MULTI-TURN AIR-CORE COILS

Specific values of inductance are often required by speaker crossover networks. The following formula gives the inductance of a closely wound, multi-layer, air-core coil with a rectangular winding cross-section. Accuracy is within 1 or 2%.

$L = [(2m)^2 / (b + 1.5t + r)] F^1 F^2 \times 10^{-9}$ H

where r is the mean radius of the inductor in cm, b is the axial length of the inductor in cm, t is the radial thickness of the winding in cm, and n is the total number of turns. F_1 and F_2 are correction factors which depend on the shape of the inductor. Thus,

$F_1 = (10b + 13t + 2r)/(10b + 10.7t + 1.4r)$

$F_8 = 0.5 \log_{10} [100 + (14r + 7t)/(2b + 3t)]$

The equations can re rearranged to solve for any variable, of course.—*Bill Shellorne*