

L A M P I R A N

# Two-Level Orthogonal Arrays

L4 Array\*

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

L4 Triangular Table (Interactions)

Column no.	Column no.	
	2	3
1	3	2
2	-	1

L8 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

L8 Triangular Table (Interactions)

Column no.	Column no.					
	2	3	4	5	6	7
1	3	2	5	4	7	6
2	-	1	6	7	4	5
3	-	-	7	6	5	4
4	-	-	-	1	2	3
5	-	-	-	-	3	2
6	-	-	-	-	-	1

\*Two-level arrays from Genichi Taguchi and Yu-in Wu, *Off-Line Quality Control*, Central Japan Quality Control Association, Nagaya, 1979, pp. 103-107.



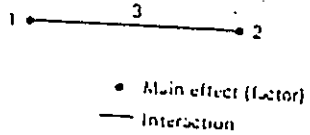
trial no.	Column no.																																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
3	1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

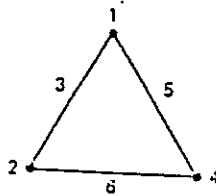
column no.	Column no.																																				
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3	—	—	7	6	5	4	11	10	9	8	15	14	13	12	19	18	17	16	23	22	21	20	27	26	25	24	31	30	29	28	28	28	28	28	28	28	
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6	—	—	—	—	—	1	14	15	12	13	10	11	8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

# Linear Graph

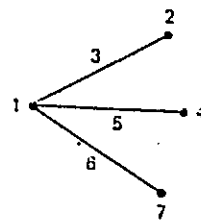
L4 LINEAR GRAPH



L8 LINEAR GRAPHS

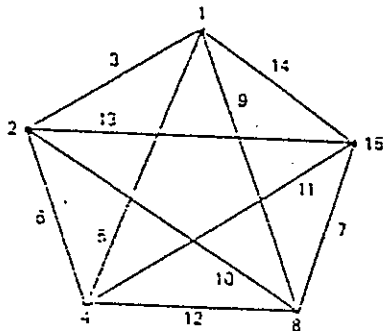


(a)

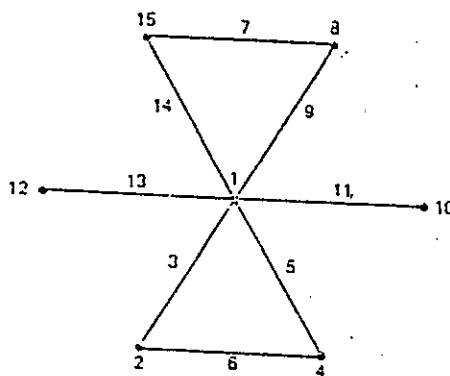


(b)

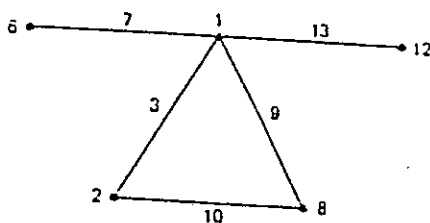
L16 LINEAR GRAPHS



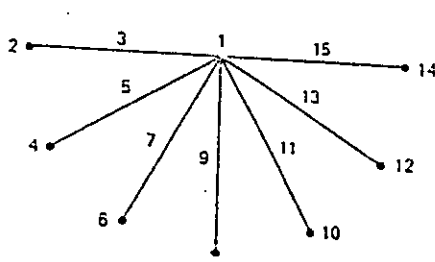
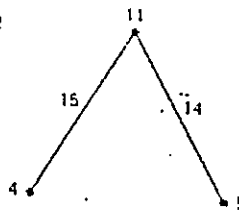
(a)



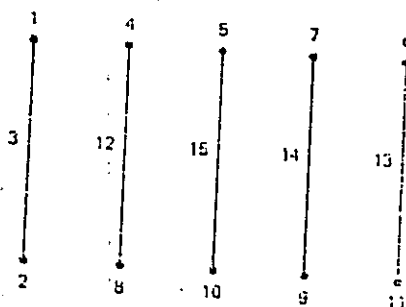
(b)



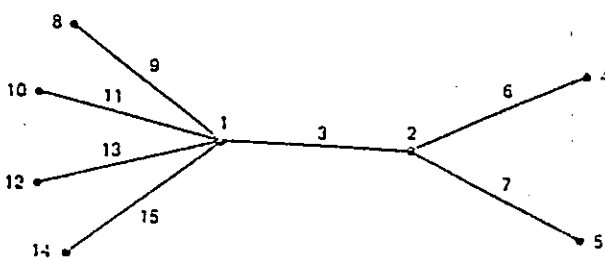
(c)



(e)



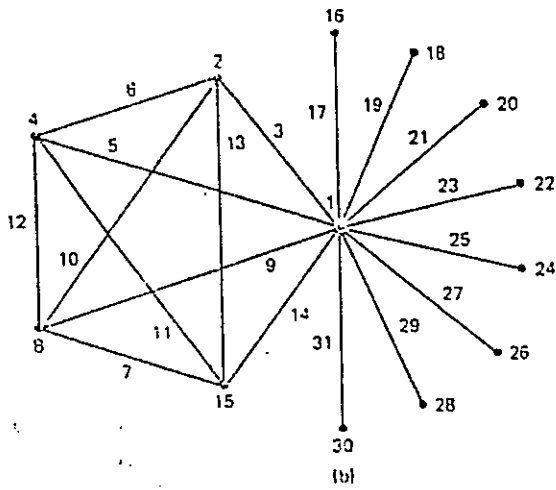
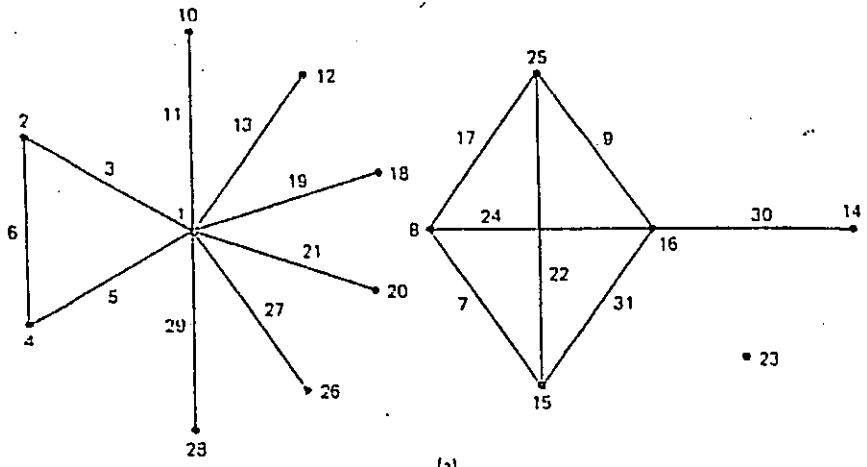
(f)



(g)

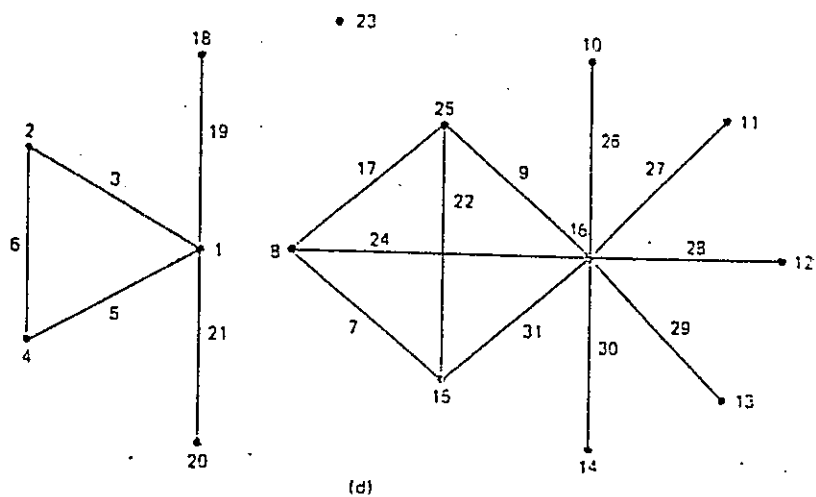
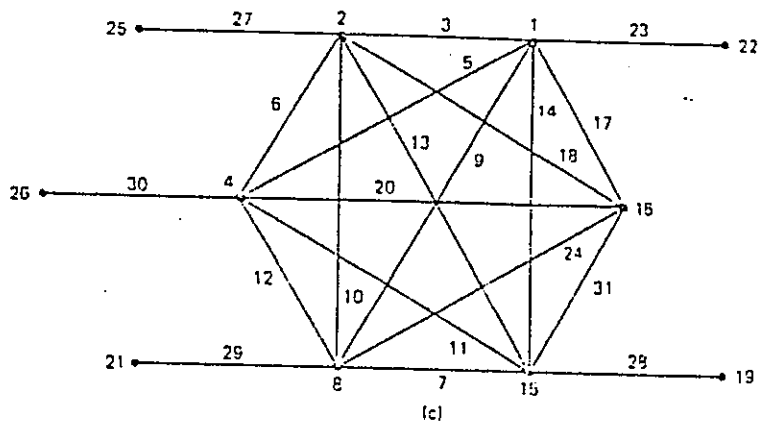
# L32 Linear Graphs\*

## L32 LINEAR GRAPHS

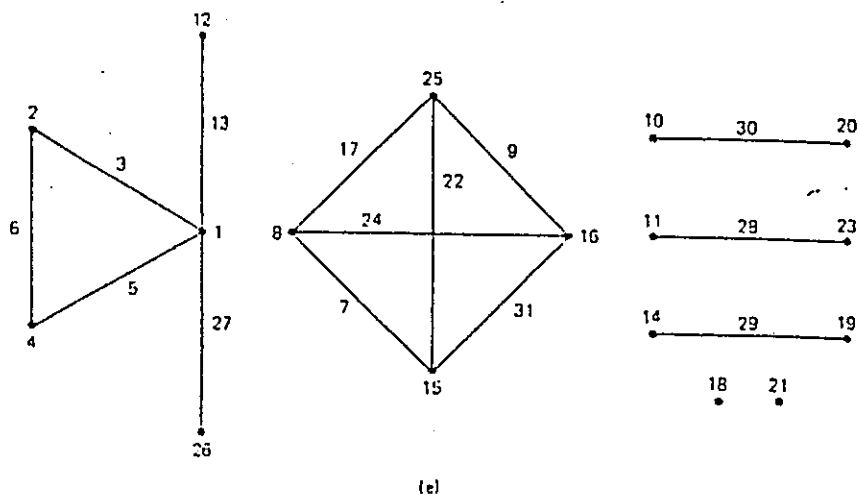


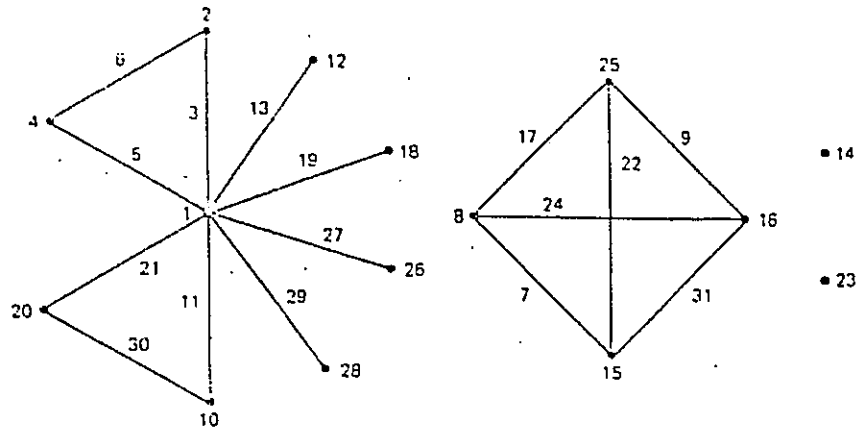
\*Reprinted with permission of the American Supplier Institute, Inc.

L32 Linear Graphs (Continued)



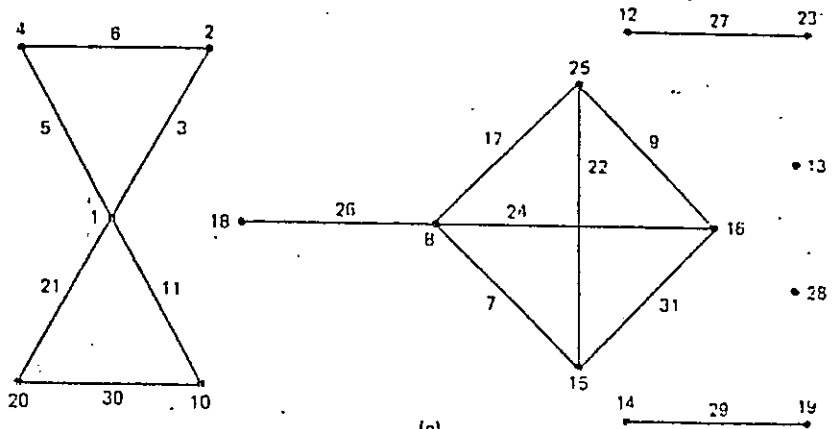
L32 Linear Graphs (Continued)



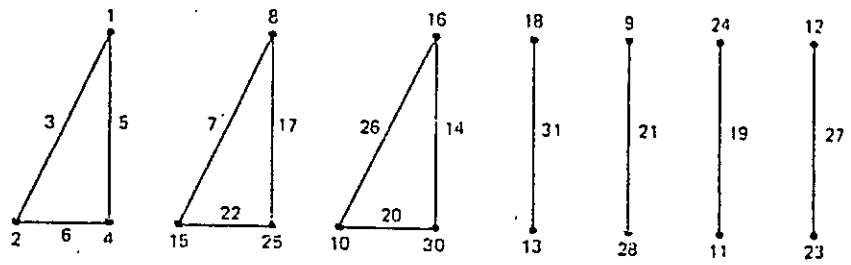


(f)

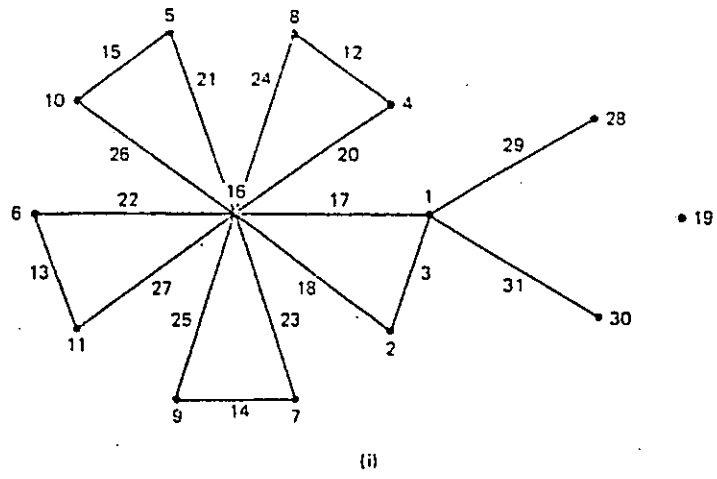
L32 Linear Graphs (Continued)



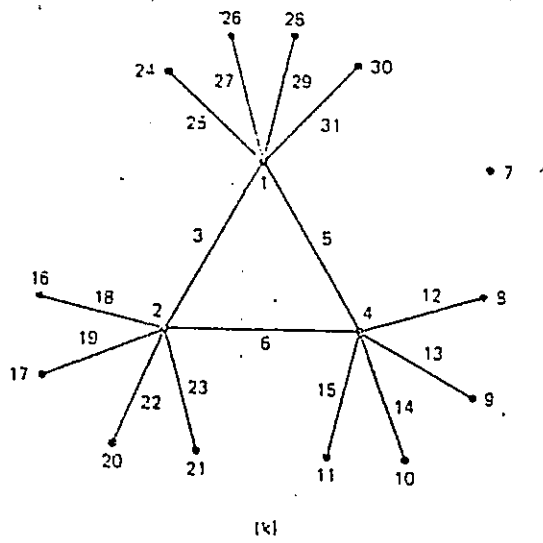
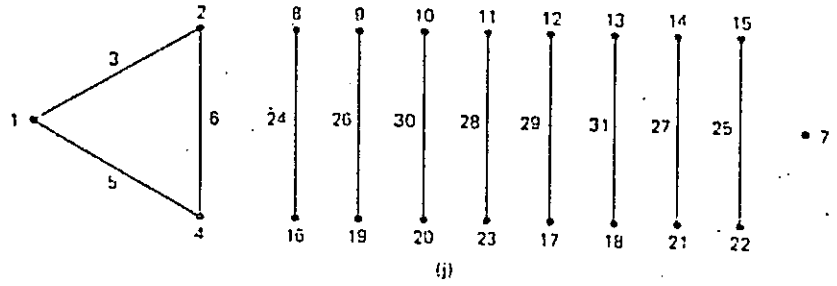
(g)



• 29  
(h)

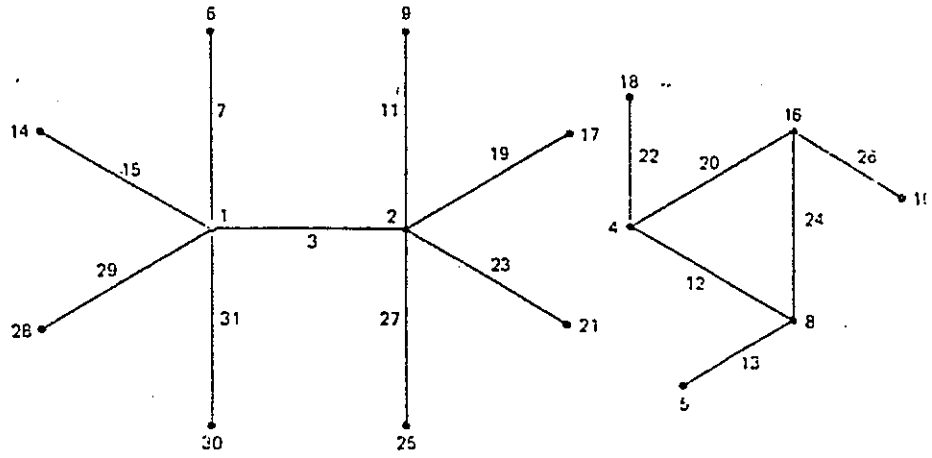


L32 Linear Graphs (Continued)

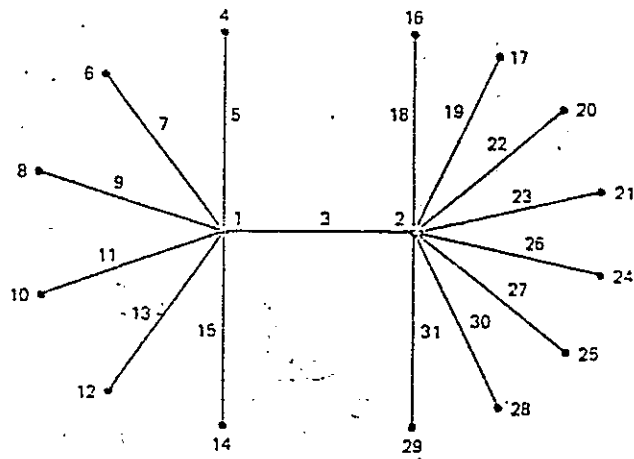




132 Linear Graphs (Continued)



(l)



(m)

TABLE D.4 F Values

		$F_{.10; \nu_1; \nu_2}$ 90% confidence†									
		Degrees of freedom for the numerator ( $\nu_1$ )									
		1	2	3	4	5	6	7	8	9	10
Degrees of freedom for the denominator ( $\nu_2$ )	1	39.9	49.5	53.6	55.8	57.2	58.2	58.9	59.4	59.9	60.2
	2	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38	9.39
	3	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24	5.23
	4	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94	3.92
	5	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32	3.30
	6	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.96	2.96	2.94
	7	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72	2.70
	8	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56	2.54
	9	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44	2.42
	10	3.28	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35	2.32
	11	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27	2.25
	12	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21	2.19
	13	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16	2.14
	14	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12	2.10
	15	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09	2.06
	16	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06	2.03
	17	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03	2.00
	18	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00	1.98
	19	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98	1.96
	20	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96	1.94
	22	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93	1.90
	24	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91	1.88
	26	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88	1.86
	28	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87	1.84
	30	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85	1.82
	40	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79	1.76
	50	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76	1.73
	60	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74	1.71
80	2.77	2.37	2.15	2.02	1.92	1.85	1.79	1.75	1.71	1.68	
100	2.76	2.36	2.14	2.00	1.91	1.83	1.78	1.73	1.70	1.66	
200	2.73	2.33	2.11	1.97	1.88	1.80	1.75	1.70	1.66	1.63	
500	2.72	2.31	2.10	1.96	1.86	1.79	1.73	1.68	1.64	1.61	
$\infty$	2.71	2.30	2.08	1.94	1.85	1.77	1.72	1.67	1.63	1.60	

D.4 F Values (Continued)

	$F_{.05, \nu_1, \nu_2}$ 95% confidence <sup>†</sup>									
	Degrees of freedom for the numerator ( $\nu_1$ )									
	1	2	3	4	5	6	7	8	9	10
1	161	200	216	225	230	234	237	239	241	242
2	18.5	19.0	19.2	19.2	19.3	19.3	19.4	19.4	19.4	19.4
3	10.1	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98
11	4.84	2.98	3.50	3.36	3.20	3.01	2.95	2.90	2.85	2.82
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35
21	4.32	3.47	3.07	2.82	2.68	2.57	2.49	2.42	2.37	2.32
22	4.30	3.44	3.05	2.84	2.66	2.55	2.46	2.40	2.34	2.30
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16
32	4.15	3.29	2.90	2.67	2.51	2.40	2.31	2.24	2.19	2.14
34	4.13	3.28	2.88	2.65	2.49	2.38	2.29	2.23	2.17	2.12
36	4.11	3.26	2.87	2.63	2.48	2.36	2.28	2.21	2.15	2.11
38	4.10	3.24	2.85	2.62	2.46	2.35	2.26	2.19	2.14	2.09
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08
42	4.07	3.22	2.83	2.59	2.44	2.32	2.24	2.16	2.11	2.06
44	4.06	3.21	2.82	2.58	2.43	2.31	2.23	2.16	2.10	2.05
46	4.05	3.20	2.81	2.57	2.42	2.30	2.22	2.15	2.09	2.04
48	4.04	3.19	2.80	2.57	2.41	2.29	2.21	2.14	2.08	2.03
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07	2.03
55	4.02	3.16	2.77	2.54	2.38	2.27	2.18	2.11	2.06	2.01
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99
65	3.99	3.14	2.75	2.51	2.36	2.24	2.15	2.08	2.03	1.98
70	3.98	3.13	2.74	2.50	2.35	2.23	2.14	2.07	2.02	1.97
80	3.96	3.11	2.73	2.49	2.33	2.21	2.13	2.06	2.00	1.95

TABLE D.4 F Values (Continued)

	$F_{.05, \nu_1, \nu_2}$ 95% confidence <sup>†</sup>									
	Degrees of freedom for the numerator ( $\nu_1$ )									
	1	2	3	4	5	6	7	8	9	10
Degrees of freedom for the denominator ( $\nu_2$ ) 90	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99	1.94
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97	1.93
125	3.92	3.07	2.68	2.44	2.29	2.17	2.08	2.01	1.96	1.91
150	3.90	3.08	2.66	2.43	2.27	2.16	2.07	2.00	1.94	1.89
200	3.89	3.04	2.65	2.42	2.26	2.14	2.06	1.98	1.93	1.88
300	3.87	3.03	2.63	2.40	2.24	2.13	2.04	1.97	1.91	1.86
500	3.86	3.01	2.62	2.39	2.23	2.12	2.03	1.96	1.90	1.85
1000	3.85	3.00	2.61	2.38	2.22	2.11	2.02	1.95	1.89	1.84
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83

$F_{.01, \nu_1, \nu_2}$  99% confidence\*

*Multiply the numbers of the first row ( $\nu_2 = 1$ ) by 10*

Degrees of freedom for the denominator ( $\nu_2$ )	1	2	3	4	5	6	7	8	9	10
1	405	500	540	563	576	596	598	598	602	606
2	93.5	99.0	99.3	99.3	99.3	99.3	99.4	99.4	99.4	99.4
3	34.1	30.8	20.5	28.7	28.2	27.9	27.7	27.5	27.3	27.2
4	21.2	18.0	16.7	16.0	15.5	15.2	15.0	14.8	14.7	14.5
5	16.8	13.2	12.1	11.4	11.0	10.7	10.5	10.3	10.2	10.1
6	13.7	10.9	9.78	9.15	8.75	8.47	8.28	8.10	7.98	7.87
7	12.2	9.55	8.45	7.85	7.46	7.19	6.99	6.94	6.72	6.62
8	11.3	8.65	7.89	7.01	6.63	6.37	6.18	6.03	5.91	5.81
9	10.6	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26
10	10.0	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.30	4.30
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10
14	8.86	6.51	5.58	5.04	4.70	4.46	4.28	4.14	4.03	3.94
15	8.68	6.26	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80
16	8.53	6.22	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69
17	8.60	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59
18	8.20	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.68	3.52	3.43
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26
23	7.86	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17
25	7.77	5.57	4.68	4.18	3.86	3.63	3.46	3.32	3.22	3.13
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18	3.09
27	7.66	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15	3.06
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12	3.03
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09	3.00
30	7.56	5.39	4.51	4.03	3.70	3.47	3.30	3.17	3.07	2.98

TABLE D.4 F Values (Continued)

$F_{.01, \nu_1, \nu_2}$  99% confidence\*

Degrees of freedom for the denominator ( $\nu_2$ )	Degrees of freedom for the numerator ( $\nu_1$ )									
	1	2	3	4	5	6	7	8	9	10
32	7.50	5.34	4.46	3.97	3.65	3.43	3.26	3.13	3.02	2.93
34	7.44	5.29	4.42	3.93	3.61	3.39	3.23	3.09	2.96	2.89
36	7.40	5.25	4.36	3.89	3.57	3.35	3.18	3.05	2.95	2.86
38	7.35	5.21	4.34	3.86	3.54	3.32	3.15	3.02	2.92	2.83
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.80	2.80
42	7.28	5.15	4.29	3.80	3.49	3.27	3.10	2.97	2.86	2.78
44	7.25	5.12	4.26	3.78	3.47	3.24	3.08	2.95	2.84	2.75
46	7.22	5.10	4.24	3.76	3.44	3.22	3.06	2.93	2.82	2.73
48	7.19	5.08	4.22	3.74	3.43	3.20	3.04	2.91	2.80	2.72
50	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.79	2.70
55	7.12	5.01	4.16	3.68	3.37	3.15	2.98	2.85	2.75	2.66
60	7.08	4.98	4.12	3.65	3.34	3.12	2.95	2.82	2.72	2.63
65	7.04	4.95	4.10	3.62	3.31	3.09	2.93	2.80	2.69	2.61
70	7.01	4.92	4.08	3.60	3.29	3.07	2.91	2.78	2.67	2.59
80	6.98	4.88	4.04	3.56	3.26	3.04	2.87	2.74	2.64	2.55
90	6.93	4.85	4.01	3.54	3.23	3.01	2.84	2.72	2.61	2.52
100	6.90	4.83	3.96	3.51	3.21	2.99	2.82	2.69	2.59	2.50
125	6.84	4.78	3.94	3.47	3.17	2.95	2.79	2.66	2.55	2.47
150	6.81	4.75	3.92	3.45	3.14	2.92	2.76	2.63	2.53	2.44
200	6.76	4.71	3.88	3.41	3.11	2.89	2.73	2.60	2.50	2.41
300	6.72	4.68	3.85	3.38	3.08	2.86	2.70	2.57	2.47	2.36
500	6.69	4.65	3.82	3.36	3.05	2.84	2.68	2.55	2.44	2.36
1000	6.66	4.63	3.80	3.34	3.04	2.82	2.66	2.53	2.43	2.34
$\infty$	6.66	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32

TABLE D.5 Omega Conversion Table\*

p, %	db	p, %	db	p, %	db
0.0	∞	5.0	-12.787	10.0	-9.541
0.1	-29.995	5.1	-12.696	10.1	-9.493
0.2	-26.980	5.2	-12.607	10.2	-9.446
0.3	-25.215	5.3	-12.520	10.3	-9.399
0.4	-23.961	5.4	-12.434	10.4	-9.352
0.5	-22.988	5.5	-12.350	10.5	-9.305
0.6	-22.191	5.6	-12.267	10.6	-9.259
0.7	-21.518	5.7	-12.185	10.7	-9.214
0.8	-20.933	5.8	-12.105	10.8	-9.168
0.9	-20.417	5.9	-12.026	10.9	-9.124
1.0	-19.955	6.0	-11.949	11.0	-9.079
1.1	-19.537	6.1	-11.872	11.1	-9.035
1.2	-19.155	6.2	-11.797	11.2	-8.991
1.3	-18.803	6.3	-11.723	11.3	-8.947
1.4	-18.476	6.4	-11.650	11.4	-8.904
1.5	-18.172	6.5	-11.578	11.5	-8.861
1.6	-17.888	6.6	-11.507	11.6	-8.819
1.7	-17.620	6.7	-11.437	11.7	-8.777
1.8	-17.367	6.8	-11.368	11.8	-8.735
1.9	-17.128	6.9	-11.300	11.9	-8.693
2.0	-16.901	7.0	-11.233	12.0	-8.652
2.1	-16.685	7.1	-11.167	12.1	-8.611
2.2	-16.478	7.2	-11.101	12.2	-8.570
2.3	-16.281	7.3	-11.037	12.3	-8.530
2.4	-16.091	7.4	-10.973	12.4	-8.490
2.5	-15.910	7.5	-10.910	12.5	-8.450
2.6	-15.735	7.6	-10.848	12.6	-8.410
2.7	-15.566	7.7	-10.786	12.7	-8.371
2.8	-15.404	7.8	-10.725	12.8	-8.332
2.9	-15.247	7.9	-10.665	12.9	-8.293
3.0	-15.096	8.0	-10.606	13.0	-8.255
3.1	-14.949	8.1	-10.547	13.1	-8.216
3.2	-14.806	8.2	-10.489	13.2	-8.178
3.3	-14.668	8.3	-10.432	13.3	-8.141
3.4	-14.534	8.4	-10.375	13.4	-8.103
3.5	-14.404	8.5	-10.319	13.5	-8.066
3.6	-14.227	8.6	-10.263	13.6	-8.029
3.7	-14.153	8.7	-10.209	13.7	-7.992
3.8	-14.033	8.8	-10.154	13.8	-7.955
3.9	-13.916	8.9	-10.100	13.9	-7.919
4.0	-13.801	9.0	-10.047	14.0	-7.883
4.1	-13.689	9.1	-9.994	14.1	-7.847
4.2	-13.580	9.2	-9.942	14.2	-7.811
4.3	-13.473	9.3	-9.890	14.3	-7.775
4.4	-13.369	9.4	-9.839	14.4	-7.740
4.5	-13.267	9.5	-9.788	14.5	-7.705
4.6	-13.167	9.6	-9.738	14.6	-7.670
4.7	-13.069	9.7	-9.688	14.7	-7.635
4.8	-12.973	9.8	-9.639	14.8	-7.601
4.9	-12.879	9.9	-9.590	14.9	-7.566

\*Genichi Taguchi and Yu-In Wu, *Off-Line Quality Control*, Central Japan Quality Control Association, Nagaya, 1979, pp. 99-102.

D.5 Omega Conversion Table (Continued)

	db	p, %	db	p, %	db
15.0	-7.532	20.0	-6.020	25.0	-4.770
15.1	-7.498	20.1	-5.993	25.1	-4.747
15.2	-7.465	20.2	-5.966	25.2	-4.724
15.3	-7.431	20.3	-5.939	25.3	-4.701
15.4	-7.397	20.4	-5.912	25.4	-4.678
15.5	-7.364	20.5	-5.885	25.5	-4.655
15.6	-7.331	20.6	-5.859	25.6	-4.632
15.7	-7.298	20.7	-5.832	25.7	-4.610
15.8	-7.266	20.8	-5.806	25.8	-4.587
15.9	-7.233	20.9	-5.779	25.9	-4.564
16.0	-7.201	21.0	-5.753	26.0	-4.542
16.1	-7.168	21.1	-5.727	26.1	-4.519
16.2	-7.136	21.2	-5.701	26.2	-4.497
16.3	-7.104	21.3	-5.675	26.3	-4.474
16.4	-7.073	21.4	-5.649	26.4	-4.452
16.5	-7.041	21.5	-5.623	26.5	-4.429
16.6	-7.010	21.6	-5.598	26.6	-4.407
16.7	-6.978	21.7	-5.572	26.7	-4.385
16.8	-6.947	21.8	-5.547	26.8	-4.363
16.9	-6.916	21.9	-5.521	26.9	-4.341
17.0	-6.885	22.0	-5.496	27.0	-4.319
17.1	-6.855	22.1	-5.470	27.1	-4.297
17.2	-6.824	22.2	-5.445	27.2	-4.275
17.3	-6.794	22.3	-5.420	27.3	-4.253
17.4	-6.763	22.4	-5.395	27.4	-4.231
17.5	-6.733	22.5	-5.370	27.5	-4.209
17.6	-6.703	22.6	-5.345	27.6	-4.187
17.7	-6.673	22.7	-5.321	27.7	-4.166
17.8	-6.644	22.8	-5.296	27.8	-4.144
17.9	-6.614	22.9	-5.271	27.9	-4.122
18.0	-6.584	23.0	-5.247	28.0	-4.101
18.1	-6.555	23.1	-5.222	28.1	-4.079
18.2	-6.526	23.2	-5.198	28.2	-4.058
18.3	-6.497	23.3	-5.173	28.3	-4.036
18.4	-6.468	23.4	-5.149	28.4	-4.015
18.5	-6.439	23.5	-5.125	28.5	-3.994
18.6	-6.410	23.6	-5.101	28.6	-3.972
18.7	-6.381	23.7	-5.077	28.7	-3.951
18.8	-6.353	23.8	-5.053	28.8	-3.930
18.9	-6.325	23.9	-5.029	28.9	-3.909
19.0	-6.296	24.0	-5.005	29.0	-3.888
19.1	-6.268	24.1	-4.981	29.1	-3.867
19.2	-6.240	24.2	-4.958	29.2	-3.846
19.3	-6.212	24.3	-4.934	29.3	-3.825
19.4	-6.184	24.4	-4.910	29.4	-3.804
19.5	-6.157	24.5	-4.887	29.5	-3.783
19.6	-6.129	24.6	-4.863	29.6	-3.762
19.7	-6.101	24.7	-4.840	29.7	-3.741
19.8	-6.074	24.8	-4.817	29.8	-3.720
19.9	-6.047	24.9	-4.793	29.9	-3.699

TABLE D.5 Omega Conversion Table (Continued)

$p, \%$	db	$p, \%$	db	$p, \%$	db
30.0	-3.679	35.0	-2.687	40.0	-1.760
30.1	-3.658	35.1	-2.668	40.1	-1.742
30.2	-3.637	35.2	-2.649	40.2	-1.724
30.3	-3.617	35.3	-2.630	40.3	-1.706
30.4	-3.596	35.4	-2.611	40.4	-1.688
30.5	-3.576	35.5	-2.592	40.5	-1.670
30.6	-3.555	35.6	-2.573	40.6	-1.652
30.7	-3.535	35.7	-2.554	40.7	-1.634
30.8	-3.515	35.8	-2.536	40.8	-1.616
30.9	-3.494	35.9	-2.517	40.9	-1.598
31.0	-3.474	36.0	-2.498	41.0	-1.580
31.1	-3.454	36.1	-2.479	41.1	-1.562
31.2	-3.433	36.2	-2.460	41.2	-1.544
31.3	-3.413	36.3	-2.441	41.3	-1.526
31.4	-3.393	36.4	-2.423	41.4	-1.508
31.5	-3.373	36.5	-2.404	41.5	-1.490
31.6	-3.353	36.6	-2.385	41.6	-1.472
31.7	-3.333	36.7	-2.366	41.7	-1.454
31.8	-3.313	36.8	-2.348	41.8	-1.436
31.9	-3.293	36.9	-2.329	41.9	-1.419
32.0	-3.273	37.0	-2.310	42.0	-1.401
32.1	-3.253	37.1	-2.292	42.1	-1.383
32.2	-3.233	37.2	-2.273	42.2	-1.365
32.3	-3.213	37.3	-2.255	42.3	-1.347
32.4	-3.193	37.4	-2.236	42.4	-1.330
32.5	-3.173	37.5	-2.217	42.5	-1.312
32.6	-3.153	37.6	-2.199	42.6	-1.294
32.7	-3.134	37.7	-2.180	42.7	-1.276
32.8	-3.114	37.8	-2.162	42.8	-1.259
32.9	-3.094	37.9	-2.144	42.9	-1.241
33.0	-3.075	38.0	-2.125	43.0	-1.223
33.1	-3.055	38.1	-2.107	43.1	-1.205
33.2	-3.035	38.2	-2.088	43.2	-1.188
33.3	-3.016	38.3	-2.070	43.3	-1.170
33.4	-2.996	38.4	-2.051	43.4	-1.152
33.5	-2.977	38.5	-2.033	43.5	-1.135
33.6	-2.957	38.6	-2.015	43.6	-1.117
33.7	-2.938	38.7	-1.996	43.7	-1.099
33.8	-2.918	38.8	-1.978	43.8	-1.082
33.9	-2.899	38.9	-1.960	43.9	-1.064
34.0	-2.880	39.0	-1.942	44.0	-1.046
34.1	-2.860	39.1	-1.923	44.1	-1.029
34.2	-2.841	39.2	-1.905	44.2	-1.011
34.3	-2.822	39.3	-1.887	44.3	-0.994
34.4	-2.802	39.4	-1.869	44.4	-0.976
34.5	-2.783	39.5	-1.851	44.5	-0.958
34.6	-2.764	39.6	-1.832	44.6	-0.941
34.7	-2.745	39.7	-1.814	44.7	-0.923
34.8	-2.726	39.8	-1.796	44.8	-0.906
34.9	-2.707	39.9	-1.778	44.9	-0.888

TABLE D.5 Omega Conversion Table (Continued)

<i>p</i> , %	db	<i>p</i> , %	db	<i>p</i> , %	db
45.0	-0.871	50.0	0.000	55.0	0.872
45.1	-0.853	50.1	0.017	55.1	0.889
45.2	-0.835	50.2	0.035	55.2	0.907
45.3	-0.818	50.3	0.052	55.3	0.924
45.4	-0.800	50.4	0.069	55.4	0.942
45.5	-0.783	50.5	0.087	55.5	0.959
45.6	-0.765	50.6	0.104	55.6	0.977
45.7	-0.748	50.7	0.122	55.7	0.995
45.8	-0.730	50.8	0.139	55.8	1.012
45.9	-0.713	50.9	0.156	55.9	1.030
46.0	-0.695	51.0	0.174	56.0	1.047
46.1	-0.678	51.1	0.191	56.1	1.065
46.2	-0.660	51.2	0.209	56.2	1.083
46.3	-0.643	51.3	0.226	56.3	1.100
46.4	-0.625	51.4	0.243	56.4	1.118
46.5	-0.608	51.5	0.261	56.5	1.136
46.6	-0.591	51.6	0.278	56.6	1.153
46.7	-0.573	51.7	0.295	56.7	1.171
46.8	-0.556	51.8	0.313	56.8	1.189
46.9	-0.538	51.9	0.330	56.9	1.206
47.0	-0.521	52.0	0.348	57.0	1.224
47.1	-0.503	52.1	0.365	57.1	1.242
47.2	-0.486	52.2	0.382	57.2	1.260
47.3	-0.468	52.3	0.400	57.3	1.277
47.4	-0.451	52.4	0.417	57.4	1.295
47.5	-0.434	52.5	0.435	57.5	1.313
47.6	-0.416	52.6	0.452	57.6	1.331
47.7	-0.399	52.7	0.469	57.7	1.348
47.8	-0.381	52.8	0.487	57.8	1.366
47.9	-0.364	52.9	0.504	57.9	1.384
48.0	-0.347	53.0	0.522	58.0	1.402
48.1	-0.329	53.1	0.539	58.1	1.420
48.2	-0.312	53.2	0.557	58.2	1.437
48.3	-0.294	53.3	0.574	58.3	1.455
48.4	-0.277	53.4	0.592	58.4	1.473
48.5	-0.260	53.5	0.609	58.5	1.491
48.6	-0.242	53.6	0.626	58.6	1.509
48.7	-0.225	53.7	0.644	58.7	1.527
48.8	-0.208	53.8	0.661	58.8	1.545
48.9	-0.190	53.9	0.679	58.9	1.563
49.0	-0.173	54.0	0.696	59.0	1.581
49.1	-0.155	54.1	0.714	59.1	1.599
49.2	-0.138	54.2	0.731	59.2	1.617
49.3	-0.121	54.3	0.749	59.3	1.635
49.4	-0.103	54.4	0.679	59.4	1.653
49.5	-0.086	54.5	0.784	59.5	1.671
49.6	-0.068	54.6	0.801	59.6	1.689
49.7	-0.051	54.7	0.819	59.7	1.707
49.8	-0.034	54.8	0.836	59.8	1.725
49.9	-0.016	54.9	0.854	59.9	1.743

- Values      + Values



TABLE D.5 Omega Conversion Table (Continued)

$p, \%$	db	$p, \%$	db	$p, \%$	db
60.0	1.761	65.0	2.688	70.0	3.680
60.1	1.779	65.1	2.708	70.1	3.700
60.2	1.797	65.2	2.727	70.2	3.721
60.3	1.815	65.3	2.746	70.3	3.742
60.4	1.833	65.4	2.765	70.4	3.763
60.5	1.852	65.5	2.784	70.5	3.784
60.6	1.870	65.6	2.803	70.6	3.805
60.7	1.888	65.7	2.823	70.7	3.826
60.8	1.906	65.8	2.842	70.8	3.847
60.9	1.924	65.9	2.861	70.9	3.868
61.0	1.943	66.0	2.881	71.0	3.889
61.1	1.961	66.1	2.900	71.1	3.910
61.2	1.979	66.2	2.919	71.2	3.931
61.3	1.997	66.3	2.939	71.3	3.952
61.4	2.016	66.4	2.958	71.4	3.973
61.5	2.034	66.5	2.978	71.5	3.995
61.6	2.052	66.6	2.997	71.6	4.016
61.7	2.071	66.7	3.017	71.7	4.037
61.8	2.089	66.8	3.036	71.8	4.059
61.9	2.108	66.9	3.056	71.9	4.080
62.0	2.126	67.0	3.076	72.0	4.102
62.1	2.145	67.1	3.095	72.1	4.123
62.2	2.163	67.2	3.115	72.2	4.145
62.3	2.181	67.3	3.135	72.3	4.167
62.4	2.200	67.4	3.154	72.4	4.188
62.5	2.218	67.5	3.174	72.5	4.210
62.6	2.237	67.6	3.194	72.6	4.232
62.7	2.256	67.7	3.214	72.7	4.254
62.8	2.274	67.8	3.234	72.8	4.276
62.9	2.293	67.9	3.254	72.9	4.298
63.0	2.311	68.0	3.274	73.0	4.320
63.1	2.330	68.1	3.294	73.1	4.342
63.2	2.349	68.2	3.314	73.2	4.364
63.3	2.367	68.3	3.334	73.3	4.386
63.4	2.386	68.4	3.354	73.4	4.408
63.5	2.405	68.5	3.374	73.5	4.430
63.6	2.424	68.6	3.394	73.6	4.453
63.7	2.442	68.7	3.414	73.7	4.475
63.8	2.461	68.8	3.434	73.8	4.498
63.9	2.480	68.9	3.455	73.9	4.520
64.0	2.499	69.0	3.475	74.0	4.543
64.1	2.518	69.1	3.495	74.1	4.565
64.2	2.537	69.2	3.516	74.2	4.588
64.3	2.555	69.3	3.536	74.3	4.611
64.4	2.574	69.4	3.556	74.4	4.633
64.5	2.593	69.5	3.577	74.5	4.656
64.6	2.612	69.6	3.597	74.6	4.679
64.7	2.631	69.7	3.618	74.7	4.702
64.8	2.650	69.8	3.638	74.8	4.725
64.9	2.669	69.9	3.659	74.9	4.748

TABLE D.5 Omega Conversion Table (Continued)

<i>p</i> , %	db	<i>p</i> , %	db	<i>p</i> , %	db
75.0	4.771	80.0	6.021	85.0	7.533
75.1	4.794	80.1	6.048	85.1	7.567
75.2	4.818	80.2	6.075	85.2	7.602
75.3	4.841	80.3	6.102	85.3	7.686
75.4	4.864	80.4	6.130	85.4	7.671
75.5	4.888	80.5	6.158	85.5	7.706
75.6	4.911	80.6	6.185	85.6	7.741
75.7	4.935	80.7	6.213	85.7	7.776
75.8	4.959	80.8	6.241	85.8	7.812
75.9	4.982	80.9	6.269	85.9	7.848
76.0	5.006	81.0	6.297	86.0	7.884
76.1	5.030	81.1	6.326	86.1	7.920
76.2	5.054	81.2	6.354	86.2	7.956
76.3	5.078	81.3	6.382	86.3	7.993
76.4	5.102	81.4	6.411	86.4	8.080
76.5	5.126	81.5	6.440	86.5	8.067
76.6	5.150	81.6	6.469	86.6	8.104
76.7	5.174	81.7	6.498	86.7	8.142
76.8	5.199	81.8	6.527	86.8	8.179
76.9	5.223	81.9	6.556	86.9	8.217
77.0	5.248	82.0	6.585	87.0	8.256
77.1	5.272	82.1	6.615	87.1	8.294
77.2	5.297	82.2	6.645	87.2	8.333
77.3	5.322	82.3	6.674	87.3	8.372
77.4	5.346	82.4	6.704	87.4	8.411
77.5	5.371	82.5	6.734	87.5	8.451
77.6	5.396	82.6	6.764	87.6	8.491
77.7	5.421	82.7	6.795	87.7	8.531
77.8	5.446	82.8	6.825	87.8	8.571
77.9	5.471	82.9	6.856	87.9	8.612
78.0	5.497	83.0	6.886	88.0	8.653
78.1	5.522	83.1	6.917	88.1	8.694
78.2	5.548	83.2	6.948	88.2	8.786
78.3	5.573	83.3	6.979	88.3	8.778
78.4	5.599	83.4	7.011	88.4	8.820
78.5	5.624	83.5	7.042	88.5	8.862
78.6	5.650	83.6	7.074	88.6	8.905
78.7	5.676	83.7	7.105	88.7	8.948
78.8	5.702	83.8	7.137	88.8	8.992
78.9	5.728	83.9	7.169	88.9	9.036
79.0	5.754	84.0	7.202	89.0	9.080
79.1	5.780	84.1	7.234	89.1	9.125
79.2	5.807	84.2	7.267	89.2	9.169
79.3	5.833	84.3	7.299	89.3	9.215
79.4	5.860	84.4	7.332	89.4	9.260
79.5	5.886	84.5	7.365	89.5	9.306
79.6	5.913	84.6	7.398	89.6	9.353
79.7	5.940	84.7	7.432	89.7	9.400
79.8	5.967	84.8	7.466	89.8	9.447
79.9	5.994	84.9	7.499	89.9	9.494

TABLE D.5 Omega Conversion Table (Continued)

<i>p</i> , %	db	<i>p</i> , %	db	<i>p</i> , %	db
90.0	9.542	94.0	11.950	98.0	16.902
90.1	9.591	94.1	12.027	98.1	17.129
90.2	9.640	94.2	12.106	98.2	17.368
90.3	9.689	94.3	12.186	98.3	17.621
90.4	9.739	94.4	12.268	98.4	17.889
90.5	9.789	94.5	12.351	98.5	18.173
90.6	9.840	94.6	12.435	98.6	18.447
90.7	9.891	94.7	12.521	98.7	18.804
90.8	9.943	94.8	12.608	98.8	19.156
90.9	9.995	94.9	12.697	98.9	19.538
91.0	10.048	95.0	12.783	99.0	19.956
91.1	10.111	95.1	12.880	99.1	20.418
91.2	10.155	95.2	12.974	99.2	20.934
91.3	10.210	95.3	13.070	99.3	21.519
91.4	10.264	95.4	13.168	99.4	22.192
91.5	10.320	95.5	13.268	99.5	22.989
91.6	10.376	95.6	13.370	99.6	23.962
91.7	10.433	95.7	13.474	99.7	25.216
91.8	10.490	95.8	13.581	99.8	26.981
91.9	10.548	95.9	13.690	99.9	29.986
92.0	10.607	96.0	13.802	100.0	∞
92.1	10.666	96.1	13.917		
92.2	10.726	96.2	14.034		
92.3	10.787	96.3	14.154		
92.4	10.840	96.4	14.278		
92.5	10.911	96.5	14.405		
92.6	10.974	96.6	14.535		
92.7	11.038	96.7	14.669		
92.8	11.102	96.8	14.807		
92.9	11.168	96.9	14.950		
93.0	11.234	97.0	15.097		
93.1	11.301	97.1	15.248		
93.2	11.369	97.2	15.405		
93.3	11.438	97.3	15.567		
93.4	11.508	97.4	15.736		
93.5	11.579	97.5	15.911		
93.6	11.651	97.6	16.092		
93.7	11.724	97.7	16.282		
93.8	11.798	97.8	16.479		
93.9	11.873	97.9	16.686		

$$\Omega(\text{db}) = 10 \log \left[ \frac{p/100}{1 - p/100} \right]$$