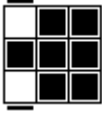
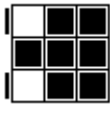
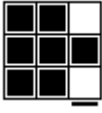
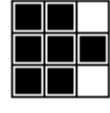
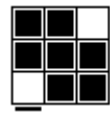
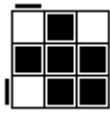
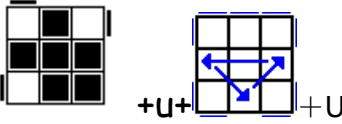
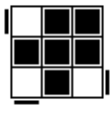
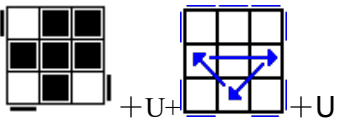
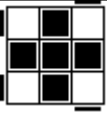
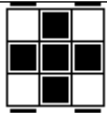
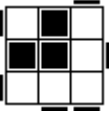
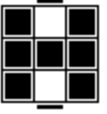
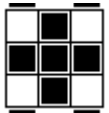
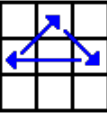
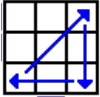
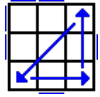
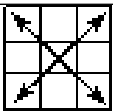
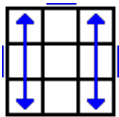


两角翻	顶层相邻两角		$(R\ U\ R'\ U\ R\ U^2\ R')(L'\ \underline{U}'\ L\ U'\ L'\ U^2\ L)$	2 1
			$(L'\ U^2\ L\ U\ L'\ U\ L)(R\ U^2\ R'\ \underline{U}'\ R\ \underline{U}'\ R')$	1 2
			$(L'\ U'\ L\ U'\ L'\ U^2\ L)\ (R\ U\ R'\ U\ R\ U^2\ R')$	4 3
			$(R\ U^2\ R'\ \underline{U}'\ R\ \underline{U}'\ R')(L'\ U^2\ L\ U\ L'\ U\ L)$	3 4
	顶层相对两角		$Z'\ (R\ U\ R'\ \underline{U}')\times 2\ L^2\ (U\ R\ U'\ R')\times 2\ L^2\ Z$	1 3 (去 Z 2 5)
			$Z'\ (U\ R\ U'\ R')\times 2\ L^2\ (R\ U\ R'\ U')\times 2\ L^2\ Z$	3 1 (去 Z 5 2)
	底层相邻两角		$(R\ U\ R'\ \underline{U}')\times 2\ D\ (U\ R\ \underline{U}'\ R')\times 2\ D'$	5 8
			$(U\ R\ \underline{U}'\ R')\times 2\ D\ (R\ U\ R'\ \underline{U}')\times 2\ D'$	8 5
	底层相对两角		$(R\ U\ R'\ \underline{U}')\times 2\ D^2\ (U\ R\ \underline{U}'\ R')\times 2\ D^2$	6 8
三角翻	三角顺转		$(R'U^2RUR'UR)\ U\ (RU'R\ URUR\ U'R'\underline{U}'R^2)\ U$	1 2 3
		左右手公式	$U^2+(L'U^2LUL'UL)\ U\ ' \ (RU'R\ URUR\ U'R'\underline{U}'R^2)\ U'$	
				
	三角逆转		$(RU^2R'\underline{U}'RU'R')\ U\ (R^2'URUR'\underline{U}'R'\underline{U}'R'UR')\ U$	4 1 2
		左右手公式	$(RU^2R'\underline{U}'RU'R')\ U\ (L'UL'U'L'U'L'ULUL^2)\ U$	
				

四角翻	$\begin{pmatrix} 4 & 3 \\ 1 & 2 \end{pmatrix}$		$F (R \ U \ R' \ \underline{U})^2 F^{-1} + (R \ U \ R' \ \underline{U} \ r)(R' \ U)(R \ U' \ r')$	$(4 \ 3)(1 \ 2)$
	$\begin{pmatrix} 4 & 3 \\ 2 & 1 \end{pmatrix}$		$(R \ U' \underline{U})(R' \ \underline{U} \ R \ U \ R' \ U') (R \ \underline{U} \ R') + (R' \ U \ R' \ \underline{U})(R' \ \underline{U})(R' \ U)(R \ U \ R'^2)$	$(4 \ 3)(2 \ 1)$
		 + 		
五角翻	顶层四个角块同向	1234 位顺转, 8 位逆转	$[(R \ U' \ \underline{U} \ R' \ U^2)(R \ U \ R' \ \underline{U}')] \times 2$	
		1234 位逆转, 7 位顺转	$[(R' \ U^2 \ R \ U' \ \underline{U}')(R' \ \underline{U} \ R \ U)] \times 2$	
	顶层三个角块同向	1238 位顺转, 4 位逆转	$[(R \ U \ R' \ \underline{U}')(R \ U' \ \underline{U} \ R' \ U^2)] \times 2$	
		1238 位逆转, 4 位顺转	$y' [(R' \ \underline{U} \ R \ U)(R' \ U^2 \ R \ U' \ \underline{U}')] \times 2 y$	
			 + 	

两棱翻	两相对棱		1 3	$(M'U) \times 2 \ M'U^2 \ (MU) \times 2 \ MU^2$
	两相邻棱		1 4	$(R'U^2)(R^2U \ R'U')(R'U^2) (r \ U \ R \ U') \ r'$
四棱翻	顶层十字		1 2 3 4	$(M'U) \times 4 \ (MU) \times 4$
	2,3,5,7		2,3,5,7	$(M' \ U) \times 4$

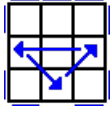
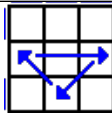
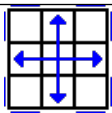
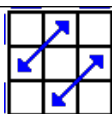
角块的 setup move 操作集为[U D F2 B2 R2 L2 x2 y z2]

同层三角换		1 3 4 1 顺	$x' R2 D2(R' \underline{U}' R) D2(R' U R')$	
		1 4 3 1 逆	$x'(R U' R) D2 (R' UR) D2 R2 x$	
同层四角换		(1 3) (2 4)	$U2 M2 U M2 U2 M2 U M2$	
		(1 2) (3 4)	$x'(R U' R' D)(R U R') u2'(R' U R) D(R' \underline{U}' R)$	
异层三角换	上层相邻两角	6→4→1→6	$(L2 D' R2 D) \times 2$	立体顺时针
	下层一角	6→1→4→6	$(D' R2 D L2) \times 2$	立体逆时针
	上层一角	2→8→5→2	$(L2 U R2 U') \times 2$	立体顺时针
	下层相邻两角	2→5→8→2	$(U R2 U' L2) \times 2$	立体逆时针
	上层相对两角	8→4→2→8	$[(R' F R F') \times 3 U2] \times 2$	
	下层一角换	8→2→4→8	$[U2 (R' F R F') \times 3] \times 2$	先到4
异层四角换	两组都是 对角换	(1 3) (5 7)	$(R' F R F') \times 3 (R F' R' F) \times 3$	斜上
面上对角换	上层对角 下层邻角	(2 4) (7 8)	$(R' UR U') (R2' UR U') (RUR U') (R2' UR U') R2'$	
	面上对角换	(1 3) (4 8)	$(R' F R F') \times 3$	

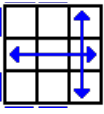
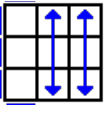
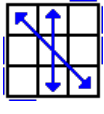
	顶和底上下换	$(5\ 7)(4\ 8)$	$(R\ F'\ R'\ F) \times 3$	
	面上邻角换	$(2\ 3)(4\ 8)$	$(R\ U\ R'\ U\ R\ U\ R'\ U^2) \times 2$	
	顶和底上下换	$(1\ 4)(3\ 7)$	$[(R'\ \underline{U}'\ R\ \underline{U}\ ')(R'\ \underline{U}'\ R\ \underline{U}'\ \underline{U}')] \times 2$	
顶层 组和 底 换 组	两组相邻	$(4\ 8)(3\ 7)$	$B(R\ U\ R'\ \underline{U}') \times 3\ B'$	
		$(1\ 5)(4\ 8)$	$R\ y'(R\ U\ R'\ \underline{U}') \times 3\ y\ R'$	
	两组相对	$(2\ 6)(4\ 8)$	$B'(R\ U\ R'\ \underline{U}') \times 3\ B$	
	前面交叉	$(1\ 8)(\ 45)$	$xU^2(M^2\ U)(M^2\ U^2)(M^2\ U)(M^2)x'$	
	一前一对	$(3\ 6)(4\ 8)$	$L^2(R'\ F\ R\ F') \times 3\ L^2$	

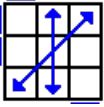
棱块 setup moves 操作集为[U D F2 B2 R L M2 E2 S2 x2 y z2]

在棱块的 setup moves 中,自由度要比角块的 setup moves 高,所以要更注意棱块的顺序,建议先 U/D, 然后 R/L, 最后是 F2/B2。

三棱换		1 4 2 逆	$(R \ U' \ R) (U \ R \ U \ R) (\underline{U}' \ R' \ \underline{U}' \ R2)$
		1 2 4 顺	$(L' \ U \ L') (U' \ L' \ U' \ L') (U \ L \ U \ L2')$
四棱换		(1 3) (2 4)	$M2 \ U \ M2 \ U2 \ M2 \ U \ M2$
		(1 4) (2 3)	$(U \ R' \ \underline{U}') (R \ \underline{U}' \ R) (U \ R \ \underline{U}') (R' \ U \ R \ U) (R2 \ \underline{U}') (R' \ U)$
异层换棱	中圈逆	$1 \rightarrow 5 \rightarrow 3 \rightarrow 1$	$M \ U2 \ M' \ U2$
	中圈顺	$3 \rightarrow 5 \rightarrow 1 \rightarrow 3$	$U2 \ M \ U2 \ M'$
	中圈	(1 3) (5 7)	$(M2' \ U2) \times 2$
	左斜切	(1 3) (0 A)	$(L2 \ U2) \times 3$
	右斜切	(1 3) (9 B)	$(R2 \ U2) \times 3$

所有涉及两角两棱换的 PLL 都能用在奇偶处理上。必须遵循 (UDF2B2R2L2)

PLL 公 式			
T 字		(3 4) (2 4)	$(R \ U \ R' \ \underline{U}') (R' \ F) (R2 \ \underline{U}' \ R' \ \underline{U}') (R \ U \ R' \ F')$
两竖		(3 4) (1 3)	$\underline{U}' (R' \ U \ R \ \underline{U}' \ R2' \ b')_x (R' \ U \ R)_y' (R \ U \ R' \ \underline{U}' \ R1)$
右下		(2 4) (1 3)	$z (R' \ U \ R') z' (RU2 \ \underline{L}' \ UR')$ $z (UR') z' (RU2 \ \underline{L}' \ UR')$

右上		$(1\ 3)\ (1\ 3)$ $3)$	$z(\underline{U}'\ R\ D')\ (R2UR'\ \underline{U}')z'\ (RUR')$ $z(R2UR')z'\ (RU')$
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