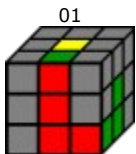


Speedcubing Fridrich-Algorithmen

First Two Layers (F2L) 1/2:

Ecke richtig
im Slot ->



U R U R' U' F' U' F,
U R U' R' U' F'

02



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

03



R U' R' d R' U2 R
U2 R' U R

04



R U2 R U R' U R U2 R2

Ecke im Slot
und weiß rechts ->

05



R U R' U' R U' R' U2
y' R' U' R

06



R U R' U' R U R'

07



F' U F U' F' U F

Ecke im Slot
und weiß vorn ->

08



F' U' F U2 F' U F
U' F' U' F

09



F' U' F U F' U F
U2 R U R'

10



F' U' F U F' U' F

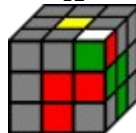
11



R U' R' U R U' R'

Weiß nach oben ->

12



R U R' U' R U R' U' R U R'

13



R U' R B' R' B R',
R U' R' U F'

14



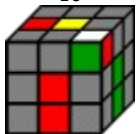
U R U2 R' U R U' R'

15



F' U F U2 F' U' F

16



R U' R' U2 R U R'

17



U' F' U2 F U' F' U F

18



F' U2 F U F' U' F

19



R' U' F' U F R F' U F

20

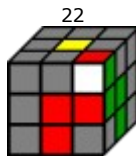


R U2 R' U' R U R'

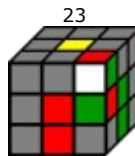
First Two Layers (F2L) 2/2:



F U R U' R' F' R U' R'



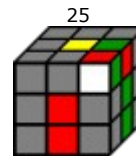
U' F' U' F U2 F' U' F,
U' R U' R' U2 R U



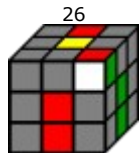
U' R U R' U F' U' F,
U2 R U' R' U' F'



U R U' R'



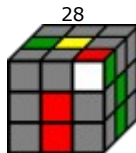
F U2 F2 U' F2 U' F',
(!F-L: F U2 F2 U' F')



U' R U R' U2 R U' R',
(!F-L: F U F' U R U' R')



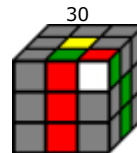
U' R U' R' U F' U' F,
(!F-L: F U' F2 U' F)



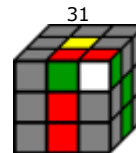
F U' F'



U' R U2 R' U2 R U' R'

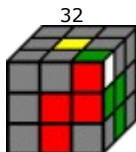


d' R' U R U' R' U' R



F' U F U2 R U R'

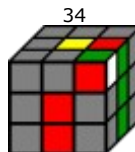
Weiß nach rechts ->



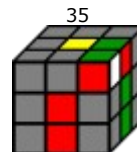
U R U R' U2 R U R'



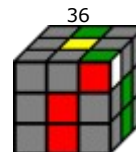
U2 F' U F U R U R'



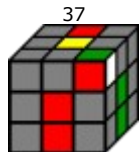
U' R U' R' U R U R'



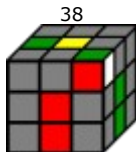
R U' R' U2 F' U' F



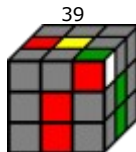
d R' U2 R U2 R' U R



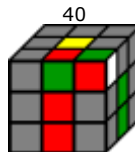
R U R'



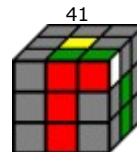
d' R' U' R U2 R' U R



d' R' U R d R U R'



R' U2 R2 U R2 U R
(+ [R' U R]
wenn F-B gefüllt)

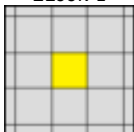


U' F' U F

Orientation of Last Layer (OLL) 1/4:

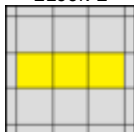
2Look OLL ->

2Look 1



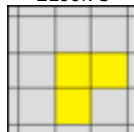
OLL2L 2+3

2Look 2



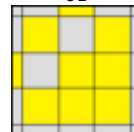
F R U R' U' F'

2Look 3



Fw R U R' U' Fw'

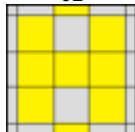
01



(M' U M) U2 (M' U M)

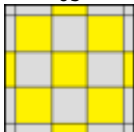
Alle Ecken richtig ->

02



(R U R' U')
(M' U R U') Rw'

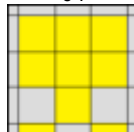
03



Rw' (R U) (R U R' U' Rw2)
(R'2 U) (R U') Rw'

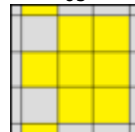
Alle Kanten richtig ->

04



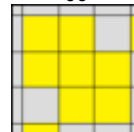
(R'2 D) (R' U2)
(R D') (R' U2 R')

05



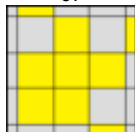
(Rw U R' U') (L' U R U')

06



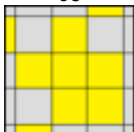
F' (Rw U R' U') (L' U R)

07



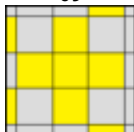
(R U R') U (R U2 R')

08



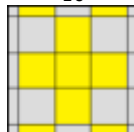
y' R U2 R' U' R U' R'

09



(R U2) (R'2 U') (R'2 U')
(R'2 U'2 R)

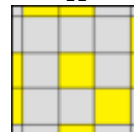
10



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

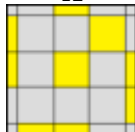
Keine Kante richtig ->

11



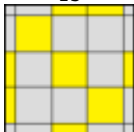
Fw (R U R' U') Fw' U'
F (R U R' U') F'

12



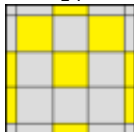
Fw (R U R' U') Fw' U F
(R U R' U') F'

13



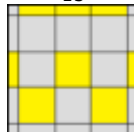
(R U R' U) (R' F R F')
U2 (R' F R F')

14



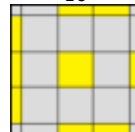
(R' U2) F (R U R' U')
y' (R'2 U2) (R B)

15



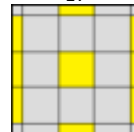
F (R U R' U) y' (R' U2)
(R' F R F')

16



F (R U R' U') S
(R U R' U') Fw'

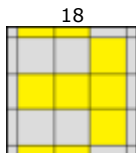
17



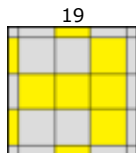
(R U) B' (Lw U
[Lw' R'] U') (R' F R F')

Orientation of Last Layer (OLL) 2/4:

T-Muster ->

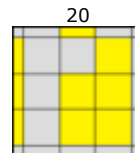


$(R\ U\ R'\ U')\ (R'\ F\ R\ F')$

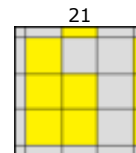


$F\ (R\ U\ R'\ U')\ F'$

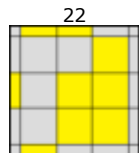
P-Muster ->



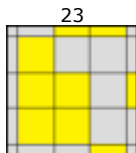
$Fw\ (R\ U\ R'\ U')\ Fw'$



$Fw'\ (L'\ U'\ L\ U)\ Fw$

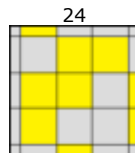


$(R\ Dw)\ (L'\ Dw')\ (R'\ U)\ (Lw\ U\ Lw')$

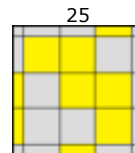


$(L'\ Dw')\ (R\ Dw)\ (L\ U)\ (Rw'\ U'\ Rw)$

W-Muster ->

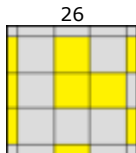


$(R\ U\ R'\ U)\ (R\ U'\ R'\ U')\ (R'\ F\ R\ F')$

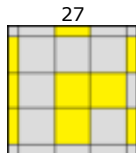


$(L'\ U'\ L\ U')\ (L'\ U\ L\ U)\ (L\ F'\ L'\ F)$

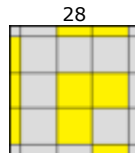
L-Muster ->



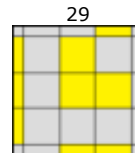
$(Rw\ U)\ (R'\ U)\ (R\ U')\ (R'\ U)\ (R\ U'2\ Rw')$



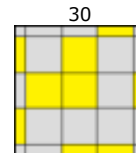
$(Rw'\ U')\ (R\ U')\ (R'\ U)\ (R\ U')\ (R'\ U'2\ Rw)$



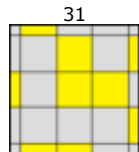
$(R\ B'\ R\ B\ R'2)\ U'2\ (F\ R'\ F'\ R)$



$(R'\ F\ R'\ F'\ R'2)\ U'2\ y\ (R'\ F\ R\ F')$

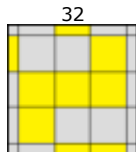


$F\ (R\ U\ R'\ U')\ (R\ U\ R'\ U')\ F'$

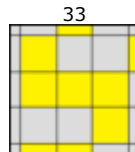


$F'\ (L'\ U'\ L\ U)\ (L'\ U'\ L\ U)\ F$

Großer Blitz-Muster ->



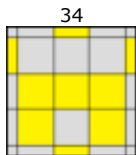
$(R\ B')\ (R'\ U'\ R\ U)\ y\ (R\ U')\ F'$



$(L'\ B)\ (L\ U\ L'\ U')\ y'\ (L'\ U)\ F$

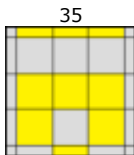
Orientation of Last Layer (OLL) 3/4:

C-Muster ->

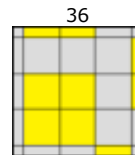


$(R\ U\ R'2\ U')\ (R'\ F)$
 $(R\ U)\ (R\ U')\ F'$

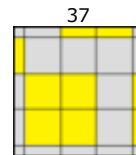
Quadrat-Muster ->



$B'\ (R'\ U'\ R)\ y\ (R\ U')$
 $(R'\ U2\ R)$

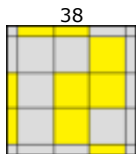


$B'\ (R'2\ F)\ (R\ F'\ R\ B)$

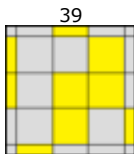


$(Lw\ U2)\ (L'\ U'\ L\ U'\ Lw')$

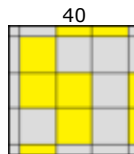
**Kleiner
Blitz-Muster ->**



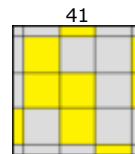
$(Lw\ U\ L'\ U)\ (L\ U'2\ Lw')$



$F\ (R\ U\ R'\ U')\ F'$
 $U\ F\ (R\ U\ R'\ U')\ F'$

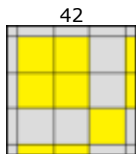


$(Rw'\ U'\ R\ U')\ (R'\ U2\ Rw)$

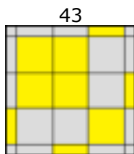


$F'\ (L'\ U'\ L\ U)\ F\ U\ F$
 $(R\ U\ R'\ U')\ F'$

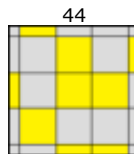
Fisch-Muster ->



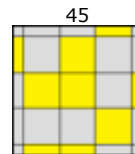
$F\ (R\ U')\ (R'\ U'\ R\ U)$
 $(R'\ F')$



$(L\ U'2)\ (L'2\ B)$
 $(L\ B'\ L\ U'2\ L')$

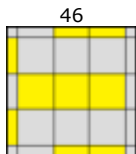


$(L\ U\ L')\ yx\ (L'\ U)$
 $(L\ F')\ (L'\ U'\ L)$

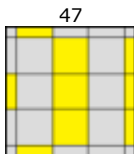


$(R'\ U'\ R)\ y'x'\ (R\ U')$
 $(R'\ F)\ (R\ U\ R')$

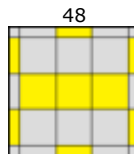
I-Muster ->



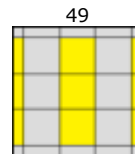
$Fw\ (R\ U\ R'\ U')$
 $(R\ U\ R'\ U')\ Fw'$



$(R\ U\ R'\ U\ R\ Dw')$
 $(R\ U'\ R'\ F')$



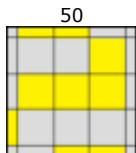
$F\ (R\ U\ R'\ U'\ R)\ y'\ (R'\ F)$
 $(R\ B')\ (R'\ F')$



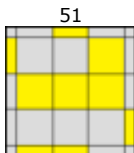
$(R'\ U2)\ (R'2\ U)\ (R'\ U)$
 $(R\ U'2)\ x'\ (U'\ R'\ U)$

Orientation of Last Layer (OLL) 4/4:

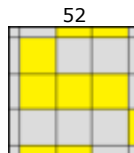
Kick-Muster ->



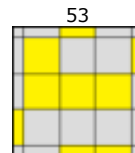
$x' (R U' R' F') (R U R')$
 $x y (R' U R)$



$(Rw U Rw') (R U R' U')$
 $(Rw U' Rw')$

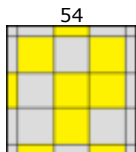


$x' (L' U L F) (L' U' L)$
 $x y' (L U' L')$

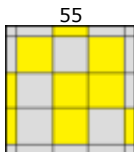


$(Lw' U' Lw) (L' U' L U)$
 $(Lw' U Lw)$

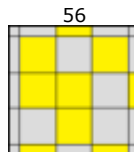
Ungünstige Muster ->



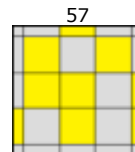
$(R U') (R' U2) (R U)$
 $y (R U') (R' U' F')$



$(R'2 U R' B') (R U')$
 $(R'2 U) (Lw U Lw')$



$(L' U) (L U'2) (L' U')$
 $y' (L' U) (L U F)$

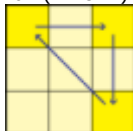


$(L2 U' L B) (L' U)$
 $(L2 U') (Rw' U' Rw)$

Permutation of Last Layer (PLL) 1/2:

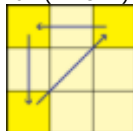
Nur Ecken:

01 (A-Perm)



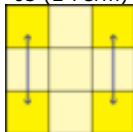
$Lw U R' D2 R U' R' D2 R2,$
 $(L' B L') (F2 L B' L') (F2 L2),$
 $R' U2 R2 U' L' U R' U' L U R' U2 R,$
 $x R' U R' D2 R U' R' D2 R2,$
 $y2 z F2 R U2 R' U2 F2 L' U2 L U2$

02 (A-Perm)



$Rw U' L D2 L' U L D2 L2,$
 $y x R2 D2 R U R' D2 R U' R,$
 $y R' U2 R U' L' U R U' L U R2 U2 R,$
 $y' z U2 L' U2 L F2 U2 R U2 R' F2,$
 $y2 z' F2 L' U2 L U2 F2 R U2 R' U2$

03 (E-Perm)

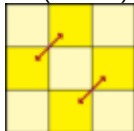


$x' R U' R' D R U R' Uw2 R' U R D R' U' R,$
 $x' R U' R' D R U R' D2 L' U L D L' U' L,$
 $y' z' R' F R2 U R' B' R U' R2 F' R z R B R',$
 $y x U R' U' L U R U' r2' U' R U L U' R' U,$
 $y (r' R' U') (L D' L' U L) (R U' R' D R) U$

Permutation of Last Layer (PLL) 2/3:

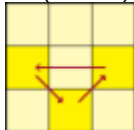
Nur Kanten:

04 (Z-Perm)



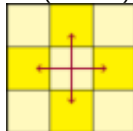
M2 U M2 U M' U2 M2 U2 M' U2,
R2 U' R2 U R2 x' U2 R2 F U2 F' R2 U2,
y R' U L' E2 L U' R L' U R' E2 R U' L',
y U' l' U R U' D' R U D' R U' R' D2,
y F2 M2 F2 M2 U M2 U M2 U2

06 (U-Perm)



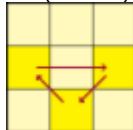
R U' R U R U R U' R' U' R2,
M2 U M U2 M' U M2,
y2 M2 U M' U2 M U M2,
y2 B2 U' M' U2 M U' B2,
y' R2 U' y r U2 r' R U2 R' y' U' R2

05 (H-Perm)



M2 U M2 U2 M2 U M2,
R2' r2 U' L2 l2' U2 R2' r2 U' L2 l2',
F2 M2 F2 U' F2 M2 F2 U,
x U2 M2 U2 B' U2 M2 U2 B,
R U2 R' U' R' U' R2 U' R2 U2 R2 U2 R' U,
L R U2 x U' D' x' y U2

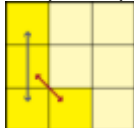
07 (U-Perm)



R2 U R U R' U' R' U' R' U' R',
M2 U' M U2 M' U' M2,
y2 M2 U' M' U2 M U' M2,
y2 R' U R' U' R' U' R' U' R U R2,
y2 L' U' L U R U R' U2 L' U L U R U R'

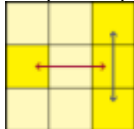
2 gegenüberliegende Ecken und 2 Kanten:

08 (L-Perm)



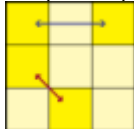
L' U' L F L' U' L U L F' L2 U L U,
R U' L' U R' U2 L U' L' U2' L,
y2 R' U2 R U R' z' R2' U R' D R U',
y2 F2 L' U' r U2 l' U R' U' R2,
y R' U L' U2 R U' R' U2 L R U'

10 (T-Perm)



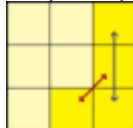
R U R' U' R' F R2 U' R' U' R U R' F',
F R U' R' U R U R2 F' R U R' U' R',
R2 U R2' U' R2 U' D R2' U' R2 U R2' D',
R2' u' R2 U R2' y R2 u R2' U

12 (R-Perm)



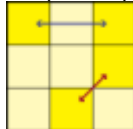
L U2 L' U2 L F' L' U' L U L F L2 U,
z U R2 U' R2 U F' U' R' U R U F U2 R,
y2 R U2 R' U2 R B' R' U' R U R B R2' U,
y2 R U R' F' R U2 R' U2 R' F R U R U2 R' U,
y R U2 R' U' (R' F' R) U2 R U2 R' F R U' R' U

09 (J-Perm)



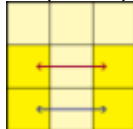
R U R' F' R U R' U' R' F R2 U' R' U',
R U2 R' U' R U2 L' U R' U' L,
L' U R' U2 L U' L' U2 R L,
y2 R L U2 L' U' L U2 R' U' L' U',
y2 r2 U' L' U' U' U2 R B' R' U2

11 (R-Perm)



R' U2 R U2 R' F R U R' U' R' F' R2 U',
R' U2 R U' y' R' F R B' R' F' R z x' R' U R',
y2 R' U2 l R U' R' U' U2' R F R U' R' U' R U R' F',
y R2 B2 U' R' U' R U R U B2 R U' R U

13 (F-Perm)

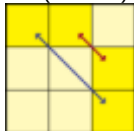


R U' R' U R2 y R U R' U' F' Dw R2 F R F',
y' U R U' R' U R2 y R U R' U' x U' R' U R U2,
(yz) R U R' U' R U2 (z'y') R U R' U' (yx) L' U' L U L2,
y2 R' U R U' R2' F' U' F U R U' x' R2 U' R' U,
y' R U R' U R U2 R2 U' R U' R' U2 R U r U R' U' L' U R U'

Permutation of Last Layer (PLL) 3/3:

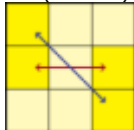
2 diagonale Ecken und 2 Kanten:

14 (V-Perm)



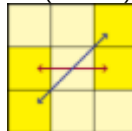
$R' U R' Dw' x Lw' U R' U' Lw R U' R' U R U,$
 $R' U R' U' y' x R' U' R2 x' U' R' U R' F R F,$
 $R' U R' U' y R' F' R2 U' R' U R' F R F,$
 $y2 R U' L' U R' U' R U' L U R' U2 L' U2 L,$
 $y L' U R U' L U L' U R' U' L U2 R U2 R'$

16 (N-Perm)



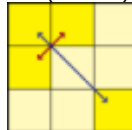
$L' U L U' Rw' U' F' U L F L' U L' U' Rw U' L,$
 $z U' R D' R2' U R' (U' D) R D' R2 U R' D R',$
 $L' U R' U2' L U' L' R U R' U2' L U' R U',$
 $R' U R U' R' F' U' F R U R' F R' F' R$

15 (N-Perm)



$R U' R' U Lw U F U' R' F' R U' R U Lw' U R',$
 $L U' L' U L F U F' L' U' L F' L F L' U L',$
 $F' R U R' U' R' F R2 F U' R' U' R U F' R',$
 $L U' R U2 L' U R' L U' R U2 L' U R' U',$
 $y' L U' R U2 L' U R' L U' R U2 L' U R' U$

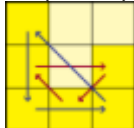
17 (Y-Perm)



$F R U' R' U' R U R' F' R U R' U' R' F R F',$
 $R2 U' R' U R U' z' y' L' U' R U' R' U' L U y z,$
 $F R' F' R U R U' R2 U' R U L U' R' U,$
 $R' F R F' y' U' R' U R2 U R' U' R' F R F' U',$
 $z U2 R U R' U' R y R U L' U L U R$

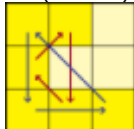
3 Ecken und 3 Kanten:

18 (G-Perm)



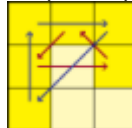
$R2 Uw' R U' R U R' Uw R2 y R U' R',$
 $y' R U R' F2 D' L U' L' U' L' D F2,$
 $y' L' R' U2 L R (y) L U' R U2 L' U' R' U2$

20 (G-Perm)



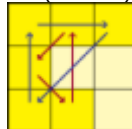
$R' U' R y R2 Uw' R U' R U' R Uw' R2,$
 $R' U' R B2 D L' U L U' L D' B2,$
 $y L' U' L y' R2' u R' U R U' R u' R2$

19 (G-Perm)



$R2 Uw R' U R' U' R Uw' R2 y' R' U R,$
 $y' R2' u R' U R' U' R u' R2 y' R' U R,$
 $y' R L U2 R' L' (y') R' U L' U2 R U' L$

21 (G-Perm)



$R U R' y' R2 Uw' R U' R' U R' Uw R2,$
 $F2 D' L U' L U L' D F2 R U' R',$
 $y (R' F' R F') (U' L' U) (F R' F' L F2 R)$

Notation:

Normale Bewegungen:



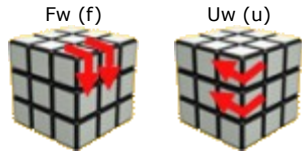
Inverse Bewegungen:

Schreibweisen: F' (F inverse (o. F prime))



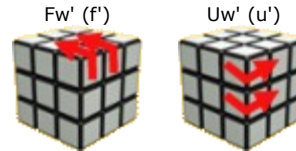
Doppelebenen-Bewegungen:

Schreibweisen: Fw (Front two layers), f (Front two layers)

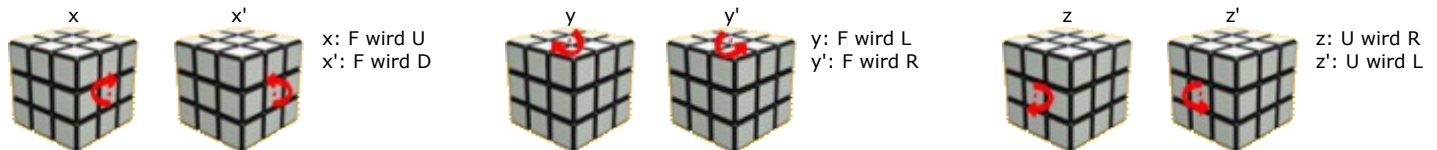


Inverse Doppelebenen-Bewegungen:

Schreibweisen: Fw' (Front two layers inverse), f' (Front two layers inverse)



Komplette Würfelbewegungen:



Doppelte Bewegungen:

Schreibweisen: F2 (F double), F'2 (F inverse double), Fw2 (Front two layers double), Fw'2 (Front two layers inverse double)

Erklärung: Ebene wird zwei mal gedreht (180°); Richtung spielt keine Rolle, wird jedoch wegen vereinfachter Fingerbewegungen oft mitgeschrieben.

