Making The Herb Kothe Torque Meter

By George White

During a recent Gathering of the Turkey's meet here in Pensacola, your friendly editor witnessed Herb Kothe winding his various size models with different torque meters. When I see a guy who is one of the best rubber fliers in the country doing something I pay attention. I soon found that he had made his own torque meters, each for a different size model. Being the giving kind of guy he is, he offered to share the plans and formulas for making these meters. The drawing below illustrates the meter for models trimmed for approximately 80 inch ounces.
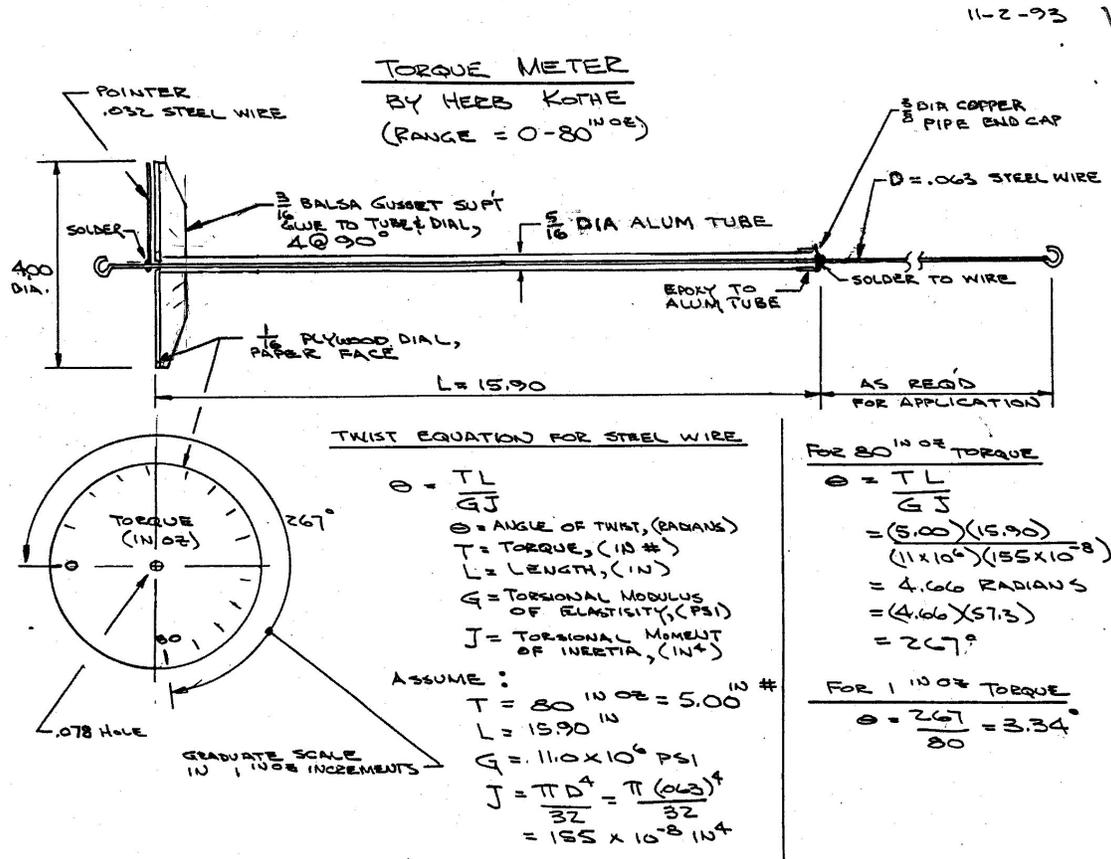
Herb offers a simplified formula which even a math retardate like me can handle. All we are doing here is determining the twist angle in degrees (designated "Ø") of a piece of **steel music wire** (the simplified formula won't apply for other types of wire). You must also not exceed the elastic strength of the wire for this to work — so don't go beyond 270degrees. There are three numbers you have to supply to decide where on the dial above you want the needle to point. They are:

T = Torque (in inch ounces) you want to measure and make a mark on the dial.
L = Length of wire in inches (see diagram above)
D = Diameter of the wire you are using (in inches)

The simplified formula is as follows:

Twist Angle "**Ø**" = $[(.00000332)(T)(L)] \div D^4$

So — rather than go through all the enjoyable math in the diagram above, we can find where on the dial to place the 80 in.oz. point in the example shown in the diagram as:

$$\text{Ø} = [(.00000332)(80)(15.9)] \div [(.063)(.063)(.063)(.063)]$$

When you do that you'll arrive at 267°. You'll then need to change "T" and recalculate for each torque reading mark you wish to show on the dial of that torque meter.

To make different size meters which will show more detail readings, Herb offers the following specifications:

T (in.oz..)	L (in.)	D(in.)	Ø (degrees)
120	25.2	.078	270
80	15.9	.063	267
40	18.7	.055	270
20	19.8	.047	270
4	8.0	.025	270