TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$

Designs with 3 Factors

(a) 2^{3-1}; 1/2 fraction of 3 factors in 4 runs — **Resolution III**

Design Generators

$C = AB$

Defining relation: $I = ABC$

Aliases

$A = BC$
$B = AC$
$C = AB$

Designs with 4 Factors

(b) 2^{4-1}; 1/2 fraction of 4 factors in 8 runs — **Resolution IV**

Design Generators

$D = ABC$

Defining relation: $I = ABCD$

Aliases

$A = BCD$
$B = ACD$
$C = ABD$
$D = ABC$
$AB = CD$
$AC = BD$
$AD = BC$

Designs with 5 Factors

(c) 2^{5-2}; 1/4 fraction of 5 factors in 8 runs — **Resolution III**

Design Generators

$D = AB \quad E = AC$

Defining relation: $I = ABD = ACE = BCDE$

Aliases

$A = BD = CE$
$B = AD = CDE$
$C = AE = BDE$
$D = AB = BCE$
$E = AC = BCD$
$BC = DE = ACD = ABE$
$CD = BE = ABC = ADE$

(d) 2^{5-1}; 1/2 fraction of 5 factors in 16 runs — **Resolution V**

Design Generators

$E = ABCD$

Defining relation: $I = ABCDE$

Aliases

Each main effect is aliased with a single 4-factor interaction.

$AB = CDE$	$BD = ACE$
$AC = BDE$	$BE = ACD$
$AD = BCE$	$CD = ABE$
$AE = BCD$	$CE = ABD$
$BC = ADE$	$DE = ABC$

2 blocks of 8: $AB = CDE$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 6 Factors

(e) 2^{6-3}; 1/8 fraction of 6 factors in 8 runs — **Resolution III**

Design Generators

$D = AB \quad E = AC \quad F = BC$

Defining relation: $I = ABD = ACE = BCDE = BCF = ACDF = ABEF = DEF$

Aliases

$A = BD = CE = CDF = BEF$	$E = AC = DF = BCD = ABF$
$B = AD = CF = CDE = AEF$	$F = BC = DE = ACD = ABE$
$C = AE = BF = BDE = ADF$	$CD = BE = AF = ABC = ADE = BDF = CEF$
$D = AB = EF = BCE = ACF$	

(f) 2^{6-2}; 1/4 fraction of 6 factors in 16 runs — **Resolution IV**

Design Generators

$E = ABC \quad F = BCD$

Defining relation: $I = ABCE = BCDF = ADEF$

Aliases

$A = BCE = DEF$	$AB = CE$
$B = ACE = CDF$	$AC = BE$
$C = ABE = BDF$	$AD = EF$
$D = BCF = AEF$	$AE = BC = DF$
$E = ABC = ADF$	$AF = DE$
$F = BCD = ADE$	$BD = CF$
$ABD = CDE = ACF = BEF$	$BF = CD$
$ACD = BDE = ABF = CEF$	

2 blocks of 8: $ABD = CDE = ACF = BEF$

(g) 2^{6-1}; 1/2 fraction of 6 factors in 32 runs — **Resolution VI**

Design Generators

$F = ABCDE$

Defining relation: $I = ABCDEF$

Aliases

Each main effect is aliased with a single 5-factor interaction.

Each 2-factor interaction is aliased with a single 4-factor interaction.

$ABC = DEF$	$ACE = BDF$
$ABD = CEF$	$ACF = BDE$
$ABE = CDF$	$ADE = BCF$
$ABF = CDE$	$ADF = BCE$
$ACD = BEF$	$AEF = BCD$
2 blocks of 16: $ABC = DEF$	4 blocks of 8: $AB = CDEF$
	$ACD = BEF$
	$AEF = BCD$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 7 Factors

(h) 2^{7-4}; 1/16 fraction of 7 factors in 8 runs — **Resolution III**

Design Generators

$D = AB \quad E = AC \quad F = BC \quad G = ABC$

Defining relation: $I = ABD = ACE = BCDE = BCF = ACDF = ABEF = DEF = ABCG$
$= CDG = BEG = ADEG = AFG = BDFG = CEFG = ABCDEFG$

Aliases

$A = BD = CE = FG$	$E = AC = DF = BG$
$B = AD = CF = EG$	$F = BC = DE = AG$
$C = AE = BF = DG$	$G = CD = BE = AF$
$D = AB = EF = CG$	

(i) 2^{7-3}; 1/8 fraction of 7 factors in 16 runs — **Resolution IV**

Design Generators

$E = ABC \quad F = BCD \quad G = ACD$

Defining relation: $I = ABCE = BCDF = ADEF = ACDG = BDEG = ABFG = CEFG$

Aliases

$A = BCE = DEF = CDG = BFG$	$AB = CE = FG$	$E = ABC = ADF = BDG = CFG$	$AF = DE = BG$
$B = ACE = CDF = DEG = AFG$	$AC = BE = DG$	$F = BCD = ADE = ABG = CEG$	$AG = CD = BF$
$C = ABE = BDF = ADG = EFG$	$AD = EF = CG$	$G = ACD = BDE = ABF = CEF$	$BD = CF = EG$
$D = BCF = AEF = ACG = BEG$	$AE = BC = DF$		

$ABD = CDE = ACF = BEF = BCG = AEG = DFG$

2 blocks of 8: $ABD = CDE = ACF = BEF = BCG = AEG = DFG$

(j) 2^{7-2}; 1/4 fraction of 7 factors in 32 runs — **Resolution IV**

Design Generators

$F = ABCD \quad G = ABDE$

Defining relation: $I = ABCDF = ABDEG = CEFG$

Aliases

$A =$	$AB = CDF = DEG$	$BC = ADF$	$CE = FG$	$ACE = AFG$
$B =$	$AC = BDF$	$BD = ACF = AEG$	$CF = ABD = EG$	$ACG = AEF$
$C = EFG$	$AD = BCF = BEG$	$BE = ADG$	$CG = EF$	$BCE = BFG$
$D =$	$AE = BDG$	$BF = ACD$	$DE = ABG$	$BCG = BEF$
$E = CFG$	$AF = BCD$	$BG = ADE$	$DF = ABC$	$CDE = DFG$
$F = CEG$	$AG = BDE$	$CD = ABF$	$DG = ABE$	$CDG = DEF$
$G = CEF$				

2 blocks of 16: $ACE = AFG$

4 blocks of 8: $ACE = AFG$
$BCE = BFG$
$AB = CDF = DEG$

(k) 2^{7-1}; 1/2 fraction of 7 factors in 64 runs — **Resolution VII**

Design Generators

$G = ABCDEF$

Defining relation: $I = ABCDEFG$

Aliases

Each main effect is aliased with a single 6-factor interaction.
Each 2-factor interaction is aliased with a single 5-factor interaction.
Each 3-factor interaction is aliased with a single 4-factor interaction.

2 blocks of 32: ABC

4 blocks of 16: ABC
CEF
CDG

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 8 Factors

(l) 2^{8-4}; 1/16 fraction of 8 factors in 16 runs — **Resolution IV**

Design Generators

$E = BCD \quad F = ACD \quad G = ABC \quad H = ABD$

Defining relation: $I = BCDE = ACDF = ABEF = ABCG = ADEG = BDFG = CEFG = ABDH$
$= ACEH = BCFH = DEFH = CDGH = BEGH = AFGH = ABCDEFGH$

Aliases

$A = CDF = BEF = BCG = DEG = BDH = CEH = FGH$	$AB = EF = CG = DH$
$B = CDE = AEF = ACG = DFG = ADH = CFH = EGH$	$AC = DF = BG = EH$
$C = BDE = ADF = ABG = EFG = AEH = BFH = DGH$	$AD = CF = EG = BH$
$D = BCE = ACF = AEG = BFG = ABH = EFH = CGH$	$AE = BF = DG = CH$
$E = BCD = ABF = ADG = CFG = ACH = DFH = BGH$	$AF = CD = BE = GH$
$F = ACD = ABE = BDG = CEG = BCH = DEH = AGH$	$AG = BC = DE = FH$
$G = ABC = ADE = BDF = CEF = CDH = BEH = AFH$	$AH = BD = CE = FG$
$H = ABD = ACE = BCF = DEF = CDG = BEG = AFG$	

2 blocks of 8: $AB = EF = CG = DH$

(m) 2^{8-3}; 1/8 fraction of 8 factors in 32 runs — **Resolution IV**

Design Generators

$F = ABC \quad G = ABD \quad H = BCDE$

Defining relation: $I = ABCF = ABDG = CDFG = BCDEH = ADEFH = ACEGH = BEFGH$

Aliases

$A = BCF = BDG$	$AE = DFH = CGH$	$DE = BCH = AFH$
$B = ACF = ADG$	$AF = BC = DEH$	$DH = BCE = AEF$
$C = ABF = DFG$	$AG = BD = CEH$	$EF = ADH = BGH$
$D = ABG = CFG$	$AH = DEF = CEG$	$EG = ACH = BFH$
$E =$	$BE = CDH = FGH$	$EH = BCD = ADF = ACG = BFG$
$F = ABC = CDG$	$BH = CDE = EFG$	$FH = ADE = BEG$
$G = ABD = CDF$	$CD = FG = BEH$	$GH = ACE = BEF$
$H =$	$CE = BDH = AGH$	$ABE = CEF = DEG$
$AB = CF = DG$	$CG = DF = AEH$	$ABH = CFH = DGH$
$AC = BF = EGH$	$CH = BDE = AEG$	$ACD = BDF = BCG = AFG$
$AD = BG = EFH$		

2 blocks of 16: $ABE = CEF = DEG$

4 blocks of 8: $ABE = CEF = DEG$
$ABH = CFH = DGH$
$EH = BCD = ADF = ACG = BFG$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 8 Factors (*Continued*)

(n) 2^{8-2}; 1/4 fraction of 8 factors in 64 runs — **Resolution V**

Design Generators

$G = ABCD \quad H = ABEF$

Defining relation: $I = ABCDG = ABEFH = CDEFGH$

Aliases

$AB = CDG = EFH$	$BG = ACD$	$EF = ABH$	$ADH =$	$BFG =$
$AC = BDG$	$BH = AEF$	$EG =$	$AEG =$	$BGH =$
$AD = BCG$	$CD = ABG$	$EH = ABF$	$AFG =$	$CDE = FGH$
$AE = BFH$	$CE =$	$FG =$	$AGH =$	$CDF = EGH$
$AF = BEH$	$CF =$	$FH = ABE$	$BCE =$	$CDH = EFG$
$AG = BCD$	$CG = ABD$	$GH =$	$BCF =$	$CEF = DGH$
$AH = BEF$	$CH =$	$ACE =$	$BCH =$	$CEG = DFH$
$BC = ADG$	$DE =$	$ACF =$	$BDE =$	$CEH = DFG$
$BD = ACG$	$DF =$	$ACH =$	$BDF =$	$CFG = DEH$
$BE = AFH$	$DG = ABC$	$ADE =$	$BDH =$	$CFH = DEG$
$BF = AEH$	$DH =$	$ADF =$	$BEG =$	$CGH = DEF$

2 blocks of 32: $CDE = FGH$ 4 blocks of 16: $CDE = FGH$
ACF
BDH

Designs with 9 Factors

(o) 2^{9-5}; 1/32 fraction of 9 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = BCD \quad G = ACD \quad H = ABD \quad J = ABCD$

Defining relation: $I = ABCE = BCDF = ADEF = ACDG = BDEG = ABFG = CEFG = ABDH$
$= CDEH = ACFH = BEFH = BCGH = AEGH = DFGH = ABCDEFGH = ABCDJ$
$= DEJ = AFJ = BCEFJ = BGJ = ACEGJ = CDFGJ = ABDEFGJ = CHJ$
$= ABEHJ = BDFHJ = ACDEFHJ = ADGHJ = BCDEGHJ = ABCFGHJ = EFGHJ$

Aliases

$A = FJ$
$B = GJ$
$C = HJ$
$D = EJ$
$E = DJ$
$F = AJ$
$G = BJ$
$H = CJ$
$J = DE = AF = BG = CH$
$AB = CE = FG = DH$
$AC = BE = DG = FH$
$AD = EF = CG = BH$
$AE = BC = DF = GH$
$AG = CD = BF = EH$
$AH = BD = CF = EG$

2 blocks of 8: $AB = CE = FG = DH$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 9 Factors (*Continued*)

(p) 2^{9-4}; 1/16 fraction of 9 factors in 32 runs **Resolution IV**

Design Generators

$F = BCDE \quad G = ACDE \quad H = ABDE \quad J = ABCE$

Defining relation: $I = BCDEF = ACDEG = ABFG = ABDEH = ACFH = BCGH = DEFGH = ABCEJ$
$= ADFJ = BDGJ = CEFGJ = CDHJ = BEFHJ = AEGHJ = ABCDFGHJ$

Aliases

$A = BFG = CFH = DFJ$	$AD = CEG = BEH = FJ$	$BJ = ACE = DG = EFH$
$B = AFG = CGH = DGJ$	$AE = CDG = BDH = BCJ = GHJ$	$CD = BEF = AEG = HJ$
$C = AFH = BGH = DHJ$	$AF = BG = CH = DJ$	$CE = BDF = ADG = ABJ = FGJ$
$D = AFJ = BGJ = CHJ$	$AG = CDE = BF = EHJ$	$CJ = ABE = EFG = DH$
$E =$	$AH = BDE = CF = EGJ$	$DE = BCF = ACG = ABH = FGH$
$F = ABG = ACH = ADJ$	$AJ = BCE = DF = EGH$	$EF = BCD = DGH = CGJ = BHJ$
$G = ABF = BCH = BDJ$	$BC = DEF = GH = AEJ$	$EG = ACD = DFH = CFJ = AHJ$
$H = ACF = BCG = CDJ$	$BD = CEF = AEH = GJ$	$EH = ABD = DFG = BFJ = AGJ$
$J = ADF = BDG = CDH$	$BE = CDF = ADH = ACJ = FHJ$	$EJ = ABC = CFG = BFH = AGH$
$AB = FG = DEH = CEJ$	$BH = ADE = CG = EFJ$	$AEF = BEG = CEH = DEJ$
$AC = DEG = FH = BEJ$		

2 blocks of 16: $AEF = BEG = CEH = DEJ$ 4 blocks of 8: $AEF = BEG = CEH = DEJ$
$AB = FG = DEH = CEJ$
$CD = BEF = AEG = HJ$

(q) 2^{9-3}; 1/8 fraction of 9 factors in 64 runs **Resolution IV**

Design Generators

$G = ABCD \quad H = ACEF \quad J = CDEF$

Defining relation: $I = ABCDG = ACEFH = BDEFGH = CDEFJ = ABEFGJ = ADHJ = BCGHJ$

Aliases

$A = DHJ$	$AC = BDG = EFH$	$BF =$
$B =$	$AD = BCG = HJ$	$BG = ACD = CHJ$
$C =$	$AE = CFH$	$BH = CGJ$
$D = AHJ$	$AF = CEH$	$BJ = CGH$
$E =$	$AG = BCD$	$CD = ABG = EFJ$
$F =$	$AH = CEF = DJ$	$CE = AFH = DFJ$
$G =$	$AJ = DH$	$CF = AEH = DEJ$
$H = ADJ$	$BC = ADG = GHJ$	$CG = ABD = BHJ$
$J = ADH$	$BD = ACG$	$CH = AEF = BGJ$
$AB = CDG$	$BE =$	$CJ = DEF = BGH$
$DE = CFJ$	$GJ = BCH$	$AFJ = BEG = DFH$
$DF = CEJ$	$ABE = FGJ$	$AGH = DGJ$
$DG = ABC$	$ABF = EGJ$	$AGJ = BEF = DGH$
$EF = ACH = CDJ$	$ABH = BDJ$	$BCE =$
$EG =$	$ABJ = EFG = BDH$	$BCF =$
$EH = ACF$	$ACJ = CDH$	$BDE = FGH$
$EJ = CDF$	$ADE = EHJ$	$BDF = EGH$
$FG =$	$ADF = FHJ$	$BEH = DFG$
$FH = ACE$	$AEG = BFJ$	$BFH = DEG$
$FJ = CDE$	$AEJ = BFG = DEH$	$CEG =$
$GH = BCJ$	$AFG = BEJ$	$CFG =$

2 blocks of 32: CFG 4 blocks of 16: $CFG =$
$AGJ = BEF = DGH$
$ADE = EHJ$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 10 Factors

(r) 2^{10-6}; 1/64 fraction of 10 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = BCD \quad G = ACD \quad H = ABD \quad J = ABCD \quad K = AB$

Defining relation: $I = ABCE = BCDF = ADEF = ACDG = BDEG = ABFG = CEFG = ABDH$
$= CDEH = ACFH = BEFH = BCGH = AEGH = DFGH = ABCDEFGH = ABCDJ$
$= DEJ = AFJ = BCEFJ = BGJ = ACEGJ = CDFGI = ABDEFGJ = CHJ$
$= ABEHJ = BDFHJ = ACDEFHJ = ADGHJ = BCDEGHJ = ABCFGHJ = EFGHJ = ABK$
$= CEK = ACDFK = BDEFK = BCDGK = ADEGK = FGK = ABCEFGK = DHK$
$= ABCDEHK = BCFHK = AEFHK = ACGHK = BEGHK = ABDFGHK = CDEFGHK = CDJK$
$= ABDEJK = BFJK = ACEFJK = AGJK = BCEGJK = ABCDFGJK = DEFGJK = ABCHJK$
$= EHJK = ADFHJK = BCDEFHJK = BDGHJK = ACDEGHJK = CFGHJK = ABEFGHJK$

Aliases

$A = FJ = BK$	$J = DE = AF = BG = CH$
$B = GJ = AK$	$K = AB = CE = FG = DH$
$C = HJ = EK$	$AC = BE = DG = FH$
$D = EJ = HK$	$AD = EF = CG = BH$
$E = DJ = CK$	$AE = BC = DF = GH$
$F = AJ = GK$	$AG = CD = BF = EH = JK$
$G = BJ = FK$	$AH = BD = CF = EG$
$H = CJ = DK$	

2 blocks of 8: $AG = CD = BF = EH = JK$

(s) 2^{10-5}; 1/32 fraction of 10 factors in 32 runs — **Resolution IV**

Design Generators

$F = ABCD \quad G = ABCE \quad H = ABDE \quad J = ACDE \quad K = BCDE$

Defining relation: $I = ABCDF = ABCEG = DEFG = ABDEH = CEFH = CDGH = ABFGH = ACDEJ$
$= BEFJ = BDGJ = ACFGJ = BCHJ = ADFHJ = AEGHJ = BCDEFGHJ = BCDEK$
$= AEFK = ADGK = BCFGK = ACHK = BDFHK = BEGHK = ACDEFGHK = ABJK$
$= CDFJK = CEGJK = ABDEFGJK = DEHJK = ABCEFHJK = ABCDGHJK = FGHJK$

Aliases

$A = EFK = DGK = CHK = BJK$	$AH = BDE = BFG = DFJ = EGJ = CK$
$B = EFJ = DGJ = CHJ = AJK$	$AJ = CDE = CFG = DFH = EGH = BK$
$C = EFH = DGH = BHJ = AHK$	$AK = EF = DG = CH = BJ$
$D = EFG = CGH = BGJ = AGK$	$BC = ADF = AEG = HJ = DEK = FGK$
$E = DFG = CFH = BFJ = AFK$	$BD = ACF = AEH = GJ = CEK = FHK$
$F = DEG = CEH = BEJ = AEK$	$BE = ACG = ADH = FJ = CDK = GHK$
$G = DEF = CDH = BDJ = ADK$	$BF = ACD = AGH = EJ = CGK = DHK$
$H = CEF = CDG = BCJ = ACK$	$BG = ACE = AFH = DJ = CFK = EHK$
$J = BEF = BDG = BCH = ABK$	$BH = ADE = AFG = CJ = DFK = EGK$
$K = AEF = ADG = ACH = ABJ$	$CD = ABF = GH = AEJ = BEK = FJK$
$AB = CDF = CEG = DEH = FGH = JK$	$CE = ABG = FH = ADJ = BDK = GJK$
$AC = BDF = BEG = DEJ = FGJ = HK$	$CF = ABD = EH = AGJ = BGK = DJK$
$AD = BCF = BEH = CEJ = FHJ = GK$	$CG = ABE = DH = AFJ = BFK = EJK$
$AE = BCG = BDH = CDJ = GHJ = FK$	$DE = FG = ABH = ACJ = BCK = HJK$
$AF = BCD = BGH = CGJ = DHJ = EK$	$DF = ABC = EG = AHJ = BHK = CJK$
$AG = BCE = BFH = CFJ = EHJ = DK$	

2 blocks of 16: $AK = EF = DG = CH = BJ$

4 blocks of 8: $AK = EF = DG = CH = BJ$
$AJ = CDE = CFG = DFH = EGH = BK$
$AB = CDF = CEG = DEH = FGH = JK$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 10 Factors (*Continued*)

(t) 2^{10-4}; 1/16 fraction of 10 factors in 64 runs **Resolution IV**

Design Generators

$G = BCDF \quad H = ACDF \quad J = ABDE \quad K = ABCE$

Defining relation: $I = BCDFG = ACDFH = ABGH = ABDEJ = ACEFGJ = BCEFHJ = DEGHJ = ABCEK$
$= ADEFGK = BDEFHK = CEGHK = CDJK = BFGJK = AFHJK = ABCDGHJK$

Aliases

$A = BGH$	$AD = CFH = BEJ$	$BK = ACE = FGJ$
$B = AGH$	$AE = BDJ = BCK$	$CD = BFG = AFH = JK$
$C = DJK$	$AF = CDH = HJK$	$CE = ABK = GHK$
$D = CJK$	$AG = BH$	$CF = BDG = ADH$
$E =$	$AH = CDF = BG = FJK$	$CG = BDF = EHK$
$F =$	$AJ = BDE = FHK$	$CH = ADF = EGK$
$G = ABH$	$AK = BCE = FHJ$	$CJ = DK$
$H = ABG$	$BC = DFG = AEK$	$CK = ABE = EGH = DJ$
$J = CDK$	$BD = CFG = AEJ$	$DE = ABJ = GHJ$
$K = CDJ$	$BE = ADJ = ACK$	$DF = BCG = ACH$
$AB = GH = DEJ = CEK$	$BF = CDG = GJK$	$DG = BCF = EHJ$
$AC = DFH = BEK$	$BJ = ADE = FGK$	$DH = ACF = EGJ$
$EF =$	$GJ = DEH = BFK$	$AEG = BEH = CFJ = DFK$
$EG = DHJ = CHK$	$GK = CEH = BFJ$	$AEH = BEG$
$EH = DGJ = CGK$	$HJ = DEG = AFK$	$AFG = BFH = CEJ = DEK$
$EJ = ABD = DGH$	$HK = CEG = AFJ$	$AGJ = CEF = BHJ$
$EK = ABC = CGH$	$ABF = FGH$	$AGK = DEF = BHK$
$FG = BCD = BJK$	$ACG = BCH = EFJ$	$BCJ = EFH = BDK$
$FH = ACD = AJK$	$ACJ = EFG = ADK$	$BEF = CHJ = DHK$
$FJ = BGK = AHK$	$ADG = BDH = EFK$	$CDE = EJK$
$FK = BGJ = AHJ$	$AEF = CGJ = DGK$	$CFK = DFJ$

2 blocks of 32: $AGJ = CEF = BHJ$ 4 blocks of 16: $AGJ = CEF = BHJ$
$AGK = DEF = BHK$
$CD = BFG = AFH = JK$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 11 Factors

(u) 2^{11-7}; 1/128 fraction of 11 factors in 16 runs **Resolution III**

Design Generators

$E = ABC \quad F = BCD \quad G = ACD \quad H = ABD \quad J = ABCD \quad K = AB \quad L = AC$

Defining relation: $I = ABCE = BCDF = ADEF = ACDG = BDEG = ABFG = CEFG = ABDH$
$= CDEH = ACFH = BEFH = BCGH = AEGH = DFGH = ABCDEFGH = ABCDJ$
$= DEJ = AFJ = BCEFJ = BGJ = ACEGJ = CDFGJ = ABDEFGJ = CHJ$
$= ABEHJ = BDFHJ = ACDEFHJ = ADGHJ = BCDEGHJ = ABCFGHJ = EFGHJ = ABK$
$= CEK = ACDFK = BDEFK = BCDGK = ADEGK = FGK = ABCEFGK = DHK$
$= ABCDEHK = BCFHK = AEFHK = ACGHK = BEGHK = ABDFGHK = CDEFGHK = CDJK$
$= ABDEJK = BFJK = ACEFJK = AGJK = BCEGJK = ABCDFGJK = DEFGJK = ABCHJK$
$= EHJK = ADFHJK = BCDEFHJK = BDGHJK = ACDEGHJK = CFGHJK = ABEFGHJK = ACL$
$= BEL = ABDFL = CDEFL = DGL = ABCDEGL = BCFGL = AEFGL = BCDHL$
$= ADEHL = FHL = ABCEFHL = ABGHL = CEGHL = ACDFGHL = BDEFGHL = BDJL$
$= ACDEJL = CFJL = ABEFJL = ABCGJL = EGJL = ADFGJL = BCDEFGJL = AHJL$
$= BCEHJL = ABCDFHJL = DEFHJL = CDGHJL = ABDEGHJL = BFGHJL = ACEFGHJL = BCKL$
$= AEKL = DFKL = ABCDEFKL = ABDGKL = CDEGKL = ACFGKL = BEFGKL = ACDHKL$
$= BDEHKL = ABFHKL = CEFHKL = GHKL = ABCEGHKL = BCDFGHKL = ADEFGHKL = ADJKL$
$= BCDEJKL = ABCFJKL = EFJKL = CGJKL = ABEGJKL = BDFGJKL = ACDEFGJKL = BHJKL$
$= ACEHJKL = CDFHJKL = ABDEFHJKL = ABCDGHJKL = DEGHJKL = AFGHJKL = BCEFGHJKL$

Aliases

$A = FJ = BK = CL$	$J = DE = AF = BG = CH$
$B = GJ = AK = EL$	$K = AB = CE = FG = DH$
$C = HJ = EK = AL$	$L = AC = BE = DG = FH$
$D = EJ = HK = GL$	$AD = EF = CG = BH$
$E = DJ = CK = BL$	$AE = BC = DF = GH = KL$
$F = AJ = GK = HL$	$AG = CD = BF = EH = JK$
$G = BJ = FK = DL$	$AH = BD = CF = EG = JL$
$H = CJ = DK = FL$	

2 blocks of 8: $AE = BC = DF = GH = KL$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 11 Factors (*Continued*)

(v) 2^{11-6}; 1/64 fraction of 11 factors in 32 runs **Resolution IV**

Design Generators

$F = ABC \quad G = BCD \quad H = CDE \quad J = ACD \quad K = ADE \quad L = BDE$

Defining relation:

$I = ABCF = BCDG = ADFG = CDEH = ABDEFH = BEGH = ACEFGH = ACDJ = BDFJ = ABGJ = CFGJ$
$= AEHJ = BCEFHJ = ABCDEGHJ = DEFGHJ = ADEK = BCDEFK = ABCEGK = EFGK = ACHK = BFHK$
$= ABDGHK = CDFGHK = CEJK = ABEFJK = BDEGJK = ACDEFGJK = DHJK = ABCDFHJK = BCGHJK$
$= AFGHJK = BDEL = ACDEFL = CEGL = ABEFGL = BCHL = AFHL = DGHL = ABCDFGHL$
$= ABCEJL = EFJL = ADEGJL = BCDEFGJL = ABDHJL = CDFHJL = ACGHJL = BFGHJL = ABKL$
$= CFKL = ACDGKL = BDFGKL = ABCDEHKL = DEFHKL = AEGHKL = BCEFGHKL = BCDJKL$
$= ADFJKL = GJKL = ABCFGJKL = BEHJKL = ACEFHJKL = CDEGHJKL = ABDEFGHJKL$

Aliases

$A = BCF = DFG = CDJ = BGJ = EHJ = DEK = CHK = FHL = BKL$
$B = ACF = CDG = EGH = DFJ = AGJ = FHK = DEL = CHL = AKL$
$C = ABF = BDG = DEH = ADJ = FGJ = AHK = EJK = EGL = BHL = FKL$
$D = BCG = AFG = CEH = ACJ = BFJ = AEK = HJK = BEL = GHL$
$E = CDH = BGH = AHJ = ADK = FGK = CJK = BDL = CGL = FJL$
$F = ABC = ADG = BDJ = CGJ = EGK = BHK = AHL = EJL = CKL$
$G = BCD = ADF = BEH = ABJ = CFJ = EFK = CEL = DHL = JKL$
$H = CDE = BEG = AEJ = ACK = BFK = DJK = BCL = AFL = DGL$
$J = ACD = BDF = ABG = CFG = AEH = CEK = DHK = EFL = GKL$
$K = ADE = EFG = ACH = BFH = CEJ = DHJ = ABL = CFL = GJL$
$L = BDE = CEG = BCH = AFH = DGH = EFJ = ABK = CFK = GJK$

$AB = CF = GJ = KL \quad AE = HJ = DK \quad AH = EJ = CK = FL \quad AL = FH = BK \quad BH = EG = CL = FK$
$AC = BF = DJ = HK \quad AF = BC = DG = HL \quad AJ = CD = BG = EH \quad BD = CG = FJ = EL \quad CE = DH = JK = GL$
$AD = FG = CJ = EK \quad AG = DF = BJ \quad AK = DE = CH = BL \quad BE = GH = DL \quad EF = GK = JL$

$ABD = CDF = ACG = BFG = EFH = BCJ = AFJ = DGJ = BEK = GHK = AEL = HJL = DKL$
$ABE = CEF = DFH = AGH = EGJ = BHJ = BDK = CGK = FJK = ADL = FGL = CJL = EKL$
$ABH = DEF = AEG = CFH = BEJ = GHJ = BCK = AFK = DGK = ACL = BFL = DJL = HKL$
$ACE = BEF = ADH = FGH = DEJ = CHJ = CDK = BGK = EHK = AJK = DFL = AGL = BJL$
$AEF = BCE = DEG = BDH = CGH = FHJ = DFK = AGK = BJK = CDL = BGL = EHL = AJL$

2 blocks of 16: $AB = CF = GJ = KL$ 4 blocks of 8: $AB = CF = GJ = KL$
$AD = FG = CJ = EK$
$BD = CG = FJ = EL$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 12 Factors

(w) 2^{12-8}; 1/256 fraction of 12 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = ABD \quad G = ACD \quad H = BCD$
$J = ABCD \quad K = AB \quad L = AC \quad M = AD$

Aliases

$A = HJ = BK = CL = DM$
$B = GJ = AK = EL = FM$
$C = FJ = EK = AL = GM$
$D = EJ = FK = GL = AM$
$E = DJ = CK = BL = HM$
$F = CJ = DK = HL = BM$
$G = BJ = HK = DL = CM$
$H = AJ = GK = FL = EM$
$J = DE = CF = BG = AH$
$K = AB = CE = DF = GH$
$L = AC = BE = DG = FH$
$M = AD = BF = CG = EH$
$AE = BC = FG = DH = KL = JM$
$AF = BD = EG = CH = JL = KM$
$AG = EF = CD = BH = JK = LM$
2 blocks of 8: $AE = BC = FG = DH = KL = JM$

Designs with 13 Factors

(x) 2^{13-9}; 1/512 fraction of 13 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = ABD \quad G = ACD \quad H = BCD$
$J = ABCD \quad K = AB \quad L = AC \quad M = AD \quad N = BC$

Aliases

$A = HJ = BK = CL = DM = EN$
$B = GJ = AK = EL = FM = CN$
$C = FJ = EK = AL = GM = BN$
$D = EJ = FK = GL = AM = HN$
$E = DJ = CK = BL = HM = AN$
$F = CJ = DK = HL = BM = GN$
$G = BJ = HK = DL = CM = FN$
$H = AJ = GK = FL = EM = DN$
$J = DE = CF = BG = AH = MN$
$K = AB = CE = DF = GH = LN$
$L = AC = BE = DG = FH = KN$
$M = AD = BF = CG = EH = JN$
$N = BC = AE = FG = DH = KL = JM$
$AF = BD = EG = CH = JL = KM$
$AG = EF = CD = BH = JK = LM$
2 blocks of 8: $AF = BD = EG = CH = JL = KM$

TABLE VIII Alias Relationships for 2^{k-p} Fractional Factorial Designs with $k \leq 15$ and $n \leq 64$ (*Continued*)

Designs with 14 Factors

(y) 2^{14-10}; 1/1024 fraction of 14 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = ABD \quad G = ACD \quad H = BCD \quad J = ABCD$
$K = AB \quad L = AC \quad M = AD \quad N = BC \quad O = BD$

Aliases

$A = HJ = BK = CL = DM = EN = FO$
$B = GJ = AK = EL = FM = CN = DO$
$C = FJ = EK = AL = GM = BN = HO$
$D = EJ = FK = GL = AM = HN = BO$
$E = DJ = CK = BL = HM = AN = GO$
$F = CJ = DK = HL = BM = GN = AO$
$G = BJ = HK = DL = CM = FN = EO$
$H = AJ = GK = FL = EM = DN = CO$
$J = DE = CF = BG = AH = MN = LO$
$K = AB = CE = DF = GH = LN = MO$
$L = AC = BE = DG = FH = KN = JO$
$M = AD = BF = CG = EH = JN = KO$
$N = BC = AE = FG = DH = KL = JM$
$O = BD = AF = EG = CH = JL = KM$
$AG = EF = CD = BH = JK = LM = NO$
2 blocks of 8: $AG = EF = CD = BH = JK = LM = NO$

Designs with 15 Factors

(z) 2^{15-11}; 1/2048 fraction of 5 factors in 16 runs — **Resolution III**

Design Generators

$E = ABC \quad F = ABD \quad G = ACD \quad H = BCD \quad J = ABCD$
$K = AB \quad L = AC \quad M = AD \quad N = BC \quad O = BD \quad P = CD$

Aliases

$A = HJ = BK = CL = DM = EN = FO = GP$
$B = GJ = AK = EL = FM = CN = DO = HP$
$C = FJ = EK = AL = GM = BN = HO = DP$
$D = EJ = FK = GL = AM = HN = BO = CP$
$E = DJ = CK = BL = HM = AN = GO = FP$
$F = CJ = DK = HL = BM = GN = AO = EP$
$G = BJ = HK = DL = CM = FN = EO = AP$
$H = AJ = GK = FL = EM = DN = CO = BP$
$J = DE = CF = BG = AH = MN = LO = KP$
$K = AB = CE = DF = GH = LN = MO = JP$
$L = AC = BE = DG = FH = KN = JO = MP$
$M = AD = BF = CG = EH = JN = KO = LP$
$N = BC = AE = FG = DH = KL = JM = OP$
$O = BD = AF = EG = CH = JL = KM = NP$
$P = CD = EF = AG = BH = JK = LM = NO$