ESTIMATING RUBBER CROSS-SECTION REQUIREMENTS

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One of the first questions to be answered before test flying that new rubber scale or sport job is: "How many strands should the rubber motor have? "Many experienced modelers have developed a 'feel', a sixth sense, for how much cross-section will likely be needed for any given model. For relative newcomers to our sport, however, a reasonable starting point may not be nearly that obvious. The "optimum" rubber cross-section, of course, will depend on many complicated variables, some predictable and others quite slippery, and is best determined by test flying. Nevertheless, a reasonable first guess could save much unnecessary effort and wasted trial and error; and if that first guess could be calculated simply and quickly it would be of use to the newcomer.

I have kept records of most of my models over the years, and looked to see if there was any pattern of rubber cross-section I had been using. For about fifty of my models (mostly scale and sport types, plus a few old timers) I plotted total model weight vs total rubber width. VOILA! A surprisingly consistent and simple relationship appeared:

MOTOR WIDTH IN INCHES = TOTAL MODEL WEIGHT IN GRAMS ÷ 90

Motor width as used above is equivalent to motor cross-section (for uniform rubber thickness), and it is much easier to calculate than actual cross-section. For example, a 4 strand motor of 1/8" rubber has a width of 4 x 1/8 = 1/2".

To use the above relationship, first estimate the total weight of your newly finished model by weighing the airframe(in grams) and adding about 25 % more for the rubber motor. Divide this number by 90, to get the rubber motor width in inches. Motors of this size will provide enough torque for scale-like flight, rather than hot contest model performance. For scorching fast climbs, increase the width by 20% or so. EXAMPLE: the airframe of your model weighs 75 grams - plus 25 % (19 grams) for a motor gives a 94 gram estimated total weight. Calculate a 94/90 = 1.04" motor width. In this case a 4 strand 1/4" rubber motor would do the trick. Easy, eh? Remember though, it's only a starting point. Keep test flying and adjusting motor width, length, and prop size to edge closer to that ethereal "perfect flyer".