

Chess : positions of cyclic zugzwang with not more than five men

JDB reporting work by Galen Huntington, Árpád Ruzs, and the late Guy Haworth

This document describes a file CZUG45.PGN which is believed to contain all chess positions with not more than five men which are cyclic zugzwang (the side to move can win, but against at least one defence only by returning to the same position with the other side to move). It contains 1,135 positions.

Presentation

The file has been designed for use and display by ChessBase and similar programs. As displayed in a ChessBase list, the men and their positions are shown under White and Black, a summary of the men involved under Tournament, the result as seen by White under Result, and the length of the path back to the original position (the length of the longest path if there are several) under Moves. If the numbers of men are unequal, White is given the larger number, so if it is the side with the smaller number which wins (as for example with queen against bishop and knight) the first move is given to Black and the result is recorded as a Black win. The play displays only the line or lines which force the winner to return to the starting position, and these may not include the line which holds out longest.

Technical report

The work is described in a paper "Position Criticality: Cyclic Zugzwangs in sub-6-man Chess" which has been posted on the Orthodox Chess / Endgames page of www.jsbeasley.co.uk.

Statistical summary

Numbers of two-against-two cyclic zugzwangs

	KQ	KR	KB	KN	KP	Total
KQ	0	0	0	0	0	0
KR		0	1	1	0	2
KB			0	0	0	0
KN				0	0	0
KP					0	0

Total	0	0	1	1	0	2

Numbers of three-against-one cyclic zugzwangs

K	
KNP	1

Total	1

Numbers of three-against-two cyclic zugzwangs (wins for the three men on the left, for the two men on the right)

	KQ	KR	KB	KN	KP	Total		KQ	KR	KB	KN	KP	Total
KQQ	0	0	0	0	0	0	KQQ	0	0	0	0	0	0
KQR	0	0	0	0	0	0	KQR	0	0	0	0	0	0
KQB	3	0	0	0	0	3	KQB	0	0	0	0	0	0
KQN	4	0	0	0	0	4	KQN	0	0	0	0	0	0
KQP	60	0	0	0	0	60	KQP	0	0	0	0	0	0
KRR	0	0	0	0	0	0	KRR	1	0	0	0	0	1
KRB	0	0	0	0	0	0	KRB	44	2	0	0	0	46
KRN	0	2	0	1	0	3	KRN	80	0	0	0	0	80
KRP	0	20	18	53	0	91	KRP	87	0	0	0	0	87
KBB	0	0	0	0	0	0	KBB	0	0	0	0	0	0
KBN	0	0	2	32	2	36	KBN	1	1	0	0	0	2
KBP	0	0	11	161	27	199	KBP	2	17	0	0	0	19
KNN	0	0	0	0	54	54	KNN	33	5	0	0	0	38
KNP	0	2	4	65	47	118	KNP	14	128	0	0	0	142
KPP	0	0	0	18	121	139	KPP	0	10	0	0	0	10
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Total	67	24	35	330	251	707	Total	262	163	0	0	0	425

Total number of cyclic zugzwangs: 1135