

WCSC 2017: The 7th World Chess Software Championship

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The 7th World Chess Software Championship started on July 1st, 2017. Seven programs (CPW, 2017) participated in a round robin tournament of seven rounds, held at Leiden University and organized by the ICGA, LIACS and LCDS. The sponsors were Oracle, the municipality of Leiden, Leiden University, Faculty of Science, ICGA, iSSC, SurfSara and Digital Game Technology. It was held in conjunction with the 23rd World Computer Chess Championship, the 20th Computer Olympiad and the 10th Computers and Games conference. The tempo was 45'+7"/move and the common platform was a Dell Precision T1700 computer with an Intel Core-I7-4770 processor at 3.4 GHz with 4 cores and 16 GB RAM supporting 4–8 process threads. Most engines ran on 64-bit Windows v7 and used sub-7-man syzygy endgame tables (de Man, 2017).

Table 1
The participants in WCSC 2017

Program	Author(s)	Country	Operator
THE BARON	Richard Pijl	NED	R.P.
CHIRON	Ubaldo Andrea Farina	IT	U.A.F.
CHESS EBBIZ 9	Bruno Bras	FRA	B.B.
JONNY	Johannes Zwanzger	DE	J.Z.
KOMODO	Don Dailey, Larry Kaufman & Mark Lefler	USA	Erdogen Günes
SHREDDER	Stefan Meyer-Kahlen	DE	S.M-K.
ZIGGURAT	David Norris	USA	D.N.

Round 1: CHIRON – KOMODO ½–½, JONNY – THE BARON 1–0, ZIGGURAT – SHREDDER 0–1

World Computer Software Champion KOMODO started the tournament against CHIRON which was considered an outsider. From a quiet Guico Pianissimo, it was clear that White tried to keep its small advantage as long as possible. KOMODO showed tough counter play but could not turn the tables. The balance was not disturbed although KOMODO attempted this strongly. The audience was surprised by the resistance CHIRON offered as it maintained the balance: the game ended in a draw.

JONNY did not have the luxury of its usual 2400 cores. However, the neutral platform hardware was sufficient to show its superiority over THE BARON. They played a King's Indian game that followed the books up to **19. ... b6** though this move may have appeared in human games. Slowly JONNY saw opportunities to take kingside initiatives. **30. g4**, Fig. 1(a), made its plans clear: opening the g-file to penetrate the black fortress. This long-term strategy worked out well. THE BARON could not find a White weakness and its own position collapsed completely. The game was soon over.

SHREDDER played a semi-Slav against ZIGGURAT. They followed a known book line up to move 17. The autonomous thinking process thereafter was in favour of SHREDDER. Since ZIGGURAT felt the

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same, it looked for unexpected moves and landed on the same idea as played by JONNY. However, the move g2–g4, see Fig. 1(b), had more drawbacks here. Black was alert and reacted accordingly which implied that White was facing a multitude of black pieces entering its position. The defence was very difficult and the progression of the black pieces was unstoppable. The complications on the board were all in favour of Black which ended the game with a nice combination beginning **34. ... Bxb4**. White soon resigned.

After R1: JONNY, SHREDDER 1; CHIRON, KOMODO ½; THE BARON, CHESS EBBIZ 9, ZIGGURAT 0.



Fig. 1. R1 (a) JONNY – THE BARON, position 30b, (b) ZIGGURAT – SHREDDER, 25b; R2 (c) KOMODO – JONNY, 40w.

Round 2: THE BARON – ZIGGURAT 1–0, KOMODO – JONNY ½–½, CHESS EBBIZ 9 – CHIRON 0–1

THE BARON showed good understanding of the Sicilian variation that occurred on the board in its contest with ZIGGURAT. On move 12 they left the opening book. In the next five moves THE BARON managed to manoeuvre its pieces to excellent places. From that move onwards Black had to solve one problem after another. Most dangerous for the black king were the two bishops on the diagonals b3–g8 and c3–h8 after **34. Bc3**. Although Black was inventive in finding many escapes, in the end it could not prevent the powers of the bishops overcoming its crumbling defences. White combined its pieces to mate in the corner.

KOMODO – JONNY was a meeting between the two top programs of the day. Both were eager to win. KOMODO was looking to use the initiative of being White in an attempt to improve its score against JONNY. Since both programs play above human world championship level it is difficult to criticize them. We can only follow the wise comments by the programs themselves or by other programs. There were chances for both sides and it must be said that they posed difficult challenges for each other. One example can be seen in Fig. 1(c) where White played **40. Rg3**. Here Black considered three possible moves: **40. ... R8c4**, **40. ... Rac4** and **40. ... Ra7** which it finally played. The game is a joy to replay and analyse. We are sure that many interesting variations will arise from accurate analysis. However for the spectator it looked like every attempt to obtain an advantage was refuted by an adequate move that showed almost the reverse. Both sides enjoyed playing on so the game ended finally in a totally drawn position. For sure the hardware used on both sides was exhausted.

The game CHESS EBBIZ 9 versus CHIRON brought us back to the old times. Then, surprising moves were possible as programs sometimes had eccentric ideas about the value of the pieces and the queen. In the current game, it is clear that a mistake decided the game. In a Scottish game, a pawn was moved with **10. cxd5** even though it was pinned. This mistake sacrificed the queen and lost the game.

After R2: CHIRON, JONNY 1½; THE BARON, KOMODO, SHREDDER 1; CHESS EBBIZ 9, ZIGGURAT 0

Round 3: JONNY – CHESS EBBIZ 9 1–0, ZIGGURAT – KOMODO 0–1,
SHREDDER – THE BARON 1–0

In the third round, JONNY established its position in the lead with an easy win against CHESS EBBIZ 9. Apparently the latter program has not recovered from its generosity in game two and again sacrificed a piece without any compensation. Not surprisingly the game was over rather quickly. A win for JONNY.

The game between ZIGGURAT and KOMODO started with promises but in the transition from opening to midgame, ZIGGURAT clearly did not follow a well-chosen strategy. The tactical line it chose after **21. ... c5** did not bring it any chance for an equal game. The white queen was chased over the board but did find a safe place – but only at the cost of accepting a bad position for its pieces. That was the start of a deterioration of its position. Black soon resigned.

SHREDDER – THE BARON showed characteristics of a game between an underdog and a superior program. The underdog showed the Blumenfeld Gambit. The stronger program was tricked into difficult choices. However, it found its way rather easily and avoided the pitfalls which were prepared for it. White sacrificed the exchange for an overwhelming position and Black had to concede that its strategy had failed. There was no time for repacking and thus the BARON threw its towel into the ring rather soon.

After R3: JONNY 2½; KOMODO, SHREDDER 2; CHIRON 1½; THE BARON 1;
CHESS EBBIZ 9, ZIGGURAT 0

Round 4: KOMODO – SHREDDER ½–½, CHESS EBBIZ 9 – ZIGGURAT 0–1,
CHIRON – JONNY ½–½

In the game KOMODO – SHREDDER, the white player sacrificed a pawn for initiative against the black king and along the center lines. Clearly White had some pressure, some play and some chances. However Black defended securely and accurately. The best White could achieve was regaining its pawn. Thereafter a position occurred with weak spots on both sides. White tried to exploit the black weaknesses but Black replied in the right way. The theme of exploiting weak spots led to a repetition of moves and thus, a draw was agreed.

The CHESS EBBIZ 9 program was carrying the same bug as in two earlier games. Before the tournament it possessed good credentials and the author thought that he had improved its playing strength with some last minute changes. However, the opposite was the case: the reverse effect was evident. The program had worsened and the its evaluation function led to the poor positioning and ill-advised sacrificing of its queen, and a clear loss.

CHIRON showed its capabilities in this tournament. In its game against JONNY it played the Guico Pianissimo opening which can be translated as “quiet, quiet, quiet”. This was exactly the course of the game. Pieces went to squares to be exchanged and other pieces were called upon to support central actions but the main goal was the exchange of these pieces. In very short time, seven pieces were exchanged and pawns suffered the same fate. A draw was inevitable.

After R4: JONNY 3; KOMODO, SHREDDER 2½; CHIRON 2; THE BARON, ZIGGURAT 1;
CHESS EBBIZ 9 0

Round 5: ZIGGURAT – CHIRON 0–1, SHREDDER – CHESS EBBIZ 9 1–0,
THE BARON – KOMODO 0–1

ZIGGURAT and CHIRON tested a theoretical variation which was in their database. ZIGGURAT followed its opening library for 15 moves but after it had left its book, CHIRON continued in book for another 10 moves. So one can argue that the game really started on move 26. The game can be

characterized as White playing carefully and cautiously whereas Black played actively and even aggressively. The difference in playing style resulted in a quite active position for the black queen. After **34. ... Qc2**, White was in danger. Black won a pawn and soon the game. This secured CHIRON a place in the top four.

SHREDDER essentially had a walk over as Bruno Bras had been unable to repair the bug in his program. On move 12 SHREDDER gratefully accepted Black's unintended piece sacrifice and soon won the game.

THE BARON had seriously prepared for its contest with KOMODO. The Benoni Defence was played with remarkable energy by White. On move 7, KOMODO was out of book. However, it played the new position so well that THE BARON could not take advantage of its preparations. KOMODO tricked THE BARON into a turmoil of combinations that started with **10. ... b5**, see Fig. 2(a), and **11. Nxb5**. The battle of captures, threats and recaptures finally resulted in an apparent material balance. However, the asymmetry of two pieces for rook and pawn turned out to be clearly in favour of KOMODO. Although THE BARON was alert to many tricks, it could not prevent KOMODO from making progress and the game moved into a won endgame.

After R5: KOMODO, SHREDDER 3½; CHIRON, JONNY 3; THE BARON, ZIGGURAT 1;
 CHESS EBBIZ 9 0



Fig. 2. R5 (a) THE BARON – KOMODO, 11w; R6 (b) CHESS EBBIZ 9 – THE BARON, 16b, (c) JONNY – ZIGGURAT, 37w.

Round 6: CHESS EBBIZ 9 – THE BARON 0–1, JONNY – ZIGGURAT 1–0,
 CHIRON – SHREDDER 0–1

The game CHESS EBBIZ 9 – THE BARON had an original start. This time CHESS EBBIZ 9 seemed to be able to build up a nice position with much influence in the center, see Fig. 2(b). However Black had a powerful reply at its disposal with the move **16. ... Nd5** which immediately ended the game. After **17. exd5**, Black begins its decisive attack with **17. ... Bxb4+**. Thus, THE BARON won the game a few moves later.

JONNY continued with its aim of achieving first place. It played very well against ZIGGURAT which was out of book after **11. Nd2**. JONNY had two more book moves taking it to **13. ... b5**. Then the players were on their own. JONNY decided to sacrifice a pawn temporarily on c4 with as compensation, mobility, initiative and pressure. It led to a dynamic game with apparent chances on both sides. Still JONNY turned out to be the program with the greater insight. In the position of Fig. 2(c) it played **37. d5**. Simple capture would have given JONNY a superior position with two bishops and a passed pawn. However Black believed it had a counter trick, sacrificing the exchange and obtaining two passed pawns in the center, Fig. 3(a).

Obviously Black had high expectations of the power of its pawns. Still JONNY's evaluation must have been better because Black has no chance at all in the current position. JONNY handled it professionally



Fig. 3. R6 (a) JONNY – ZIGGURAT, 40w, and CHIRON – SHREDDER (b) 25b and (c) 32w.

and achieved a full point with convincing play. The strategic line was to bring the white rook to the seventh rank with accompanying death and destruction. A clear win for White.

CHIRON – SHREDDER was a Sicilian game with white fianchetto. Both programs played along well-known paths originating directly from their opening books. A deeply strategic decision was made by SHREDDER when it played **25. ... f4**, in essence weakening the white king's position, see Fig. 3(b).

However White was not awaiting the strategic pressure which Black anticipated but decided to take the initiative by playing **26. gxf4 Rxf4 27. Nxe5**. It brought to light possibilities like d6 and opening the long diagonal up to a8. Meanwhile White enriched the possibilities by inserting the advance of the c-pawn. After the captures Black's pawn position was completely shattered, see Fig. 3(c). White may have evaluated this position as better since it is able to collect three weak pawns: **32. Rxe5 Rh4 33. Qxc5 Nf6 34. Qxa5**.

Yet it was difficult for White to gain advantage from this materially favourable position, since the dynamic of the two black light pieces and the weakening of White's king-fortress proved to be sufficient compensation. What followed was an exciting battle under speed chess conditions as both players were in the last quarter of the time allotted. Finally, they arrived in the position of Fig. 4(a).

Here, White decided to exchange the rooks via an indirect method by playing **41. Re7 Qxe7 42. Qxh4**. The resulting position was the start of a fascinating endgame in which subtle manoeuvres finally decided the winner. Figure 4(b) shows one of the subtleties. Here, Black kept the initiative by playing **79. ... Ne6**. Subsequently Black continued to gain spatial advantage and with a simple but nice combination it transformed the game into a win. SHREDDER deservedly emerged in the clear lead followed by JONNY. This set up the last round in which the two were to play each other for the WCSC 2017 title, a suitable climax to the tournament.

After R6: SHREDDER 4½; JONNY 4; KOMODO 3½; CHIRON 3; THE BARON 2; ZIGGURAT 1;
CHESS EBBIZ 9 0

Round 7: SHREDDER – JONNY ½–½, THE BARON – CHIRON ½–½,
KOMODO – CHESS EBBIZ 9 1–0

The title of World Computer Software Champion was therefore decided in the last round in the game SHREDDER – JONNY. Both programmers know each other very well but a respectful, end-of-tournament draw was out of the question as that would mean that SHREDDER took the title. Their fight was of the highest calibre, exciting with sacrifices on both sides and with subtle manoeuvres. Below we provide four high points of the contest which did in fact ultimately end in a draw.

After a quiet Semi-Slav opening in which both sides followed book lines far into the middle game, the real struggle showed many subtleties. In Fig. 4(c), we see that White is confronted with a black

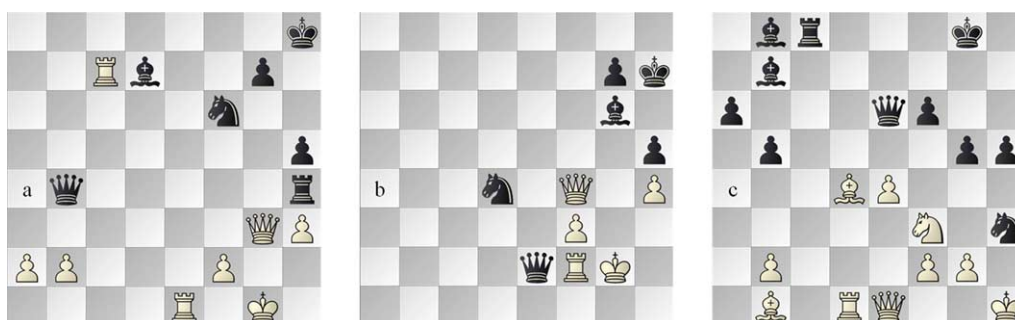


Fig. 4. R6, CHIRON – SHREDDER (a) 41w, (b) 79b; (c) R7, SHREDDER – JONNY, 42w.



Fig. 5. R7, SHREDDER – JONNY, positions (a) 47b, (b) 58b and (c) 84w.

knight which has just capture the pawn on h3. Its reaction was to ignore that knight and look for its own opportunities with **42. Qa5**.

After White had captured the knight on h3, Black manoeuvred its pieces to positions such that it could immediately regain the piece by a nice combination, namely (Fig. 5(a)) **47. ... Rxb1 48. Rxb1 Qxe4 49. Rf1** (49. Rd1 is answered by 49. ... g4) **Qxd4 50. Qxh5 Qe4**.

With two bishops and four pawns against rook and knight with three pawns there was a kind of material balance but positionally the situation was rather dynamic. An example is seen in the diagram 5b where Black played **58. ... Bc5**. The game continued by **59. Nxb5 Bxf2 60. Kxf2 Qxb5 61. Qd4**. In the following it turned out that both sides had sufficient resources to maintain the delicate balance.

A second example of this balance is shown in Fig. 5(c) where the game continued **84. Qd4 Qxb3 85. Rxf5+ Kf7 86. Qa7+ Ke8**.

After exchanging the queens, the final result was a draw both on the board and according to the 6-man KRPKBP endgame database tables (de Man, 2017; Nalimov, 2017). Once more, we applaud SHREDDER, better than ever before, as a world champion.

In the game THE BARON versus CHIRON, THE BARON showed its power and its potential as a dangerous program even against strong contenders. It left the opening phase with a small advantage, a pawn up with some obstacles to overcome. However Black showed that the obstacles were able to help it to regain the pawn. Thereafter the result was a draw.

A remarkable game was played by KOMODO and CHESS EBBIZ 9. KOMODO won after a time forfeit by CHESS EBBIZ 9 in position 12b but was already winning. This left KOMODO equal with JONNY.

Our congratulations therefore go to Stefan Meyer-Kahlen for SHREDDER's performance, winning the tournament with 5 points out of 6 games, a fantastic result. After R7: SHREDDER 5; JONNY, KOMODO 4½; CHIRON 3½; THE BARON 2½; ZIGGURAT 1; CHESS EBBIZ 9 0

Table 2
The WCSC 2017 cross-table

#	id	Program	S	K	J	C	B	Z	E	W	D	L	Score
1	S	SHREDDER		½	½	1	1	1	1	4	2	0	5
2	K	KOMODO	½		½	½	1	1	1	3	3	0	4½
3	J	JONNY	½	½		½	1	1	1	3	3	0	4½
4	C	CHIRON	0	½	½		½	1	1	2	3	1	3½
5	B	THE BARON	0	0	0	½		1	1	2	1	3	2½
6	Z	ZIGGURAT	0	0	0	0	0		1	1	0	5	1
7	E	CHESS EBBIZ 9	0	0	0	0	0	0		0	0	6	0

Table 3
The WCSC 2017 results

id	Program	r1	r2	r3	r4	r5	r6	r7
S	SHREDDER	Zb1	bye	Bw1	Kb½	Ew1	Cb1	Jw½
K	KOMODO	Cb½	Jw½	Zb1	Sw½	Bb1	bye	Ew1
J	JONNY	Bw1	Kb½	Ew1	Cb½	bye	Zw1	Sb½
C	CHIRON	Kw½	Eb1	bye	Jw½	Zb1	Sw0	Bb½
B	THE BARON	Jb0	Zw1	Sb0	bye	Kw0	Eb1	Cw½
Z	ZIGGURAT	Sw0	Bb0	Kw0	Eb1	Cw0	Jb0	bye
E	CHESS EBBIZ 9	bye	Cw0	Jb0	Zw0	Sb0	Bw0	Kb0

Table 4
WCSC 2017 progress, round by round

Program	r1	r2	r3	r4	r5	r6	r7
SHREDDER	1	1	2	2½	3½	4½	5
KOMODO	½	1	2	2½	3½	3½	4½
JONNY	1	1½	2½	3	3	4	4½
CHIRON	½	1½	1½	2	3	3	3½
THE BARON	0	1	1	1	1	2	2½
ZIGGURAT	0	0	0	1	1	1	1
CHESS EBBIZ 9	0	0	0	0	0	0	0

The play-off: JONNY – KOMODO ½–½, KOMODO – JONNY 1–0.

To decide second and third place, a play-off was necessary between JONNY and KOMODO. Two games were played with the time control of 20'+15"/move.

The first game, with JONNY as White, was a Queens Pawn opening. Both players followed trodden paths and reached an equal middle game. Many pieces were exchanged and only a few remained on the board. However all pawns remained on the board and soon they were positioned in such a way that there were two walls which were intermingled, although in the meantime White had sacrificed a pawn. Both players continued to move the pieces forwards, backwards, left and right. After 170 moves they stopped playing and agreed on a draw.

The second game with colours reversed was won by KOMODO. Its attack on the kingside could not be stopped by JONNY which gave up after **39. g5** in a clearly inferior position.

So, our thanks to all the participants, and particular congratulations to the new title-holder SHREDDER, and to the runners-up on the podium, KOMODO and JONNY.



Fig. 6. Tension in KOMODO–JONNY play-off game 2 at position 21w: Qe2, Qf3 or g4?

All games, with some annotation, are available (Krabbenbos et al., 2017). Some eight games¹ reached the sub-8-man and/or FINALGEN zones but none of their results were in doubt by that time.

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¹The games are numbered 2, 3, 7, 8, 10, 13, 14 and 19 in the pgn file provided.