

TABLE 8.15-1 (continued)

$$\begin{aligned}
 &+ [ABD] + [ACD] \\
 &+ [ABS] + [ACS] \\
 &+ [ADS] - [AB] - [AC] \\
 &- [AD] - [AS] + [A] \quad p(n-1)(q-1)(r-1)(u-1) \\
 26 \quad SS_{\text{total}} = [ABCD] - [X] \quad npqr \dots 1
 \end{aligned}$$

8.16 COMPUTATIONAL PROCEDURES FOR TYPE SPF-*pr.qu* DESIGN

A type SPF-*pr.qu* design represents an extension of analysis procedures described for type *pr.q* and *p.qr* designs. A block diagram of this design appears in Figure 8.16-1. The structural model for the design is

$$\begin{aligned}
 X_{ijklm} = & \mu + \alpha_i + \gamma_k + \alpha\gamma_{ik} + \pi_{m(ik)} + \beta_j + \alpha\beta_{ij} + \beta\gamma_{jk} + \alpha\beta\gamma_{ijk} + \beta\pi_{jm(ik)} \\
 & + \delta_l + \alpha\delta_{il} + \gamma\delta_{kl} + \alpha\gamma\delta_{ikl} + \delta\pi_{lm(ik)} + \beta\delta_{jl} + \alpha\beta\delta_{ijl} + \beta\gamma\delta_{ikl} \\
 & + \alpha\beta\gamma\delta_{ijkl} + \beta\delta\pi_{jlm(ik)} + \epsilon_{o(ijklm)}
 \end{aligned}$$

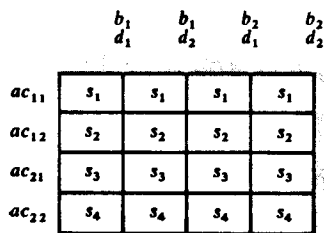


Figure 8.16-1 Block diagram of type SPF-22 22 design

The computational formulas for the design, degrees of freedom, and *F* ratios for Model III appear in Table 8.16-1. The meaning of the terms should be clear from previous examples.

TABLE 8.16-1 Computational Formulas for Type SPF-*pr.qu* Design and *F* Ratios

	Computational Formulas	df	<i>F</i> ratio (A, B, C and D Fixed Effects Subjects Random)
1	$SS_{\text{between sub}_j} = [ACS] - [X]$	$np - 1$	
2	$SS_A = [A] - [X]$	$p - 1$	$\left[\frac{2}{3}\right]$
3	$SS_C = [C] - [X]$	$r - 1$	$\left[\frac{3}{2}\right]$