

# THE PUZZLING SIDE OF CHESS

Jeff Coakley

## CYCLOTRONIC LIFE

### Queen of the Air

number 180

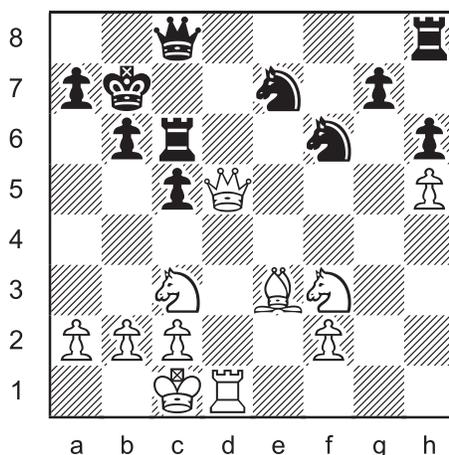
July 24, 2019

Part two of the *Cyclotron Life* is cleared for takeoff on runway 180. Propellers synchronised, minds engaged. Departing from our final destination, charting a course of circumnavigation.



Happy birthday Amelia Earhart. July 24, 1897.

### Cyclotron 73



Cycle three pieces so that Black is in checkmate.  
(See rules on next page.)

## CYCLOTRONS

Switch the position of three pieces so that Black is in checkmate. No actual chess moves are made. The pieces simply swap squares. The pieces trade places in a “cycle”. Piece A goes to square B, piece B goes to square C, and piece C goes to square A.

Any three pieces can trade places. Colours do not matter. The cycled pieces can be all white, all black, or a mix of both. Cycling the black king is a common trick.

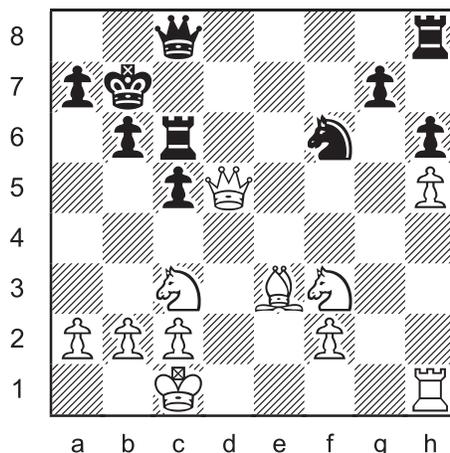
The position after the cycle must be legal. This rule implies several things.

- a) A pawn cannot be on the 1st or 8th rank.
- b) Both kings cannot be in check.
- c) There must be a way to reach the position with a legal white move.  
Impossible checks, especially double checks, are a frequent “violation”.
- d) In some cases, retrograde analysis is required to decide if the position after a cycle is legal.



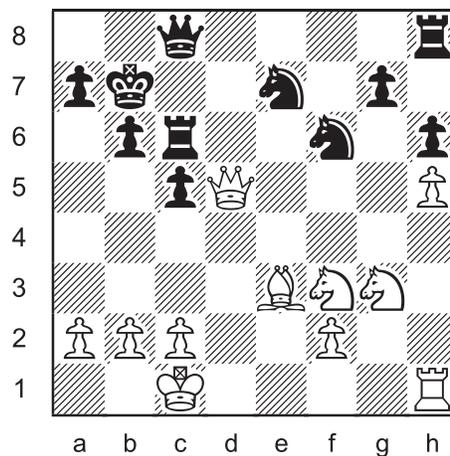
Amelia Earhart disappeared over the Pacific Ocean on July 2, 1937. Her intended flight around the world was the longest ever attempted, taking an equatorial route of 47,000 km (29,000 miles). The mystery surrounding her death continues to this day.

### Cyclotron 74



Cycle three pieces so that Black is in checkmate.

## Cyclotron 75

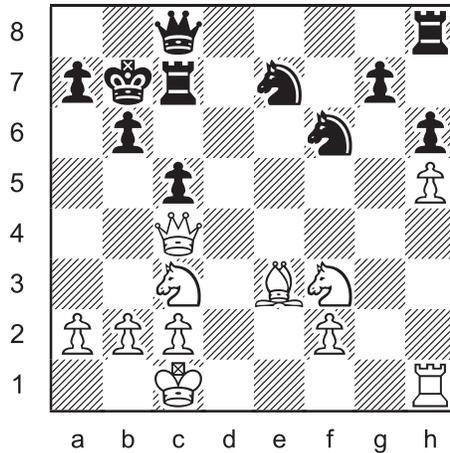


Cycle three pieces so that Black is in checkmate.



Amelia Earhart was born at Atchinson, Kansas in 1897. Always the tomboy, always on the move, she attended public school in Des Moines, Iowa; St. Paul, Minnesota; and Chicago. During World War I, she served as a nurse at Spadina Military Hospital in Toronto. Later she studied at Columbia University in New York City, learned to fly in Los Angeles, and worked as an aircraft sales representative in Boston. All before she became an international celebrity following her historic 1928 flight across the Atlantic Ocean.

## Cyclotron 76



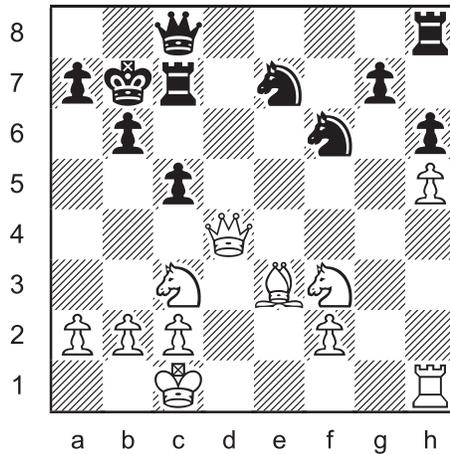
Cycle three pieces so that Black is in checkmate.



The list of Amelia Earhart's accomplishments and accolades is long and impressive. Here are some of the highlights.

- \* First woman to fly solo across the Atlantic Ocean.
- \* First person to fly solo from Hawaii to California.
- \* World altitude record, 1931. 18,415 feet (5,613 m).
- \* Awarded the *Distinguished Flying Cross* by U.S. Congress, 1932.
- \* Faculty advisor, Department of Aeronautics, Purdue University.
- \* Investor and promoter of commercial passenger airlines.
- \* Influential advocate of equal rights and opportunities for women.
- \* Associate editor of *Cosmopolitan* magazine.
- \* Designer of a successful line of women's clothing bearing her name.
- \* Admiringly referred to in the media as "Queen of the Air".

## Cyclotron 77

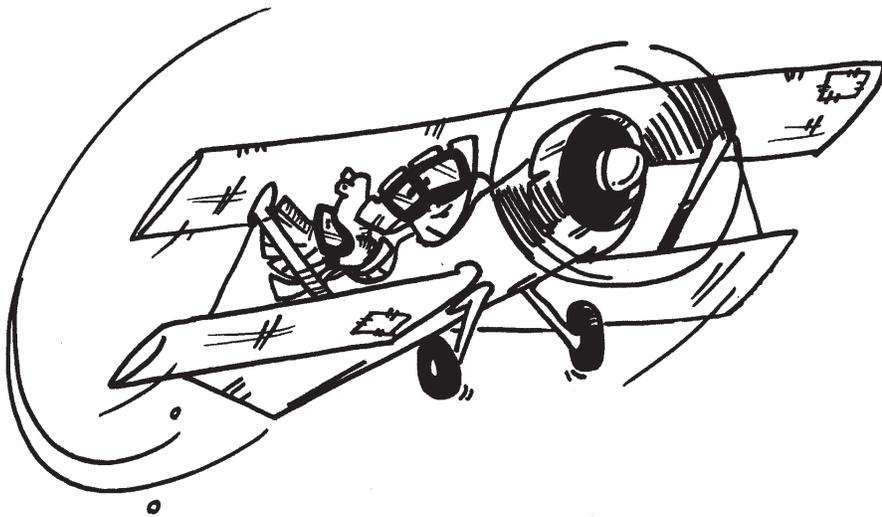


Cycle three pieces so that Black is in checkmate.

The first circumnavigation of the world by aircraft was achieved in 1924 by two bi-planes of the U.S. military. Pilots and crew members were Lowell Smith, Eric Nelson, John Harding, and Henry Ogden. Their flight took 175 days and covered 44,300 km (27,500 miles).

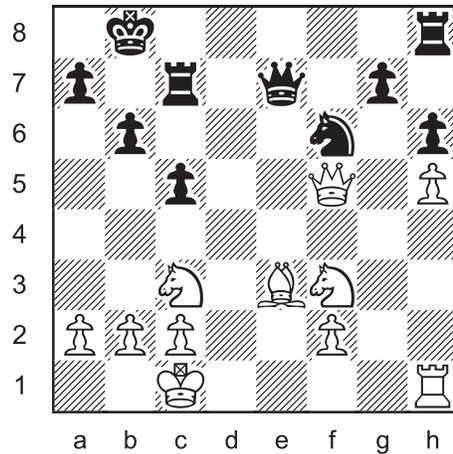
Amelia Earhart's goal was to fly around the world closer to the equator, increasing the distance travelled. If she had completed the journey, it would have taken 35 days.

In her words, "*One flight which I most wanted to attempt - a circumnavigation of the globe as near its waistline as could be.*"



The next problem, another approximate twin, is the last leg of this column. But not the end of the series. Stay tuned for more puzzles from the *Cyclotronic Side of Life*.

## Cyclotron 78



Cycle three pieces so that  
Black is in checkmate.



*“The most difficult thing is the decision to act. The rest is merely tenacity. The fears are paper tigers. You can do anything you decide to do. You can act to change and control your life and the procedure. The process is its own reward.”*

Amelia Earhart

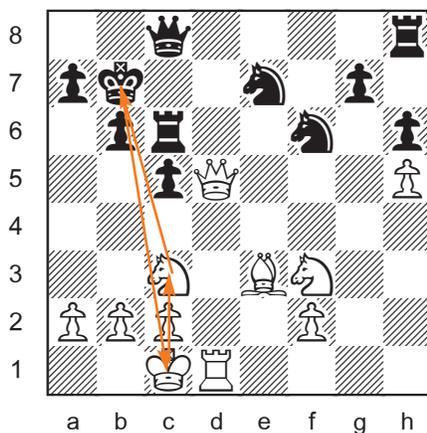
## SOLUTIONS

All cyclotrons by J. Coakley. *Puzzling Side of Chess* (2019).  
Computer checked by Caisay 4.1 (Adrian Storisteanu).

**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.** Other columns with similar problems can be found in the archives (55, 89, 92, 95, 119, 126, 128, 130, 132, 177, 178). For more information on ordinary switcheroos, see column 4.

### Cyclotron 73

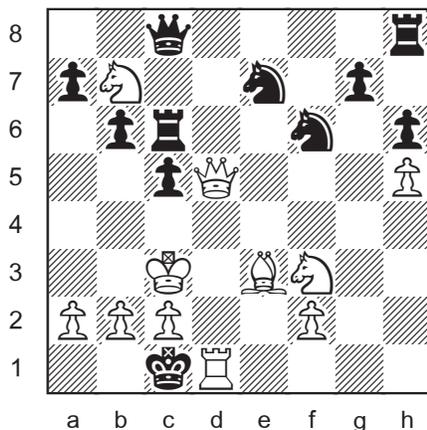


Kb7→c1 Kc1→c3 Nc3→b7

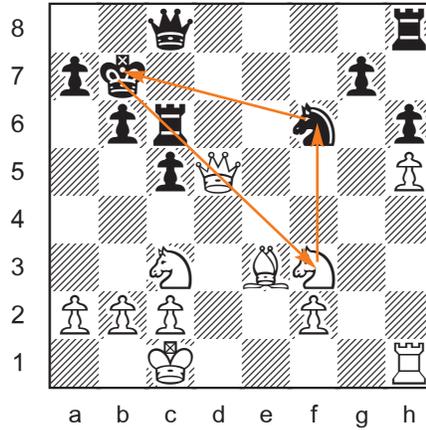
Cycling kings! The last move was Rd2>d1#.

The cycle a2→b7 Kb7→d5 Qd5→a2 is an illegal double check.

The order in which the pieces are cycled is not important. The resulting position will still be the same. See diagram below.



## Cyclotron 74



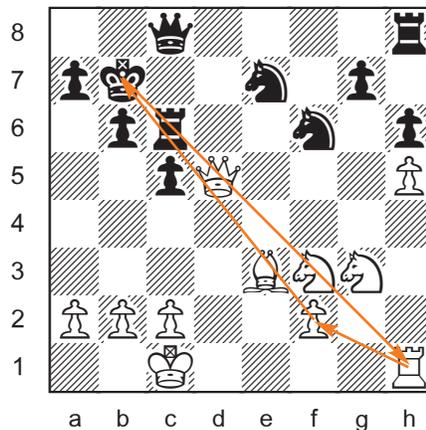
$Kb7 \rightarrow f3$   $Nf3 \rightarrow f6$   $Nf6 \rightarrow b7$

As in most cyclotrons, the black king journeys to his fate.

The cycle  $Kb7 \rightarrow c1$   $Kc1 \rightarrow c3$   $Nc3 \rightarrow b7$  is an illegal double check. The same applies to problems 74, 75, and 76.



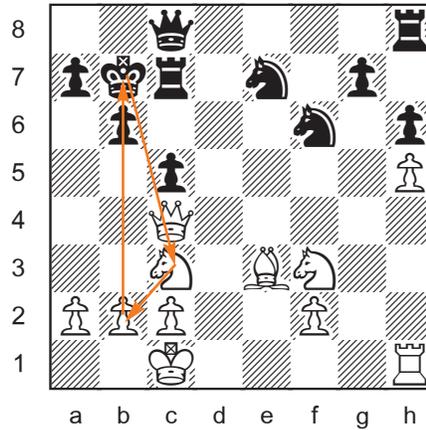
## Cyclotron 75



$Kb7 \rightarrow h1$   $Rh1 \rightarrow f2$   $f2 \rightarrow b7$

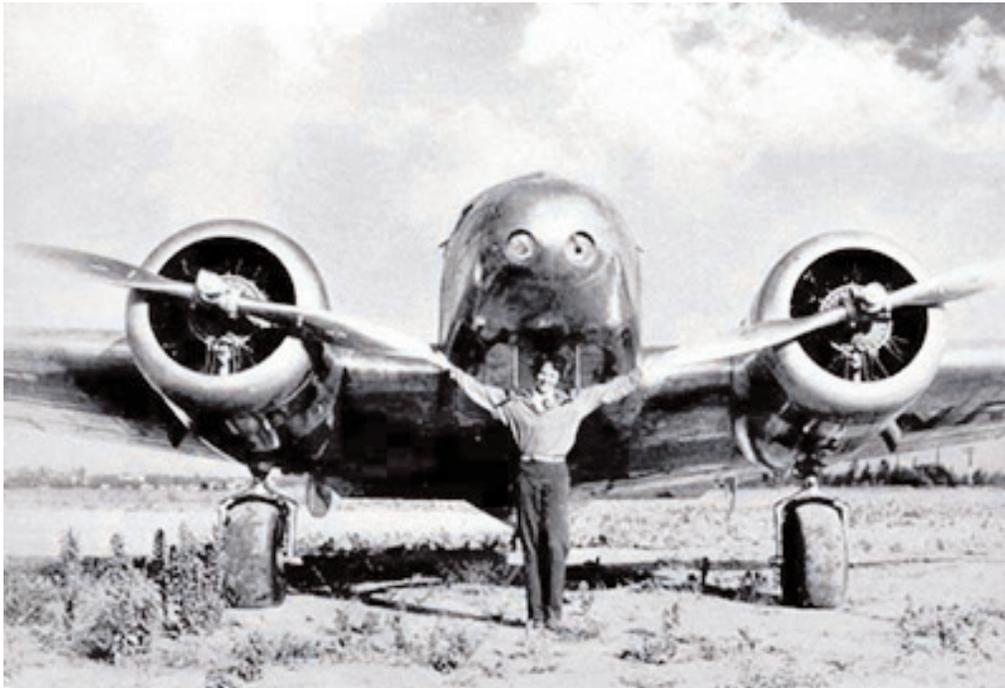
Another royal visit to the 1st rank.

## Cyclotron 76



$b2 \rightarrow b7$   $Kb7 \rightarrow c3$   $Nc3 \rightarrow b2$

The knight cycles to defend the queen.



### Quotes from the Heart by the Queen of the Air

*“Courage is the price that life exacts for granting peace, the soul that knows it not, knows no release from little things.”*

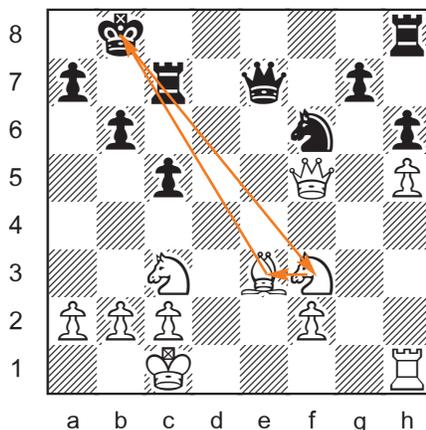
*“Decide whether or not the goal is worth the risks involved. If it is, stop worrying.”*

*“Women, like men, should try to do the impossible. And when they fail, their failure should be a challenge to others.”*

*“Never interrupt someone doing something you said couldn’t be done.”*



## Cyclotron 78



Kb8→f3 Nf3→e3 Be3→b8

The knight shifts one square left to guard g2.

Cycles involving Kb7→h5 are all illegal double checks.



From a letter written in New Guinea a few days before she and navigator Fred Noonan vanished en route to Howland Island.

*“Not much more than a month ago, I was on the other shore of the Pacific, looking westward. This evening, I looked eastward over the Pacific. In those fast-moving days, which have intervened, the whole width of the world has passed behind us, except this broad ocean. I shall be glad when we have the hazards of its navigation behind us.”*