B.1 TWO-LEVEL ORTHOGONAL ARRAYS

L_4 Standard Array

Trial no.	Column no.		
	1	2	3
1	1	1	1
2	1	2	2
3	2	1	2
4	2	2	1

L_8 Standard Array

Trial no.	Column no.						
	1	2	3	4	5	6	7
1	1	1	1	1	1	1	1
2	1	1	1	2	2	2	2
3	1	2	2	1	1	2	2
4	1	2	2	2	2	1	1
5	2	1	2	1	2	1	2
6	2	1	2	2	1	2	1
7	2	2	1	1	2	2	1
8	2	2	1	2	1	1	2

L_{12} Standard Array*

Trial no.	Column no.										
	1	2	3	4	5	6	7	8	9	10	11
1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	2	2	2	2	2	2
3	1	1	2	2	2	1	1	1	2	2	2
4	1	2	1	2	2	1	2	2	1	1	2
5	1	2	2	1	2	2	1	2	1	2	1
6	1	2	2	2	1	2	2	1	2	1	1
7	2	1	2	2	1	1	2	2	1	2	1
8	2	1	2	1	2	2	2	1	1	1	2
9	2	1	1	2	2	2	1	2	2	1	1
10	2	2	2	1	1	1	1	2	2	1	2
11	2	2	1	2	1	2	1	1	1	2	2
12	2	2	1	1	2	1	2	1	2	2	1

*No specific interaction columns are available.

L_{16} Standard Array

Trial no.	Column no.														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
3	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2
4	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1
5	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2
6	1	2	2	1	1	2	2	2	2	1	1	2	2	1	1
7	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1
8	1	2	2	2	2	1	1	2	2	1	1	1	1	2	2
9	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
10	2	1	2	1	2	1	2	2	1	2	1	2	1	2	1
11	2	1	2	2	1	2	1	1	2	1	2	2	1	2	1
12	2	1	2	2	1	2	1	2	1	2	1	1	2	1	2
13	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1
14	2	2	1	1	2	2	1	2	1	1	2	2	1	1	2
15	2	2	1	2	1	1	2	1	2	2	1	2	1	1	2
16	2	2	1	2	1	1	2	2	1	1	2	1	2	2	1

L_{32} Standard Array

Trial no.	Column no.																	
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2
3	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1
4	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
5	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1
6	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2
7	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1
8	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2
9	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2
10	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	2	2	1
11	1	2	2	1	1	2	2	2	2	1	1	2	2	1	1	1	1	2
12	1	2	2	1	1	2	2	2	2	1	1	2	2	1	1	2	2	1
13	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	1	2
14	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	2	2	1
15	1	2	2	2	2	1	1	2	2	1	1	1	1	2	2	1	1	2
16	1	2	2	2	2	1	1	2	2	1	1	1	1	2	2	2	2	1
17	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
18	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	2	1	2
19	2	1	2	1	2	1	2	2	1	2	1	2	1	2	1	1	2	1
20	2	1	2	1	2	1	2	2	1	2	1	2	1	2	1	2	1	2
21	2	1	2	2	1	2	1	1	2	1	2	2	1	2	1	1	2	1
22	2	1	2	2	1	2	1	1	2	1	2	2	1	2	1	2	1	2
23	2	1	2	2	1	2	1	2	1	2	1	1	2	1	2	1	2	1
24	2	1	2	2	1	2	1	2	1	2	1	1	2	1	2	2	1	2
25	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2
26	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	2	1	1
27	2	2	1	1	2	2	1	2	1	1	2	2	1	1	2	1	2	2
28	2	2	1	1	2	2	1	2	1	1	2	2	1	1	2	2	1	1
29	2	2	1	2	1	1	2	1	2	2	1	2	1	1	2	1	2	2
30	2	2	1	2	1	1	2	1	2	2	1	2	1	1	2	2	1	1
31	2	2	1	2	1	1	2	2	1	1	2	1	2	2	1	1	2	2
32	2	2	1	2	1	1	2	2	1	1	2	1	2	2	1	2	1	1

L_{32} Standard Array (*Contd.*)

Trial no.	Column no.												
	19	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	1	1	1	1	1	2	2	2	2	2	2	2	2
4	2	2	2	2	2	1	1	1	1	1	1	1	1
5	1	2	2	2	2	1	1	1	1	2	2	2	2
6	2	1	1	1	1	2	2	2	2	1	1	1	1
7	1	2	2	2	2	2	2	2	2	1	1	1	1
8	2	1	1	1	1	1	1	1	1	2	2	2	2
9	2	1	1	2	2	1	1	2	2	1	1	2	2
10	1	2	2	1	1	2	2	1	1	2	2	1	1
11	2	1	1	2	2	2	2	1	1	2	2	1	1
12	1	2	2	1	1	1	1	2	2	1	1	2	2
13	2	2	2	1	1	1	1	2	2	2	2	1	1
14	1	1	1	2	2	2	2	1	1	1	1	2	2
15	2	2	2	1	1	2	2	1	1	1	1	2	2
16	1	1	1	2	2	1	1	2	2	2	2	1	1
17	2	1	2	1	2	1	2	1	2	1	2	1	2
18	1	2	1	2	1	2	1	2	1	2	1	2	1
19	2	1	2	1	2	2	1	2	1	2	1	2	1
20	1	2	1	2	1	1	2	1	2	1	2	1	2
21	2	2	1	2	1	1	2	1	2	2	1	2	1
22	1	1	2	1	2	2	1	2	1	1	2	1	2
23	2	2	1	2	1	2	1	2	1	1	2	1	2
24	1	1	2	1	2	1	2	1	2	2	1	2	1
25	1	1	2	2	1	1	2	2	1	1	2	2	1
26	2	2	1	1	2	2	1	1	2	2	1	1	2
27	1	1	2	2	1	2	1	1	2	2	1	1	2
28	2	2	1	1	2	1	2	2	1	1	2	2	1
29	1	2	1	1	2	1	2	2	1	2	1	1	2
30	2	1	2	2	1	2	1	1	2	1	2	2	1
31	1	2	1	1	2	2	1	1	2	1	2	2	1
32	2	1	2	2	1	1	2	2	1	2	1	1	2

Two-level Interaction Table

Column							Column no.							
no.	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1	3	2	5	4	7	6	9	8	11	10	13	12	15	14
2	–	1	6	7	4	5	10	11	8	9	14	15	12	13
3	–	–	7	6	5	4	11	10	9	8	15	14	13	12
4	–	–	–	1	2	3	12	13	14	15	8	9	10	11
5	–	–	–	–	3	2	13	12	15	14	9	8	11	10
6	–	–	–	–	–	1	14	15	12	13	10	11	8	9
7	–	–	–	–	–	–	15	14	13	12	11	10	9	8
8	–	–	–	–	–	–	–	1	2	3	4	5	6	7
9	–	–	–	–	–	–	–	–	3	2	5	4	7	6
10	–	–	–	–	–	–	–	–	–	1	6	7	4	5
11	–	–	–	–	–	–	–	–	–	–	7	6	5	4
12	–	–	–	–	–	–	–	–	–	–	–	1	2	3
13	–	–	–	–	–	–	–	–	–	–	–	–	3	2
14	–	–	–	–	–	–	–	–	–	–	–	–	–	1
15	–	–	–	–	–	–	–	–	–	–	–	–	–	–
16	–	–	–	–	–	–	–	–	–	–	–	–	–	–
17	–	–	–	–	–	–	–	–	–	–	–	–	–	–
18	–	–	–	–	–	–	–	–	–	–	–	–	–	–
19	–	–	–	–	–	–	–	–	–	–	–	–	–	–
20	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	–	–	–	–
25	–	–	–	–	–	–	–	–	–	–	–	–	–	–
26	–	–	–	–	–	–	–	–	–	–	–	–	–	–
27	–	–	–	–	–	–	–	–	–	–	–	–	–	–
28	–	–	–	–	–	–	–	–	–	–	–	–	–	–
29	–	–	–	–	–	–	–	–	–	–	–	–	–	–
30	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Two-level Interaction Table

Column no.	Column no.															
	16	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
1	17	16	19	18	21	20	23	22	25	24	27	26	29	28	31	30
2	18	19	16	17	22	23	20	21	26	27	24	25	30	31	28	29
3	19	18	17	16	23	22	21	20	27	26	25	24	31	30	29	28
4	20	21	22	23	16	17	18	19	28	29	30	31	24	25	26	27
5	21	20	23	22	17	16	19	18	29	28	31	30	25	24	27	26
6	22	23	20	21	18	19	16	17	30	31	28	29	26	27	24	25
7	23	22	21	20	19	18	17	16	31	30	29	28	27	26	25	24
8	24	25	26	27	28	29	30	31	16	17	18	19	20	21	22	23
9	25	24	27	26	29	28	31	30	17	16	19	18	21	20	23	22
10	26	27	24	25	30	31	28	29	18	19	16	17	22	23	20	21
11	27	26	25	24	31	30	29	28	19	18	17	16	23	22	21	20
12	28	29	30	31	24	25	26	27	20	21	22	23	16	17	18	19
13	29	28	31	30	25	24	27	26	21	20	23	22	17	16	19	18
14	30	31	28	29	26	27	24	25	22	23	20	21	18	19	16	17
15	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
16	–	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
17	–	–	3	2	5	4	7	6	9	8	11	10	13	12	15	14
18	–	–	–	1	6	7	4	5	10	11	8	9	14	15	12	13
19	–	–	–	–	7	6	5	4	11	10	9	8	15	14	13	12
20	–	–	–	–	–	1	2	3	12	13	14	15	8	9	10	11
21	–	–	–	–	–	–	3	2	13	12	15	14	9	8	11	10
22	–	–	–	–	–	–	–	1	14	15	12	13	10	11	8	9
23	–	–	–	–	–	–	–	–	15	14	13	12	11	10	9	8
24	–	–	–	–	–	–	–	–	–	1	2	3	4	5	6	7
25	–	–	–	–	–	–	–	–	–	–	3	2	5	4	7	6
26	–	–	–	–	–	–	–	–	–	–	–	1	6	7	4	5
27	–	–	–	–	–	–	–	–	–	–	–	–	7	6	5	4
28	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2	3
29	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	2
30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1

B.2 THREE–LEVEL ORTHOGONAL ARRAYS

L_9 Standard Array

Trial no.	Column no.			
	1	2	3	4
1	1	1	1	1
2	1	2	2	2
3	1	3	3	3
4	2	1	2	3
5	2	2	3	1
6	2	3	1	2
7	3	1	3	2
8	3	2	1	3
9	3	3	2	1

L_{18} Standard Array*

Trial no.	Column no.							
	1	2	3	4	5	6	7	8
1	1	1	1	1	1	1	1	1
2	1	1	2	2	2	2	2	2
3	1	1	3	3	3	3	3	3
4	1	2	1	1	2	2	3	3
5	1	2	2	2	3	3	1	1
6	1	2	3	3	1	1	2	2
7	1	3	1	2	1	3	2	3
8	1	3	2	3	2	1	3	1
9	1	3	3	1	3	2	1	2
10	2	1	1	3	3	2	2	1
11	2	1	2	1	1	3	3	2
12	2	1	3	2	2	1	1	3
13	2	2	1	2	3	1	3	2
14	2	2	2	3	1	2	1	3
15	2	2	3	1	2	3	2	1
16	2	3	1	3	2	3	1	2
17	2	3	2	1	3	1	2	3
18	2	3	3	2	1	2	3	1

*Interaction between column 1 and 2 only allowed.

L_{27} **Standard Array**

Trial no.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	2	2	2	2	2	2	2	2	2
3	1	1	1	1	3	3	3	3	3	3	3	3	3
4	1	2	2	2	1	1	1	2	2	2	3	3	3
5	1	2	2	2	2	2	2	3	3	3	1	1	1
6	1	2	2	2	3	3	3	1	1	1	2	2	2
7	1	3	3	3	1	1	1	3	3	3	2	2	2
8	1	3	3	3	2	2	2	1	1	1	3	3	3
9	1	3	3	3	3	3	3	2	2	2	1	1	1
10	2	1	2	3	1	2	3	1	2	3	1	2	3
11	2	1	2	3	2	3	1	2	3	1	2	3	1
12	2	1	2	3	3	1	2	3	1	2	3	1	2
13	2	2	3	1	1	2	3	2	3	1	3	1	2
14	2	2	3	1	2	3	1	3	1	2	1	2	3
15	2	2	3	1	3	1	2	1	2	3	2	3	1
16	2	3	1	2	1	2	3	3	1	2	2	3	1
17	2	3	1	2	2	3	1	1	2	3	3	1	2
18	2	3	1	2	3	1	2	2	3	1	1	2	3
19	3	1	3	2	1	3	2	1	3	2	1	3	2
20	3	1	3	2	2	1	3	2	1	3	2	1	3
21	3	1	3	2	3	2	1	3	2	1	3	2	1
22	3	2	1	3	1	3	2	2	1	3	3	2	1
23	3	2	1	3	2	1	3	3	2	1	1	3	2
24	3	2	1	3	3	2	1	1	3	2	2	1	3
25	3	3	2	1	1	3	2	3	2	1	2	1	3
26	3	3	2	1	2	1	3	1	3	2	3	2	1
27	3	3	2	1	3	2	1	2	1	3	1	3	2

Three-level Interaction Table (Does not apply to L_{18})

Column no.	Column no.											
	2	3	4	5	6	7	8	9	10	11	12	13
1	3	2	2	6	5	5	9	8	8	12	11	11
1	4	4	3	7	7	6	10	10	9	13	13	12
2	–	1	1	8	9	10	5	6	7	5	6	7
2	–	4	3	11	12	13	11	12	13	8	9	10
3	–	–	1	9	10	8	7	5	6	6	7	5
3	–	–	2	13	11	12	12	13	11	10	8	9
4	–	–	–	10	8	9	6	7	5	7	5	6
4	–	–	–	12	13	11	13	11	12	9	10	8
5	–	–	–	–	1	1	2	3	4	2	4	3
5	–	–	–	–	7	6	11	13	12	8	10	9
6	–	–	–	–	–	1	4	2	3	3	2	4
6	–	–	–	–	–	5	13	12	11	10	9	8
7	–	–	–	–	–	–	3	4	2	4	3	2
7	–	–	–	–	–	–	12	11	13	9	8	10
8	–	–	–	–	–	–	–	1	1	2	3	4
8	–	–	–	–	–	–	–	10	9	5	7	6
9	–	–	–	–	–	–	–	–	1	4	2	3
9	–	–	–	–	–	–	–	–	8	7	6	5
10	–	–	–	–	–	–	–	–	–	3	4	2
10	–	–	–	–	–	–	–	–	–	6	5	7
11	–	–	–	–	–	–	–	–	–	–	1	1
11	–	–	–	–	–	–	–	–	–	–	13	12
12	–	–	–	–	–	–	–	–	–	–	–	1
12	–	–	–	–	–	–	–	–	–	–	–	11

C

Linear Graphs*

Linear graph for L_4

Linear graph for L_8

(a)   (b)

FIGURE C.1   Standard linear graphs for L_4 and L_8 OAs.
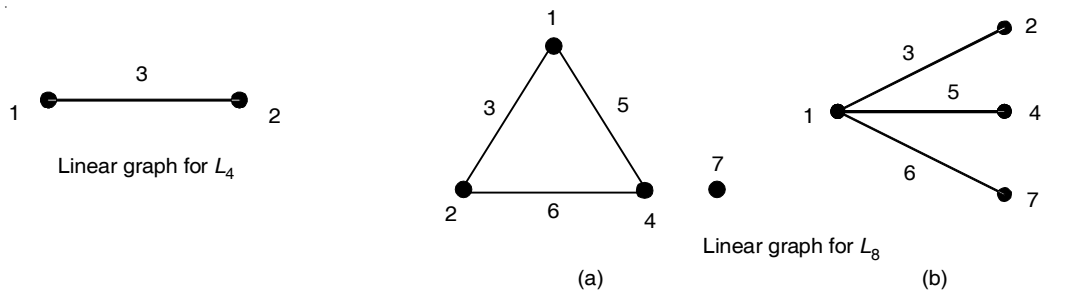

(a)   (b)   (c)

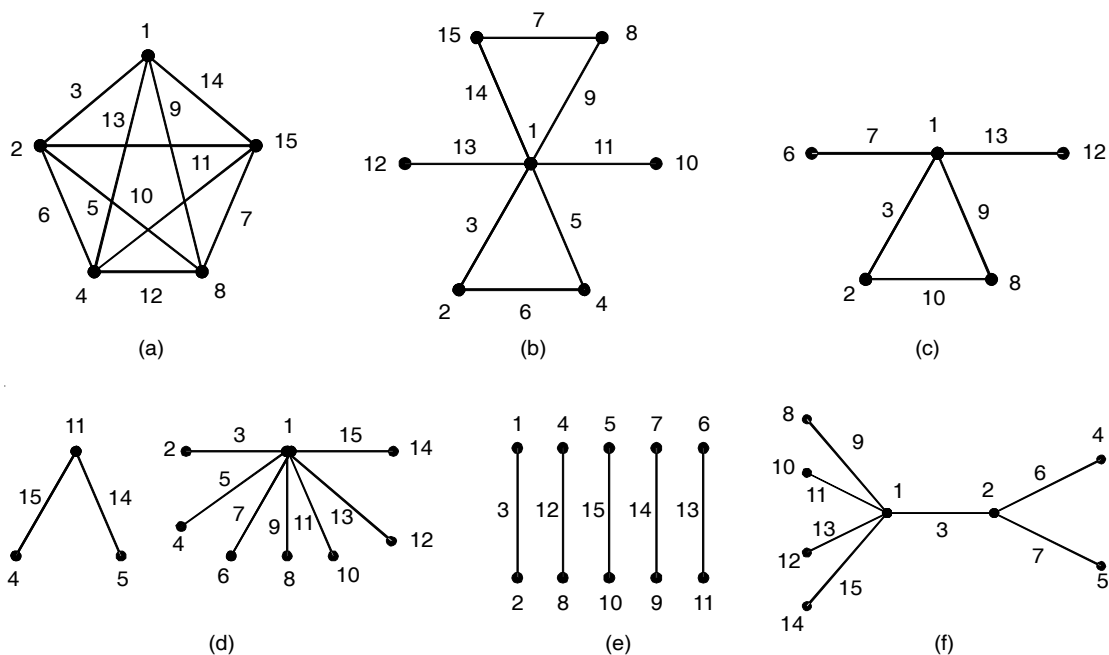(d)   (e)   (f)

FIGURE C.2   Standard linear graph for L_{16} OA.

*Taguchi and Konishi, Orthogonal Arrays and Linear Graphs: Tools for Quality Engineering, 1987, ASI, Press.