

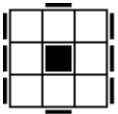
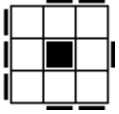
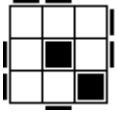
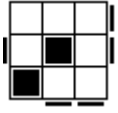
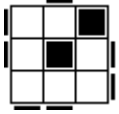
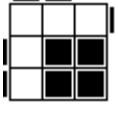
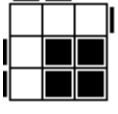
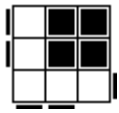
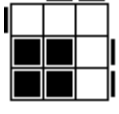
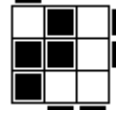
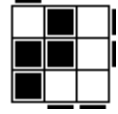
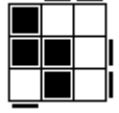
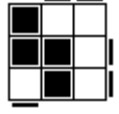
Gan's CFOP+海盗's OP 大乱战 整合版

原作者：gan & QAZZ 海盗

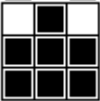
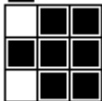
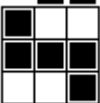
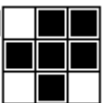
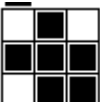
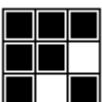
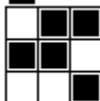
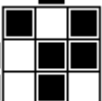
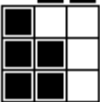
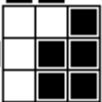
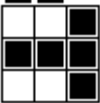
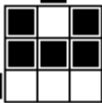
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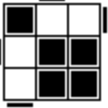
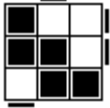
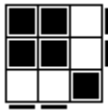
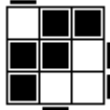
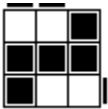
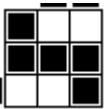
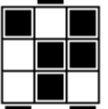
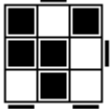
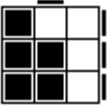
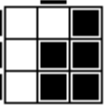
2012 年 8 月 12 日第一版(未校正)

OLL 手法

1 	1、(R U'<u>U'</u>)(R2' F R F') U2(R' F R F') 2、R'U'xUR'U'R2x'UIU'R'U 3、RU x' U'RU(xR'2)U'R'FRF'	2 	1、(F R U R' <u>U'</u> F')(f R U R' <u>U'</u> f) 2、双向：(y2) x UR'U' x' RU (R l) U'R'UF'R 3、双向：(y2)F'(L'U'LU)Ff(L'U'LU)f 4、双向：(y2) x UR'U' x' RU (R l) U'R'U x U'R' 5、(y')r'U'rU'U'R'U2RU'U'rUr
3  	1、f(R U R' <u>U'</u>)f' <u>U'</u> F(R U R' <u>U'</u>)F' 2、(y) r'R2UR'UrU'2r'UrR 3、双向：(y2)FURU'R'F'UFRUR'U'F' (r' R2 U R' U)(r U2)(r' U r R')	4 	1、f (RUR'U') f' UF (RUR'U') F' 2、R'U2xR'URU'yR'U'R'UR'F 3、双向：(y2) FU'RU'R'F'U'FRU'R'U'F' 4、(y)Rr'U'rU'2r'U'RU'R'2r
5  	1、(r' U2)(R U R'U) r 2、FRUR'U'F'U'FRUR'U'F' 1、l'U2LUL'U l 2、(y')B'R'2FRF'RB	6  	1、(r U'<u>U'</u>)(R' <u>U'</u> R U' r') 2、(y')F(R l) U'R'UR' u' 3、FRUR'U'F'U f RUR'U' f' l U2 L' U' L U' l'
7  	1、r UR' U RU'<u>U'</u> r' 2、(y2)R'U2RU'2x'RU'R'U lUL'ULU2l'	8  	1、r' <u>U'</u> RU' R' U2 r 1、l'U'LU'L'U2l 2、RU'2R'U2R'FRF'
9	1、(R' U' R) y' x' (R <u>U'</u>)(R'F)	10	1、(R U R'U)(R'FR F')(RU'<u>U'</u>R')

	(R U R') 2、RUR'U'R'FR2UR'U'F' 3、(R'U'R)y(r'U'r'U r U r') 4、双向：(y2)(L'U'L)y'(LF'L'U r Ur')		2、RUR' y R'FRU'R'F'R 3、(R U R')y'(r'U r U' r'U' r) 4、双向：(y2)f(UR'FRF')(RU'R' f') (L U L') y'(R'F R U')(R' F' R)
11 	1、r'(R2 U R' U)(R U'U' R' U)(r R') 2、(y)F'L'U'LUF y FRUR'U'F' 3、双向：(y2)rUR'UR'FRF'RU'2r'	12 	1、(r R'2 U' R U')(R' U2 R U' R)r' 2、(y)FRUR'U'F' y FRUR'U'F' 3、双向：(y2)FRUR'2FRy'R2URU'2R' F (R U R' U') y L' F (R U R' U') F'
13 	1、(r U' r' U')(r U r')(F' U F) 或者把 (F'UF) 换成 y' R'UR 2、FURU'2R'U'RUR'F'/ FURU'R2F'RURU'R' 3、双向：(y2)fRUR2U'R'URU'f' 4、双向：(y2)l U'R'F'RUR' x y R'UR l U' R' F' R U l' y R' U R	14 	1、R' F R U R' F' R (F U' F') 或者把 (F'UF) 换成 y' R'UR 2、l' U l U l' U' l F U' F' 3、双向：(y2)B'U'R'UR2BR'U'R'UR 4、双向：(y2)r' U r U r' U' r y RU'R
15 	1、(r' U' r)(R'U'R U)(r' U r) 2、双向：(y2)R'F'RL'U'LUR'FR 3、双向：(y2)l'U' l(L'U'LU)l' U l	16 	1、(r U r')(R U R' U')(r U' r') 2、lU'lLUL'U'lU'l'
17 	1、F(U R'U'F')U(F R2 U R'U'F') 2、(RUR'U)(R'FRF')U2(R'FRF') 3、fRUR'U'y'r'RUR'U'R'FRF'/ 4、fRUR'U'fU'RUR'U'R'FRF'	18 	1、rUR'URU'2r'2U'RU'R'U2r 2、(y)RU2R'2FRF'U'2rR'URU'r' 3、双向：(y2) F (R U R' d)(R' U2)(R' F R F')
19 	1、(r' R U)(R U R' U' r) (R'2 F R F') 2、双向：(y2)F(URU'R'2F')U'F(URU')F' 3、双向：(y2)rR'U'R'U'RU'r'2x'U'R'U	20 	1、r'(R U)(R U R'U' r2)(R2'U) (R U') r' 2、r'RURUR'U'M2URU'r' 3、rUR'U'M2URU'R'U'M' (注：M2 可以做成 r2R'2 或 r'2R2 或直接拨中层等，具体做法视个人习惯定)
21 	1、(R U'U')(R' U'R U R' U')(R U' R') 2、F(RUR'U')3F' 3、R'U2RUR'U'RUR'UR 4、(y)R'U'RU'R'URU'R'U2R	22 	1、R U'U' (R'2 U')(R2 U')R'2 U' U'R 2、fRUR'U'fFRUR'U'F' 3、双向：(y2)fL'U'LUf'L'U'LUF
23 	1、(R2 D')(R U'U')(R' D)(R U'U' R)	24 	1、(r U R' U')(r' F R F')

	2、RUR'URU'2R'2U'RUR'U2R 或 R'U'RU'R'U2R2UR'URU'2R' 3、FRU'R'URUR'URU'R'F' 4、R'U2RFU'R'U'RUF' 5、RU'2R'B'URUR'U'B 6、R'U2RU'2R'F'RUR'U'R'FR2 （镜像：RU'2R'U2RBR'U'RURB'R'2） 7、zF'RUR'U'R'FUR2U'/zUR2U'F'RURU'R'F 8、x'(Rl) U'Rz'R'2U'LUl'2u		2、双向：(y2)lUL'U'R'zRUR' 3、三向：(y')x'RUR'DRU'R'D'
25 	1、F'(r U R' U')(r' F R) 2、双向：(y2)x'RU'R'DRUR'D' 3、三向：(y)R'U'RUR'F'RUR'U'R'FR2	26 	1、R U' U'R' U' R U' R' 2、(y)RU'2R'U'RUR' 3、三向：(y')LU'2L'U'LU'L'
27 	1、R' U2 R UR' U R 2、yRUR'URU'2R' 3、双向(y2)L'U2LUL'UL	28 	1、(r U R' U')(r' R U)(R U' R') 2、双向(y')r'U'RUM'U'R'UR 3、三向(y2)MU'M'U2MU'M' 4、四向(y)M'UMU2M'UM
29 	1、(r U R' U')(R r'2 F R F')(r R') 2、RUR'U'RU'R'F'U'FRUR' 3、(y)R'FRF'RU'2R'd'L'U'L 4、(y')r'RURUR'U'R'FRF'M' 5、rUR'U'(L'r')RURU'R'L	30 	1、(R2 U R' B')(RU')(R'2 U)(R B R') 2、M'U'R'U'RUx'RU'R'URr' 3、(y)x'RUR'z'RUL'2ULU'2R' 4、(y)r'U'RU(Lr)R'U'R'Ur'R
31 	1、(r' F' U F) (L F' L' U' r) 2、R'FRUR'U'y'R2URB 3、(y)xUR'U'IURUR'U'RU'R' 4、(y2)R'U'FURU'R'F'R	32 	1、(R U)(B' U')(R' U R B R') 2、fF'RUR'U'R'FRf' 3、(y)x'U'RUI'U'R'U'RUR'UR 4、RUx'U'F'R'FRUR'
33 	1、(R U R' U')(R' F R F') 2、(y2)L'U'LUrU'r'F	34 	1、(R'U'R U)y(r U R' U')r' R 2、FRUR'U'R'F'rURU'r'

			3、双向: $(y^2)RUR'U'y'r'U'RUM'$ 4、双向: $(y^2)RUR^2U'R'FRURU'F'$ (右无名指挑)
35 	1、 $RU^2R^2FRF'RU^2R'$ 2、 $(y')R'U^2(Rl)U'R'U'l'U^2R$	36 	1、 $R'\underline{U}'R\ U'R'U\ R\ U\ 1\ \underline{U}'R'U$ 2、 $(y^2)L'U'L'U'L'ULULF'L'F$
37 	1、 $F\ (R\ \underline{U}'R'\underline{U}'R\ U)(R'\ F')$ 2、 $FR'F'RURU'R'$ 3、 $(y')x'U'RUI'U'R'UR$ 4、双向: $F'rUr'U'r'Fr$	38 	1、 $(R\ U\ R'U)(R'\underline{U}'R'\underline{U}')(R'F\ R\ F')$ 2、 $(y^2)LUL'ULU'L'U'r'ULU'$
39 	1、 $(r\ \underline{U}'\ r'\ \underline{U}'\ r)y(R\ U\ R'\ f')$ 2、 $(y^2)frUr'U'r'FrF'f$ 3、 $(y^2)RB'R'U'RUBU'R'$	40 	1、 $(R'\ F\ R\ U\ R'\underline{U}')(F'\ U\ R)$ 2、 $(y^2)fr'F'FRURU'R'Ff$
41 	1、 $R\ U'\ R'\ U^2\ R\ U\ y\ R\ \underline{U}'\ R'\ \underline{U}'\ F'$ 2、 $(y)x'(RU'R'U)2x'R'U'RUR'U'R$ 3、 $(y^2)RUR'URU^2R'FRUR'U'F'$ 4、 $(y^2)rR^2F'U'FURU'r'R$ (中间的 $U'FU$ 可以参考 GAN 的 PLL09 中的 $U'FU$ 手法, 即整个右手放在 U 面上, 把 U 当 R 来做, 这样感觉起来就像是做 $R'FR$)	42  	1、 $(R'U\ R\ U'\underline{U}'R'\underline{U}')(F'U)(F\ U\ R)$ 2、 $(y')R'U^2RUR'UR^2yRUR'U'F'$ 3、 $(y')x(R'URU')2x'RUR'U'RUR'$ 1、 $(r'\ R^2)y(R\ U\ R'\ \underline{U}')y'\ (R'\ U\ R')r$ 2、 $R'U'RUFURU'U'R'URU'F'$ 3、 $r'R^2Bx'FU'xU'R'UM'$
43 	1、 $(B'\ \underline{U}')(R'\ U\ R\ B)$ 2、 $fL'U'LUf$ 3、 $(y)R'U'y'R'URB$	44 	1、 $f\ (R\ U\ R'\ \underline{U}')f'$ 2、双向: $(y^2)FURU'R'F'$

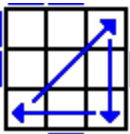
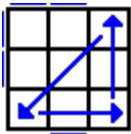
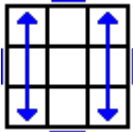
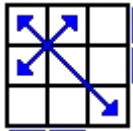
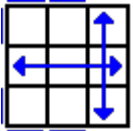
45	1、F (R U R' <u>U</u>) F' 2、(y2)fURU'R'f	46	1、(R' <u>U</u>) R' F R F'(U R) 2、RUIU'R'UxU'R' 3、双向：(y2)LFU'RUR'F'L'
47	1、B'(R' <u>U</u> R U)2 B 1、b'(U'R'UR)2b 2、F'(L'U'LU)2F 3、R'U'x(R'URU')2UR	48	1、F (R U R' <u>U</u>)2 F' 2、双向：(y2)f(URU'R')2f' 3、双向：(y2)RUx'(RU'R'U)2xU'R'
49	1、R B'(R2 F)(R2 B) R2 F' R 2、双向：(y2)l'UR'U'(Rl)U2x'U'RUR' 3、三向：(y')R'U2RUR'URFRUR'U'F' 4、三向：(y')B'R'URUR'U'RU'R'URB（其中 B'用右拇指下压）	50	1、L'B (L2 <u>F</u>')(L2<u>B</u>')L2 F L' 2、r'Ur2U'r'2U'r2U'r' 3、双向：(y2)R'FR2B'R'2F'R2BR' 4、双向：(y2) (R' URU'R'2F) (R2UR'U')F' R 5、三向：(y')FRU'R'U'RUR'URU'R'F' 6、三向：(y')RU'2R'U'RU'R'FRUR'U'F'
51	1、f (R U R' <u>U</u>)2 f' 2、双向：(y2)F(URU'R')2F'	52	1、R'<u>U</u>' R <u>U</u>' R' d R' U l U 2、R'U'RU'R'dR'URB 3、RUR'URd'RU'R'F' 4、R'U'b'R'2FR2F'R'2FRD（中间的 R2F'中的 F'用右手换手了） 5、双向：(y2)R'U'x(UR'U'R)2x'UR 6、三向（y'）FRUR'dR'U'RU'R'
53	1、r'U'(RU'R'U)(RU'R'U2r) 2、双向：(y') (r' U2)(R U R'<u>U</u>')(R U R'U) r 3、三向：(y2)F(RUR'U')(RU'R'U)(RUR'F')	54	1、(r U'<u>U</u>')(R' <u>U</u>' R U R' <u>U</u>')(R U' r') 2、rU'2(R'U'RU)(R'U'RU'r') 3、(y) rU(R'URU')(R'URU'2r') 4、(y') B'(R'U'RU)(R'URU')(R'U'RB)

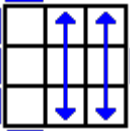
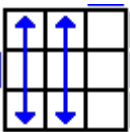
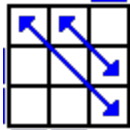
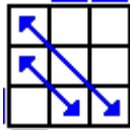
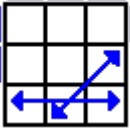
55 	1、 $(R\ U'\underline{U}')\ (R'^2\ \underline{U}')\ R\ U'\ R'U^2(F\ R\ F')$ 2、 $RU'^2R'^2U'R'U'R'UdRBR'$ 3、 $(y)RB'U'R'UR^2BR'^2U'RUR'$ 4、 $(y)R'FURU'R'^2F'R^2UR'U'R$ 5、 $(y)R'FRUR'FRU'R'F'RUM'U'M$	56 	1、 $F\ (R\ U\ R'\underline{U}')\ (R\ F')\ (r\ U\ R'\underline{U}')r'$ 2、 $(r'U'rU')(R'URU'R'U)(Rr'Ur)$ 3、 $(y)fRUR'U'fF(RUR'U')^2F'$
57 	$(R\ U\ R'\ \underline{U}\ r')(R'\ U)(R\ U'\ r')$ 若遇到双向的情况则在这个公式前加 U'		

PLL 手法

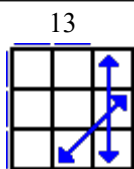
棱 换	1 	1、 $(R\ U'\ R')(U\ R\ U\ R)(\underline{U}'\ R'\ \underline{U}'\ R^2)$ 2、 $M'^2UMU^2M'UM'^2$ 3、双向： $(y^2)(R^2U'R'U'RU)(RURU'R)$ 4、双向： $(y^2)M'^2UM'U^2MUM'^2$	2 	1、 $(R^2'\ U')(R\ U\ R'\ \underline{U}')\ (R'\ \underline{U}')\ (R'\ U\ R')$ 2、 $M'^2U'MU^2M'U'M'^2$ 3、双向： $(y^2)(R'UR'U')(R'U'R'URUR^2)$ 4、双向： $(y^2)M'^2U'M'U^2MU'M'^2$
	3 	1、 $M^2\ U\ M^2\ U^2\ M^2\ U\ M^2$ 2、 $(R^2U'^2RU^2R'^2)U^2(R^2U'^2RU^2R'^2)$	4 	1、 $(U\ R'\underline{U}')\ (R\ \underline{U}'R)\ (U\ R\ \underline{U}')\ (R'U\ R\ U)\ (R^2\ \underline{U}')\ (R'U)$ 2、 $(y)RURB'R'BU'R'fRUR'U'f$ 3、 $M'^2U'M'U^2M'^2U^2M'UM'^2$ 4、 $x'RUR'Uz'RUR'L'$ (左食指) $z'R'URz'R'^2F$

角换

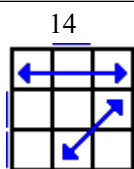
	5 	1、$x'R_2D_2(R'\underline{U}R)D_2(R'UR')$ 2、双向：$(y')(l'UR')D_2(RU'R')D_2R_2$ 3、三向： $(y_2)RUR'F'rUR'U'r'FR_2U'R'$ 4、三向：$rUr'U'r'Fr_2U'r'U'rUr'F'U$	6 	1、$x'(RUR)z'(R^2\underline{U}LU R_2'xyR_2)$上式中的 $R_2'xy$ 是同时进行的 2、$x'(RU'R)D_2(R'UR)D_2R_2$ 3、$lURz'(R^2U'rBR^2)yR_2$ 4、双向：$(y')l'R'D_2(RUR')D_2(RU'R)$
	7 	1、$x'(RU'R'D)(RU'R')u_2'(R'UR)D(R'\underline{U}R)$ 2、$x'(RU'R'D)(RUR'D')(RUR'D)(RU'R'D')$注：D'用左无名指回推 3、$z'(R'FR_2UR'B'RU'R^2F'R)z(RBR')$注：B'用右无名指下压 4、$(y)R_2UR'd'(RUR'U')_2RUR'FU'F_2$ 5、$(y)x(UR'U'LURU')(r'FRF'rUR'U'r')$ 6、$(y)x(UR'U'LURU')(r^2U'RULU'R'U)$ 7、$(y)(F'rUR'U'r'F)x'(R_2UL'U'R'ULU')$		
	11 	1、$F(R\underline{U}R'\underline{U})(RU'R'F')(RU'R'\underline{U})(R'FRF')$ 2、$FRU'R'U'RdRUR'B'RU'R_2$ 3、双向：$L'U'rD_2r'ULUyR_2U'R^2U'R_2$		
	8 	1、$RUR'U'R'FR_2'U'R'URUR'F'$ 2、双向：$(y_2)L'U'LULF'L^2ULUL'U'LF$ 3、双向：$(y_2)x'UrU'L'ULUL'U'r'ULU'L'$		

	9 	1、$\underline{U}'(R'U'R'\underline{U}'R'^2b')x(R'U'R)y'(R'U'R'\underline{U}'R^2)$ 2、$U'R'URU'R'^2F'(zR'FRz')xRUR'U'R^2$ (注：$zR'FRz'$的部分只是把顶面稍微往右边倾斜，左手不换手。开头的U'可以放到最后，不过开头就要加一个y') 3、$R'U'F'RUR'U'R'FR^2U'R'U'RUR'UR$ (注：就是 $R'U'F'+PLL08+FUR$,其中的F与PLL08最后的F抵消) 4、$(y')R'URU'R'^2F'(zR'FRz')RU'R'^2B'R'f$ 5、$(y')(RU'R'URU)(FRUR'U'F')(R'^2FRF')$ 6、$(y)R'U^2R'd'R'F'R^2U'R'UR'FRU'F$
	9' 	1、$z(R'U'R'\underline{U}'R'U'\underline{U}')(x'z')(R'U'R'\underline{U}')x(\underline{U}'R'U'R'U'\underline{U}')$
	10  1、$(R'U'R'\underline{U}')yx^2(R'U'R'\underline{U}'R^2)xz'(R'\underline{U}'R'UR)$ 2、$R'UR'd'R'F'R^2U'R'UR'FRF$ 3、$R'UR'U'yx^2R'UR'U'IRU'R'URU$	10'  1、$z(U'R'U'l')z(R'U'R'U')(lR)(U'R'URU)$ 2、$L'UL'U'y'R'F'R^2U'R'UR'FRF$
	12 	1、$z(\underline{U}'R'D')(R^2U'R'\underline{U}'R^2U)z'(R'U')$ 2、$(y)L'U'LFL'U'LULF'L^2ULU$ 3、$UL'U'LFL'U'LULF'L^2ULU$ 4、$L'UR'zR^2UR'U'R^2(DU)R'$注：$L'UR'z$这个动作很常见，L'用左手食指拨LBD角块的B面，UR'的同时翻转做z 5、$(y')xU^2r'U'rU^2xR'UR'U'R^2$ 6、$(y')U'R'UL'U^2RU'R'U^2(Rr)$注：最后的r用左无名指拨BD棱块的B面，故R和r可以同时做 7、$(y')R'U^2RUR'zR'^2UR'DRU'$ 8、$(y^2)lRu'R'uR^2x'y'R'UR'U'R^2$

角

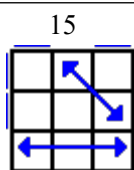


- 1、 $(R\ U\ R'F')(R\ U\ R'\underline{U})(R'F\ R2\ \underline{U}R'U)$
- 2、 $(y)U'RUR'F'RUR'U'R'FR2U'R'$
- 3、 $(y2)xU2RBR'U2rU'LUL'2$ (最后的 $L'2$ 可以改成 $r2$)
- 4、 $(y2)z(UD)R2U'R'UR2D'RU'R'(D'$ 可以用右食指,也可以用右无名指)
- 5、 $(y2)zUR2U'R'UR2D'RU'R'u(D'$ 可以用右食指,也可以用右无名指)
- 6、 $(y2)ULU'RU'2r'FrU'2r'R'$
- 7、 $(y')r'2fru'L'2x'yLU'LUL'2$

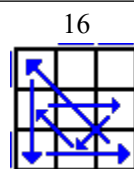


- 1、 $(R'\ U2)(R\ U'\underline{U})(R'\ F\ R\ U\ R'\ \underline{U})(R'F'\ R2\ \underline{U})$ (注: $U2$ 用右食指中指连拨, $U'2$ 先用右拇指接着用左食指)
- 2、 $(y2)R'U2R2x'U'R'UR'FRUF'U'R'FR$

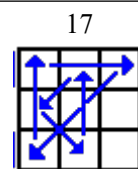
棱



- 1、 $(R\ U'\underline{U})(R'\ U2)(R\ B'\ R'\ \underline{U})(R\ U\ R\ B\ R2'\ U)$ (注: B' 用右拇指下压)
- 2、 $(y)x'R'U'F'UR'U'xUR'U'(R'URBR'2)$
- 3、 $(y2)LU'2L'U2LF'L'U'LULFL'2U$ (与 14 左右镜像)
- 4、 $(y2)RU'2R'2FRF'RU'R'F'UFRU'R'$
- 5、 $(y')R2B'R'U'R'URBR'yzR'2FR2F'R'$ (注: 最后的 F' 用右无名指挑)



- 1、 $(R2'\ \underline{u}'\ R\ U'\ R)(U\ R'\ u)(R2\ f'R'\ f)$
($R2fR'f$) 可以改成 $R2xuR'u'$ 或 $xR'2uR'u'$ 或 $R2yRU'R'$ 或 $R2BU'B'$

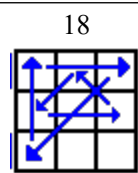


- 1、 $(R\ U\ R')y'(R2'\ u'\ R\ U')(R'\ U\ R'\ u\ R2)$
- 2、 $(y')xuRu'x'R'2$ (或 $R2$) $u'RU'R'UR'uR2$
- 3、 $(y2)zURU'y(l'R')u'RU'R'UR'uR2$ (前面部分可以改成 $LUL'yR'2$ (或 $R2$))

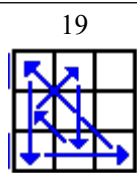
邻

三棱换

三角三

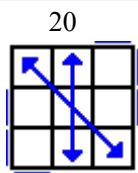


1、 $(R^2 u)(R'UR'\underline{U})(R u')(R^2 F'UF)$
 $(R^2 F'UF)$ 可以改成 $R^2 y'R'UR$ 或 $R'2F'zRb$

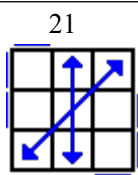


1、 $(R' d'F)(R^2 u)(R' U)(R U' R \underline{u} R^2)$
 $R'd'F$ 可以换成 $(R'U'Ry)$
 2、 $(y^2)L'U'L y'R^2 uR'URU'Ru'R^2$

角棱



1、 $z(R' U R')z'(R U^2 \underline{L}' U R')$
 2、 $z(U R')z'(R U^2 \underline{L}' U R')$
 3、 $(RU'R'UIU)(FU'R'FRU')(RUI'UR')$
 4、 $(RU'RB'(\text{右拇指下压}))(R'BR'URBU'B'(\text{右拇指下压})R'URUR')$
 5、 $(RU'IU')(R'UR'FRUF'U'I'URUR')$
 6、 $zRUR'DR^2U'R(UD')R'DR^2U'RD'$ (注: 开头的 R 可以改成 R'或干脆不做)
 7、 $F'RUR'U'R'FR^2F(\text{右拇指下压})U'R'U'RUF'(\text{左食指})R'$ (注: 另一种做法是最后的 $UF'R'$ 中 U 用左食指推, F'用右无名指挑)
 8、 $(UIF')(rU'^2R'Ur')RF'(rU'^2R'Ur')$



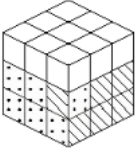
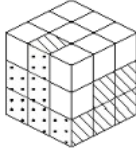
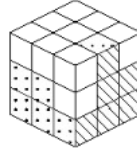
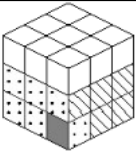
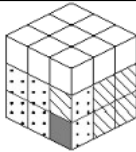
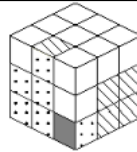
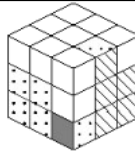
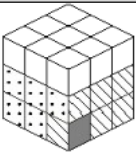
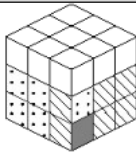
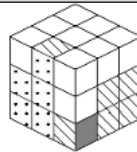
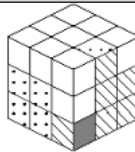
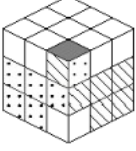
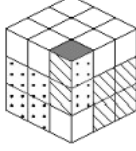
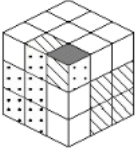
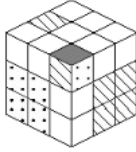
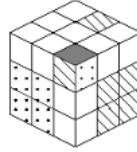
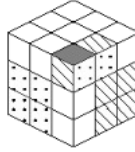
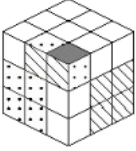
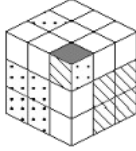
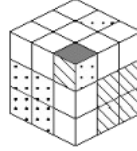
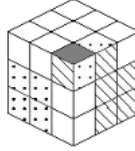
1、 $z(\underline{U}'R D')(R^2 U R' \underline{U}')z'(R U R')$
 2、 $z(R^2 U R')z'(R U')$
 3、 $(R'UR'FRF')(RU'R'F'UFRUR'U'R)$
 4、 $(R'URU'R'F'U'FRUR'F')(R'F'RU'R)$
 5、 $L'UR'zR^2UR'U'z'RUR'zR^2UR'DR$
 6、 $z(U'RD'(\text{右食指})R^2UR'D)*2R$

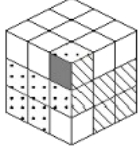
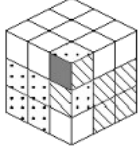
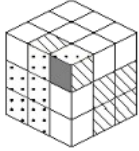
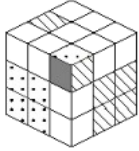
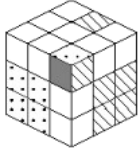
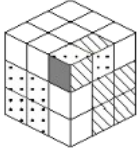
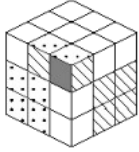
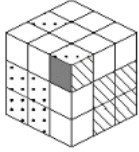
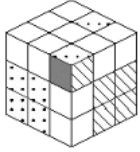
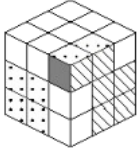
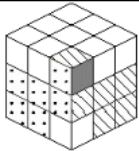
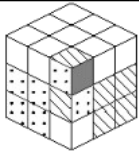
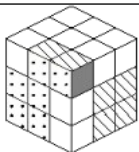
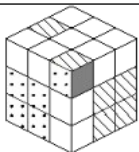
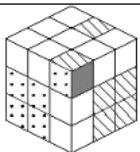
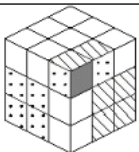
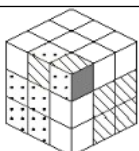
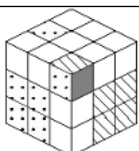
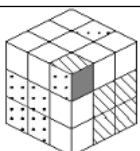
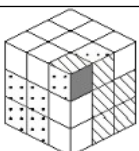
对对

换明说

符号系统: RLUDFB, rludfb(转两层) 如 u 就是上两层顺时针转 90 度
 x(整个魔方以 R 的方向转动), y(整个魔方以 U 的方向转动), z(整个魔方以 F 的方向转动),
 斜体是用右拇指
 下划线用左食指

F2L 手法

 $(R \ U' \underline{U} \ R' \ U) 2 \ y' (R' \ \underline{U} \ R)$	 $(U \ R \ \underline{U} \ R' \ \underline{U}) \ y' (R' \ U \ R)$	 $(R' \ F' \ RU) (R \ U' \ R' \ F)$ $U' (F' \ RUR' \ U') (R' \ FR)$	
 $(R \ U \ R' \ U') (R \ U' \underline{U} \ R' \ U') (R \ U \ R')$	 $(R \ U' \ R \ U) \ y' (R \ U' \ R' \ F 2)$	 $y' (R' \ \underline{U} \ R \ U) (R' \ \underline{U} \ R)$	 $(R \ U' \ R' \ U) (R \ U' \ R')$
 $(RU'R'U)(R \ U' \underline{U} \ R' U) (RU'R')$	 $R 2 \ y' (R \ U \ R' \ \underline{U}) y' (R' \ U \ R')$	 $y' (R' \ U) (R \ \underline{U}) (R' \ U \ R)$	 $(R \ U \ R' \ \underline{U}) (R \ U \ R')$
 $(R \ U \ R' \ \underline{U}) 2 \ (R \ U \ R')$	 $(R \ \underline{U} \ R') \ y' (R' \ U 2 \ R)$		
 $y' (R' \ U 2) (R \ U \ R' \ \underline{U}) R$	 $y' \ \underline{U} (R' \ U 2) (R \ \underline{U} \ R' \ U) R$	 $y' (R' \ U \ R \ U' \underline{U}) (R' \ \underline{U} \ R)$	 $y' (U 2 \ R 2' \ U 2) (R \ U \ R' \ U \ R 2)$ $(R \ U \ R' U) (R \ U' \underline{U} \ R' d) (R' U \ R)$
 $(R \ U \ R') U 2 (R \ U \ R' \ \underline{U}) (R \ U \ R')$	 $(R \ U' \ R' \ U 2) (R \ U \ R')$	 $U (R \ U' \underline{U}) (R' \ U \ R \ U') R'$	 $(R \ U' \underline{U}) (R' \ \underline{U} \ R \ U) R'$

 $\underline{U}'(R' \underline{U}')(R' U^2)(R' U' R')$	 $\underline{U}'(R' U' R') d(R' \underline{U}' R)$		
 $d(R' U' R U')(R' \underline{U}' R)$	 $y'(R' \underline{U}' R)$	 $(d R' \underline{U}' R U')(R' \underline{U}' R)$	 $y'(R' U' \underline{U}') R'^2 \underline{U}' R^2 \underline{U}' R'$ $U'(R' U' \underline{U}' R' d)(R' U' R)$
 $y'(R' U)(R' d' \underline{U}')(R' U' R')$	 $U'(R' U' \underline{U}')(R' U^2)(R' U' R')$	 $U'(R' U' R' U')(R' U' \underline{U}' R')$	 $U' R' U' R'$
 $\underline{U}'(R' U' \underline{U}' R' U)(R' U' R')$	 $d(R' U' R) d'(R' U' R')$		
 $y' \underline{U}'(R' U' R)$	 $(d R' \underline{U}' R' U' \underline{U}')(R' U' R)$	 $d(R' U^2)(R' U' \underline{U}')(R' U' R)$	 $(R' U' R' U)(d R' \underline{U}' R)$
 $(R' U')(R' U)(R' U')(R' U^2)(R' U' R')$	 $\underline{U}'(R' U' R' U)(R' U' R')$	 $(R' U' R')$	 $\underline{U}'(R' \underline{U}' R' U)(R' U' R')$

加下划线的是用左食指完成，斜体是用右拇指

浅蓝色的是最少步数版本

红色是新增的多解

魔方的某个面

	U 上层作顺时针 90 度转(即转 一下)		R 右面作顺时针 90度转(即转 一下)		F 前面作顺时针 90度转(即转 一下)
	U' 上层作逆时针 90度转(即转 一下)		R' 右面作逆时针 90度转(即转 一下)		F' 前面作逆时针 90度转(即转 一下)
	U2 上层作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!		R2 右面作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!		F2 前面作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!
	D 底层作顺时针 90 度转(即转 一下)		L 左面作顺时针 90度转(即转 一下)		B 后面作顺时针 90度转(即转 一下)
	D' 底层作逆时针 90度转(即转 一下)		L' 左面作逆时针 90度转(即转 一下)		B' 后面作逆时针 90度转(即转 一下)
	D2 底层作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!		L2 左面作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!		B2 后面作顺时针 180度转而逆 时针180度实 际结果与顺时 针是一样的!

(图 5)

整个魔方					
	x 整个魔方作一个R方向90度转		y 整个魔方作一个U方向90度转		z 整个魔方作一个F方向90度转
	x' 整个魔方作一个R'方向90度转		y' 整个魔方作一个U'方向90度转		z' 整个魔方作一个F'方向90度转
	x2 整个魔方作一个R方向180度转		y2 整个魔方作一个U'方向180度转		z2 整个魔方作一个F方向180度转

(图6)

魔方双层转					
	u 上面两层作顺时针90度转(即转一下)		r 右面两层作顺时针90度转(即转一下)		f 前面两层作顺时针90度转(即转一下)
	u' 上面两层作逆时针90度转(即转一下)		r' 右面两层作逆时针90度转(即转一下)		f' 前面两层作逆时针90度转(即转一下)
	u2 上面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!		r2 右面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!		f2 前面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!
	d 底面两层作顺时针90度转(即转一下)		l 左面两层作顺时针90度转(即转一下)		b 后面两层作顺时针90度转(即转一下)
	d' 底面两层作逆时针90度转(即转一下)		l' 左面两层作逆时针90度转(即转一下)		b' 后面两层作逆时针90度转(即转一下)
	d2 底面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!		l2 左面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!		b2 后面两层作顺时针180度转而逆时针180度实际结果与顺时针是一样的!

(图7)

中间层

	E 中层作顺时针 90 度转(即转一下)		M 中层作顺时针 90度转(即转一下)		S 中层向F作顺时针 90度转(即转一下)
	E' 中层作逆时针 90度转(即转一下)		M' 中层作逆时针 90度转(即转一下)		S' 中层作逆时针 90度转(即转一下)
	E2 中层作顺时针 180度转而逆时针 180度实际结果与顺时针是一样的!		M2 中层作顺时针 180度转而逆时针 180度实际结果与顺时针是一样的!		S2 中层作顺时针 180度转而逆时针 180度实际结果与顺时针是一样的!

(图 8)