Dr. Bill's Fly Line Analyzer

Fly Line Facts and/or Fantasies

by William "Dr. Bill" Hanneman

Before considering how to characterize a fly line, let's confront the issue that all fly lines are not created equal.

There is a general belief among fly anglers that, for example, all AFTMA No. 5 lines are equivalent. This is effectively reinforced by current fly line advertising copy concentrating on the advantages of new proprietary line coatings. It is also accepted because few anglers have knowledge of manufacturing processes and fewer have any means of checking to determine if it is actually true.

Those who have delved a little deeper in the subject might quote the AFTMA standard of 1961 which states the first 30 feet of a No. 5 line (exclusive of tip), weighs 140 grains. We would like to believe that all the products fly line dealers sell meet AFTMA standards. However, when few anglers have the means of making the measurements and there are no penalties associated with ignoring the AFTMA standards, one might suspect that fly line manufacturing and selling has been optimized for profits. Herein lie the seeds of destruction for the AFTMA standards.

Manufacturers know anglers want to buy more powerful rods of lower and lower nominal Line Numbers, and they readily supply them. Today, we find rods with the intrinsic power to cast No. 6 lines called something like "fast action for No. 5 line." However, these "so called 5-weight rods" require a No. 6 or 7 line to perform satisfactorily for average casters.

Now it becomes the problem of the line manufacturers to make the customers happy with the performance of these rods. One obvious solution is to follow the lead of the rod makers — make heavier lines and assign lower Line Numbers to them.

Current "Solutions"

Recent fly fishing catalogs feature a new series of GPX lines from Scientific Anglers and a notice to the effect that these lines are heavier than AFTMA Specs — to cast with med-fast to fast graphite rods. These lines are said to help any level fly caster load or sweeten fast (stiff) rods. (Think, rods with greater IP.)

On checking with Scientific Anglers I was graciously supplied with their actual manufacturing goals. A comparison of the weight for each Line No. with the AFTMA Standards shows its weight corresponds exactly with the dividing weight between each Line Number.

Essentially, each line is one half Line Number heavier than the AFTMA standard and is technically "out of the AFTMA manufacturing range" for any line. This raises the question of how such lines should be labeled relative to AFTMA Standards?

Following the concept of the previously described Common Cents System and the ERN (Effective Rod Number), each AFTMA Line Number can be divided into ten parts. For example, No. 5 lines can be divided into ten values between 5.0 and 6.0. A line weighing 140 grains would receive an ERN rating of 5.5. The AFTMA manufacturing range lies between 5.2 and 5.8. continued...

In order to preserve the AFTMA Standards, avoid confusion among anglers, and make the playing field level for all line manufacturers, such an "out of specification line," e.g., a 150 grain line, should either be numbered something like ELN=6.0 or the weight in grains of the first 30 feet should be prominently printed on the box.

Recently we have seen the introduction by Sage of Performance Taper™ fly lines designed to optimize the use of their high performance fly rods.(Again, think, greater IP, as previously documented in Part 2.) While "taper" is stressed in their advertising, it is actually the line weight which is "optimizing performance." These lines, similar to Scientific Angler's GPX™ lines, appear to be out of specification and one half a Line Number heavier than the Line Number printed on the box.

On another note, anyone familiar with manufacturing processes recognizes a certain portion of all production will not meet strict manufacturing tolerances. Nevertheless, it is perfectly satisfactory for its intended purpose — propelling a fly towards a trout.

Someone must decide whether to simply throw this material away and take the loss, salvage some value by putting it on the market under a different name, sell it to another distributor to sell under a different brand, or offer it as "seconds." These are marketing decisions.

Today, there are a number of "out of AFTMA specification" fly lines floating about the market place — and possibly even on your own rods. This is another reason why buying the Line No. designated on a rod may not produce the expected results. Using a Fly Line Analyzer you can easily characterize any fly line.

Measurements

With the Common Cents System, you can objectively determine the Intrinsic Power of your rod in terms of its Effective Rod Number (ERN) — e.g., 5.0, 5.2, 5.5, or 5.8. This clearly illustrates how a 5.0 rod varies only slightly from a 4.9 rod, a 5.9 rod varies only slightly from a 6.0 rod, and why one rod designated for a No. 5 line might function better with a No. 4 line while another so designated rod requires a No. 6 line.

Now, as shown in Part 3, you can define exactly what the weight of the line must be in order to optimally load your rod. You can also make a simple tool, Dr. Bill's Fly Line Analyzer, shown in Photo 2. With it, you can easily weigh any length of any fly line and determine if indeed it is what you need. Complete instructions on how to construct it are found in the following section.

While ELN is useful for describing trout rod lines, this term is not recommended for lines corresponding to AFTMA Line Numbers 7 or higher. Instead, because of the non-uniformity of the arbitrary AFTMA Line Number divisions, the IP (Intrinsic Power) is a better measure. It can be related directly to the Weight of Line (WL), and, if desired, converted to standard AFTMA Line Numbers. ✍

Instructions for Making Dr. Bill's Fly Line Analyzer

Materials:
wire coat hanger
pizza box top
copy of scale shown in Photo 2
2 feet of old leader material
paper clip, glue, transparent mending tape
three one cent pieces, minted after 1996

Construction (Refer to Photo 1)

1. Copy or cut out the scale and glue it to a pizza box top or equivalent piece of corrugated cardboard. Make certain the scale runs lengthwise with the corrugations. Trim to size and cut out notch at 200 mark of scale.

2. With a hat pin or equivalent, punch small holes at the points indicated by the small circles on the scale.

3. Tie a loop of leader (2X or smaller) through the hole at the origin of the grain scale.

4. To suspend the apparatus, bend the coat hanger as shown in Photo 2.

5. Cut out a piece of heavy stiff cardboard that is about 5 and 7/8 inches wide and 4 and 1/2 inches deep. You will want to wrap 30 feet of line around the cardboard. If you precisely adjust the long direction so that each wrap takes exactly 1 foot of line (this is a function of how tightly you wrap the line around the card), you can simply count wraps instead of measuring the length each time.

6. Punch a hole in the center of the cardboard near the top and hang it from an opened out paper clip which fits loosely in the hole near the left end of the scale.

7. When first assembled, the beam will probably be slightly out of balance. Hopefully, the cardboard end will be too heavy. The beam is balanced when the top half of the paper clip lies parallel to the vertical line draw downward from the hole in which the paper clip loosely resides. To balance, trim off some of the lower portion of the cardboard. Should that end be too light, affix a little more weight to the card with your stick putty as in Photo 2

8. Prepare calibrated weights by making loops from 4 inches of leader material. Attach them by means of a one half inch square of transparent mending tape to each of three 1996 or later one cent pieces which still exhibit mint luster. (See Photo 3)

9. You are now ready to analyze your fly line.

Measuring Fly Line Weight

1. With your analyzer balanced, remove the cardboard. The right arm of the balance will go down. Wrap the first 30 feet of the fly line to be tested around the cardboard. If you wish, you can fasten each end with a small piece of transparent mending tape. Let the remainder of the line hang loose for the moment.

2. Replace the card containing the line on the wire hook. The right arm of the balance will now go up.

3. Place the loop of one of the one cent pieces over the end of the right arm of the balance and position the weight so that the balance arm is again in a horizontal position. While doing this, the remainder of the fly line should be supported so that the connecting line forms a slight horizontal loop.

4. Read the position of the leader loop on the grain scale which is calibrated from 0 to 200 and located along the top of the beam. This value is the weight in grains of the first 30 feet of the fly line. The numerical scale directly below the Grains Scale is called the Effective Line Number (ELN) Scale. This scale divides each line number into 10 increments which relate lines to the corresponding 10 increments of each Effective Rod Number (ERN) described previously.

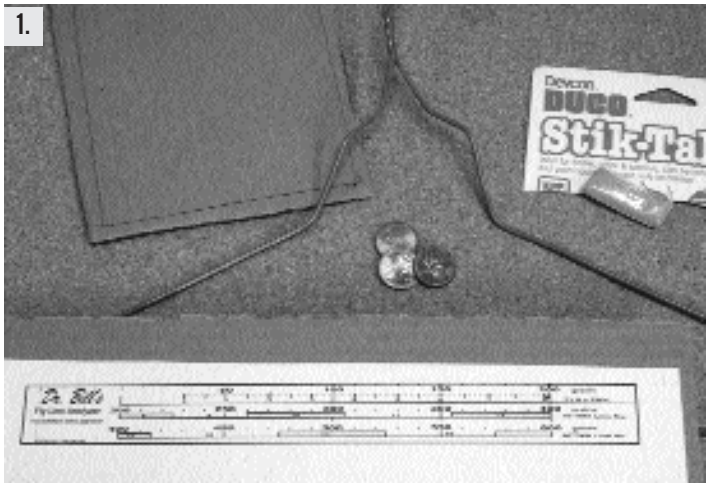
5. Repeat this measurement using the other two coins. If you get the same reading with all three coins, you can use any one of them for future measurements. If one coin gives a significantly different reading, replace it. It is probability not an "average cent."

When weighing lines weighing between 200 and 400 grains, place one of the cents in the notch at 200. Add that amount to the value determined by adjusting the other one cent piece to rebalance the beam.

When weighing lines weighing between 400 and 600 grains, place the loops of two of the cents in the notch at 200 and add 400 to the value determined by adjusting the other one cent piece to rebalance the beam.

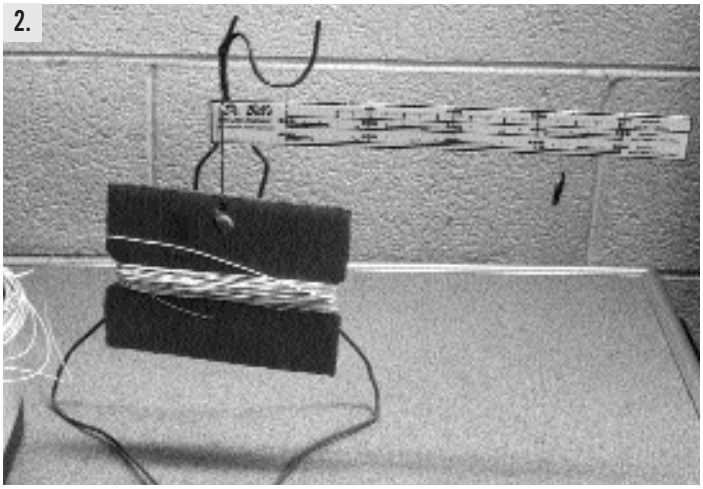
6. For a further characterization of the line to predict its performance in short or longer distance casting, determine the weight of the first 15 feet of the line or 40 of line. The variations one finds for these values reflect the effects of different line tapers.

1.



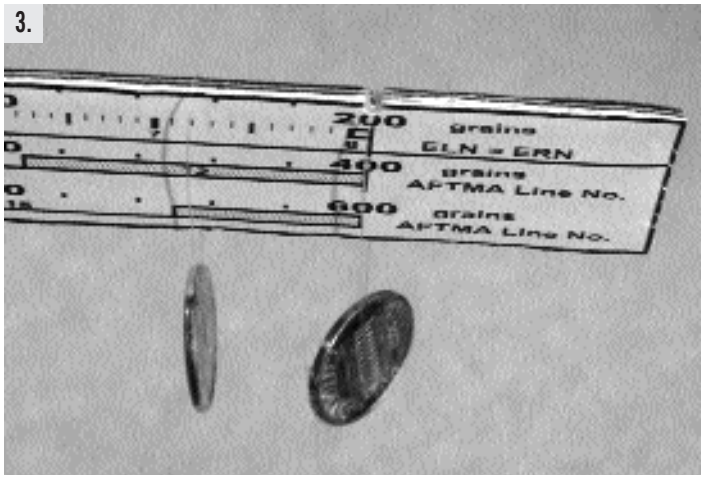
Dr. Bill's fly Line Analizer is simple and easy to make. With the supplied Common Cents Scale, you need only add 3 pennies minted during or after 1996, a few 4 inch loops of tippet material, a piece of cardboard or pizza box, a coathanger, some stick putty and a paper clip.

2.



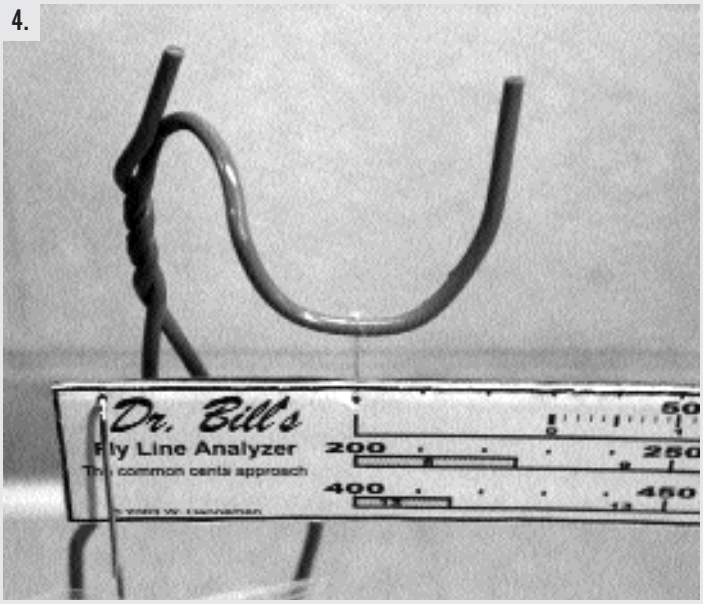
A small dab of "stick putty" is used to zero the scale before use. Line is measured and wrapped around the slotted cardboard as shown, or you can size the card perfectly so that each wrap equates to a certain length of line (see text).

3.



As you move to more or heavier line, you'll need to place a cent into the notch at the 200 grain line and then use another cent to slide on the beam until balance is achieved. With a cent or cents located in the notch, make sure to take your measurement reading from the correct line.

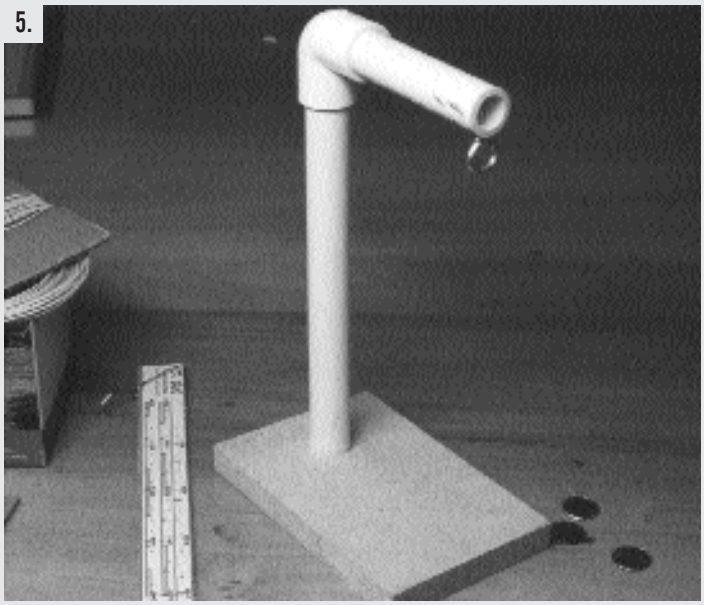
4.



The beam scale for Dr. Bill's Fly Line Analyzer has been produced here at full size (right). If you choose to copy it rather than cut it directly from this page, make very sure that you reproduce it at 100% scale.

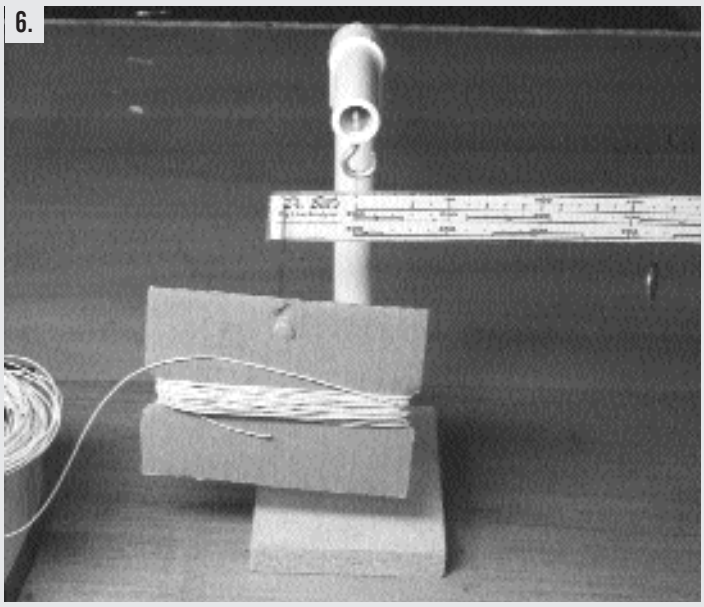
It is important that the beam scale be able to move/swing freely. This is accomplished by hanging the beam from your support by a short loop of leader or tippet material. Use 2X or less (left).

5.



If you plan on measuring many lines, you may desire a sturdier stand from which to hang your beam scale. This one has been fabricated from some small diameter PVC pieces and a wooden base. The make up of your stand is really not all that important. Just make sure the beam scale can move freely.

6.



Notice that we have located the remainder of the line not being weighed onto a box so that it is not adding any weight or influence to that length which we are attempting to weigh. Position the line not being weighed in such a manner so that it does not influence your results.

Regardless of the stand style you choose to employ, Dr. Bill's Fly Line Analyzer is used in the same manner. It's a simple beam scale that has been calibrated to provide you with a quick and easy means for determining the weight of any length of any fly line.