



# THE PUZZLING SIDE OF CHESS

Jeff Coakley

## LOOPOLOGY VII

### Three Piece Single Loops, Part 2

number 166

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This episode of the looper saga covers three-piece single loops with pawns.

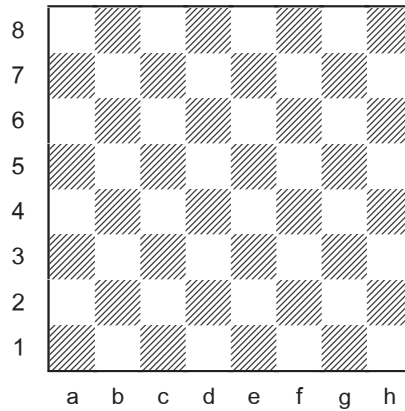
The piece groups KQP, KBP, QRP, QBP cannot form a single loop. The six loopable trios are KRP, RBP, QNP, RNP, KNP, BNP.

For all problems, the stipulated number of pieces is the maximum possible in a single loop with an equal number of each piece. A repeating sequence of pieces is not necessary. In many solutions, pawns protect pawns. Pawns may not be placed on the 1st rank.

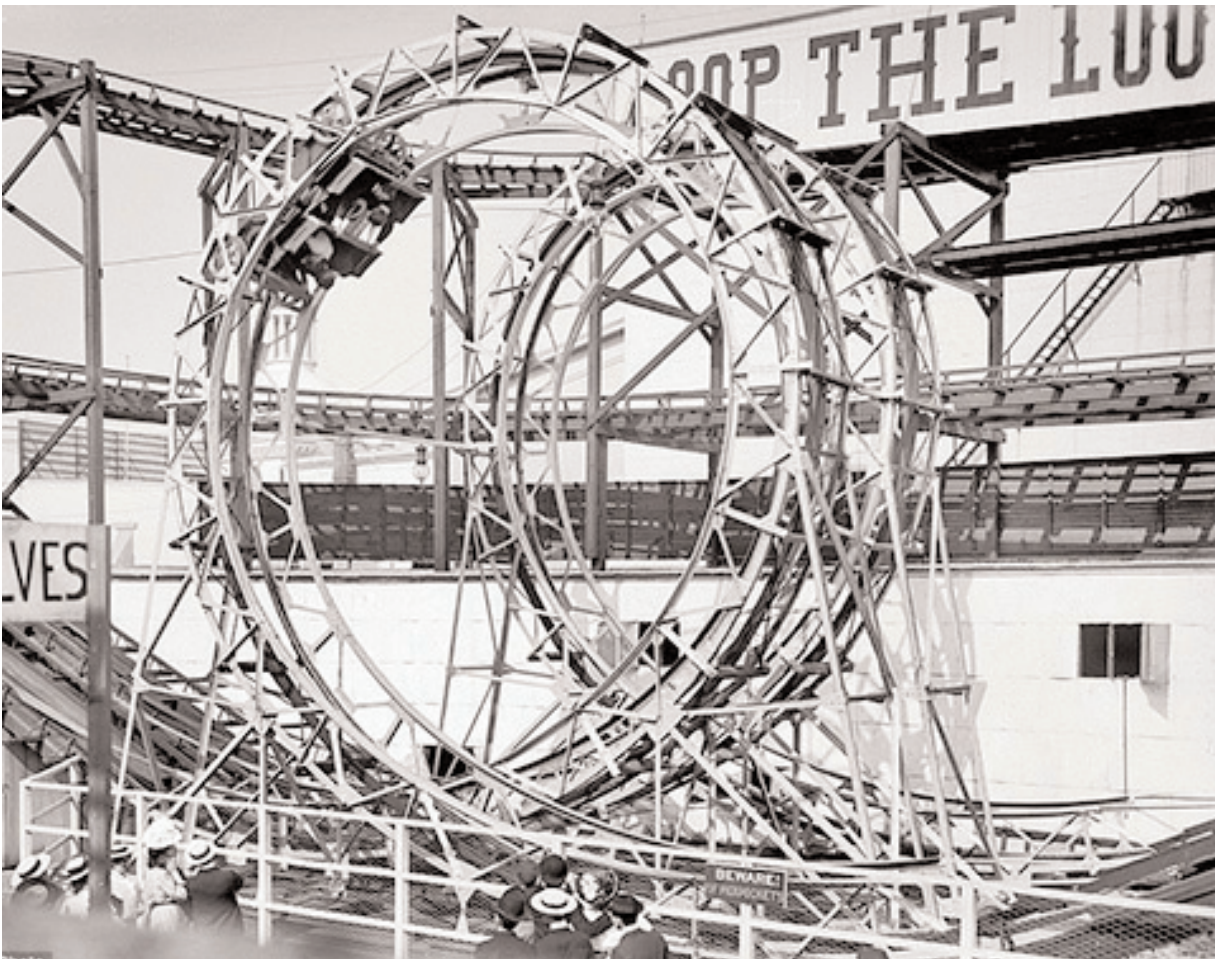
François Labelle has kindly provided optimal solutions. An updated table showing the maximum piece count for two- and three-piece single loops is given at the end.



## Single KRP Loop



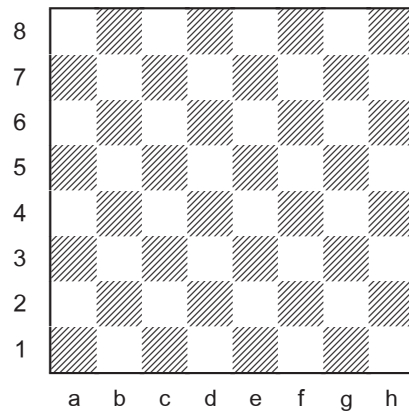
Place four kings, four rooks and four pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.



*Loop the Loop*

*Coney Island, New York 1901*

## Single RBP Loop



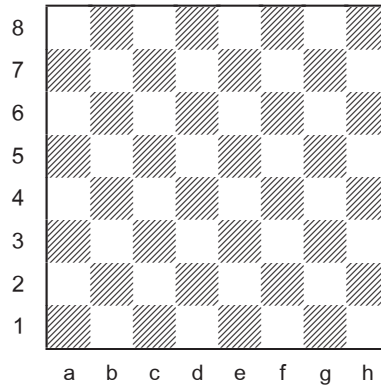
Place five rooks, five bishops, and five pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.



*Damien Walters  
Human Loop*

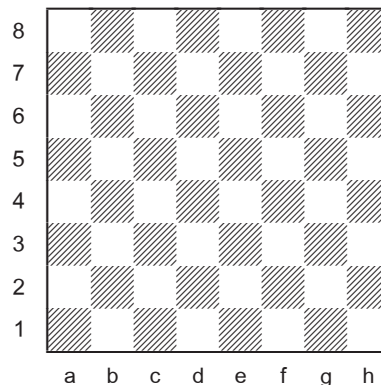
The next two problems (QNP, RNP) have unique solutions. That usually means that the *stump potential* is very high. Are you up to the challenge?

### Single QNP Loop



Place five queens, five knights, and five pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.

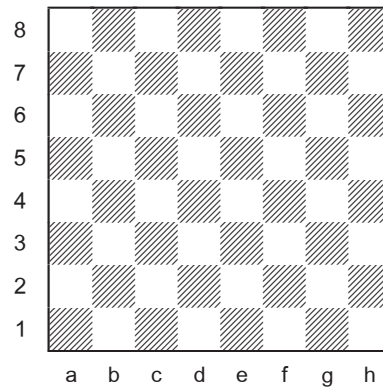
### Single RNP Loop



Place six rooks, six knights, and six pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.

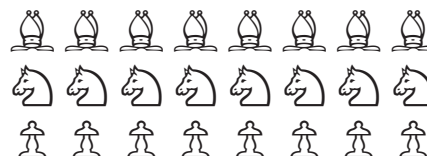
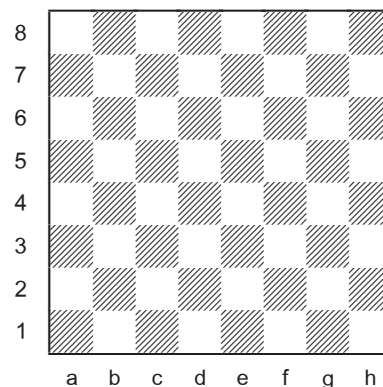
The final two problems, with seven or eight of each piece, are surely unsolvable by human loopers. How close can you come to the max?

### Single KNP Loop



Place seven kings, seven knights, and seven pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.

### Single BNP Loop



Place eight bishops, eight knights, and eight pawns so that every piece is defended exactly once and every piece defends exactly one other. The chain of defence must form a continuous loop.

Stay tuned for Loopology VIII, four-piece single loops.

## SOLUTIONS

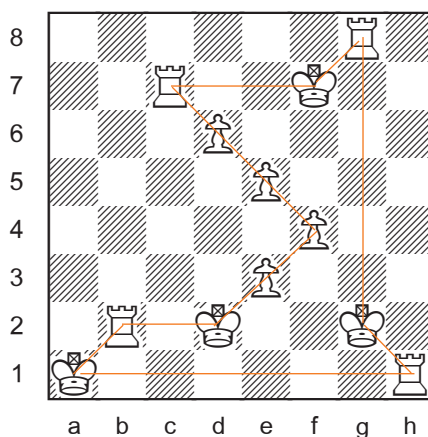
**PDF hyperlinks.** You can advance to the solution of any puzzle by clicking on the underlined title above the diagram. To return to the puzzle, click on the title above the solution diagram.

**Archives.** Past columns and a detailed index of problem-types and composers are available in the *Puzzling Side of Chess* archives.

### Single KRP Loop

François Labelle 2018

*Puzzling Side of Chess*



12 pieces, 4 each

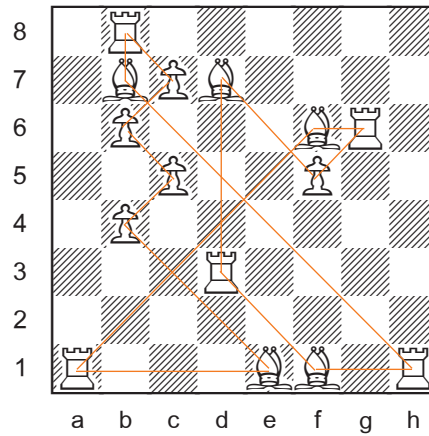
There are 792 solutions. This total does not include positions with the same pattern that are reflections or rotations of a previously counted solution, a convention used for all problems.

There are no symmetrical solutions for any three-piece single loop involving pawns.



## Single RBP Loop

François Labelle 2018  
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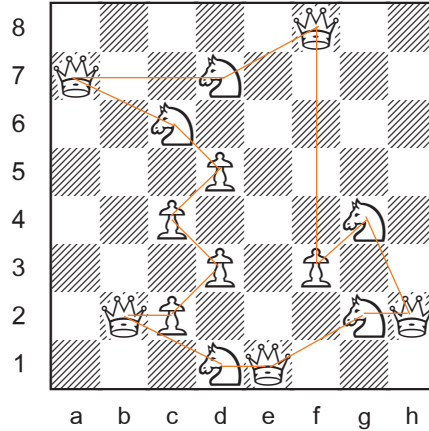


15 pieces, 5 each

1973 solutions.

## Single QNP Loop

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15 pieces, 5 each

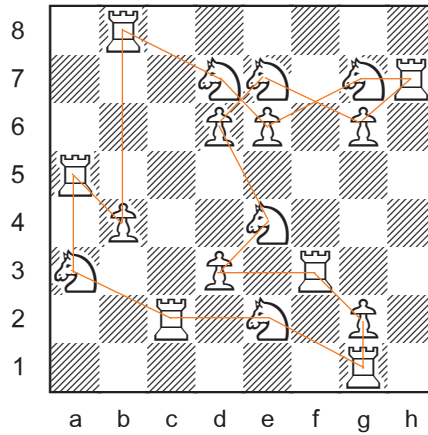
Unique solution!



## Single RNP Loop

François Labelle 2018

*Puzzling Side of Chess*



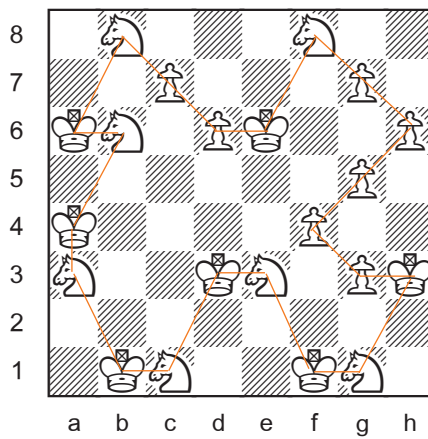
18 pieces, 6 each

Unique solution!

## Single KNP Loop

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21 pieces, 7 each

49 solutions.

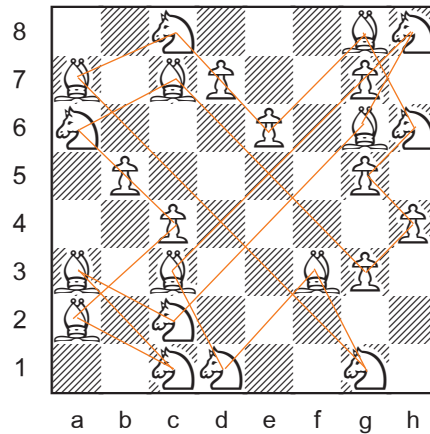




## Single BNP Loop

François Labelle 2018

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24 pieces, 8 each

2 solutions, almost identical.

In the second solution, Ba7 Bc7 are replaced by Bb6 Bb8.

### Maximum Pieces in Single Loop

Equal Number of Each Piece

BN	20	KBN	21	BNP	24
KB	20	RBN	18	KNP	21
KN	20	KRB	15	RNP	18
RN	16	KRN	15	QNP	15
RB	14	KQN	12	RBP	15
QN	12	QBN	12	KRP	12
KR	12	QRN	9		
RP	10				
NP	8				

Until next time!

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