

Part 4 : New Advanced Study of Magic Squares and Cubes
Chapter 4 : Commentary Articles No.2 : Kanji Setsuda
"Various Arts and Tools for Studying Magic Squares"
Section 5 : Analytical Study of 'Complete Euler Squares' 5x5:
Pan-diagonal Type and Simultaneous Type: SC and PD;

1. Analytical Study of 'Complete Euler Squares' of Order 5

Let's study 'Complete Euler Squares' of Order 5 analytically about the Pan-diagonal Type and the Simultaneous one: Self-complementary and Pan-diagonal;

After finding anything interesting, let's invent another way of reconstructing those objects with our new knowledge of combining high layer with low one made of decompositions by the Positional Writing System of Numbers of the Base 5.

2. Decomposed Layers of 'Complete Euler Squares' of Order 5

We now know the 16 Simultaneous Magic Squares of Order 5: Self-complementary and Pan-diagonal type and the 3600 Pan-diagonal Magic Squares of Order 5 are all 'Complete Euler Squares'.

It makes me think that we should study more directly about the two decomposed layers of each solution. Why don't you study about them analytically?

But what could we do? How should we deal with these objects?

I advise you to do the next things first of all:

- (1) Watch the solutions on the decomposed layers intensively, and find anything same and common, and collect everything similar and make a group for them.
- (2) When we could make some groups, then compare each member with others, and extend our comparison to the outside and find anything same and common with the ones in any other group.
- (3) Try to find any transformation method, and you may know any beautiful relations among them.

3. Simultaneous MS55: both Self-complementary and Pan-diagonal;

Let me take the Simultaneous Magic Squares of Order 5: Self-complementary and Pan-diagonal type for our first object.

** List of the 16 Standard Solutions of Sm1MS55 with /D5i **

1# /D5i: H/					L/					2# /D5i: H/					L/														
1	23	20	12	9	0	4	3	2	1	0	2	4	1	3	1	23	20	14	7	0	4	3	2	1	0	2	4	3	1
15	7	4	21	18	2	1	0	4	3	4	1	3	0	2	15	9	2	21	18	2	1	0	4	3	4	3	1	0	2
24	16	13	10	2	4	3	2	1	0	3	0	2	4	1	22	16	13	10	4	4	3	2	1	0	1	0	2	4	3
8	5	22	19	11	1	0	4	3	2	2	4	1	3	0	8	5	24	17	11	1	0	4	3	2	2	4	3	1	0
17	14	6	3	25	3	2	1	0	4	1	3	0	2	4	19	12	6	3	25	3	2	1	0	4	3	1	0	2	4
3# /D5i: H/					L/					4# /D5i: H/					L/														
1	23	10	12	19	0	4	1	2	3	0	2	4	1	3	1	23	10	14	17	0	4	1	2	3	0	2	4	3	1
15	17	4	21	8	2	3	0	4	1	4	1	3	0	2	15	19	2	21	8	2	3	0	4	1	4	3	1	0	2
24	6	13	20	2	4	1	2	3	0	3	0	2	4	1	22	6	13	20	4	4	1	2	3	0	1	0	2	4	3
18	5	22	9	11	3	0	4	1	2	2	4	1	3	0	18	5	24	7	11	3	0	4	1	2	2	4	3	1	0
7	14	16	3	25	1	2	3	0	4	1	3	0	2	4	9	12	16	3	25	1	2	3	0	4	3	1	0	2	4
5# /D5i: H/					L/					6# /D5i: H/					L/														
2	23	19	11	10	0	4	3	2	1	1	2	3	0	4	2	23	19	15	6	0	4	3	2	1	1	2	3	4	0
14	6	5	22	18	2	1	0	4	3	3	0	4	1	2	14	10	1	22	18	2	1	0	4	3	3	4	0	1	2
25	17	13	9	1	4	3	2	1	0	4	1	2	3	0	21	17	13	9	5	4	3	2	1	0	0	1	2	3	4
8	4	21	20	12	1	0	4	3	2	2	3	0	4	1	8	4	25	16	12	1	0	4	3	2	2	3	4	0	1
16	15	7	3	24	3	2	1	0	4	0	4	1	2	3	20	11	7	3	24	3	2	1	0	4	4	0	1	2	3

					7# /D5i: H/	L/						8# /D5i: H/	L/																
2	23	9	11	20	0	4	1	2	3	1	2	3	0	4	2	23	9	15	16	0	4	1	2	3	1	2	3	4	0
14	16	5	22	8	2	3	0	4	1	3	0	4	1	2	14	20	1	22	8	2	3	0	4	1	3	4	0	1	2
25	7	13	19	1	4	1	2	3	0	4	1	2	3	0	21	7	13	19	5	4	1	2	3	0	0	1	2	3	4
18	4	21	10	12	3	0	4	1	2	2	3	0	4	1	18	4	25	6	12	3	0	4	1	2	2	3	4	0	1
6	15	17	3	24	1	2	3	0	4	0	4	1	2	3	10	11	17	3	24	1	2	3	0	4	4	0	1	2	3
					9# /D5i: H/	L/						10# /D5i: H/	L/																
4	23	17	11	10	0	4	3	2	1	3	2	1	0	4	4	23	17	15	6	0	4	3	2	1	3	2	1	4	0
12	6	5	24	18	2	1	0	4	3	1	0	4	3	2	12	10	1	24	18	2	1	0	4	3	1	4	0	3	2
25	19	13	7	1	4	3	2	1	0	4	3	2	1	0	21	19	13	7	5	4	3	2	1	0	0	3	2	1	4
8	2	21	20	14	1	0	4	3	2	2	1	0	4	3	8	2	25	16	14	1	0	4	3	2	2	1	4	0	3
16	15	9	3	22	3	2	1	0	4	0	4	3	2	1	20	11	9	3	22	3	2	1	0	4	4	0	3	2	1
					11# /D5i: H/	L/						12# /D5i: H/	L/																
4	23	7	11	20	0	4	1	2	3	3	2	1	0	4	4	23	7	15	16	0	4	1	2	3	3	2	1	4	0
12	16	5	24	8	2	3	0	4	1	1	0	4	3	2	12	20	1	24	8	2	3	0	4	1	1	4	0	3	2
25	9	13	17	1	4	1	2	3	0	4	3	2	1	0	21	9	13	17	5	4	1	2	3	0	0	3	2	1	4
18	2	21	10	14	3	0	4	1	2	2	1	0	4	3	18	2	25	6	14	3	0	4	1	2	2	1	4	0	3
6	15	19	3	22	1	2	3	0	4	0	4	3	2	1	10	11	19	3	22	1	2	3	0	4	4	0	3	2	1
					13# /D5i: H/	L/						14# /D5i: H/	L/																
5	23	16	12	9	0	4	3	2	1	4	2	0	1	3	5	23	16	14	7	0	4	3	2	1	4	2	0	3	1
11	7	4	25	18	2	1	0	4	3	0	1	3	4	2	11	9	2	25	18	2	1	0	4	3	0	3	1	4	2
24	20	13	6	2	4	3	2	1	0	3	4	2	0	1	22	20	13	6	4	4	3	2	1	0	1	4	2	0	3
8	1	22	19	15	1	0	4	3	2	2	0	1	3	4	8	1	24	17	15	1	0	4	3	2	2	0	3	1	4
17	14	10	3	21	3	2	1	0	4	1	3	4	2	0	19	12	10	3	21	3	2	1	0	4	3	1	4	2	0
					15# /D5i: H/	L/						16# /D5i: H/	L/																
5	23	6	12	19	0	4	1	2	3	4	2	0	1	3	5	23	6	14	17	0	4	1	2	3	4	2	0	3	1
11	17	4	25	8	2	3	0	4	1	0	1	3	4	2	11	19	2	25	8	2	3	0	4	1	0	3	1	4	2
24	10	13	16	2	4	1	2	3	0	3	4	2	0	1	22	10	13	16	4	4	1	2	3	0	1	4	2	0	3
18	1	22	9	15	3	0	4	1	2	2	0	1	3	4	18	1	24	7	15	3	0	4	1	2	2	0	3	1	4
7	14	20	3	21	1	2	3	0	4	1	3	4	2	0	9	12	20	3	21	1	2	3	0	4	3	1	4	2	0

[Count = 16] OK!

** Calculated and Listed by Kanji Setsuda on
Feb.26. 2015 with MacOSX 10.10.2 & Xcode 6.1.1 **

The above list shows the solution set of 16 precious gems called "Suzuki Squares".
Could you find anything interesting among those decomposed layers?

I found there are only two forms of high layers, and the solutions could be
classified into two groups with 8 members in each.

I actually made them into such the two groups as follows, changing a little bit of list
order (under the Inequality Conditions: $n_1 < n_{25}$; $n_1 < n_5$; $n_1 < n_{21}$ and $n_2 > n_6$;) .

[Group 1]

					1# /D5i	1/H	1/L						2# /D5i	1/H	2/L														
1	23	20	12	9	0	4	3	2	1	0	2	4	1	3	1	23	20	14	7	0	4	3	2	1	0	2	4	3	1
15	7	4	21	18	2	1	0	4	3	4	1	3	0	2	15	9	2	21	18	2	1	0	4	3	4	3	1	0	2
24	16	13	10	2	4	3	2	1	0	3	0	2	4	1	22	16	13	10	4	4	3	2	1	0	1	0	2	4	3
8	5	22	19	11	1	0	4	3	2	2	4	1	3	0	8	5	24	17	11	1	0	4	3	2	2	4	3	1	0
17	14	6	3	25	3	2	1	0	4	1	3	0	2	4	19	12	6	3	25	3	2	1	0	4	3	1	0	2	4
					6# /D5i	1/H	6/L						5# /D5i	1/H	5/L														
2	23	19	15	6	0	4	3	2	1	1	2	3	4	0	2	23	19	11	10	0	4	3	2	1	1	2	3	0	4
14	10	1	22	18	2	1	0	4	3	3	4	0	1	2	14	6	5	22	18	2	1	0	4	3	3	0	4	1	2
21	17	13	9	5	4	3	2	1	0	0	1	2	3	4	25	17	13	9	1	4	3	2	1	0	4	1	2	3	0
8	4	25	16	12	1	0	4	3	2	2	3	4	0	1	8	4	21	20	12	1	0	4	3	2	2	3	0	4	1
20	11	7	3	24	3	2	1	0	4	4	0	1	2	3	16	15	7	3	24	3	2	1	0	4	0	4	1	2	3

				9#	/D5i	1/H	9/L								10#	/D5i	1/H	10/L											
4	23	17	11	10	0	4	3	2	1	3	2	1	0	4	4	23	17	15	6	0	4	3	2	1	3	2	1	4	0
12	6	5	24	18	2	1	0	4	3	1	0	4	3	2	12	10	1	24	18	2	1	0	4	3	1	4	0	3	2
25	19	13	7	1	4	3	2	1	0	4	3	2	1	0	21	19	13	7	5	4	3	2	1	0	0	3	2	1	4
8	2	21	20	14	1	0	4	3	2	2	1	0	4	3	8	2	25	16	14	1	0	4	3	2	2	1	4	0	3
16	15	9	3	22	3	2	1	0	4	0	4	3	2	1	20	11	9	3	22	3	2	1	0	4	4	0	3	2	1

				14#	/D5i	1/H	14/L								13#	/D5i	1/H	13/L											
5	23	16	14	7	0	4	3	2	1	4	2	0	3	1	5	23	16	12	9	0	4	3	2	1	4	2	0	1	3
11	9	2	25	18	2	1	0	4	3	0	3	1	4	2	11	7	4	25	18	2	1	0	4	3	0	1	3	4	2
22	20	13	6	4	4	3	2	1	0	1	4	2	0	3	24	20	13	6	2	4	3	2	1	0	3	4	2	0	1
8	1	24	17	15	1	0	4	3	2	2	0	3	1	4	8	1	22	19	15	1	0	4	3	2	2	0	1	3	4
19	12	10	3	21	3	2	1	0	4	3	1	4	2	0	17	14	10	3	21	3	2	1	0	4	1	3	4	2	0

[Group 2]

				3#	/D5i	3/H	1/L								4#	/D5i	3/H	2/L											
1	23	10	12	19	0	4	1	2	3	0	2	4	1	3	1	23	10	14	17	0	4	1	2	3	0	2	4	3	1
15	17	4	21	8	2	3	0	4	1	4	1	3	0	2	15	19	2	21	8	2	3	0	4	1	4	3	1	0	2
24	6	13	20	2	4	1	2	3	0	3	0	2	4	1	22	6	13	20	4	4	1	2	3	0	1	0	2	4	3
18	5	22	9	11	3	0	4	1	2	2	4	1	3	0	18	5	24	7	11	3	0	4	1	2	2	4	3	1	0
7	14	16	3	25	1	2	3	0	4	1	3	0	2	4	9	12	16	3	25	1	2	3	0	4	3	1	0	2	4

				8#	/D5i	3/H	6/L								7#	/D5i	3/H	5/L											
2	23	9	15	16	0	4	1	2	3	1	2	3	4	0	2	23	9	11	20	0	4	1	2	3	1	2	3	0	4
14	20	1	22	8	2	3	0	4	1	3	4	0	1	2	14	16	5	22	8	2	3	0	4	1	3	0	4	1	2
21	7	13	19	5	4	1	2	3	0	0	1	2	3	4	25	7	13	19	1	4	1	2	3	0	4	1	2	3	0
18	4	25	6	12	3	0	4	1	2	2	3	4	0	1	18	4	21	10	12	3	0	4	1	2	2	3	0	4	1
10	11	17	3	24	1	2	3	0	4	4	0	1	2	3	6	15	17	3	24	1	2	3	0	4	0	4	1	2	3

				11#	/D5i	3/H	9/L								12#	/D5i	3/H	10/L											
4	23	7	11	20	0	4	1	2	3	3	2	1	0	4	4	23	7	15	16	0	4	1	2	3	3	2	1	4	0
12	16	5	24	8	2	3	0	4	1	1	0	4	3	2	12	20	1	24	8	2	3	0	4	1	1	4	0	3	2
25	9	13	17	1	4	1	2	3	0	4	3	2	1	0	21	9	13	17	5	4	1	2	3	0	0	3	2	1	4
18	2	21	10	14	3	0	4	1	2	2	1	0	4	3	18	2	25	6	14	3	0	4	1	2	2	1	4	0	3
6	15	19	3	22	1	2	3	0	4	0	4	3	2	1	10	11	19	3	22	1	2	3	0	4	4	0	3	2	1

				16#	/D5i	3/H	14/L								15#	/D5i	3/H	13/L											
5	23	6	14	17	0	4	1	2	3	4	2	0	3	1	5	23	6	12	19	0	4	1	2	3	4	2	0	1	3
11	19	2	25	8	2	3	0	4	1	0	3	1	4	2	11	17	4	25	8	2	3	0	4	1	0	1	3	4	2
22	10	13	16	4	4	1	2	3	0	1	4	2	0	3	24	10	13	16	2	4	1	2	3	0	3	4	2	0	1
18	1	24	7	15	3	0	4	1	2	2	0	3	1	4	18	1	22	9	15	3	0	4	1	2	2	0	1	3	4
9	12	20	3	21	1	2	3	0	4	3	1	4	2	0	7	14	20	3	21	1	2	3	0	4	1	3	4	2	0

[Count = 16]

Of course, every high layer in each group has the same form in the same order, since I have made it so. How about low layers?

Can you see the beautiful relationship between the low layers of the two groups?

Could you find the one-to-one-correspondence between them?

Each low layer is just the same with the corresponding one in the other group.

Eight low layers in one group are just the same with the eight ones of the other.

We now know the real meaning of the equation: $2 \times 8 = 16$.

4. Rotation of Low Layers Makes 4 Groups

Let's go on further analysis on the list above to find the beautiful relations among low layers.

Watch carefully the following 4 solution groups as follows:

(1) { 1, 6, 9, 14 } has {1L, 6L, 9L, 14L},

- (2) { 2, 5, 10, 13} has {2L, 5L, 10L, 13L},
- (3) { 3, 8, 11, 16} has {1L, 6L, 9L, 14L},
- (4) { 4, 7, 12, 15} has {2L, 5L, 10L, 13L}

We could see rotation movement by 90 degrees clockwise between 1L and 6L, and also the same between 2L and 10L. We could see 180-degree rotation between 1L and 14L and between 2L and 13L, and 270-degree rotation clockwise between 1L and 9L, and between 2L and 5L.

If you want to invent any transformation method about them, you may well think of the only one rotation transformation by 90 degrees clockwise, since you could repeat it twice to obtain 180-degree rotation, and three times to get 270-degree rotation.

	1/L	->	6/L	->	14/L	->	9/L												
0	2	4	1	3	1	2	3	4	0	4	2	0	3	1	3	2	1	0	4
4	1	3	0	2	3	4	0	1	2	0	3	1	4	2	1	0	4	3	2
3	0	2	4	1	0	1	2	3	4	1	4	2	0	3	4	3	2	1	0
2	4	1	3	0	2	3	4	0	1	2	0	3	1	4	2	1	0	4	3
1	3	0	2	4	4	0	1	2	3	3	1	4	2	0	0	4	3	2	1

How could we have 2L transformed from 1L, then?

	1/L		2/L						
0	2	4	1	3	0	2	4	3	1
4	1	3	0	2	4	3	1	0	2
3	0	2	4	1	1	0	2	4	3
2	4	1	3	0	2	4	3	1	0
1	3	0	2	4	3	1	0	2	4

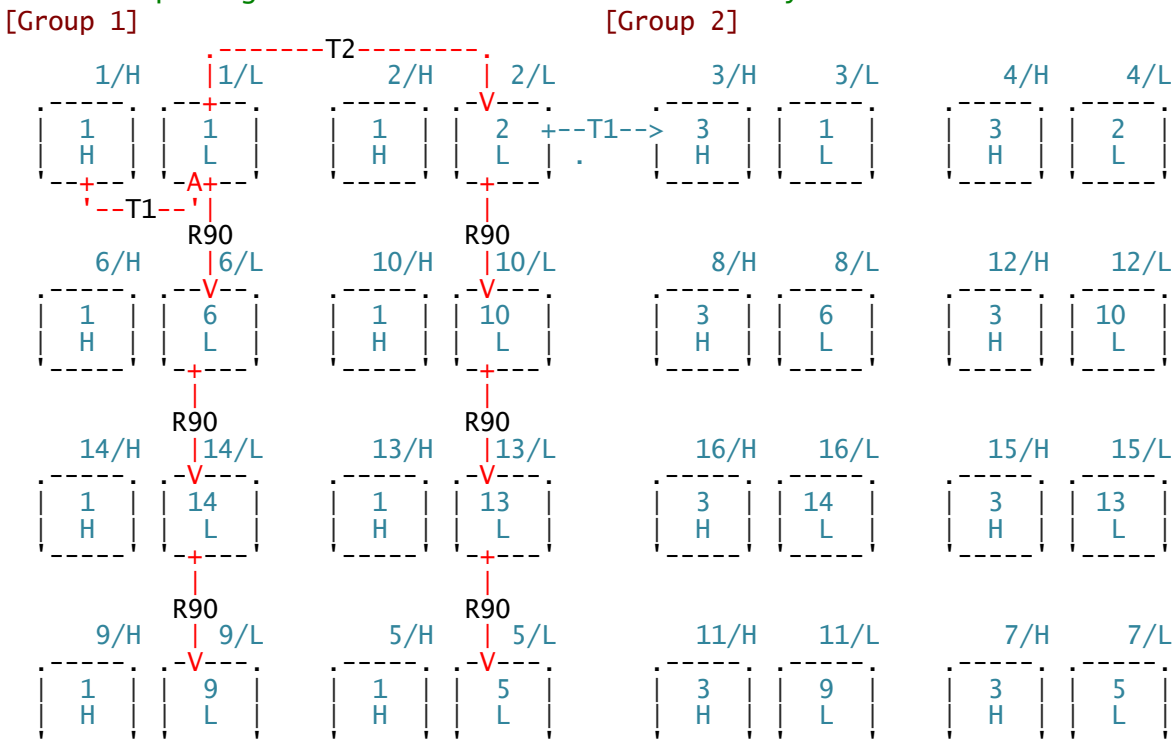
We could obtain 2L just by replacing all 1 with 3 and all 3 with 1 of 1L.

5. Transformation System for Simultaneous Type of C.E.S. 5x5

Let me skip all my trivial explanations and directly come to my conclusion.

I invented such a transformation system as follows:

**** Step Diagram of Our New Transformation System ****



Almost all layers of Group 2 could be made by just copying the ones of Group 1.
I dictated the next transformation rules for my computer program listed below:

```

/** Transformation Rules: *
/** Transform Type01: Mirror Reflection *
void trns01(){
    d[1]=c[1];    d[2]=c[6];    d[3]=c[11];    d[4]=c[16];    d[5]=c[21];
    d[6]=c[2];    d[7]=c[7];    d[8]=c[12];    d[9]=c[17];    d[10]=c[22];
    d[11]=c[3];   d[12]=c[8];    d[13]=c[13];   d[14]=c[18];   d[15]=c[23];
    d[16]=c[4];   d[17]=c[9];    d[18]=c[14];   d[19]=c[19];   d[20]=c[24];
    d[21]=c[5];   d[22]=c[10];   d[23]=c[15];   d[24]=c[20];   d[25]=c[25];
}
//
/** Transform Type02: Data Exchange *
void trns02(){
    short n;
    for(n=1;n<26;n++){d[n]=c[n];}
    for(n=1;n<26;n++){
        if(c[n]==1){d[n]=3;}
        if(c[n]==3){d[n]=1;}
    }
}
//
/** Transform Rotat90: Rotation *
void rotat90(){
    d[1]=c[21];   d[2]=c[16];   d[3]=c[11];   d[4]=c[6];    d[5]=c[1];
    d[6]=c[22];   d[7]=c[17];   d[8]=c[12];   d[9]=c[7];    d[10]=c[2];
    d[11]=c[23];  d[12]=c[18];  d[13]=c[13];  d[14]=c[8];   d[15]=c[3];
    d[16]=c[24];  d[17]=c[19];  d[18]=c[14];  d[19]=c[9];   d[20]=c[4];
    d[21]=c[25];  d[22]=c[20];  d[23]=c[15];  d[24]=c[10];  d[25]=c[5];
}
//
/** Give the Initial Data *
short d1h[26]={
    0,4,3,2,1,
    2,1,0,4,3,
    4,3,2,1,0,
    1,0,4,3,2,
    3,2,1,0,4};
//
/** Convert it into the Classical Notation *
/** short dh[17][26], dl[17][26], df[17][26]; *
void convrt(){
    short m,n;
    for(m=0;m<16;m++){
        for(n=1;n<26;n++){
            df[m][n]=dh[m][n]*5+dl[m][n]+1;
        }
    }
}
//

```

If you only give the initial data to 1H as shown above, then you can reconstruct all the objects automatically by our new transformation system.

The next list demonstrates the result of my reconstruction.

**** Reconstruction List of C.E.S. 5x5 of Simultaneous Magic Type ****

[Group 1]

D5i: 1/H	1/L	1#	D5i: 1/H	2/L	2#
0 4 3 2 1	0 2 4 1 3	1 23 20 12 9	0 4 3 2 1	0 2 4 3 1	1 23 20 14 7
2 1 0 4 3	4 1 3 0 2	15 7 4 21 18	2 1 0 4 3	4 3 1 0 2	15 9 2 21 18
4 3 2 1 0	3 0 2 4 1	24 16 13 10 2	4 3 2 1 0	1 0 2 4 3	22 16 13 10 4
1 0 4 3 2	2 4 1 3 0	8 5 22 19 11	1 0 4 3 2	2 4 3 1 0	8 5 24 17 11
3 2 1 0 4	1 3 0 2 4	17 14 6 3 25	3 2 1 0 4	3 1 0 2 4	19 12 6 3 25

D5i: 1/H	6/L	6#	D5i: 1/H	10/L	10#
0 4 3 2 1	1 2 3 4 0	2 23 19 15 6	0 4 3 2 1	3 2 1 4 0	4 23 17 15 6
2 1 0 4 3	3 4 0 1 2	14 10 1 22 18	2 1 0 4 3	1 4 0 3 2	12 10 1 24 18
4 3 2 1 0	0 1 2 3 4	21 17 13 9 5	4 3 2 1 0	0 3 2 1 4	21 19 13 7 5
1 0 4 3 2	2 3 4 0 1	8 4 25 16 12	1 0 4 3 2	2 1 4 0 3	8 2 25 16 14
3 2 1 0 4	4 0 1 2 3	20 11 7 3 24	3 2 1 0 4	4 0 3 2 1	20 11 9 3 22

D5i: 1/H	14/L	14#	D5i: 1/H	13/L	13#
0 4 3 2 1	4 2 0 3 1	5 23 16 14 7	0 4 3 2 1	4 2 0 1 3	5 23 16 12 9
2 1 0 4 3	0 3 1 4 2	11 9 2 25 18	2 1 0 4 3	0 1 3 4 2	11 7 4 25 18
4 3 2 1 0	1 4 2 0 3	22 20 13 6 4	4 3 2 1 0	3 4 2 0 1	24 20 13 6 2
1 0 4 3 2	2 0 3 1 4	8 1 24 17 15	1 0 4 3 2	2 0 1 3 4	8 1 22 19 15
3 2 1 0 4	3 1 4 2 0	19 12 10 3 21	3 2 1 0 4	1 3 4 2 0	17 14 10 3 21

D5i: 1/H	9/L	9#	D5i: 1/H	5/L	5#
0 4 3 2 1	3 2 1 0 4	4 23 17 11 10	0 4 3 2 1	1 2 3 0 4	2 23 19 11 10
2 1 0 4 3	1 0 4 3 2	12 6 5 24 18	2 1 0 4 3	3 0 4 1 2	14 6 5 22 18
4 3 2 1 0	4 3 2 1 0	25 19 13 7 1	4 3 2 1 0	4 1 2 3 0	25 17 13 9 1
1 0 4 3 2	2 1 0 4 3	8 2 21 20 14	1 0 4 3 2	2 3 0 4 1	8 4 21 20 12
3 2 1 0 4	0 4 3 2 1	16 15 9 3 22	3 2 1 0 4	0 4 1 2 3	16 15 7 3 24

[Group 2]

D5i: 3/H	1/L	3#	D5i: 3/H	2/L	4#
0 4 1 2 3	0 2 4 1 3	1 23 10 12 19	0 4 1 2 3	0 2 4 3 1	1 23 10 14 17
2 3 0 4 1	4 1 3 0 2	15 17 4 21 8	2 3 0 4 1	4 3 1 0 2	15 19 2 21 8
4 1 2 3 0	3 0 2 4 1	24 6 13 20 2	4 1 2 3 0	1 0 2 4 3	22 6 13 20 4
3 0 4 1 2	2 4 1 3 0	18 5 22 9 11	3 0 4 1 2	2 4 3 1 0	18 5 24 7 11
1 2 3 0 4	1 3 0 2 4	7 14 16 3 25	1 2 3 0 4	3 1 0 2 4	9 12 16 3 25

D5i: 3/H	6/L	8#	D5i: 3/H	10/L	12#
0 4 1 2 3	1 2 3 4 0	2 23 9 15 16	0 4 1 2 3	3 2 1 4 0	4 23 7 15 16
2 3 0 4 1	3 4 0 1 2	14 20 1 22 8	2 3 0 4 1	1 4 0 3 2	12 20 1 24 8
4 1 2 3 0	0 1 2 3 4	21 7 13 19 5	4 1 2 3 0	0 3 2 1 4	21 9 13 17 5
3 0 4 1 2	2 3 4 0 1	18 4 25 6 12	3 0 4 1 2	2 1 4 0 3	18 2 25 6 14
1 2 3 0 4	4 0 1 2 3	10 11 17 3 24	1 2 3 0 4	4 0 3 2 1	10 11 19 3 22

D5i: 3/H	14/L	16#	D5i: 3/H	13/L	15#
0 4 1 2 3	4 2 0 3 1	5 23 6 14 17	0 4 1 2 3	4 2 0 1 3	5 23 6 12 19
2 3 0 4 1	0 3 1 4 2	11 19 2 25 8	2 3 0 4 1	0 1 3 4 2	11 17 4 25 8
4 1 2 3 0	1 4 2 0 3	22 10 13 16 4	4 1 2 3 0	3 4 2 0 1	24 10 13 16 2
3 0 4 1 2	2 0 3 1 4	18 1 24 7 15	3 0 4 1 2	2 0 1 3 4	18 1 22 9 15
1 2 3 0 4	3 1 4 2 0	9 12 20 3 21	1 2 3 0 4	1 3 4 2 0	7 14 20 3 21

D5i: 3/H	9/L	11#	D5i: 3/H	5/L	7#
0 4 1 2 3	3 2 1 0 4	4 23 7 11 20	0 4 1 2 3	1 2 3 0 4	2 23 9 11 20
2 3 0 4 1	1 0 4 3 2	12 16 5 24 8	2 3 0 4 1	3 0 4 1 2	14 16 5 22 8
4 1 2 3 0	4 3 2 1 0	25 9 13 17 1	4 1 2 3 0	4 1 2 3 0	25 7 13 19 1
3 0 4 1 2	2 1 0 4 3	18 2 21 10 14	3 0 4 1 2	2 3 0 4 1	18 4 21 10 12
1 2 3 0 4	0 4 3 2 1	6 15 19 3 22	1 2 3 0 4	0 4 1 2 3	6 15 17 3 24

[Count = 16]

Each number on the right shoulder of each classical notation was referred to the number of our old solution list we got before.

6. Analytical Study of Pan-diagonal Magic Squares 5x5

The next job we have to do is making analysis on the decomposed layers of 3600 Pan-diagonal Magic Squares 5x5 (another "Suzuki Squares").

But it sounds horrible that we have to deal with so many solutions as 3600. Imagine we have to put out every list on this page. It is actually too hard.

Let me take the 144 Fundamental Solutions of PDMS55 only for our study here.

We now know what a job we have to do:

- (1) Try to find any solution whose high layer is the same, and collect all of them to make a group for them.
- (2) Compare each member with the others or with the ones in other groups, and find any correspondences among them.
- (3) Try to find any transformation method we can reconstruct all 144 objects with.

The next list shows the 6 groups each of which has the same high layer.

** List of the Fundamental Solutions of PDMS55 with Decomposed Layers **

[Group 1]

1/	1H	1L	2/	1H	2L	5/	1H	5L
1 24 10 18 12	04132	03421	1 24 10 17 13	04132	03412	1 23 10 19 12	04132	02431
20 13 2 21 9	32041	42103	20 12 3 21 9	32041	41203	20 14 2 21 8	32041	43102
22 6 19 15 3	41320	10342	23 6 19 15 2	41320	20341	22 6 18 15 4	41320	10243
14 5 23 7 16	20413	34210	14 5 22 8 16	20413	34120	13 5 24 7 16	20413	24310
8 17 11 4 25	13204	21034	7 18 11 4 25	13204	12034	9 17 11 3 25	13204	31024
6/	1H	6L	9/	1H	9L	10/	1H	10L
1 23 10 17 14	04132	02413	1 22 10 19 13	04132	01432	1 22 10 18 14	04132	01423
20 12 4 21 8	32041	41302	20 14 3 21 7	32041	43201	20 13 4 21 7	32041	42301
24 6 18 15 2	41320	30241	23 6 17 15 4	41320	20143	24 6 17 15 3	41320	30142
13 5 22 9 16	20413	24130	12 5 24 8 16	20413	14320	12 5 23 9 16	20413	14230
7 19 11 3 25	13204	13024	9 18 11 2 25	13204	32014	8 19 11 2 25	13204	23014
19/	1H	19L	20/	1H	20L	23/	1H	23L
1 25 9 18 12	04132	04321	1 25 9 17 13	04132	04312	1 23 9 20 12	04132	02341
19 13 2 21 10	32041	32104	19 12 3 21 10	32041	31204	19 15 2 21 8	32041	34102
22 6 20 14 3	41320	10432	23 6 20 14 2	41320	20431	22 6 18 14 5	41320	10234
15 4 23 7 16	20413	43210	15 4 22 8 16	20413	43120	13 4 25 7 16	20413	23410
8 17 11 5 24	13204	21043	7 18 11 5 24	13204	12043	10 17 11 3 24	13204	41023
24/	1H	24L	27/	1H	27L	28/	1H	28L
1 23 9 17 15	04132	02314	1 22 9 20 13	04132	01342	1 22 9 18 15	04132	01324
19 12 5 21 8	32041	31402	19 15 3 21 7	32041	34201	19 13 5 21 7	32041	32401
25 6 18 14 2	41320	40231	23 6 17 14 5	41320	20134	25 6 17 14 3	41320	40132
13 4 22 10 16	20413	23140	12 4 25 8 16	20413	13420	12 4 23 10 16	20413	13240
7 20 11 3 24	13204	14023	10 18 11 2 24	13204	42013	8 20 11 2 24	13204	24013
37/	1H	37L	38/	1H	38L	41/	1H	41L
1 25 8 19 12	04132	04231	1 25 8 17 14	04132	04213	1 24 8 20 12	04132	03241
18 14 2 21 10	32041	23104	18 12 4 21 10	32041	21304	18 15 2 21 9	32041	24103
22 6 20 13 4	41320	10423	24 6 20 13 2	41320	30421	22 6 19 13 5	41320	10324
15 3 24 7 16	20413	42310	15 3 22 9 16	20413	42130	14 3 25 7 16	20413	32410
9 17 11 5 23	13204	31042	7 19 11 5 23	13204	13042	10 17 11 4 23	13204	41032
42/	1H	42L	45/	1H	45L	46/	1H	46L
1 24 8 17 15	04132	03214	1 22 8 20 14	04132	01243	1 22 8 19 15	04132	01234
18 12 5 21 9	32041	21403	18 15 4 21 7	32041	24301	18 14 5 21 7	32041	23401
25 6 19 13 2	41320	40321	24 6 17 13 5	41320	30124	25 6 17 13 4	41320	40123
14 3 22 10 16	20413	32140	12 3 25 9 16	20413	12430	12 3 24 10 16	20413	12340
7 20 11 4 23	13204	14032	10 19 11 2 23	13204	43012	9 20 11 2 23	13204	34012

1 25 7 19 13	55/ 1H 55L	04132 04132	1 25 7 18 14	56/ 1H 56L	04132 04123	1 24 7 20 13	59/ 1H 59L	04132 03142
17 14 3 21 10		32041 13204	17 13 4 21 10		32041 12304	17 15 3 21 9		32041 14203
23 6 20 12 4		41320 20413	24 6 20 12 3		41320 30412	23 6 19 12 5		41320 20314
15 2 24 8 16		20413 41320	15 2 23 9 16		20413 41230	14 2 25 8 16		20413 31420
9 18 11 5 22		13204 32041	8 19 11 5 22		13204 23041	10 18 11 4 22		13204 42031
1 24 7 18 15	60/ 1H 60L	04132 03124	1 23 7 20 14	63/ 1H 63L	04132 02143	1 23 7 19 15	64/ 1H 64L	04132 02134
17 13 5 21 9		32041 12403	17 15 4 21 8		32041 14302	17 14 5 21 8		32041 13402
25 6 19 12 3		41320 40312	24 6 18 12 5		41320 30214	25 6 18 12 4		41320 40213
14 2 23 10 16		20413 31240	13 2 25 9 16		20413 21430	13 2 24 10 16		20413 21340
8 20 11 4 22		13204 24031	10 19 11 3 22		13204 43021	9 20 11 3 22		13204 34021

[Group 2]

1 24 15 18 7	3/ 3H 1L	04231 03421	1 24 15 17 8	4/ 3H 2L	04231 03412	1 23 15 19 7	7/ 3H 5L	04231 02431
20 8 2 21 14		31042 42103	20 7 3 21 14		31042 41203	20 9 2 21 13		31042 43102
22 11 19 10 3		42310 10342	23 11 19 10 2		42310 20341	22 11 18 10 4		42310 10243
9 5 23 12 16		10423 34210	9 5 22 13 16		10423 34120	8 5 24 12 16		10423 24310
13 17 6 4 25		23104 21034	12 18 6 4 25		23104 12034	14 17 6 3 25		23104 31024
1 23 15 17 9	8/ 3H 6L	04231 02413	1 22 15 19 8	11/ 3H 9L	04231 01432	1 22 15 18 9	12/ 3H 10L	04231 01423
20 7 4 21 13		31042 41302	20 9 3 21 12		31042 43201	20 8 4 21 12		31042 42301
24 11 18 10 2		42310 30241	23 11 17 10 4		42310 20143	24 11 17 10 3		42310 30142
8 5 22 14 16		10423 24130	7 5 24 13 16		10423 14320	7 5 23 14 16		10423 14230
12 19 6 3 25		23104 13024	14 18 6 2 25		23104 32014	13 19 6 2 25		23104 23014
1 25 14 18 7	21/ 3H 19L	04231 04321	1 25 14 17 8	22/ 3H 20L	04231 04312	1 23 14 20 7	25/ 3H 23L	04231 02341
19 8 2 21 15		31042 32104	19 7 3 21 15		31042 31204	19 10 2 21 13		31042 34102
22 11 20 9 3		42310 10432	23 11 20 9 2		42310 20431	22 11 18 9 5		42310 10234
10 4 23 12 16		10423 43210	10 4 22 13 16		10423 43120	8 4 25 12 16		10423 23410
13 17 6 5 24		23104 21043	12 18 6 5 24		23104 12043	15 17 6 3 24		23104 41023
1 23 14 17 10	26/ 3H 24L	04231 02314	1 22 14 20 8	29/ 3H 27L	04231 01342	1 22 14 18 10	30/ 3H 28L	04231 01324
19 7 5 21 13		31042 31402	19 10 3 21 12		31042 34201	19 8 5 21 12		31042 32401
25 11 18 9 2		42310 40231	23 11 17 9 5		42310 20134	25 11 17 9 3		42310 40132
8 4 22 15 16		10423 23140	7 4 25 13 16		10423 13420	7 4 23 15 16		10423 13240
12 20 6 3 24		23104 14023	15 18 6 2 24		23104 42013	13 20 6 2 24		23104 24013
1 25 13 19 7	39/ 3H 37L	04231 04231	1 25 13 17 9	40/ 3H 38L	04231 04213	1 24 13 20 7	43/ 3H 41L	04231 03241
18 9 2 21 15		31042 23104	18 7 4 21 15		31042 21304	18 10 2 21 14		31042 24103
22 11 20 8 4		42310 10423	24 11 20 8 2		42310 30421	22 11 19 8 5		42310 10324
10 3 24 12 16		10423 42310	10 3 22 14 16		10423 42130	9 3 25 12 16		10423 32410
14 17 6 5 23		23104 31042	12 19 6 5 23		23104 13042	15 17 6 4 23		23104 41032
1 24 13 17 10	44/ 3H 42L	04231 03214	1 22 13 20 9	47/ 3H 45L	04231 01243	1 22 13 19 10	48/ 3H 46L	04231 01234
18 7 5 21 14		31042 21403	18 10 4 21 12		31042 24301	18 9 5 21 12		31042 23401
25 11 19 8 2		42310 40321	24 11 17 8 5		42310 30124	25 11 17 8 4		42310 40123
9 3 22 15 16		10423 32140	7 3 25 14 16		10423 12430	7 3 24 15 16		10423 12340
12 20 6 4 23		23104 14032	15 19 6 2 23		23104 43012	14 20 6 2 23		23104 34012
1 25 12 19 8	57/ 3H 55L	04231 04132	1 25 12 18 9	58/ 3H 56L	04231 04123	1 24 12 20 8	61/ 3H 59L	04231 03142
17 9 3 21 15		31042 13204	17 8 4 21 15		31042 12304	17 10 3 21 14		31042 14203
23 11 20 7 4		42310 20413	24 11 20 7 3		42310 30412	23 11 19 7 5		42310 20314
10 2 24 13 16		10423 41320	10 2 23 14 16		10423 41230	9 2 25 13 16		10423 31420
14 18 6 5 22		23104 32041	13 19 6 5 22		23104 23041	15 18 6 4 22		23104 42031
1 24 12 18 10	62/ 3H 60L	04231 03124	1 23 12 20 9	65/ 3H 63L	04231 02143	1 23 12 19 10	66/ 3H 64L	04231 02134
17 8 5 21 14		31042 12403	17 10 4 21 13		31042 14302	17 9 5 21 13		31042 13402
25 11 19 7 3		42310 40312	24 11 18 7 5		42310 30214	25 11 18 7 4		42310 40213
9 2 23 15 16		10423 31240	8 2 25 14 16		10423 21430	8 2 24 15 16		10423 21340
13 20 6 4 22		23104 24031	15 19 6 3 22		23104 43021	14 20 6 3 22		23104 34021

[Group 3]

13/	13H	1L	14/	13H	2L	15/	13H	5L
1 24 10 13 17	04123	03421	1 24 10 12 18	04123	03412	1 23 10 14 17	04123	02431
15 18 2 21 9	23041	42103	15 17 3 21 9	23041	41203	15 19 2 21 8	23041	43102
22 6 14 20 3	41230	10342	23 6 14 20 2	41230	20341	22 6 13 20 4	41230	10243
19 5 23 7 11	30412	34210	19 5 22 8 11	30412	34120	18 5 24 7 11	30412	24310
8 12 16 4 25	12304	21034	7 13 16 4 25	12304	12034	9 12 16 3 25	12304	31024
16/	13H	6L	17/	13H	9L	18/	13H	10L
1 23 10 12 19	04123	02413	1 22 10 14 18	04123	01432	1 22 10 13 19	04123	01423
15 17 4 21 8	23041	41302	15 19 3 21 7	23041	43201	15 18 4 21 7	23041	42301
24 6 13 20 2	41230	30241	23 6 12 20 4	41230	20143	24 6 12 20 3	41230	30142
18 5 22 9 11	30412	24130	17 5 24 8 11	30412	14320	17 5 23 9 11	30412	14230
7 14 16 3 25	12304	13024	9 13 16 2 25	12304	32014	8 14 16 2 25	12304	23014
31/	13H	19L	32/	13H	20L	33/	13H	23L
1 25 9 13 17	04123	04321	1 25 9 12 18	04123	04312	1 23 9 15 17	04123	02341
14 18 2 21 10	23041	32104	14 17 3 21 10	23041	31204	14 20 2 21 8	23041	34102
22 6 15 19 3	41230	10432	23 6 15 19 2	41230	20431	22 6 13 19 5	41230	10234
20 4 23 7 11	30412	43210	20 4 22 8 11	30412	43120	18 4 25 7 11	30412	23410
8 12 16 5 24	12304	21043	7 13 16 5 24	12304	12043	10 12 16 3 24	12304	41023
34/	13H	24L	35/	13H	27L	36/	13H	28L
1 23 9 12 20	04123	02314	1 22 9 15 18	04123	01342	1 22 9 13 20	04123	01324
14 17 5 21 8	23041	31402	14 20 3 21 7	23041	34201	14 18 5 21 7	23041	32401
25 6 13 19 2	41230	40231	23 6 12 19 5	41230	20134	25 6 12 19 3	41230	40132
18 4 22 10 11	30412	23140	17 4 25 8 11	30412	13420	17 4 23 10 11	30412	13240
7 15 16 3 24	12304	14023	10 13 16 2 24	12304	42013	8 15 16 2 24	12304	24013
49/	13H	37L	50/	13H	38L	51/	13H	41L
1 25 8 14 17	04123	04231	1 25 8 12 19	04123	04213	1 24 8 15 17	04123	03241
13 19 2 21 10	23041	23104	13 17 4 21 10	23041	21304	13 20 2 21 9	23041	24103
22 6 15 18 4	41230	10423	24 6 15 18 2	41230	30421	22 6 14 18 5	41230	10324
20 3 24 7 11	30412	42310	20 3 22 9 11	30412	42130	19 3 25 7 11	30412	32410
9 12 16 5 23	12304	31042	7 14 16 5 23	12304	13042	10 12 16 4 23	12304	41032
52/	13H	42L	53/	13H	45L	54/	13H	46L
1 24 8 12 20	04123	03214	1 22 8 15 19	04123	01243	1 22 8 14 20	04123	01234
13 17 5 21 9	23041	21403	13 20 4 21 7	23041	24301	13 19 5 21 7	23041	23401
25 6 14 18 2	41230	40321	24 6 12 18 5	41230	30124	25 6 12 18 4	41230	40123
19 3 22 10 11	30412	32140	17 3 25 9 11	30412	12430	17 3 24 10 11	30412	12340
7 15 16 4 23	12304	14032	10 14 16 2 23	12304	43012	9 15 16 2 23	12304	34012
67/	13H	55L	68/	13H	56L	69/	13H	59L
1 25 7 14 18	04123	04132	1 25 7 13 19	04123	04123	1 24 7 15 18	04123	03142
12 19 3 21 10	23041	13204	12 18 4 21 10	23041	12304	12 20 3 21 9	23041	14203
23 6 15 17 4	41230	20413	24 6 15 17 3	41230	30412	23 6 14 17 5	41230	20314
20 2 24 8 11	30412	41320	20 2 23 9 11	30412	41230	19 2 25 8 11	30412	31420
9 13 16 5 22	12304	32041	8 14 16 5 22	12304	23041	10 13 16 4 22	12304	42031
70/	13H	60L	71/	13H	63L	72/	13H	64L
1 24 7 13 20	04123	03124	1 23 7 15 19	04123	02143	1 23 7 14 20	04123	02134
12 18 5 21 9	23041	12403	12 20 4 21 8	23041	14302	12 19 5 21 8	23041	13402
25 6 14 17 3	41230	40312	24 6 13 17 5	41230	30214	25 6 13 17 4	41230	40213
19 2 23 10 11	30412	31240	18 2 25 9 11	30412	21430	18 2 24 10 11	30412	21340
8 15 16 4 22	12304	24031	10 14 16 3 22	12304	43021	9 15 16 3 22	12304	34021

[Group 4]

73/	73H	73L	74/	73H	74L	77/	73H	77L
1 25 17 14 8	04321	04132	1 25 18 14 7	04321	04231	1 25 17 13 9	04321	04123
19 13 6 5 22	32104	32041	19 12 6 5 23	32104	31042	18 14 6 5 22	32104	23041
10 2 24 18 11	10432	41320	10 3 24 17 11	10432	42310	10 2 23 19 11	10432	41230
23 16 15 7 4	43210	20413	22 16 15 8 4	43210	10423	24 16 15 7 3	43210	30412
12 9 3 21 20	21043	13204	13 9 2 21 20	21043	23104	12 8 4 21 20	21043	12304
78/	73H	78L	81/	73H	81L	82/	73H	82L
1 25 19 13 7	04321	04321	1 25 18 12 9	04321	04213	1 25 19 12 8	04321	04312
18 12 6 5 24	32104	21043	17 14 6 5 23	32104	13042	17 13 6 5 24	32104	12043
10 4 23 17 11	10432	43210	10 3 22 19 11	10432	42130	10 4 22 18 11	10432	43120
22 16 15 9 3	43210	10432	24 16 15 8 2	43210	30421	23 16 15 9 2	43210	20431
14 8 2 21 20	21043	32104	13 7 4 21 20	21043	21304	14 7 3 21 20	21043	31204

1 24 17 15 8	85/ 73H 85L	04321 03142	1 24 18 15 7	86/ 73H 86L	04321 03241	1 24 17 13 10	89/ 73H 89L	04321 03124
20 13 6 4 22		32104 42031	20 12 6 4 23		32104 41032	18 15 6 4 22		32104 24031
9 2 25 18 11		10432 31420	9 3 25 17 11		10432 32410	9 2 23 20 11		10432 31240
23 16 14 7 5		43210 20314	22 16 14 8 5		43210 10324	25 16 14 7 3		43210 40312
12 10 3 21 19		21043 14203	13 10 2 21 19		21043 24103	12 8 5 21 19		21043 12403
1 24 20 13 7	90/ 73H 90L	04321 03421	1 24 18 12 10	93/ 73H 93L	04321 03214	1 24 20 12 8	94/ 73H 94L	04321 03412
18 12 6 4 25		32104 21034	17 15 6 4 23		32104 14032	17 13 6 4 25		32104 12034
9 5 23 17 11		10432 34210	9 3 22 20 11		10432 32140	9 5 22 18 11		10432 34120
22 16 14 10 3		43210 10342	25 16 14 8 2		43210 40321	23 16 14 10 2		43210 20341
15 8 2 21 19		21043 42103	13 7 5 21 19		21043 21403	15 7 3 21 19		21043 41203
1 23 17 15 9	97/ 73H 97L	04321 02143	1 23 19 15 7	98/ 73H 98L	04321 02341	1 23 17 14 10	101/ 73H 101L	04321 02134
20 14 6 3 22		32104 43021	20 12 6 3 24		32104 41023	19 15 6 3 22		32104 34021
8 2 25 19 11		10432 21430	8 4 25 17 11		10432 23410	8 2 24 20 11		10432 21340
24 16 13 7 5		43210 30214	22 16 13 9 5		43210 10234	25 16 13 7 4		43210 40213
12 10 4 21 18		21043 14302	14 10 2 21 18		21043 34102	12 9 5 21 18		21043 13402
1 23 20 14 7	102/ 73H 102L	04321 02431	1 23 19 12 10	105/ 73H 105L	04321 02314	1 23 20 12 9	106/ 73H 106L	04321 02413
19 12 6 3 25		32104 31024	17 15 6 3 24		32104 14023	17 14 6 3 25		32104 13024
8 5 24 17 11		10432 24310	8 4 22 20 11		10432 23140	8 5 22 19 11		10432 24130
22 16 13 10 4		43210 10243	25 16 13 9 2		43210 40231	24 16 13 10 2		43210 30241
15 9 2 21 18		21043 43102	14 7 5 21 18		21043 31402	15 7 4 21 18		21043 41302
1 22 18 15 9	109/ 73H 109L	04321 01243	1 22 19 15 8	110/ 73H 110L	04321 01342	1 22 18 14 10	113/ 73H 113L	04321 01234
20 14 6 2 23		32104 43012	20 13 6 2 24		32104 42013	19 15 6 2 23		32104 34012
7 3 25 19 11		10432 12430	7 4 25 18 11		10432 13420	7 3 24 20 11		10432 12340
24 16 12 8 5		43210 30124	23 16 12 9 5		43210 20134	25 16 12 8 4		43210 40123
13 10 4 21 17		21043 24301	14 10 3 21 17		21043 34201	13 9 5 21 17		21043 23401
1 22 20 14 8	114/ 73H 114L	04321 01432	1 22 19 13 10	117/ 73H 117L	04321 01324	1 22 20 13 9	118/ 73H 118L	04321 01423
19 13 6 2 25		32104 32014	18 15 6 2 24		32104 24013	18 14 6 2 25		32104 23014
7 5 24 18 11		10432 14320	7 4 23 20 11		10432 13240	7 5 23 19 11		10432 14230
23 16 12 10 4		43210 20143	25 16 12 9 3		43210 40132	24 16 12 10 3		43210 30142
15 9 3 21 17		21043 43201	14 8 5 21 17		21043 32401	15 8 4 21 17		21043 42301

[Group 5]

1 25 17 9 13	75/ 75H 73L	04312 04132	1 25 18 9 12	76/ 75H 74L	04312 04231	1 25 17 8 14	79/ 75H 77L	04312 04123
19 8 11 5 22		31204 32041	19 7 11 5 23		31204 31042	18 9 11 5 22		31204 23041
15 2 24 18 6		20431 41320	15 3 24 17 6		20431 42310	15 2 23 19 6		20431 41230
23 16 10 12 4		43120 20413	22 16 10 13 4		43120 10423	24 16 10 12 3		43120 30412
7 14 3 21 20		12043 13204	8 14 2 21 20		12043 23104	7 13 4 21 20		12043 12304
1 25 19 8 12	80/ 75H 78L	04312 04321	1 25 18 7 14	83/ 75H 81L	04312 04213	1 25 19 7 13	84/ 75H 82L	04312 04312
18 7 11 5 24		31204 21043	17 9 11 5 23		31204 13042	17 8 11 5 24		31204 12043
15 4 23 17 6		20431 43210	15 3 22 19 6		20431 42130	15 4 22 18 6		20431 43120
22 16 10 14 3		43120 10432	24 16 10 13 2		43120 30421	23 16 10 14 2		43120 20431
9 13 2 21 20		12043 32104	8 12 4 21 20		12043 21304	9 12 3 21 20		12043 31204
1 24 17 10 13	87/ 75H 85L	04312 03142	1 24 18 10 12	88/ 75H 86L	04312 03241	1 24 17 8 15	91/ 75H 89L	04312 03124
20 8 11 4 22		31204 42031	20 7 11 4 23		31204 41032	18 10 11 4 22		31204 24031
14 2 25 18 6		20431 31420	14 3 25 17 6		20431 32410	14 2 23 20 6		20431 31240
23 16 9 12 5		43120 20314	22 16 9 13 5		43120 10324	25 16 9 12 3		43120 40312
7 15 3 21 19		12043 14203	8 15 2 21 19		12043 24103	7 13 5 21 19		12043 12403
1 24 20 8 12	92/ 75H 90L	04312 03421	1 24 18 7 15	95/ 75H 93L	04312 03214	1 24 20 7 13	96/ 75H 94L	04312 03412
18 7 11 4 25		31204 21034	17 10 11 4 23		31204 14032	17 8 11 4 25		31204 12034
14 5 23 17 6		20431 34210	14 3 22 20 6		20431 32140	14 5 22 18 6		20431 34120
22 16 9 15 3		43120 10342	25 16 9 13 2		43120 40321	23 16 9 15 2		43120 20341
10 13 2 21 19		12043 42103	8 12 5 21 19		12043 21403	10 12 3 21 19		12043 41203

1 23 17 10 14	99/ 75H 97L	04312 02143	1 23 19 10 12	100/ 75H 98L	04312 02341	1 23 17 9 15	103/ 75H 101L	04312 02134
20 9 11 3 22		31204 43021	20 7 11 3 24		31204 41023	19 10 11 3 22		31204 34021
13 2 25 19 6		20431 21430	13 4 25 17 6		20431 23410	13 2 24 20 6		20431 21340
24 16 8 12 5		43120 30214	22 16 8 14 5		43120 10234	25 16 8 12 4		43120 40213
7 15 4 21 18		12043 14302	9 15 2 21 18		12043 34102	7 14 5 21 18		12043 13402
1 23 20 9 12	104/ 75H 102L	04312 02431	1 23 19 7 15	107/ 75H 105L	04312 02314	1 23 20 7 14	108/ 75H 106L	04312 02413
19 7 11 3 25		31204 31024	17 10 11 3 24		31204 14023	17 9 11 3 25		31204 13024
13 5 24 17 6		20431 24310	13 4 22 20 6		20431 23140	13 5 22 19 6		20431 24130
22 16 8 15 4		43120 10243	25 16 8 14 2		43120 40231	24 16 8 15 2		43120 30241
10 14 2 21 18		12043 43102	9 12 5 21 18		12043 31402	10 12 4 21 18		12043 41302
1 22 18 10 14	111/ 75H 109L	04312 01243	1 22 19 10 13	112/ 75H 110L	04312 01342	1 22 18 9 15	115/ 75H 113L	04312 01234
20 9 11 2 23		31204 43012	20 8 11 2 24		31204 42013	19 10 11 2 23		31204 34012
12 3 25 19 6		20431 12430	12 4 25 18 6		20431 13420	12 3 24 20 6		20431 12340
24 16 7 13 5		43120 30124	23 16 7 14 5		43120 20134	25 16 7 13 4		43120 40123
8 15 4 21 17		12043 24301	9 15 3 21 17		12043 34201	8 14 5 21 17		12043 23401
1 22 20 9 13	116/ 75H 114L	04312 01432	1 22 19 8 15	119/ 75H 117L	04312 01324	1 22 20 8 14	120/ 75H 118L	04312 01423
19 8 11 2 25		31204 32014	18 10 11 2 24		31204 24013	18 9 11 2 25		31204 23014
12 5 24 18 6		20431 14320	12 4 23 20 6		20431 13240	12 5 23 19 6		20431 14230
23 16 7 15 4		43120 20143	25 16 7 14 3		43120 40132	24 16 7 15 3		43120 30142
10 14 3 21 17		12043 43201	9 13 5 21 17		12043 32401	10 13 4 21 17		12043 42301

[Group 6]

1 25 12 9 18	121/ 121H 73L	04213 04132	1 25 13 9 17	122/ 121H 74L	04213 04231	1 25 12 8 19	123/ 121H 77L	04213 04123
14 8 16 5 22		21304 32041	14 7 16 5 23		21304 31042	13 9 16 5 22		21304 23041
20 2 24 13 6		30421 41320	20 3 24 12 6		30421 42310	20 2 23 14 6		30421 41230
23 11 10 17 4		42130 20413	22 11 10 18 4		42130 10423	24 11 10 17 3		42130 30412
7 19 3 21 15		13042 13204	8 19 2 21 15		13042 23104	7 18 4 21 15		13042 12304
1 25 14 8 17	124/ 121H 78L	04213 04321	1 25 13 7 19	125/ 121H 81L	04213 04213	1 25 14 7 18	126/ 121H 82L	04213 04312
13 7 16 5 24		21304 21043	12 9 16 5 23		21304 13042	12 8 16 5 24		21304 12043
20 4 23 12 6		30421 43210	20 3 22 14 6		30421 42130	20 4 22 13 6		30421 43120
22 11 10 19 3		42130 10432	24 11 10 18 2		42130 30421	23 11 10 19 2		42130 20431
9 18 2 21 15		13042 32104	8 17 4 21 15		13042 21304	9 17 3 21 15		13042 31204
1 24 12 10 18	127/ 121H 85L	04213 03142	1 24 13 10 17	128/ 121H 86L	04213 03241	1 24 12 8 20	129/ 121H 89L	04213 03124
15 8 16 4 22		21304 42031	15 7 16 4 23		21304 41032	13 10 16 4 22		21304 24031
19 2 25 13 6		30421 31420	19 3 25 12 6		30421 32410	19 2 23 15 6		30421 31240
23 11 9 17 5		42130 20314	22 11 9 18 5		42130 10324	25 11 9 17 3		42130 40312
7 20 3 21 14		13042 14203	8 20 2 21 14		13042 24103	7 18 5 21 14		13042 12403
1 24 15 8 17	130/ 121H 90L	04213 03421	1 24 13 7 20	131/ 121H 93L	04213 03214	1 24 15 7 18	132/ 121H 94L	04213 03412
13 7 16 4 25		21304 21034	12 10 16 4 23		21304 14032	12 8 16 4 25		21304 12034
19 5 23 12 6		30421 34210	19 3 22 15 6		30421 32140	19 5 22 13 6		30421 34120
22 11 9 20 3		42130 10342	25 11 9 18 2		42130 40321	23 11 9 20 2		42130 20341
10 18 2 21 14		13042 42103	8 17 5 21 14		13042 21403	10 17 3 21 14		13042 41203
1 23 12 10 19	133/ 121H 97L	04213 02143	1 23 14 10 17	134/ 121H 98L	04213 02341	1 23 12 9 20	135/ 121H 101L	04213 02134
15 9 16 3 22		21304 43021	15 7 16 3 24		21304 41023	14 10 16 3 22		21304 34021
18 2 25 14 6		30421 21430	18 4 25 12 6		30421 23410	18 2 24 15 6		30421 21340
24 11 8 17 5		42130 30214	22 11 8 19 5		42130 10234	25 11 8 17 4		42130 40213
7 20 4 21 13		13042 14302	9 20 2 21 13		13042 34102	7 19 5 21 13		13042 13402
1 23 15 9 17	136/ 121H 102L	04213 02431	1 23 14 7 20	137/ 121H 105L	04213 02314	1 23 15 7 19	138/ 121H 106L	04213 02413
14 7 16 3 25		21304 31024	12 10 16 3 24		21304 14023	12 9 16 3 25		21304 13024
18 5 24 12 6		30421 24310	18 4 22 15 6		30421 23140	18 5 22 14 6		30421 24130
22 11 8 20 4		42130 10243	25 11 8 19 2		42130 40231	24 11 8 20 2		42130 30241
10 19 2 21 13		13042 43102	9 17 5 21 13		13042 31402	10 17 4 21 13		13042 41302

139/	121H	109L	140/	121H	110L	141/	121H	113L
1 22 13 10 19	04213	01243	1 22 14 10 18	04213	01342	1 22 13 9 20	04213	01234
15 9 16 2 23	21304	43012	15 8 16 2 24	21304	42013	14 10 16 2 23	21304	34012
17 3 25 14 6	30421	12430	17 4 25 13 6	30421	13420	17 3 24 15 6	30421	12340
24 11 7 18 5	42130	30124	23 11 7 19 5	42130	20134	25 11 7 18 4	42130	40123
8 20 4 21 12	13042	24301	9 20 3 21 12	13042	34201	8 19 5 21 12	13042	23401
142/	121H	114L	143/	121H	117L	144/	121H	118L
1 22 15 9 18	04213	01432	1 22 14 8 20	04213	01324	1 22 15 8 19	04213	01423
14 8 16 2 25	21304	32014	13 10 16 2 24	21304	24013	13 9 16 2 25	21304	23014
17 5 24 13 6	30421	14320	17 4 23 15 6	30421	13240	17 5 23 14 6	30421	14230
23 11 7 20 4	42130	20143	25 11 7 19 3	42130	40132	24 11 7 20 3	42130	30142
10 19 3 21 12	13042	43201	9 18 5 21 12	13042	32401	10 18 4 21 12	13042	42301

The first three groups have the same set of 24 low layers, and the last three ones have another set of 24 low layers. We could classify 144 objects into 2 x 3 groups.

$$2 \times 3 \times 24 = 144$$

To my great surprise every low layer of the second three groups is corresponding to every low layer in the first three groups by one to one. See (1L, 73L), (2L, 74L) and (5L, 77L) in the next list below. They could be transformed by the same manner, simple 'mirror reflection', symmetrical with respect to the first primary diagonal.

[Group 1]

1/	1H	1L	2/	1H	2L	5/	1H	5L
1 24 10 18 12	04132	03421	1 24 10 17 13	04132	03412	1 23 10 19 12	04132	02431
20 13 2 21 9	32041	42103	20 12 3 21 9	32041	41203	20 14 2 21 8	32041	43102
22 6 19 15 3	41320	10342	23 6 19 15 2	41320	20341	22 6 18 15 4	41320	10243
14 5 23 7 16	20413	34210	14 5 22 8 16	20413	34120	13 5 24 7 16	20413	24310
8 17 11 4 25	13204	21034	7 18 11 4 25	13204	12034	9 17 11 3 25	13204	31024

[Group 4]

73/	73H	73L	74/	73H	74L	77/	73H	77L
1 25 17 14 8	04321	04132	1 25 18 14 7	04321	04231	1 25 17 13 9	04321	04123
19 13 6 5 22	32104	32041	19 12 6 5 23	32104	31042	18 14 6 5 22	32104	23041
10 2 24 18 11	10432	41320	10 3 24 17 11	10432	42310	10 2 23 19 11	10432	41230
23 16 15 7 4	43210	20413	22 16 15 8 4	43210	10423	24 16 15 7 3	43210	30412
12 9 3 21 20	21043	13204	13 9 2 21 20	21043	23104	12 8 4 21 20	21043	12304

Therefore we could concentrate our analytical study only to the next list of object.

[Group 1] D5i

1/	1/H	1/L	2/L	5/L	6/L	9/L	10/L
0 4 1 3 2		0 3 4 2 1	0 3 4 1 2	0 2 4 3 1	0 2 4 1 3	0 1 4 3 2	0 1 4 2 3
3 2 0 4 1		4 2 1 0 3	4 1 2 0 3	4 3 1 0 2	4 1 3 0 2	4 3 2 0 1	4 2 3 0 1
4 1 3 2 0		1 0 3 4 2	2 0 3 4 1	1 0 2 4 3	3 0 2 4 1	2 0 1 4 3	3 0 1 4 2
2 0 4 1 3		3 4 2 1 0	3 4 1 2 0	2 4 3 1 0	2 4 1 3 0	1 4 3 2 0	1 4 2 3 0
1 3 2 0 4		2 1 0 3 4	1 2 0 3 4	3 1 0 2 4	1 3 0 2 4	3 2 0 1 4	2 3 0 1 4
19/	1/H	19/L	20/L	23/L	24/L	27/L	28/L
0 4 1 3 2		0 4 3 2 1	0 4 3 1 2	0 2 3 4 1	0 2 3 1 4	0 1 3 4 2	0 1 3 2 4
3 2 0 4 1		3 2 1 0 4	3 1 2 0 4	3 4 1 0 2	3 1 4 0 2	3 4 2 0 1	3 2 4 0 1
4 1 3 2 0		1 0 4 3 2	2 0 4 3 1	1 0 2 3 4	4 0 2 3 1	2 0 1 3 4	4 0 1 3 2
2 0 4 1 3		4 3 2 1 0	4 3 1 2 0	2 3 4 1 0	2 3 1 4 0	1 3 4 2 0	1 3 2 4 0
1 3 2 0 4		2 1 0 4 3	1 2 0 4 3	4 1 0 2 3	1 4 0 2 3	4 2 0 1 3	2 4 0 1 3
37/	1/H	37/L	38/L	41/L	42/L	45/L	46/L
0 4 1 3 2		0 4 2 3 1	0 4 2 1 3	0 3 2 4 1	0 3 2 1 4	0 1 2 4 3	0 1 2 3 4
3 2 0 4 1		2 3 1 0 4	2 1 3 0 4	2 4 1 0 3	2 1 4 0 3	2 4 3 0 1	2 3 4 0 1
4 1 3 2 0		1 0 4 2 3	3 0 4 2 1	1 0 3 2 4	4 0 3 2 1	3 0 1 2 4	4 0 1 2 3
2 0 4 1 3		4 2 3 1 0	4 2 1 3 0	3 2 4 1 0	3 2 1 4 0	1 2 4 3 0	1 2 3 4 0
1 3 2 0 4		3 1 0 4 2	1 3 0 4 2	4 1 0 3 2	1 4 0 3 2	4 3 0 1 2	3 4 0 1 2
55/	1/H	55/L	56/L	59/L	60/L	63/L	64/L
0 4 1 3 2		0 4 1 3 2	0 4 1 2 3	0 3 1 4 2	0 3 1 2 4	0 2 1 4 3	0 2 1 3 4

3 2 0 4 1		1 3 2 0 4	1 2 3 0 4	1 4 2 0 3	1 2 4 0 3	1 4 3 0 2	1 3 4 0 2
4 1 3 2 0		2 0 4 1 3	3 0 4 1 2	2 0 3 1 4	4 0 3 1 2	3 0 2 1 4	4 0 2 1 3
2 0 4 1 3		4 1 3 2 0	4 1 2 3 0	3 1 4 2 0	3 1 2 4 0	2 1 4 3 0	2 1 3 4 0
1 3 2 0 4		3 2 0 4 1	2 3 0 4 1	4 2 0 3 1	2 4 0 3 1	4 3 0 2 1	3 4 0 2 1

[Group 2] D5i

3/	3/H		1/L	2/L	5/L	6/L	9/L	10/L
0 4 2 3 1		0 3 4 2 1	0 3 4 1 2	0 2 4 3 1	0 2 4 1 3	0 1 4 3 2	0 1 4 2 3	
3 1 0 4 2		4 2 1 0 3	4 1 2 0 3	4 3 1 0 2	4 1 3 0 2	4 3 2 0 1	4 2 3 0 1	
4 2 3 1 0		1 0 3 4 2	2 0 3 4 1	1 0 2 4 3	3 0 2 4 1	2 0 1 4 3	3 0 1 4 2	
1 0 4 2 3		3 4 2 1 0	3 4 1 2 0	2 4 3 1 0	2 4 1 3 0	1 4 3 2 0	1 4 2 3 0	
2 3 1 0 4		2 1 0 3 4	1 2 0 3 4	3 1 0 2 4	1 3 0 2 4	3 2 0 1 4	2 3 0 1 4	

[Group 3] D5i

13/	13/H		1/L	2/L	5/L	6/L	9/L	10/L
0 4 1 2 3		0 3 4 2 1	0 3 4 1 2	0 2 4 3 1	0 2 4 1 3	0 1 4 3 2	0 1 4 2 3	
2 3 0 4 1		4 2 1 0 3	4 1 2 0 3	4 3 1 0 2	4 1 3 0 2	4 3 2 0 1	4 2 3 0 1	
4 1 2 3 0		1 0 3 4 2	2 0 3 4 1	1 0 2 4 3	3 0 2 4 1	2 0 1 4 3	3 0 1 4 2	
3 0 4 1 2		3 4 2 1 0	3 4 1 2 0	2 4 3 1 0	2 4 1 3 0	1 4 3 2 0	1 4 2 3 0	
1 2 3 0 4		2 1 0 3 4	1 2 0 3 4	3 1 0 2 4	1 3 0 2 4	3 2 0 1 4	2 3 0 1 4	

[Group 4] D5i

73/	73/H		73/L	74/L	77/L	78/L	81/L	82/L
0 4 3 2 1		0 4 1 3 2	0 4 2 3 1	0 4 1 2 3	0 4 3 2 1	0 4 2 1 3	0 4 3 1 2	
3 2 1 0 4		3 2 0 4 1	3 1 0 4 2	2 3 0 4 1	2 1 0 4 3	1 3 0 4 2	1 2 0 4 3	
1 0 4 3 2		4 1 3 2 0	4 2 3 1 0	4 1 2 3 0	4 3 2 1 0	4 2 1 3 0	4 3 1 2 0	
4 3 2 1 0		2 0 4 1 3	1 0 4 2 3	3 0 4 1 2	1 0 4 3 2	3 0 4 2 1	2 0 4 3 1	
2 1 0 4 3		1 3 2 0 4	2 3 1 0 4	1 2 3 0 4	3 2 1 0 4	2 1 3 0 4	3 1 2 0 4	
85/	73/H		85/L	86/L	89/L	90/L	93/L	94/L
0 4 3 2 1		0 3 1 4 2	0 3 2 4 1	0 3 1 2 4	0 3 4 2 1	0 3 2 1 4	0 3 4 1 2	
3 2 1 0 4		4 2 0 3 1	4 1 0 3 2	2 4 0 3 1	2 1 0 3 4	1 4 0 3 2	1 2 0 3 4	
1 0 4 3 2		3 1 4 2 0	3 2 4 1 0	3 1 2 4 0	3 4 2 1 0	3 2 1 4 0	3 4 1 2 0	
4 3 2 1 0		2 0 3 1 4	1 0 3 2 4	4 0 3 1 2	1 0 3 4 2	4 0 3 2 1	2 0 3 4 1	
2 1 0 4 3		1 4 2 0 3	2 4 1 0 3	1 2 4 0 3	4 2 1 0 3	2 1 4 0 3	4 1 2 0 3	
97/	73/H		97/L	98/L	101/L	102/L	105/L	106/L
0 4 3 2 1		0 2 1 4 3	0 2 3 4 1	0 2 1 3 4	0 2 4 3 1	0 2 3 1 4	0 2 4 1 3	
3 2 1 0 4		4 3 0 2 1	4 1 0 2 3	3 4 0 2 1	3 1 0 2 4	1 4 0 2 3	1 3 0 2 4	
1 0 4 3 2		2 1 4 3 0	2 3 4 1 0	2 1 3 4 0	2 4 3 1 0	2 3 1 4 0	2 4 1 3 0	
4 3 2 1 0		3 0 2 1 4	1 0 2 3 4	4 0 2 1 3	1 0 2 4 3	4 0 2 3 1	3 0 2 4 1	
2 1 0 4 3		1 4 3 0 2	3 4 1 0 2	1 3 4 0 2	4 3 1 0 2	3 1 4 0 2	4 1 3 0 2	
109/	73/H		109/L	110/L	113/L	114/L	117/L	118/L
0 4 3 2 1		0 1 2 4 3	0 1 3 4 2	0 1 2 3 4	0 1 4 3 2	0 1 3 2 4	0 1 4 2 3	
3 2 1 0 4		4 3 0 1 2	4 2 0 1 3	3 4 0 1 2	3 2 0 1 4	2 4 0 1 3	2 3 0 1 4	
1 0 4 3 2		1 2 4 3 0	1 3 4 2 0	1 2 3 4 0	1 4 3 2 0	1 3 2 4 0	1 4 2 3 0	
4 3 2 1 0		3 0 1 2 4	2 0 1 3 4	4 0 1 2 3	2 0 1 4 3	4 0 1 3 2	3 0 1 4 2	
2 1 0 4 3		2 4 3 0 1	3 4 2 0 1	2 3 4 0 1	4 3 2 0 1	3 2 4 0 1	4 2 3 0 1	

[Group 5] D5i

75/	75/H		73/L	74/L	77/L	78/L	81/L	82/L
0 4 3 1 2		0 4 1 3 2	0 4 2 3 1	0 4 1 2 3	0 4 3 2 1	0 4 2 1 3	0 4 3 1 2	
3 1 2 0 4		3 2 0 4 1	3 1 0 4 2	2 3 0 4 1	2 1 0 4 3	1 3 0 4 2	1 2 0 4 3	
2 0 4 3 1		4 1 3 2 0	4 2 3 1 0	4 1 2 3 0	4 3 2 1 0	4 2 1 3 0	4 3 1 2 0	
4 3 1 2 0		2 0 4 1 3	1 0 4 2 3	3 0 4 1 2	1 0 4 3 2	3 0 4 2 1	2 0 4 3 1	
1 2 0 4 3		1 3 2 0 4	2 3 1 0 4	1 2 3 0 4	3 2 1 0 4	2 1 3 0 4	3 1 2 0 4	

[Group 6] D5i

121/	121/H		73/L	74/L	77/L	78/L	81/L	82/L
0 4 2 1 3		0 4 1 3 2	0 4 2 3 1	0 4 1 2 3	0 4 3 2 1	0 4 2 1 3	0 4 3 1 2	
2 1 3 0 4		3 2 0 4 1	3 1 0 4 2	2 3 0 4 1	2 1 0 4 3	1 3 0 4 2	1 2 0 4 3	
3 0 4 2 1		4 1 3 2 0	4 2 3 1 0	4 1 2 3 0	4 3 2 1 0	4 2 1 3 0	4 3 1 2 0	
4 2 1 3 0		2 0 4 1 3	1 0 4 2 3	3 0 4 1 2	1 0 4 3 2	3 0 4 2 1	2 0 4 3 1	
1 3 0 4 2		1 3 2 0 4	2 3 1 0 4	1 2 3 0 4	3 2 1 0 4	2 1 3 0 4	3 1 2 0 4	

From what into what can we transform by any simple exchanges of data?

7. Transformation System for Pan-diagonal Magic Squares 5x5

Let me come to my conclusion. I invented such a transformation system as follows:

```
//
/** Transform: Mirror Reflection */
void reflct(){
    short n;
    d[1]=c[1]; d[2]=c[6]; d[3]=c[11]; d[4]=c[16]; d[5]=c[21];
    d[6]=c[2]; d[7]=c[7]; d[8]=c[12]; d[9]=c[17]; d[10]=c[22];
    d[11]=c[3]; d[12]=c[8]; d[13]=c[13]; d[14]=c[18]; d[15]=c[23];
    d[16]=c[4]; d[17]=c[9]; d[18]=c[14]; d[19]=c[19]; d[20]=c[24];
    d[21]=c[5]; d[22]=c[10]; d[23]=c[15]; d[24]=c[20]; d[25]=c[25];
    for(n=1;n<26;n++){c[n]=d[n];}
}
//
/** Transform: Exchange 5 Pairs */
void trnsf01(){
    short n;
    for(n=1;n<26;n++){d[n]=c[n];}
    for(n=1;n<26;n++){
        if(c[n]==1){d[n]=2;}
        if(c[n]==2){d[n]=1;}
    }
    for(n=1;n<26;n++){c[n]=d[n];}
}
//
/** Transform: Exchange 5 Pairs */
void trnsf02(){
    short n;
    for(n=1;n<26;n++){d[n]=c[n];}
    for(n=1;n<26;n++){
        if(c[n]==2){d[n]=3;}
        if(c[n]==3){d[n]=2;}
    }
    for(n=1;n<26;n++){c[n]=d[n];}
}
//
/** Transform: Exchange 5 Pairs */
void trnsf03(){
    short n;
    for(n=1;n<26;n++){d[n]=c[n];}
    for(n=1;n<26;n++){
        if(c[n]==1){d[n]=3;}
        if(c[n]==3){d[n]=1;}
    }
    for(n=1;n<26;n++){c[n]=d[n];}
}
//
/** Transform: Exchange 5 Pairs */
void trnsf04(){
    short n;
    for(n=1;n<26;n++){d[n]=c[n];}
    for(n=1;n<26;n++){
        if(c[n]==4){d[n]=3;}
        if(c[n]==3){d[n]=4;}
    }
    for(n=1;n<26;n++){c[n]=d[n];}
}
```

```

//
// * Transform: Exchange 5 Pairs *
void trnsf05(){
  short n;
  for(n=1;n<26;n++){d[n]=c[n];}
  for(n=1;n<26;n++){
    if(c[n]==4){d[n]=2;}
    if(c[n]==2){d[n]=4;}
  }
  for(n=1;n<26;n++){c[n]=d[n];}
}
//
// * Transform: Exchange 5 Pairs *
void trnsf06(){
  short n;
  for(n=1;n<26;n++){d[n]=c[n];}
  for(n=1;n<26;n++){
    if(c[n]==4){d[n]=1;}
    if(c[n]==1){d[n]=4;}
  }
  for(n=1;n<26;n++){c[n]=d[n];}
}
//

```

**** Quick View: What Pairs can we transform by that type?**

(Group 1)

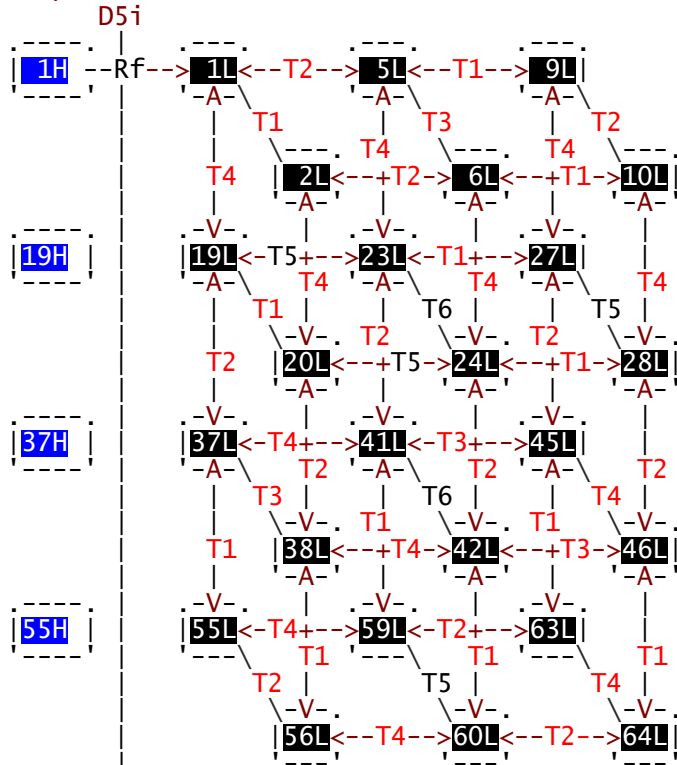
(Group 4)

n	nL	Rf	T1	T2	T3	T4	T5	T6	n	nL	Rf	T1	T2	T3	T4	T5	T6
1	1	73	2	5	10	19	41	60	73	73	1	74	77	82	85	101	114
2	2	74	1	6	9	20	42	59	74	74	2	73	78	81	86	102	113
5	5	77	9	1	6	23	37	64	77	77	5	81	73	78	89	97	118
6	6	78	10	2	5	24	38	63	78	78	6	82	74	77	90	98	117
9	9	81	5	10	2	27	46	55	81	81	9	77	82	74	93	106	109
10	10	82	6	9	1	28	45	56	82	82	10	78	81	73	94	105	110
19	19	85	20	37	56	1	23	28	85	85	19	86	97	110	73	89	94
20	20	86	19	38	55	2	24	27	86	86	20	85	98	109	74	90	93
23	23	89	27	41	63	5	19	24	89	89	23	93	101	117	77	85	90
24	24	90	28	42	64	6	20	23	90	90	24	94	102	118	78	86	89
27	27	93	23	45	59	9	28	20	93	93	27	89	105	113	81	94	86
28	28	94	24	46	60	10	27	19	94	94	28	90	106	114	82	93	85
37	37	97	55	19	38	41	5	46	97	97	37	109	85	98	101	77	106
38	38	98	56	20	37	42	6	45	98	98	38	110	86	97	102	78	105
41	41	101	59	23	45	37	1	42	101	101	41	113	89	105	97	73	102
42	42	102	60	24	46	38	2	41	102	102	42	114	90	106	98	74	101
45	45	105	63	27	41	46	10	38	105	105	45	117	93	101	106	82	98
46	46	106	64	28	42	45	9	37	106	106	46	118	94	102	105	81	97
55	55	109	37	56	20	59	64	9	109	109	55	97	110	86	113	118	81

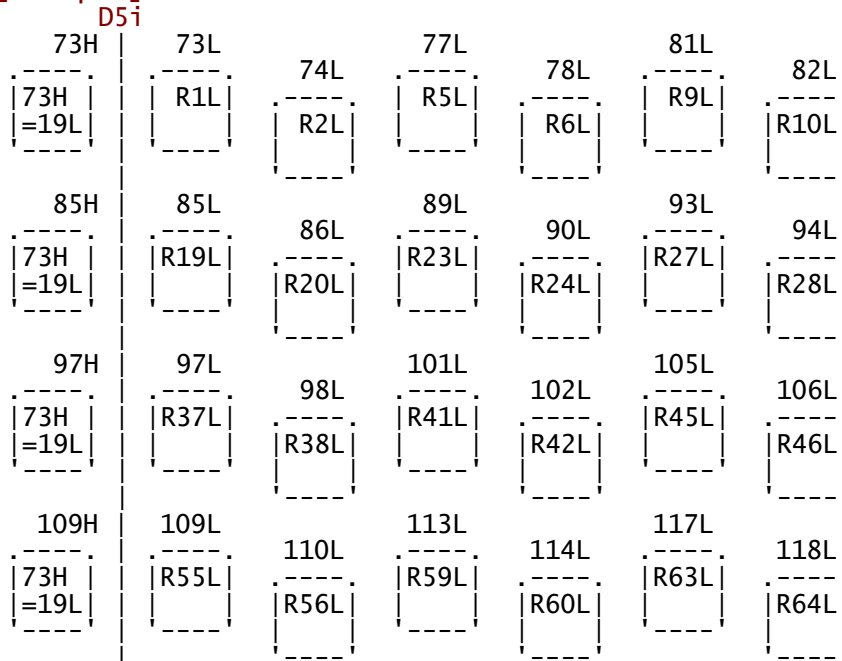
56	56	110	38	55	19	60	63	10	110	110	56	98	109	85	114	117	82
59	59	113	41	63	27	55	60	2	113	113	59	101	117	93	109	114	74
60	60	114	42	64	28	56	59	1	114	114	60	102	118	94	110	113	73
63	63	117	45	59	23	64	56	6	117	117	63	105	113	89	118	110	78
64	64	118	46	60	24	63	55	5	118	118	64	106	114	90	117	109	77
n	nL	Rf	T1	T2	T3	T4	T5	T6	n	nL	Rf	T1	T2	T3	T4	T5	T6

**** Step Diagram for our New Transformation System ****

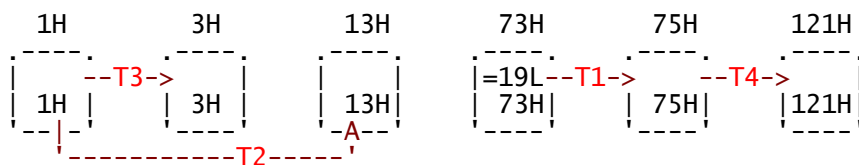
[Group 1]



[Group 4]



**** How to make High Layers for All Groups ****



If you want to reconstruct all 144 objects, give the initial data to 1H and use our new transformation system. Let me skip here showing my list of reconstruction.

But I want you to see the step diagram of our transformation system again.

Although it simply shows how to use various transformation methods, it also looks like indicating some structural information about object solution set, doesn't it?

I say we have discovered various types of mutual relationship among solutions. How impressive they are!

(Written in English on May 31, 2003 by Kanji Setsuda;

Revised on Feb.26, 2015 with MacOSX 10.10.2 & Xcode 6.1.1)

E-Mail Address: <jag12001@nifty.com>

<< Appendix: Another Data Sheet >>

**** 'Complete Euler Squares' of Order 5 for the Pan-Diagonal Magic Type ****

**** Compact List of Layer Units: ****

[High Layers]

1/H1	2/H1	3/H1	4/H1	5/H1	6/H1	7/H1	8/H2	9/H1	10/H2
04321	04231	04312	04132	04213	04123	03421	04312	03412	04321
21043	31042	12043	32041	13042	23041	21034	31204	12034	32104
43210	42310	43120	41320	42130	41230	34210	20431	34120	10432
10432	10423	20431	20413	30421	30412	10342	43120	20341	43210
32104	23104	31204	13204	21304	12304	42103	12043	41203	21043

11/H1	12/H1	13/H2	14/H2	15/H1	16/H2	17/H1	18/H2	19/H2	20/H2
03214	03124	03214	04213	02413	04231	02314	03241	03124	04123
14032	24031	21403	21304	13024	23104	14023	24103	12403	12304
32140	31240	40321	30421	24130	10423	23140	10324	40312	30412
40321	40312	32140	42130	30241	42310	40231	32410	31240	41230
21403	12403	14032	13042	41302	31042	31402	41032	24031	23041

21/H2	22/H2	23/H2	24/H2	25/H1	26/H1	27/H1	28/H1	29/H1	30/H1
02134	04132	02143	03142	14302	14203	13402	13204	12403	12304
13402	13204	14302	14203	02143	03142	02134	04132	03124	04123
40213	20413	30214	20314	43021	42031	34021	32041	24031	23041
21340	41320	21430	31420	21430	31420	21340	41320	31240	41230
34021	32041	43021	42031	30214	20314	40213	20413	40312	30412

[Low Layers]

1/L1	2/L2	3/L1	4/L2	5/L1	6/L2	7/L1	8/L2	9/L1	10/L2
04321	02413	04231	03412	04312	01423	04132	03421	04213	01432
21043	41302	31042	41203	12043	42301	32041	42103	13042	43201
43210	30241	42310	20341	43120	30142	41320	10342	42130	20143
10432	24130	10423	34120	20431	14230	20413	34210	30421	14320
32104	13024	23104	12034	31204	23014	13204	21034	21304	32014

31/L1	32/L2	33/L1	34/L2	35/L1	36/L2	37/L1	38/L2	39/L1	40/L2
02143	04231	02314	01243	02134	03241	01432	03124	01342	04123
43021	23104	14023	24301	34021	24103	32014	12403	42013	12304
21430	10423	23140	30124	21340	10324	14320	40312	13420	30412
30214	42310	40231	12430	40213	32410	20143	31240	20134	41230
14302	31042	31402	43012	13402	41032	43201	24031	34201	23041

61/L1	62/L2	63/L1	64/L2	65/L1	66/L2	67/L1	68/L2	69/L1	70/L2
13420	12304	13240	14302	13402	10324	13042	14320	13204	10342
20134	30412	40132	30214	02134	32410	42130	32014	04132	34210
34201	41230	32401	21430	34021	41032	30421	01432	32041	21034
01342	23041	01324	43021	21340	03241	21304	43201	41320	03421
42013	04123	24013	02143	40213	24103	04213	20143	20413	42103
91/L1	92/L2	93/L1	94/L2	95/L1	96/L2	97/L1	98/L2	99/L1	100/L2
10243	14032	10324	12043	10234	13042	24310	21403	24130	23401
43102	03214	24103	04312	34102	04213	10243	40321	30241	40123
02431	21403	03241	31204	02341	21304	43102	32140	41302	12340
31024	40321	41032	20431	41023	30421	02431	14032	02413	34012
24310	32140	32410	43120	23410	42130	31024	03214	13024	01234
121/L1	122/L2	123/L1	124/L2	125/L1	126/L2	127/L1	128/L2	129/L1	130/L2
21430	23104	21340	24103	21403	20134	21043	24130	21304	20143
30214	10423	40213	10324	03214	13420	43210	13024	04213	14320
14302	42310	13402	32410	14032	42013	10432	02413	13042	32014
02143	31042	02134	41032	32140	01342	32104	41302	42130	01432
43021	04231	34021	03241	40321	34201	04321	30241	30421	43201
151/L1	152/L2	153/L1	154/L2	155/L1	156/L2	157/L1	158/L2	159/L1	160/L2
34021	32410	34102	30421	34012	31420	32410	31204	32140	34201
21340	41032	02341	42130	12340	42031	10324	20431	40321	20134
40213	03241	41023	13042	40123	03142	24103	43120	21403	13420
13402	24103	23410	04213	23401	14203	03241	12043	03214	42013
02134	10324	10234	21304	01234	20314	41032	04312	14032	01342
181/L1	182/L2	183/L1	184/L2	185/L1	186/L2	187/L1	188/L2	189/L1	190/L2
30421	32014	30241	34012	30412	31024	30142	34021	30214	31042
21304	01432	41302	01234	12304	02431	42301	02134	14302	04231
04213	43201	02413	23401	04123	43102	01423	13402	02143	23104
13042	20143	13024	40123	23041	10243	23014	40213	43021	10423
42130	14320	24130	12340	41230	24310	14230	21340	21430	42310
211/L1	212/L2	213/L1	214/L2	215/L1	216/L2	217/L1	218/L2	219/L1	220/L2
42031	43210	42103	40231	42013	41230	41320	42103	41230	43102
31420	21043	03421	23140	13420	23041	20413	10342	30412	10243
20314	04321	21034	14023	20134	04123	13204	34210	12304	24310
14203	32104	34210	02314	34201	12304	04132	21034	04123	31024
03142	10432	10342	31402	01342	30412	32041	03421	23041	02431

[Count = 30 x 240 = 7200]

**** Reconstruction Result of the 3600 Pan-diagonal Magic Squares 5x5 (Part) ****

[Group 1]

1/H1	2/L2	1#	1/H1	4/L2	2#
0 4 3 2 1	0 2 4 1 3	1 23 20 12 9	0 4 3 2 1	0 3 4 1 2	1 24 20 12 8
2 1 0 4 3	4 1 3 0 2	15 7 4 21 18	2 1 0 4 3	4 1 2 0 3	15 7 3 21 19
4 3 2 1 0	3 0 2 4 1	24 16 13 10 2	4 3 2 1 0	2 0 3 4 1	23 16 14 10 2
1 0 4 3 2	2 4 1 3 0	8 5 22 19 11	1 0 4 3 2	3 4 1 2 0	9 5 22 18 11
3 2 1 0 4	1 3 0 2 4	17 14 6 3 25	3 2 1 0 4	1 2 0 3 4	17 13 6 4 25
1/H1	6/L2	5#	1/H1	8/L2	6#
0 4 3 2 1	0 1 4 2 3	1 22 20 13 9	0 4 3 2 1	0 3 4 2 1	1 24 20 13 7
2 1 0 4 3	4 2 3 0 1	15 8 4 21 17	2 1 0 4 3	4 2 1 0 3	15 8 2 21 19
4 3 2 1 0	3 0 1 4 2	24 16 12 10 3	4 3 2 1 0	1 0 3 4 2	22 16 14 10 3
1 0 4 3 2	1 4 2 3 0	7 5 23 19 11	1 0 4 3 2	3 4 2 1 0	9 5 23 17 11
3 2 1 0 4	2 3 0 1 4	18 14 6 2 25	3 2 1 0 4	2 1 0 3 4	18 12 6 4 25
1/H1	10/L2	9#	1/H1	12/L2	10#
0 4 3 2 1	0 1 4 3 2	1 22 20 14 8	0 4 3 2 1	0 2 4 3 1	1 23 20 14 7
2 1 0 4 3	4 3 2 0 1	15 9 3 21 17	2 1 0 4 3	4 3 1 0 2	15 9 2 21 18
4 3 2 1 0	2 0 1 4 3	23 16 12 10 4	4 3 2 1 0	1 0 2 4 3	22 16 13 10 4
1 0 4 3 2	1 4 3 2 0	7 5 24 18 11	1 0 4 3 2	2 4 3 1 0	8 5 24 17 11
3 2 1 0 4	3 2 0 1 4	19 13 6 2 25	3 2 1 0 4	3 1 0 2 4	19 12 6 3 25

[Group 2]

2/H1	2/L2	3#	2/H1	4/L2	4#
0 4 2 3 1	0 2 4 1 3	1 23 15 17 9	0 4 2 3 1	0 3 4 1 2	1 24 15 17 8
3 1 0 4 2	4 1 3 0 2	20 7 4 21 13	3 1 0 4 2	4 1 2 0 3	20 7 3 21 14
4 2 3 1 0	3 0 2 4 1	24 11 18 10 2	4 2 3 1 0	2 0 3 4 1	23 11 19 10 2
1 0 4 2 3	2 4 1 3 0	8 5 22 14 16	1 0 4 2 3	3 4 1 2 0	9 5 22 13 16
2 3 1 0 4	1 3 0 2 4	12 19 6 3 25	2 3 1 0 4	1 2 0 3 4	12 18 6 4 25

2/H1	6/L2	7#	2/H1	8/L2	8#
0 4 2 3 1	0 1 4 2 3	1 22 15 18 9	0 4 2 3 1	0 3 4 2 1	1 24 15 18 7
3 1 0 4 2	4 2 3 0 1	20 8 4 21 12	3 1 0 4 2	4 2 1 0 3	20 8 2 21 14
4 2 3 1 0	3 0 1 4 2	24 11 17 10 3	4 2 3 1 0	1 0 3 4 2	22 11 19 10 3
1 0 4 2 3	1 4 2 3 0	7 5 23 14 16	1 0 4 2 3	3 4 2 1 0	9 5 23 12 16
2 3 1 0 4	2 3 0 1 4	13 19 6 2 25	2 3 1 0 4	2 1 0 3 4	13 17 6 4 25

2/H1	10/L2	11#	2/H1	12/L2	12#
0 4 2 3 1	0 1 4 3 2	1 22 15 19 8	0 4 2 3 1	0 2 4 3 1	1 23 15 19 7
3 1 0 4 2	4 3 2 0 1	20 9 3 21 12	3 1 0 4 2	4 3 1 0 2	20 9 2 21 13
4 2 3 1 0	2 0 1 4 3	23 11 17 10 4	4 2 3 1 0	1 0 2 4 3	22 11 18 10 4
1 0 4 2 3	1 4 3 2 0	7 5 24 13 16	1 0 4 2 3	2 4 3 1 0	8 5 24 12 16
2 3 1 0 4	3 2 0 1 4	14 18 6 2 25	2 3 1 0 4	3 1 0 2 4	14 17 6 3 25

[Group 3]

3/H1	2/L2	13#	3/H1	4/L2	14#
0 4 3 1 2	0 2 4 1 3	1 23 20 7 14	0 4 3 1 2	0 3 4 1 2	1 24 20 7 13
1 2 0 4 3	4 1 3 0 2	10 12 4 21 18	1 2 0 4 3	4 1 2 0 3	10 12 3 21 19
4 3 1 2 0	3 0 2 4 1	24 16 8 15 2	4 3 1 2 0	2 0 3 4 1	23 16 9 15 2
2 0 4 3 1	2 4 1 3 0	13 5 22 19 6	2 0 4 3 1	3 4 1 2 0	14 5 22 18 6
3 1 2 0 4	1 3 0 2 4	17 9 11 3 25	3 1 2 0 4	1 2 0 3 4	17 8 11 4 25

3/H1	6/L2	17#	3/H1	8/L2	18#
0 4 3 1 2	0 1 4 2 3	1 22 20 8 14	0 4 3 1 2	0 3 4 2 1	1 24 20 8 12
1 2 0 4 3	4 2 3 0 1	10 13 4 21 17	1 2 0 4 3	4 2 1 0 3	10 13 2 21 19
4 3 1 2 0	3 0 1 4 2	24 16 7 15 3	4 3 1 2 0	1 0 3 4 2	22 16 9 15 3
2 0 4 3 1	1 4 2 3 0	12 5 23 19 6	2 0 4 3 1	3 4 2 1 0	14 5 23 17 6
3 1 2 0 4	2 3 0 1 4	18 9 11 2 25	3 1 2 0 4	2 1 0 3 4	18 7 11 4 25

3/H1	10/L2	21#	3/H1	12/L2	22#
0 4 3 1 2	0 1 4 3 2	1 22 20 9 13	0 4 3 1 2	0 2 4 3 1	1 23 20 9 12
1 2 0 4 3	4 3 2 0 1	10 14 3 21 17	1 2 0 4 3	4 3 1 0 2	10 14 2 21 18
4 3 1 2 0	2 0 1 4 3	23 16 7 15 4	4 3 1 2 0	1 0 2 4 3	22 16 8 15 4
2 0 4 3 1	1 4 3 2 0	12 5 24 18 6	2 0 4 3 1	2 4 3 1 0	13 5 24 17 6
3 1 2 0 4	3 2 0 1 4	19 8 11 2 25	3 1 2 0 4	3 1 0 2 4	19 7 11 3 25

[Group 4]

4/H1	2/L2	15#	4/H1	4/L2	16#
0 4 1 3 2	0 2 4 1 3	1 23 10 17 14	0 4 1 3 2	0 3 4 1 2	1 24 10 17 13
3 2 0 4 1	4 1 3 0 2	20 12 4 21 8	3 2 0 4 1	4 1 2 0 3	20 12 3 21 9
4 1 3 2 0	3 0 2 4 1	24 6 18 15 2	4 1 3 2 0	2 0 3 4 1	23 6 19 15 2
2 0 4 1 3	2 4 1 3 0	13 5 22 9 16	2 0 4 1 3	3 4 1 2 0	14 5 22 8 16
1 3 2 0 4	1 3 0 2 4	7 19 11 3 25	1 3 2 0 4	1 2 0 3 4	7 18 11 4 25

4/H1	6/L2	19#	4/H1	8/L2	20#
0 4 1 3 2	0 1 4 2 3	1 22 10 18 14	0 4 1 3 2	0 3 4 2 1	1 24 10 18 12
3 2 0 4 1	4 2 3 0 1	20 13 4 21 7	3 2 0 4 1	4 2 1 0 3	20 13 2 21 9
4 1 3 2 0	3 0 1 4 2	24 6 17 15 3	4 1 3 2 0	1 0 3 4 2	22 6 19 15 3
2 0 4 1 3	1 4 2 3 0	12 5 23 9 16	2 0 4 1 3	3 4 2 1 0	14 5 23 7 16
1 3 2 0 4	2 3 0 1 4	8 19 11 2 25	1 3 2 0 4	2 1 0 3 4	8 17 11 4 25

4/H1	10/L2	23#	4/H1	12/L2	24#
0 4 1 3 2	0 1 4 3 2	1 22 10 19 13	0 4 1 3 2	0 2 4 3 1	1 23 10 19 12
3 2 0 4 1	4 3 2 0 1	20 14 3 21 7	3 2 0 4 1	4 3 1 0 2	20 14 2 21 8
4 1 3 2 0	2 0 1 4 3	23 6 17 15 4	4 1 3 2 0	1 0 2 4 3	22 6 18 15 4
2 0 4 1 3	1 4 3 2 0	12 5 24 8 16	2 0 4 1 3	2 4 3 1 0	13 5 24 7 16
1 3 2 0 4	3 2 0 1 4	9 18 11 2 25	1 3 2 0 4	3 1 0 2 4	9 17 11 3 25

[Group 5]

5/H1	2/L2	25#	5/H1	4/L2	26#
0 4 2 1 3	0 2 4 1 3	1 23 15 7 19	0 4 2 1 3	0 3 4 1 2	1 24 15 7 18
1 3 0 4 2	4 1 3 0 2	10 17 4 21 13	1 3 0 4 2	4 1 2 0 3	10 17 3 21 14
4 2 1 3 0	3 0 2 4 1	24 11 8 20 2	4 2 1 3 0	2 0 3 4 1	23 11 9 20 2

3 0 4 2 1 2 4 1 3 0 18 5 22 14 6
 2 1 3 0 4 1 3 0 2 4 12 9 16 3 25
 5/H1 6/L2 29#
 0 4 2 1 3 0 1 4 2 3 1 22 15 8 19
 1 3 0 4 2 4 2 3 0 1 10 18 4 21 12
 4 2 1 3 0 3 0 1 4 2 24 11 7 20 3
 3 0 4 2 1 1 4 2 3 0 17 5 23 14 6
 2 1 3 0 4 2 3 0 1 4 13 9 16 2 25
 5/H1 10/L2 33#
 0 4 2 1 3 0 1 4 3 2 1 22 15 9 18
 1 3 0 4 2 4 3 2 0 1 10 19 3 21 12
 4 2 1 3 0 2 0 1 4 3 23 11 7 20 4
 3 0 4 2 1 1 4 3 2 0 17 5 24 13 6
 2 1 3 0 4 3 2 0 1 4 14 8 16 2 25

[Group 6]

6/H1 2/L2 27#
 0 4 1 2 3 0 2 4 1 3 1 23 10 12 19
 2 3 0 4 1 4 1 3 0 2 15 17 4 21 8
 4 1 2 3 0 3 0 2 4 1 24 6 13 20 2
 3 0 4 1 2 2 4 1 3 0 18 5 22 9 11
 1 2 3 0 4 1 3 0 2 4 7 14 16 3 25
 6/H1 6/L2 31#
 0 4 1 2 3 0 1 4 2 3 1 22 10 13 19
 2 3 0 4 1 4 2 3 0 1 15 18 4 21 7
 4 1 2 3 0 3 0 1 4 2 24 6 12 20 3
 3 0 4 1 2 1 4 2 3 0 17 5 23 9 11
 1 2 3 0 4 2 3 0 1 4 8 14 16 2 25
 6/H1 10/L2 35#
 0 4 1 2 3 0 1 4 3 2 1 22 10 14 18
 2 3 0 4 1 4 3 2 0 1 15 19 3 21 7
 4 1 2 3 0 2 0 1 4 3 23 6 12 20 4
 3 0 4 1 2 1 4 3 2 0 17 5 24 8 11
 1 2 3 0 4 3 2 0 1 4 9 13 16 2 25

[Group 7]

7/H1 2/L2 145#
 0 3 4 2 1 0 2 4 1 3 1 18 25 12 9
 2 1 0 3 4 4 1 3 0 2 15 7 4 16 23
 3 4 2 1 0 3 0 2 4 1 19 21 13 10 2
 1 0 3 4 2 2 4 1 3 0 8 5 17 24 11
 4 2 1 0 3 1 3 0 2 4 22 14 6 3 20
 7/H1 6/L2 149#
 0 3 4 2 1 0 1 4 2 3 1 17 25 13 9
 2 1 0 3 4 4 2 3 0 1 15 8 4 16 22
 3 4 2 1 0 3 0 1 4 2 19 21 12 10 3
 1 0 3 4 2 1 4 2 3 0 7 5 18 24 11
 4 2 1 0 3 2 3 0 1 4 23 14 6 2 20
 7/H1 10/L2 153#
 0 3 4 2 1 0 1 4 3 2 1 17 25 14 8
 2 1 0 3 4 4 3 2 0 1 15 9 3 16 22
 3 4 2 1 0 2 0 1 4 3 18 21 12 10 4
 1 0 3 4 2 1 4 3 2 0 7 5 19 23 11
 4 2 1 0 3 3 2 0 1 4 24 13 6 2 20

[Group 8]

8/H2 1/L1 147#
 0 4 3 1 2 0 4 3 2 1 1 25 19 8 12
 3 1 2 0 4 2 1 0 4 3 18 7 11 5 24
 2 0 4 3 1 4 3 2 1 0 15 4 23 17 6
 4 3 1 2 0 1 0 4 3 2 22 16 10 14 3
 1 2 0 4 3 3 2 1 0 4 9 13 2 21 20
 8/H2 5/L1 151#
 0 4 3 1 2 0 4 3 1 2 1 25 19 7 13
 3 1 2 0 4 1 2 0 4 3 17 8 11 5 24

3 0 4 2 1 3 4 1 2 0 19 5 22 13 6
 2 1 3 0 4 1 2 0 3 4 12 8 16 4 25
 5/H1 8/L2 30#
 0 4 2 1 3 0 3 4 2 1 1 24 15 8 17
 1 3 0 4 2 4 2 1 0 3 10 18 2 21 14
 4 2 1 3 0 1 0 3 4 2 22 11 9 20 3
 3 0 4 2 1 3 4 2 1 0 19 5 23 12 6
 2 1 3 0 4 2 1 0 3 4 13 7 16 4 25
 5/H1 12/L2 34#
 0 4 2 1 3 0 2 4 3 1 1 23 15 9 17
 1 3 0 4 2 4 3 1 0 2 10 19 2 21 13
 4 2 1 3 0 1 0 2 4 3 22 11 8 20 4
 3 0 4 2 1 2 4 3 1 0 18 5 24 12 6
 2 1 3 0 4 3 1 0 2 4 14 7 16 3 25

6/H1 4/L2 28#
 0 4 1 2 3 0 3 4 1 2 1 24 10 12 18
 2 3 0 4 1 4 1 2 0 3 15 17 3 21 9
 4 1 2 3 0 2 0 3 4 1 23 6 14 20 2
 3 0 4 1 2 3 4 1 2 0 19 5 22 8 11
 1 2 3 0 4 1 2 0 3 4 7 13 16 4 25
 6/H1 8/L2 32#
 0 4 1 2 3 0 3 4 2 1 1 24 10 13 17
 2 3 0 4 1 4 2 1 0 3 15 18 2 21 9
 4 1 2 3 0 1 0 3 4 2 22 6 14 20 3
 3 0 4 1 2 3 4 2 1 0 19 5 23 7 11
 1 2 3 0 4 2 1 0 3 4 8 12 16 4 25
 6/H1 12/L2 36#
 0 4 1 2 3 0 2 4 3 1 1 23 10 14 17
 2 3 0 4 1 4 3 1 0 2 15 19 2 21 8
 4 1 2 3 0 1 0 2 4 3 22 6 13 20 4
 3 0 4 1 2 2 4 3 1 0 18 5 24 7 11
 1 2 3 0 4 3 1 0 2 4 9 12 16 3 25

7/H1 4/L2 146#
 0 3 4 2 1 0 3 4 1 2 1 19 25 12 8
 2 1 0 3 4 4 1 2 0 3 15 7 3 16 24
 3 4 2 1 0 2 0 3 4 1 18 21 14 10 2
 1 0 3 4 2 3 4 1 2 0 9 5 17 23 11
 4 2 1 0 3 1 2 0 3 4 22 13 6 4 20
 7/H1 8/L2 150#
 0 3 4 2 1 0 3 4 2 1 1 19 25 13 7
 2 1 0 3 4 4 2 1 0 3 15 8 2 16 24
 3 4 2 1 0 1 0 3 4 2 17 21 14 10 3
 1 0 3 4 2 3 4 2 1 0 9 5 18 22 11
 4 2 1 0 3 2 1 0 3 4 23 12 6 4 20
 7/H1 12/L2 154#
 0 3 4 2 1 0 2 4 3 1 1 18 25 14 7
 2 1 0 3 4 4 3 1 0 2 15 9 2 16 23
 3 4 2 1 0 1 0 2 4 3 17 21 13 10 4
 1 0 3 4 2 2 4 3 1 0 8 5 19 22 11
 4 2 1 0 3 3 1 0 2 4 24 12 6 3 20

8/H2 3/L1 148#
 0 4 3 1 2 0 4 2 3 1 1 25 18 9 12
 3 1 2 0 4 3 1 0 4 2 19 7 11 5 23
 2 0 4 3 1 4 2 3 1 0 15 3 24 17 6
 4 3 1 2 0 1 0 4 2 3 22 16 10 13 4
 1 2 0 4 3 2 3 1 0 4 8 14 2 21 20
 8/H2 7/L1 152#
 0 4 3 1 2 0 4 1 3 2 1 25 17 9 13
 3 1 2 0 4 3 2 0 4 1 19 8 11 5 22

2 0 4 3 1	4 3 1 2 0	15 4 22 18 6	2 0 4 3 1	4 1 3 2 0	15 2 24 18 6
4 3 1 2 0	2 0 4 3 1	23 16 10 14 2	4 3 1 2 0	2 0 4 1 3	23 16 10 12 4
1 2 0 4 3	3 1 2 0 4	9 12 3 21 20	1 2 0 4 3	1 3 2 0 4	7 14 3 21 20
8/H2	9/L1	155#	8/H2	11/L1	156#
0 4 3 1 2	0 4 2 1 3	1 25 18 7 14	0 4 3 1 2	0 4 1 2 3	1 25 17 8 14
3 1 2 0 4	1 3 0 4 2	17 9 11 5 23	3 1 2 0 4	2 3 0 4 1	18 9 11 5 22
2 0 4 3 1	4 2 1 3 0	15 3 22 19 6	2 0 4 3 1	4 1 2 3 0	15 2 23 19 6
4 3 1 2 0	3 0 4 2 1	24 16 10 13 2	4 3 1 2 0	3 0 4 1 2	24 16 10 12 3
1 2 0 4 3	2 1 3 0 4	8 12 4 21 20	1 2 0 4 3	1 2 3 0 4	7 13 4 21 20

[Group 9]

9/H1	2/L2	157#	9/H1	4/L2	158#
0 3 4 1 2	0 2 4 1 3	1 18 25 7 14	0 3 4 1 2	0 3 4 1 2	1 19 25 7 13
1 2 0 3 4	4 1 3 0 2	10 12 4 16 23	1 2 0 3 4	4 1 2 0 3	10 12 3 16 24
3 4 1 2 0	3 0 2 4 1	19 21 8 15 2	3 4 1 2 0	2 0 3 4 1	18 21 9 15 2
2 0 3 4 1	2 4 1 3 0	13 5 17 24 6	2 0 3 4 1	3 4 1 2 0	14 5 17 23 6
4 1 2 0 3	1 3 0 2 4	22 9 11 3 20	4 1 2 0 3	1 2 0 3 4	22 8 11 4 20
9/H1	6/L2	161#	9/H1	8/L2	162#
0 3 4 1 2	0 1 4 2 3	1 17 25 8 14	0 3 4 1 2	0 3 4 2 1	1 19 25 8 12
1 2 0 3 4	4 2 3 0 1	10 13 4 16 22	1 2 0 3 4	4 2 1 0 3	10 13 2 16 24
3 4 1 2 0	3 0 1 4 2	19 21 7 15 3	3 4 1 2 0	1 0 3 4 2	17 21 9 15 3
2 0 3 4 1	1 4 2 3 0	12 5 18 24 6	2 0 3 4 1	3 4 2 1 0	14 5 18 22 6
4 1 2 0 3	2 3 0 1 4	23 9 11 2 20	4 1 2 0 3	2 1 0 3 4	23 7 11 4 20
9/H1	10/L2	165#	9/H1	12/L2	166#
0 3 4 1 2	0 1 4 3 2	1 17 25 9 13	0 3 4 1 2	0 2 4 3 1	1 18 25 9 12
1 2 0 3 4	4 3 2 0 1	10 14 3 16 22	1 2 0 3 4	4 3 1 0 2	10 14 2 16 23
3 4 1 2 0	2 0 1 4 3	18 21 7 15 4	3 4 1 2 0	1 0 2 4 3	17 21 8 15 4
2 0 3 4 1	1 4 3 2 0	12 5 19 23 6	2 0 3 4 1	2 4 3 1 0	13 5 19 22 6
4 1 2 0 3	3 2 0 1 4	24 8 11 2 20	4 1 2 0 3	3 1 0 2 4	24 7 11 3 20

[Group10]

10/H2	1/L1	159#	10/H2	3/L1	160#
0 4 3 2 1	0 4 3 2 1	1 25 19 13 7	0 4 3 2 1	0 4 2 3 1	1 25 18 14 7
3 2 1 0 4	2 1 0 4 3	18 12 6 5 24	3 2 1 0 4	3 1 0 4 2	19 12 6 5 23
1 0 4 3 2	4 3 2 1 0	10 4 23 17 11	1 0 4 3 2	4 2 3 1 0	10 3 24 17 11
4 3 2 1 0	1 0 4 3 2	22 16 15 9 3	4 3 2 1 0	1 0 4 2 3	22 16 15 8 4
2 1 0 4 3	3 2 1 0 4	14 8 2 21 20	2 1 0 4 3	2 3 1 0 4	13 9 2 21 20
10/H2	5/L1	163#	10/H2	7/L1	164#
0 4 3 2 1	0 4 3 1 2	1 25 19 12 8	0 4 3 2 1	0 4 1 3 2	1 25 17 14 8
3 2 1 0 4	1 2 0 4 3	17 13 6 5 24	3 2 1 0 4	3 2 0 4 1	19 13 6 5 22
1 0 4 3 2	4 3 1 2 0	10 4 22 18 11	1 0 4 3 2	4 1 3 2 0	10 2 24 18 11
4 3 2 1 0	2 0 4 3 1	23 16 15 9 2	4 3 2 1 0	2 0 4 1 3	23 16 15 7 4
2 1 0 4 3	3 1 2 0 4	14 7 3 21 20	2 1 0 4 3	1 3 2 0 4	12 9 3 21 20
10/H2	9/L1	167#	10/H2	11/L1	168#
0 4 3 2 1	0 4 2 1 3	1 25 18 12 9	0 4 3 2 1	0 4 1 2 3	1 25 17 13 9
3 2 1 0 4	1 3 0 4 2	17 14 6 5 23	3 2 1 0 4	2 3 0 4 1	18 14 6 5 22
1 0 4 3 2	4 2 1 3 0	10 3 22 19 11	1 0 4 3 2	4 1 2 3 0	10 2 23 19 11
4 3 2 1 0	3 0 4 2 1	24 16 15 8 2	4 3 2 1 0	3 0 4 1 2	24 16 15 7 3
2 1 0 4 3	2 1 3 0 4	13 7 4 21 20	2 1 0 4 3	1 2 3 0 4	12 8 4 21 20

[Group11]

11/H1	2/L2	169#	11/H1	4/L2	170#
0 3 2 1 4	0 2 4 1 3	1 18 15 7 24	0 3 2 1 4	0 3 4 1 2	1 19 15 7 23
1 4 0 3 2	4 1 3 0 2	10 22 4 16 13	1 4 0 3 2	4 1 2 0 3	10 22 3 16 14
3 2 1 4 0	3 0 2 4 1	19 11 8 25 2	3 2 1 4 0	2 0 3 4 1	18 11 9 25 2
4 0 3 2 1	2 4 1 3 0	23 5 17 14 6	4 0 3 2 1	3 4 1 2 0	24 5 17 13 6
2 1 4 0 3	1 3 0 2 4	12 9 21 3 20	2 1 4 0 3	1 2 0 3 4	12 8 21 4 20

[Group12]

12/H1	2/L2	171#	12/H1	4/L2	172#
0 3 1 2 4	0 2 4 1 3	1 18 10 12 24	0 3 1 2 4	0 3 4 1 2	1 19 10 12 23
2 4 0 3 1	4 1 3 0 2	15 22 4 16 8	2 4 0 3 1	4 1 2 0 3	15 22 3 16 9
3 1 2 4 0	3 0 2 4 1	19 6 13 25 2	3 1 2 4 0	2 0 3 4 1	18 6 14 25 2
4 0 3 1 2	2 4 1 3 0	23 5 17 9 11	4 0 3 1 2	3 4 1 2 0	24 5 17 8 11
1 2 4 0 3	1 3 0 2 4	7 14 21 3 20	1 2 4 0 3	1 2 0 3 4	7 13 21 4 20

[Group13]

13/H2	1/L1	289#	13/H2	3/L1	290#
0 3 2 1 4	0 4 3 2 1	1 20 14 8 22	0 3 2 1 4	0 4 2 3 1	1 20 13 9 22
2 1 4 0 3	2 1 0 4 3	13 7 21 5 19	2 1 4 0 3	3 1 0 4 2	14 7 21 5 18
4 0 3 2 1	4 3 2 1 0	25 4 18 12 6	4 0 3 2 1	4 2 3 1 0	25 3 19 12 6
3 2 1 4 0	1 0 4 3 2	17 11 10 24 3	3 2 1 4 0	1 0 4 2 3	17 11 10 23 4
1 4 0 3 2	3 2 1 0 4	9 23 2 16 15	1 4 0 3 2	2 3 1 0 4	8 24 2 16 15

[Group14]

14/H2	1/L1	291#	14/H2	3/L1	292#
0 4 2 1 3	0 4 3 2 1	1 25 14 8 17	0 4 2 1 3	0 4 2 3 1	1 25 13 9 17
2 1 3 0 4	2 1 0 4 3	13 7 16 5 24	2 1 3 0 4	3 1 0 4 2	14 7 16 5 23
3 0 4 2 1	4 3 2 1 0	20 4 23 12 6	3 0 4 2 1	4 2 3 1 0	20 3 24 12 6
4 2 1 3 0	1 0 4 3 2	22 11 10 19 3	4 2 1 3 0	1 0 4 2 3	22 11 10 18 4
1 3 0 4 2	3 2 1 0 4	9 18 2 21 15	1 3 0 4 2	2 3 1 0 4	8 19 2 21 15

[Group15]

15/H1	2/L2	301#	15/H1	4/L2	302#
0 2 4 1 3	0 2 4 1 3	1 13 25 7 19	0 2 4 1 3	0 3 4 1 2	1 14 25 7 18
1 3 0 2 4	4 1 3 0 2	10 17 4 11 23	1 3 0 2 4	4 1 2 0 3	10 17 3 11 24
2 4 1 3 0	3 0 2 4 1	14 21 8 20 2	2 4 1 3 0	2 0 3 4 1	13 21 9 20 2
3 0 2 4 1	2 4 1 3 0	18 5 12 24 6	3 0 2 4 1	3 4 1 2 0	19 5 12 23 6
4 1 3 0 2	1 3 0 2 4	22 9 16 3 15	4 1 3 0 2	1 2 0 3 4	22 8 16 4 15

[Group16]

16/H2	1/L1	303#	16/H2	3/L1	304#
0 4 2 3 1	0 4 3 2 1	1 25 14 18 7	0 4 2 3 1	0 4 2 3 1	1 25 13 19 7
2 3 1 0 4	2 1 0 4 3	13 17 6 5 24	2 3 1 0 4	3 1 0 4 2	14 17 6 5 23
1 0 4 2 3	4 3 2 1 0	10 4 23 12 16	1 0 4 2 3	4 2 3 1 0	10 3 24 12 16
4 2 3 1 0	1 0 4 3 2	22 11 20 9 3	4 2 3 1 0	1 0 4 2 3	22 11 20 8 4
3 1 0 4 2	3 2 1 0 4	19 8 2 21 15	3 1 0 4 2	2 3 1 0 4	18 9 2 21 15

[Group17]

17/H1	2/L2	313#	17/H1	4/L2	314#
0 2 3 1 4	0 2 4 1 3	1 13 20 7 24	0 2 3 1 4	0 3 4 1 2	1 14 20 7 23
1 4 0 2 3	4 1 3 0 2	10 22 4 11 18	1 4 0 2 3	4 1 2 0 3	10 22 3 11 19
2 3 1 4 0	3 0 2 4 1	14 16 8 25 2	2 3 1 4 0	2 0 3 4 1	13 16 9 25 2
4 0 2 3 1	2 4 1 3 0	23 5 12 19 6	4 0 2 3 1	3 4 1 2 0	24 5 12 18 6
3 1 4 0 2	1 3 0 2 4	17 9 21 3 15	3 1 4 0 2	1 2 0 3 4	17 8 21 4 15

[Group18]

18/H2	1/L1	315#	18/H2	3/L1	316#
0 3 2 4 1	0 4 3 2 1	1 20 14 23 7	0 3 2 4 1	0 4 2 3 1	1 20 13 24 7
2 4 1 0 3	2 1 0 4 3	13 22 6 5 19	2 4 1 0 3	3 1 0 4 2	14 22 6 5 18
1 0 3 2 4	4 3 2 1 0	10 4 18 12 21	1 0 3 2 4	4 2 3 1 0	10 3 19 12 21
3 2 4 1 0	1 0 4 3 2	17 11 25 9 3	3 2 4 1 0	1 0 4 2 3	17 11 25 8 4
4 1 0 3 2	3 2 1 0 4	24 8 2 16 15	4 1 0 3 2	2 3 1 0 4	23 9 2 16 15

[Group19]

19/H2	1/L1	433#	19/H2	3/L1	434#
0 3 1 2 4	0 4 3 2 1	1 20 9 13 22	0 3 1 2 4	0 4 2 3 1	1 20 8 14 22
1 2 4 0 3	2 1 0 4 3	8 12 21 5 19	1 2 4 0 3	3 1 0 4 2	9 12 21 5 18
4 0 3 1 2	4 3 2 1 0	25 4 18 7 11	4 0 3 1 2	4 2 3 1 0	25 3 19 7 11
3 1 2 4 0	1 0 4 3 2	17 6 15 24 3	3 1 2 4 0	1 0 4 2 3	17 6 15 23 4
2 4 0 3 1	3 2 1 0 4	14 23 2 16 10	2 4 0 3 1	2 3 1 0 4	13 24 2 16 10

[Group20]

20/H2	1/L1	435#	20/H2	3/L1	436#
0 4 1 2 3	0 4 3 2 1	1 25 9 13 17	0 4 1 2 3	0 4 2 3 1	1 25 8 14 17
1 2 3 0 4	2 1 0 4 3	8 12 16 5 24	1 2 3 0 4	3 1 0 4 2	9 12 16 5 23
3 0 4 1 2	4 3 2 1 0	20 4 23 7 11	3 0 4 1 2	4 2 3 1 0	20 3 24 7 11
4 1 2 3 0	1 0 4 3 2	22 6 15 19 3	4 1 2 3 0	1 0 4 2 3	22 6 15 18 4
2 3 0 4 1	3 2 1 0 4	14 18 2 21 10	2 3 0 4 1	2 3 1 0 4	13 19 2 21 10

[Group21]

21/H2	1/L1	445#	21/H2	3/L1	446#
0 2 1 3 4	0 4 3 2 1	1 15 9 18 22	0 2 1 3 4	0 4 2 3 1	1 15 8 19 22
1 3 4 0 2	2 1 0 4 3	8 17 21 5 14	1 3 4 0 2	3 1 0 4 2	9 17 21 5 13
4 0 2 1 3	4 3 2 1 0	25 4 13 7 16	4 0 2 1 3	4 2 3 1 0	25 3 14 7 16
2 1 3 4 0	1 0 4 3 2	12 6 20 24 3	2 1 3 4 0	1 0 4 2 3	12 6 20 23 4
3 4 0 2 1	3 2 1 0 4	19 23 2 11 10	3 4 0 2 1	2 3 1 0 4	18 24 2 11 10

[Group22]

22/H2	1/L1	447#	22/H2	3/L1	448#
0 4 1 3 2	0 4 3 2 1	1 25 9 18 12	0 4 1 3 2	0 4 2 3 1	1 25 8 19 12
1 3 2 0 4	2 1 0 4 3	8 17 11 5 24	1 3 2 0 4	3 1 0 4 2	9 17 11 5 23
2 0 4 1 3	4 3 2 1 0	15 4 23 7 16	2 0 4 1 3	4 2 3 1 0	15 3 24 7 16
4 1 3 2 0	1 0 4 3 2	22 6 20 14 3	4 1 3 2 0	1 0 4 2 3	22 6 20 13 4
3 2 0 4 1	3 2 1 0 4	19 13 2 21 10	3 2 0 4 1	2 3 1 0 4	18 14 2 21 10

[Group23]

23/H2	1/L1	457#	23/H2	3/L1	458#
0 2 1 4 3	0 4 3 2 1	1 15 9 23 17	0 2 1 4 3	0 4 2 3 1	1 15 8 24 17
1 4 3 0 2	2 1 0 4 3	8 22 16 5 14	1 4 3 0 2	3 1 0 4 2	9 22 16 5 13
3 0 2 1 4	4 3 2 1 0	20 4 13 7 21	3 0 2 1 4	4 2 3 1 0	20 3 14 7 21
2 1 4 3 0	1 0 4 3 2	12 6 25 19 3	2 1 4 3 0	1 0 4 2 3	12 6 25 18 4
4 3 0 2 1	3 2 1 0 4	24 18 2 11 10	4 3 0 2 1	2 3 1 0 4	23 19 2 11 10

[Group24]

24/H2	1/L1	459#	24/H2	3/L1	460#
0 3 1 4 2	0 4 3 2 1	1 20 9 23 12	0 3 1 4 2	0 4 2 3 1	1 20 8 24 12
1 4 2 0 3	2 1 0 4 3	8 22 11 5 19	1 4 2 0 3	3 1 0 4 2	9 22 11 5 18
2 0 3 1 4	4 3 2 1 0	15 4 18 7 21	2 0 3 1 4	4 2 3 1 0	15 3 19 7 21
3 1 4 2 0	1 0 4 3 2	17 6 25 14 3	3 1 4 2 0	1 0 4 2 3	17 6 25 13 4
4 2 0 3 1	3 2 1 0 4	24 13 2 16 10	4 2 0 3 1	2 3 1 0 4	23 14 2 16 10

[Group25]

25/H1	2/L2	2881#	25/H1	4/L2	2882#
1 4 3 0 2	0 2 4 1 3	6 23 20 2 14	1 4 3 0 2	0 3 4 1 2	6 24 20 2 13
0 2 1 4 3	4 1 3 0 2	5 12 9 21 18	0 2 1 4 3	4 1 2 0 3	5 12 8 21 19
4 3 0 2 1	3 0 2 4 1	24 16 3 15 7	4 3 0 2 1	2 0 3 4 1	23 16 4 15 7
2 1 4 3 0	2 4 1 3 0	13 10 22 19 1	2 1 4 3 0	3 4 1 2 0	14 10 22 18 1
3 0 2 1 4	1 3 0 2 4	17 4 11 8 25	3 0 2 1 4	1 2 0 3 4	17 3 11 9 25

[Group26]

26/H1	2/L2	2887#	26/H1	4/L2	2888#
1 4 2 0 3	0 2 4 1 3	6 23 15 2 19	1 4 2 0 3	0 3 4 1 2	6 24 15 2 18
0 3 1 4 2	4 1 3 0 2	5 17 9 21 13	0 3 1 4 2	4 1 2 0 3	5 17 8 21 14
4 2 0 3 1	3 0 2 4 1	24 11 3 20 7	4 2 0 3 1	2 0 3 4 1	23 11 4 20 7
3 1 4 2 0	2 4 1 3 0	18 10 22 14 1	3 1 4 2 0	3 4 1 2 0	19 10 22 13 1
2 0 3 1 4	1 3 0 2 4	12 4 16 8 25	2 0 3 1 4	1 2 0 3 4	12 3 16 9 25

[Group27]

27/H1	2/L2	2929#	27/H1	4/L2	2930#
1 3 4 0 2	0 2 4 1 3	6 18 25 2 14	1 3 4 0 2	0 3 4 1 2	6 19 25 2 13
0 2 1 3 4	4 1 3 0 2	5 12 9 16 23	0 2 1 3 4	4 1 2 0 3	5 12 8 16 24
3 4 0 2 1	3 0 2 4 1	19 21 3 15 7	3 4 0 2 1	2 0 3 4 1	18 21 4 15 7
2 1 3 4 0	2 4 1 3 0	13 10 17 24 1	2 1 3 4 0	3 4 1 2 0	14 10 17 23 1
4 0 2 1 3	1 3 0 2 4	22 4 11 8 20	4 0 2 1 3	1 2 0 3 4	22 3 11 9 20

[Group28]

28/H1	2/L2	2935#	28/H1	4/L2	2936#
1 3 2 0 4	0 2 4 1 3	6 18 15 2 24	1 3 2 0 4	0 3 4 1 2	6 19 15 2 23
0 4 1 3 2	4 1 3 0 2	5 22 9 16 13	0 4 1 3 2	4 1 2 0 3	5 22 8 16 14
3 2 0 4 1	3 0 2 4 1	19 11 3 25 7	3 2 0 4 1	2 0 3 4 1	18 11 4 25 7
4 1 3 2 0	2 4 1 3 0	23 10 17 14 1	4 1 3 2 0	3 4 1 2 0	24 10 17 13 1
2 0 4 1 3	1 3 0 2 4	12 4 21 8 20	2 0 4 1 3	1 2 0 3 4	12 3 21 9 20

[Group29]

29/H1	2/L2	2977#	29/H1	4/L2	2978#
1 2 4 0 3	0 2 4 1 3	6 13 25 2 19	1 2 4 0 3	0 3 4 1 2	6 14 25 2 18
0 3 1 2 4	4 1 3 0 2	5 17 9 11 23	0 3 1 2 4	4 1 2 0 3	5 17 8 11 24
2 4 0 3 1	3 0 2 4 1	14 21 3 20 7	2 4 0 3 1	2 0 3 4 1	13 21 4 20 7
3 1 2 4 0	2 4 1 3 0	18 10 12 24 1	3 1 2 4 0	3 4 1 2 0	19 10 12 23 1
4 0 3 1 2	1 3 0 2 4	22 4 16 8 15	4 0 3 1 2	1 2 0 3 4	22 3 16 9 15
29/H1	6/L2	2979#	29/H1	8/L2	2980#
1 2 4 0 3	0 1 4 2 3	6 12 25 3 19	1 2 4 0 3	0 3 4 2 1	6 14 25 3 17
0 3 1 2 4	4 2 3 0 1	5 18 9 11 22	0 3 1 2 4	4 2 1 0 3	5 18 7 11 24
2 4 0 3 1	3 0 1 4 2	14 21 2 20 8	2 4 0 3 1	1 0 3 4 2	12 21 4 20 8
3 1 2 4 0	1 4 2 3 0	17 10 13 24 1	3 1 2 4 0	3 4 2 1 0	19 10 13 22 1
4 0 3 1 2	2 3 0 1 4	23 4 16 7 15	4 0 3 1 2	2 1 0 3 4	23 2 16 9 15

1297: 1
1333: 1
1369: 1
1405: 1
1441: 1
1477: 1
1513: 1
1549: 1
1585: 1
1621: 1
1657: 1
1693: 1
1729: 1
1765: 1

.

2701: 1
2737: 1
2773: 1
2809: 1
2845: 1
2881: 1
2917: 1
2953: 1
2989: 1
3025: 1
3061: 1
3097: 1
3133: 1
3169: 1
3205: 1
3241: 1
3277: 1
3313: 1
3349: 1
3385: 1
3421: 1
3457: 1
3493: 1
3529: 1
3565: 1

[Count = 3600] OK!

** Recompiled and Listed by Kanji Setsuda on
Feb.26, 2015 with MacOSX 10.10.2 & Xcode 6.1.1 **