



01/C	02/C	03/C	04/C	
$\begin{array}{ c c } \hline 1 & 2 \\ \hline 5 & 6 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 2 & 3 \\ \hline 6 & 7 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 3 & 4 \\ \hline 7 & 8 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 4 & 1 \\ \hline 8 & 5 \\ \hline \end{array}$	C01 = $n1+n2+n5+n6$ ; C02 = $n2+n3+n6+n7$ ; C03 = $n3+n4+n7+n8$ ; C04 = $n4+n1+n8+n5$ ;
05/C	06/C	07/C	08/C	
$\begin{array}{ c c } \hline 5 & 6 \\ \hline 9 & 10 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 6 & 7 \\ \hline 10 & 11 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 7 & 8 \\ \hline 11 & 12 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 8 & 5 \\ \hline 12 & 9 \\ \hline \end{array}$	C05 = $n5+n6+n9+n10$ ; C06 = $n6+n7+n10+n11$ ; C07 = $n7+n8+n11+n12$ ; C08 = $n8+n5+n12+n9$ ;
09/C	10/C	11/C	12/C	
$\begin{array}{ c c } \hline 9 & 10 \\ \hline 13 & 14 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 10 & 11 \\ \hline 14 & 15 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 11 & 12 \\ \hline 15 & 16 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 12 & 9 \\ \hline 16 & 13 \\ \hline \end{array}$	C09 = $n9+n10+n13+n14$ ; C10 = $n10+n11+n14+n15$ ; C11 = $n11+n12+n15+n16$ ; C12 = $n12+n9+n16+n13$ ;
13/C	14/C	15/C	16/C	
$\begin{array}{ c c } \hline 13 & 14 \\ \hline 1 & 2 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 14 & 15 \\ \hline 2 & 3 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 15 & 16 \\ \hline 3 & 4 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 16 & 13 \\ \hline 4 & 1 \\ \hline \end{array}$	C13 = $n13+n14+n1+n2$ ; C14 = $n14+n15+n2+n3$ ; C15 = $n15+n16+n3+n4$ ; C16 = $n16+n13+n4+n1$ ;

[Case #1: Pan-diagonal MS44]

3	6	15	10	3	6	15	10	3	
13	12	$\begin{array}{ c c } \hline 1 & 8 \\ \hline 14 & 11 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 8 & 13 \\ \hline 11 & 2 \\ \hline \end{array}$	1	8	13	12	1	8
2	7	$\begin{array}{ c c } \hline 14 & 11 \\ \hline 4 & 5 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 11 & 2 \\ \hline 5 & 16 \\ \hline \end{array}$	2	7	14	11	2	7
16	9	$\begin{array}{ c c } \hline 4 & 5 \\ \hline 15 & 10 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 9 & 4 \\ \hline 10 & 3 \\ \hline \end{array}$	16	9	4	5	16	9
3	6	$\begin{array}{ c c } \hline 15 & 10 \\ \hline 3 & 6 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 3 & 6 \\ \hline 15 & 10 \\ \hline \end{array}$	3	6	15	10	3	6
13	12	1	8	13	12	1	8	13	13
2	7	14	11	2	7	14	11	2	2

\* Diagrams of 16 'Composite 2x2 Units' and the List of Actual Results of 'Composite Sums' \*

01/C	02/C	03/C	04/C	
$\begin{array}{ c c } \hline 1 & 8 \\ \hline 14 & 11 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 8 & 13 \\ \hline 11 & 2 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 13 & 12 \\ \hline 2 & 7 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 12 & 1 \\ \hline 7 & 14 \\ \hline \end{array}$	C01 = $1+8+14+11 = 34$ ; C02 = $8+13+11+2 = 34$ ; C03 = $13+12+2+7 = 34$ ; C04 = $12+1+7+14 = 34$ ;
05/C	06/C	07/C	08/C	
$\begin{array}{ c c } \hline 14 & 11 \\ \hline 4 & 5 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 11 & 2 \\ \hline 5 & 16 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 2 & 7 \\ \hline 16 & 9 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 7 & 14 \\ \hline 9 & 4 \\ \hline \end{array}$	C05 = $14+11+4+5 = 34$ ; C06 = $11+2+5+16 = 34$ ; C07 = $2+7+16+9 = 34$ ; C08 = $7+14+9+4 = 34$ ;
09/C	10/C	11/C	12/C	
$\begin{array}{ c c } \hline 4 & 5 \\ \hline 15 & 10 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 5 & 16 \\ \hline 10 & 3 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 16 & 9 \\ \hline 3 & 6 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 9 & 4 \\ \hline 6 & 15 \\ \hline \end{array}$	C09 = $4+5+15+10 = 34$ ; C10 = $5+16+10+3 = 34$ ; C11 = $16+9+3+6 = 34$ ; C12 = $9+4+6+15 = 34$ ;
13/C	14/C	15/C	16/C	
$\begin{array}{ c c } \hline 15 & 10 \\ \hline 1 & 8 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 10 & 3 \\ \hline 8 & 13 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 3 & 6 \\ \hline 13 & 12 \\ \hline \end{array}$	$\begin{array}{ c c } \hline 6 & 15 \\ \hline 12 & 1 \\ \hline \end{array}$	C13 = $15+10+1+8 = 34$ ; C14 = $10+3+8+13 = 34$ ; C15 = $3+6+13+12 = 34$ ; C16 = $6+15+12+1 = 34$ ;

\* Compact List of Solution with the Check-Sums and Check-Sum-Errors of 16 'Composite Sums' \*

3#	Rw	C1\	P1/P2	Compst-Sums	Compst-Error
1	8	13	12	34 34\34/34 34 34 34 34	0 0 0 0
14	11	2	7	34 34\34/34 34 34 34 34	0 0 0 0
4	5	16	9	34 34\34/34 34 34 34 34	0 0 0 0
15	10	3	6	34 34\34/34 34 34 34 34	0 0 0 0

[Case #2: Self-complementary MS44]

9	16	4	5	9	16	4	5	9
12	13	1	8	12	13	1	8	12
7	2	14	11	7	2	14	11	7
6	3	15	10	6	3	15	10	6
9	16	4	5	9	16	4	5	9
12	13	1	8	12	13	1	8	12
7	2	14	11	7	2	14	11	7

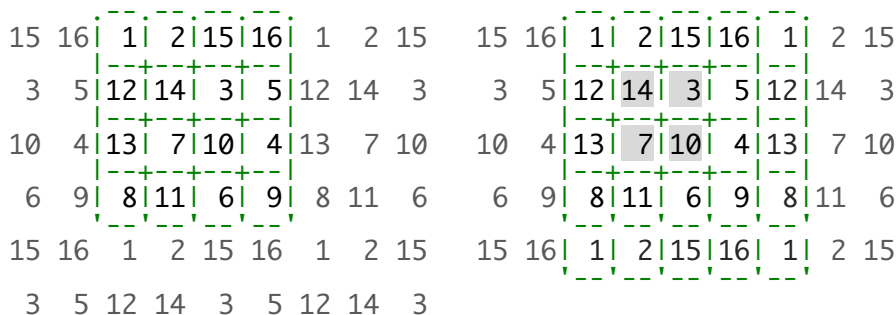
\* Diagrams of 16 'Composite 2x2 Units' and the List of Actual Results of 'Composite Sums' \*

01/C	02/C	03/C	04/C	
1 8	8 12	12 13	13 1	C01 = 1+8+14+11 = 34;
14 11	11 7	7 2	2 14	C02 = 8+12+11+7 = 38;
15 10	10 6	6 3	3 15	C03 = 12+13+7+2 = 34;
4 5	5 9	9 16	16 4	C04 = 13+1+2+14 = 30;
05/C	06/C	07/C	08/C	
14 11	11 7	7 2	2 14	C05 = 14+11+15+10 = 50;
15 10	10 6	6 3	3 15	C06 = 11+7+10+6 = 34;
4 5	5 9	9 16	16 4	C07 = 7+2+6+3 = 18;
1 8	8 12	12 13	13 1	C08 = 2+14+3+15 = 34;
09/C	10/C	11/C	12/C	
15 10	10 6	6 3	3 15	C09 = 15+10+4+5 = 34;
4 5	5 9	9 16	16 4	C10 = 10+6+5+9 = 30;
1 8	8 12	12 13	13 1	C11 = 6+3+9+16 = 34;
4 5	5 9	9 16	16 4	C12 = 3+15+16+4 = 38;
13/C	14/C	15/C	16/C	
4 5	5 9	9 16	16 4	C13 = 4+5+1+8 = 18;
1 8	8 12	12 13	13 1	C14 = 5+9+8+12 = 34;
15 10	10 6	6 3	3 15	C15 = 9+16+12+13 = 50;
4 5	5 9	9 16	16 4	C16 = 16+4+13+1 = 34;

\* Compact List of Solution with the Check-Sums and Check-Sum-Errors of 16 'Composite Sums' \*

2#	Rw	C1\	P1/P2	Compst-Sums	Compst-Error
1	8	12	13	34 34\34/14 34 38 34 30	0 4 0 -4
14	11	7	2	34 34\22/34 50 34 18 34	16 0-16 0
15	10	6	3	34 34\34/54 34 30 34 38	0 -4 0 4
4	5	9	16	34 34\46/34 18 34 50 34	-16 0 16 0

[Case #3: Standard MS44]



\* Diagrams of 16 'Composite 2x2 Units' and the List of Actual Results of 'Composite Sums' \*

01/C	02/C	03/C	04/C	
1 2	2 15	15 16	16 1	C01 = 1+2+12+14 = 29;
12 14	14 3	3 5	5 12	C02 = 2+15+14+3 = 34;
13 7	7 10	10 4	4 13	C03 = 15+16+3+5 = 39;
8 11	6 9	8 11	6 9	C04 = 16+1+5+12 = 34;
05/C	06/C	07/C	08/C	
12 14	14 3	3 5	5 12	C05 = 12+14+13+7 = 46;
13 7	7 10	10 4	4 13	C06 = 14+3+7+10 = 34;
				C07 = 3+5+10+4 = 22;
				C08 = 5+12+4+13 = 34;

. . . (skip) . .

\* Compact List of Solution with the Check-Sums and Check-Sum-Errors of 16 'Composite Sums' \*

1#	Rw	Cl	P1/P2	Compst-Sums	Compst-Error
1	2	15	16	34 34 34 27 29	34 39 34  -5 0 5 0
12	14	3	5	34 34 17 24 46	34 22 34  12 0-12 0
13	7	10	4	34 34 44 51 39	34 29 34  5 0 -5 0
8	11	6	9	34 34 41 34 22	34 46 34  -12 0 12 0

Whenever I see the Case #1: Pan-diagonal MS44, I cannot help admiring it for the pure consistency of its Composite Sum Pattern.

Case #2: Self-complementary MS44 shows its interesting sum pattern. Eight, it means, half of all 16 sums add up to the constant value 34. Is that always right?

Even the example Case #3: Standard MS44 above seems to show the regular pattern. Is that really the same for all?

You want to have more examples in a large list with full information, don't you? Here you are at the larger list having more examples of those three types in it.

### #3. 'Standard' Magic Squares 4x4 Composed by the Ordinary Method:

List of the 880 Standard Solutions with precise Check-Sums

\Primary-diagonals/  
|Rows|Columns|16 'Composite 2x2 Units'|

1/st\34/34 Compst-Sums	2/st\34/34 Compst-Sums	3/st\34/34 Compst-Sums
1 2 15 16 34 34 29 34 39 34	1 2 15 16 34 34 30 34 38 34	1 2 16 15 34 34 30 36 38 32
12 14 3 5 34 34 46 34 22 34	13 14 3 4 34 34 46 34 22 34	13 14 4 3 34 34 46 34 22 34
13 7 10 4 34 34 39 34 29 34	12 7 10 5 34 34 38 34 30 34	12 7 9 6 34 34 38 32 30 36
8 11 6 9 34 34 22 34 46 34	8 11 6 9 34 34 22 34 46 34	8 11 5 10 34 34 22 34 46 34
4/st\34/34 Compst-Sums	5/st\34/34 Compst-Sums	6/st\34/34 Compst-Sums
1 3 14 16 34 34 27 34 41 34	1 3 14 16 34 34 29 34 39 34	1 3 14 16 34 34 32 34 36 34
10 13 4 7 34 34 44 34 24 34	12 13 4 5 34 34 48 34 20 34	15 13 4 2 34 34 44 34 24 34
15 6 11 2 34 34 41 34 27 34	15 8 9 2 34 34 39 34 29 34	10 6 11 7 34 34 36 34 32 34
8 12 5 9 34 34 24 34 44 34	6 10 7 11 34 34 20 34 48 34	8 12 5 9 34 34 24 34 44 34

7/st\34/34 Compst-Sums	8/st\34/34 Compst-Sums	9/st\34/34 Compst-Sums
1 3 14 16 34 34 32 34 36 34	1 3 16 14 34 34 27 36 41 32	1 3 16 14 34 34 31 36 37 32
15 13 4 2 34 34 48 34 20 34	8 15 2 9 34 34 42 34 26 34	12 15 2 5 34 34 50 34 18 34
12 8 9 5 34 34 36 34 32 34	13 6 11 4 34 34 41 32 27 36	13 10 7 4 34 34 37 32 31 36
6 10 7 11 34 34 20 34 48 34	12 10 5 7 34 34 26 34 42 34	8 6 9 11 34 34 18 34 50 34
10/st\34/34 Compst-Sums	11/st\34/34 Compst-Sums	12/st\34/34 Compst-Sums
1 3 16 14 34 34 32 36 36 32	1 3 16 14 34 34 32 36 36 32	1 4 13 16 34 34 27 34 41 34
13 15 2 4 34 34 42 34 26 34	13 15 2 4 34 34 50 34 18 34	8 14 3 9 34 34 42 34 26 34
8 6 11 9 34 34 36 32 32 36	12 10 7 5 34 34 36 32 32 36	15 5 12 2 34 34 41 34 27 34
12 10 5 7 34 34 26 34 42 34	8 6 9 11 34 34 18 34 50 34	10 11 6 7 34 34 26 34 42 34
13/st\34/34 Compst-Sums	14/st\34/34 Compst-Sums	15/st\34/34 Compst-Sums
1 4 13 16 34 34 28 34 40 34	1 4 13 16 34 34 31 34 37 34	1 4 13 16 34 34 32 34 36 34
8 15 2 9 34 34 42 34 26 34	12 14 3 5 34 34 50 34 18 34	12 15 2 5 34 34 50 34 18 34
14 5 12 3 34 34 40 34 28 34	15 9 8 2 34 34 37 34 31 34	14 9 8 3 34 34 36 34 32 34
11 10 7 6 34 34 26 34 42 34	6 7 10 11 34 34 18 34 50 34	7 6 11 10 34 34 18 34 50 34
16/st\34/34 Compst-Sums	17/st\34/34 Compst-Sums	18/st\34/34 Compst-Sums
1 4 13 16 34 34 34 34 34 34	1 4 13 16 34 34 34 34 34 34	1 4 13 16 34 34 34 34 34 34
14 15 2 3 34 34 42 34 26 34	14 15 2 3 34 34 50 34 18 34	15 14 3 2 34 34 42 34 26 34
8 5 12 9 34 34 34 34 34 34	12 9 8 5 34 34 34 34 34 34	8 5 12 9 34 34 34 34 34 34
11 10 7 6 34 34 26 34 42 34	7 6 11 10 34 34 18 34 50 34	10 11 6 7 34 34 26 34 42 34
19/st\34/34 Compst-Sums	20/st\34/34 Compst-Sums	21/st\34/34 Compst-Sums
1 4 13 16 34 34 34 34 34 34	1 4 14 15 34 34 26 36 42 32	1 4 14 15 34 34 34 36 34 32
15 14 3 2 34 34 50 34 18 34	9 12 6 7 34 34 42 34 26 34	13 16 2 3 34 34 42 34 26 34
12 9 8 5 34 34 34 34 34 34	16 5 11 2 34 34 42 32 26 36	8 5 11 10 34 34 34 32 34 36
6 7 10 11 34 34 18 34 50 34	8 13 3 10 34 34 26 34 42 34	12 9 7 6 34 34 26 34 42 34
22/st\34/34 Compst-Sums	23/st\34/34 Compst-Sums	24/st\34/34 Compst-Sums
1 4 14 15 34 34 34 36 34 32	1 4 14 15 34 34 32 34 36 34	1 4 14 15 34 34 34 34 34 34
13 16 2 3 34 34 50 34 18 34	16 11 5 2 34 34 42 34 26 34	16 13 3 2 34 34 42 34 26 34
12 9 7 6 34 34 34 32 34 36	9 6 12 7 34 34 36 34 32 34	7 6 12 9 34 34 34 34 34 34
8 5 11 10 34 34 18 34 50 34	8 13 3 10 34 34 26 34 42 34	10 11 5 8 34 34 26 34 42 34
25/st\34/34 Compst-Sums	26/st\34/34 Compst-Sums	27/st\34/34 Compst-Sums
1 4 14 15 34 34 34 34 34 34	1 4 15 14 34 34 26 38 42 30	1 4 15 14 34 34 34 38 34 30
16 13 3 2 34 34 50 34 18 34	9 12 7 6 34 34 42 34 26 34	13 16 3 2 34 34 42 34 26 34
11 10 8 5 34 34 34 34 34 34	16 5 10 3 34 34 42 30 26 38	8 5 10 11 34 34 34 30 34 38
6 7 9 12 34 34 18 34 50 34	8 13 2 11 34 34 26 34 42 34	12 9 6 7 34 34 26 34 42 34
28/st\34/34 Compst-Sums	29/st\34/34 Compst-Sums	30/st\34/34 Compst-Sums
1 4 15 14 34 34 34 38 34 30	1 4 15 14 34 34 31 34 37 34	1 4 15 14 34 34 34 34 34 34
13 16 3 2 34 34 50 34 18 34	16 10 5 3 34 34 42 34 26 34	16 13 2 3 34 34 42 34 26 34
12 9 6 7 34 34 34 30 34 38	9 7 12 6 34 34 37 34 31 34	6 7 12 9 34 34 34 34 34 34
8 5 10 11 34 34 18 34 50 34	8 13 2 11 34 34 26 34 42 34	11 10 5 8 34 34 26 34 42 34
31/st\34/34 Compst-Sums	32/st\34/34 Compst-Sums	33/st\34/34 Compst-Sums
1 4 15 14 34 34 34 34 34 34	1 4 16 13 34 34 34 38 34 30	1 4 16 13 34 34 34 38 34 30
16 13 2 3 34 34 50 34 18 34	14 15 3 2 34 34 42 34 26 34	14 15 3 2 34 34 50 34 18 34
10 11 8 5 34 34 34 34 34 34	7 6 10 11 34 34 34 30 34 38	11 10 6 7 34 34 34 30 34 38
7 6 9 12 34 34 18 34 50 34	12 9 5 8 34 34 26 34 42 34	8 5 9 12 34 34 18 34 50 34
34/st\34/34 Compst-Sums	35/st\34/34 Compst-Sums	36/st\34/34 Compst-Sums
1 4 16 13 34 34 34 36 34 32	1 4 16 13 34 34 34 36 34 32	1 5 12 16 34 34 27 34 41 34
15 14 2 3 34 34 42 34 26 34	15 14 2 3 34 34 50 34 18 34	10 11 6 7 34 34 40 34 28 34
6 7 11 10 34 34 34 32 34 36	10 11 7 6 34 34 34 32 34 36	15 4 13 2 34 34 41 34 27 34
12 9 5 8 34 34 26 34 42 34	8 5 9 12 34 34 18 34 50 34	8 14 3 9 34 34 28 34 40 34
37/st\34/34 Compst-Sums	38/st\34/34 Compst-Sums	39/st\34/34 Compst-Sums
1 5 12 16 34 34 31 34 37 34	1 5 12 16 34 34 32 34 36 34	1 5 12 16 34 34 32 34 36 34
14 11 6 3 34 34 48 34 20 34	15 11 6 2 34 34 40 34 28 34	15 11 6 2 34 34 48 34 20 34
15 8 9 2 34 34 37 34 31 34	10 4 13 7 34 34 36 34 32 34	14 8 9 3 34 34 36 34 32 34
4 10 7 13 34 34 20 34 48 34	8 14 3 9 34 34 28 34 40 34	4 10 7 13 34 34 20 34 48 34
40/st\34/34 Compst-Sums	41/st\34/34 Compst-Sums	42/st\34/34 Compst-Sums
1 5 16 12 34 34 28 38 40 30	1 5 16 12 34 34 30 38 38 30	1 5 16 12 34 34 30 38 38 30
8 14 3 9 34 34 36 34 32 34	10 14 3 7 34 34 36 34 32 34	10 14 3 7 34 34 50 34 18 34
10 4 13 7 34 34 40 30 28 38	8 4 13 9 34 34 38 30 30 38	15 11 6 2 34 34 38 30 30 38
15 11 2 6 34 34 32 34 36 34	15 11 2 6 34 34 32 34 36 34	8 4 9 13 34 34 18 34 50 34

43/st\34/34 Compst-Sums	44/st\34/34 Compst-Sums	45/st\34/34 Compst-Sums
1 5 16 12 34 34 35 38 33 30	1 6 11 16 34 34 29 34 39 34	1 6 11 16 34 34 27 34 41 34
15 14 3 2 34 34 50 34 18 34	7 15 2 10 34 34 40 34 28 34	8 12 5 9 34 34 38 34 30 34
10 11 6 7 34 34 33 30 35 38	14 4 13 3 34 34 39 34 29 34	15 3 14 2 34 34 41 34 27 34
8 4 9 13 34 34 18 34 50 34	12 9 8 5 34 34 28 34 40 34	10 13 4 7 34 34 30 34 38 34
46/st\34/34 Compst-Sums	47/st\34/34 Compst-Sums	48/st\34/34 Compst-Sums
1 6 11 16 34 34 30 34 38 34	1 6 11 16 34 34 29 34 39 34	1 6 11 16 34 34 34 34 34 34
8 15 2 9 34 34 38 34 30 34	12 10 7 5 34 34 38 34 30 34	12 15 2 5 34 34 38 34 30 34
12 3 14 5 34 34 38 34 30 34	13 3 14 4 34 34 39 34 29 34	8 3 14 9 34 34 34 34 34 34
13 10 7 4 34 34 30 34 38 34	8 15 2 9 34 34 30 34 38 34	13 10 7 4 34 34 30 34 38 34
49/st\34/34 Compst-Sums	50/st\34/34 Compst-Sums	51/st\34/34 Compst-Sums
1 6 11 16 34 34 34 34 34 34	1 6 11 16 34 34 30 34 38 34	1 6 11 16 34 34 33 34 35 34
12 15 2 5 34 34 50 34 18 34	13 10 7 4 34 34 38 34 30 34	14 12 5 3 34 34 50 34 18 34
14 9 8 3 34 34 34 34 34 34	12 3 14 5 34 34 38 34 30 34	15 9 8 2 34 34 35 34 33 34
7 4 13 10 34 34 18 34 50 34	8 15 2 9 34 34 30 34 38 34	4 7 10 13 34 34 18 34 50 34
52/st\34/34 Compst-Sums	53/st\34/34 Compst-Sums	54/st\34/34 Compst-Sums
1 6 11 16 34 34 36 34 32 34	1 6 11 16 34 34 36 34 32 34	1 6 11 16 34 34 34 34 34 34
14 15 2 3 34 34 40 34 28 34	14 15 2 3 34 34 50 34 18 34	15 12 5 2 34 34 38 34 30 34
7 4 13 10 34 34 32 34 36 34	12 9 8 5 34 34 32 34 36 34	8 3 14 9 34 34 34 34 34 34
12 9 8 5 34 34 28 34 40 34	7 4 13 10 34 34 18 34 50 34	10 13 4 7 34 34 30 34 38 34
55/st\34/34 Compst-Sums	56/st\34/34 Compst-Sums	57/st\34/34 Compst-Sums
1 6 11 16 34 34 34 34 34 34	1 6 12 15 34 34 34 36 34 32	1 6 12 15 34 34 34 36 34 32
15 12 5 2 34 34 50 34 18 34	11 16 2 5 34 34 38 34 30 34	11 16 2 5 34 34 50 34 18 34
14 9 8 3 34 34 34 34 34 34	8 3 13 10 34 34 34 32 34 36	14 9 7 4 34 34 34 32 34 36
4 7 10 13 34 34 18 34 50 34	14 9 7 4 34 34 30 34 38 34	8 3 13 10 34 34 18 34 50 34
58/st\34/34 Compst-Sums	59/st\34/34 Compst-Sums	60/st\34/34 Compst-Sums
1 6 12 15 34 34 30 36 38 32	1 6 12 15 34 34 32 34 36 34	1 6 12 15 34 34 34 34 34 34
13 10 8 3 34 34 46 34 22 34	16 9 7 2 34 34 46 34 22 34	16 11 5 2 34 34 38 34 30 34
16 7 9 2 34 34 38 32 30 36	13 8 10 3 34 34 36 34 32 34	7 4 14 9 34 34 34 34 34 34
4 11 5 14 34 34 22 34 46 34	4 11 5 14 34 34 22 34 46 34	10 13 3 8 34 34 30 34 38 34
61/st\34/34 Compst-Sums	62/st\34/34 Compst-Sums	63/st\34/34 Compst-Sums
1 6 12 15 34 34 34 34 34 34	1 6 15 12 34 34 34 42 34 26	1 6 15 12 34 34 34 42 34 26
16 11 5 2 34 34 50 34 18 34	11 16 5 2 34 34 38 34 30 34	11 16 5 2 34 34 50 34 18 34
13 10 8 3 34 34 34 34 34 34	8 3 10 13 34 34 34 26 34 42	14 9 4 7 34 34 34 26 34 42
4 7 9 14 34 34 18 34 50 34	14 9 4 7 34 34 30 34 38 34	8 3 10 13 34 34 18 34 50 34
64/st\34/34 Compst-Sums	65/st\34/34 Compst-Sums	66/st\34/34 Compst-Sums
1 6 15 12 34 34 34 34 34 34	1 6 15 12 34 34 34 34 34 34	1 6 16 11 34 34 34 42 34 26
16 11 2 5 34 34 38 34 30 34	16 11 2 5 34 34 50 34 18 34	12 15 5 2 34 34 38 34 30 34
4 7 14 9 34 34 34 34 34 34	10 13 8 3 34 34 34 34 34 34	7 4 10 13 34 34 34 26 34 42
13 10 3 8 34 34 30 34 38 34	7 4 9 14 34 34 18 34 50 34	14 9 3 8 34 34 30 34 38 34
67/st\34/34 Compst-Sums	68/st\34/34 Compst-Sums	69/st\34/34 Compst-Sums
1 6 16 11 34 34 34 42 34 26	1 6 16 11 34 34 34 36 34 32	1 6 16 11 34 34 34 36 34 32
12 15 5 2 34 34 50 34 18 34	15 12 2 5 34 34 38 34 30 34	15 12 2 5 34 34 50 34 18 34
13 10 4 7 34 34 34 26 34 42	4 7 13 10 34 34 34 32 34 36	10 13 7 4 34 34 34 32 34 36
8 3 9 14 34 34 18 34 50 34	14 9 3 8 34 34 30 34 38 34	8 3 9 14 34 34 18 34 50 34
70/st\34/34 Compst-Sums	71/st\34/34 Compst-Sums	72/st\34/34 Compst-Sums
1 7 10 16 34 34 28 34 40 34	1 7 10 16 34 34 30 34 38 34	1 7 10 16 34 34 29 34 39 34
8 12 5 9 34 34 36 34 32 34	8 14 3 9 34 34 36 34 32 34	12 9 8 5 34 34 40 34 28 34
14 2 15 3 34 34 40 34 28 34	12 2 15 5 34 34 38 34 30 34	15 4 13 2 34 34 39 34 29 34
11 13 4 6 34 34 32 34 36 34	13 11 6 4 34 34 32 34 36 34	6 14 3 11 34 34 28 34 40 34
73/st\34/34 Compst-Sums	74/st\34/34 Compst-Sums	75/st\34/34 Compst-Sums
1 7 10 16 34 34 34 34 34 34	1 7 10 16 34 34 34 34 34 34	1 7 10 16 34 34 31 34 37 34
12 14 3 5 34 34 36 34 32 34	12 14 3 5 34 34 50 34 18 34	14 9 8 3 34 34 44 34 24 34
8 2 15 9 34 34 34 34 34 34	15 9 8 2 34 34 34 34 34 34	15 6 11 2 34 34 37 34 31 34
13 11 6 4 34 34 32 34 36 34	6 4 13 11 34 34 18 34 50 34	4 12 5 13 34 34 24 34 44 34
76/st\34/34 Compst-Sums	77/st\34/34 Compst-Sums	78/st\34/34 Compst-Sums
1 7 10 16 34 34 34 34 34 34	1 7 10 16 34 34 34 34 34 34	1 7 10 16 34 34 32 34 36 34
14 12 5 3 34 34 36 34 32 34	14 12 5 3 34 34 50 34 18 34	15 9 8 2 34 34 40 34 28 34
8 2 15 9 34 34 34 34 34 34	15 9 8 2 34 34 34 34 34 34	12 4 13 5 34 34 36 34 32 34
11 13 4 6 34 34 32 34 36 34	4 6 11 13 34 34 18 34 50 34	6 14 3 11 34 34 28 34 40 34

79/st\34/34 Compst-Sums	80/st\34/34 Compst-Sums	81/st\34/34 Compst-Sums
1 7 10 16 34 34 32 34 36 34	1 7 10 16 34 34 35 34 33 34	1 7 10 16 34 34 37 34 31 34
15 9 8 2 34 34 44 34 24 34	15 12 5 2 34 34 50 34 18 34	15 14 3 2 34 34 50 34 18 34
14 6 11 3 34 34 36 34 32 34	14 9 8 3 34 34 33 34 35 34	12 9 8 5 34 34 31 34 37 34
4 12 5 13 34 34 24 34 44 34	4 6 11 13 34 34 18 34 50 34	6 4 13 11 34 34 18 34 50 34
82/st\34/34 Compst-Sums	83/st\34/34 Compst-Sums	84/st\34/34 Compst-Sums
1 7 12 14 34 34 34 38 34 30	1 7 12 14 34 34 34 38 34 30	1 7 12 14 34 34 34 34 34 34
10 16 3 5 34 34 36 34 32 34	10 16 3 5 34 34 50 34 18 34	16 10 5 3 34 34 36 34 32 34
8 2 13 11 34 34 34 30 34 38	15 9 6 4 34 34 34 30 34 38	6 4 15 9 34 34 34 34 34 34
15 9 6 4 34 34 32 34 36 34	8 2 13 11 34 34 18 34 50 34	11 13 2 8 34 34 32 34 36 34
85/st\34/34 Compst-Sums	86/st\34/34 Compst-Sums	87/st\34/34 Compst-Sums
1 7 12 14 34 34 34 34 34 34	1 7 14 12 34 34 29 36 39 32	1 7 14 12 34 34 32 40 36 28
16 10 5 3 34 34 50 34 18 34	8 13 2 11 34 34 34 34 34 34	9 15 4 6 34 34 34 34 34 34
13 11 8 2 34 34 34 34 34 34	9 4 15 6 34 34 39 32 29 36	8 2 13 11 34 34 36 28 32 40
4 6 9 15 34 34 18 34 50 34	16 10 3 5 34 34 34 34 34 34	16 10 3 5 34 34 34 34 34 34
88/st\34/34 Compst-Sums	89/st\34/34 Compst-Sums	90/st\34/34 Compst-Sums
1 7 14 12 34 34 32 40 36 28	1 7 14 12 34 34 34 42 34 26	1 7 14 12 34 34 34 42 34 26
9 15 4 6 34 34 50 34 18 34	10 16 5 3 34 34 36 34 32 34	10 16 5 3 34 34 50 34 18 34
16 10 5 3 34 34 36 28 32 40	8 2 11 13 34 34 34 26 34 42	15 9 4 6 34 34 34 26 34 42
8 2 11 13 34 34 18 34 50 34	15 9 4 6 34 34 32 34 36 34	8 2 11 13 34 34 18 34 50 34
91/st\34/34 Compst-Sums	92/st\34/34 Compst-Sums	93/st\34/34 Compst-Sums
1 7 14 12 34 34 32 36 36 32	1 7 14 12 34 34 34 34 34 34	1 7 14 12 34 34 34 34 34 34
11 13 2 8 34 34 34 34 34 34	16 10 3 5 34 34 36 34 32 34	16 10 3 5 34 34 50 34 18 34
6 4 15 9 34 34 36 32 32 36	4 6 15 9 34 34 34 34 34 34	11 13 8 2 34 34 34 34 34 34
16 10 3 5 34 34 34 34 34 34	13 11 2 8 34 34 32 34 36 34	6 4 9 15 34 34 18 34 50 34
94/st\34/34 Compst-Sums	95/st\34/34 Compst-Sums	96/st\34/34 Compst-Sums
1 7 16 10 34 34 32 40 36 28	1 7 16 10 34 34 34 42 34 26	1 7 16 10 34 34 34 42 34 26
11 13 4 6 34 34 50 34 18 34	12 14 5 3 34 34 36 34 32 34	12 14 5 3 34 34 50 34 18 34
14 12 5 3 34 34 36 28 32 40	6 4 11 13 34 34 34 26 34 42	13 11 4 6 34 34 34 26 34 42
8 2 9 15 34 34 18 34 50 34	15 9 2 8 34 34 32 34 36 34	8 2 9 15 34 34 18 34 50 34
97/st\34/34 Compst-Sums	98/st\34/34 Compst-Sums	99/st\34/34 Compst-Sums
1 7 16 10 34 34 34 38 34 30	1 7 16 10 34 34 34 38 34 30	1 7 16 10 34 34 35 40 33 28
14 12 3 5 34 34 36 34 32 34	14 12 3 5 34 34 50 34 18 34	14 13 4 3 34 34 50 34 18 34
4 6 13 11 34 34 34 30 34 38	11 13 6 4 34 34 34 30 34 38	11 12 5 6 34 34 33 28 35 40
15 9 2 8 34 34 32 34 36 34	8 2 9 15 34 34 18 34 50 34	8 2 9 15 34 34 18 34 50 34
100/st\34/34 Compst-Sums	101/st\34/34 Compst-Sums	102/PD\34/34 Compst-Sums
1 8 9 16 34 34 36 34 32 34	1 8 10 15 34 34 34 36 34 32	1 8 10 15 34 34 34 34 34 34
14 13 4 3 34 34 36 34 32 34	11 14 4 5 34 34 50 34 18 34	12 13 3 6 34 34 34 34 34 34
7 2 15 10 34 34 32 34 36 34	16 9 7 2 34 34 34 32 34 36	7 2 16 9 34 34 34 34 34 34
12 11 6 5 34 34 32 34 36 34	6 3 13 12 34 34 18 34 50 34	14 11 5 4 34 34 34 34 34 34
103/st\34/34 Compst-Sums	104/PD\34/34 Compst-Sums	105/st\34/34 Compst-Sums
1 8 10 15 34 34 34 36 34 32	1 8 10 15 34 34 34 34 34 34	1 8 10 15 34 34 38 34 30 34
13 12 6 3 34 34 50 34 18 34	14 11 5 4 34 34 34 34 34 34	16 13 3 2 34 34 38 34 30 34
16 9 7 2 34 34 34 32 34 36	7 2 16 9 34 34 34 34 34 34	5 4 14 11 34 34 30 34 38 34
4 5 11 14 34 34 18 34 50 34	12 13 3 6 34 34 34 34 34 34	12 9 7 6 34 34 30 34 38 34
106/st\34/34 Compst-Sums	107/PD\34/34 Compst-Sums	108/st\34/34 Compst-Sums
1 8 11 14 34 34 34 38 34 30	1 8 11 14 34 34 34 34 34 34	1 8 11 14 34 34 34 38 34 30
10 15 4 5 34 34 50 34 18 34	12 13 2 7 34 34 34 34 34 34	13 12 7 2 34 34 50 34 18 34
16 9 6 3 34 34 34 30 34 38	6 3 16 9 34 34 34 34 34 34	16 9 6 3 34 34 34 30 34 38
7 2 13 12 34 34 18 34 50 34	15 10 5 4 34 34 34 34 34 34	4 5 10 15 34 34 18 34 50 34
109/PD\34/34 Compst-Sums	110/st\34/34 Compst-Sums	111/st\34/34 Compst-Sums
1 8 11 14 34 34 34 34 34 34	1 8 12 13 34 34 34 38 34 30	1 8 12 13 34 34 34 36 34 32
15 10 5 4 34 34 34 34 34 34	10 15 3 6 34 34 34 34 34 34	11 14 2 7 34 34 34 34 34 34
6 3 16 9 34 34 34 34 34 34	7 2 14 11 34 34 34 30 34 38	6 3 15 10 34 34 34 32 34 36
12 13 2 7 34 34 34 34 34 34	16 9 5 4 34 34 34 34 34 34	16 9 5 4 34 34 34 34 34 34
112/SC\34/34 Compst-Sums	113/SC\34/34 Compst-Sums	114/st\34/34 Compst-Sums
1 8 12 13 34 34 34 38 34 30	1 8 12 13 34 34 34 36 34 32	1 8 13 12 34 34 34 42 34 26
14 11 7 2 34 34 50 34 18 34	15 10 6 3 34 34 50 34 18 34	10 15 6 3 34 34 50 34 18 34
15 10 6 3 34 34 34 30 34 38	14 11 7 2 34 34 34 32 34 36	16 9 4 5 34 34 34 26 34 42
4 5 9 16 34 34 18 34 50 34	4 5 9 16 34 34 18 34 50 34	7 2 11 14 34 34 18 34 50 34



115/st\34\34 Compst-Sums	116/PD\34\34 Compst-Sums	117/PD\34\34 Compst-Sums
1 8 13 12 34 34 34 42 34 26	1 8 13 12 34 34 34 34 34 34	1 8 13 12 34 34 34 34 34 34
11 14 7 2 34 34 50 34 18 34	14 11 2 7 34 34 34 34 34 34	15 10 3 6 34 34 34 34 34 34
16 9 4 5 34 34 34 26 34 42	4 5 16 9 34 34 34 34 34 34	4 5 16 9 34 34 34 34 34 34
6 3 10 15 34 34 18 34 50 34	15 10 3 6 34 34 34 34 34 34	14 11 2 7 34 34 34 34 34 34
118/st\34\34 Compst-Sums	119/st\34\34 Compst-Sums	120/SC\34\34 Compst-Sums
1 8 13 12 34 34 36 34 32 34	1 8 14 11 34 34 34 42 34 26	1 8 14 11 34 34 34 42 34 26
16 11 2 5 34 34 36 34 32 34	10 15 5 4 34 34 34 34 34 34	12 13 7 2 34 34 50 34 18 34
3 6 15 10 34 34 32 34 36 34	7 2 12 13 34 34 34 26 34 42	15 10 4 5 34 34 34 26 34 42
14 9 4 7 34 34 32 34 36 34	16 9 3 6 34 34 34 34 34 34	6 3 9 16 34 34 18 34 50 34
121/st\34\34 Compst-Sums	122/SC\34\34 Compst-Sums	123/st\34\34 Compst-Sums
1 8 14 11 34 34 34 36 34 32	1 8 14 11 34 34 34 36 34 32	1 8 15 10 34 34 34 42 34 26
13 12 2 7 34 34 34 34 34 34	15 10 4 5 34 34 50 34 18 34	11 14 5 4 34 34 34 34 34 34
4 5 15 10 34 34 34 32 34 36	12 13 7 2 34 34 34 32 34 36	6 3 12 13 34 34 34 26 34 42
16 9 3 6 34 34 34 34 34 34	6 3 9 16 34 34 18 34 50 34	16 9 2 7 34 34 34 34 34 34
124/SC\34\34 Compst-Sums	125/st\34\34 Compst-Sums	126/SC\34\34 Compst-Sums
1 8 15 10 34 34 34 42 34 26	1 8 15 10 34 34 34 38 34 30	1 8 15 10 34 34 34 38 34 30
12 13 6 3 34 34 50 34 18 34	13 12 3 6 34 34 34 34 34 34	14 11 4 5 34 34 50 34 18 34
14 11 4 5 34 34 34 26 34 42	4 5 14 11 34 34 34 30 34 38	12 13 6 3 34 34 34 30 34 38
7 2 9 16 34 34 18 34 50 34	16 9 2 7 34 34 34 34 34 34	7 2 9 16 34 34 18 34 50 34
127/st\34\34 Compst-Sums	128/st\34\34 Compst-Sums	129/st\34\34 Compst-Sums
1 9 8 16 34 34 39 34 29 34	1 9 16 8 34 34 36 42 32 26	1 9 16 8 34 34 37 42 31 26
14 15 2 3 34 34 40 34 28 34	14 12 5 3 34 34 36 34 32 34	15 12 5 2 34 34 38 34 30 34
7 4 13 10 34 34 29 34 39 34	4 6 11 13 34 34 32 26 36 42	4 7 10 13 34 34 31 26 37 42
12 6 11 5 34 34 28 34 40 34	15 7 2 10 34 34 32 34 36 34	14 6 3 11 34 34 30 34 38 34
130/st\34\34 Compst-Sums	131/st\34\34 Compst-Sums	132/st\34\34 Compst-Sums
1 10 7 16 34 34 31 34 37 34	1 10 7 16 34 34 36 34 32 34	1 10 7 16 34 34 38 34 30 34
12 8 9 5 34 34 38 34 30 34	12 13 4 5 34 34 48 34 20 34	12 15 2 5 34 34 38 34 30 34
15 3 14 2 34 34 37 34 31 34	15 8 9 2 34 34 32 34 36 34	8 3 14 9 34 34 30 34 38 34
6 13 4 11 34 34 30 34 38 34	6 3 14 11 34 34 20 34 48 34	13 6 11 4 34 34 30 34 38 34
133/st\34\34 Compst-Sums	134/st\34\34 Compst-Sums	135/st\34\34 Compst-Sums
1 10 7 16 34 34 33 34 35 34	1 10 7 16 34 34 36 34 32 34	1 10 7 16 34 34 40 34 28 34
14 8 9 3 34 34 42 34 26 34	14 11 6 3 34 34 48 34 20 34	14 15 2 3 34 34 42 34 26 34
15 5 12 2 34 34 35 34 33 34	15 8 9 2 34 34 32 34 36 34	8 5 12 9 34 34 28 34 40 34
4 11 6 13 34 34 26 34 42 34	4 5 12 13 34 34 20 34 48 34	11 4 13 6 34 34 26 34 42 34
136/st\34\34 Compst-Sums	137/st\34\34 Compst-Sums	138/st\34\34 Compst-Sums
1 10 7 16 34 34 34 34 34 34	1 10 7 16 34 34 34 34 34 34	1 10 7 16 34 34 37 34 31 34
15 8 9 2 34 34 38 34 30 34	15 8 9 2 34 34 42 34 26 34	15 11 6 2 34 34 48 34 20 34
12 3 14 5 34 34 34 34 34 34	14 5 12 3 34 34 34 34 34 34	14 8 9 3 34 34 31 34 37 34
6 13 4 11 34 34 30 34 38 34	4 11 6 13 34 34 26 34 42 34	4 5 12 13 34 34 20 34 48 34
139/st\34\34 Compst-Sums	140/st\34\34 Compst-Sums	141/st\34\34 Compst-Sums
1 10 7 16 34 34 39 34 29 34	1 10 8 15 34 34 34 34 34 34	1 10 8 15 34 34 34 34 34 34
15 13 4 2 34 34 48 34 20 34	16 7 9 2 34 34 38 34 30 34	16 7 9 2 34 34 42 34 26 34
12 8 9 5 34 34 29 34 39 34	11 4 14 5 34 34 34 34 34 34	13 6 12 3 34 34 34 34 34 34
6 3 14 11 34 34 20 34 48 34	6 13 3 12 34 34 30 34 38 34	4 11 5 14 34 34 26 34 42 34
142/st\34\34 Compst-Sums	143/st\34\34 Compst-Sums	144/st\34\34 Compst-Sums
1 10 8 15 34 34 40 34 28 34	1 10 15 8 34 34 36 44 32 24	1 10 15 8 34 34 36 40 32 28
16 13 3 2 34 34 38 34 30 34	12 13 6 3 34 34 34 34 34 34	14 11 4 5 34 34 34 34 34 34
5 4 14 11 34 34 28 34 40 34	5 4 11 14 34 34 32 24 36 44	3 6 13 12 34 34 32 28 36 40
12 7 9 6 34 34 30 34 38 34	16 7 2 9 34 34 34 34 34 34	16 7 2 9 34 34 34 34 34 34
145/st\34\34 Compst-Sums	146/st\34\34 Compst-Sums	147/st\34\34 Compst-Sums
1 10 15 8 34 34 33 34 35 34	1 10 15 8 34 34 34 34 34 34	1 10 15 8 34 34 34 34 34 34
16 6 3 9 34 34 38 34 30 34	16 7 2 9 34 34 38 34 30 34	16 7 2 9 34 34 42 34 26 34
5 11 14 4 34 34 35 34 33 34	4 11 14 5 34 34 34 34 34 34	6 13 12 3 34 34 34 34 34 34
12 7 2 13 34 34 30 34 38 34	13 6 3 12 34 34 30 34 38 34	11 4 5 14 34 34 26 34 42 34
148/st\34\34 Compst-Sums	149/st\34\34 Compst-Sums	150/st\34\34 Compst-Sums
1 10 16 7 34 34 34 36 34 32	1 10 16 7 34 34 34 36 34 32	1 11 6 16 34 34 32 34 36 34
15 8 2 9 34 34 38 34 30 34	15 8 2 9 34 34 42 34 26 34	12 8 9 5 34 34 36 34 32 34
4 11 13 6 34 34 34 32 34 36	6 13 11 4 34 34 34 32 34 36	14 2 15 3 34 34 36 34 32 34
14 5 3 12 34 34 30 34 38 34	12 3 5 14 34 34 26 34 42 34	7 13 4 10 34 34 32 34 36 34



151/st\34/34 Compst-Sums	152/st\34/34 Compst-Sums	153/st\34/34 Compst-Sums
1 11 6 16 34 34 38 34 30 34	1 11 6 16 34 34 38 34 30 34	1 11 6 16 34 34 39 34 29 34
12 14 3 5 34 34 36 34 32 34	12 14 3 5 34 34 46 34 22 34	13 14 3 4 34 34 46 34 22 34
8 2 15 9 34 34 30 34 38 34	13 7 10 4 34 34 30 34 38 34	12 7 10 5 34 34 29 34 39 34
13 7 10 4 34 34 32 34 36 34	8 2 15 9 34 34 22 34 46 34	8 2 15 9 34 34 22 34 46 34
154/st\34/34 Compst-Sums	155/st\34/34 Compst-Sums	156/st\34/34 Compst-Sums
1 11 6 16 34 34 34 34 34 34	1 11 6 16 34 34 34 34 34 34	1 11 6 16 34 34 39 34 29 34
14 8 9 3 34 34 36 34 32 34	14 8 9 3 34 34 42 34 26 34	14 13 4 3 34 34 36 34 32 34
12 2 15 5 34 34 34 34 34 34	15 5 12 2 34 34 34 34 34 34	7 2 15 10 34 34 29 34 39 34
7 13 4 10 34 34 32 34 36 34	4 10 7 13 34 34 26 34 42 34	12 8 9 5 34 34 32 34 36 34
157/st\34/34 Compst-Sums	158/st\34/34 Compst-Sums	159/st\34/34 Compst-Sums
1 11 6 16 34 34 35 34 33 34	1 11 6 16 34 34 41 34 27 34	1 11 8 14 34 34 34 34 34 34
15 8 9 2 34 34 42 34 26 34	15 14 3 2 34 34 42 34 26 34	16 6 9 3 34 34 36 34 32 34
14 5 12 3 34 34 33 34 35 34	8 5 12 9 34 34 27 34 41 34	10 4 15 5 34 34 34 34 34 34
4 10 7 13 34 34 26 34 42 34	10 4 13 7 34 34 26 34 42 34	7 13 2 12 34 34 32 34 36 34
160/st\34/34 Compst-Sums	161/st\34/34 Compst-Sums	162/st\34/34 Compst-Sums
1 11 8 14 34 34 34 34 34 34	1 11 14 8 34 34 33 34 35 34	1 11 14 8 34 34 34 34 34 34
16 6 9 3 34 34 42 34 26 34	16 5 4 9 34 34 40 34 28 34	16 6 3 9 34 34 36 34 32 34
13 7 12 2 34 34 34 34 34 34	7 12 13 2 34 34 35 34 33 34	4 10 15 5 34 34 34 34 34 34
4 10 5 15 34 34 26 34 42 34	10 6 3 15 34 34 28 34 40 34	13 7 2 12 34 34 32 34 36 34
163/st\34/34 Compst-Sums	164/st\34/34 Compst-Sums	165/st\34/34 Compst-Sums
1 11 14 8 34 34 34 34 34 34	1 11 16 6 34 34 34 38 34 30	1 11 16 6 34 34 34 38 34 30
16 6 3 9 34 34 42 34 26 34	14 8 3 9 34 34 36 34 32 34	14 8 3 9 34 34 42 34 26 34
7 13 12 2 34 34 34 34 34 34	4 10 13 7 34 34 34 30 34 38	7 13 10 4 34 34 34 30 34 38
10 4 5 15 34 34 26 34 42 34	15 5 2 12 34 34 32 34 36 34	12 2 5 15 34 34 26 34 42 34
166/st\34/34 Compst-Sums	167/st\34/34 Compst-Sums	168/st\34/34 Compst-Sums
1 12 5 16 34 34 36 34 32 34	1 12 5 16 34 34 37 34 31 34	1 12 5 16 34 34 41 34 27 34
14 9 8 3 34 34 44 34 24 34	15 9 8 2 34 34 44 34 24 34	15 13 4 2 34 34 44 34 24 34
15 6 11 2 34 34 32 34 36 34	14 6 11 3 34 34 31 34 37 34	10 6 11 7 34 34 27 34 41 34
4 7 10 13 34 34 24 34 44 34	4 7 10 13 34 34 24 34 44 34	8 3 14 9 34 34 24 34 44 34
169/st\34/34 Compst-Sums	170/st\34/34 Compst-Sums	171/PD\34/34 Compst-Sums
1 12 6 15 34 34 34 36 34 32	1 12 6 15 34 34 36 36 32 32	1 12 6 15 34 34 34 34 34 34
13 8 10 3 34 34 42 34 26 34	13 10 8 3 34 34 46 34 22 34	14 7 9 4 34 34 34 34 34 34
16 5 11 2 34 34 34 32 34 36	16 7 9 2 34 34 32 32 36 36	11 2 16 5 34 34 34 34 34 34
4 9 7 14 34 34 26 34 42 34	4 5 11 14 34 34 22 34 46 34	8 13 3 10 34 34 34 34 34 34
172/st\34/34 Compst-Sums	173/st\34/34 Compst-Sums	174/PD\34/34 Compst-Sums
1 12 6 15 34 34 38 34 30 34	1 12 7 14 34 34 34 38 34 30	1 12 7 14 34 34 34 34 34 34
16 9 7 2 34 34 46 34 22 34	13 8 11 2 34 34 42 34 26 34	15 6 9 4 34 34 34 34 34 34
13 8 10 3 34 34 30 34 38 34	16 5 10 3 34 34 34 30 34 38	10 3 16 5 34 34 34 34 34 34
4 5 11 14 34 34 22 34 46 34	4 9 6 15 34 34 26 34 42 34	8 13 2 11 34 34 34 34 34 34
175/SC\34/34 Compst-Sums	176/SC\34/34 Compst-Sums	177/PD\34/34 Compst-Sums
1 12 8 13 34 34 34 38 34 30	1 12 8 13 34 34 34 36 34 32	1 12 13 8 34 34 34 34 34 34
14 7 11 2 34 34 42 34 26 34	15 6 10 3 34 34 42 34 26 34	14 7 2 11 34 34 34 34 34 34
15 6 10 3 34 34 34 30 34 38	14 7 11 2 34 34 34 32 34 36	4 9 16 5 34 34 34 34 34 34
4 9 5 16 34 34 26 34 42 34	4 9 5 16 34 34 26 34 42 34	15 6 3 10 34 34 34 34 34 34
178/PD\34/34 Compst-Sums	179/st\34/34 Compst-Sums	180/st\34/34 Compst-Sums
1 12 13 8 34 34 34 34 34 34	1 12 13 8 34 34 38 38 30 30	1 12 13 8 34 34 36 34 32 34
15 6 3 10 34 34 34 34 34 34	15 10 3 6 34 34 34 34 34 34	16 7 2 9 34 34 36 34 32 34
4 9 16 5 34 34 34 34 34 34	2 7 14 11 34 34 30 30 38 38	3 10 15 6 34 34 32 34 36 34
14 7 2 11 34 34 34 34 34 34	16 5 4 9 34 34 34 34 34 34	14 5 4 11 34 34 32 34 36 34
181/st\34/34 Compst-Sums	182/st\34/34 Compst-Sums	183/SC\34/34 Compst-Sums
1 12 13 8 34 34 38 38 30 30	1 12 14 7 34 34 34 36 34 32	1 12 14 7 34 34 34 36 34 32
16 9 4 5 34 34 34 34 34 34	13 8 2 11 34 34 34 34 34 34	15 6 4 9 34 34 42 34 26 34
2 7 14 11 34 34 30 30 38 38	4 9 15 6 34 34 34 32 34 36	8 13 11 2 34 34 34 32 34 36
15 6 3 10 34 34 34 34 34 34	16 5 3 10 34 34 34 34 34 34	10 3 5 16 34 34 26 34 42 34
184/st\34/34 Compst-Sums	185/SC\34/34 Compst-Sums	186/st\34/34 Compst-Sums
1 12 15 6 34 34 34 38 34 30	1 12 15 6 34 34 34 38 34 30	1 12 15 6 34 34 36 40 32 28
13 8 3 10 34 34 34 34 34 34	14 7 4 9 34 34 42 34 26 34	14 9 4 7 34 34 34 34 34 34
4 9 14 7 34 34 34 30 34 38	8 13 10 3 34 34 34 30 34 38	3 8 13 10 34 34 32 28 36 40
16 5 2 11 34 34 34 34 34 34	11 2 5 16 34 34 26 34 42 34	16 5 2 11 34 34 34 34 34 34

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187/st\34/34|Compst-Sums|      188/st\34/34|Compst-Sums|      189/st\34/34|Compst-Sums|
1 13 4 16|34|34|36 34 32 34|  1 13 4 16|34|34|40 34 28 34|  1 13 4 16|34|34|37 34 31 34|
14 8 9 3|34|34|36 34 32 34|  14 12 5 3|34|34|36 34 32 34|  15 8 9 2|34|34|38 34 30 34|
12 2 15 5|34|34|32 34 36 34|  8 2 15 9|34|34|28 34 40 34|  12 3 14 5|34|34|31 34 37 34|
7 11 6 10|34|34|32 34 36 34|  11 7 10 6|34|34|32 34 36 34|  6 10 7 11|34|34|30 34 38 34|

190/st\34/34|Compst-Sums|      191/st\34/34|Compst-Sums|      192/st\34/34|Compst-Sums|
1 13 4 16|34|34|41 34 27 34|  1 13 8 12|34|34|34 34 34 34|  1 13 8 12|34|34|34 34 34 34|
15 12 5 2|34|34|38 34 30 34|  16 4 9 5|34|34|36 34 32 34|  16 4 9 5|34|34|38 34 30 34|
8 3 14 9|34|34|27 34 41 34|  10 6 15 3|34|34|34 34 34 34|  11 7 14 2|34|34|34 34 34 34|
10 6 11 7|34|34|30 34 38 34|  7 11 2 14|34|34|32 34 36 34|  6 10 3 15|34|34|30 34 38 34|

193/st\34/34|Compst-Sums|      194/st\34/34|Compst-Sums|      195/st\34/34|Compst-Sums|
1 13 8 12|34|34|41 34 27 34|  1 13 12 8|34|34|39 38 29 30|  1 13 12 8|34|34|34 34 34 34|
16 11 2 5|34|34|36 34 32 34|  15 10 3 6|34|34|34 34 34 34|  16 4 5 9|34|34|36 34 32 34|
3 6 15 10|34|34|27 34 41 34|  2 7 14 11|34|34|29 30 39 38|  6 10 15 3|34|34|34 34 34 34|
14 4 9 7|34|34|32 34 36 34|  16 4 5 9|34|34|34 34 34 34|  11 7 2 14|34|34|32 34 36 34|

196/st\34/34|Compst-Sums|      197/st\34/34|Compst-Sums|      198/st\34/34|Compst-Sums|
1 13 12 8|34|34|34 34 34 34|  1 13 12 8|34|34|37 34 31 34|  1 14 3 16|34|34|39 34 29 34|
16 4 5 9|34|34|38 34 30 34|  16 7 2 9|34|34|36 34 32 34|  15 9 8 2|34|34|40 34 28 34|
7 11 14 2|34|34|34 34 34 34|  3 10 15 6|34|34|31 34 37 34|  12 4 13 5|34|34|29 34 39 34|
10 6 3 15|34|34|30 34 38 34|  14 4 5 11|34|34|32 34 36 34|  6 7 10 11|34|34|28 34 40 34|

199/st\34/34|Compst-Sums|      200/st\34/34|Compst-Sums|      201/PD\34/34|Compst-Sums|
1 14 3 16|34|34|41 34 27 34|  1 14 4 15|34|34|42 34 26 34|  1 14 7 12|34|34|34 34 34 34|
15 11 6 2|34|34|40 34 28 34|  16 11 5 2|34|34|42 34 26 34|  15 4 9 6|34|34|34 34 34 34|
10 4 13 7|34|34|27 34 41 34|  9 6 12 7|34|34|26 34 42 34|  10 5 16 3|34|34|34 34 34 34|
8 5 12 9|34|34|28 34 40 34|  8 3 13 10|34|34|26 34 42 34|  8 11 2 13|34|34|34 34 34 34|

202/st\34/34|Compst-Sums|      203/SC\34/34|Compst-Sums|      204/PD\34/34|Compst-Sums|
1 14 7 12|34|34|36 36 32 32|  1 14 8 11|34|34|34 36 34 32|  1 14 11 8|34|34|34 34 34 34|
16 5 10 3|34|34|34 34 34 34|  15 4 10 5|34|34|38 34 30 34|  15 4 5 10|34|34|34 34 34 34|
9 4 15 6|34|34|32 32 36 36|  12 7 13 2|34|34|34 32 34 36|  6 9 16 3|34|34|34 34 34 34|
8 11 2 13|34|34|34 34 34 34|  6 9 3 16|34|34|30 34 38 34|  12 7 2 13|34|34|34 34 34 34|

205/st\34/34|Compst-Sums|      206/SC\34/34|Compst-Sums|      207/st\34/34|Compst-Sums|
1 14 11 8|34|34|36 34 32 34|  1 14 12 7|34|34|34 36 34 32|  1 15 4 14|34|34|42 34 26 34|
16 5 4 9|34|34|40 34 28 34|  15 4 6 9|34|34|38 34 30 34|  16 10 5 3|34|34|42 34 26 34|
7 12 13 2|34|34|32 34 36 34|  8 11 13 2|34|34|34 32 34 36|  9 7 12 6|34|34|26 34 42 34|
10 3 6 15|34|34|28 34 40 34|  10 5 3 16|34|34|30 34 38 34|  8 2 13 11|34|34|26 34 42 34|

208/st\34/34|Compst-Sums|      209/st\34/34|Compst-Sums|      409/st\34/34|Compst-Sums|
1 15 10 8|34|34|38 34 30 34|  2 1 15 16|34|34|30 32 38 36|  3 1 14 16|34|34|27 32 41 36|
16 6 3 9|34|34|38 34 30 34|  14 13 3 4|34|34|46 34 22 34|  8 15 2 9|34|34|42 34 26 34|
5 11 14 4|34|34|30 34 38 34|  11 8 10 5|34|34|38 36 30 32|  13 6 11 4|34|34|41 36 27 32|
12 2 7 13|34|34|30 34 38 34|  7 12 6 9|34|34|22 34 46 34|  10 12 7 5|34|34|26 34 42 34|

575/st\34/34|Compst-Sums|      753/st\34/34|Compst-Sums|      817/st\34/34|Compst-Sums|
4 1 13 16|34|34|34 32 34 36|  5 1 16 12|34|34|30 38 38 30|  6 1 15 12|34|34|34 34 34 34|
14 15 3 2|34|34|42 34 26 34|  10 14 7 3|34|34|36 34 32 34|  11 16 2 5|34|34|50 34 18 34|
7 6 10 11|34|34|34 36 34 32|  8 4 9 13|34|34|38 30 30 38|  10 13 3 8|34|34|34 34 34 34|
9 12 8 5|34|34|26 34 42 34|  11 15 2 6|34|34|32 34 36 34|  7 4 14 9|34|34|18 34 50 34|

865/st\34/34|Compst-Sums|
7 1 16 10|34|34|28 42 40 26|
6 14 11 3|34|34|36 34 32 34|
12 4 5 13|34|34|40 26 28 42|
9 15 2 8|34|34|32 34 36 34|
(SC:'Self-Complementary', PD:'Pan-Diagonal',
st:'Standard' Type)

```

[Total Count of Standard Solutions = 880; Counts of Types: 48/SC, 48/PD, 880/st]

\*\* Calculated and Listed by Kanji Setsuda  
on April 23, 2013 with MacOSX 10.8.3 & Xcode 4.6.2 \*\*

As I was afraid it might get too long to list out all the 880 solutions, I skipped printing almost all of them when  $n_1 > 1$ . But you can probably understand the outlines of their Composite Patterns, I hope.

Could you find anything meaningful here in this list?

- (1) The solutions marked with /PD mean 'Pan-Diagonal' type. Every rows, columns and pan-diagonals of them do not only add up to the constant sum 34, but every Composite 2x2 little squares also add up to the same sum and no exceptions could be found. How beautiful they are!
- (2) The solutions with /SC mean 'Self-Complementary' type. All symmetric pairs with respect to the geometric center of square obey the next Complementary Conditions:  $n_1+n_{16}=n_2+n_{15}=n_3+n_{14}=n_4+n_{13}=n_5+n_{12}=n_6+n_{11}=n_7+n_{10}=n_8+n_9=17$   
While every rows, columns and 2 primary diagonals add up to the constant sum 34, only half counts of Composite 2x2 units of them add up to the same sum. Their positions seem to be steady and no exceptions could be found.
- (3) The other solutions with /st mean 'Standard' type. Every rows, columns and two primary diagonals add up to the same 34, but the constant Composite Sums look quite irregular in their counts and positions. It might be difficult for you to find any rules here that make any sense.  
But when you watch them carefully and patiently, you could finally find at least four Composite units add up to the constant 34 in any solution. Their positions seem to be steady. It surely makes any sense. We must verify that by reconstructing our object actually with these presupposed rules.

#### #4. Reconstruction of 'Self-Complimentary MS44' by our new definitions

About the case of Pan-diagonal MS44, I want to skip showing its reconstruction here, because I already reported about it in the article of previous section.

Let's come directly to the case of reconstructing Self-complementary MS44 at first, by using the 'selected' Composite Conditions and some additional ones.

Watch the next list of definitions, please.

[Contrast: Classic Definitions Left; New Definitions Right; Common at the Bottom]

```

** Basic Conditions: C=34 **
n1+n2+n3+n4=C ...row1;
n5+n6+n7+n8=C ...row2;
n9+n10+n11+n12=C ...row3;
n13+n14+n15+n16=C ...row4;
n1+n5+n9+n13=C ...c1m1;
n2+n6+n10+n14=C ...c1m2;
n3+n7+n11+n15=C ...c1m3;
n4+n8+n12+n16=C ...c1m4;
n1+n6+n11+n16=C ...prd1;
n4+n7+n10+n13=C ...prd2;

** Composite Conditions: C=34 **
n1+n2+n5+n6=C ...C01;
n3+n4+n7+n8=C ...C03;
n6+n7+n10+n11=C ...C06;
n8+n5+n12+n9=C ...C08;
n9+n10+n13+n14=C ...C09;
n11+n12+n15+n16=C ...C11;
n14+n15+n2+n3=C ...C14;
n16+n13+n4+n1=C ...C16;

** Additional Conditions **
n1+n2+n3+n4=C ...Ad1;
n1+n5+n9+n13=C ...Ad2;
n1+n6+n11+n16=C ...Ad3;

** Self-complementary Conditions: CC=17 ** \
n1+n16=n2+n15=n3+n14=n4+n13=n5+n12=n6+n11=n7+n10=n8+n9=CC ...cc;

** List-forming Inequality Conditions for Standard Solutions: **
n1<n4, n1<n13, n1<n16 and n2<n5

```

The new list presented on the right hand side defines what we would have now to make our Self-Complementary MS44. It has the 8 equations of Composite Sums and the additional 3 equations. We absolutely need to have the last 3 to reconstruct our object. This is what I have found by my experiments.

The last equation of the first primary diagonal:  $n_1+n_6+n_{11}+n_{16}=C \dots Ad3$ ; is not always necessary for our first definition stage, only when we accept the last common equations for the 'Self-complementary Conditions'.

$$n_1+n_6+n_{11}+n_{16}=(n_1+n_{16})+(n_6+n_{11})=CC+CC=17+17=34=C \dots cc;$$

Now in this section let's examine the following two cases: (1) **With** those 'Self-complementary Conditions' and (2) **Without** the same conditions.

But, how do we deal with the other eight Composite Conditions un-defined?

```

*** List 2: New Conditions for Composite Sums: C=34; ***
** 'Positive' Conditions **
n1+n2+n5+n6=C ...C01; 4| 1| 2| 3| 4| 1
n3+n4+n7+n8=C ...C03; |---+---+---+---|
n6+n7+n10+n11=C ...C06; 8| 5| 6| 7| 8| 5
n8+n5+n12+n9=C ...C08; |---+---+---+---|
n9+n10+n13+n14=C ...C09; 12| 9|10|11|12| 9
n11+n12+n15+n16=C ...C11; |---+---+---+---|
n14+n15+n2+n3=C ...C14; 16|13|14|15|16|13
n16+n13+n4+n1=C ...C16; '-----'
                        4 1 2 3 4 1
** 'Negative' Conditions **
n2+n3+n6+n7!=C ...C02;
n4+n1+n8+n5!=C ...C04;
n5+n6+n9+n10!=C ...C05;
n7+n8+n11+n12!=C ...C07;
n10+n11+n14+n15!=C ...C10;
n12+n9+n16+n13!=C ...C12;
n13+n14+n15+n16!=C ...C13;
n15+n16+n3+n4!=C ...C15;
('!=' means 'Not Equal to')

```

Watch those conditions in red on the right hand side above. Before all we must decide our attitude how to deal with them.

If we only keep them 'undefined' in our program, the 8 counts of red quartets above will not refuse to add up to the same 34, so that we will have various types of MS44 included in the solution list. We cannot deny anything unexpected.

But if we clearly dictate them in our program, those 8 red quartets cannot add up to 34 and only the 8 blue ones left above can fulfill our presupposition.

Therefore we should now adopt the definite dictation even to those 8 'Negative' conditions in red above. I would like to call the 'exclusive mode' for this style.

The next 2 lists of solutions show what we have got by our new definitions:

(1) **Without** the Self-complementary Conditions, and (2) **With** those Conditions.

[List 1: Standard Magic Squares 4x4 Composed by the Exclusive Method  
List of Standard Solutions without the 'Self-complementary Conditions']

\Primary diagonals|Rows|Columns|'Composite 2x2 units'| \*\*

```

1#\34/34|Compst-Sums|          3#\34/34|Compst-Sums|          5#\34/34|Compst-Sums|
1  4 14 15|34|34|34 36 34 32| 1  4 15 14|34|34|34 38 34 30| 1  4 16 13|34|34|34 38 34 30|
13 16  2  3|34|34|42 34 26 34| 13 16  3  2|34|34|42 34 26 34| 14 15  3  2|34|34|42 34 26 34|
 8  5 11 10|34|34|34 32 34 36|  8  5 10 11|34|34|34 30 34 38|  7  6 10 11|34|34|34 30 34 38|
12  9  7  6|34|34|26 34 42 34| 12  9  6  7|34|34|26 34 42 34| 12  9  5  8|34|34|26 34 42 34|

7#\34/34|Compst-Sums|          9#\34/34|Compst-Sums|          11#\34/34|Compst-Sums|
1  4 16 13|34|34|34 36 34 32| 1  6 12 15|34|34|34 36 34 32| 1  6 15 12|34|34|34 42 34 26|
15 14  2  3|34|34|42 34 26 34| 11 16  2  5|34|34|38 34 30 34| 11 16  5  2|34|34|38 34 30 34|
 6  7 11 10|34|34|34 32 34 36|  8  3 13 10|34|34|34 32 34 36|  8  3 10 13|34|34|34 26 34 42|
12  9  5  8|34|34|26 34 42 34| 14  9  7  4|34|34|30 34 38 34| 14  9  4  7|34|34|30 34 38 34|

13#\34/34|Compst-Sums|          15#\34/34|Compst-Sums|          17#\34/34|Compst-Sums|
1  6 16 11|34|34|34 42 34 26| 1  6 16 11|34|34|34 36 34 32| 1  7 12 14|34|34|34 38 34 30|
12 15  5  2|34|34|38 34 30 34| 15 12  2  5|34|34|38 34 30 34| 10 16  3  5|34|34|36 34 32 34|
 7  4 10 13|34|34|34 26 34 42|  4  7 13 10|34|34|34 32 34 36|  8  2 13 11|34|34|34 30 34 38|
14  9  3  8|34|34|30 34 38 34| 14  9  3  8|34|34|30 34 38 34| 15  9  6  4|34|34|32 34 36 34|

19#\34/34|Compst-Sums|          21#\34/34|Compst-Sums|          23#\34/34|Compst-Sums|
1  7 14 12|34|34|34 42 34 26| 1  7 16 10|34|34|34 42 34 26| 1  7 16 10|34|34|34 38 34 30|
10 16  5  3|34|34|36 34 32 34| 12 14  5  3|34|34|36 34 32 34| 14 12  3  5|34|34|36 34 32 34|
 8  2 11 13|34|34|34 26 34 42|  6  4 11 13|34|34|34 26 34 42|  4  6 13 11|34|34|34 30 34 38|
15  9  4  6|34|34|32 34 36 34| 15  9  2  8|34|34|32 34 36 34| 15  9  2  8|34|34|32 34 36 34|

25#\34/34|Compst-Sums|          26#\34/34|Compst-Sums|          27#\34/34|Compst-Sums|
1  8 10 15|34|34|34 36 34 32| 1  8 10 15|34|34|34 36 34 32| 1  8 11 14|34|34|34 38 34 30|
11 14  4  5|34|34|50 34 18 34| 13 12  6  3|34|34|50 34 18 34| 10 15  4  5|34|34|50 34 18 34|
16  9  7  2|34|34|34 32 34 36| 16  9  7  2|34|34|34 32 34 36| 16  9  6  3|34|34|34 30 34 38|
 6  3 13 12|34|34|18 34 50 34|  4  5 11 14|34|34|18 34 50 34|  7  2 13 12|34|34|18 34 50 34|

```

```

28#\34/34|Compst-Sums| [SC] 29#\34/34|Compst-Sums| [SC] 30#\34/34|Compst-Sums|
1 8 11 14|34|34|34 38 34 30| 1 8 12 13|34|34|34 38 34 30| 1 8 12 13|34|34|34 36 34 32|
13 12 7 2|34|34|50 34 18 34| 14 11 7 2|34|34|50 34 18 34| 15 10 6 3|34|34|50 34 18 34|
16 9 6 3|34|34|34 30 34 38| 15 10 6 3|34|34|34 30 34 38| 14 11 7 2|34|34|34 32 34 36|
4 5 10 15|34|34|18 34 50 34| 4 5 9 16|34|34|18 34 50 34| 4 5 9 16|34|34|18 34 50 34|

31#\34/34|Compst-Sums| 32#\34/34|Compst-Sums| [SC] 33#\34/34|Compst-Sums|
1 8 13 12|34|34|34 42 34 26| 1 8 13 12|34|34|34 42 34 26| 1 8 14 11|34|34|34 42 34 26|
10 15 6 3|34|34|50 34 18 34| 11 14 7 2|34|34|50 34 18 34| 12 13 7 2|34|34|50 34 18 34|
16 9 4 5|34|34|34 26 34 42| 16 9 4 5|34|34|34 26 34 42| 15 10 4 5|34|34|34 26 34 42|
7 2 11 14|34|34|18 34 50 34| 6 3 10 15|34|34|18 34 50 34| 6 3 9 16|34|34|18 34 50 34|

[SC] 34#\34/34|Compst-Sums| [SC] 35#\34/34|Compst-Sums| [SC] 36#\34/34|Compst-Sums|
1 8 14 11|34|34|34 36 34 32| 1 8 15 10|34|34|34 42 34 26| 1 8 15 10|34|34|34 38 34 30|
15 10 4 5|34|34|50 34 18 34| 12 13 6 3|34|34|50 34 18 34| 14 11 4 5|34|34|50 34 18 34|
12 13 7 2|34|34|34 32 34 36| 14 11 4 5|34|34|34 26 34 42| 12 13 6 3|34|34|34 30 34 38|
6 3 9 16|34|34|18 34 50 34| 7 2 9 16|34|34|18 34 50 34| 7 2 9 16|34|34|18 34 50 34|

37#\34/34|Compst-Sums| 39#\34/34|Compst-Sums| 41#\34/34|Compst-Sums|
1 10 16 7|34|34|34 36 34 32| 1 11 16 6|34|34|34 38 34 30| 1 12 6 15|34|34|34 36 34 32|
15 8 2 9|34|34|38 34 30 34| 14 8 3 9|34|34|36 34 32 34| 13 8 10 3|34|34|42 34 26 34|
4 11 13 6|34|34|34 32 34 36| 4 10 13 7|34|34|34 30 34 38| 16 5 11 2|34|34|34 32 34 36|
14 5 3 12|34|34|30 34 38 34| 15 5 2 12|34|34|32 34 36 34| 4 9 7 14|34|34|26 34 42 34|

42#\34/34|Compst-Sums| [SC] 43#\34/34|Compst-Sums| [SC] 44#\34/34|Compst-Sums|
1 12 7 14|34|34|34 38 34 30| 1 12 8 13|34|34|34 38 34 30| 1 12 8 13|34|34|34 36 34 32|
13 8 11 2|34|34|42 34 26 34| 14 7 11 2|34|34|42 34 26 34| 15 6 10 3|34|34|42 34 26 34|
16 5 10 3|34|34|34 30 34 38| 15 6 10 3|34|34|34 30 34 38| 14 7 11 2|34|34|34 32 34 36|
4 9 6 15|34|34|26 34 42 34| 4 9 5 16|34|34|26 34 42 34| 4 9 5 16|34|34|26 34 42 34|

[SC] 45#\34/34|Compst-Sums| [SC] 46#\34/34|Compst-Sums| [SC] 47#\34/34|Compst-Sums|
1 12 14 7|34|34|34 36 34 32| 1 12 15 6|34|34|34 38 34 30| 1 14 8 11|34|34|34 36 34 32|
15 6 4 9|34|34|42 34 26 34| 14 7 4 9|34|34|42 34 26 34| 15 4 10 5|34|34|38 34 30 34|
8 13 11 2|34|34|34 32 34 36| 8 13 10 3|34|34|34 30 34 38| 12 7 13 2|34|34|34 32 34 36|
10 3 5 16|34|34|26 34 42 34| 11 2 5 16|34|34|26 34 42 34| 6 9 3 16|34|34|30 34 38 34|

[SC] 48#\34/34|Compst-Sums| 49#\34/34|Compst-Sums| 97#\34/34|Compst-Sums|
1 14 12 7|34|34|34 36 34 32| 2 3 13 16|34|34|34 32 34 36| 3 2 13 16|34|34|34 30 34 38|
15 4 6 9|34|34|38 34 30 34| 14 15 1 4|34|34|42 34 26 34| 15 14 1 4|34|34|42 34 26 34|
8 11 13 2|34|34|34 32 34 36| 7 6 12 9|34|34|34 36 34 32| 6 7 12 9|34|34|34 38 34 30|
10 5 3 16|34|34|30 34 38 34| 11 10 8 5|34|34|26 34 42 34| 10 11 8 5|34|34|26 34 42 34|

135#\34/34|Compst-Sums| 173#\34/34|Compst-Sums| 183#\34/34|Compst-Sums|
4 1 13 16|34|34|34 32 34 36| 5 2 16 11|34|34|34 36 34 32| 6 1 15 12|34|34|34 32 34 36|
14 15 3 2|34|34|42 34 26 34| 15 12 6 1|34|34|38 34 30 34| 16 11 5 2|34|34|38 34 30 34|
7 6 10 11|34|34|34 36 34 32| 4 7 9 14|34|34|34 32 34 36| 3 8 10 13|34|34|34 36 34 32|
9 12 8 5|34|34|26 34 42 34| 10 13 3 8|34|34|30 34 38 34| 9 14 4 7|34|34|30 34 38 34|

```

([PD]:Pan-diagonal; [SC]:Self-Complementary;)

[Total Count of Standard Solutions = 192; Counts of Types: 0/PD; 48/SC; 192/ST]

This is the result list of Standard MS44 when we have those eight Composite Conditions and the additional three without the Self-complementary Conditions. And the next list shows the result with the Self-complementary Conditions.

[List 2: 'Self-Complementary' Magic Squares 4x4  
 Composed with the 'Self-complementary Conditions'  
 List of Standard Solutions with precise Check-Sums]  
 \Primary diagonals/  
 |Rows|Columns|'Composite 2x2 units'| \*\*

```

[SC] 1#\34/34|Compst-Sums| [SC] 2#\34/34|Compst-Sums| [SC] 3#\34/34|Compst-Sums|
1 8 12 13|34|34|34 38 34 30| 1 8 12 13|34|34|34 36 34 32| 1 8 14 11|34|34|34 42 34 26|
14 11 7 2|34|34|50 34 18 34| 15 10 6 3|34|34|50 34 18 34| 12 13 7 2|34|34|50 34 18 34|
15 10 6 3|34|34|34 30 34 38| 14 11 7 2|34|34|34 32 34 36| 15 10 4 5|34|34|34 26 34 42|
4 5 9 16|34|34|18 34 50 34| 4 5 9 16|34|34|18 34 50 34| 6 3 9 16|34|34|18 34 50 34|

```

[SC] 4#\34/34|Compst-Sums| [SC] 5#\34/34|Compst-Sums| [SC] 6#\34/34|Compst-Sums|  
1 8 14 11|34|34|34 36 34 32| 1 8 15 10|34|34|34 42 34 26| 1 8 15 10|34|34|34 38 34 30|  
15 10 4 5|34|34|50 34 18 34| 12 13 6 3|34|34|50 34 18 34| 14 11 4 5|34|34|50 34 18 34|  
12 13 7 2|34|34|34 32 34 36| 14 11 4 5|34|34|34 26 34 42| 12 13 6 3|34|34|34 30 34 38|  
6 3 9 16|34|34|18 34 50 34| 7 2 9 16|34|34|18 34 50 34| 7 2 9 16|34|34|18 34 50 34|

[SC] 7#\34/34|Compst-Sums| [SC] 8#\34/34|Compst-Sums| [SC] 9#\34/34|Compst-Sums|  
1 12 8 13|34|34|34 38 34 30| 1 12 8 13|34|34|34 36 34 32| 1 12 14 7|34|34|34 36 34 32|  
14 7 11 2|34|34|42 34 26 34| 15 6 10 3|34|34|42 34 26 34| 15 6 4 9|34|34|42 34 26 34|  
15 6 10 3|34|34|34 30 34 38| 14 7 11 2|34|34|34 32 34 36| 8 13 11 2|34|34|34 32 34 36|  
4 9 5 16|34|34|26 34 42 34| 4 9 5 16|34|34|26 34 42 34| 10 3 5 16|34|34|26 34 42 34|

[SC] 10#\34/34|Compst-Sums| [SC] 11#\34/34|Compst-Sums| [SC] 12#\34/34|Compst-Sums|  
1 12 15 6|34|34|34 38 34 30| 1 14 8 11|34|34|34 36 34 32| 1 14 12 7|34|34|34 36 34 32|  
14 7 4 9|34|34|42 34 26 34| 15 4 10 5|34|34|38 34 30 34| 15 4 6 9|34|34|38 34 30 34|  
8 13 10 3|34|34|34 30 34 38| 12 7 13 2|34|34|34 32 34 36| 8 11 13 2|34|34|34 32 34 36|  
11 2 5 16|34|34|26 34 42 34| 6 9 3 16|34|34|30 34 38 34| 10 5 3 16|34|34|30 34 38 34|

[SC] 13#\34/34|Compst-Sums| [SC] 14#\34/34|Compst-Sums| [SC] 15#\34/34|Compst-Sums|  
2 7 11 14|34|34|34 38 34 30| 2 7 11 14|34|34|34 32 34 36| 2 7 13 12|34|34|34 42 34 26|  
13 12 8 1|34|34|50 34 18 34| 16 9 5 4|34|34|50 34 18 34| 11 14 8 1|34|34|50 34 18 34|  
16 9 5 4|34|34|34 30 34 38| 13 12 8 1|34|34|34 36 34 32| 16 9 3 6|34|34|34 26 34 42|  
3 6 10 15|34|34|18 34 50 34| 3 6 10 15|34|34|18 34 50 34| 5 4 10 15|34|34|18 34 50 34|

[SC] 16#\34/34|Compst-Sums| [SC] 17#\34/34|Compst-Sums| [SC] 18#\34/34|Compst-Sums|  
2 7 13 12|34|34|34 32 34 36| 2 7 16 9|34|34|34 42 34 26| 2 7 16 9|34|34|34 38 34 30|  
16 9 3 6|34|34|50 34 18 34| 11 14 5 4|34|34|50 34 18 34| 13 12 3 6|34|34|50 34 18 34|  
11 14 8 1|34|34|34 36 34 32| 13 12 3 6|34|34|34 26 34 42| 11 14 5 4|34|34|34 30 34 38|  
5 4 10 15|34|34|18 34 50 34| 8 1 10 15|34|34|18 34 50 34| 8 1 10 15|34|34|18 34 50 34|

[SC] 19#\34/34|Compst-Sums| [SC] 20#\34/34|Compst-Sums| [SC] 21#\34/34|Compst-Sums|  
2 11 7 14|34|34|34 38 34 30| 2 11 7 14|34|34|34 32 34 36| 2 11 13 8|34|34|34 32 34 36|  
13 8 12 1|34|34|42 34 26 34| 16 5 9 4|34|34|42 34 26 34| 16 5 3 10|34|34|42 34 26 34|  
16 5 9 4|34|34|34 30 34 38| 13 8 12 1|34|34|34 36 34 32| 7 14 12 1|34|34|34 36 34 32|  
3 10 6 15|34|34|26 34 42 34| 3 10 6 15|34|34|26 34 42 34| 9 4 6 15|34|34|26 34 42 34|

[SC] 22#\34/34|Compst-Sums| [SC] 23#\34/34|Compst-Sums| [SC] 24#\34/34|Compst-Sums|  
2 11 16 5|34|34|34 38 34 30| 2 13 7 12|34|34|34 32 34 36| 2 13 11 8|34|34|34 32 34 36|  
13 8 3 10|34|34|42 34 26 34| 16 3 9 6|34|34|38 34 30 34| 16 3 5 10|34|34|38 34 30 34|  
7 14 9 4|34|34|34 30 34 38| 11 8 14 1|34|34|34 36 34 32| 7 12 14 1|34|34|34 36 34 32|  
12 1 6 15|34|34|26 34 42 34| 5 10 4 15|34|34|30 34 38 34| 9 6 4 15|34|34|30 34 38 34|

[SC] 25#\34/34|Compst-Sums| [SC] 26#\34/34|Compst-Sums| [SC] 27#\34/34|Compst-Sums|  
3 6 13 12|34|34|34 42 34 26| 3 6 13 12|34|34|34 30 34 38| 3 6 16 9|34|34|34 42 34 26|  
10 15 8 1|34|34|50 34 18 34| 16 9 2 7|34|34|50 34 18 34| 10 15 5 4|34|34|50 34 18 34|  
16 9 2 7|34|34|34 26 34 42| 10 15 8 1|34|34|34 38 34 30| 13 12 2 7|34|34|34 26 34 42|  
5 4 11 14|34|34|18 34 50 34| 5 4 11 14|34|34|18 34 50 34| 8 1 11 14|34|34|18 34 50 34|

[SC] 28#\34/34|Compst-Sums| [SC] 29#\34/34|Compst-Sums| [SC] 30#\34/34|Compst-Sums|  
3 6 16 9|34|34|34 36 34 32| 3 10 13 8|34|34|34 30 34 38| 3 10 16 5|34|34|34 36 34 32|  
13 12 2 7|34|34|50 34 18 34| 16 5 2 11|34|34|42 34 26 34| 13 8 2 11|34|34|42 34 26 34|  
10 15 5 4|34|34|34 32 34 36| 6 15 12 1|34|34|34 38 34 30| 6 15 9 4|34|34|34 32 34 36|  
8 1 11 14|34|34|18 34 50 34| 9 4 7 14|34|34|26 34 42 34| 12 1 7 14|34|34|26 34 42 34|

[SC] 31#\34/34|Compst-Sums| [SC] 32#\34/34|Compst-Sums| [SC] 33#\34/34|Compst-Sums|  
3 13 6 12|34|34|34 30 34 38| 3 13 10 8|34|34|34 30 34 38| 4 5 14 11|34|34|34 42 34 26|  
16 2 9 7|34|34|36 34 32 34| 16 2 5 11|34|34|36 34 32 34| 9 16 7 2|34|34|50 34 18 34|  
10 8 15 1|34|34|34 38 34 30| 6 12 15 1|34|34|34 38 34 30| 15 10 1 8|34|34|34 26 34 42|  
5 11 4 14|34|34|32 34 36 34| 9 7 4 14|34|34|32 34 36 34| 6 3 12 13|34|34|18 34 50 34|

[SC] 34#\34/34|Compst-Sums| [SC] 35#\34/34|Compst-Sums| [SC] 36#\34/34|Compst-Sums|  
4 5 14 11|34|34|34 30 34 38| 4 5 15 10|34|34|34 42 34 26| 4 5 15 10|34|34|34 32 34 36|  
15 10 1 8|34|34|50 34 18 34| 9 16 6 3|34|34|50 34 18 34| 14 11 1 8|34|34|50 34 18 34|  
9 16 7 2|34|34|34 38 34 30| 14 11 1 8|34|34|34 26 34 42| 9 16 6 3|34|34|34 36 34 32|  
6 3 12 13|34|34|18 34 50 34| 7 2 12 13|34|34|18 34 50 34| 7 2 12 13|34|34|18 34 50 34|



```

[SC] 37#\34/34|Compst-Sums| [SC] 38#\34/34|Compst-Sums| [SC] 39#\34/34|Compst-Sums|
4 9 14 7|34|34|34 30 34 38| 4 9 15 6|34|34|34 32 34 36| 4 14 5 11|34|34|34 30 34 38|
15 6 1 12|34|34|42 34 26 34| 14 7 1 12|34|34|42 34 26 34| 15 1 10 8|34|34|32 34 36 34|
5 16 11 2|34|34|34 38 34 30| 5 16 10 3|34|34|34 36 34 32| 9 7 16 2|34|34|34 38 34 30|
10 3 8 13|34|34|26 34 42 34| 11 2 8 13|34|34|26 34 42 34| 6 12 3 13|34|34|36 34 32 34|

[SC] 40#\34/34|Compst-Sums| [SC] 41#\34/34|Compst-Sums| [SC] 42#\34/34|Compst-Sums|
4 14 9 7|34|34|34 30 34 38| 5 4 16 9|34|34|34 38 34 30| 5 4 16 9|34|34|34 36 34 32|
15 1 6 12|34|34|32 34 36 34| 10 15 3 6|34|34|50 34 18 34| 11 14 2 7|34|34|50 34 18 34|
5 11 16 2|34|34|34 38 34 30| 11 14 2 7|34|34|34 30 34 38| 10 15 3 6|34|34|34 32 34 36|
10 8 3 13|34|34|36 34 32 34| 8 1 13 12|34|34|18 34 50 34| 8 1 13 12|34|34|18 34 50 34|

[SC] 43#\34/34|Compst-Sums| [SC] 44#\34/34|Compst-Sums| [SC] 45#\34/34|Compst-Sums|
5 10 11 8|34|34|34 26 34 42| 5 11 10 8|34|34|34 26 34 42| 6 3 15 10|34|34|34 38 34 30|
16 3 2 13|34|34|38 34 30 34| 16 2 3 13|34|34|36 34 32 34| 9 16 4 5|34|34|50 34 18 34|
4 15 14 1|34|34|34 42 34 26| 4 14 15 1|34|34|34 42 34 26| 12 13 1 8|34|34|34 30 34 38|
9 6 7 12|34|34|30 34 38 34| 9 7 6 12|34|34|32 34 36 34| 7 2 14 11|34|34|18 34 50 34|

[SC] 46#\34/34|Compst-Sums| [SC] 47#\34/34|Compst-Sums| [SC] 48#\34/34|Compst-Sums|
6 3 15 10|34|34|34 32 34 36| 6 9 12 7|34|34|34 26 34 42| 6 12 9 7|34|34|34 26 34 42|
12 13 1 8|34|34|50 34 18 34| 15 4 1 14|34|34|38 34 30 34| 15 1 4 14|34|34|32 34 36 34|
9 16 4 5|34|34|34 36 34 32| 3 16 13 2|34|34|34 42 34 26| 3 13 16 2|34|34|34 42 34 26|
7 2 14 11|34|34|18 34 50 34| 10 5 8 11|34|34|30 34 38 34| 10 8 5 11|34|34|36 34 32 34|

```

([PD]:Pan-diagonal; [SC]:Self-Complementary;)

[Total Count of Standard Solutions = 48; Counts of Types: 0/PD; 48/SC; 48/ST]

\*\* Calculated and Listed by Kanji Setsuda  
on June 27, 2013 with MacOSX 10.8.4 & Xcode 4.6.3 \*\*

This is just what we have wanted to have! We could have succeeded in getting the final object 'Self-complementary MS44' by our new definitions presupposed. I would like to show you the program list I have recently written for them.

```

/** 'Self-Complementary' Magic Squares 4x4 Composed by the 'Composite Method' **
/** Standard Solutions with Check-Sums of Composite 2x2 **
/** File 'MS44CmpstSC.c': Dictated by Kanji Setsuda **
/** on Dec.13, 2011; Feb.3, 2012; and June 27, 2013 **
/** Working with MacOSX 10.8.4 and Xcode 4.6.3 **
//
#include <stdio.h>
//
short int cnt;
short cntr[3];
short cnt2, cnt3;
short tcnt[3];
short LSM, PSM;
short tp0;
short nm[17], uflg[17];
short tnm[3][18];
short csm[3][17], csm2[3][17];
//
void stp01(void), stp02(void), stp03(void), stp04(void), stp05(void);
void stp06(void), stp07(void), stp08(void), stp09(void);
void stp10(void), stp11(void), stp12(void), stp13(void);
void stp14(void), stp15(void), stp16(void), stp17(void);
void ansprint(void);
void printsol(short x);
void chksms(short x), chk2sms(short x);
void prsol(short x);
//
/** Main Program *
int main(void){
short n;

```



```

tp0=2; // Type 0: Standard MS44 by 'Inclusive' Composite Method
// Type 1: Standard MS44 by 'Exclusive' Composite Method
// Type 2: Reconstruct the 48 Self-complementary Magic Squares 4x4
printf("//\n");
printf("/** ");
if(tp0==2){printf("Self-Complementary");}else{printf("Standard");}
printf(" Magic Squares 4x4 Composed by the ");
if(tp0==0){printf("Inclusive");}else{printf("Exclusive");}
printf(" Composite Method\n");
printf("// List of Standard Solutions with precise Check-Sums: **\n");
printf("// \Primary diagonals/\n");
printf("// |Rows|Columns|'Composite 2x2 units'| **\n");
for(n=0;n<17;n++){nm[n]=0; uflg[n]=0;}
LSM=34; PSM=17;
cnt=0; cnt3=0; tcnt[0]=0; tcnt[1]=0;
stp01(); // * Begin the Calculations *
if(cnt3>0){prsol(cnt3);}
printf("// ([PD]:Pan-diagonal; [SC]:Self-Complementary);\n");
printf("//\n");
printf("// [Total Count of Standard Solutions = %d;",cnt);
printf(" Counts of Types: %d/PD; %d/SC; %d/ST]\n",tcnt[2],tcnt[1],tcnt[0]);
printf("//\n");
printf("/** Calculated and Listed by Kanji Setsuda\n");
printf("// on June 27, 2013 with MacOSX 10.8.4 & Xcode 4.6.3 **\n");
printf("//\n");
return 0;
}
//
/* Begin the Calculations *
/* Set N1 *
void stp01(){
short a;
for(a=1;a<17;a++){
if(uflg[a]==0){if(tp0<2){cnt2=0;}
nm[1]=a; uflg[a]=1;
stp02();
uflg[a]=0;}
}
}
/* Set N2 *
void stp02(){
short a;
for(a=1;a<17;a++){
if(uflg[a]==0){
nm[2]=a; uflg[a]=1;
stp03();
uflg[a]=0;}
}
}
/* Set N3 *
void stp03(){
short a;
for(a=1;a<17;a++){
if(uflg[a]==0){if((tp0==0)&&(nm[1]==1)){cnt2=0;}
nm[3]=a; uflg[a]=1;
stp04();
uflg[a]=0;}
}
}
/* Set n4=LSM-n1-n2-n3 & n4>N1 *
void stp04(){
short a;
a=LSM-nm[1]-nm[2]-nm[3];
if((nm[1]<a)&&(a<17)){
if(uflg[a]==0){
nm[4]=a; uflg[a]=1;

```

```

        stp05();
        uflg[a]=0;}}
}
/** Set N5(>N2) *
void stp05(){
    short a;
    for(a=nm[2]+1;a<17;a++){
        if(uflg[a]==0){if((tp0==1)&&(nm[1]==1)){cnt2=0;}
            nm[5]=a; uflg[a]=1;
            stp06();
            uflg[a]=0;}
        }
}
/** Set n6=LSM-n1-n2-n5 *
void stp06(){
    short a;
    a=LSM-nm[1]-nm[2]-nm[5];
    if((0<a)&&(a<17)){
        if(uflg[a]==0){
            nm[6]=a; uflg[a]=1;
            stp07();
            uflg[a]=0;}}
}
/** Set N7 *
void stp07(){
    short a;
    for(a=1;a<17;a++){
        if(uflg[a]==0){
            nm[7]=a; uflg[a]=1;
            if(tp0==0){stp08();}
            else if(nm[2]+nm[3]+nm[6]+nm[7]!=LSM){stp08();}
            uflg[a]=0;}
        }
}
/** Set n8=LSM-n3-n4-n7 *
void stp08(){
    short a;
    a=LSM-nm[3]-nm[4]-nm[7];
    if((0<a)&&(a<17)){
        if(uflg[a]==0){
            nm[8]=a; uflg[a]=1;
            if(tp0==0){stp09();}
            else if(nm[4]+nm[1]+nm[8]+nm[5]!=LSM){stp09();}
            uflg[a]=0;}}
}
/** Search Level #2 **
/** Set N9 *
void stp09(){
    short a;
    for(a=1;a<17;a++){
        if(uflg[a]==0){
            nm[9]=a; uflg[a]=1;
            stp10();
            uflg[a]=0;}
        }
}
/** Set N10 *
void stp10(){
    short a;
    for(a=1;a<17;a++){
        if(uflg[a]==0){if(tp0==2){cnt2=0;}
            nm[10]=a; uflg[a]=1;
            if(tp0==0){stp11();}
            else if(nm[5]+nm[6]+nm[9]+nm[10]!=LSM){stp11();}
            uflg[a]=0;}
        }
}

```

```

}
/** Set n11=LSM-n6-n7-n10 *
void stp11(){
short a;
a=LSM-nm[6]-nm[7]-nm[10];
if((0<a)&&(a<17)){
if(uflg[a]==0){
nm[11]=a; uflg[a]=1;
stp12();
uflg[a]=0;}}
}
/** Set n12=LSM-n8-n5-n9 *
void stp12(){
short a;
a=LSM-nm[8]-nm[5]-nm[9];
if((0<a)&&(a<17)){
if(uflg[a]==0){
nm[12]=a; uflg[a]=1;
if(tp0==0){stp13();}
else if(nm[7]+nm[8]+nm[11]+nm[12]!=LSM){stp13();}
uflg[a]=0;}}
}
/** Set n13=LSM-n1-n5-n9 & n13>N1 *
void stp13(){
short a;
a=LSM-nm[1]-nm[5]-nm[9];
if((nm[1]<a)&&(a<17)){
if(uflg[a]==0){
nm[13]=a; uflg[a]=1;
stp14();
uflg[a]=0;}}
}
/** Set n14=LSM-n9-n10-n13 *
void stp14(){
short a;
a=LSM-nm[9]-nm[10]-nm[13];
if((0<a)&&(a<17)){
if(uflg[a]==0){
nm[14]=a; uflg[a]=1;
if(tp0==0){stp15();}
else if(nm[13]+nm[14]+nm[1]+nm[2]!=LSM){stp15();}
uflg[a]=0;}}
}
/** Set n15=LSM-n14-n2-n3 *
void stp15(){
short a;
a=LSM-nm[14]-nm[2]-nm[3];
if((0<a)&&(a<17)){
if(uflg[a]==0){
nm[15]=a; uflg[a]=1;
if(tp0==0){stp16();}
else if(nm[10]+nm[11]+nm[14]+nm[15]!=LSM){stp16();}
uflg[a]=0;}}
}
/** Set n16=LSM-n11-n12-n15 & n16>N1 *
void stp16(){
short a,b;
a=LSM-nm[11]-nm[12]-nm[15];
if((nm[1]<a)&&(a<17)){
b=LSM-nm[13]-nm[4]-nm[1];
if((a==b)&&(uflg[a]==0)){
nm[16]=a; uflg[a]=1;
if(tp0==0){stp17();}
else if((nm[15]+nm[16]+nm[3]+nm[4]!=LSM)&&(nm[12]+nm[9]+nm[16]+nm[13]!=LSM)){
stp17();}
uflg[a]=0;}}
}

```

```

}
/* Check the Primary Diagonal *
void stp17(){
short tsc,n;
if(nm[1]+nm[6]+nm[11]+nm[16]==LSM){
if(tp0<=1){ansprint();}
else if(tp0==2){tsc=1;
for(n=1;n<9;n++){if(nm[n]+nm[PSM-n]!=PSM){tsc=0; break;}}
if(tsc==1){ansprint();}}
}
}
/* Print the Answers *
void ansprint(){
short tp1,tp2,tp3,tp4,tp5;
short n;
cnt++; cnt2++;
for(n=1;n<17;n++){tnm[cnt3][n]=nm[n];}
cntr[cnt3]=cnt; tnm[cnt3][17]=-1;
chksms(cnt3);
chk2sms(cnt3);
tp1=0; for(n=1;n<5;n++){if(csm2[cnt3][n]!=LSM){tp1=-1; break;}}
tp2=0; for(n=5;n<9;n++){if(csm2[cnt3][n]!=LSM){tp2=-1; break;}}
tp3=-1; if((csm2[cnt3][9]==LSM)&&(csm2[cnt3][16]==LSM)){tp3=0;}
tp4=0; for(n=9;n<17;n++){if(csm2[cnt3][n]!=LSM){tp4=-1; break;}}
tp5=0; for(n=1;n<9;n++){if(nm[n]+nm[PSM-n]!=PSM){tp5=-1; break;}}
if((tp1==0)&&(tp2==0)&&(tp3==0)){
tnm[cnt3][17]=0; tcnt[0]++;
if(tp5==0){tnm[cnt3][17]=1; tcnt[1]++;}
else if(tp4==0){tnm[cnt3][17]=2; tcnt[2]++;}
}
if(cnt2==1){cnt3++;
if(cnt3==3){prsol(cnt3); cnt3=0;}
}
}
//
/* Check Sums of Composite Fours *
void chksms(short x){
csm[x][1]=tnm[x][1]+tnm[x][2]+tnm[x][5]+tnm[x][6];
csm[x][2]=tnm[x][2]+tnm[x][3]+tnm[x][6]+tnm[x][7];
csm[x][3]=tnm[x][3]+tnm[x][4]+tnm[x][7]+tnm[x][8];
csm[x][4]=tnm[x][4]+tnm[x][1]+tnm[x][8]+tnm[x][5];
csm[x][5]=tnm[x][5]+tnm[x][6]+tnm[x][9]+tnm[x][10];
csm[x][6]=tnm[x][6]+tnm[x][7]+tnm[x][10]+tnm[x][11];
csm[x][7]=tnm[x][7]+tnm[x][8]+tnm[x][11]+tnm[x][12];
csm[x][8]=tnm[x][8]+tnm[x][5]+tnm[x][12]+tnm[x][9];
csm[x][9]=tnm[x][9]+tnm[x][10]+tnm[x][13]+tnm[x][14];
csm[x][10]=tnm[x][10]+tnm[x][11]+tnm[x][14]+tnm[x][15];
csm[x][11]=tnm[x][11]+tnm[x][12]+tnm[x][15]+tnm[x][16];
csm[x][12]=tnm[x][12]+tnm[x][9]+tnm[x][16]+tnm[x][13];
csm[x][13]=tnm[x][13]+tnm[x][14]+tnm[x][1]+tnm[x][2];
csm[x][14]=tnm[x][14]+tnm[x][15]+tnm[x][2]+tnm[x][3];
csm[x][15]=tnm[x][15]+tnm[x][16]+tnm[x][3]+tnm[x][4];
csm[x][16]=tnm[x][16]+tnm[x][13]+tnm[x][4]+tnm[x][1];
}
/* Check Sums of Rows, Columns and Pan-Diagonals *
void chk2sms(short x){
csm2[x][1]=tnm[x][1]+tnm[x][2]+tnm[x][3]+tnm[x][4];
csm2[x][2]=tnm[x][5]+tnm[x][6]+tnm[x][7]+tnm[x][8];
csm2[x][3]=tnm[x][9]+tnm[x][10]+tnm[x][11]+tnm[x][12];
csm2[x][4]=tnm[x][13]+tnm[x][14]+tnm[x][15]+tnm[x][16];
csm2[x][5]=tnm[x][1]+tnm[x][5]+tnm[x][9]+tnm[x][13];
csm2[x][6]=tnm[x][2]+tnm[x][6]+tnm[x][10]+tnm[x][14];
csm2[x][7]=tnm[x][3]+tnm[x][7]+tnm[x][11]+tnm[x][15];
csm2[x][8]=tnm[x][4]+tnm[x][8]+tnm[x][12]+tnm[x][16];
csm2[x][9]=tnm[x][1]+tnm[x][6]+tnm[x][11]+tnm[x][16];
csm2[x][10]=tnm[x][2]+tnm[x][7]+tnm[x][12]+tnm[x][13];
}

```

```

    csm2[x][11]=tnm[x][3]+tnm[x][8]+tnm[x][9]+tnm[x][14];
    csm2[x][12]=tnm[x][4]+tnm[x][5]+tnm[x][10]+tnm[x][15];
    csm2[x][13]=tnm[x][1]+tnm[x][8]+tnm[x][11]+tnm[x][14];
    csm2[x][14]=tnm[x][2]+tnm[x][5]+tnm[x][12]+tnm[x][15];
    csm2[x][15]=tnm[x][3]+tnm[x][6]+tnm[x][9]+tnm[x][16];
    csm2[x][16]=tnm[x][4]+tnm[x][7]+tnm[x][10]+tnm[x][13];
}
/* Print Each Solution with full Information */
void prsol(short x){
    short l,l4,m,n;
    printf("//\n//");
    for(m=0;m<x;m++){
        if(tnm[m][17]==2){printf(" [PD]");}
        else if(tnm[m][17]==1){printf(" [SC]");}
        else{printf(" ");}
        printf("%6d#\%2d/\%2d|Compst-Sums|",cntr[m],csm2[m][9],csm2[m][16]);
    }
    printf("\n");
    for(l=0;l<4;l++){l4=l*4;
        printf("//");
        for(m=0;m<x;m++){
            for(n=1;n<5;n++){printf("%3d",tnm[m][l4+n]);}
            printf(" |%2d| %2d",csm2[m][l+1],csm2[m][l+5]);
            printf(" |%2d%3d%3d%3d|",csm[m][l4+1],csm[m][l4+2],csm[m][l4+3],csm[m][l4+4]);
        }
        printf("\n");
    }
}
//

```

But, why could we rebuild the final object Self-complementary MS44 by our new set of definitions?

Let's have some algebraic study only a little about the definitions themselves.

At first watch the next two lists again to examine those definitions. I want to demonstrate how the two sets of definitions are transformed into each other.

**\*\* Algebraic Study: Transform the Definition from Old to New \*\***

- (1) C06:  $n6+n7+n10+n11 = (n6+n11)+(n7+n10) = 17+17 = 34(=C)$   
Self-complementary Conditions
- C08:  $n8+n5+n12+n9 = (n5+n12)+(n8+n9) = 17+17 = 34(=C)$   
Self-complementary Conditions
- C14:  $n14+n15+n2+n3 = (n2+n15)+(n3+n14) = 17+17 = 34(=C)$   
Self-complementary Conditions
- C16:  $n16+n13+n4+n1 = (n1+n16)+(n4+n13) = 17+17 = 34(=C)$   
Self-complementary Conditions

**[Contrast: Classic Definitions Left; New Definitions Right; Common at the Bottom]**

<p><b>* Basic Conditions: C=34 *</b></p> <p>n1+n2+n3+n4=C ...row1;  n5+n6+n7+n8=C ...row2;  n9+n10+n11+n12=C ...row3;  n13+n14+n15+n16=C ...row4;  n1+n5+n9+n13=C ...c7m1;  n2+n6+n10+n14=C ...c7m2;  n3+n7+n11+n15=C ...c7m3;  n4+n8+n12+n16=C ...c7m4;  n1+n6+n11+n16=C ...prd1;  n4+n7+n10+n13=C ...prd2;</p>	<pre> .----- 4  1  2  3  4  1  ---+---+---+ 8  5  6  7  8  5  ---+---+---+ 12  9 10 11 12  9  ---+---+---+ 16 13 14 15 16 13 '-----' 4 1 2 3 4 1 </pre>	<p><b>* Composite Conditions: C=34 *</b></p> <p>n1+n2+n5+n6=C ...C01;  n3+n4+n7+n8=C ...C03;  n6+n7+n10+n11=C ...C06;  n8+n5+n12+n9=C ...C08;  n9+n10+n13+n14=C ...C09;  n11+n12+n15+n16=C ...C11;  n14+n15+n2+n3=C ...C14;  n16+n13+n4+n1=C ...C16;</p> <p><b>* Additional Conditions *</b></p> <p>n1+n2+n3+n4=C ...Ad1;  n1+n5+n9+n13=C ...Ad2;  n1+n6+n11+n16=C ...Ad3;</p>
<p><b>** Self-complementary Conditions: CC=17 ** \</b>  n1+n16=n2+n15=n3+n14=n4+n13=n5+n12=n6+n11=n7+n10=n8+n9=CC ...cc;</p>		

(2)  $C01+C03: n1+n2+n5+n6 + n3+n4+n7+n8 = \frac{(n1+n2+n3+n4)}{\text{row1}} + \frac{(n5+n6+n7+n8)}{\text{row2}} = 34+34=68$   
 $C01+C09: n1+n2+n5+n6 + n9+n10+n13+n14 = \frac{(n1+n5+n9+n13)}{\text{c1m1}} + \frac{(n2+n6+n10+n14)}{\text{c1m2}} = 34+34=68$   
 $C01+C03=C01+C09$  means  $C03=C09: n3+n4+n7+n8 = n9+n10+n13+n14$   
 But  $C03+C09 = (n3+n14)+(n4+n13)+(n7+n10)+(n8+n9)=17+17+17+17=68$   
 Self-complementary Conditions  
 It means  $C03=C09=68/2=34$ ; and  $C01=68-C03=34$ ;  
 In the same way  $C01+C11 = (n1+n16)+(n2+n15)+(n5+n12)+(n6+n11)=17+17+17+17=68$   
 Therefore  $C11 = 68-C01=68-34=34$

(3) Transform the New Definitions into old  
 3-1:  $n1+n2+n3+n4=C \dots Ad1(=row1)$ ; and  $n1+n2+n5+n6=C \dots C01$ ;  $\rightarrow n3+n4 = n5+n6$   
 and  $n3+n4+n7+n8=C \dots C03$ ; is transformed into  $n5+n6+n7+n8 = C \dots row2$ ;  
 3-2:  $n1+n5+n9+n13=C \dots Ad2(=c1m1)$ ; and  $n1+n2+n5+n6=C \dots C01$ ;  $\rightarrow n2+n6 = n9+n13$ ;  
 and  $n9+n10+n13+n14=C \dots C09$ ; is transformed into  $n2+n6+n10+n14=C \dots c1m2$ ;  
 3-3:  $n6+n7+n10+n11=C \dots C06$ ;  $n5+n6+n7+n8 = C \dots row2$ ;  $\rightarrow n10+n11 = n5+n8$   
 and  $n8+n5+n12+n9=C \dots C08$ ; is transformed into  $n9+n10+n11+n12 = C \dots row3$ ;  
 3-4:  $n9=17-n8$ ;  $n10=17-n7$ ;  $n11=17-n6$ ;  $n12=17-n5$ ; (SC Conditions ...cc)  
 $n9+n10+n11+n12 = 17*4 - (n5+n6+n7+n8) = 68-34 = 34 = C \dots row3$   
 $n13+n14+n15+n16 = (17-n4)+(17-n3)+(17-n2)+(17-n1) = 68 - (n1+n2+n3+n4) = C \dots row4$ ;  
 $n3+n7+n11+n15 = (17-n14)+(17-n10)+(17-n6)+(17-n2) = 68 - (n2+n6+n10+n12) = C \dots c1m3$ ;  
 $n4+n8+n12+n16 = (17-n13)+(17-n9)+(17-n5)+(17-n1) = 68 - (n1+n5+n9+n13) = C \dots c1m4$ ;  
 $n1+n6+n11+n16 = (n1+n16)+(n6+n11) = 17+17 = 34 \dots pd1$ ; (SC Conditions ...cc)  
 $n4+n7+n10+n13 = (n4+n13)+(n7+n10) = 17+17 = 34 \dots pd2$ ; (SC Conditions ...cc)

These transformations surely explain about the ‘logical equivalence’ existing between the old set of definitions and the new. Both of them express the same ‘phenomenon’, that is, Self-complementary Magic Squares of Order 4.

### #5. Reconstruction of the ‘Standard’ type of MS44 by our new definitions

The next case we have to study about is the 880 solutions of ‘Standard’ MS44. Let’s accept the following new definitions on the right: 4 Composite Conditions and 5 Additional Ones borrowed from the original set on the left. But, how do we deal with the other 12 Composite Conditions un-defined? Let’s not dictate them definitely in our program and let’s allow they might add up to the constant sum 34. I call this style the ‘inclusive mode’.

Before reconstruction we should verify the validity of new definition set by our usual ‘algebraic’ study.

[Contrast: Classic Definitions Left; New Definitions Right; Common at the Bottom]

<pre> * Basic Conditions: C=34 * n1+n2+n3+n4=C ...row1; n5+n6+n7+n8=C ...row2; n9+n10+n11+n12=C ...row3; n13+n14+n15+n16=C ...row4; n1+n5+n9+n13=C ...c1m1; n2+n6+n10+n14=C ...c1m2; n3+n7+n11+n15=C ...c1m3; n4+n8+n12+n16=C ...c1m4; n1+n6+n11+n16=C ...prd1; n4+n7+n10+n13=C ...prd2; </pre>	<pre> .------. 4  1  2  3  4  1  ---+---+---+  8  5  6  7  8  5  ---+---+---+  12  9 10 11 12  9  ---+---+---+  16 13 14 15 16 13 '-----' 4 1 2 3 4 1 </pre>	<pre> * Composite Conditions: C=34 * n6+n7+n10+n11=C ...C06; n8+n5+n12+n9=C ...C08; n14+n15+n2+n3=C ...C14; n16+n13+n4+n1=C ...C16; * Additional Conditions: C=34 * n1+n2+n3+n4=C ...Ad1; n5+n6+n7+n8=C ...Ad2; n1+n5+n9+n13=C ...Ad3; n2+n6+n10+n14=C ...Ad4; n1+n6+n11+n16=C ...Ad5; </pre>
<pre> ** List-forming Inequality Conditions for Standard Solutions: ** n1&lt;n4, n1&lt;n13, n1&lt;n16 and n2&lt;n5 </pre>		

**\*\* Algebraic Study 2: Transform Definition from Old Set to New \*\***

(1) Collect all the equations containing  $n_6, n_7, n_{10}, n_{11}$  and add them as follows.

$$\begin{array}{l} n_5+n_6+n_7+n_8=C \quad \dots \text{row2;} \\ n_9+n_{10}+n_{11}+n_{12}=C \quad \dots \text{row3;} \\ n_2+n_6+n_{10}+n_{14}=C \quad \dots \text{c1m2;} \\ n_3+n_7+n_{11}+n_{15}=C \quad \dots \text{c1m3;} \\ n_1+n_6+n_{11}+n_{16}=C \quad \dots \text{prd1;} \\ +) \quad n_4+n_7+n_{10}+n_{13}=C \quad \dots \text{prd2;} \end{array}$$

$$2*(n_6+n_7+n_{10}+n_{11})+$$

$$(n_1+n_2+n_3+n_4+n_5+n_6+n_7+n_8+n_9+n_{10}+n_{11}+n_{12}+n_{13}+n_{14}+n_{15}+n_{16}) = 6*C = 204$$

$$\text{But, } n_1+n_2+n_3+n_4+\dots+n_{15}+n_{16} = 1+2+3+4+\dots+15+16 = (16+1)*16/2 = 136$$

$$\text{Therefore, } 2*(n_6+n_7+n_{10}+n_{11})+136 = 204$$

$$\text{Meaning } n_6+n_7+n_{10}+n_{11} = 34 = C \quad \dots \text{C06;}$$

$$\begin{array}{l} (2) \quad n_5+n_6+n_7+n_8=C \quad \dots \text{row2;} \\ +) \quad n_9+n_{10}+n_{11}+n_{12}=C \quad \dots \text{row3;} \end{array}$$

$$(n_6+n_7+n_{10}+n_{11})+n_5+n_8+n_9+n_{12} = 2*C$$

$$\text{Therefore, } n_8+n_5+n_{12}+n_9 = 2*C-(n_6+n_7+n_{10}+n_{11}) = 2*C-C = C = 34 \quad \dots \text{C08;}$$

In the same way

$$\begin{array}{l} n_2+n_6+n_{10}+n_{14}=C \quad \dots \text{c1m2;} \\ +) \quad n_3+n_7+n_{11}+n_{15}=C \quad \dots \text{c1m3;} \end{array}$$

$$(n_6+n_7+n_{10}+n_{11})+n_2+n_3+n_{14}+n_{15} = 2*C$$

$$\text{Therefore, } n_{14}+n_{15}+n_2+n_3 = 2*C-(n_6+n_7+n_{10}+n_{11}) = 2*C-C = C = 34 \quad \dots \text{C14;}$$

$$\text{And } n_1+n_6+n_{11}+n_{16}=C \quad \dots \text{prd1;}$$

$$+ ) \quad n_4+n_7+n_{10}+n_{13}=C \quad \dots \text{prd2;}$$

$$(n_6+n_7+n_{10}+n_{11})+n_1+n_4+n_{13}+n_{16} = 2*C$$

$$\text{Therefore, } n_{16}+n_{13}+n_4+n_1 = 2*C-(n_6+n_7+n_{10}+n_{11}) = 2*C-C = C = 34 \quad \dots \text{C16;}$$

(3) Additional 5 equations are just from the original old set of definitions.

(4) Transform Definition from New Set to Old

$$\begin{array}{l} 4-1: \quad n_5+n_6+n_7+n_8=C \quad \dots \text{Ad2;} \\ -) \quad n_8+n_5+n_{12}+n_9=C \quad \dots \text{C08;} \end{array}$$

$$n_6+n_7=n_{12}+n_9$$

$$\text{While } n_6+n_7+n_{10}+n_{11}=C \quad \dots \text{C06;} \therefore n_{12}+n_9+n_{10}+n_{11} = n_9+n_{10}+n_{11}+n_{12}=C \quad \dots \text{row3;}$$

In the same way

$$\begin{array}{l} 4-2: \quad n_1+n_2+n_3+n_4=C \quad \dots \text{Ad1;} \\ \quad \quad n_{14}+n_{15}+n_2+n_3=C \quad \dots \text{C14;} (-) \end{array}$$

$$n_1+n_4=n_{14}+n_{15}$$

$$\text{While } n_{16}+n_{13}+n_4+n_1=C \quad \dots \text{C16;} \therefore n_{16}+n_{13}+n_{14}+n_{15} = n_{13}+n_{14}+n_{15}+n_{16}=C \quad \dots \text{row4;}$$

$$4-3: \quad n_2+n_6+n_{10}+n_{14}=C \quad \dots \text{Ad4;}$$

$$- ) \quad n_6+n_7+n_{10}+n_{11}=C \quad \dots \text{C06;}$$

$$n_2+n_{14}=n_7+n_{11}$$

$$\text{While } n_{14}+n_{15}+n_2+n_3=C \quad \dots \text{C14;} \therefore n_7+n_{11}+n_{15}+n_3 = n_3+n_7+n_{11}+n_{15}=C \quad \dots \text{c1m3;}$$

$$4-4: \quad n_1+n_5+n_9+n_{13}=C \quad \dots \text{Ad3;}$$

$$\quad \quad n_8+n_5+n_{12}+n_9=C \quad \dots \text{C08;} (-)$$

$$n_1+n_{13}=n_8+n_{12}$$

$$\text{While } n_{16}+n_{13}+n_4+n_1=C \quad \dots \text{C16;} \therefore n_{16}+n_8+n_4+n_{12} = n_4+n_8+n_{12}+n_{16}=C \quad \dots \text{c1m4;}$$

About the other Primary Diagonal

$$4-5: \quad n_1+n_6+n_{11}+n_{16}=C \quad \dots \text{Ad5;}$$

$$- ) \quad n_6+n_7+n_{10}+n_{11}=C \quad \dots \text{C06;}$$

$$n_1+n_{16}=n_7+n_{10}$$

$$\text{While } n_{16}+n_{13}+n_4+n_1=C \quad \dots \text{C16;} \therefore n_7+n_{10}+n_{13}+n_4 = n_4+n_7+n_{10}+n_{13}=C \quad \dots \text{prd2;}$$

Both new and old sets of definitions indicate the **logical equivalence** between them and express the same 'phenomenon' to be realized: 'Standard' MS44.

I have prepared the next list of program dictated for the object by the **inclusive** mode. Would you read and study it, please?



```

/**
*** 'Standard' Type of MS44 Reconstructed by our 'Composite Method': ***
*** Listing the 880 Standard Solutions with Precise Check-Sum-Errors **
*** of Rows, Columns, Primary-diagonals and 'Composite 2x2 Units' **
*** File 'MS44CmpstStd.c': Dictated by Kanji Setsuda **
*** on Dec.13, 2011; Feb. 3, 2012; and June 27, 2013 **
*** Working with MacOSX 10.8.4 and Xcode 4.6.3 **
//
#include <stdio.h>
//
short int cnt;
short tcnt[3], clscnt[17];
short cnt2, cnt3, ccnt;
short LSM, PSM;
short nm[17], uflg[17];
short tnm[3][19];
short csm[3][17], csm2[3][17];
short clsf[881][17];
//
void stp01(void), stp02(void), stp03(void), stp04(void);
void stp05(void), stp06(void), stp07(void), stp08(void);
void stp09(void), stp10(void), stp11(void), stp12(void);
void stp13(void), stp14(void), stp15(void), stp16(void);
void ansprint(void);
void printsol(short x);
void chksms(short x), chk2sms(short x);
void prsol(short x);
void ctabl(short x);
//
/* Main Program *
int main(void){
short n;
printf("//\n");
printf("/** 'Standard' Magic Squares 4x4 Reconstructed by our 'Composite Method':\n");
printf("//      List of the 880 Standard Solutions with precise Check-Sum-Errors **\n");
printf("//      \\\Primary-diagonals/\n");
printf("//      |Rows|Columns|16 'Composite 2x2 Units': CPatn Name|\n");
for(n=0;n<17;n++){nm[n]=0; uflg[n]=0;}
LSM=34; PSM=17;
cnt=0; cnt3=0; tcnt[0]=0; tcnt[1]=0; ccnt=0;
for(n=0;n<17;n++){clsf[ccnt][n]=-1; clscnt[n]=0;}
stp01(); // Make the MS44Std by our Composite Method
if(cnt3>0){prsol(cnt3);}
printf("// (SC:'Self-Complementary'; PD:'Pan-Diagonal'; st:'Standard' Type)\n");
printf("// [Total Count of Solutions = %d;", cnt);
printf(" Counts of Types: %d/SC, %d/PD, %d/st]\n", tcnt[1], tcnt[2], tcnt[0]);
printf("// [Counts of C-Patterns:");
for(n=1;n<8;n++){printf(" %d/P%d,", clscnt[n], n);}; printf("]\n");
printf("//\n");
printf("/** Calculated and Listed by Kanji Setsuda\n");
printf("//      on June 27, 2013 with MacOSX 10.8.4 & Xcode 4.6.3 **\n");
printf("//\n");
return 0;
}
//
/* Search Level #1 *
/* Set N1 *
void stp01(){
short a;
for(a=1;a<17;a++){
if(uflg[a]==0){cnt2=0;
nm[1]=a; uflg[a]=1;
stp02();
uflg[a]=0;}
}
}
}

```

```

/** Set N2 *
void stp02(){
  short a;
  for(a=1;a<17;a++){
    if(uflg[a]==0){
      nm[2]=a; uflg[a]=1;
      stp03();
      uflg[a]=0;}
  }
}
/** Set N3 *
void stp03(){
  short a;
  for(a=1;a<17;a++){
    if(uflg[a]==0){
      nm[3]=a; uflg[a]=1;
      stp04();
      uflg[a]=0;}
  }
}
/** Set n4=LSM-n1-n2-n3 & n4>N1 *
void stp04(){
  short a;
  a=LSM-nm[1]-nm[2]-nm[3];
  if((nm[1]<a)&&(a<17)){
    if(uflg[a]==0){
      nm[4]=a; uflg[a]=1;
      stp05();
      uflg[a]=0;}}
}
/** Search Level #2 *
/** Set N5(>N2) *
void stp05(){
  short a;
  for(a=nm[2]+1;a<17;a++){
    if(uflg[a]==0){
      nm[5]=a; uflg[a]=1;
      stp06();
      uflg[a]=0;}
  }
}
/** Set N6 *
void stp06(){
  short a;
  for(a=1;a<17;a++){
    if(uflg[a]==0){
      nm[6]=a; uflg[a]=1;
      stp07();
      uflg[a]=0;}
  }
}
/** Set N7 *
void stp07(){
  short a;
  for(a=1;a<17;a++){
    if(uflg[a]==0){
      nm[7]=a; uflg[a]=1;
      stp08();
      uflg[a]=0;}
  }
}
/** Set n8=LSM-n5-n6-n7 *
void stp08(){
  short a;
  a=LSM-nm[5]-nm[6]-nm[7];
  if((0<a)&&(a<17)){

```

```

        if(uflg[a]==0){
            nm[8]=a; uflg[a]=1;
            stp09();
            uflg[a]=0;}}
    }
    /* Search Level #3 *
    /* Set N9 *
void stp09(){
    short a;
    for(a=1;a<17;a++){
        if(uflg[a]==0){
            nm[9]=a; uflg[a]=1;
            stp10();
            uflg[a]=0;}}
    }
}
/* Set N10 *
void stp10(){
    short a;
    for(a=1;a<17;a++){
        if(uflg[a]==0){if(nm[1]==1){cnt2=0;}}
        nm[10]=a; uflg[a]=1;
        stp11();
        uflg[a]=0;}}
    }
}
/* Set n11=LSM-n6-n7-n10 *
void stp11(){
    short a;
    a=LSM-nm[6]-nm[7]-nm[10];
    if((0<a)&&(a<17)){
        if(uflg[a]==0){
            nm[11]=a; uflg[a]=1;
            stp12();
            uflg[a]=0;}}
    }
}
/* Set n12=LSM-n8-n5-n9 *
void stp12(){
    short a;
    a=LSM-nm[8]-nm[5]-nm[9];
    if((0<a)&&(a<17)){
        if(uflg[a]==0){
            nm[12]=a; uflg[a]=1;
            stp13();
            uflg[a]=0;}}
    }
}
/* Search Level #4 *
/* Set n13=LSM-n1-n5-n9 & n13>N1 *
void stp13(){
    short a;
    a=LSM-nm[1]-nm[5]-nm[9];
    if((nm[1]<a)&&(a<17)){
        if(uflg[a]==0){
            nm[13]=a; uflg[a]=1;
            stp14();
            uflg[a]=0;}}
    }
}
/* Set n14=LSM-n2-n6-n10 *
void stp14(){
    short a;
    a=LSM-nm[2]-nm[6]-nm[10];
    if((0<a)&&(a<17)){
        if(uflg[a]==0){
            nm[14]=a; uflg[a]=1;
            stp15();
            uflg[a]=0;}}
    }
}

```

```

}
/** Set n15=LSM-n14-n2-n3 *
void stp15(){
  short a;
  a=LSM-nm[14]-nm[2]-nm[3];
  if((0<a)&&(a<17)){
    if(uflg[a]==0){
      nm[15]=a; uflg[a]=1;
      stp16();
      uflg[a]=0;}}
}
/** Set n16=LSM-n13-n4-n1 & N1<n16 *
void stp16(){
  short a,b;
  a=LSM-nm[13]-nm[4]-nm[1];
  b=LSM-nm[1]-nm[6]-nm[11];
  if((a==b)&&(nm[1]<a)&&(a<17)){
    if(uflg[a]==0){
      nm[16]=a; uflg[a]=1;
      ansprint();
      uflg[a]=0;}}
}
//
/** Print the Answers *
void ansprint(){
  short tp1, tp2, tp3, tp4, tp5;
  short n;
  cnt++; cnt2++;
  for(n=1;n<17;n++){tnm[cnt3][n]=nm[n];}
  tnm[cnt3][0]=cnt; tnm[cnt3][17]=-1;
  chksms(cnt3); chk2sms(cnt3);
  ctabl(cnt3);
  tp1=0; for(n=1;n<5;n++){if(csm2[cnt3][n]!=0){tp1=-1; break;}}
  tp2=0; for(n=5;n<9;n++){if(csm2[cnt3][n]!=0){tp2=-1; break;}}
  tp3=-1; if((csm2[cnt3][9]==0)&&(csm2[cnt3][16]==0)){tp3=0;}
  tp4=0; for(n=9;n<17;n++){if(csm2[cnt3][n]!=0){tp4=-1; break;}}
  tp5=0; for(n=1;n<9;n++){if(nm[n]+nm[PSM-n]!=PSM){tp5=-1; break;}}
  if((tp1==0)&&(tp2==0)&&(tp3==0)){
    tnm[cnt3][17]=0; tcnt[0]++;
    if(tp4==0){tnm[cnt3][17]=2; tcnt[2]++;}
    else if(tp5==0){tnm[cnt3][17]=1; tcnt[1]++;}
  }
  if(cnt2==1){cnt3++;
  if(cnt3==3){prsol(cnt3); cnt3=0;}
}
}
//
/** Check Sums of Composite Fours *
void chksms(short x){
  csm[x][1]=nm[1]+nm[2]+nm[5]+nm[6]-LSM;
  csm[x][2]=nm[2]+nm[3]+nm[6]+nm[7]-LSM;
  csm[x][3]=nm[3]+nm[4]+nm[7]+nm[8]-LSM;
  csm[x][4]=nm[4]+nm[1]+nm[8]+nm[5]-LSM;
  csm[x][5]=nm[5]+nm[6]+nm[9]+nm[10]-LSM;
  csm[x][6]=nm[6]+nm[7]+nm[10]+nm[11]-LSM;
  csm[x][7]=nm[7]+nm[8]+nm[11]+nm[12]-LSM;
  csm[x][8]=nm[8]+nm[5]+nm[12]+nm[9]-LSM;
  csm[x][9]=nm[9]+nm[10]+nm[13]+nm[14]-LSM;
  csm[x][10]=nm[10]+nm[11]+nm[14]+nm[15]-LSM;
  csm[x][11]=nm[11]+nm[12]+nm[15]+nm[16]-LSM;
  csm[x][12]=nm[12]+nm[9]+nm[16]+nm[13]-LSM;
  csm[x][13]=nm[13]+nm[14]+nm[1]+nm[2]-LSM;
  csm[x][14]=nm[14]+nm[15]+nm[2]+nm[3]-LSM;
  csm[x][15]=nm[15]+nm[16]+nm[3]+nm[4]-LSM;
  csm[x][16]=nm[16]+nm[13]+nm[4]+nm[1]-LSM;
}

```

```

//
/** Check Sums of Rows, Columns and 8 Pan-Diagonals *
void chk2sms(short x){
    csm2[x][1]=nm[1]+nm[2]+nm[3]+nm[4]-LSM;
    csm2[x][2]=nm[5]+nm[6]+nm[7]+nm[8]-LSM;
    csm2[x][3]=nm[9]+nm[10]+nm[11]+nm[12]-LSM;
    csm2[x][4]=nm[13]+nm[14]+nm[15]+nm[16]-LSM;
    csm2[x][5]=nm[1]+nm[5]+nm[9]+nm[13]-LSM;
    csm2[x][6]=nm[2]+nm[6]+nm[10]+nm[14]-LSM;
    csm2[x][7]=nm[3]+nm[7]+nm[11]+nm[15]-LSM;
    csm2[x][8]=nm[4]+nm[8]+nm[12]+nm[16]-LSM;
    csm2[x][9]=nm[1]+nm[6]+nm[11]+nm[16]-LSM;
    csm2[x][10]=nm[2]+nm[7]+nm[12]+nm[13]-LSM;
    csm2[x][11]=nm[3]+nm[8]+nm[9]+nm[14]-LSM;
    csm2[x][12]=nm[4]+nm[5]+nm[10]+nm[15]-LSM;
    csm2[x][13]=nm[1]+nm[8]+nm[11]+nm[14]-LSM;
    csm2[x][14]=nm[2]+nm[5]+nm[12]+nm[15]-LSM;
    csm2[x][15]=nm[3]+nm[6]+nm[9]+nm[16]-LSM;
    csm2[x][16]=nm[4]+nm[7]+nm[10]+nm[13]-LSM;
}
//
/** Print Each Solution with full Information *
void prsol(short x){
    short l,l4,m,n;
    printf("//");
    for(m=0;m<x;m++){
        printf("%9d/",tnm[m][0]);
        if(tnm[m][17]==2){printf("PD");}
        else if(tnm[m][17]==1){printf("SC");}
        else{printf("st");}
        printf("\%d/%d Comp-SmE: P%d",csm2[m][9],csm2[m][16],tnm[m][18]);
    }
    printf("\n");
    for(l=0;l<4;l++){l4=l*4;
        printf("//");
        for(m=0;m<x;m++){
            for(n=1;n<5;n++){printf("%3d",tnm[m][l4+n]);}
            printf(" |%d|%d",csm2[m][l+1],csm2[m][l+5]);
            printf(" |%3d%3d%3d%3d|",csm[m][l4+1],csm[m][l4+2],csm[m][l4+3],csm[m][l4+4]);
        }
        printf("\n");
    }
    printf("//\n");
}
//
/** Save the Sum-Pattern of 2x2 Units to the Classified Table *
void ctabl(short x){
    short m,n,v,t;
    for(n=1;n<17;n++){v=csm[x][n]; if(v==0){clsf[ccnt][n]=0;}else{clsf[ccnt][n]=-1;}}
    for(m=0;m<=ccnt;m++){t=0;
        for(n=1;n<17;n++){if(clsf[m][n]==clsf[ccnt][n]){t++;}}
        if(t==16){tnm[x][18]=m+1; break;}
    }
    n=tnm[x][18]; clscnt[n]++;
    if(m==ccnt){ccnt++; for(n=1;n<17;n++){clsf[ccnt][n]=-1;}}
}
//

```

Here you are at the result list of our experiment below. Try to compare it with the first list presented in this article. And you will find they are perfectly the same, though the Check-sum-error Monitor looks a little different.

'0' means 34; '5' means 39; and '-5' means 29 there in this monitor; since each of them is designed to show its difference from the constant value 34.

## #6. List of Solutions of the 'Standard' MS44 Reconstructed

\*\* 'Standard' Magic Squares 4x4 Reconstructed by our 'Composite Method':  
List of the 880 Standard Solutions with precise Check-Sum-Errors \*\*

\Primary-diagonals/

|Rows|Columns|16 'Composite 2x2 Units': CPatn Name|

1/st\0/0 Comp-SmE: P1				2/st\0/0 Comp-SmE: P1				3/st\0/0 Comp-SmE: P2															
1	2	15	16 0 0	-5	0	5	0	1	2	15	16 0 0	-4	0	4	0	1	2	16	15 0 0	-4	2	4	-2
12	14	3	5 0 0	12	0	-12	0	13	14	3	4 0 0	12	0	-12	0	13	14	4	3 0 0	12	0	-12	0
13	7	10	4 0 0	5	0	-5	0	12	7	10	5 0 0	4	0	-4	0	12	7	9	6 0 0	4	-2	-4	2
8	11	6	9 0 0	-12	0	12	0	8	11	6	9 0 0	-12	0	12	0	8	11	5	10 0 0	-12	0	12	0
4/st\0/0 Comp-SmE: P1				5/st\0/0 Comp-SmE: P1				6/st\0/0 Comp-SmE: P1															
1	3	14	16 0 0	-7	0	7	0	1	3	14	16 0 0	-5	0	5	0	1	3	14	16 0 0	-2	0	2	0
10	13	4	7 0 0	10	0	-10	0	12	13	4	5 0 0	14	0	-14	0	15	13	4	2 0 0	10	0	-10	0
15	6	11	2 0 0	7	0	-7	0	15	8	9	2 0 0	5	0	-5	0	10	6	11	7 0 0	2	0	-2	0
8	12	5	9 0 0	-10	0	10	0	6	10	7	11 0 0	-14	0	14	0	8	12	5	9 0 0	-10	0	10	0
7/st\0/0 Comp-SmE: P1				8/st\0/0 Comp-SmE: P2				9/st\0/0 Comp-SmE: P2															
1	3	14	16 0 0	-2	0	2	0	1	3	16	14 0 0	-7	2	7	-2	1	3	16	14 0 0	-3	2	3	-2
15	13	4	2 0 0	14	0	-14	0	8	15	2	9 0 0	8	0	-8	0	12	15	2	5 0 0	16	0	-16	0
12	8	9	5 0 0	2	0	-2	0	13	6	11	4 0 0	7	-2	-7	2	13	10	7	4 0 0	3	-2	-3	2
6	10	7	11 0 0	-14	0	14	0	12	10	5	7 0 0	-8	0	8	0	8	6	9	11 0 0	-16	0	16	0
10/st\0/0 Comp-SmE: P2				11/st\0/0 Comp-SmE: P2				12/st\0/0 Comp-SmE: P1															
1	3	16	14 0 0	-2	2	2	-2	1	3	16	14 0 0	-2	2	2	-2	1	4	13	16 0 0	-7	0	7	0
13	15	2	4 0 0	8	0	-8	0	13	15	2	4 0 0	16	0	-16	0	8	14	3	9 0 0	8	0	-8	0
8	6	11	9 0 0	2	-2	-2	2	12	10	7	5 0 0	2	-2	-2	2	15	5	12	2 0 0	7	0	-7	0
12	10	5	7 0 0	-8	0	8	0	8	6	9	11 0 0	-16	0	16	0	10	11	6	7 0 0	-8	0	8	0
13/st\0/0 Comp-SmE: P1				14/st\0/0 Comp-SmE: P1				15/st\0/0 Comp-SmE: P1															
1	4	13	16 0 0	-6	0	6	0	1	4	13	16 0 0	-3	0	3	0	1	4	13	16 0 0	-2	0	2	0
8	15	2	9 0 0	8	0	-8	0	12	14	3	5 0 0	16	0	-16	0	12	15	2	5 0 0	16	0	-16	0
14	5	12	3 0 0	6	0	-6	0	15	9	8	2 0 0	3	0	-3	0	14	9	8	3 0 0	2	0	-2	0
11	10	7	6 0 0	-8	0	8	0	6	7	10	11 0 0	-16	0	16	0	7	6	11	10 0 0	-16	0	16	0
16/st\0/0 Comp-SmE: P3				17/st\0/0 Comp-SmE: P3				18/st\0/0 Comp-SmE: P3															
1	4	13	16 0 0	0	0	0	0	1	4	13	16 0 0	0	0	0	0	1	4	13	16 0 0	0	0	0	0
14	15	2	3 0 0	8	0	-8	0	14	15	2	3 0 0	16	0	-16	0	15	14	3	2 0 0	8	0	-8	0
8	5	12	9 0 0	0	0	0	0	12	9	8	5 0 0	0	0	0	0	8	5	12	9 0 0	0	0	0	0
11	10	7	6 0 0	-8	0	8	0	7	6	11	10 0 0	-16	0	16	0	10	11	6	7 0 0	-8	0	8	0
19/st\0/0 Comp-SmE: P3				20/st\0/0 Comp-SmE: P2				21/st\0/0 Comp-SmE: P4															
1	4	13	16 0 0	0	0	0	0	1	4	14	15 0 0	-8	2	8	-2	1	4	14	15 0 0	0	2	0	-2
15	14	3	2 0 0	16	0	-16	0	9	12	6	7 0 0	8	0	-8	0	13	16	2	3 0 0	8	0	-8	0
12	9	8	5 0 0	0	0	0	0	16	5	11	2 0 0	8	-2	-8	2	8	5	11	10 0 0	0	-2	0	2
6	7	10	11 0 0	-16	0	16	0	8	13	3	10 0 0	-8	0	8	0	12	9	7	6 0 0	-8	0	8	0
22/st\0/0 Comp-SmE: P4				23/st\0/0 Comp-SmE: P1				24/st\0/0 Comp-SmE: P3															
1	4	14	15 0 0	0	2	0	-2	1	4	14	15 0 0	-2	0	2	0	1	4	14	15 0 0	0	0	0	0
13	16	2	3 0 0	16	0	-16	0	16	11	5	2 0 0	8	0	-8	0	16	13	3	2 0 0	8	0	-8	0
12	9	7	6 0 0	0	-2	0	2	9	6	12	7 0 0	2	0	-2	0	7	6	12	9 0 0	0	0	0	0
8	5	11	10 0 0	-16	0	16	0	8	13	3	10 0 0	-8	0	8	0	10	11	5	8 0 0	-8	0	8	0
25/st\0/0 Comp-SmE: P3				26/st\0/0 Comp-SmE: P2				27/st\0/0 Comp-SmE: P4															
1	4	14	15 0 0	0	0	0	0	1	4	15	14 0 0	-8	4	8	-4	1	4	15	14 0 0	0	4	0	-4
16	13	3	2 0 0	16	0	-16	0	9	12	7	6 0 0	8	0	-8	0	13	16	3	2 0 0	8	0	-8	0
11	10	8	5 0 0	0	0	0	0	16	5	10	3 0 0	8	-4	-8	4	8	5	10	11 0 0	0	-4	0	4
6	7	9	12 0 0	-16	0	16	0	8	13	2	11 0 0	-8	0	8	0	12	9	6	7 0 0	-8	0	8	0
28/st\0/0 Comp-SmE: P4				29/st\0/0 Comp-SmE: P1				30/st\0/0 Comp-SmE: P3															
1	4	15	14 0 0	0	4	0	-4	1	4	15	14 0 0	-3	0	3	0	1	4	15	14 0 0	0	0	0	0
13	16	3	2 0 0	16	0	-16	0	16	10	5	3 0 0	8	0	-8	0	16	13	2	3 0 0	8	0	-8	0
12	9	6	7 0 0	0	-4	0	4	9	7	12	6 0 0	3	0	-3	0	6	7	12	9 0 0	0	0	0	0
8	5	10	11 0 0	-16	0	16	0	8	13	2	11 0 0	-8	0	8	0	11	10	5	8 0 0	-8	0	8	0

31/st\0/0 Comp-SmE: P3	32/st\0/0 Comp-SmE: P4	33/st\0/0 Comp-SmE: P4
1 4 15 14 0 0  0 0 0 0	1 4 16 13 0 0  0 4 0 -4	1 4 16 13 0 0  0 4 0 -4
16 13 2 3 0 0  16 0-16 0	14 15 3 2 0 0  8 0 -8 0	14 15 3 2 0 0  16 0-16 0
10 11 8 5 0 0  0 0 0 0	7 6 10 11 0 0  0 -4 0 4	11 10 6 7 0 0  0 -4 0 4
7 6 9 12 0 0 -16 0 16 0	12 9 5 8 0 0 -8 0 8 0	8 5 9 12 0 0 -16 0 16 0
34/st\0/0 Comp-SmE: P4	35/st\0/0 Comp-SmE: P4	36/st\0/0 Comp-SmE: P1
1 4 16 13 0 0  0 2 0 -2	1 4 16 13 0 0  0 2 0 -2	1 5 12 16 0 0  -7 0 7 0
15 14 2 3 0 0  8 0 -8 0	15 14 2 3 0 0  16 0-16 0	10 11 6 7 0 0  6 0 -6 0
6 7 11 10 0 0  0 -2 0 2	10 11 7 6 0 0  0 -2 0 2	15 4 13 2 0 0  7 0 -7 0
12 9 5 8 0 0 -8 0 8 0	8 5 9 12 0 0 -16 0 16 0	8 14 3 9 0 0 -6 0 6 0
37/st\0/0 Comp-SmE: P1	38/st\0/0 Comp-SmE: P1	39/st\0/0 Comp-SmE: P1
1 5 12 16 0 0  -3 0 3 0	1 5 12 16 0 0  -2 0 2 0	1 5 12 16 0 0  -2 0 2 0
14 11 6 3 0 0  14 0-14 0	15 11 6 2 0 0  6 0 -6 0	15 11 6 2 0 0  14 0-14 0
15 8 9 2 0 0  3 0 -3 0	10 4 13 7 0 0  2 0 -2 0	14 8 9 3 0 0  2 0 -2 0
4 10 7 13 0 0 -14 0 14 0	8 14 3 9 0 0 -6 0 6 0	4 10 7 13 0 0 -14 0 14 0
40/st\0/0 Comp-SmE: P2	41/st\0/0 Comp-SmE: P2	42/st\0/0 Comp-SmE: P2
1 5 16 12 0 0  -6 4 6 -4	1 5 16 12 0 0  -4 4 4 -4	1 5 16 12 0 0  -4 4 4 -4
8 14 3 9 0 0  2 0 -2 0	10 14 3 7 0 0  2 0 -2 0	10 14 3 7 0 0  16 0-16 0
10 4 13 7 0 0  6 -4 -6 4	8 4 13 9 0 0  4 -4 -4 4	15 11 6 2 0 0  4 -4 -4 4
15 11 2 6 0 0 -2 0 2 0	15 11 2 6 0 0 -2 0 2 0	8 4 9 13 0 0 -16 0 16 0
43/st\0/0 Comp-SmE: P2	44/st\0/0 Comp-SmE: P1	45/st\0/0 Comp-SmE: P1
1 5 16 12 0 0  1 4 -1 -4	1 6 11 16 0 0  -5 0 5 0	1 6 11 16 0 0  -7 0 7 0
15 14 3 2 0 0  16 0-16 0	7 15 2 10 0 0  6 0 -6 0	8 12 5 9 0 0  4 0 -4 0
10 11 6 7 0 0 -1 -4 1 4	14 4 13 3 0 0  5 0 -5 0	15 3 14 2 0 0  7 0 -7 0
8 4 9 13 0 0 -16 0 16 0	12 9 8 5 0 0 -6 0 6 0	10 13 4 7 0 0 -4 0 4 0
46/st\0/0 Comp-SmE: P1	47/st\0/0 Comp-SmE: P1	48/st\0/0 Comp-SmE: P3
1 6 11 16 0 0  -4 0 4 0	1 6 11 16 0 0  -5 0 5 0	1 6 11 16 0 0  0 0 0 0
8 15 2 9 0 0  4 0 -4 0	12 10 7 5 0 0  4 0 -4 0	12 15 2 5 0 0  4 0 -4 0
12 3 14 5 0 0  4 0 -4 0	13 3 14 4 0 0  5 0 -5 0	8 3 14 9 0 0  0 0 0 0
13 10 7 4 0 0 -4 0 4 0	8 15 2 9 0 0 -4 0 4 0	13 10 7 4 0 0 -4 0 4 0
49/st\0/0 Comp-SmE: P3	50/st\0/0 Comp-SmE: P1	51/st\0/0 Comp-SmE: P1
1 6 11 16 0 0  0 0 0 0	1 6 11 16 0 0  -4 0 4 0	1 6 11 16 0 0  -1 0 1 0
12 15 2 5 0 0  16 0-16 0	13 10 7 4 0 0  4 0 -4 0	14 12 5 3 0 0  16 0-16 0
14 9 8 3 0 0  0 0 0 0	12 3 14 5 0 0  4 0 -4 0	15 9 8 2 0 0  1 0 -1 0
7 4 13 10 0 0 -16 0 16 0	8 15 2 9 0 0 -4 0 4 0	4 7 10 13 0 0 -16 0 16 0
52/st\0/0 Comp-SmE: P1	53/st\0/0 Comp-SmE: P1	54/st\0/0 Comp-SmE: P3
1 6 11 16 0 0  2 0 -2 0	1 6 11 16 0 0  2 0 -2 0	1 6 11 16 0 0  0 0 0 0
14 15 2 3 0 0  6 0 -6 0	14 15 2 3 0 0  16 0-16 0	15 12 5 2 0 0  4 0 -4 0
7 4 13 10 0 0  -2 0 2 0	12 9 8 5 0 0  -2 0 2 0	8 3 14 9 0 0  0 0 0 0
12 9 8 5 0 0 -6 0 6 0	7 4 13 10 0 0 -16 0 16 0	10 13 4 7 0 0 -4 0 4 0
55/st\0/0 Comp-SmE: P3	56/st\0/0 Comp-SmE: P4	57/st\0/0 Comp-SmE: P4
1 6 11 16 0 0  0 0 0 0	1 6 12 15 0 0  0 2 0 -2	1 6 12 15 0 0  0 2 0 -2
15 12 5 2 0 0  16 0-16 0	11 16 2 5 0 0  4 0 -4 0	11 16 2 5 0 0  16 0-16 0
14 9 8 3 0 0  0 0 0 0	8 3 13 10 0 0  0 -2 0 2	14 9 7 4 0 0  0 -2 0 2
4 7 10 13 0 0 -16 0 16 0	14 9 7 4 0 0 -4 0 4 0	8 3 13 10 0 0 -16 0 16 0
58/st\0/0 Comp-SmE: P2	59/st\0/0 Comp-SmE: P1	60/st\0/0 Comp-SmE: P3
1 6 12 15 0 0  -4 2 4 -2	1 6 12 15 0 0  -2 0 2 0	1 6 12 15 0 0  0 0 0 0
13 10 8 3 0 0  12 0-12 0	16 9 7 2 0 0  12 0-12 0	16 11 5 2 0 0  4 0 -4 0
16 7 9 2 0 0  4 -2 -4 2	13 8 10 3 0 0  2 0 -2 0	7 4 14 9 0 0  0 0 0 0
4 11 5 14 0 0 -12 0 12 0	4 11 5 14 0 0 -12 0 12 0	10 13 3 8 0 0 -4 0 4 0
61/st\0/0 Comp-SmE: P3	62/st\0/0 Comp-SmE: P4	63/st\0/0 Comp-SmE: P4
1 6 12 15 0 0  0 0 0 0	1 6 15 12 0 0  0 8 0 -8	1 6 15 12 0 0  0 8 0 -8
16 11 5 2 0 0  16 0-16 0	11 16 5 2 0 0  4 0 -4 0	11 16 5 2 0 0  16 0-16 0
13 10 8 3 0 0  0 0 0 0	8 3 10 13 0 0  0 -8 0 8	14 9 4 7 0 0  0 -8 0 8
4 7 9 14 0 0 -16 0 16 0	14 9 4 7 0 0 -4 0 4 0	8 3 10 13 0 0 -16 0 16 0



64/st\0\0|Comp-SmE: P3| 65/st\0\0|Comp-SmE: P3| 66/st\0\0|Comp-SmE: P4|  
1 6 15 12|0|0| 0 0 0 0| 1 6 15 12|0|0| 0 0 0 0| 1 6 16 11|0|0| 0 8 0 -8|  
16 11 2 5|0|0| 4 0 -4 0| 16 11 2 5|0|0| 16 0-16 0| 12 15 5 2|0|0| 4 0 -4 0|  
4 7 14 9|0|0| 0 0 0 0| 10 13 8 3|0|0| 0 0 0 0| 7 4 10 13|0|0| 0 -8 0 8|  
13 10 3 8|0|0| -4 0 4 0| 7 4 9 14|0|0| -16 0 16 0| 14 9 3 8|0|0| -4 0 4 0|

67/st\0\0|Comp-SmE: P4| 68/st\0\0|Comp-SmE: P4| 69/st\0\0|Comp-SmE: P4|  
1 6 16 11|0|0| 0 8 0 -8| 1 6 16 11|0|0| 0 2 0 -2| 1 6 16 11|0|0| 0 2 0 -2|  
12 15 5 2|0|0| 16 0-16 0| 15 12 2 5|0|0| 4 0 -4 0| 15 12 2 5|0|0| 16 0-16 0|  
13 10 4 7|0|0| 0 -8 0 8| 4 7 13 10|0|0| 0 -2 0 2| 10 13 7 4|0|0| 0 -2 0 2|  
8 3 9 14|0|0| -16 0 16 0| 14 9 3 8|0|0| -4 0 4 0| 8 3 9 14|0|0| -16 0 16 0|

70/st\0\0|Comp-SmE: P1| 71/st\0\0|Comp-SmE: P1| 72/st\0\0|Comp-SmE: P1|  
1 7 10 16|0|0| -6 0 6 0| 1 7 10 16|0|0| -4 0 4 0| 1 7 10 16|0|0| -5 0 5 0|  
8 12 5 9|0|0| 2 0 -2 0| 8 14 3 9|0|0| 2 0 -2 0| 12 9 8 5|0|0| 6 0 -6 0|  
14 2 15 3|0|0| 6 0 -6 0| 12 2 15 5|0|0| 4 0 -4 0| 15 4 13 2|0|0| 5 0 -5 0|  
11 13 4 6|0|0| -2 0 2 0| 13 11 6 4|0|0| -2 0 2 0| 6 14 3 11|0|0| -6 0 6 0|

73/st\0\0|Comp-SmE: P3| 74/st\0\0|Comp-SmE: P3| 75/st\0\0|Comp-SmE: P1|  
1 7 10 16|0|0| 0 0 0 0| 1 7 10 16|0|0| 0 0 0 0| 1 7 10 16|0|0| -3 0 3 0|  
12 14 3 5|0|0| 2 0 -2 0| 12 14 3 5|0|0| 16 0-16 0| 14 9 8 3|0|0| 10 0-10 0|  
8 2 15 9|0|0| 0 0 0 0| 15 9 8 2|0|0| 0 0 0 0| 15 6 11 2|0|0| 3 0 -3 0|  
13 11 6 4|0|0| -2 0 2 0| 6 4 13 11|0|0| -16 0 16 0| 4 12 5 13|0|0| -10 0 10 0|

76/st\0\0|Comp-SmE: P3| 77/st\0\0|Comp-SmE: P3| 78/st\0\0|Comp-SmE: P1|  
1 7 10 16|0|0| 0 0 0 0| 1 7 10 16|0|0| 0 0 0 0| 1 7 10 16|0|0| -2 0 2 0|  
14 12 5 3|0|0| 2 0 -2 0| 14 12 5 3|0|0| 16 0-16 0| 15 9 8 2|0|0| 6 0 -6 0|  
8 2 15 9|0|0| 0 0 0 0| 15 9 8 2|0|0| 0 0 0 0| 12 4 13 5|0|0| 2 0 -2 0|  
11 13 4 6|0|0| -2 0 2 0| 4 6 11 13|0|0| -16 0 16 0| 6 14 3 11|0|0| -6 0 6 0|

79/st\0\0|Comp-SmE: P1| 80/st\0\0|Comp-SmE: P1| 81/st\0\0|Comp-SmE: P1|  
1 7 10 16|0|0| -2 0 2 0| 1 7 10 16|0|0| 1 0 -1 0| 1 7 10 16|0|0| 3 0 -3 0|  
15 9 8 2|0|0| 10 0-10 0| 15 12 5 2|0|0| 16 0-16 0| 15 14 3 2|0|0| 16 0-16 0|  
14 6 11 3|0|0| 2 0 -2 0| 14 9 8 3|0|0| -1 0 1 0| 12 9 8 5|0|0| -3 0 3 0|  
4 12 5 13|0|0| -10 0 10 0| 4 6 11 13|0|0| -16 0 16 0| 6 4 13 11|0|0| -16 0 16 0|

82/st\0\0|Comp-SmE: P4| 83/st\0\0|Comp-SmE: P4| 84/st\0\0|Comp-SmE: P3|  
1 7 12 14|0|0| 0 4 0 -4| 1 7 12 14|0|0| 0 4 0 -4| 1 7 12 14|0|0| 0 0 0 0|  
10 16 3 5|0|0| 2 0 -2 0| 10 16 3 5|0|0| 16 0-16 0| 16 10 5 3|0|0| 2 0 -2 0|  
8 2 13 11|0|0| 0 -4 0 4| 15 9 6 4|0|0| 0 -4 0 4| 6 4 15 9|0|0| 0 0 0 0|  
15 9 6 4|0|0| -2 0 2 0| 8 2 13 11|0|0| -16 0 16 0| 11 13 2 8|0|0| -2 0 2 0|

85/st\0\0|Comp-SmE: P3| 86/st\0\0|Comp-SmE: P5| 87/st\0\0|Comp-SmE: P5|  
1 7 12 14|0|0| 0 0 0 0| 1 7 14 12|0|0| -5 2 5 -2| 1 7 14 12|0|0| -2 6 2 -6|  
16 10 5 3|0|0| 16 0-16 0| 8 13 2 11|0|0| 0 0 0 0| 9 15 4 6|0|0| 0 0 0 0|  
13 11 8 2|0|0| 0 0 0 0| 9 4 15 6|0|0| 5 -2 -5 2| 8 2 13 11|0|0| 2 -6 -2 6|  
4 6 9 15|0|0| -16 0 16 0| 16 10 3 5|0|0| 0 0 0 0| 16 10 3 5|0|0| 0 0 0 0|

88/st\0\0|Comp-SmE: P2| 89/st\0\0|Comp-SmE: P4| 90/st\0\0|Comp-SmE: P4|  
1 7 14 12|0|0| -2 6 2 -6| 1 7 14 12|0|0| 0 8 0 -8| 1 7 14 12|0|0| 0 8 0 -8|  
9 15 4 6|0|0| 16 0-16 0| 10 16 5 3|0|0| 2 0 -2 0| 10 16 5 3|0|0| 16 0-16 0|  
16 10 5 3|0|0| 2 -6 -2 6| 8 2 11 13|0|0| 0 -8 0 8| 15 9 4 6|0|0| 0 -8 0 8|  
8 2 11 13|0|0| -16 0 16 0| 15 9 4 6|0|0| -2 0 2 0| 8 2 11 13|0|0| -16 0 16 0|

91/st\0\0|Comp-SmE: P5| 92/st\0\0|Comp-SmE: P3| 93/st\0\0|Comp-SmE: P3|  
1 7 14 12|0|0| -2 2 2 -2| 1 7 14 12|0|0| 0 0 0 0| 1 7 14 12|0|0| 0 0 0 0|  
11 13 2 8|0|0| 0 0 0 0| 16 10 3 5|0|0| 2 0 -2 0| 16 10 3 5|0|0| 16 0-16 0|  
6 4 15 9|0|0| 2 -2 -2 2| 4 6 15 9|0|0| 0 0 0 0| 11 13 8 2|0|0| 0 0 0 0|  
16 10 3 5|0|0| 0 0 0 0| 13 11 2 8|0|0| -2 0 2 0| 6 4 9 15|0|0| -16 0 16 0|

94/st\0\0|Comp-SmE: P2| 95/st\0\0|Comp-SmE: P4| 96/st\0\0|Comp-SmE: P4|  
1 7 16 10|0|0| -2 6 2 -6| 1 7 16 10|0|0| 0 8 0 -8| 1 7 16 10|0|0| 0 8 0 -8|  
11 13 4 6|0|0| 16 0-16 0| 12 14 5 3|0|0| 2 0 -2 0| 12 14 5 3|0|0| 16 0-16 0|  
14 12 5 3|0|0| 2 -6 -2 6| 6 4 11 13|0|0| 0 -8 0 8| 13 11 4 6|0|0| 0 -8 0 8|  
8 2 9 15|0|0| -16 0 16 0| 15 9 2 8|0|0| -2 0 2 0| 8 2 9 15|0|0| -16 0 16 0|

97/st\0\0 Comp-SmE: P4	98/st\0\0 Comp-SmE: P4	99/st\0\0 Comp-SmE: P2
1 7 16 10 0 0  0 4 0 -4	1 7 16 10 0 0  0 4 0 -4	1 7 16 10 0 0  1 6 -1 -6
14 12 3 5 0 0  2 0 -2 0	14 12 3 5 0 0  16 0-16 0	14 13 4 3 0 0  16 0-16 0
4 6 13 11 0 0  0 -4 0 4	11 13 6 4 0 0  0 -4 0 4	11 12 5 6 0 0  -1 -6 1 6
15 9 2 8 0 0  -2 0 2 0	8 2 9 15 0 0  -16 0 16 0	8 2 9 15 0 0  -16 0 16 0
100/st\0\0 Comp-SmE: P1	101/st\0\0 Comp-SmE: P4	102/PD\0\0 Comp-SmE: P6
1 8 9 16 0 0  2 0 -2 0	1 8 10 15 0 0  0 2 0 -2	1 8 10 15 0 0  0 0 0 0
14 13 4 3 0 0  2 0 -2 0	11 14 4 5 0 0  16 0-16 0	12 13 3 6 0 0  0 0 0 0
7 2 15 10 0 0  -2 0 2 0	16 9 7 2 0 0  0 -2 0 2	7 2 16 9 0 0  0 0 0 0
12 11 6 5 0 0  -2 0 2 0	6 3 13 12 0 0  -16 0 16 0	14 11 5 4 0 0  0 0 0 0
103/st\0\0 Comp-SmE: P4	104/PD\0\0 Comp-SmE: P6	105/st\0\0 Comp-SmE: P1
1 8 10 15 0 0  0 2 0 -2	1 8 10 15 0 0  0 0 0 0	1 8 10 15 0 0  4 0 -4 0
13 12 6 3 0 0  16 0-16 0	14 11 5 4 0 0  0 0 0 0	16 13 3 2 0 0  4 0 -4 0
16 9 7 2 0 0  0 -2 0 2	7 2 16 9 0 0  0 0 0 0	5 4 14 11 0 0  -4 0 4 0
4 5 11 14 0 0  -16 0 16 0	12 13 3 6 0 0  0 0 0 0	12 9 7 6 0 0  -4 0 4 0
106/st\0\0 Comp-SmE: P4	107/PD\0\0 Comp-SmE: P6	108/st\0\0 Comp-SmE: P4
1 8 11 14 0 0  0 4 0 -4	1 8 11 14 0 0  0 0 0 0	1 8 11 14 0 0  0 4 0 -4
10 15 4 5 0 0  16 0-16 0	12 13 2 7 0 0  0 0 0 0	13 12 7 2 0 0  16 0-16 0
16 9 6 3 0 0  0 -4 0 4	6 3 16 9 0 0  0 0 0 0	16 9 6 3 0 0  0 -4 0 4
7 2 13 12 0 0  -16 0 16 0	15 10 5 4 0 0  0 0 0 0	4 5 10 15 0 0  -16 0 16 0
109/PD\0\0 Comp-SmE: P6	110/st\0\0 Comp-SmE: P7	111/st\0\0 Comp-SmE: P7
1 8 11 14 0 0  0 0 0 0	1 8 12 13 0 0  0 4 0 -4	1 8 12 13 0 0  0 2 0 -2
15 10 5 4 0 0  0 0 0 0	10 15 3 6 0 0  0 0 0 0	11 14 2 7 0 0  0 0 0 0
6 3 16 9 0 0  0 0 0 0	7 2 14 11 0 0  0 -4 0 4	6 3 15 10 0 0  0 -2 0 2
12 13 2 7 0 0  0 0 0 0	16 9 5 4 0 0  0 0 0 0	16 9 5 4 0 0  0 0 0 0
112/SC\0\0 Comp-SmE: P4	113/SC\0\0 Comp-SmE: P4	114/st\0\0 Comp-SmE: P4
1 8 12 13 0 0  0 4 0 -4	1 8 12 13 0 0  0 2 0 -2	1 8 13 12 0 0  0 8 0 -8
14 11 7 2 0 0  16 0-16 0	15 10 6 3 0 0  16 0-16 0	10 15 6 3 0 0  16 0-16 0
15 10 6 3 0 0  0 -4 0 4	14 11 7 2 0 0  0 -2 0 2	16 9 4 5 0 0  0 -8 0 8
4 5 9 16 0 0  -16 0 16 0	4 5 9 16 0 0  -16 0 16 0	7 2 11 14 0 0  -16 0 16 0
115/st\0\0 Comp-SmE: P4	116/PD\0\0 Comp-SmE: P6	117/PD\0\0 Comp-SmE: P6
1 8 13 12 0 0  0 8 0 -8	1 8 13 12 0 0  0 0 0 0	1 8 13 12 0 0  0 0 0 0
11 14 7 2 0 0  16 0-16 0	14 11 2 7 0 0  0 0 0 0	15 10 3 6 0 0  0 0 0 0
16 9 4 5 0 0  0 -8 0 8	4 5 16 9 0 0  0 0 0 0	4 5 16 9 0 0  0 0 0 0
6 3 10 15 0 0  -16 0 16 0	15 10 3 6 0 0  0 0 0 0	14 11 2 7 0 0  0 0 0 0
118/st\0\0 Comp-SmE: P1	119/st\0\0 Comp-SmE: P7	120/SC\0\0 Comp-SmE: P4
1 8 13 12 0 0  2 0 -2 0	1 8 14 11 0 0  0 8 0 -8	1 8 14 11 0 0  0 8 0 -8
16 11 2 5 0 0  2 0 -2 0	10 15 5 4 0 0  0 0 0 0	12 13 7 2 0 0  16 0-16 0
3 6 15 10 0 0  -2 0 2 0	7 2 12 13 0 0  0 -8 0 8	15 10 4 5 0 0  0 -8 0 8
14 9 4 7 0 0  -2 0 2 0	16 9 3 6 0 0  0 0 0 0	6 3 9 16 0 0  -16 0 16 0
121/st\0\0 Comp-SmE: P7	122/SC\0\0 Comp-SmE: P4	123/st\0\0 Comp-SmE: P7
1 8 14 11 0 0  0 2 0 -2	1 8 14 11 0 0  0 2 0 -2	1 8 15 10 0 0  0 8 0 -8
13 12 2 7 0 0  0 0 0 0	15 10 4 5 0 0  16 0-16 0	11 14 5 4 0 0  0 0 0 0
4 5 15 10 0 0  0 -2 0 2	12 13 7 2 0 0  0 -2 0 2	6 3 12 13 0 0  0 -8 0 8
16 9 3 6 0 0  0 0 0 0	6 3 9 16 0 0  -16 0 16 0	16 9 2 7 0 0  0 0 0 0
124/SC\0\0 Comp-SmE: P4	125/st\0\0 Comp-SmE: P7	126/SC\0\0 Comp-SmE: P4
1 8 15 10 0 0  0 8 0 -8	1 8 15 10 0 0  0 4 0 -4	1 8 15 10 0 0  0 4 0 -4
12 13 6 3 0 0  16 0-16 0	13 12 3 6 0 0  0 0 0 0	14 11 4 5 0 0  16 0-16 0
14 11 4 5 0 0  0 -8 0 8	4 5 14 11 0 0  0 -4 0 4	12 13 6 3 0 0  0 -4 0 4
7 2 9 16 0 0  -16 0 16 0	16 9 2 7 0 0  0 0 0 0	7 2 9 16 0 0  -16 0 16 0
127/st\0\0 Comp-SmE: P1	128/st\0\0 Comp-SmE: P2	129/st\0\0 Comp-SmE: P2
1 9 8 16 0 0  5 0 -5 0	1 9 16 8 0 0  2 8 -2 -8	1 9 16 8 0 0  3 8 -3 -8
14 15 2 3 0 0  6 0 -6 0	14 12 5 3 0 0  2 0 -2 0	15 12 5 2 0 0  4 0 -4 0
7 4 13 10 0 0  -5 0 5 0	4 6 11 13 0 0  -2 -8 2 8	4 7 10 13 0 0  -3 -8 3 8
12 6 11 5 0 0  -6 0 6 0	15 7 2 10 0 0  -2 0 2 0	14 6 3 11 0 0  -4 0 4 0

130/st\0\0 Comp-SmE: P1	131/st\0\0 Comp-SmE: P1	132/st\0\0 Comp-SmE: P1
1 10 7 16 0 0  -3 0 3 0	1 10 7 16 0 0  2 0 -2 0	1 10 7 16 0 0  4 0 -4 0
12 8 9 5 0 0  4 0 -4 0	12 13 4 5 0 0  14 0 -14 0	12 15 2 5 0 0  4 0 -4 0
15 3 14 2 0 0  3 0 -3 0	15 8 9 2 0 0  -2 0 2 0	8 3 14 9 0 0  -4 0 4 0
6 13 4 11 0 0  -4 0 4 0	6 3 14 11 0 0  -14 0 14 0	13 6 11 4 0 0  -4 0 4 0
133/st\0\0 Comp-SmE: P1	134/st\0\0 Comp-SmE: P1	135/st\0\0 Comp-SmE: P1
1 10 7 16 0 0  -1 0 1 0	1 10 7 16 0 0  2 0 -2 0	1 10 7 16 0 0  6 0 -6 0
14 8 9 3 0 0  8 0 -8 0	14 11 6 3 0 0  14 0 -14 0	14 15 2 3 0 0  8 0 -8 0
15 5 12 2 0 0  1 0 -1 0	15 8 9 2 0 0  -2 0 2 0	8 5 12 9 0 0  -6 0 6 0
4 11 6 13 0 0  -8 0 8 0	4 5 12 13 0 0  -14 0 14 0	11 4 13 6 0 0  -8 0 8 0
136/st\0\0 Comp-SmE: P3	137/st\0\0 Comp-SmE: P3	138/st\0\0 Comp-SmE: P1
1 10 7 16 0 0  0 0 0 0	1 10 7 16 0 0  0 0 0 0	1 10 7 16 0 0  3 0 -3 0
15 8 9 2 0 0  4 0 -4 0	15 8 9 2 0 0  8 0 -8 0	15 11 6 2 0 0  14 0 -14 0
12 3 14 5 0 0  0 0 0 0	14 5 12 3 0 0  0 0 0 0	14 8 9 3 0 0  -3 0 3 0
6 13 4 11 0 0  -4 0 4 0	4 11 6 13 0 0  -8 0 8 0	4 5 12 13 0 0  -14 0 14 0
139/st\0\0 Comp-SmE: P1	140/st\0\0 Comp-SmE: P3	141/st\0\0 Comp-SmE: P3
1 10 7 16 0 0  5 0 -5 0	1 10 8 15 0 0  0 0 0 0	1 10 8 15 0 0  0 0 0 0
15 13 4 2 0 0  14 0 -14 0	16 7 9 2 0 0  4 0 -4 0	16 7 9 2 0 0  8 0 -8 0
12 8 9 5 0 0  -5 0 5 0	11 4 14 5 0 0  0 0 0 0	13 6 12 3 0 0  0 0 0 0
6 3 14 11 0 0  -14 0 14 0	6 13 3 12 0 0  -4 0 4 0	4 11 5 14 0 0  -8 0 8 0
142/st\0\0 Comp-SmE: P1	143/st\0\0 Comp-SmE: P5	144/st\0\0 Comp-SmE: P5
1 10 8 15 0 0  6 0 -6 0	1 10 15 8 0 0  2 10 -2 -10	1 10 15 8 0 0  2 6 -2 -6
16 13 3 2 0 0  4 0 -4 0	12 13 6 3 0 0  0 0 0 0	14 11 4 5 0 0  0 0 0 0
5 4 14 11 0 0  -6 0 6 0	5 4 11 14 0 0  -2 -10 2 10	3 6 13 12 0 0  -2 -6 2 6
12 7 9 6 0 0  -4 0 4 0	16 7 2 9 0 0  0 0 0 0	16 7 2 9 0 0  0 0 0 0
145/st\0\0 Comp-SmE: P1	146/st\0\0 Comp-SmE: P3	147/st\0\0 Comp-SmE: P3
1 10 15 8 0 0  -1 0 1 0	1 10 15 8 0 0  0 0 0 0	1 10 15 8 0 0  0 0 0 0
16 6 3 9 0 0  4 0 -4 0	16 7 2 9 0 0  4 0 -4 0	16 7 2 9 0 0  8 0 -8 0
5 11 14 4 0 0  1 0 -1 0	4 11 14 5 0 0  0 0 0 0	6 13 12 3 0 0  0 0 0 0
12 7 2 13 0 0  -4 0 4 0	13 6 3 12 0 0  -4 0 4 0	11 4 5 14 0 0  -8 0 8 0
148/st\0\0 Comp-SmE: P4	149/st\0\0 Comp-SmE: P4	150/st\0\0 Comp-SmE: P1
1 10 16 7 0 0  0 2 0 -2	1 10 16 7 0 0  0 2 0 -2	1 11 6 16 0 0  -2 0 2 0
15 8 2 9 0 0  4 0 -4 0	15 8 2 9 0 0  8 0 -8 0	12 8 9 5 0 0  2 0 -2 0
4 11 13 6 0 0  0 -2 0 2	6 13 11 4 0 0  0 -2 0 2	14 2 15 3 0 0  2 0 -2 0
14 5 3 12 0 0  -4 0 4 0	12 3 5 14 0 0  -8 0 8 0	7 13 4 10 0 0  -2 0 2 0
151/st\0\0 Comp-SmE: P1	152/st\0\0 Comp-SmE: P1	153/st\0\0 Comp-SmE: P1
1 11 6 16 0 0  4 0 -4 0	1 11 6 16 0 0  4 0 -4 0	1 11 6 16 0 0  5 0 -5 0
12 14 3 5 0 0  2 0 -2 0	12 14 3 5 0 0  12 0 -12 0	13 14 3 4 0 0  12 0 -12 0
8 2 15 9 0 0  -4 0 4 0	13 7 10 4 0 0  -4 0 4 0	12 7 10 5 0 0  -5 0 5 0
13 7 10 4 0 0  -2 0 2 0	8 2 15 9 0 0  -12 0 12 0	8 2 15 9 0 0  -12 0 12 0
154/st\0\0 Comp-SmE: P3	155/st\0\0 Comp-SmE: P3	156/st\0\0 Comp-SmE: P1
1 11 6 16 0 0  0 0 0 0	1 11 6 16 0 0  0 0 0 0	1 11 6 16 0 0  5 0 -5 0
14 8 9 3 0 0  2 0 -2 0	14 8 9 3 0 0  8 0 -8 0	14 13 4 3 0 0  2 0 -2 0
12 2 15 5 0 0  0 0 0 0	15 5 12 2 0 0  0 0 0 0	7 2 15 10 0 0  -5 0 5 0
7 13 4 10 0 0  -2 0 2 0	4 10 7 13 0 0  -8 0 8 0	12 8 9 5 0 0  -2 0 2 0
157/st\0\0 Comp-SmE: P1	158/st\0\0 Comp-SmE: P1	159/st\0\0 Comp-SmE: P3
1 11 6 16 0 0  1 0 -1 0	1 11 6 16 0 0  7 0 -7 0	1 11 8 14 0 0  0 0 0 0
15 8 9 2 0 0  8 0 -8 0	15 14 3 2 0 0  8 0 -8 0	16 6 9 3 0 0  2 0 -2 0
14 5 12 3 0 0  -1 0 1 0	8 5 12 9 0 0  -7 0 7 0	10 4 15 5 0 0  0 0 0 0
4 10 7 13 0 0  -8 0 8 0	10 4 13 7 0 0  -8 0 8 0	7 13 2 12 0 0  -2 0 2 0
160/st\0\0 Comp-SmE: P3	161/st\0\0 Comp-SmE: P1	162/st\0\0 Comp-SmE: P3
1 11 8 14 0 0  0 0 0 0	1 11 14 8 0 0  -1 0 1 0	1 11 14 8 0 0  0 0 0 0
16 6 9 3 0 0  8 0 -8 0	16 5 4 9 0 0  6 0 -6 0	16 6 3 9 0 0  2 0 -2 0
13 7 12 2 0 0  0 0 0 0	7 12 13 2 0 0  1 0 -1 0	4 10 15 5 0 0  0 0 0 0
4 10 5 15 0 0  -8 0 8 0	10 6 3 15 0 0  -6 0 6 0	13 7 2 12 0 0  -2 0 2 0

163/st\0\0 Comp-SmE: P3	164/st\0\0 Comp-SmE: P4	165/st\0\0 Comp-SmE: P4
1 11 14 8 0 0  0 0 0 0	1 11 16 6 0 0  0 4 0 -4	1 11 16 6 0 0  0 4 0 -4
16 6 3 9 0 0  8 0 -8 0	14 8 3 9 0 0  2 0 -2 0	14 8 3 9 0 0  8 0 -8 0
7 13 12 2 0 0  0 0 0 0	4 10 13 7 0 0  0 -4 0 4	7 13 10 4 0 0  0 -4 0 4
10 4 5 15 0 0  -8 0 8 0	15 5 2 12 0 0  -2 0 2 0	12 2 5 15 0 0  -8 0 8 0
166/st\0\0 Comp-SmE: P1	167/st\0\0 Comp-SmE: P1	168/st\0\0 Comp-SmE: P1
1 12 5 16 0 0  2 0 -2 0	1 12 5 16 0 0  3 0 -3 0	1 12 5 16 0 0  7 0 -7 0
14 9 8 3 0 0  10 0 -10 0	15 9 8 2 0 0  10 0 -10 0	15 13 4 2 0 0  10 0 -10 0
15 6 11 2 0 0  -2 0 2 0	14 6 11 3 0 0  -3 0 3 0	10 6 11 7 0 0  -7 0 7 0
4 7 10 13 0 0  -10 0 10 0	4 7 10 13 0 0  -10 0 10 0	8 3 14 9 0 0  -10 0 10 0
169/st\0\0 Comp-SmE: P4	170/st\0\0 Comp-SmE: P2	171/PD\0\0 Comp-SmE: P6
1 12 6 15 0 0  0 2 0 -2	1 12 6 15 0 0  2 2 -2 -2	1 12 6 15 0 0  0 0 0 0
13 8 10 3 0 0  8 0 -8 0	13 10 8 3 0 0  12 0 -12 0	14 7 9 4 0 0  0 0 0 0
16 5 11 2 0 0  0 -2 0 2	16 7 9 2 0 0  -2 -2 2 2	11 2 16 5 0 0  0 0 0 0
4 9 7 14 0 0  -8 0 8 0	4 5 11 14 0 0  -12 0 12 0	8 13 3 10 0 0  0 0 0 0
172/st\0\0 Comp-SmE: P1	173/st\0\0 Comp-SmE: P4	174/PD\0\0 Comp-SmE: P6
1 12 6 15 0 0  4 0 -4 0	1 12 7 14 0 0  0 4 0 -4	1 12 7 14 0 0  0 0 0 0
16 9 7 2 0 0  12 0 -12 0	13 8 11 2 0 0  8 0 -8 0	15 6 9 4 0 0  0 0 0 0
13 8 10 3 0 0  -4 0 4 0	16 5 10 3 0 0  0 -4 0 4	10 3 16 5 0 0  0 0 0 0
4 5 11 14 0 0  -12 0 12 0	4 9 6 15 0 0  -8 0 8 0	8 13 2 11 0 0  0 0 0 0
175/SC\0\0 Comp-SmE: P4	176/SC\0\0 Comp-SmE: P4	177/PD\0\0 Comp-SmE: P6
1 12 8 13 0 0  0 4 0 -4	1 12 8 13 0 0  0 2 0 -2	1 12 13 8 0 0  0 0 0 0
14 7 11 2 0 0  8 0 -8 0	15 6 10 3 0 0  8 0 -8 0	14 7 2 11 0 0  0 0 0 0
15 6 10 3 0 0  0 -4 0 4	14 7 11 2 0 0  0 -2 0 2	4 9 16 5 0 0  0 0 0 0
4 9 5 16 0 0  -8 0 8 0	4 9 5 16 0 0  -8 0 8 0	15 6 3 10 0 0  0 0 0 0
178/PD\0\0 Comp-SmE: P6	179/st\0\0 Comp-SmE: P5	180/st\0\0 Comp-SmE: P1
1 12 13 8 0 0  0 0 0 0	1 12 13 8 0 0  4 4 -4 -4	1 12 13 8 0 0  2 0 -2 0
15 6 3 10 0 0  0 0 0 0	15 10 3 6 0 0  0 0 0 0	16 7 2 9 0 0  2 0 -2 0
4 9 16 5 0 0  0 0 0 0	2 7 14 11 0 0  -4 -4 4 4	3 10 15 6 0 0  -2 0 2 0
14 7 2 11 0 0  0 0 0 0	16 5 4 9 0 0  0 0 0 0	14 5 4 11 0 0  -2 0 2 0
181/st\0\0 Comp-SmE: P5	182/st\0\0 Comp-SmE: P7	183/SC\0\0 Comp-SmE: P4
1 12 13 8 0 0  4 4 -4 -4	1 12 14 7 0 0  0 2 0 -2	1 12 14 7 0 0  0 2 0 -2
16 9 4 5 0 0  0 0 0 0	13 8 2 11 0 0  0 0 0 0	15 6 4 9 0 0  8 0 -8 0
2 7 14 11 0 0  -4 -4 4 4	4 9 15 6 0 0  0 -2 0 2	8 13 11 2 0 0  0 -2 0 2
15 6 3 10 0 0  0 0 0 0	16 5 3 10 0 0  0 0 0 0	10 3 5 16 0 0  -8 0 8 0
184/st\0\0 Comp-SmE: P7	185/SC\0\0 Comp-SmE: P4	186/st\0\0 Comp-SmE: P5
1 12 15 6 0 0  0 4 0 -4	1 12 15 6 0 0  0 4 0 -4	1 12 15 6 0 0  2 6 -2 -6
13 8 3 10 0 0  0 0 0 0	14 7 4 9 0 0  8 0 -8 0	14 9 4 7 0 0  0 0 0 0
4 9 14 7 0 0  0 -4 0 4	8 13 10 3 0 0  0 -4 0 4	3 8 13 10 0 0  -2 -6 2 6
16 5 2 11 0 0  0 0 0 0	11 2 5 16 0 0  -8 0 8 0	16 5 2 11 0 0  0 0 0 0
187/st\0\0 Comp-SmE: P1	188/st\0\0 Comp-SmE: P1	189/st\0\0 Comp-SmE: P1
1 13 4 16 0 0  2 0 -2 0	1 13 4 16 0 0  6 0 -6 0	1 13 4 16 0 0  3 0 -3 0
14 8 9 3 0 0  2 0 -2 0	14 12 5 3 0 0  2 0 -2 0	15 8 9 2 0 0  4 0 -4 0
12 2 15 5 0 0  -2 0 2 0	8 2 15 9 0 0  -6 0 6 0	12 3 14 5 0 0  -3 0 3 0
7 11 6 10 0 0  -2 0 2 0	11 7 10 6 0 0  -2 0 2 0	6 10 7 11 0 0  -4 0 4 0
190/st\0\0 Comp-SmE: P1	191/st\0\0 Comp-SmE: P3	192/st\0\0 Comp-SmE: P3
1 13 4 16 0 0  7 0 -7 0	1 13 8 12 0 0  0 0 0 0	1 13 8 12 0 0  0 0 0 0
15 12 5 2 0 0  4 0 -4 0	16 4 9 5 0 0  2 0 -2 0	16 4 9 5 0 0  4 0 -4 0
8 3 14 9 0 0  -7 0 7 0	10 6 15 3 0 0  0 0 0 0	11 7 14 2 0 0  0 0 0 0
10 6 11 7 0 0  -4 0 4 0	7 11 2 14 0 0  -2 0 2 0	6 10 3 15 0 0  -4 0 4 0
193/st\0\0 Comp-SmE: P1	194/st\0\0 Comp-SmE: P5	195/st\0\0 Comp-SmE: P3
1 13 8 12 0 0  7 0 -7 0	1 13 12 8 0 0  5 4 -5 -4	1 13 12 8 0 0  0 0 0 0
16 11 2 5 0 0  2 0 -2 0	15 10 3 6 0 0  0 0 0 0	16 4 5 9 0 0  2 0 -2 0
3 6 15 10 0 0  -7 0 7 0	2 7 14 11 0 0  -5 -4 5 4	6 10 15 3 0 0  0 0 0 0
14 4 9 7 0 0  -2 0 2 0	16 4 5 9 0 0  0 0 0 0	11 7 2 14 0 0  -2 0 2 0

```

196/st\0/0|Comp-SmE: P3|    197/st\0/0|Comp-SmE: P1|    198/st\0/0|Comp-SmE: P1|
1 13 12 8|0|0| 0 0 0 0| 1 13 12 8|0|0| 3 0 -3 0| 1 14 3 16|0|0| 5 0 -5 0|
16 4 5 9|0|0| 4 0 -4 0| 16 7 2 9|0|0| 2 0 -2 0| 15 9 8 2|0|0| 6 0 -6 0|
7 11 14 2|0|0| 0 0 0 0| 3 10 15 6|0|0| -3 0 3 0| 12 4 13 5|0|0| -5 0 5 0|
10 6 3 15|0|0| -4 0 4 0| 14 4 5 11|0|0| -2 0 2 0| 6 7 10 11|0|0| -6 0 6 0|

199/st\0/0|Comp-SmE: P1|    200/st\0/0|Comp-SmE: P1|    201/PD\0/0|Comp-SmE: P6|
1 14 3 16|0|0| 7 0 -7 0| 1 14 4 15|0|0| 8 0 -8 0| 1 14 7 12|0|0| 0 0 0 0|
15 11 6 2|0|0| 6 0 -6 0| 16 11 5 2|0|0| 8 0 -8 0| 15 4 9 6|0|0| 0 0 0 0|
10 4 13 7|0|0| -7 0 7 0| 9 6 12 7|0|0| -8 0 8 0| 10 5 16 3|0|0| 0 0 0 0|
8 5 12 9|0|0| -6 0 6 0| 8 3 13 10|0|0| -8 0 8 0| 8 11 2 13|0|0| 0 0 0 0|

202/st\0/0|Comp-SmE: P5|    203/SC\0/0|Comp-SmE: P4|    204/PD\0/0|Comp-SmE: P6|
1 14 7 12|0|0| 2 2 -2 -2| 1 14 8 11|0|0| 0 2 0 -2| 1 14 11 8|0|0| 0 0 0 0|
16 5 10 3|0|0| 0 0 0 0| 15 4 10 5|0|0| 4 0 -4 0| 15 4 5 10|0|0| 0 0 0 0|
9 4 15 6|0|0| -2 -2 2 2| 12 7 13 2|0|0| 0 -2 0 2| 6 9 16 3|0|0| 0 0 0 0|
8 11 2 13|0|0| 0 0 0 0| 6 9 3 16|0|0| -4 0 4 0| 12 7 2 13|0|0| 0 0 0 0|

205/st\0/0|Comp-SmE: P1|    206/SC\0/0|Comp-SmE: P4|    207/st\0/0|Comp-SmE: P1|
1 14 11 8|0|0| 2 0 -2 0| 1 14 12 7|0|0| 0 2 0 -2| 1 15 4 14|0|0| 8 0 -8 0|
16 5 4 9|0|0| 6 0 -6 0| 15 4 6 9|0|0| 4 0 -4 0| 16 10 5 3|0|0| 8 0 -8 0|
7 12 13 2|0|0| -2 0 2 0| 8 11 13 2|0|0| 0 -2 0 2| 9 7 12 6|0|0| -8 0 8 0|
10 3 6 15|0|0| -6 0 6 0| 10 5 3 16|0|0| -4 0 4 0| 8 2 13 11|0|0| -8 0 8 0|

208/st\0/0|Comp-SmE: P1|    209/st\0/0|Comp-SmE: P2|    409/st\0/0|Comp-SmE: P2|
1 15 10 8|0|0| 4 0 -4 0| 2 1 15 16|0|0| -4 -2 4 2| 3 1 14 16|0|0| -7 -2 7 2|
16 6 3 9|0|0| 4 0 -4 0| 14 13 3 4|0|0| 12 0 -12 0| 8 15 2 9|0|0| 8 0 -8 0|
5 11 14 4|0|0| -4 0 4 0| 11 8 10 5|0|0| 4 2 -4 -2| 13 6 11 4|0|0| 7 2 -7 -2|
12 2 7 13|0|0| -4 0 4 0| 7 12 6 9|0|0| -12 0 12 0| 10 12 7 5|0|0| -8 0 8 0|

575/st\0/0|Comp-SmE: P4|    753/st\0/0|Comp-SmE: P2|    817/st\0/0|Comp-SmE: P3|
4 1 13 16|0|0| 0 -2 0 2| 5 1 16 12|0|0| -4 4 4 -4| 6 1 15 12|0|0| 0 0 0 0|
14 15 3 2|0|0| 8 0 -8 0| 10 14 7 3|0|0| 2 0 -2 0| 11 16 2 5|0|0| 16 0 -16 0|
7 6 10 11|0|0| 0 2 0 -2| 8 4 9 13|0|0| 4 -4 -4 4| 10 13 3 8|0|0| 0 0 0 0|
9 12 8 5|0|0| -8 0 8 0| 11 15 2 6|0|0| -2 0 2 0| 7 4 14 9|0|0| -16 0 16 0|

865/st\0/0|Comp-SmE: P2|
7 1 16 10|0|0| -6 8 6 -8|
6 14 11 3|0|0| 2 0 -2 0|
12 4 5 13|0|0| 6 -8 -6 8|
9 15 2 8|0|0| -2 0 2 0|
(SC:'Self-Complementary';
PD:'Pan-Diagonal';
st:'Standard' Type)

```

[Total Count of Solutions = 880; Counts of Types: 48/SC, 48/PD, 880/st]  
[Counts of C-Patterns: 229/P1, 120/P2, 144/P3, 192/P4, 99/P5, 48/P6, 48/P7,]

\*\* Calculated and Listed by Kanji Setsuda  
on June 27, 2013 with MacOSX 10.8.4 & Xcode 4.6.3 \*\*

We could have got the perfect list of 880 solutions of Standard MS44 with our new definitions of the 4 Composite Conditions and Additional Ones, you know.

The validity of our new presupposition is really certified so that we can surely accept it, I believe.

“P1”, “P2”, “P3”, ... “P7” on the shoulders of every Composite-Sum-Error Monitor in the list are the classified names of the Composite Patterns I simply put.

I have found there are 7 patterns in all according to the sums of Composite 2x2 units, identifying whether each of them adds up to the constant value 34 or not.

Yes. We can classify all the 880 solutions into 7 groups according to the sum patterns of Composite 2x2 Units.

All the 48 solutions of Pan-diagonal MS44 are classified into the Group “P6”, and no other type is included there.

While all the 48 solutions of Self-complementary MS44 are classified into the Group “P4”, other types of Standard MS44 are included there at the same time.

Solutions of “P4” Group count as many as 192 in total. How interesting!

The relation between 192 and 48 is exactly corresponding to the two cases we already examined in this section: (1) 8 Composite Conditions and 3 Additional Ones **without** the Self-complementary Conditions, (2) 8 Composite Conditions and 3 Additional Ones **with** the Self-complementary Conditions.

## #7. Conclusion

You may be impressed with these Composite Sums as much as me, I hope.

This is such the big inspiration Mr. William Walkington gave to me that I had to study about them again and write this article here. I owe it to him very much.

But what is the set of Composite 2x2 Units in itself?

What does it mean in the theoretical aspect?

Is it the final “Mater Key” to discover the secret nature of magic squares 4x4?

No, I don’t think so. It cannot be the first rule when we make our MS44.

Magic Squares of Order 4 have to have the constant sums of every rows, every columns and 2 primary diagonals, and nothing else. It has been one of the oldest promises we must absolutely obey from the ancient past. Composite Conditions do not directly reply to this fundamental request. You know we actually had to add the old fundamental conditions to the new set of Composite Conditions.

I think the origin of Composite 2x2 Units should come from the other aspects.

One comes from the aesthetic standard. It is natural we always want ‘beauty’ even in the method of making our object. Composite Conditions are always beautiful, especially about the Pan-diagonal type. Don’t you think so?

The other origin is the only one high dimensional Extra-Cubic Object of Order 2. I indicated that idea when I studied and wrote about the Pan-diagonal MS44.

I have written so many articles about it that you could follow my story. They may be a little too philosophical, but you can understand them, I hope.

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(Written by Kanji Setsuda on April 24 and July 7, 2013  
with MacOSX 10.8.4 and Xcode 4.6.3;  
E-Mail Address: jag12001@nifty.com)

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