

Tom Dorigatti

# Proactive Bow Setup Documentation

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—A Means to Ensure You Can Get Your Bow Back on Track

*The accuracy of a target archer is based upon the consistency of the archer and, upon missing a shot or shots, the ability to make a quick analysis as to whether it is the archer who erred, or something in his equipment has changed. Setup documentation is making sure you can quickly check any part of your setup and then, if something has changed, to accurately duplicate the correct setting with confidence. Keep the above in mind as you read through many variables and facts about equipment setup documentation that I have used myself and/or learned from others over the past 35 years. This article deals primarily with what to document, and how to mark the items down for quick use and future reference. There are a couple of “special items” I have used for quite some time that are somewhat different, and these have proven themselves time and time again to be nearly “dead-on” when I make a string and/or cable change, or have to re-serve the center serving on the bow string.*

## The System in Detail

Whenever an archer gets a new bow, regardless of brand, the bow needs to be set to the proper draw length and then properly tuned. It is often a good idea to get a ‘basic setup’ without too much attention to groups or impact point for at least the first 200 shots or so. This allows the strings and cables to get set into the grooves on

the cams, and also for any “stretch” of the system to take place. Sometimes there is some stretch in the system, even with today’s “pre-stretched” or “pre-stressed” strings and cables. Once the bow is properly set up and you are satisfied with the grouping, forgiveness, and shootability, then it is time to write the settings down, and get the bow “marked” so you have a quick visual reference to see whether something has changed.

The steps below are based upon the assumption that the shooter has established his correct draw length, peep sight height, nocking point, and arrow rest positioning and that the bow is grouping well. Once you have documented and marked everything, you should be able to duplicate these settings with ease; especially during a bow string and/or cable change, or a change of your D-loop.

## Items Required

1. Tuned bow with correct draw length and proper grouping already established (final tune completed)
2. Bow square
3. Measuring instrument, millimeter gauge or ruler marked in  $\frac{1}{64}$  inch increments, calipers (optional)
4. Tape measure
5. Fine-tipped permanent marker and masking

- tape  
6. Long arrow or measuring arrow

***“Many of today’s compound bow instructions state that the axle-to-axle length (ATA) is more important than the brace height.”***

pocket to the inside or outside of the string. An example 9 1/2" I (The "I" = Inside of string). With some bows, tiller measurements are not really exact, but can be duplicated.

**Items To Write Down**

Many shooters use a notebook or journal to write down everything concerning any bow that they ever owned. This includes, of course, all the settings and measurements obtained after the bow is properly set up and shooting well for them. The following table lists the most common items to measure and write down. In the next section of the article, I'll discuss how to get the most critical items marked on the bow, bow square and a measuring arrow. This will allow speedy duplication of the proper settings in the event of the movement of something or a string/cable/D-loop change. It is easy to duplicate the table below and either put it on an Avery label for filling out, or simply make a copy and tape it into your journal. Then you can just fill it in as you go. (see Figure below).

**3. D-loop Starting Length**

You should measure the starting length of the untied D-loop to the nearest 1/6", and write it down. It is also a good idea to set up a couple of spare D-loops to that length. It will save you time and trouble when your D-loop finally fails or needs changing. This is not a case of "if", it is a case of "when", so you should be proactive and be prepared.

1. **Axle-to-Axle Length** Many of today’s compound bow instructions state that the axle-to-axle length (ATA) is more important than the brace height. Axle to axle length should be measured from the center of the top axle to the center of the bottom axle to the nearest 1/6". Most bows allow a range of ATA, but once your bow is tuned, you need to know, for sure, the best shooting ATA of the bow.

4. **D-Loop - String to Inside** I use a set of calipers to measure the "length" of the tied D-loop from the outside of the bow string to the inside of the stretched out loop. This is a very important measurement, because it does affect both your anchor point, which directly affects how your draw length feels as well. When changing a D-loop, if you have pre-made your spare D-loop the same length as #3 above, then this should fall into place when your D-loop is secured. A word to the "wise" on changing D-loops: it is a better practice, when changing D-loops, to remove only one end at a time. First place a nock on the string, and then remove one end of the D-loop. Tie on that end against the nock or tied on nocking point, and then tie on the other end of the D-loop. However, if you tie in serving above and below the arrow

2. **Top & Bottom Tiller** I normally measure the top and bottom tiller from the limb at the top of the limb

*Continued on the Next Page*

Bow \_\_\_\_\_ Date \_\_\_\_\_

Item	Measurement	Item	Measurement
Axle to Axle Length		Power Cable length (& # strands)	
Top Tiller		Arrow being shot & Length	
Bottom Tiller		Center shot	
D-loop starting length		Launcher height from shelf	
D-loop – string to inside		Launcher blade thickness	
Brace Height		Peep eight from top of nock.	
True Draw Length		Size of peep aperture	
String Length (& # strands)		Cam Size & Module #	
Control Cable Length		Nocking Point Height	
Peak Weight		Holding Weight	

*This sample Bow Setup Measurements table lists the most common items to measure and write down to allow for speedy duplication of the proper settings in the event of the movement of something or a string/cable/D-loop change. It is easy to duplicate the table and either print it on an adhesive label for filling out, or simply make a copy and tape it into your journal.*

nock, and then place the D-loop on the outside, then this is not necessary.

5. **Brace Height** Many bow manufacturers specify a given brace height range for optimum performance of their bows. However, if the brace height changes, then it also changes your true draw length, thus affecting your performance as a shooter. Most good shooters will operate from the True Draw length rather than the AMO draw length as far as bow tuning and set up are concerned. Over the years, I've come up with a sure way of establishing a consistent measuring point for obtaining true draw length, based upon the brace height of the bow. By doing it this way, you have always got a positive reference point that is the correct True Draw of the bow. I use this method in lieu of simply measuring to the tip of the launcher blade or arrow rest because this method works even when the arrow rest has been changed! Here are the steps I use to get a good brace height marked onto the bow itself.

- a. Using your bow square or any straight edge long enough lay the "T" part of the square into the deepest part of the grip and then mark the square or straight edge at the inside edge of the bowstring when it is at rest. This is important so that this measurement can be transferred over to the inside of the riser of the bow. Write this measurement down on your Bow Setup Measurements Table as close as possible to the real measurement you obtain with this step.
- b. Reverse the "T" of the bow square or straight edge so that the "T" is resting against the inside edge of the bow string—do not clip the bow square onto the string—place the edge of it against the inside of the bowstring. Be careful not to displace the bowstring.
- c. Align the bow square or the straight edge horizontally along the inside of the sight window and along the centerline of the holes in the riser for arrow rest attachment.
- d. Using a magic marker of a color you can see, make a straight vertical line on the inside of the riser that matches the distance you marked in step a above. On many bows, you will notice that it is not in the center of the mounting screw hole, and in many bows with two holes, you will find that it is not exactly halfway between them. Many people just assume that this is the case and never bother to measure it, thus throwing themselves off by as much as  $\frac{3}{16}$ " on what they think they have for True Draw (then pass this

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error to their AMO draw length as well). Even more interesting is that if you have a grip on your bow and remove it, generally the measurement above will change by as much as  $\frac{1}{2}$ ", due to the thickness of the grip itself!

6. **True Draw Length** The mark on the riser you end up in step 5d can be used to establish your true draw length as the bow is now set up, which is easily duplicated, time and again,

unless you change grips, or add a grip, or remove the grip. I feel that it is more accurate and useful than marking at the tip of the arrow rest or launcher blade, mostly because this can be used regardless of the arrow rest you mount on the bow and won't have to be redone unless you change brace height. This will measure the true draw (not the AMO draw) of the bow. Steps to get this measurement are simple:

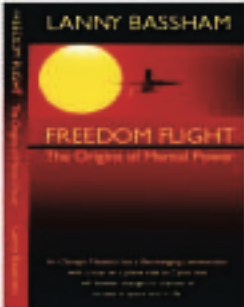
- a. Load an arrow on the string and then draw the bow back to the stops either with your release aid or use a crank board and mark a long arrow at where the arrow and the vertical line match up. Do this three times to ensure it is the same each time. If line "moves" then you are not pulling consistently and must "average" the lines and go for the middle, or start again.
- b. If not using a measuring arrow, then measure from the bottom of the nock slot to the line on the arrow and write this distance down as close to the measurement as your measuring instrument measures.  $\frac{1}{16}$ " is close enough, in my opinion.
- c. You now have your true draw length that your bow is set for. To get your AMO draw length, simply add  $1\frac{3}{4}$  inches to this measurement.
- d. Write this measurement down in the Table, and it is a good idea to set aside that arrow that you marked for a permanent reference to have available in case you suspect the string or buss cable has stretched, thus changing the bow's draw length. If you suspect a change, all you have to do is draw back this arrow and see if the lines on the bow and the arrow still match or not.
- e. Realize that changing the length of the D-loop does not change the draw length of the bow; it simply moves your anchor point and makes it feel like the bow has changed.

7. **String Control Cable, & Buss Cable Lengths and the Number of Strands** Many shooters today do

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not shoot the strings and cables that came on their new bows, opting rather to order a custom made set of strings and cables. Thus, most shooters opt to make sure that their strings and cables are indeed the length specified in the specifications for the bow. I've found from experience that the strings and cables on the bow, and what is marked on the limb tag are not necessarily the same! It is not difficult, however, once you have twisted up the cables and strings to get the bow tuned and set to proper draw length to get these "numbers" as they really are without pulling them off the bow to measure them. Simply use a tailor's or cloth tape measure, or you can use string to match up from peg to peg, and then compare it to specifications. If you have ordered up a set of custom strings and cables, then it is simply a case of marking down those measurements in the table so that you have them for reference. It has been my experience that custom strings and cables will be the length you specify. Always remember to change these numbers if for some reason you order a custom set that differs from specifications.

8. **Peak Weight** The standard means of measuring the bow's peak weight is to use a hanging bow scale, and, placing the string or loop on the hook, pull down on the bow until you reach full poundage and it starts to let down. Do not let up and then pull back down on the same pull, this introduces error into the reading. Some people also use their "crank boards" to measure their peak weight. The important part here is to use your own scale to measure the poundage, or if not your own, then always measure your poundage on the same scale all the time. If you have to make a change and you aren't using

your scale, then before making the change, always check the poundage before you start, write it down, and then make the change and weigh it again and mark it down. Be sure to write it on the Table or in your journal and the date of change. Then, when you get home, immediately make the measurements on your scale and write them down.

9. **Arrow Being Shot & Length** Which arrow you are tuned with is self-explanatory. You could expand this to include fletching, tip weight, nock, etc.

10. **Center Shot From Window to Center of Arrow** Place an arrow on the rest, and measure directly above the rest from the center of the arrow (or from center of the "V" if a launcher) to the inside of the sight window.

11. **Launcher Height from Arrow Shelf to Tips of Launcher** This is a critical measurement that is easy to make.

- Take a business card (trim it if necessary) and place it against the side of the sight window and slide it down onto the arrow shelf
- Mark the tips of the prongs of the launcher or the tip of the vertical support for your arrow.
- Measure this distance up from the bottom of the card to your mark
- Write it on the table, and then retain the card for future positive reference.
- An alternative is to simply mark your bow square with a marker at the tip of the prongs or launcher up from the arrow shelf.

12. **Launcher Blade Thickness** Archers today are using various thicknesses of launcher blades. Some use

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0.008", 0.010", or 0.012" thick blades. It is imperative that you write down the blade you are using and its thickness. If you change blades, then change your table entry.

13. **Peep Height from Top of Nock** This is a very important measurement. I use the top of the nock because it is a very repeatable and positive reference point. I also shoot an angled peep site, so I measure from the top of the nock to where the "/" contacts my measuring tool; again another positive and consistent, exact measurement. It is impossible to accurately measure to the "center of the peep hole."

14. **Size of Peep Aperture** Self explanatory.

15. **Cam Size and Module** Write down which cam and module (if required) you have on the bow.

16. **Nocking Point Height** This is one of the most critical parts of your documentation. Most people try to match up a mark on their bow square with placing the tips of the launcher blade just nicking the bottom of the bow square then reading across a small gap to the lines on the "T" of the bow square. Others use a split arrow shaft of the same size they are shooting and place it onto the bottom of the bow square and then place that onto the launcher to get their nocking point. *Special Tip* I have recently found a way of duplicating your nocking point height nearly perfectly with a single positive measurement, as long as the arrow diameter and arrow length are not changed. Here's what to do:

***"I have recently found a way of duplicating your nocking point height nearly perfectly with a single positive measurement, as long as the arrow diameter and arrow length are not changed."***

- a. Place your bow into a bow vise or get it set into a steady vertical position.
- b. Place an arrow your bow is tuned to on the bowstring and also onto the arrow rest.
- c. If a fall-away rest, raise the rest to the full up position and hold it solidly there. No need to draw the bow back to full draw. In fact drawing the bow isn't necessary and may be less accurate.
- d. Making sure your fall-away (if used) is in the full up position, go to the very tip of the arrow.
- e. Using a good ruler or your bow square, place the "T" of the bow square on the top of your stabilizer directly under the tip (point) of the arrow.
- f. Be sure you are perpendicular to the stabilizer and then make a mark on the measure or bow square at the exact sharp tip of the arrow. Then, write down the measurement on the Table, and extend the mark on your measuring instrument.
- g. You will be able to use this anytime that you change servings, strings, cables, or D-loops and it should, if you measure it correctly, return your nocking point to near perfect. I've used it to re-tune several bows after a string/cable change or a center serving change, and it has worked perfectly every time. In every case, the first shot has impacted in the X-ring or the Bullseye.
- h. This is especially effective on center serving changes, where the cables and strings weren't disturbed. In most cases I've tested, the first shot has been into the X-ring.

i. Make sure you use the same length arrow and measure perpendicular to the stabilizer without pushing down on the stabilizer or moving the arrow when you mark it.

17.  **Holding Weight** This is sometimes difficult to ascertain. Again, be sure to use the same scale you measured peak weight with. Also be certain to never "bounce" the scale back and forth.



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This introduces “hysteresis” into your measurement and it will not be accurate. If you weigh your bow on a crank board, then you also will check the holding weight on a crank board.

18. **Other Items to Mark on the Bow Itself** There are a few other items a person should mark with reference lines once the bow is finally tuned and set up. These are marks made on the cams and limb bolts.

- a. It is a good idea to mark both cams with a piece of tape or a magic marker dot or arrow at the exact point where the bowstring “leaves” each cam. This way, if a bow string stretches, you will be able to see the change without having to use your “measuring arrow.”
- b. If you are shooting a hybrid cam bow, make two lines, one on each side, of the buss (power) cable where it comes off the cam.
- c. Always mark the limb bolts with either a magic marker or even liquid paper. They do have a tendency on some bows to move. I like to line up my lines parallel with the limbs, facing towards the center of the bow. Another thing I always try to accomplish is to have the Allen wrench handle parallel to the limbs as well. In other words, I make my limb bolt adjustments in  $\frac{1}{6}$ th turn increments and not  $\frac{1}{4}$ th turns. This keeps the Allen wrench handle parallel to the plane of the limbs.
- d. Mark both cams with a line or tape where you visually can line up the outside and inside edge of the limb with the cam (string side of cam). This way, if there is any movement, you will pick up on it visually.
- e. If your cable guard is a movable type, it is a good idea to place a mark on the riser and a matching line on the cable guard. This way, if the cable guard starts to move, you will pick up on it quickly, or if it has come loose, you can put it back exactly where it was. Eyeballing it isn’t close enough.

We have discussed how to measure the most important bow tune criteria, from axle to axle length on through to holding weight. In addition, several techniques of marking the measuring tools or the bow have been discussed. In conclusion, the most important aspects of this documentation are:

- Don’t document items until a new bow has been shot in and the new strings and cables have had some time to “seat” themselves.
- Once the bow is group tuned and your draw length is set, then measure and document everything in the Bow Setup Measurements Table.
- The Bow Setup Measurements Table isn’t cast in stone, and there may well be other items you wish to include in the table.

- It is important to not only write the measurements down, but it is also important to mark as many of the measurements onto the bow or onto a measuring instrument, such as your bow square.
- Draw length can be quickly checked by using a mark on the riser and a marked arrow or a measuring arrow.
- Nocking point can be nearly exactly re-set by using your stabilizer and measuring up to the tip of the arrow and matching the number in the Table, or the mark on your measuring instrument.
- Further document the cam settings by marking the cams with dots and reference lines with regards to limb and cam alignment, power cable positioning, and the cable guard rake.
- Measurements should always be made with the same instrument and always made to a positive and consistent point of reference that can be duplicated and minimizes error.

**Tom Dorigatti** has been shooting archery since he was 12 years old. He has been bowhunting and in competitive archery for nearly 40 years. During his archery career, Tom has competed or shot archery in no fewer than 38 of the contiguous United States plus Alaska, Hawaii, the Azores, and Guam. He has won numerous local and state tournament titles and has placed as high as second overall in three different sections of the NFAA. Tom prefers to shoot in the Unlimited Division, but has recently been learning to shoot a recurve bow FITA style. He is also the mastermind behind the archery puzzles currently adorning these pages.

