first the option top down from the list of S1 exchanges.
  - Take then the option top down from the list of S2 exchanges.
- After each exchange both S1 and S2 shall be ordered according to A2.

Remark: Following this procedure, pairs that have already been checked may appear again. These repetitions are harmless because they give no better pairing than at their first occurrence.

Example for the exchange of one player:

		S1				
		5	**4**	**3**	**2**	**1**
S2	**6**	1	3	6	10	15
	7	2	5	9	14	20
	8	4	8	13	19	24
	9	7	12	18	23	27
	10	11	17	22	26	29
	11	16	21	25	28	30

1. exchange player 5 from S1 with player 6 from S2 : difference 1
2. exchange player 5 from S1 with player 7 from S2 : difference 2

3. exchange player 4 from S1 with player 6 from S2 : difference 2
Etc.

Example for the exchange of two players:

		S1									
		5,4	**5,3**	**5,2**	**5,1**	**4,3**	**4,2**	**4,1**	**3,2**	**3,1**	**2,1**
S2	**6,7**	1	3	7	14	8	16	28	29	45	65
	6,8	2	6	13	24	15	27	43	44	64	85
	6,9	4	11	22	37	25	41	60	62	83	104
	6,10	9	20	35	53	39	58	79	81	102	120
	6,11	17	32	50	71	55	76	96	99	117	132
	7,8	5	12	23	38	26	42	61	63	84	105
	7,9	10	21	36	54	40	59	80	82	103	121
	7,10	18	33	51	72	56	77	97	100	118	133
	7,11	30	48	69	90	74	94	113	115	130	141
	8,9	19	34	52	73	57	78	98	101	119	134
	8,10	31	49	70	91	75	95	114	116	131	142
	8,11	46	67	88	108	92	111	126	128	139	146
	9,10	47	68	89	109	93	112	127	129	140	147
	9,11	66	87	107	123	110	125	137	138	145	149
	10,11	86	106	122	135	124	136	143	144	148	150

1. Exchange 5,4 from S1 with 6,7 from S2: difference = 4
2. Exchange 5,4 from S1 with 6,8 from S2: difference = 5
3. Exchange 5,3 from S1 with 6,7 from S2: difference = 5
4. Exchange 5,4 from S1 with 6,9 from S2: difference = 6
5. Exchange 5,4 from S1 with 7,8 from S2: difference = 6
6. Exchange 5,3 from S1 with 6,8 from S2: difference = 6
Etc.

Example for the exchange of three players:

List of S1 exchanges:
5,4,3 5,4,2 5,4,1 5,3,2 5,3,1
5,2,1 4,3,2 4,3,1 4,2,1 3,2,1

List of S2 exchanges:
6,7,8 6,7,9 6,7,10 6,7,11 6,8,9 6,8,10
6,8,11 6,9,10 6,9,11 6,10,11 7,8,9 7,8,10
7,8,11 7,9,10 7,9,11 7,10,11 8,9,10 8,9,11
8,10,11 9,10,11

1. Exchange 5,4,3 from S1 with 6,7,8 from S2: difference = 9
2. Exchange 5,4,3 from S1 with 6,7,9 from S2: difference = 10
3. Exchange 5,4,2 from S1 with 6,7,8 from S2: difference = 10
4. Exchange 5,4,3 from S1 with 6,7,10 from S2: difference = 11
5. Exchange 5,4,3 from S1 with 6,8,9 from S2: difference = 11

6. Exchange 5,4,2 from S1 with 6,7,9 from S2: difference = 11
Etc.

Full procedure to exchange N (N= 1,2,3,4, ...) players in a bracket.

- Sort all possible subsets of N players of S1 in decreasing lexicographic order to an array S1LIST which may have S1NLIST elements.
- Sort all possible subsets of N players of S2 in increasing lexicographic order to an array S2LIST which may have S2NLIST elements.
- Assign a difference to each possible exchange between S1 and S2. It is a number defined as:

(Sum of numbers of players in S2, included in that exchange) - (Sum of numbers of players in S1, included in that exchange)

In functional terms:

DIFFERENZ(I,J) = sum of numbers of players of S2 in subset J – sum of numbers of players of S1 in subset I

This difference has a minimum DIFFMIN = DIFFERENZ (1,1)

and a maximum DIFFMAX = DIFFERENZ (S1NLIST, S2NLIST).

Now the procedure to find the exchanges in correct order:

1 DELTA = DIFFMIN
2 I=1, J=1
3 if DELTA = DIFFERENZ(I,J) then do this exchange. After that, goto 4
4 if J < S2NLIST then J=J+1, goto 3
5 if I<S1NLIST then I=I+1, J=1, goto 3
6 DELTA =DELTA+1
7 if DELTA > DIFFMAX goto 9
8 goto 2
9 The possibilities to exchange N players are exhausted

After each exchange both S1 and S2 shall be ordered according to A2.

D.3 Moved-down players exchange

To properly compute the sequence of moved-down players exchanges, the following elements are to be considered:

M0	(see A.6.b) total number of moved-down players.
M1	(see C.1.a) number of pairable moved-down players.
Limbo	set of the M0-M1 moved-down players that are unpaired (and thus will double-float).
resident score (RS)	score of the players coming from the current bracket.
floater theoretical score (FTS)	one point less than the resident score (see D.4).
(Limbo) weight	Partial PSD (see D.4) of the bracket. Note that only Limbo players are meaningful *(highlighted in the example below)*, since games with

resident players are like constant values in this computation.

The maximum priority is for the lowest weight of the Limbo. For equal weights, the priority goes to the lowest lexicographic value of the ranking-id(s) (sorted in ascending order) of the moved-down players that are candidates for being paired.

Example: M0 is 5. The players originally in S1 {1, 2, 3, 4, 5}, whose scores are respectively {7.0, 7.0, 6.5, 6.5, 6.0}, are to be paired in the 5.5 bracket. Therefore: M1 ranges from 5 to 1, RS=5.5, FTS=4.5.

The elements in S1 start with the M1 highest players, then with descending priority:

M0 = 5	S1	(Limbo) weight
M1 = 5	1-2-3-4-5	(1.5, 1.5, 1.0, 1.0, 0.5)
M1 = 4	1-2-3-4	(1.5, 1.5, **1.5**, 1.0, 1.0)
	1-2-3-5	(**2.0**, 1.5, 1.5, 1.0, 0.5)
	1-2-4-5	(**2.0**, 1.5, 1.5, 1.0, 0.5)
	1-3-4-5	(**2.5**, 1.5, 1.0, 1.0, 0.5)
	2-3-4-5	(**2.5**, 1.5, 1.0, 1.0, 0.5)
M1 = 3	1-2-3	(**2.0**, 1.5, 1.5, **1.5**, 1.0)
	1-2-4	(**2.0**, 1.5, 1.5, **1.5**, 1.0)
	1-2-5	(**2.0**, **2.0**, 1.5, 1.5, 0.5)
	1-3-4	(**2.5**, 1.5, **1.5**, 1.0, 1.0)
	2-3-4	(**2.5**, 1.5, **1.5**, 1.0, 1.0)
	1-3-5	(**2.5**, **2.0**, 1.5, 1.0, 0.5)
	1-4-5	(**2.5**, **2.0**, 1.5, 1.0, 0.5)
	2-3-5	(**2.5**, **2.0**, 1.5, 1.0, 0.5)
	2-4-5	(**2.5**, **2.0**, 1.5, 1.0, 0.5)
	3-4-5	(**2.5**, **2.5**, 1.0, 1.0, 0.5)
M1 = 2	1-2	(**2.0**, **2.0**, 1.5, 1.5, **1.5**)
	1-3	(**2.5**, **2.0**, 1.5, **1.5**, 1.0)
	1-4	(**2.5**, **2.0**, 1.5, **1.5**, 1.0)
	2-3	(**2.5**, **2.0**, 1.5, **1.5**, 1.0)
	2-4	(**2.5**, **2.0**, 1.5, **1.5**, 1.0)
	1-5	(**2.5**, **2.0**, **2.0**, 1.5, 0.5)
	2-5	(**2.5**, **2.0**, **2.0**, 1.5, 0.5)
	3-4	(**2.5**, **2.5**, **1.5**, 1.0, 1.0)
	3-5	(**2.5**, **2.5**, **2.0**, 1.0, 0.5)
	4-5	(**2.5**, **2.5**, **2.0**, 1.0, 0.5)
M1 = 1	1	(**2.5**, **2.0**, **2.0**, 1.5, **1.5**)
	2	(**2.5**, **2.0**, **2.0**, 1.5, **1.5**)
	3	(**2.5**, **2.5**, **2.0**, **1.5**, 1.0)
	4	(**2.5**, **2.5**, **2.0**, **1.5**, 1.0)
	5	(**2.5**, **2.5**, **2.0**, **2.0**, 0.5)

D.4 **Pairing Score Difference (PSD)**

It is a list of score-differences (SD), computed as shown below, and sorted from the highest to the

lowest. The best pairing is the one with the lowest PSD (in the lexicographic order).

A Pairing is composed by pairs and downfloaters.

- The SD of a pair is given by the difference (in absolute value) of the scores of the two players of the pair.
- Being a downfloater is equivalent to face an artificial opponent with one point less than the lowest ranked player (LRP) of the bracket (even when this is resulting in -1).

The artificial value **LRP - 1** was chosen as it is strictly less than LRP and it is generic enough to work with different scoring-point systems and in presence of non-existent, empty or sparsely populated brackets that may follow the current one.

Remark: This algorithm is nothing especial. It is the best mathematical method to find the pairs, which an arbiter, seeing all the player's data, should naturally achieve.

Example 1

In the bracket at 5.5 points, there is just one resident player (3) and two moved-down players (1, 2), who, of course, cannot play between themselves:

7.5 : 1 (expected colour: white)
6.0 : 2 (expected colour: black)
5.5 : 3 (expected colour: white)

There are two possible pairings:

Png1 : 1-3 (or 3-1) and 2 downfloats *(note: 1-3 fails B7 criterion)*
Png2 : 3-2 and 1 downfloats

Let's compute the PSD:

Png1 : SD(1-3) => 2.0; SD (2 DF) => 1.5; PSD1 => (2.0, 1.5)
Png2 : SD(2-3) => 0.5; SD (1 DF) => 3.0; PSD2 => (3.0, 0.5)

The first pairing is chosen because PSD1 precedes PSD2 in the lexicographic order (the fact that 1-3 does not properly satisfy the colour preferences of either 1 or 3 is inconsequential).

Example 2

Let us now consider an example of lowest score bracket (note: expected colours are not meaningful):

3.0 : 1 (possible opponents: 4 6 and can receive the bye)
2.0 : 4 (possible opponents: 1 5)
2.0 : 5 (possible opponent: 4 and can receive the bye)
1.5 : 6 (possible opponents: 1 7)
1.0 : 7 (possible opponent: 6 and can receive the bye)

Player-1 comes from the penultimate score bracket. The players 4 thru 7 belong to the lowest score bracket.

This is a heterogeneous bracket, with S1={1} and S2={4, 5, 6, 7}.

Pairing this bracket seems straightforward: 1-4 is possible, so go to the remainder score bracket, which is [5, 6, 7]. After exchanging 5 and 6 and transposing 5 and 7, we get 6-7, with 5 getting the bye. Pairing concluded?

Not yet. As this is a bracket where there are players with different scores (see B.4), we have to evaluate all possible pairings. Besides 1-4 6-7 5=bye, there are two alternative pairings: 1-6 4-5 7=bye and 4-5 6-7 1=bye.

Before proceeding to any other consideration, we want to evaluate the PSD of all the possible pairings (note: the downfloater receives the bye, so the bye is an artificial opponent with 0 points):

SD(1-4)=>1.0 SD(6-7)=>0.5 SD(5=bye)=>2.0 PSD1=>(2.0, 1.0, 0.5)

SD(1-6)=>1.5 SD(4-5)=>0.0 SD(7=bye)=>1.0 PSD2=>(1.5, 1.0, 0.0)

SD(4-5)=>0.0 SD(6-7)=>0.5 SD(1=bye)=>3.0 PSD3=>(3.0, 0.5, 0.0)

This clearly shows that PSD2 is the best pairing.

Now, let us slightly modify the example, giving Player-7 half point more (his score is thus 1.5). This will also increase the artificial value of the bye (now 0.5).

The possible pairings are the same as above, but their PSD(s) change:

SD(1-4)=>1.0 SD(6-7)=>0.0 SD(5=bye)=>1.5 PSD1=>(1.5, 1.0, 0.0)

SD(1-6)=>1.5 SD(4-5)=>0.0 SD(7=bye)=>1.0 PSD2=>(1.5, 1.0, 0.0)

SD(4-5)=>0.0 SD(6-7)=>0.0 SD(1=bye)=>2.5 PSD3=>(2.5, 0.0, 0.0)

PSD1 and PSD2 are now equal, i.e. the B4 criterion is not discriminating. Therefore the best pairing will be determined first by colours considerations (B7, B8) and then by floaters history (B9 thru B12). If even those criteria cannot clearly indicate a preferred one, the chosen pairing shall be 1-4 6-7 5=bye, which is the first to be generated (see the beginning of our example).

E Colour Allocation rules

Initial-colour
It is the colour determined by drawing of lots before the pairing of the first round.

For each pair apply (with descending priority):

E.1 Grant both colour preferences.

E.2 Grant the stronger colour preference. If both are absolute (topscorers, see A.10) grant the wider colour difference (see A.7).

E.3 Taking into account C.04.2.D.5, alternate the colours to the most recent time in which one player had white and the other black.

E.4 Grant the colour preference of the higher ranked player.

E.5 If the higher ranked player has an odd pairing number, give him the initial-colour; otherwise give him the opposite colour.
Note: Always consider sections C.04.2.B/C (Initial Order/Late Entries) for the proper management of the pairing numbers.

Proposal for a FIDE Pairings Server

1. How to ensure that swiss pairings are correct in norm results

1.1 QC rules to avoid cheating

Due to the rules of the Qualification Commission it is forbidden to change pairings in a swiss tournament to favour a player. In principle each pairing deviating from the Swiss rules is under suspicion of cheating to favour a player. An analysis of the pairings may be made whether such a deviation is enhancing the chances of a player to achieve a title norm

1.2 Current situation

Today there is no systematical checking of pairings which resulted in a title norm. Some very few randomly chosen or suspected title norms can be checked.

If such a check is really done the results are very unreliable because of many reasons:

- manually paired tournaments are allowed and any deviation from the rules may be a simple error of the arbiter

- there are many programs in use. Only a small number of these programs are FIDE endorsed.

If the program used is FIDE endorsed there is no obligatory test whether the pairings are correctly produced or manipulated by the arbiter. All programs must allow that the arbiter changes the output of the program due to special reasons (Illness and/or withdrawals of players encourage to change the pairings to give the remaining players a chance to play each other; wrongly entered results; late entrants). If this happens near the bottom of the tournament it is acceptable. But it is nearly impossible to check all the pairings to find the truth.

If the program is not FIDE endorsed the detailed algorithm of such a program may be fully unknown. The pairings cannot be checked.

1.2.1 Current plans to enhance the situation

Up to now we had the idea that in (near or late future) title norms will be accepted only if a FIDE endorsed program was used in the tournament

1.2.2 Problems of the current plans

The current plan is loaded with severe problems

- The number of endorsed programs is to low and this is resulting in a to low percentage of tournaments run by endorsed programs. We do not really know what happens outside Europe.

- If we try to get more endorsed programs we are limited to introduce enhancements to the swiss rules because we must ensure that the endorsed programs implement the enhancements. The re-endorsement of earlier endorsed programs is as time consuming as the first endorsement. We lose programs whose programmers will not take part in the re-endorsement procedure.

As long as pairings are done decentralized on site of the tournaments we have no control over manual changes there.

1.3 Proposal to do the pairings for norm tournament centralized at FIDE

All these problems can be solved by the use of a central FIDE Pairings Server (FPS).

The use of this server must be obligatory for each swiss tournament which may allow to achieve title norms. Title norms achieved in tournaments without the use of the FIDE Pairings Server are not valid.

The decentralized pairings on site of the tournament will be allowed for FIDE rated tournaments where norms are not expected and consequently not valid.

In the beginning the Dutch Swiss will be used. Other systems may be offered later.

2. Working of a FIDE pairings server (FPS)

There will be one program officially endorsed for use by FPS

- On site of the tournament the tournament will be managed like today using a normal computer program. That includes all data collecting, input and output as today with one exception:

- The tournament data must be sent before the first and before all other rounds to FIDE Pairings server (FPS) using a slightly extended TRF format called TRFp.
- The difference between TRF and TRFp: TRFp contains just some additional information , (e.g. about withdrawals of players for the current round).

- After each round the FPS is checking the results of the round whether the results are fitting to the pairings sent to the tournament before the round . If there is a deviation, the difference is stored to a file.

- The FPS is calculating the pairings and sends the pairings back to the tournament using the same TRFp as received but with the pairings added in the column of the forthcoming round.

3. Benefits of the FIDE Pairings Sever

3.1 FIDE

FIDE may charge the tournament a reasonable fee for the pairings

3.2 Qualification Commission

Each title norm can be checked using the protocol of the tournament whether any changes are concerning the player.

3.3 FIDE SPP commission

FIDE SPP commission will not have the problem of insisting on the implementation of the latest high sophisticated enhancements of swiss rules in decentralized programs. There will be more time to deal with developing of existing or new swiss systems. In future there may be a choice which swiss rules (Dutch, Dubov, Burstein, or others) to be used by the FPS for special tournaments.

3.4 Programmers of tournament software

The programmers will have easier endorsements. It will not be necessary to implement the latest high sophisticated enhancements of the swiss rules.

4. Installation of a FIDE Pairings Server (FPS)

As the functions of the FPS are quite similar to the existing FRS, most of the FRS software may be modified for the FPS.

The following system elements are available to be easily implemented in a FPS:

- Pairings engine for Dutch Swiss
- TRF format for communication between FPS and tournaments. All endorsed programs are able to send and receive the current TRF format. The changes of the current TRF format to the format TRFp are very small.

New functions will be necessary:

- overall management for receiving and sending TRFp (this may be very similar to the functions of the FRS)
- storing deviations between pairings and results (this may be a database using the tournament code of the FRS
- evaluation of the database (this must be defined and programmed). In the beginning this may be simple. Later it may grow up by enhancements.

5. Time schedule

Including the necessary tests the full system may working two years after the decision.

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