

WHY USE A TORQUE METER?

By Dave Bubolz

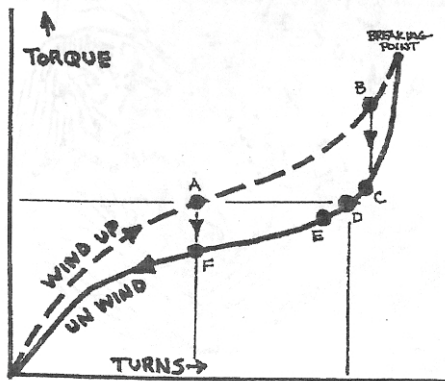
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The simple answer is that one can get more consistent motor runs than just counting turns and feeling the hardness of the rubber. My comments apply mainly to indoor flying but some of the reference material I reviewed shows the torque meter can be handy for outdoor flying also.

I started to explore the use of a torque meter a few years ago after observing at Heritage that fellows like Fred Tellier and Stu Weckerly consistently launched flights with a beautiful slow climb, long cruise just below the ceiling beams followed by a slow decent. My flights seemed to cycle between rocket climbs into the ceiling, getting caught in the beams, or maxing out at some height well short of the ceiling. At that point I decided to learn more about the use of torque meters and give them a try. For reference I turned to a conversation with Fred Tellier (see his torque meter plan on the club website) and reading in Don Ross's book *Rubber Powered Model Airplanes* and an article given to me by Dan Olah from the March/April 1996 MAX FAX by Don Srull.

Simply speaking, the torque meter allows the flyer to control the maximum climb power of the model to adjust for ceiling height, and to maximize the number of turns stored in the wound motor for longest duration. Although my explanation is very simplified and maybe not totally accurate it seems to work.

The chart shows what you would get if you recorded motor torque and turns as the motor is wound and unwound. Controlling the climb torque for ceiling height is the easy part to understand. It's like selecting the floor you want in an elevator. Let's say you decide to try torque D as a starter. If the model hits the ceiling, back off to E. If you are short of the ceiling try C. By winding to torque, the motor runs are pretty consistent even as the motor gets tired.



Maximizing the turns for longest duration is a little more complicated but revolves around the fact that the motor doesn't give back exactly what you put into it during windup. Fred Tellier's torque meter plan on the club website advises the flyer to wind to full torque and turns for the motor being used and then back off turns to get the desired launch torque. In the example shown winding to a torque B shy of the

breaking torque and then unwinding to the launch torque at point D results in many more turns in the motor than stopping the first time the torque meter registers the launch torque at point A.