

Andy Klise's Speedcubing Guide

Algorithms by Dan Harris and Erik Akkersdijk

First 2 Layers

You must solve the cross first. It can be done in 6 moves or less ~82% of the time and ≤7 moves 99.95% of the time. These are just optimal example solves; F2L should be solved intuitively.

Easy Cases (1-4)



U (R U' R')
Use (R' F R F') if no U face edges are oriented properly on final slot



y' (R' U' R)
Note - this image is blue and red because a cube rotation is required

y' U' (R' U R)
Use (F R' F' R) if no U face edges are oriented properly on final slot

(R U R')
Note - this image is green and red because no cube rotation is required

Reposition Edge (5-8)



(U' R U R') U² (R U' R')



U' (R U² R') U² (R U' R')

y' (U R' U' R) U² (R' U R)
d (R' U' R) U² (R' U R)
Note - (y' U) and (d) are interchangeable

y' U (R' U² R) U² (R' U R)
d (R' U² R) U² (R' U R)

Reposition Edge and Flip Corner (9-14)



y' U (R' U' R U') (R' U' R)
y² U' (L U') d' (L' U' L)

U' (R U R' U) (R U R')



U' (R U² R') y' U (R' U' R)

y' U (R' U² R) d' (R U R')
(R U' R' U) (R U' R') U² (R U' R') *
R' U² R² U R² U R



y' U (R' U R U') (R' U' R)
d (R' U R U') (R' U' R)

U' (R U' R' U) (R U R')

Split Pair by Going Over (15-18)



y' (R' U R U') y U' (R U R')
(R U R') U² (R U' R' U) (R U' R') *
y (L' U' L) U² y (R U R')

(R U' R' U) y' U (R' U' R)
(R U' R') U² (F' U' F)



(R U² R') U' (R U R')

y' (R' U² R) U (R' U' R)

Pair Made on Side (19-22)



U (R U² R') U (R U' R')

y' U' (R' U² R) U' (R' U R)



U² (R U R' U) (R U' R')

y' U² (R' U' R U') (R' U R)

Weird (23-24)



(R U R' U') U' (R U R' U') (R U R')
U² R² U² (R' U' R U') R²

y' (R' U' R U) U (R' U' R U) (R' U' R)
y' U² R² U² (R U R' U) R²

Corner in Place, Edge in U Face (25-30)



y U' (L' U L) d (R U' R')
(R U' R' U') (R U' R' U) (R U R')
R' F' R U (R U' R') F
U' (F' U F) U (R U' R')

U (R U' R') y U' (L' U L)
U (R U' R') U' (F' U F)
Note - (y U') and (d') are interchangeable



(R U' R' U) (R U' R')

y' (R' U R U') (R' U R)
(R U' R') U² (F' U F)



y' (R' U' R U) (R' U' R)

(R U R' U') (R U R')

Edge in Place, Corner in U face (31-36)



(R U' R') y' U (R' U R)
(R U' R' U) (F' U F)

(R U R' U') (R U R' U') (R U R')



(U' R U' R') U² (R U' R')
y U' (L U' L') U² (L U' L)

U' (R U² R') U (R U R')
U (R U R') U² (R U R')
d (R' U R) U² (R' U R)



(U' R U R') y' (U R' U' R)
U² (R U' R') U' (F' U' F)

y' (U R' U' R) y (U' R U R')
y U² (L' U L) U (F U F')

Edge and Corner in Place (37-42)



Solved Pair

(R U' R') d (R' U² R) U² (R' U R)
(R U R') U² (R U² R') d (R' U' R)



(R U' R') U' (R U R') U² (R U' R')
y (L' U' L) U² (L' U L U') (L' U' L)

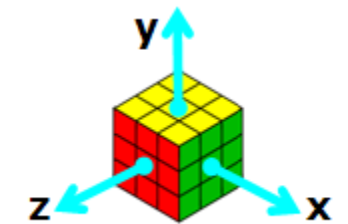
(R U' R' U) (R U² R') U (R U' R')
(R U R') U² (R U' R' U) (R U R')



(R U' R' U) y' (R' U' R U') (R' U' R)
y (L' U' L U) (L' U L) U² (F U F')

(R U' R' U) d (R' U' R U') (R' U R)
(R U R' U') (R U' R') U² (F' U' F)

Color Coding
Green = R U R' U' Family
Blue = R U R' U R U² R' Family
Orange = R F' R' F Family



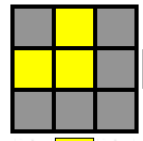
Credits

Dan Harris - <http://www.cubestation.co.uk/>
Erik Akkersdijk - <http://www.erikku.110mb.com>
Nathan Christie - <http://my.fit.edu/~dchristi/cube/>
Joël van Noort - <http://solvethecube.110mb.com/>
Josef Jelinek - <http://software.rubikscube.info/icube/>
And everyone else

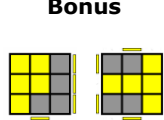
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<http://www.kungfoomanchu.com/>

Orient Last Layer (Two Look)

Step 1

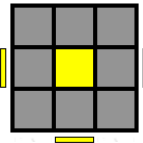


$F U (R U' R') F'$
 $y^2 f (R U R' U') f'$
 Probability = 1/2



Bonus

$F (R U R' U') F'$
 Probability = 1/4



$F (R U R' U') F' f (R U R' U') f'$
 $(R' F R F') U^2 (R' F R F^2) U^2 F$
 Probability = 1/8

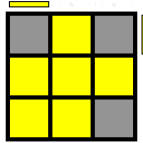


Move to Second Look
 Probability = 1/8

Orient Last Layer (Two Look)

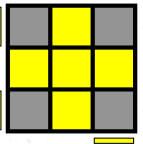
Step 2

All Edges Oriented Correctly



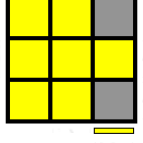
$(R U R' U R U^2 R')$
 $y' (R' U^2 R U R' U R) **$
 Probability = 4/27

$(R' U' R U' R' U^2 R)$
 $y' (R U^2 R' U' R U' R')$
 Probability = 4/27



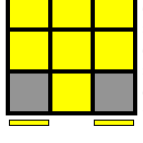
$R U^2 R^2 U' R^2 U' R^2 U^2 R$
 Probability = 4/27

$(R U R' U)(R U' R' U)(R U^2 R')$
 $y R U^2 R' (U' R U R')(U' R U' R')$
 Probability = 2/27



$x (R' U')(L U)(R U')(L' U)$
 $y x' (R U R') D (R U' R') D' x$
 Probability = 4/27

$(R' F)(R B')(R' F')(R B)$
 $y^2 x' D (R U R') D' (R U' R') x$
 $x (R' U R) D' (R' U' R) D$
 Probability = 4/27



$(R^2 D)(R' U^2)(R D')(R' U^2 R')$
 $y^2 (R^2 D')(R U^2)(R' D)(R U^2 R)$
 Probability = 4/27

Solved
 Probability = 1/27

Notation



R



R'



R²



r/Rw



r'/Rw'



x



y



U



U'



U²



u/Uw



u'/Uw'



z



M



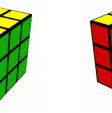
F



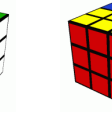
F'



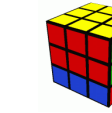
L



L'



B



B'



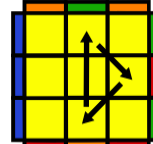
D

D'

Permute Last Layer

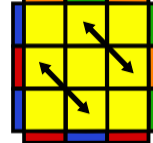
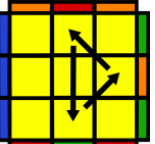
* - indicates a faster alg. If this is included, then the previous alg is easier to learn

Permutations of Edges or Corners Only



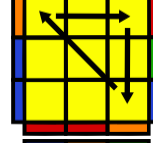
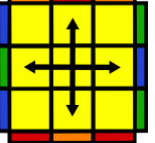
$R^2 U (F B') R^2 (F' B) U R^2$
 $y (R^2 U)(R U R' U')(R' U')(R' U R') *$
 $y (M^2 U' M) U^2 (M' U' M^2)$
 Ub - Probability = 1/18

$R^2 U' (F B') R^2 (F' B) U' R^2$
 $y' (R^2 U')(R' U' R' U)(R U)(R U' R) *$
 $y (M^2 U' M) U^2 (M' U' M^2)$
 Ua - Probability = 1/18



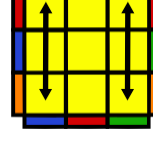
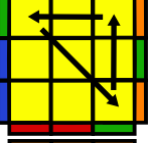
$x' F (R U' R' U)(D R')(D U')(R' U R) D^2$
 $(R' U' R U) R U (R U' R' U) R U R^2 U' R' (U^2) *$
 $y (M^2 U' M') U^2 M^2 U^2 (M' U' M^2)$
 Z - Probability = 1/36

$(M^2 U' M^2) U^2 (M^2 U' M^2)$
 $(R' M^2 R) U' (R' M^2 R) U^2 (R' M^2 R) U' (R' M^2 R)$
 H - Probability = 1/72



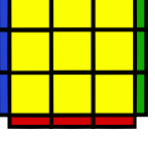
$x (R' U R') D^2 (R U' R')(D^2 R^2)$
 Aa - Probability = 1/18

$x (R^2 D^2)(R U R') D^2 (R U' R)$
 Ab - Probability = 1/18

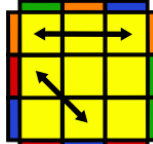


$x' (R U' R') D (R U R') D' (R U R') D (R U' R') D'$
 $R^2 U R' y (R U' R' U)*3 y' R U' R^2 *$
 $x' (R U' R') D (R U R') U^2 (R' U R) D (R' U' R)$
 E - Probability = 1/36

Solved
 Probability = 1/72

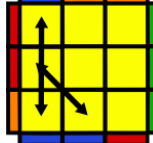
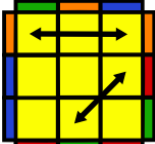


Swap One Set of Adjacent Corners



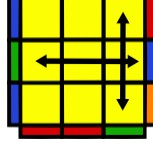
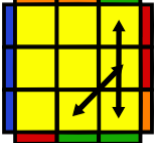
$(L U^2)(L' U^2)(L F')(L' U' L U)(L F L^2 U)$
 $z (U R^2)(U' R^2)(U F')(U' R' U R)(U F U^2 R) *$
 $y (R U' R' U')(R U R) D (R' U' R) D' (R' U^2 R')(U')$
 Ra - Probability = 1/18

$(R' U^2)(R U^2)(R' F)(R U R' U')(R' F' R^2 U')$
 Rb - Probability = 1/18



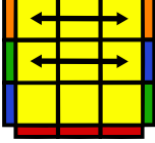
$(R U')(L' U)(R' U^2)(L U')(L' U^2) L$
 $y^2 (R' U^2 R) U z D' (R^2 U)(R' D R U) z' *$
 Ja - Probability = 1/18

$(L' U)(R U')(L U^2)(R' U)(R U^2) R'$
 $(R U R' F')(R U R' U')(R' F)(R^2 U')(R' U' R) *$
 Jb - Probability = 1/18

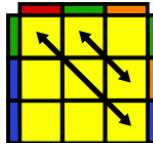


$(R U R' U')(R' F)(R^2 U')(R' U' R U) R' F'$
 T - Probability = 1/18

$(R' U R U') R^2 y' (R' U' R U) y x (R U R' U') R^2 B'$
 $y (R' U' F')(R U R' U')(R' F)(R^2 U')(R' U' R U) R' U R *$
 $y^2 (R' U^2 R') d' (R' F')(R^2 U' R' U)(R' F)(R U) F$
 F - Probability = 1/18

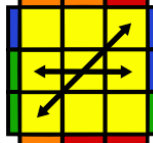


Swap One Set of Corners Diagonally



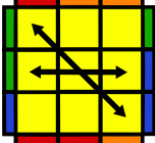
$(R' U R' U') y (R' F')(R^2 U')(R' U R' F)(R F)$
 $(R' U R' U') x^2 y' (R' U R' U') I (R U' R' U) R U$
 V - Probability = 1/18

$F (R U')(R' U' R U)(R' F')(R U R' U')(R' F R F')$
 $F R U (R U^2 R')(L' U R U')(L U^2)(R^2 F')$
 Y - Probability = 1/18



$[(L U') R U^2 (L' U) R'] * 2 U'$
 $z (R' U R') D (R^2 U' R)(U D')(R' D R^2 U' R D') *$
 Na - Probability = 1/72

$[(R' U) L' U^2 (R U') L] * 2 U$
 $(R' U R U')(R' F' U')(F R U)(R' F R' F')(R U' R) *$
 Nb - Probability = 1/72

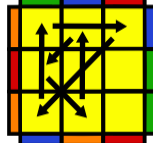


Double Spins



$(R^2 u)(R' U R' U')(R u') R^2 y' (R' U R)$
 Ga - Probability = 1/18

$(L^2 u')(L U' L U)(L' u) L^2 y' (R U' R')$
 $y^2 (R^2 u')(R U' R U)(R' u) R^2 y (R U' R')$
 Gc - Probability = 1/18



$(R U R') y' (R^2 u')(R U' R' U)(R' u) R^2$
 Gd - Probability = 1/18

$(L' U' L) y (L^2 u)(L' U' L U)(L u') L^2$
 $y^2 (R' U' R)(U D')(R^2 U)(R' U R U')(R U') R^2 D U' *$
 $(L' U' L) y' (R^2 u)(R' U R U')(R u') R^2$
 Gb - Probability = 1/18

