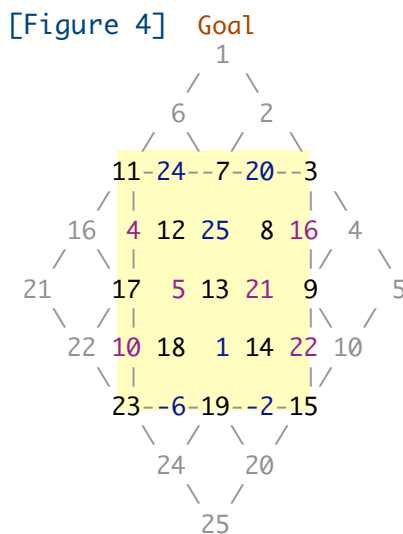
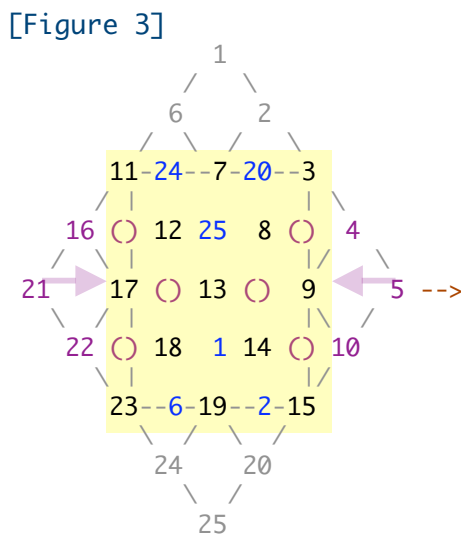
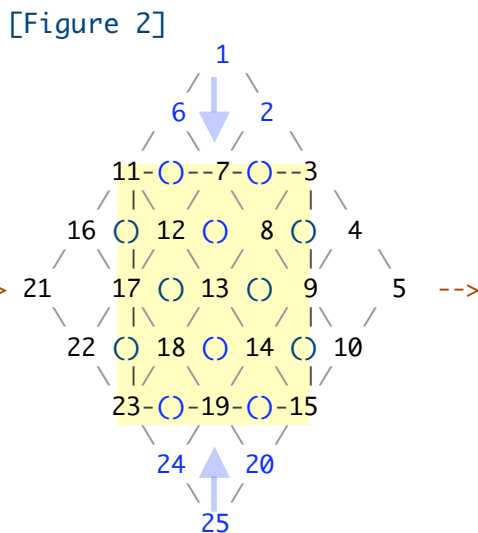
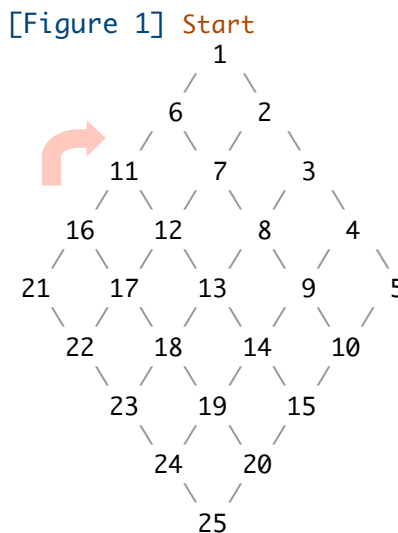
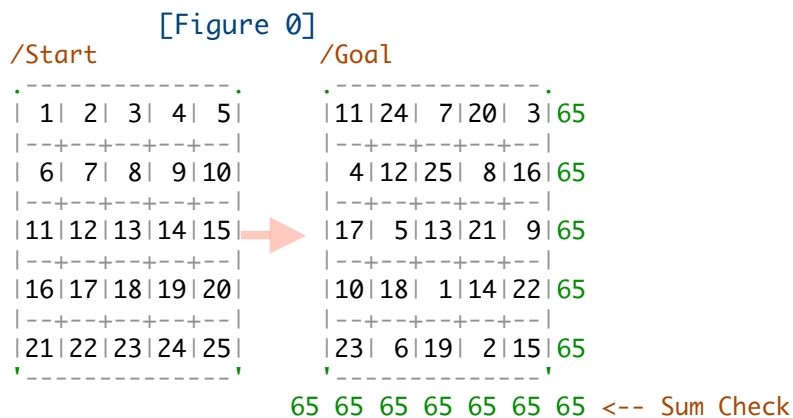


Chapter 3 : New Algebraic Study of Magic Squares 5x5: Kanji Setsuda

Section 4: Analysis on the 'Classic Composition' of Order 5

#1. You know this method of 'Classic Composition', don't you?



It is supposed to be such an old method that it has been introduced just as above for a long time in many books. You must have seen it before, haven't you?

It is a way of composing a Self-complementary Magic Square of Order $2n+1$ ($n=1, 2, 3, 4, 5, \dots$). Let me take an example of order 5 here.

[Figure 0] illustrates both the starting form and the goal object. Which numbers do you have to move? Which ones don't you have to move? How do you have to transform the left square into the right one?

Step 1. This old method directs you first to rotate the starting square by 45 degrees clockwise on the whole, and put the result as [Figure 1].

Step 2. Choose 3, 11, 23, 15(at middle points of each edge line), and connect them with lines making a new square frame as [Figure 2].

Step 3. Keep the following 13 numbers {3, 7, 11, 8, 12, 9, 13, 17, 14, 18, 15, 19 and 23} unchanged, and do not move them at all. Make the blank positions as [Figure 3] for the rest 12 numbers instead.

Step 4. Pick up the 4 tops {1, 5, 21, 25} from outside the new frame and carry them to the opposite side, and put them inside near the central position between (14, 18), (12, 18), (8, 14) and (8, 25).

Step 5. Move the rest 8 numbers outside the frame to the opposite side, and put them on the edge lines by 2 on each. The new inner square of order 5 of [Figure 4] shows our goal object.

Step 6. Check if every row, every column and every primary diagonal add up to the magic constant 65. Check if all the complementary pairs (1, 25), (2, 24), (3, 23), ... , (11, 15), (12, 14) are placed symmetrically with respect to 13 in the center.

#2. The Importance of the Basic Form of 5 by 5

Let's make some analyses on this method.

First of all, we have to find some secrets of the starting square 5x5.

It is the same with the 'Basic Form' made after the regular array of 5x5. The value of each position is set keeping equal to the position name itself.

[Figure 5: Basic Form]

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

Pan-diagonals:

- * 1+ 7+13+19+25=65 ... (1)
- 1+10+14+18+22=65 ... (2)
- 2+ 8+14+20+21=65 ... (3)
- 2+ 6+15+19+23=65 ... (4)
- 3+ 9+15+16+22=65 ... (5)
- 3+ 7+11+20+24=65 ... (6)
- 4+10+11+17+23=65 ... (7)
- 4+ 8+12+16+25=65 ... (8)
- 5+ 6+12+18+24=65 ... (9)
- * 5+ 9+13+17+21=65 .. (10)

(1) and (10) are the 'Primary Diagonals'

Please check if each pan-diagonal adds up to the magic constant 65. Yes, it does.

And check if all complementary pairs are placed symmetrically with respect to the central 13. Yes, they are.

It means that the Basic Form is always a 'Simultaneous' square: both Self-complementary and Pan-diagonal type, although it is not a 'Magic' square at all, since all rows and columns do not always add up to the same constant 65.

If you want any proofs for those properties, you should try to decompose it by the positional number system of the base 5.

Every pan-diagonal always consists of {0, 1, 2, 3, and 4} in both higher layer and lower one. Therefore the sum is always calculated in the same way as:

$$(0+1+2+3+4) \times 5^1 + (0+1+2+3+4) \times 5^0 = 10 \times 5 + 10 \times 1 = 60(\text{Decimal})$$

* Basic Forms with Decomposition Diagrams(/D5i) *

/Original	/D5i: H/L	/Transformed	/D5i: H/L
1 2 3 4 5	00000 01234	11 24 7 20 3	24130 03142
6 7 8 9 10	11111 01234	4 12 25 8 16	02413 31420
11 12 13 14 15	22222 01234	17 5 13 21 9	30241 14203
16 17 18 19 20	33333 01234	10 18 1 14 22	13024 42031
21 22 23 24 25	44444 01234	23 6 19 2 15	41302 20314
	H/5 ¹ L/5 ⁰		H/5 ¹ L/5 ⁰

The sum 60 is equivalent to the magic constant 65 in our conventional notation.

As you notice, these properties of the Basic Form are re-used by that Classic Method of Transformation as often as possible.

* Transform it by the 'Classic Composition' *

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

Which row and column did the number **1** moved into? The lines 1+7+13+19+25 ... (1) and 10+18+1+14+22 ... (2). They were the pan-diagonals of the Basic Form.

Where did the number 5 go? Into the 3rd row and the 2nd column that were the pan-diagonal 5+9+13+17+12=65 ... (10) and pan-diagonal 5+6+12+18+24=65 ... (9) of the Basic Form before.

Where did 2 and 6 go? They are found in the 5th row in the object, the same as the original pan-diagonal 2+6+15+19+23=65 ... (4) of the Basic Form.

This method makes every row and every column of the new object from what was every pan-diagonal of the original starting square. Therefore, it is sure to make them add up to the same magic constant 65.

First of all, it is wise to rotate the whole square by 45 degrees clockwise. That really enables the magic possible, since it treats the old pan-diagonals as the new rows or columns in such an elegant manner as those.

And both the 3rd row 11+12+13+14+15=65 and the 3rd column 3+8+13+18+23=65 in the original are also wisely used into the two primary diagonals of the new object.

The symmetrical positioning of all complementary pairs are kept undestroyed by the straight movement of 12 numbers.

#3. What Potentiality does this Method have?

This method is long known only to make a Self-complementary Magic Square from the Basic Form. But can't we think of it in another way? If we take it as a kind of effective 'transformation technique', what else can we really do by that?

A wild imagination began to grow in my mind.

I tried to make some experiments for our Suzuki's Squares, the 16 Simultaneous Magic Squares of Order 5: Both Self-complementary and Pan-diagonal.

Why did I choose them? Because the type of these Suzuki's Squares is common and the same as the Basic Form. They are the 'Simultaneous' squares 5x5.

Why don't you apply the Classic Transformation Method to them? How can we use those Simultaneous properties of Self-complementary and Pan-diagonal types?

At first, I dictated the transformation rules to my computer program as follows:

Then I applied this procedure to those 16 Suzuki's Squares.

```

/**/
/* Classic Composition */
void clscmp(){
  d[1]=c[11]; d[2]=c[24]; d[3]=c[7]; d[4]=c[20]; d[5]=c[3];
  d[6]=c[4]; d[7]=c[12]; d[8]=c[25]; d[9]=c[8]; d[10]=c[16];
  d[11]=c[17]; d[12]=c[5]; d[13]=c[13]; d[14]=c[21]; d[15]=c[9];
  d[16]=c[10]; d[17]=c[18]; d[18]=c[1]; d[19]=c[14]; d[20]=c[22];
  d[21]=c[23]; d[22]=c[6]; d[23]=c[19]; d[24]=c[2]; d[25]=c[15];
}
/**/

```

Let me show you the result of my first experiment.

```

** Simultaneous Magic Squares 5*5: Both S-C and P-D Type **
** Transform the first 4 by the 'Classic Composition' **

      1/T0 ->          0/T1 ->          14/T2 ->          0/T3
1 23 20 12 9 24 3 7 11 20 5 23 16 14 7 22 3 9 15 16
15 7 4 21 18 12 16 25 4 8 11 9 2 25 18 14 20 21 2 8
24 16 13 10 2 5 9 13 17 21 22 20 13 6 4 1 7 13 19 25
8 5 22 19 11 18 22 1 10 14 8 1 24 17 15 18 24 5 6 12
17 14 6 3 25 6 15 19 23 2 19 12 10 3 21 10 11 17 23 4

      2/T0 ->          0/T1 ->          16/T2 ->          0/T3
1 23 20 14 7 22 3 9 11 20 5 23 16 12 9 24 3 7 15 16
15 9 2 21 18 14 16 25 2 8 11 7 4 25 18 12 20 21 4 8
22 16 13 10 4 5 7 13 19 21 24 20 13 6 2 1 9 13 17 25
8 5 24 17 11 18 24 1 10 12 8 1 22 19 15 18 22 5 6 14
19 12 6 3 25 6 15 17 23 4 17 14 10 3 21 10 11 19 23 2

      3/T0 ->          0/T1 ->          0/T2 ->          0/T3
1 15 24 18 7 10 11 17 3 24 21 15 4 8 17 20 11 7 23 4
23 17 6 5 14 18 4 25 6 12 3 7 16 25 14 8 24 5 16 12
10 4 13 22 16 21 7 13 19 5 20 24 13 2 6 1 17 13 9 25
12 21 20 9 3 14 20 1 22 8 12 1 10 19 23 14 10 21 2 18
19 8 2 11 25 2 23 9 15 16 9 18 22 11 5 22 3 19 15 6

      4/T0 ->          0/T1 ->          0/T2 ->          0/T3
1 15 22 18 9 10 11 19 3 22 21 15 2 8 19 20 11 9 23 2
23 19 6 5 12 18 2 25 6 14 3 9 16 25 12 8 22 5 16 14
10 2 13 24 16 21 9 13 17 5 20 22 13 4 6 1 19 13 7 25
14 21 20 7 3 12 20 1 24 8 14 1 10 17 23 12 10 21 4 18
17 8 4 11 25 4 23 7 15 16 7 18 24 11 5 24 3 17 15 6

```

The above list shows the sequential results of repeating application of the same Classic Composition. /T0 is made into /T1, /T1 is made into /T2, and /T2 is made into /T3 by applying the same method to one after another.

But many of the results are against the list-forming inequality conditions for the standard solutions: $n_1 < n_5 < n_{21}$ and $n_1 < n_{25}$. It may be confusing. We could not always have got anything same in our old set of standard solutions.

We have come to realize the next thing. We have to prepare the Mother Set of 128 Primitive Solutions of Suzuki's Squares as a matter of course, as long as we have to deal with such a transformation method as this.

The next list shows the 128 Primitive Solutions including the reflected patterns and rotated ones of a standard solution accepted as different from one another.

[Simultaneous Magic Squares of Order 5: Self-complementary and Pan-diagonal;
List of **Primitive Solutions** with Solution_Number# | Check_Sums |]

1# Rw C1 P1\P2/					2# Rw C1 P1\P2/					3# Rw C1 P1\P2/													
1	23	20	12	9	15	24	8	17	65	65	65	65	65	1	23	20	14	7	65	65	65	65	65
15	7	4	21	18	23	7	16	5	14	15	9	2	21	18	65	65	65	65	65	65	65	65	65
24	16	13	10	2	20	4	13	22	6	22	16	13	10	4	65	65	65	65	65	65	65	65	65
8	5	22	19	11	12	21	10	19	3	8	5	24	17	11	65	65	65	65	65	65	65	65	65
17	14	6	3	25	9	18	2	11	25	19	12	6	3	25	65	65	65	65	65	65	65	65	65
4# Rw C1 P1\P2/					5# Rw C1 P1\P2/					6# Rw C1 P1\P2/													
1	15	22	8	19	1	23	10	12	19	1	15	24	18	7	65	65	65	65	65	65	65	65	65
23	9	16	5	12	15	17	4	21	8	23	17	6	5	14	65	65	65	65	65	65	65	65	65
20	2	13	24	6	24	6	13	20	2	10	4	13	22	16	65	65	65	65	65	65	65	65	65
14	21	10	17	3	18	5	22	9	11	12	21	20	9	3	65	65	65	65	65	65	65	65	65
7	18	4	11	25	7	14	16	3	25	19	8	2	11	25	65	65	65	65	65	65	65	65	65
7# Rw C1 P1\P2/					8# Rw C1 P1\P2/					9# Rw C1 P1\P2/													
1	23	10	14	17	1	15	22	18	9	2	23	19	11	10	65	65	65	65	65	65	65	65	65
15	19	2	21	8	23	19	6	5	12	14	6	5	22	18	65	65	65	65	65	65	65	65	65
22	6	13	20	4	10	2	13	24	16	25	17	13	9	1	65	65	65	65	65	65	65	65	65
18	5	24	7	11	14	21	20	7	3	8	4	21	20	12	65	65	65	65	65	65	65	65	65
9	12	16	3	25	17	8	4	11	25	16	15	7	3	24	65	65	65	65	65	65	65	65	65
10# Rw C1 P1\P2/					11# Rw C1 P1\P2/					12# Rw C1 P1\P2/													
2	14	25	8	16	2	23	19	15	6	2	14	21	8	20	65	65	65	65	65	65	65	65	65
23	6	17	4	15	14	10	1	22	18	23	10	17	4	11	65	65	65	65	65	65	65	65	65
19	5	13	21	7	21	17	13	9	5	19	1	13	25	7	65	65	65	65	65	65	65	65	65
11	22	9	20	3	8	4	25	16	12	15	22	9	16	3	65	65	65	65	65	65	65	65	65
10	18	1	12	24	20	11	7	3	24	6	18	5	12	24	65	65	65	65	65	65	65	65	65
13# Rw C1 P1\P2/					14# Rw C1 P1\P2/					15# Rw C1 P1\P2/													
2	23	9	11	20	2	14	25	18	6	2	23	9	15	16	65	65	65	65	65	65	65	65	65
14	16	5	22	8	23	16	7	4	15	14	20	1	22	8	65	65	65	65	65	65	65	65	65
25	7	13	19	1	9	5	13	21	17	21	7	13	19	5	65	65	65	65	65	65	65	65	65
18	4	21	10	12	11	22	19	10	3	18	4	25	6	12	65	65	65	65	65	65	65	65	65
6	15	17	3	24	20	8	1	12	24	10	11	17	3	24	65	65	65	65	65	65	65	65	65
16# Rw C1 P1\P2/					17# Rw C1 P1\P2/					18# Rw C1 P1\P2/													
2	14	21	18	10	4	23	17	11	10	4	12	25	8	16	65	65	65	65	65	65	65	65	65
23	20	7	4	11	12	6	5	24	18	23	6	19	2	15	65	65	65	65	65	65	65	65	65
9	1	13	25	17	25	19	13	7	1	17	5	13	21	9	65	65	65	65	65	65	65	65	65
15	22	19	6	3	8	2	21	20	14	11	24	7	20	3	65	65	65	65	65	65	65	65	65
16	8	5	12	24	16	15	9	3	22	10	18	1	14	22	65	65	65	65	65	65	65	65	65
19# Rw C1 P1\P2/					20# Rw C1 P1\P2/					21# Rw C1 P1\P2/													
4	23	17	15	6	4	12	21	8	20	4	23	7	11	20	65	65	65	65	65	65	65	65	65
12	10	1	24	18	23	10	19	2	11	12	16	5	24	8	65	65	65	65	65	65	65	65	65
21	19	13	7	5	17	1	13	25	9	25	9	13	17	1	65	65	65	65	65	65	65	65	65
8	2	25	16	14	15	24	7	16	3	18	2	21	10	14	65	65	65	65	65	65	65	65	65
20	11	9	3	22	6	18	5	14	22	6	15	19	3	22	65	65	65	65	65	65	65	65	65
22# Rw C1 P1\P2/					23# Rw C1 P1\P2/					24# Rw C1 P1\P2/													
4	12	25	18	6	4	23	7	15	16	4	12	21	18	10	65	65	65	65	65	65	65	65	65
23	16	9	2	15	12	20	1	24	8	23	20	9	2	11	65	65	65	65	65	65	65	65	65
7	5	13	21	19	21	9	13	17	5	7	1	13	25	19	65	65	65	65	65	65	65	65	65
11	24	17	10	3	18	2	25	6	14	15	24	17	6	3	65	65	65	65	65	65	65	65	65
20	8	1	14	22	10	11	19	3	22	16	8	5	14	22	65	65	65	65	65	65	65	65	65
25# Rw C1 P1\P2/					26# Rw C1 P1\P2/					27# Rw C1 P1\P2/													
5	23	16	12	9	5	11	24	8	17	5	23	16	14	7	65	65	65	65	65	65	65	65	65
11	7	4	25	18	23	7	20	1	14	11	9	2	25	18	65	65	65	65	65	65	65	65	65
24	20	13	6	2	16	4	13	22	10	22	20	13	6	4	65	65	65	65	65	65	65	65	65
8	1	22	19	15	12	25	6	19	3	8	1	24	17	15	65	65	65	65	65	65	65	65	65
17	14	10	3	21	9	18	2	15	21	19	12	10	3	21	65	65	65	65	65	65	65	65	65

28# Rw C1 P1\P2/				29# Rw C1 P1\P2/				30# Rw C1 P1\P2/																
5	11	22	8	19 65 65 65\65/	5	23	6	12	19 65 65 65\65/	5	11	24	18	7 65 65 65\65/										
23	9	20	1	12 65 65 65\65/	11	17	4	25	8 65 65 65\65/	23	17	10	1	14 65 65 65\65/										
16	2	13	24	10 65 65 65\65/	24	10	13	16	2 65 65 65\65/	6	4	13	22	20 65 65 65\65/										
14	25	6	17	3 65 65 65\65/	18	1	22	9	15 65 65 65\65/	12	25	16	9	3 65 65 65\65/										
7	18	4	15	21 65 65 65\65/	7	14	20	3	21 65 65 65\65/	19	8	2	15	21 65 65 65\65/										
31# Rw C1 P1\P2/				32# Rw C1 P1\P2/				33# Rw C1 P1\P2/																
5	23	6	14	17 65 65 65\65/	5	11	22	18	9 65 65 65\65/	6	18	25	12	4 65 65 65\65/										
11	19	2	25	8 65 65 65\65/	23	19	10	1	12 65 65 65\65/	15	2	9	16	23 65 65 65\65/										
22	10	13	16	4 65 65 65\65/	6	2	13	24	20 65 65 65\65/	19	21	13	5	7 65 65 65\65/										
18	1	24	7	15 65 65 65\65/	14	25	16	7	3 65 65 65\65/	3	10	17	24	11 65 65 65\65/										
9	12	20	3	21 65 65 65\65/	17	8	4	15	21 65 65 65\65/	22	14	1	8	20 65 65 65\65/										
34#				35#				36#				37#				38#								
6	15	19	3	22	6	18	25	14	2	6	15	17	3	24	6	18	5	12	24	6	15	19	23	2
18	2	21	10	14	15	4	7	16	23	18	4	21	10	12	15	22	9	16	3	18	22	1	10	14
25	9	13	17	1	17	21	13	5	9	25	7	13	19	1	19	1	13	25	7	5	9	13	17	21
12	16	5	24	8	3	10	19	22	11	14	16	5	22	8	23	10	17	4	11	12	16	25	4	8
4	23	7	11	20	24	12	1	8	20	2	23	9	11	20	2	14	21	8	20	24	3	7	11	20
39#				40#				41#				42#				43#								
6	18	5	14	22	6	15	17	23	4	7	18	24	11	5	7	14	20	3	21	7	18	24	15	1
15	24	7	16	3	18	24	1	10	12	14	1	10	17	23	18	1	22	9	15	14	5	6	17	23
17	1	13	25	9	5	7	13	19	21	20	22	13	4	6	24	10	13	16	2	16	22	13	4	10
23	10	19	2	11	14	16	25	2	8	3	9	16	25	12	11	17	4	25	8	3	9	20	21	12
4	12	21	8	20	22	3	9	11	20	21	15	2	8	19	5	23	6	12	19	25	11	2	8	19
44#				45#				46#				47#				48#								
7	14	16	3	25	7	18	4	11	25	7	14	20	23	1	7	18	4	15	21	7	14	16	23	5
18	5	22	9	11	14	21	10	17	3	18	21	2	9	15	14	25	6	17	3	18	25	2	9	11
24	6	13	20	2	20	2	13	24	6	4	10	13	16	22	16	2	13	24	10	4	6	13	20	22
15	17	4	21	8	23	9	16	5	12	11	17	24	5	8	23	9	20	1	12	15	17	24	1	8
1	23	10	12	19	1	15	22	8	19	25	3	6	12	19	5	11	22	8	19	21	3	10	12	19
49#				50#				51#				52#				53#								
9	18	22	11	5	9	12	20	3	21	9	18	22	15	1	9	12	16	3	25	9	18	2	11	25
12	1	10	19	23	18	1	24	7	15	12	5	6	19	23	18	5	24	7	11	12	21	10	19	3
20	24	13	2	6	22	10	13	16	4	16	24	13	2	10	22	6	13	20	4	20	4	13	22	6
3	7	16	25	14	11	19	2	25	8	3	7	20	21	14	15	19	2	21	8	23	7	16	5	14
21	15	4	8	17	5	23	6	14	17	25	11	4	8	17	1	23	10	14	17	1	15	24	8	17
54#				55#				56#				57#				58#								
9	12	20	23	1	9	18	2	15	21	9	12	16	23	5	10	18	21	12	4	10	11	19	3	22
18	21	4	7	15	12	25	6	19	3	18	25	4	7	11	11	2	9	20	23	18	2	25	6	14
2	10	13	16	24	16	4	13	22	10	2	6	13	20	24	19	25	13	1	7	21	9	13	17	5
11	19	22	5	8	23	7	20	1	14	15	19	22	1	8	3	6	17	24	15	12	20	1	24	8
25	3	6	14	17	5	11	24	8	17	21	3	10	14	17	22	14	5	8	16	4	23	7	15	16
59#				60#				61#				62#				63#								
10	18	21	14	2	10	11	17	3	24	10	18	1	12	24	10	11	19	23	2	10	18	1	14	22
11	4	7	20	23	18	4	25	6	12	11	22	9	20	3	18	22	5	6	14	11	24	7	20	3
17	25	13	1	9	21	7	13	19	5	19	5	13	21	7	1	9	13	17	25	17	5	13	21	9
3	6	19	22	15	14	20	1	22	8	23	6	17	4	15	12	20	21	4	8	23	6	19	2	15
24	12	5	8	16	2	23	9	15	16	2	14	25	8	16	24	3	7	15	16	4	12	25	8	16
64#				65#				66#				67#				68#								
10	11	17	23	4	16	15	9	3	22	16	8	25	12	4	16	15	7	3	24	16	8	25	14	2
18	24	5	6	12	8	2	21	20	14	15	2	19	6	23	8	4	21	20	12	15	4	17	6	23
1	7	13	19	25	25	19	13	7	1	9	21	13	5	17	25	17	13	9	1	7	21	13	5	19
14	20	21	2	8	12	6	5	24	18	3	20	7	24	11	14	6	5	22	18	3	20	9	22	11
22	3	9	15	16	4	23	17	11	10	22	14	1	18	10	2	23	19	11	10	24	12	1	18	10
124#				125#				126#				127#				128#								
25	3	16	14	7	25	11	4	18	7	25	3	6	12	19	25	11	2	18	9	25	3	6	14	17
11	9	22	5	18	3	17	10	21	14	11	17	24	5	8	3	19	10	21	12	11	19	22	5	8
2	20	13	6	24	6	24	13	2	20	4	10	13	16	22	6	22	13	4	20	2	10	13	16	24
8	21	4	17	15	12	5	16	9	23	18	21	2	9	15	14	5	16	7	23	18	21	4	7	15
19	12	10	23	1	19	8	22	15	1	7	14	20	23	1	17	8	24	15	1	9	12	20	23	1

[Counts(n1=1/A11) = 8/128] OK!

** Calculated and Listed by Kanji Setsuda on Feb. 3, 2011 **

Let's apply our Classic Composition to these solutions one after another. Let's repeat applying the same method to the first result of transformation, and apply again to the second result for the third, and to the third result for the fourth.

The next list shows the result of such experiment I have recently tried.

The first case [Group #0] illustrates the result of application to the Basic Form.

It shows the fourth result of sequential application comes back to the original, indicating a circular process by its four successive steps.

When you apply to the Suzuki's Squares, you will find the same circular process.

** Apply 'Classic Transformation' Sequentially **

[Group #0]: Conceptual Diagrams

0# Row C1m Pd1\Pd2/ ->					1# Row C1m Pd1\Pd2/				
1	2	3	4	5 15 55 65\ 65/	11	24	7	20	3 65 65 65\ 55/
6	7	8	9	10 40 60 65\ 65/	4	12	25	8	16 65 65 115\ 70/
11	12	13	14	15 65 65 65\ 65/	17	5	13	21	9 65 65 40\ 60/
16	17	18	19	20 90 70 65\ 65/	10	18	1	14	22 65 65 90\ 75/
21	22	23	24	25 115 75 65\ 65/	23	6	19	2	15 65 65 15\ 65/
					↓				
3# Row C1m Pd1\Pd2/ <-					2# Row C1m Pd1\Pd2/				
18	24	5	6	12 65 65 65\ 90/	17	2	12	22	7 60 90 65\ 65/
22	3	9	15	16 65 65 70\115/	20	5	15	25	10 75 15 65\ 65/
1	7	13	19	25 65 65 75\ 15/	18	3	13	23	8 65 65 65\ 65/
10	11	17	23	4 65 65 55\ 40/	16	1	11	21	6 55 115 65\ 65/
14	20	21	2	8 65 65 60\ 65/	19	4	14	24	9 70 40 65\ 65/
					↓				
0# Row C1m Pd1\Pd2/ ->					1# Row C1m Pd1\Pd2/				
1	2	3	4	5 15 55 65\ 65/	11	24	7	20	3 65 65 65\ 55/
6	7	8	9	10 40 60 65\ 65/	4	12	25	8	16 65 65 115\ 70/
11	12	13	14	15 65 65 65\ 65/	17	5	13	21	9 65 65 40\ 60/
16	17	18	19	20 90 70 65\ 65/	10	18	1	14	22 65 65 90\ 75/
21	22	23	24	25 115 75 65\ 65/	23	6	19	2	15 65 65 15\ 65/

[Group #01]

1# Row C1m Pd1\Pd2/ ->					118# Row C1m Pd1\Pd2/				
1	23	20	12	9 65 65 65\ 65/	24	3	7	11	20 65 65 65\ 65/
15	7	4	21	18 65 65 65\ 65/	12	16	25	4	8 65 65 65\ 65/
24	16	13	10	2 65 65 65\ 65/	5	9	13	17	21 65 65 65\ 65/
8	5	22	19	11 65 65 65\ 65/	18	22	1	10	14 65 65 65\ 65/
17	14	6	3	25 65 65 65\ 65/	6	15	19	23	2 65 65 65\ 65/
					↓				
112# Row C1m Pd1\Pd2/ <-					27# Row C1m Pd1\Pd2/				
22	3	9	15	16 65 65 65\ 65/	5	23	16	14	7 65 65 65\ 65/
14	20	21	2	8 65 65 65\ 65/	11	9	2	25	18 65 65 65\ 65/
1	7	13	19	25 65 65 65\ 65/	22	20	13	6	4 65 65 65\ 65/
18	24	5	6	12 65 65 65\ 65/	8	1	24	17	15 65 65 65\ 65/
10	11	17	23	4 65 65 65\ 65/	19	12	10	3	21 65 65 65\ 65/

[Group #02]

2# Row C1m Pd1\Pd2/ ->					91# Row C1m Pd1\Pd2/				
1	15	24	8	17 65 65 65\ 65/	20	11	7	3	24 65 65 65\ 65/
23	7	16	5	14 65 65 65\ 65/	8	4	25	16	12 65 65 65\ 65/
20	4	13	22	6 65 65 65\ 65/	21	17	13	9	5 65 65 65\ 65/
12	21	10	19	3 65 65 65\ 65/	14	10	1	22	18 65 65 65\ 65/
9	18	2	11	25 65 65 65\ 65/	2	23	19	15	6 65 65 65\ 65/

↑	64# Row C1m Pd1\Pd2/ <-	↓	101# Row C1m Pd1\Pd2/
10 11 17 23 4 65 65 65\ 65/		21 15 4 18 7 65 65 65\ 65/	
18 24 5 6 12 65 65 65\ 65/		3 17 6 25 14 65 65 65\ 65/	
1 7 13 19 25 65 65 65\ 65/		10 24 13 2 16 65 65 65\ 65/	
14 20 21 2 8 65 65 65\ 65/		12 1 20 9 23 65 65 65\ 65/	
22 3 9 15 16 65 65 65\ 65/		19 8 22 11 5 65 65 65\ 65/	

[Group #03]

3# Row C1m Pd1\Pd2/ ->	110# Row C1m Pd1\Pd2/
1 23 20 14 7 65 65 65\ 65/	22 3 9 11 20 65 65 65\ 65/
15 9 2 21 18 65 65 65\ 65/	14 16 25 2 8 65 65 65\ 65/
22 16 13 10 4 65 65 65\ 65/	5 7 13 19 21 65 65 65\ 65/
8 5 24 17 11 65 65 65\ 65/	18 24 1 10 12 65 65 65\ 65/
19 12 6 3 25 65 65 65\ 65/	6 15 17 23 4 65 65 65\ 65/
↑	↓
120# Row C1m Pd1\Pd2/ <-	25# Row C1m Pd1\Pd2/
24 3 7 15 16 65 65 65\ 65/	5 23 16 12 9 65 65 65\ 65/
12 20 21 4 8 65 65 65\ 65/	11 7 4 25 18 65 65 65\ 65/
1 9 13 17 25 65 65 65\ 65/	24 20 13 6 2 65 65 65\ 65/
18 22 5 6 14 65 65 65\ 65/	8 1 22 19 15 65 65 65\ 65/
10 11 19 23 2 65 65 65\ 65/	17 14 10 3 21 65 65 65\ 65/

[Group #04]

4# Row C1m Pd1\Pd2/ ->	89# Row C1m Pd1\Pd2/
1 15 22 8 19 65 65 65\ 65/	20 11 9 3 22 65 65 65\ 65/
23 9 16 5 12 65 65 65\ 65/	8 2 25 16 14 65 65 65\ 65/
20 2 13 24 6 65 65 65\ 65/	21 19 13 7 5 65 65 65\ 65/
14 21 10 17 3 65 65 65\ 65/	12 10 1 24 18 65 65 65\ 65/
7 18 4 11 25 65 65 65\ 65/	4 23 17 15 6 65 65 65\ 65/
62# Row C1m Pd1\Pd2/ <-	103# Row C1m Pd1\Pd2/
10 11 19 23 2 65 65 65\ 65/	21 15 2 18 9 65 65 65\ 65/
18 22 5 6 14 65 65 65\ 65/	3 19 6 25 12 65 65 65\ 65/
1 9 13 17 25 65 65 65\ 65/	10 22 13 4 16 65 65 65\ 65/
12 20 21 4 8 65 65 65\ 65/	14 1 20 7 23 65 65 65\ 65/
24 3 7 15 16 65 65 65\ 65/	17 8 24 11 5 65 65 65\ 65/

[Group #05]

5# Row C1m Pd1\Pd2/ ->	114# Row C1m Pd1\Pd2/
1 23 10 12 19 65 65 65\ 65/	24 3 17 11 10 65 65 65\ 65/
15 17 4 21 8 65 65 65\ 65/	12 6 25 4 18 65 65 65\ 65/
24 6 13 20 2 65 65 65\ 65/	5 19 13 7 21 65 65 65\ 65/
18 5 22 9 11 65 65 65\ 65/	8 22 1 20 14 65 65 65\ 65/
7 14 16 3 25 65 65 65\ 65/	16 15 9 23 2 65 65 65\ 65/
108# Row C1m Pd1\Pd2/ <-	31# Row C1m Pd1\Pd2/
22 3 19 15 6 65 65 65\ 65/	5 23 6 14 17 65 65 65\ 65/
14 10 21 2 18 65 65 65\ 65/	11 19 2 25 8 65 65 65\ 65/
1 17 13 9 25 65 65 65\ 65/	22 10 13 16 4 65 65 65\ 65/
8 24 5 16 12 65 65 65\ 65/	18 1 24 7 15 65 65 65\ 65/
20 11 7 23 4 65 65 65\ 65/	9 12 20 3 21 65 65 65\ 65/

[Group #06]

6# Row C1m Pd1\Pd2/ ->	60# Row C1m Pd1\Pd2/
1 15 24 18 7 65 65 65\ 65/	10 11 17 3 24 65 65 65\ 65/
23 17 6 5 14 65 65 65\ 65/	18 4 25 6 12 65 65 65\ 65/
10 4 13 22 16 65 65 65\ 65/	21 7 13 19 5 65 65 65\ 65/
12 21 20 9 3 65 65 65\ 65/	14 20 1 22 8 65 65 65\ 65/
19 8 2 11 25 65 65 65\ 65/	2 23 9 15 16 65 65 65\ 65/

95# Row C1m Pd1\Pd2/ <-	97# Row C1m Pd1\Pd2/
20 11 7 23 4 65 65 65\ 65/	21 15 4 8 17 65 65 65\ 65/
8 24 5 16 12 65 65 65\ 65/	3 7 16 25 14 65 65 65\ 65/
1 17 13 9 25 65 65 65\ 65/	20 24 13 2 6 65 65 65\ 65/
14 10 21 2 18 65 65 65\ 65/	12 1 10 19 23 65 65 65\ 65/
22 3 19 15 6 65 65 65\ 65/	9 18 22 11 5 65 65 65\ 65/

[Group #07]

7# Row C1m Pd1\Pd2/ ->	106# Row C1m Pd1\Pd2/
1 23 10 14 17 65 65 65\ 65/	22 3 19 11 10 65 65 65\ 65/
15 19 2 21 8 65 65 65\ 65/	14 6 25 2 18 65 65 65\ 65/
22 6 13 20 4 65 65 65\ 65/	5 17 13 9 21 65 65 65\ 65/
18 5 24 7 11 65 65 65\ 65/	8 24 1 20 12 65 65 65\ 65/
9 12 16 3 25 65 65 65\ 65/	16 15 7 23 4 65 65 65\ 65/

116# Row C1m Pd1\Pd2/ <-	29# Row C1m Pd1\Pd2/
24 3 17 15 6 65 65 65\ 65/	5 23 6 12 19 65 65 65\ 65/
12 10 21 4 18 65 65 65\ 65/	11 17 4 25 8 65 65 65\ 65/
1 19 13 7 25 65 65 65\ 65/	24 10 13 16 2 65 65 65\ 65/
8 22 5 16 14 65 65 65\ 65/	18 1 22 9 15 65 65 65\ 65/
20 11 9 23 2 65 65 65\ 65/	7 14 20 3 21 65 65 65\ 65/

[Group #08]

8# Row C1m Pd1\Pd2/ ->	58# Row C1m Pd1\Pd2/
1 15 22 18 9 65 65 65\ 65/	10 11 19 3 22 65 65 65\ 65/
23 19 6 5 12 65 65 65\ 65/	18 2 25 6 14 65 65 65\ 65/
10 2 13 24 16 65 65 65\ 65/	21 9 13 17 5 65 65 65\ 65/
14 21 20 7 3 65 65 65\ 65/	12 20 1 24 8 65 65 65\ 65/
17 8 4 11 25 65 65 65\ 65/	4 23 7 15 16 65 65 65\ 65/

93# Row C1m Pd1\Pd2/ <-	99# Row C1m Pd1\Pd2/
20 11 9 23 2 65 65 65\ 65/	21 15 2 8 19 65 65 65\ 65/
8 22 5 16 14 65 65 65\ 65/	3 9 16 25 12 65 65 65\ 65/
1 19 13 7 25 65 65 65\ 65/	20 22 13 4 6 65 65 65\ 65/
12 10 21 4 18 65 65 65\ 65/	14 1 10 17 23 65 65 65\ 65/
24 3 17 15 6 65 65 65\ 65/	7 18 24 11 5 65 65 65\ 65/

[Group #09]

9# ->	126# ->	19# ->	104# ->	9#
2 23 19 11 10	25 3 6 12 19	4 23 17 15 6	21 3 10 14 17	2 23 19 11 10
14 6 5 22 18	11 17 24 5 8	12 10 1 24 18	15 19 22 1 8	14 6 5 22 18
25 17 13 9 1	4 10 13 16 22	21 19 13 7 5	2 6 13 20 24	25 17 13 9 1
8 4 21 20 12	18 21 2 9 15	8 2 25 16 14	18 25 4 7 11	8 4 21 20 12
16 15 7 3 24	7 14 20 23 1	20 11 9 3 22	9 12 16 23 5	16 15 7 3 24

[Group #10]

10# ->	83# ->	109# ->	56# ->	10#
2 14 25 8 16	19 12 6 3 25	22 14 5 18 6	9 12 16 23 5	2 14 25 8 16
23 6 17 4 15	8 5 24 17 11	3 16 7 24 15	18 25 4 7 11	23 6 17 4 15
19 5 13 21 7	22 16 13 10 4	9 25 13 1 17	2 6 13 20 24	19 5 13 21 7
11 22 9 20 3	15 9 2 21 18	11 2 19 10 23	15 19 22 1 8	11 22 9 20 3
10 18 1 12 24	1 23 20 14 7	20 8 21 12 4	21 3 10 14 17	10 18 1 12 24

[Group #11]

11# ->	102# ->	17# ->	128# ->	11#
2 23 19 15 6	21 3 10 12 19	4 23 17 11 10	25 3 6 14 17	2 23 19 15 6
14 10 1 22 18	15 17 24 1 8	12 6 5 24 18	11 19 22 5 8	14 10 1 22 18
21 17 13 9 5	4 6 13 20 22	25 19 13 7 1	2 10 13 16 24	21 17 13 9 5
8 4 25 16 12	18 25 2 9 11	8 2 21 20 14	18 21 4 7 15	8 4 25 16 12
20 11 7 3 24	7 14 16 23 5	16 15 9 3 22	9 12 20 23 1	20 11 7 3 24

[Group #12]				
12# ->	81# ->	111# ->	54# ->	12#
2 14 21 8 20	19 12 10 3 21	22 14 1 18 10	9 12 20 23 1	2 14 21 8 20
23 10 17 4 11	8 1 24 17 15	3 20 7 24 11	18 21 4 7 15	23 10 17 4 11
19 1 13 25 7	22 20 13 6 4	9 21 13 5 17	2 10 13 16 24	19 1 13 25 7
15 22 9 16 3	11 9 2 25 18	15 2 19 6 23	11 19 22 5 8	15 22 9 16 3
6 18 5 12 24	5 23 16 14 7	16 8 25 12 4	25 3 6 14 17	6 18 5 12 24
[Group #13]				
13# ->	122# ->	23# ->	100# ->	13#
2 23 9 11 20	25 3 16 12 9	4 23 7 15 16	21 3 20 14 7	2 23 9 11 20
14 16 5 22 8	11 7 24 5 18	12 20 1 24 8	15 9 22 1 18	14 16 5 22 8
25 7 13 19 1	4 20 13 6 22	21 9 13 17 5	2 16 13 10 24	25 7 13 19 1
18 4 21 10 12	8 21 2 19 15	18 2 25 6 14	8 25 4 17 11	18 4 21 10 12
6 15 17 3 24	17 14 10 23 1	10 11 19 3 22	19 12 6 23 5	6 15 17 3 24
[Group #14]				
14# ->	52# ->	105# ->	87# ->	14#
2 14 25 18 6	9 12 16 3 25	22 14 5 8 16	19 12 6 23 5	2 14 25 18 6
23 16 7 4 15	18 5 24 7 11	3 6 17 24 15	8 25 4 17 11	23 16 7 4 15
9 5 13 21 17	22 6 13 20 4	19 25 13 1 7	2 16 13 10 24	9 5 13 21 17
11 22 19 10 3	15 19 2 21 8	11 2 9 20 23	15 9 22 1 18	11 22 19 10 3
20 8 1 12 24	1 23 10 14 17	10 18 21 12 4	21 3 20 14 7	20 8 1 12 24
[Group #15]				
15# ->	98# ->	21# ->	124# ->	15#
2 23 9 15 16	21 3 20 12 9	4 23 7 11 20	25 3 16 14 7	2 23 9 15 16
14 20 1 22 8	15 7 24 1 18	12 16 5 24 8	11 9 22 5 18	14 20 1 22 8
21 7 13 19 5	4 16 13 10 22	25 9 13 17 1	2 20 13 6 24	21 7 13 19 5
18 4 25 6 12	8 25 2 19 11	18 2 21 10 14	8 21 4 17 15	18 4 25 6 12
10 11 17 3 24	17 14 6 23 5	6 15 19 3 22	19 12 10 23 1	10 11 17 3 24
[Group #16]				
16# ->	50# ->	107# ->	85# ->	16#
2 14 21 18 10	9 12 20 3 21	22 14 1 8 20	19 12 10 23 1	2 14 21 18 10
23 20 7 4 11	18 1 24 7 15	3 10 17 24 11	8 21 4 17 15	23 20 7 4 11
9 1 13 25 17	22 10 13 16 4	19 21 13 5 7	2 20 13 6 24	9 1 13 25 17
15 22 19 6 3	11 19 2 25 8	15 2 9 16 23	11 9 22 5 18	15 22 19 6 3
16 8 5 12 24	5 23 6 14 17	6 18 25 12 4	25 3 16 14 7	16 8 5 12 24
[Group #17]				
18# ->	75# ->	117# ->	48# ->	18#
4 12 25 8 16	17 14 6 3 25	24 12 5 18 6	7 14 16 23 5	4 12 25 8 16
23 6 19 2 15	8 5 22 19 11	3 16 9 22 15	18 25 2 9 11	23 6 19 2 15
17 5 13 21 9	24 16 13 10 2	7 25 13 1 19	4 6 13 20 22	17 5 13 21 9
11 24 7 20 3	15 7 4 21 18	11 4 17 10 23	15 17 24 1 8	11 24 7 20 3
10 18 1 14 22	1 23 20 12 9	20 8 21 14 2	21 3 10 12 19	10 18 1 14 22
.				
[Group #32]				
47# ->	66# ->	53# ->	92# ->	47#
7 18 4 15 21	16 8 25 12 4	9 18 2 11 25	20 8 21 14 2	7 18 4 15 21
14 25 6 17 3	15 2 19 6 23	12 21 10 19 3	11 4 17 10 23	14 25 6 17 3
16 2 13 24 10	9 21 13 5 17	20 4 13 22 6	7 25 13 1 19	16 2 13 24 10
23 9 20 1 12	3 20 7 24 11	23 7 16 5 14	3 16 9 22 15	23 9 20 1 12
5 11 22 8 19	22 14 1 18 10	1 15 24 8 17	24 12 5 18 6	5 11 22 8 19

[Solution Counts(Original/Reconstructed) = 32/128]

** Monitor of the Solution Numbers between Old and New **

```

??: 0
1:  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
33: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
65: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
97: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

OK!

** Calculated and Listed by Kanji Setsuda on Mar.30, 2011 **

#4. What did this Experiment tell us?

The result is really surprising. We could find every reconstruction in the original Primitive Set of Simultaneous MS55: Both S-C and P-D and miss nothing.

(1) The Mother Set of Suzuki's Squares is really 'closed' with respect to this Classic Transformation. It never leads us to a broad outer world of collections, but it seems to make us look for the inner structures and classifications.

(2) It is also surprising that there are some circular linkages among every four solutions. Therefore we can make those 32 groups of solutions in all as above.

See the last Monitor List. They proved to cover all the 128 Primitive Solutions:

$$4 \times 32 = 128;$$

#5. 'Complete Euler Squares'

We already know every Suzuki's Square is always 'Complete Euler Square'.

Let me show you the solution list with Latin Units by the base 5, apply our Classic Transformation to each solution of each group and demonstrate what is going on.

** 'Complete Euler Squares' of Order 5 for the Simultaneous Type: **

** Self-complementary & Pan-diagonal; Made by 'New Euler's Method' **

[List of Latin Units]

1/	2/	3/	4/	5/	6/	7/	8/
0 4 3 2 1	0 2 4 1 3	0 4 1 2 3	0 2 4 3 1	1 3 4 2 0	1 2 3 0 4	1 3 0 2 4	1 2 3 4 0
2 1 0 4 3	4 1 3 0 2	2 3 0 4 1	4 3 1 0 2	2 0 1 3 4	3 0 4 1 2	2 4 1 3 0	3 4 0 1 2
4 3 2 1 0	3 0 2 4 1	4 1 2 3 0	1 0 2 4 3	3 4 2 0 1	4 1 2 3 0	3 0 2 4 1	0 1 2 3 4
1 0 4 3 2	2 4 1 3 0	3 0 4 1 2	2 4 3 1 0	0 1 3 4 2	2 3 0 4 1	4 1 3 0 2	2 3 4 0 1
3 2 1 0 4	1 3 0 2 4	1 2 3 0 4	3 1 0 2 4	4 2 0 1 3	0 4 1 2 3	0 2 4 1 3	4 0 1 2 3

9/	10/	11/	12/	13/	14/	15/	16/
3 2 1 0 4	3 1 4 2 0	3 2 1 4 0	3 1 0 2 4	4 2 0 1 3	4 0 3 2 1	4 2 0 3 1	4 0 1 2 3
1 0 4 3 2	2 0 3 1 4	1 4 0 3 2	2 4 3 1 0	0 1 3 4 2	2 1 4 0 3	0 3 1 4 2	2 3 4 0 1
4 3 2 1 0	1 4 2 0 3	0 3 2 1 4	1 0 2 4 3	3 4 2 0 1	0 3 2 1 4	1 4 2 0 3	0 1 2 3 4
2 1 0 4 3	0 3 1 4 2	2 1 4 0 3	4 3 1 0 2	2 0 1 3 4	1 4 0 3 2	2 0 3 1 4	3 4 0 1 2
0 4 3 2 1	4 2 0 3 1	4 0 3 2 1	0 2 4 3 1	1 3 4 2 0	3 2 1 4 0	3 1 4 2 0	1 2 3 4 0

[Count of Latin Units = 16]

** Apply the Classic Transformation sequentially to each Group **

[Group #01]

1/H	2/L	1# Rw C1 P1\P2/	->	16/H	9/L	118# Rw C1 P1\P2/
04321	02413	1 23 20 12 9 65 65 65\65/		40123	32104	24 3 7 11 20 65 65 65\65/
21043	41302	15 7 4 21 18 65 65 65\65/		23401	10432	12 16 25 4 8 65 65 65\65/
43210	30241	24 16 13 10 2 65 65 65\65/		01234	43210	5 9 13 17 21 65 65 65\65/
10432	24130	8 5 22 19 11 65 65 65\65/		34012	21043	18 22 1 10 14 65 65 65\65/
32104	13024	17 14 6 3 25 65 65 65\65/		12340	04321	6 15 19 23 2 65 65 65\65/

16/H	8/L	112# Rw C1 P1\P2/	<-	1/H	15/L	27# Rw C1 P1\P2/
40123	12340	22 3 9 15 16 65 65 65\65/		04321	42031	5 23 16 14 7 65 65 65\65/
23401	34012	14 20 21 2 8 65 65 65\65/		21043	03142	11 9 2 25 18 65 65 65\65/
01234	01234	1 7 13 19 25 65 65 65\65/		43210	14203	22 20 13 6 4 65 65 65\65/
34012	23401	18 24 5 6 12 65 65 65\65/		10432	20314	8 1 24 17 15 65 65 65\65/
12340	40123	10 11 17 23 4 65 65 65\65/		32104	31420	19 12 10 3 21 65 65 65\65/

[Group #02]

2/H	1/L	2# Rw C1 P1\P2/	->	9/H	16/L	91# Rw C1 P1\P2/
02413	04321	1 15 24 8 17 65 65 65\65/		32104	40123	20 11 7 3 24 65 65 65\65/
41302	21043	23 7 16 5 14 65 65 65\65/		10432	23401	8 4 25 16 12 65 65 65\65/
30241	43210	20 4 13 22 6 65 65 65\65/		43210	01234	21 17 13 9 5 65 65 65\65/
24130	10432	12 21 10 19 3 65 65 65\65/		21043	34012	14 10 1 22 18 65 65 65\65/
13024	32104	9 18 2 11 25 65 65 65\65/		04321	12340	2 23 19 15 6 65 65 65\65/

8/H	16/L	64# Rw C1 P1\P2/	<-	15/H	1/L	101# Rw C1 P1\P2/
12340	40123	10 11 17 23 4 65 65 65\65/		42031	04321	21 15 4 18 7 65 65 65\65/
34012	23401	18 24 5 6 12 65 65 65\65/		03142	21043	3 17 6 25 14 65 65 65\65/
01234	01234	1 7 13 19 25 65 65 65\65/		14203	43210	10 24 13 2 16 65 65 65\65/
23401	34012	14 20 21 2 8 65 65 65\65/		20314	10432	12 1 20 9 23 65 65 65\65/
40123	12340	22 3 9 15 16 65 65 65\65/		31420	32104	19 8 22 11 5 65 65 65\65/

[Group #03]

1/H	4/L	3# Rw C1 P1\P2/	->	16/H	6/L	110# Rw C1 P1\P2/
04321	02431	1 23 20 14 7 65 65 65\65/		40123	12304	22 3 9 11 20 65 65 65\65/
21043	43102	15 9 2 21 18 65 65 65\65/		23401	30412	14 16 25 2 8 65 65 65\65/
43210	10243	22 16 13 10 4 65 65 65\65/		01234	41230	5 7 13 19 21 65 65 65\65/
10432	24310	8 5 24 17 11 65 65 65\65/		34012	23041	18 24 1 10 12 65 65 65\65/
32104	31024	19 12 6 3 25 65 65 65\65/		12340	04123	6 15 17 23 4 65 65 65\65/

16/H	11/L	120# Rw C1 P1\P2/	<-	1/H	13/L	25# Rw C1 P1\P2/
40123	32140	24 3 7 15 16 65 65 65\65/		04321	42013	5 23 16 12 9 65 65 65\65/
23401	14032	12 20 21 4 8 65 65 65\65/		21043	01342	11 7 4 25 18 65 65 65\65/
01234	03214	1 9 13 17 25 65 65 65\65/		43210	34201	24 20 13 6 2 65 65 65\65/
34012	21403	18 22 5 6 14 65 65 65\65/		10432	20134	8 1 22 19 15 65 65 65\65/
12340	40321	10 11 19 23 2 65 65 65\65/		32104	13420	17 14 10 3 21 65 65 65\65/

[Group #04]

2/H	3/L	4# Rw C1 P1\P2/	->	9/H	14/L	89# Rw C1 P1\P2/
02413	04123	1 15 22 8 19 65 65 65\65/		32104	40321	20 11 9 3 22 65 65 65\65/
41302	23041	23 9 16 5 12 65 65 65\65/		10432	21403	8 2 25 16 14 65 65 65\65/
30241	41230	20 2 13 24 6 65 65 65\65/		43210	03214	21 19 13 7 5 65 65 65\65/
24130	30412	14 21 10 17 3 65 65 65\65/		21043	14032	12 10 1 24 18 65 65 65\65/
13024	12304	7 18 4 11 25 65 65 65\65/		04321	32140	4 23 17 15 6 65 65 65\65/

8/H	14/L	62# Rw C1 P1\P2/	<-	15/H	3/L	103# Rw C1 P1\P2/
12340	40321	10 11 19 23 2 65 65 65\65/		42031	04123	21 15 2 18 9 65 65 65\65/
34012	21403	18 22 5 6 14 65 65 65\65/		03142	23041	3 19 6 25 12 65 65 65\65/
01234	03214	1 9 13 17 25 65 65 65\65/		14203	41230	10 22 13 4 16 65 65 65\65/
23401	14032	12 20 21 4 8 65 65 65\65/		20314	30412	14 1 20 7 23 65 65 65\65/
40123	32140	24 3 7 15 16 65 65 65\65/		31420	12304	17 8 24 11 5 65 65 65\65/

[Group #05]

3/H	2/L	5# Rw C1 P1\P2/	->	14/H	9/L	114# Rw C1 P1\P2/
04123	02413	1 23 10 12 19 65 65 65\65/		40321	32104	24 3 17 11 10 65 65 65\65/
23041	41302	15 17 4 21 8 65 65 65\65/		21403	10432	12 6 25 4 18 65 65 65\65/
41230	30241	24 6 13 20 2 65 65 65\65/		03214	43210	5 19 13 7 21 65 65 65\65/
30412	24130	18 5 22 9 11 65 65 65\65/		14032	21043	8 22 1 20 14 65 65 65\65/
12304	13024	7 14 16 3 25 65 65 65\65/		32140	04321	16 15 9 23 2 65 65 65\65/

14/H	8/L	108# Rw C1 P1\P2/	<-	3/H	15/L	31# Rw C1 P1\P2/
40321	12340	22 3 19 15 6 65 65 65\65/		04123	42031	5 23 6 14 17 65 65 65\65/
21403	34012	14 10 21 2 18 65 65 65\65/		23041	03142	11 19 2 25 8 65 65 65\65/
03214	01234	1 17 13 9 25 65 65 65\65/		41230	14203	22 10 13 16 4 65 65 65\65/
14032	23401	8 24 5 16 12 65 65 65\65/		30412	20314	18 1 24 7 15 65 65 65\65/
32140	40123	20 11 7 23 4 65 65 65\65/		12304	31420	9 12 20 3 21 65 65 65\65/

[Group #06]

4/H	1/L	6# Rw C1 P1\P2/	->	6/H	16/L	60# Rw C1 P1\P2/
02431	04321	1 15 24 18 7 65 65 65\65/		12304	40123	10 11 17 3 24 65 65 65\65/
43102	21043	23 17 6 5 14 65 65 65\65/		30412	23401	18 4 25 6 12 65 65 65\65/

10243	43210	10	4	13	22	16	65 65 65\65/	41230	01234	21	7	13	19	5	65 65 65\65/	
24310	10432	12	21	20	9	3	65 65 65\65/	23041	34012	14	20	1	22	8	65 65 65\65/	
31024	32104	19	8	2	11	25	65 65 65\65/	04123	12340	2	23	9	15	16	65 65 65\65/	
11/H	16/L					95#	Rw C1 P1\P2/	<-	13/H	1/L					97#	Rw C1 P1\P2/
32140	40123	20	11	7	23	4	65 65 65\65/	42013	04321	21	15	4	8	17	65 65 65\65/	
14032	23401	8	24	5	16	12	65 65 65\65/	01342	21043	3	7	16	25	14	65 65 65\65/	
03214	01234	1	17	13	9	25	65 65 65\65/	34201	43210	20	24	13	2	6	65 65 65\65/	
21403	34012	14	10	21	2	18	65 65 65\65/	20134	10432	12	1	10	19	23	65 65 65\65/	
40321	12340	22	3	19	15	6	65 65 65\65/	13420	32104	9	18	22	11	5	65 65 65\65/	
[Group #07]																
3/H	4/L					7#	Rw C1 P1\P2/	->	14/H	6/L					106#	Rw C1 P1\P2/
04123	02431	1	23	10	14	17	65 65 65\65/	40321	12304	22	3	19	11	10	65 65 65\65/	
23041	43102	15	19	2	21	8	65 65 65\65/	21403	30412	14	6	25	2	18	65 65 65\65/	
41230	10243	22	6	13	20	4	65 65 65\65/	03214	41230	5	17	13	9	21	65 65 65\65/	
30412	24310	18	5	24	7	11	65 65 65\65/	14032	23041	8	24	1	20	12	65 65 65\65/	
12304	31024	9	12	16	3	25	65 65 65\65/	32140	04123	16	15	7	23	4	65 65 65\65/	
14/H	11/L					116#	Rw C1 P1\P2/	<-	3/H	13/L					29#	Rw C1 P1\P2/
40321	32140	24	3	17	15	6	65 65 65\65/	04123	42013	5	23	6	12	19	65 65 65\65/	
21403	14032	12	10	21	4	18	65 65 65\65/	23041	01342	11	17	4	25	8	65 65 65\65/	
03214	03214	1	19	13	7	25	65 65 65\65/	41230	34201	24	10	13	16	2	65 65 65\65/	
14032	21403	8	22	5	16	14	65 65 65\65/	30412	20134	18	1	22	9	15	65 65 65\65/	
32140	40321	20	11	9	23	2	65 65 65\65/	12304	13420	7	14	20	3	21	65 65 65\65/	
[Group #08]																
4/H	3/L					8#	Rw C1 P1\P2/	->	6/H	14/L					58#	Rw C1 P1\P2/
02431	04123	1	15	22	18	9	65 65 65\65/	12304	40321	10	11	19	3	22	65 65 65\65/	
43102	23041	23	19	6	5	12	65 65 65\65/	30412	21403	18	2	25	6	14	65 65 65\65/	
10243	41230	10	2	13	24	16	65 65 65\65/	41230	03214	21	9	13	17	5	65 65 65\65/	
24310	30412	14	21	20	7	3	65 65 65\65/	23041	14032	12	20	1	24	8	65 65 65\65/	
31024	12304	17	8	4	11	25	65 65 65\65/	04123	32140	4	23	7	15	16	65 65 65\65/	
11/H	14/L					93#	Rw C1 P1\P2/	<-	13/H	3/L					99#	Rw C1 P1\P2/
32140	40321	20	11	9	23	2	65 65 65\65/	42013	04123	21	15	2	8	19	65 65 65\65/	
14032	21403	8	22	5	16	14	65 65 65\65/	01342	23041	3	9	16	25	12	65 65 65\65/	
03214	03214	1	19	13	7	25	65 65 65\65/	34201	41230	20	22	13	4	6	65 65 65\65/	
21403	14032	12	10	21	4	18	65 65 65\65/	20134	30412	14	1	10	17	23	65 65 65\65/	
40321	32140	24	3	17	15	6	65 65 65\65/	13420	12304	7	18	24	11	5	65 65 65\65/	
[Group #09]																
1/H	6/L					9#	Rw C1 P1\P2/	->	16/H	13/L					126#	Rw C1 P1\P2/
04321	12304	2	23	19	11	10	65 65 65\65/	40123	42013	25	3	6	12	19	65 65 65\65/	
21043	30412	14	6	5	22	18	65 65 65\65/	23401	01342	11	17	24	5	8	65 65 65\65/	
43210	41230	25	17	13	9	1	65 65 65\65/	01234	34201	4	10	13	16	22	65 65 65\65/	
10432	23041	8	4	21	20	12	65 65 65\65/	34012	20134	18	21	2	9	15	65 65 65\65/	
32104	04123	16	15	7	3	24	65 65 65\65/	12340	13420	7	14	20	23	1	65 65 65\65/	
16/H	4/L					104#	Rw C1 P1\P2/	<-	1/H	11/L					19#	Rw C1 P1\P2/
40123	02431	21	3	10	14	17	65 65 65\65/	04321	32140	4	23	17	15	6	65 65 65\65/	
23401	43102	15	19	22	1	8	65 65 65\65/	21043	14032	12	10	1	24	18	65 65 65\65/	
01234	10243	2	6	13	20	24	65 65 65\65/	43210	03214	21	19	13	7	5	65 65 65\65/	
34012	24310	18	25	4	7	11	65 65 65\65/	10432	21403	8	2	25	16	14	65 65 65\65/	
12340	31024	9	12	16	23	5	65 65 65\65/	32104	40321	20	11	9	3	22	65 65 65\65/	
[Group #10]																
2/H	5/L					10#	Rw C1 P1\P2/	->	9/H	12/L					83#	Rw C1 P1\P2/
02413	13420	2	14	25	8	16	65 65 65\65/	32104	31024	19	12	6	3	25	65 65 65\65/	
41302	20134	23	6	17	4	15	65 65 65\65/	10432	24310	8	5	24	17	11	65 65 65\65/	
30241	34201	19	5	13	21	7	65 65 65\65/	43210	10243	22	16	13	10	4	65 65 65\65/	
24130	01342	11	22	9	20	3	65 65 65\65/	21043	43102	15	9	2	21	18	65 65 65\65/	
13024	42013	10	18	1	12	24	65 65 65\65/	04321	02431	1	23	20	14	7	65 65 65\65/	
8/H	12/L					56#	Rw C1 P1\P2/	<-	15/H	5/L					109#	Rw C1 P1\P2/

12340 31024	9 12 16 23	5 65 65 65\65/	42031 13420	22 14 5 18	6 65 65 65\65/
34012 24310	18 25 4 7	11 65 65 65\65/	03142 20134	3 16 7 24	15 65 65 65\65/
01234 10243	2 6 13 20	24 65 65 65\65/	14203 34201	9 25 13 1	17 65 65 65\65/
23401 43102	15 19 22 1	8 65 65 65\65/	20314 01342	11 2 19 10	23 65 65 65\65/
40123 02431	21 3 10 14	17 65 65 65\65/	31420 42013	20 8 21 12	4 65 65 65\65/

[Group #11]

1/H 8/L	11# Rw C1 P1\P2/	-> 16/H 2/L	102# Rw C1 P1\P2/		
04321 12340	2 23 19 15	6 65 65 65\65/	40123 02413	21 3 10 12	19 65 65 65\65/
21043 34012	14 10 1 22	18 65 65 65\65/	23401 41302	15 17 24 1	8 65 65 65\65/
43210 01234	21 17 13 9	5 65 65 65\65/	01234 30241	4 6 13 20	22 65 65 65\65/
10432 23401	8 4 25 16	12 65 65 65\65/	34012 24130	18 25 2 9	11 65 65 65\65/
32104 40123	20 11 7 3	24 65 65 65\65/	12340 13024	7 14 16 23	5 65 65 65\65/
16/H 15/L	128# Rw C1 P1\P2/	<- 1/H 9/L	17# Rw C1 P1\P2/		
40123 42031	25 3 6 14	17 65 65 65\65/	04321 32104	4 23 17 11	10 65 65 65\65/
23401 03142	11 19 22 5	8 65 65 65\65/	21043 10432	12 6 5 24	18 65 65 65\65/
01234 14203	2 10 13 16	24 65 65 65\65/	43210 43210	25 19 13 7	1 65 65 65\65/
34012 20314	18 21 4 7	15 65 65 65\65/	10432 21043	8 2 21 20	14 65 65 65\65/
12340 31420	9 12 20 23	1 65 65 65\65/	32104 04321	16 15 9 3	22 65 65 65\65/

[Group #12]

2/H 7/L	12# Rw C1 P1\P2/	-> 9/H 10/L	81# Rw C1 P1\P2/		
02413 13024	2 14 21 8	20 65 65 65\65/	32104 31420	19 12 10 3	21 65 65 65\65/
41302 24130	23 10 17 4	11 65 65 65\65/	10432 20314	8 1 24 17	15 65 65 65\65/
30241 30241	19 1 13 25	7 65 65 65\65/	43210 14203	22 20 13 6	4 65 65 65\65/
24130 41302	15 22 9 16	3 65 65 65\65/	21043 03142	11 9 2 25	18 65 65 65\65/
13024 02413	6 18 5 12	24 65 65 65\65/	04321 42031	5 23 16 14	7 65 65 65\65/
8/H 10/L	54# Rw C1 P1\P2/	<- 15/H 7/L	111# Rw C1 P1\P2/		
12340 31420	9 12 20 23	1 65 65 65\65/	42031 13024	22 14 1 18	10 65 65 65\65/
34012 20314	18 21 4 7	15 65 65 65\65/	03142 24130	3 20 7 24	11 65 65 65\65/
01234 14203	2 10 13 16	24 65 65 65\65/	14203 30241	9 21 13 5	17 65 65 65\65/
23401 03142	11 19 22 5	8 65 65 65\65/	20314 41302	15 2 19 6	23 65 65 65\65/
40123 42031	25 3 6 14	17 65 65 65\65/	31420 02413	16 8 25 12	4 65 65 65\65/

[Group #13]

3/H 6/L	13# Rw C1 P1\P2/	-> 14/H 13/L	122# Rw C1 P1\P2/		
04123 12304	2 23 9 11	20 65 65 65\65/	40321 42013	25 3 16 12	9 65 65 65\65/
23041 30412	14 16 5 22	8 65 65 65\65/	21403 01342	11 7 24 5	18 65 65 65\65/
41230 41230	25 7 13 19	1 65 65 65\65/	03214 34201	4 20 13 6	22 65 65 65\65/
30412 23041	18 4 21 10	12 65 65 65\65/	14032 20134	8 21 2 19	15 65 65 65\65/
12304 04123	6 15 17 3	24 65 65 65\65/	32140 13420	17 14 10 23	1 65 65 65\65/
14/H 4/L	100# Rw C1 P1\P2/	<- 3/H 11/L	23# Rw C1 P1\P2/		
40321 02431	21 3 20 14	7 65 65 65\65/	04123 32140	4 23 7 15	16 65 65 65\65/
21403 43102	15 9 22 1	18 65 65 65\65/	23041 14032	12 20 1 24	8 65 65 65\65/
03214 10243	2 16 13 10	24 65 65 65\65/	41230 03214	21 9 13 17	5 65 65 65\65/
14032 24310	8 25 4 17	11 65 65 65\65/	30412 21403	18 2 25 6	14 65 65 65\65/
32140 31024	19 12 6 23	5 65 65 65\65/	12304 40321	10 11 19 3	22 65 65 65\65/

[Group #14]

4/H 5/L	14# Rw C1 P1\P2/	-> 6/H 12/L	52# Rw C1 P1\P2/		
02431 13420	2 14 25 18	6 65 65 65\65/	12304 31024	9 12 16 3	25 65 65 65\65/
43102 20134	23 16 7 4	15 65 65 65\65/	30412 24310	18 5 24 7	11 65 65 65\65/
10243 34201	9 5 13 21	17 65 65 65\65/	41230 10243	22 6 13 20	4 65 65 65\65/
24310 01342	11 22 19 10	3 65 65 65\65/	23041 43102	15 19 2 21	8 65 65 65\65/
31024 42013	20 8 1 12	24 65 65 65\65/	04123 02431	1 23 10 14	17 65 65 65\65/
11/H 12/L	87# Rw C1 P1\P2/	<- 13/H 5/L	105# Rw C1 P1\P2/		
32140 31024	19 12 6 23	5 65 65 65\65/	42013 13420	22 14 5 8	16 65 65 65\65/
14032 24310	8 25 4 17	11 65 65 65\65/	01342 20134	3 6 17 24	15 65 65 65\65/
03214 10243	2 16 13 10	24 65 65 65\65/	34201 34201	19 25 13 1	7 65 65 65\65/
21403 43102	15 9 22 1	18 65 65 65\65/	20134 01342	11 2 9 20	23 65 65 65\65/
40321 02431	21 3 20 14	7 65 65 65\65/	13420 42013	10 18 21 12	4 65 65 65\65/

[Group #15]

3/H	8/L	15# Rw C1 P1\P2/						->	14/H	2/L	98# Rw C1 P1\P2/					
04123	12340	2	23	9	15	16	65 65 65\65/		40321	02413	21	3	20	12	9	65 65 65\65/
23041	34012	14	20	1	22	8	65 65 65\65/		21403	41302	15	7	24	1	18	65 65 65\65/
41230	01234	21	7	13	19	5	65 65 65\65/		03214	30241	4	16	13	10	22	65 65 65\65/
30412	23401	18	4	25	6	12	65 65 65\65/		14032	24130	8	25	2	19	11	65 65 65\65/
12304	40123	10	11	17	3	24	65 65 65\65/		32140	13024	17	14	6	23	5	65 65 65\65/
14/H	15/L	124# Rw C1 P1\P2/						<-	3/H	9/L	21# Rw C1 P1\P2/					
40321	42031	25	3	16	14	7	65 65 65\65/		04123	32104	4	23	7	11	20	65 65 65\65/
21403	03142	11	9	22	5	18	65 65 65\65/		23041	10432	12	16	5	24	8	65 65 65\65/
03214	14203	2	20	13	6	24	65 65 65\65/		41230	43210	25	9	13	17	1	65 65 65\65/
14032	20314	8	21	4	17	15	65 65 65\65/		30412	21043	18	2	21	10	14	65 65 65\65/
32140	31420	19	12	10	23	1	65 65 65\65/		12304	04321	6	15	19	3	22	65 65 65\65/

[Group #16]

4/H	7/L	16# Rw C1 P1\P2/						->	6/H	10/L	50# Rw C1 P1\P2/					
02431	13024	2	14	21	18	10	65 65 65\65/		12304	31420	9	12	20	3	21	65 65 65\65/
43102	24130	23	20	7	4	11	65 65 65\65/		30412	20314	18	1	24	7	15	65 65 65\65/
10243	30241	9	1	13	25	17	65 65 65\65/		41230	14203	22	10	13	16	4	65 65 65\65/
24310	41302	15	22	19	6	3	65 65 65\65/		23041	03142	11	19	2	25	8	65 65 65\65/
31024	02413	16	8	5	12	24	65 65 65\65/		04123	42031	5	23	6	14	17	65 65 65\65/
11/H	10/L	85# Rw C1 P1\P2/						<-	13/H	7/L	107# Rw C1 P1\P2/					
32140	31420	19	12	10	23	1	65 65 65\65/		42013	13024	22	14	1	8	20	65 65 65\65/
14032	20314	8	21	4	17	15	65 65 65\65/		01342	24130	3	10	17	24	11	65 65 65\65/
03214	14203	2	20	13	6	24	65 65 65\65/		34201	30241	19	21	13	5	7	65 65 65\65/
21403	03142	11	9	22	5	18	65 65 65\65/		20134	41302	15	2	9	16	23	65 65 65\65/
40321	42031	25	3	16	14	7	65 65 65\65/		13420	02413	6	18	25	12	4	65 65 65\65/

[Group #17]

2/H	10/L	18# Rw C1 P1\P2/						->	9/H	7/L	75# Rw C1 P1\P2/					
02413	31420	4	12	25	8	16	65 65 65\65/		32104	13024	17	14	6	3	25	65 65 65\65/
41302	20314	23	6	19	2	15	65 65 65\65/		10432	24130	8	5	22	19	11	65 65 65\65/
30241	14203	17	5	13	21	9	65 65 65\65/		43210	30241	24	16	13	10	2	65 65 65\65/
24130	03142	11	24	7	20	3	65 65 65\65/		21043	41302	15	7	4	21	18	65 65 65\65/
13024	42031	10	18	1	14	22	65 65 65\65/		04321	02413	1	23	20	12	9	65 65 65\65/
8/H	7/L	48# Rw C1 P1\P2/						<-	15/H	10/L	117# Rw C1 P1\P2/					
12340	13024	7	14	16	23	5	65 65 65\65/		42031	31420	24	12	5	18	6	65 65 65\65/
34012	24130	18	25	2	9	11	65 65 65\65/		03142	20314	3	16	9	22	15	65 65 65\65/
01234	30241	4	6	13	20	22	65 65 65\65/		14203	14203	7	25	13	1	19	65 65 65\65/
23401	41302	15	17	24	1	8	65 65 65\65/		20314	03142	11	4	17	10	23	65 65 65\65/
40123	02413	21	3	10	12	19	65 65 65\65/		31420	42031	20	8	21	14	2	65 65 65\65/

.

[Group #32]

7/H	8/L	47# Rw C1 P1\P2/						->	10/H	2/L	66# Rw C1 P1\P2/					
13024	12340	7	18	4	15	21	65 65 65\65/		31420	02413	16	8	25	12	4	65 65 65\65/
24130	34012	14	25	6	17	3	65 65 65\65/		20314	41302	15	2	19	6	23	65 65 65\65/
30241	01234	16	2	13	24	10	65 65 65\65/		14203	30241	9	21	13	5	17	65 65 65\65/
41302	23401	23	9	20	1	12	65 65 65\65/		03142	24130	3	20	7	24	11	65 65 65\65/
02413	40123	5	11	22	8	19	65 65 65\65/		42031	13024	22	14	1	18	10	65 65 65\65/
10/H	15/L	92# Rw C1 P1\P2/						<-	7/H	9/L	53# Rw C1 P1\P2/					
31420	42031	20	8	21	14	2	65 65 65\65/		13024	32104	9	18	2	11	25	65 65 65\65/
20314	03142	11	4	17	10	23	65 65 65\65/		24130	10432	12	21	10	19	3	65 65 65\65/
14203	14203	7	25	13	1	19	65 65 65\65/		30241	43210	20	4	13	22	6	65 65 65\65/
03142	20314	3	16	9	22	15	65 65 65\65/		41302	21043	23	7	16	5	14	65 65 65\65/
42031	31420	24	12	5	18	6	65 65 65\65/		02413	04321	1	15	24	8	17	65 65 65\65/

[Solution Counts(Original/Reconstructed) = 32/128]

** Monitor of the Solution Numbers between Old and New **

```

??: 0
1:  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
33: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
65: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
97: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

[OK!]

What do you find about the change in the contents of Latin Units for each group? What kind of characteristic movements or regularity do you find among them?

I would like to inform you those unit pairs (1/, 16/), (2/, 15/), (3/, 14/), ..., (7/, 10/), (8/, 9/) make the Complementary Pairs with the rule $m_1+n_1 = m_2+n_2 = m_3+n_3 = \dots = m_{12}+n_{12} = m_{13}+n_{13} = \dots = m_{24}+n_{24} = m_{25}+n_{25} = 4$ in them.

Do you notice four solutions of the same group always have any Complementary pairs of those units? Do you also find any unit making the rotation by 90 degrees anti-clockwise? You must feel you are now at the entrance of 'Structural Studies'?

#6 How about the Standard Set of 16 Solutions?

Let's get back to the case of 16 Standard Solutions of Suzuki's Squares. I selected them by the Inequality Conditions out of the 128 Primitive Solutions.

** 'Complete Euler Squares' of Order 5 for the Simultaneous Type: S-C & P-D **

[List of Latin Units]

1/		2/		3/		4/		5/		6/		7/		8/															
0	4	3	2	1	0	2	4	1	3	0	4	1	3	0	2	4	1	2	3	4	0								
2	1	0	4	3	4	1	3	0	2	2	3	0	4	1	4	3	1	0	2	2	0	1	3	4	0	1	2		
4	3	2	1	0	3	0	2	4	1	4	1	2	3	0	1	0	2	4	3	3	4	2	0	1	4	1	2	3	4
1	0	4	3	2	2	4	1	3	0	3	0	4	1	2	2	4	3	1	0	0	1	3	4	2	2	3	0	4	1
3	2	1	0	4	1	3	0	2	4	1	2	3	0	4	3	1	0	2	4	4	2	0	1	3	0	4	1	2	3

9/		10/		11/		12/		13/		14/		15/		16/																									
3	2	1	0	4	3	1	4	2	0	3	2	1	4	0	3	1	0	2	4	4	2	0	1	3	4	0	3	1	4	0	1	2	3	4					
1	0	4	3	2	2	0	3	1	4	1	4	0	3	2	2	4	3	1	0	0	1	3	4	2	2	1	4	0	3	0	3	1	4	2	2	3	4	0	1
4	3	2	1	0	1	4	2	0	3	0	3	2	1	4	1	0	2	4	3	3	4	2	0	1	0	3	2	1	4	1	4	2	0	3	0	1	2	3	4
2	1	0	4	3	0	3	1	4	2	2	1	4	0	3	4	3	1	0	2	2	0	1	3	4	1	4	0	3	2	2	0	3	1	4	3	4	0	1	2
0	4	3	2	1	4	2	0	3	1	4	0	3	2	1	0	2	4	3	1	1	3	4	2	0	3	2	1	4	0	3	1	4	2	0	1	2	3	4	0

[Count of Latin Units = 16]

[CES55 for the Simultaneous Type: Self-complementary & Pan-diagonal; Standard Solutions with Used_Units// Solution_Number#|Check_Sums|]

1/H		2/L		1# Rw C P1 P2/		1/H		4/L		2# Rw C P1 P2/			
04321	02413	1	23	20	12	9 65 65 65 65/	04321	02431	1	23	20	14	7 65 65 65 65/
21043	41302	15	7	4	21	18 65 65 65 65/	21043	43102	15	9	2	21	18 65 65 65 65/
43210	30241	24	16	13	10	2 65 65 65 65/	43210	10243	22	16	13	10	4 65 65 65 65/
10432	24130	8	5	22	19	11 65 65 65 65/	10432	24310	8	5	24	17	11 65 65 65 65/
32104	13024	17	14	6	3	25 65 65 65 65/	32104	31024	19	12	6	3	25 65 65 65 65/

3/H		2/L		3# Rw C P1 P2/		3/H		4/L		4# Rw C P1 P2/			
04123	02413	1	23	10	12	19 65 65 65 65/	04123	02431	1	23	10	14	17 65 65 65 65/
23041	41302	15	17	4	21	8 65 65 65 65/	23041	43102	15	19	2	21	8 65 65 65 65/
41230	30241	24	6	13	20	2 65 65 65 65/	41230	10243	22	6	13	20	4 65 65 65 65/
30412	24130	18	5	22	9	11 65 65 65 65/	30412	24310	18	5	24	7	11 65 65 65 65/
12304	13024	7	14	16	3	25 65 65 65 65/	12304	31024	9	12	16	3	25 65 65 65 65/

1/H		6/L		5# Rw C P1 P2/		1/H		8/L		6# Rw C P1 P2/			
04321	12304	2	23	19	11	10 65 65 65 65/	04321	12340	2	23	19	15	6 65 65 65 65/
21043	30412	14	6	5	22	18 65 65 65 65/	21043	34012	14	10	1	22	18 65 65 65 65/
43210	41230	25	17	13	9	1 65 65 65 65/	43210	01234	21	17	13	9	5 65 65 65 65/
10432	23041	8	4	21	20	12 65 65 65 65/	10432	23401	8	4	25	16	12 65 65 65 65/
32104	04123	16	15	7	3	24 65 65 65 65/	32104	40123	20	11	7	3	24 65 65 65 65/

3/H	6/L					7# Rw C1 P1\P2/						3/H	8/L					8# Rw C1 P1\P2/
04123	12304	2	23	9	11	20 65 65 65\65/						04123	12340	2	23	9	15	16 65 65 65\65/
23041	30412	14	16	5	22	8 65 65 65\65/						23041	34012	14	20	1	22	8 65 65 65\65/
41230	41230	25	7	13	19	1 65 65 65\65/						41230	01234	21	7	13	19	5 65 65 65\65/
30412	23041	18	4	21	10	12 65 65 65\65/						30412	23401	18	4	25	6	12 65 65 65\65/
12304	04123	6	15	17	3	24 65 65 65\65/						12304	40123	10	11	17	3	24 65 65 65\65/
1/H	9/L					9# Rw C1 P1\P2/						1/H	11/L					10# Rw C1 P1\P2/
04321	32104	4	23	17	11	10 65 65 65\65/						04321	32140	4	23	17	15	6 65 65 65\65/
21043	10432	12	6	5	24	18 65 65 65\65/						21043	14032	12	10	1	24	18 65 65 65\65/
43210	43210	25	19	13	7	1 65 65 65\65/						43210	03214	21	19	13	7	5 65 65 65\65/
10432	21043	8	2	21	20	14 65 65 65\65/						10432	21403	8	2	25	16	14 65 65 65\65/
32104	04321	16	15	9	3	22 65 65 65\65/						32104	40321	20	11	9	3	22 65 65 65\65/
3/H	9/L					11# Rw C1 P1\P2/						3/H	11/L					12# Rw C1 P1\P2/
04123	32104	4	23	7	11	20 65 65 65\65/						04123	32140	4	23	7	15	16 65 65 65\65/
23041	10432	12	16	5	24	8 65 65 65\65/						23041	14032	12	20	1	24	8 65 65 65\65/
41230	43210	25	9	13	17	1 65 65 65\65/						41230	03214	21	9	13	17	5 65 65 65\65/
30412	21043	18	2	21	10	14 65 65 65\65/						30412	21403	18	2	25	6	14 65 65 65\65/
12304	04321	6	15	19	3	22 65 65 65\65/						12304	40321	10	11	19	3	22 65 65 65\65/
1/H	13/L					13# Rw C1 P1\P2/						1/H	15/L					14# Rw C1 P1\P2/
04321	42013	5	23	16	12	9 65 65 65\65/						04321	42031	5	23	16	14	7 65 65 65\65/
21043	01342	11	7	4	25	18 65 65 65\65/						21043	03142	11	9	2	25	18 65 65 65\65/
43210	34201	24	20	13	6	2 65 65 65\65/						43210	14203	22	20	13	6	4 65 65 65\65/
10432	20134	8	1	22	19	15 65 65 65\65/						10432	20314	8	1	24	17	15 65 65 65\65/
32104	13420	17	14	10	3	21 65 65 65\65/						32104	31420	19	12	10	3	21 65 65 65\65/
3/H	13/L					15# Rw C1 P1\P2/						3/H	15/L					16# Rw C1 P1\P2/
04123	42013	5	23	6	12	19 65 65 65\65/						04123	42031	5	23	6	14	17 65 65 65\65/
23041	01342	11	17	4	25	8 65 65 65\65/						23041	03142	11	19	2	25	8 65 65 65\65/
41230	34201	24	10	13	16	2 65 65 65\65/						41230	14203	22	10	13	16	4 65 65 65\65/
30412	20134	18	1	22	9	15 65 65 65\65/						30412	20314	18	1	24	7	15 65 65 65\65/
12304	13420	7	14	20	3	21 65 65 65\65/						12304	31420	9	12	20	3	21 65 65 65\65/

[Count(n1=1/A11) = 4/16] Selected under n1<n5; n1<n21; n1<n25; and n2>n6;
 ** Calculated and Listed by Kanji Setsuda on Feb. 3, 2011 **

** Apply our Classical Transformation to the Standard Solutions **
 ** Under the Inequality Conditions: n1<n5; n1<n21; n1<n25; and n2>n6; **

[Group #1]

1/H	2/L					1# Rw C1 P1\P2/	->	0/H	0/L							0# Rw C1 P1\P2/
04321	02413	1	23	20	12	9 65 65 65\65/		00000	00000	24	3	7	11	20 65 65 65\65/		
21043	41302	15	7	4	21	18 65 65 65\65/		00000	00000	12	16	25	4	8 65 65 65\65/		
43210	30241	24	16	13	10	2 65 65 65\65/		00000	00000	5	9	13	17	21 65 65 65\65/		
10432	24130	8	5	22	19	11 65 65 65\65/		00000	00000	18	22	1	10	14 65 65 65\65/		
32104	13024	17	14	6	3	25 65 65 65\65/		00000	00000	6	15	19	23	2 65 65 65\65/		
0/H	0/L					0# Rw C1 P1\P2/	<-	1/H	15/L							14# Rw C1 P1\P2/
00000	00000	22	3	9	15	16 65 65 65\65/		04321	42031	5	23	16	14	7 65 65 65\65/		
00000	00000	14	20	21	2	8 65 65 65\65/		21043	03142	11	9	2	25	18 65 65 65\65/		
00000	00000	1	7	13	19	25 65 65 65\65/		43210	14203	22	20	13	6	4 65 65 65\65/		
00000	00000	18	24	5	6	12 65 65 65\65/		10432	20314	8	1	24	17	15 65 65 65\65/		
00000	00000	10	11	17	23	4 65 65 65\65/		32104	31420	19	12	10	3	21 65 65 65\65/		

[Group #2]

1/H	4/L					2# Rw C1 P1\P2/	->	0/H	0/L							0# Rw C1 P1\P2/
04321	02431	1	23	20	14	7 65 65 65\65/		00000	00000	22	3	9	11	20 65 65 65\65/		
21043	43102	15	9	2	21	18 65 65 65\65/		00000	00000	14	16	25	2	8 65 65 65\65/		
43210	10243	22	16	13	10	4 65 65 65\65/		00000	00000	5	7	13	19	21 65 65 65\65/		
10432	24310	8	5	24	17	11 65 65 65\65/		00000	00000	18	24	1	10	12 65 65 65\65/		
32104	31024	19	12	6	3	25 65 65 65\65/		00000	00000	6	15	17	23	4 65 65 65\65/		

0/H	0/L	0# Rw C1 P1\P2/	<-	1/H	13/L	13# Rw C1 P1\P2/
00000	00000	24 3 7 15 16 65 65 65\65/		04321	42013	5 23 16 12 9 65 65 65\65/
00000	00000	12 20 21 4 8 65 65 65\65/		21043	01342	11 7 4 25 18 65 65 65\65/
00000	00000	1 9 13 17 25 65 65 65\65/		43210	34201	24 20 13 6 2 65 65 65\65/
00000	00000	18 22 5 6 14 65 65 65\65/		10432	20134	8 1 22 19 15 65 65 65\65/
00000	00000	10 11 19 23 2 65 65 65\65/		32104	13420	17 14 10 3 21 65 65 65\65/

[Group #3]

3/H	2/L	3# Rw C1 P1\P2/	->	0/H	0/L	0# Rw C1 P1\P2/
04123	02413	1 23 10 12 19 65 65 65\65/		00000	00000	24 3 17 11 10 65 65 65\65/
23041	41302	15 17 4 21 8 65 65 65\65/		00000	00000	12 6 25 4 18 65 65 65\65/
41230	30241	24 6 13 20 2 65 65 65\65/		00000	00000	5 19 13 7 21 65 65 65\65/
30412	24130	18 5 22 9 11 65 65 65\65/		00000	00000	8 22 1 20 14 65 65 65\65/
12304	13024	7 14 16 3 25 65 65 65\65/		00000	00000	16 15 9 23 2 65 65 65\65/

0/H	0/L	0# Rw C1 P1\P2/	<-	3/H	15/L	16# Rw C1 P1\P2/
00000	00000	22 3 19 15 6 65 65 65\65/		04123	42031	5 23 6 14 17 65 65 65\65/
00000	00000	14 10 21 2 18 65 65 65\65/		23041	03142	11 19 2 25 8 65 65 65\65/
00000	00000	1 17 13 9 25 65 65 65\65/		41230	14203	22 10 13 16 4 65 65 65\65/
00000	00000	8 24 5 16 12 65 65 65\65/		30412	20314	18 1 24 7 15 65 65 65\65/
00000	00000	20 11 7 23 4 65 65 65\65/		12304	31420	9 12 20 3 21 65 65 65\65/

[Group #4]

3/H	4/L	4# Rw C1 P1\P2/	->	0/H	0/L	0# Rw C1 P1\P2/
04123	02431	1 23 10 14 17 65 65 65\65/		00000	00000	22 3 19 11 10 65 65 65\65/
23041	43102	15 19 2 21 8 65 65 65\65/		00000	00000	14 6 25 2 18 65 65 65\65/
41230	10243	22 6 13 20 4 65 65 65\65/		00000	00000	5 17 13 9 21 65 65 65\65/
30412	24310	18 5 24 7 11 65 65 65\65/		00000	00000	8 24 1 20 12 65 65 65\65/
12304	31024	9 12 16 3 25 65 65 65\65/		00000	00000	16 15 7 23 4 65 65 65\65/

0/H	0/L	0# Rw C1 P1\P2/	<-	3/H	13/L	15# Rw C1 P1\P2/
00000	00000	24 3 17 15 6 65 65 65\65/		04123	42013	5 23 6 12 19 65 65 65\65/
00000	00000	12 10 21 4 18 65 65 65\65/		23041	01342	11 17 4 25 8 65 65 65\65/
00000	00000	1 19 13 7 25 65 65 65\65/		41230	34201	24 10 13 16 2 65 65 65\65/
00000	00000	8 22 5 16 14 65 65 65\65/		30412	20134	18 1 22 9 15 65 65 65\65/
00000	00000	20 11 9 23 2 65 65 65\65/		12304	13420	7 14 20 3 21 65 65 65\65/

[Group #5]

1/H	6/L	5# Rw C1 P1\P2/	->	0/H	0/L	0# Rw C1 P1\P2/
04321	12304	2 23 19 11 10 65 65 65\65/		00000	00000	25 3 6 12 19 65 65 65\65/
21043	30412	14 6 5 22 18 65 65 65\65/		00000	00000	11 17 24 5 8 65 65 65\65/
43210	41230	25 17 13 9 1 65 65 65\65/		00000	00000	4 10 13 16 22 65 65 65\65/
10432	23041	8 4 21 20 12 65 65 65\65/		00000	00000	18 21 2 9 15 65 65 65\65/
32104	04123	16 15 7 3 24 65 65 65\65/		00000	00000	7 14 20 23 1 65 65 65\65/

0/H	0/L	0# Rw C1 P1\P2/	<-	1/H	11/L	10# Rw C1 P1\P2/
00000	00000	21 3 10 14 17 65 65 65\65/		04321	32140	4 23 17 15 6 65 65 65\65/
00000	00000	15 19 22 1 8 65 65 65\65/		21043	14032	12 10 1 24 18 65 65 65\65/
00000	00000	2 6 13 20 24 65 65 65\65/		43210	03214	21 19 13 7 5 65 65 65\65/
00000	00000	18 25 4 7 11 65 65 65\65/		10432	21403	8 2 25 16 14 65 65 65\65/
00000	00000	9 12 16 23 5 65 65 65\65/		32104	40321	20 11 9 3 22 65 65 65\65/

[Group #6]

1/H	8/L	6# Rw C1 P1\P2/	->	0/H	0/L	0# Rw C1 P1\P2/
04321	12340	2 23 19 15 6 65 65 65\65/		00000	00000	21 3 10 12 19 65 65 65\65/
21043	34012	14 10 1 22 18 65 65 65\65/		00000	00000	15 17 24 1 8 65 65 65\65/
43210	01234	21 17 13 9 5 65 65 65\65/		00000	00000	4 6 13 20 22 65 65 65\65/
10432	23401	8 4 25 16 12 65 65 65\65/		00000	00000	18 25 2 9 11 65 65 65\65/
32104	40123	20 11 7 3 24 65 65 65\65/		00000	00000	7 14 16 23 5 65 65 65\65/

0/H	0/L	0# Rw C1 P1\P2/	<-	1/H	9/L	9# Rw C1 P1\P2/
00000	00000	25 3 6 14 17 65 65 65\65/		04321	32104	4 23 17 11 10 65 65 65\65/
00000	00000	11 19 22 5 8 65 65 65\65/		21043	10432	12 6 5 24 18 65 65 65\65/
00000	00000	2 10 13 16 24 65 65 65\65/		43210	43210	25 19 13 7 1 65 65 65\65/

```

00000 00000 18 21 4 7 15|65|65|65\65/ 10432 21043 8 2 21 20 14|65|65|65\65/
00000 00000 9 12 20 23 1|65|65|65\65/ 32104 04321 16 15 9 3 22|65|65|65\65/
[Group #7]
 3/H 6/L 7#|Rw|C1|P1\P2/ -> 0/H 0/L 0#|Rw|C1|P1\P2/
04123 12304 2 23 9 11 20|65|65|65\65/ 00000 00000 25 3 16 12 9|65|65|65\65/
23041 30412 14 16 5 22 8|65|65|65\65/ 00000 00000 11 7 24 5 18|65|65|65\65/
41230 41230 25 7 13 19 1|65|65|65\65/ 00000 00000 4 20 13 6 22|65|65|65\65/
30412 23041 18 4 21 10 12|65|65|65\65/ 00000 00000 8 21 2 19 15|65|65|65\65/
12304 04123 6 15 17 3 24|65|65|65\65/ 00000 00000 17 14 10 23 1|65|65|65\65/
 0/H 0/L 0#|Rw|C1|P1\P2/ <- 3/H 11/L 12#|Rw|C1|P1\P2/
00000 00000 21 3 20 14 7|65|65|65\65/ 04123 32140 4 23 7 15 16|65|65|65\65/
00000 00000 15 9 22 1 18|65|65|65\65/ 23041 14032 12 20 1 24 8|65|65|65\65/
00000 00000 2 16 13 10 24|65|65|65\65/ 41230 03214 21 9 13 17 5|65|65|65\65/
00000 00000 8 25 4 17 11|65|65|65\65/ 30412 21403 18 2 25 6 14|65|65|65\65/
00000 00000 19 12 6 23 5|65|65|65\65/ 12304 40321 10 11 19 3 22|65|65|65\65/

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[Group #8]
 3/H 8/L 8#|Rw|C1|P1\P2/ -> 0/H 0/L 0#|Rw|C1|P1\P2/
04123 12340 2 23 9 15 16|65|65|65\65/ 00000 00000 21 3 20 12 9|65|65|65\65/
23041 34012 14 20 1 22 8|65|65|65\65/ 00000 00000 15 7 24 1 18|65|65|65\65/
41230 01234 21 7 13 19 5|65|65|65\65/ 00000 00000 4 16 13 10 22|65|65|65\65/
30412 23401 18 4 25 6 12|65|65|65\65/ 00000 00000 8 25 2 19 11|65|65|65\65/
12304 40123 10 11 17 3 24|65|65|65\65/ 00000 00000 17 14 6 23 5|65|65|65\65/
 0/H 0/L 0#|Rw|C1|P1\P2/ <- 3/H 9/L 11#|Rw|C1|P1\P2/
00000 00000 25 3 16 14 7|65|65|65\65/ 04123 32104 4 23 7 11 20|65|65|65\65/
00000 00000 11 9 22 5 18|65|65|65\65/ 23041 10432 12 16 5 24 8|65|65|65\65/
00000 00000 2 20 13 6 24|65|65|65\65/ 41230 43210 25 9 13 17 1|65|65|65\65/
00000 00000 8 21 4 17 15|65|65|65\65/ 30412 21043 18 2 21 10 14|65|65|65\65/
00000 00000 19 12 10 23 1|65|65|65\65/ 12304 04321 6 15 19 3 22|65|65|65\65/

```

[Solution Counts(Original/Reconstructed) = 8/16]

** Monitor of the Solution Numbers between Old and New **

```

??: 16
1: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

OK!

** Calculated and Listed by Kanji Setsuda on Apr. 1, 2011 with MacOSX & Xcode3 **

You might not accept this as it is for the final result of our experiment, since it has some waste in the list.

How should we deal with the 2nd and 4th results of each group? What can we do for the restorations of them into any 'Standard Solutions'?

Why don't you take the next 'Complementary Transformation' procedure after applying our Classic Composition to each step, if necessary? We can manage to make any 'Standard' form for every results, can't we?

[Conceptual Diagrams for 'Complementary Transformation']

/Original	/D5i: H/L	/Transformed	/D5i: H/L
1 2 3 4 5	00000 01234	25 24 23 22 21	44444 43210
6 7 8 9 10	11111 01234	20 19 18 17 16	33333 43210
11 12 13 14 15	22222 01234	15 14 13 12 11	22222 43210
16 17 18 19 20	33333 01234	10 9 8 7 6	11111 43210
21 22 23 24 25	44444 01234	5 4 3 2 1	00000 43210

This procedure gives us the same pattern with the rotation by 180 degrees. Let me show you the result list of such experiment I have finally tried.

**** Classic Composition with Complementary Transformation if necessary ****

[Group #1]

1/H	2/L	1# Rw C1 P1\P2/	->	1/H	8/L	6# Rw C1 P1\P2/
04321	02413	1 23 20 12 9 65 65 65\65/		04321	12340	2 23 19 15 6 65 65 65\65/
21043	41302	15 7 4 21 18 65 65 65\65/		21043	34012	14 10 1 22 18 65 65 65\65/
43210	30241	24 16 13 10 2 65 65 65\65/		43210	01234	21 17 13 9 5 65 65 65\65/
10432	24130	8 5 22 19 11 65 65 65\65/		10432	23401	8 4 25 16 12 65 65 65\65/
32104	13024	17 14 6 3 25 65 65 65\65/		32104	40123	20 11 7 3 24 65 65 65\65/

1/H	9/L	9# Rw C1 P1\P2/	<-	1/H	15/L	14# Rw C1 P1\P2/
04321	32104	4 23 17 11 10 65 65 65\65/		04321	42031	5 23 16 14 7 65 65 65\65/
21043	10432	12 6 5 24 18 65 65 65\65/		21043	03142	11 9 2 25 18 65 65 65\65/
43210	43210	25 19 13 7 1 65 65 65\65/		43210	14203	22 20 13 6 4 65 65 65\65/
10432	21043	8 2 21 20 14 65 65 65\65/		10432	20314	8 1 24 17 15 65 65 65\65/
32104	04321	16 15 9 3 22 65 65 65\65/		32104	31420	19 12 10 3 21 65 65 65\65/

[Group #2]

1/H	4/L	2# Rw C1 P1\P2/	->	1/H	11/L	10# Rw C1 P1\P2/
04321	02431	1 23 20 14 7 65 65 65\65/		04321	32140	4 23 17 15 6 65 65 65\65/
21043	43102	15 9 2 21 18 65 65 65\65/		21043	14032	12 10 1 24 18 65 65 65\65/
43210	10243	22 16 13 10 4 65 65 65\65/		43210	03214	21 19 13 7 5 65 65 65\65/
10432	24310	8 5 24 17 11 65 65 65\65/		10432	21403	8 2 25 16 14 65 65 65\65/
32104	31024	19 12 6 3 25 65 65 65\65/		32104	40321	20 11 9 3 22 65 65 65\65/

1/H	6/L	5# Rw C1 P1\P2/	<-	1/H	13/L	13# Rw C1 P1\P2/
04321	12304	2 23 19 11 10 65 65 65\65/		04321	42013	5 23 16 12 9 65 65 65\65/
21043	30412	14 6 5 22 18 65 65 65\65/		21043	01342	11 7 4 25 18 65 65 65\65/
43210	41230	25 17 13 9 1 65 65 65\65/		43210	34201	24 20 13 6 2 65 65 65\65/
10432	23041	8 4 21 20 12 65 65 65\65/		10432	20134	8 1 22 19 15 65 65 65\65/
32104	04123	16 15 7 3 24 65 65 65\65/		32104	13420	17 14 10 3 21 65 65 65\65/

[Group #3]

3/H	2/L	3# Rw C1 P1\P2/	->	3/H	8/L	8# Rw C1 P1\P2/
04123	02413	1 23 10 12 19 65 65 65\65/		04123	12340	2 23 9 15 16 65 65 65\65/
23041	41302	15 17 4 21 8 65 65 65\65/		23041	34012	14 20 1 22 8 65 65 65\65/
41230	30241	24 6 13 20 2 65 65 65\65/		41230	01234	21 7 13 19 5 65 65 65\65/
30412	24130	18 5 22 9 11 65 65 65\65/		30412	23401	18 4 25 6 12 65 65 65\65/
12304	13024	7 14 16 3 25 65 65 65\65/		12304	40123	10 11 17 3 24 65 65 65\65/

3/H	9/L	11# Rw C1 P1\P2/	<-	3/H	15/L	16# Rw C1 P1\P2/
04123	32104	4 23 7 11 20 65 65 65\65/		04123	42031	5 23 6 14 17 65 65 65\65/
23041	10432	12 16 5 24 8 65 65 65\65/		23041	03142	11 19 2 25 8 65 65 65\65/
41230	43210	25 9 13 17 1 65 65 65\65/		41230	14203	22 10 13 16 4 65 65 65\65/
30412	21043	18 2 21 10 14 65 65 65\65/		30412	20314	18 1 24 7 15 65 65 65\65/
12304	04321	6 15 19 3 22 65 65 65\65/		12304	31420	9 12 20 3 21 65 65 65\65/

[Group #4]

3/H	4/L	4# Rw C1 P1\P2/	->	3/H	11/L	12# Rw C1 P1\P2/
04123	02431	1 23 10 14 17 65 65 65\65/		04123	32140	4 23 7 15 16 65 65 65\65/
23041	43102	15 19 2 21 8 65 65 65\65/		23041	14032	12 20 1 24 8 65 65 65\65/
41230	10243	22 6 13 20 4 65 65 65\65/		41230	03214	21 9 13 17 5 65 65 65\65/
30412	24310	18 5 24 7 11 65 65 65\65/		30412	21403	18 2 25 6 14 65 65 65\65/
12304	31024	9 12 16 3 25 65 65 65\65/		12304	40321	10 11 19 3 22 65 65 65\65/

3/H	6/L	7# Rw C1 P1\P2/	<-	3/H	13/L	15# Rw C1 P1\P2/
04123	12304	2 23 9 11 20 65 65 65\65/		04123	42013	5 23 6 12 19 65 65 65\65/
23041	30412	14 16 5 22 8 65 65 65\65/		23041	01342	11 17 4 25 8 65 65 65\65/
41230	41230	25 7 13 19 1 65 65 65\65/		41230	34201	24 10 13 16 2 65 65 65\65/
30412	23041	18 4 21 10 12 65 65 65\65/		30412	20134	18 1 22 9 15 65 65 65\65/
12304	04123	6 15 17 3 24 65 65 65\65/		12304	13420	7 14 20 3 21 65 65 65\65/

[Solution Counts(Original/Reconstructed) = 4/16]

**** Monitor of the Solution Numbers between Old and New ****

```

??: 0
1: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

OK!

** Calculated and Listed by Kanji Setsuda on Apr. 1, 2011 with MacOSX & Xcode3 **

What a beautiful result list we could have got!

It demonstrates the 4 original solutions with $n1=1$ could reconstruct all the 16 Standard Solutions of our object, and miss nothing: $4 \times 4 = 16$;

Watch the Latin Units of 4 solutions in each group.

Could you find the higher units are common and the same in it, and only $1/H$ and $3/H$ are totally used? Could you also notice the lower units of each group show the common, characteristic change by each sequential application of transformation: the rotation by 90 degrees clockwise?

(1) $2/L \rightarrow 8/L \rightarrow 15/L \rightarrow 9/L \rightarrow 2/L$; (2) $4/L \rightarrow 11/L \rightarrow 13/L \rightarrow 6/L \rightarrow 4/L$;

(3) $2/L \rightarrow 8/L \rightarrow 15/L \rightarrow 9/L \rightarrow 2/L$; (4) $4/L \rightarrow 11/L \rightarrow 13/L \rightarrow 6/L \rightarrow 4/L$;

Check and see if it is true, won't you, please?

It seems to mean the beautiful structure of our object by all of them.

The ambitious dream of 'Euler School' has come true at last in the case of Order 5. They say they could finally explain about the secret of Magic Squares by the Greco-Latin Units. I personally think they could have done it. Yes, I mean it.

(Written by Kanji Setsuda on Dec. 6, 2002; May 31, 2005;

Revised on Apr. 4, 2011 working with MacOSX 10.5.8 & Xcode 3.1.2)

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#7. How to Make Basic Form into the Representative Solution of MS55Sml

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

** How to Make a Simultaneous 'Suzuki Square' 5x5 Step by Step **

1/Start

```

0 25 0 0 0 0 25 0 0 0
0 0 | 1 | 0 | 0 | 0 | 0 | 1 0 0
|---+---+---+---+---|
0 0 | 0 | 7 | 0 | 0 | 0 | 0 7 0
|---+---+---+---+---|
0 0 | 0 | 0 | 13 | 0 | 0 | 0 0 13
|---+---+---+---+---|
19 0 | 0 | 0 | 0 | 19 | 0 | 0 0 0
|---+---+---+---+---|
0 25 | 0 | 0 | 0 | 0 | 25 | 0 0 0
|---+---+---+---+---|
0 0 1 0 0 0 0 1 0 0

```

2/Place **1** 2 3 4 5

```

3 25 0 0 0 0 3 25 0 0 0
0 0 | 1 | 0 | 0 | 0 | 0 | 1 0 0
|---+---+---+---+---|
0 0 | 0 | 7 | 4 | 0 | 0 | 0 7 4
|---+---+---+---+---|
0 2 | 0 | 0 | 13 | 0 | 2 | 0 0 13
|---+---+---+---+---|
19 0 | 0 | 5 | 0 | 19 | 0 | 0 5 0
|---+---+---+---+---|
3 25 | 0 | 0 | 0 | 0 | 25 | 0 0 0
|---+---+---+---+---|
0 0 1 0 0 0 0 1 0 0

```

3/Place 6 7 8 9 10

3	25	0	0	6	3	25	0	0	6
0	9	1	0	0	0	9	1	0	0
0	0	0	7	4	0	0	0	7	4
10	2	0	0	13	10	2	0	0	13
19	0	8	5	0	19	0	8	5	0
3	25	0	0	6	3	25	0	0	6
0	9	1	0	0	0	9	1	0	0

4/Place 11 12 13 14 15

3	25	0	14	6	3	25	0	14	6
12	9	1	0	0	12	9	1	0	0
0	0	15	7	4	0	0	15	7	4
10	2	0	0	13	10	2	0	0	13
19	11	8	5	0	19	11	8	5	0
3	25	0	14	6	3	25	0	14	6
12	9	1	0	0	12	9	1	0	0

5/Place 16 17 18 19 20

3	25	17	14	6	3	25	17	14	6
12	9	1	0	20	12	9	1	0	20
0	18	15	7	4	0	18	15	7	4
10	2	0	16	13	10	2	0	16	13
19	11	8	5	0	19	11	8	5	0
3	25	17	14	6	3	25	17	14	6
12	9	1	0	20	12	9	1	0	20

6/Place 21 22 23 24 25

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

[Goal]