

Algorithms used in the solution:

A : R U R U R U' R' U' R' U' [= J from (\*)]

A': U R U R U R' U' R' U' R' (The reverse version of A) [= J' from (\*)]

Â : L' U' L' U' L' U L U L U (The mirror version of A) [= K from (\*)]

Â': U' L' U' L' U' L U L U L (The reverse version of Â) [= K' from (\*)]

C : R' D' R D

C': D' R' D R (The mirror version of C)

G : R U R' U'

G': U R U' R' (The mirror version of G)

E : R B<sup>4</sup> R'

Ê : L' B<sup>4</sup> L (The mirror version of E)

W : (R<sup>4</sup> U R<sup>4</sup> U')<sup>3</sup> [= W from (\*)]

CC: short for counterclockwise in descriptions

CW: short for clockwise in descriptions

1. Solve the Edges/Centers:

A: swaps FL and F, as well as B and BD

Â: swaps FR and F, as well as B and BD

A Â: 3-Cycles FR -> F -> FL

Â A: 3-Cycles FL -> F -> FR

W : FR and BL, as well as F and B (\*)

F R' W R F': swaps U and LB, as well as FL and BD (\*)

2. Rotating the Edges:

Variants of the following algorithm:

X = B: Turns the edge 90° CC

X = B': Turns the edge 90° CW

x = B2: Turns the edge 180°

A R4 X R4 A R4 X' R4: turns the FL edge

Â R4 X R4 Â R4 X' R4: turns the FR edge

### 3. Positioning the Gears:

A2 E A'2 E: 3-Cycles LF -> FR -> DL

E A2 E A'2: 3-Cycles LF -> DL -> FR

Â2 Ê Â'2 Ê: 3-Cycles RF -> FL -> DR

Ê Â2 Ê Â'2: 3-Cycles RF -> DR -> FL

A2: 3-Cycles LF -> FL -> FR, as well as DB -> BD -> BU

A'2: 3-Cycles LF -> FR -> FL, as well as DB -> BU -> BD

Â2: 3-Cycles RF -> FL -> FR, as well as DB -> BD -> BU

Â'2: 3-Cycles RF -> FR -> FL, as well as DB -> BU -> BD

### 4. Rotating the Gears:

C4 D A2 Â'2 D' C'4 D Â2 A'2 D': Turns the FL gear 90° CC and the FR gear 90° CW (\*)

C8 D A2 Â'2 D' C'8 D Â2 A'2 D': Turns the FL and FR gear 180° each (\*)

G4 A2 E A'2 E G'4 E A2 E A'2: Turns the LF gear 90° CW and the FR gear 90° CC

G'4 A2 E A'2 E G4 E A2 E A'2: Turns the LF gear 90° CC and the FR gear 90° CW

G8 A2 E A'2 E G'8 E A2 E A'2: Turns the LF and FR gear 180° each

This Solution was mainly taken from [https://youtu.be/h2gFN2fUjyw?si=Tx\\_pfsfr95ZM9dFB](https://youtu.be/h2gFN2fUjyw?si=Tx_pfsfr95ZM9dFB) and expanded with backwards/mirror versions of algorithms

Some algorithms were also taken from

<https://docs.google.com/document/d/1I09a6xbzKWGQb7jY3yRpnsV-4QXyYQWsbNOzY1adAHc/edit?usp=sharing> [They are marked with (\*)]