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# Archery Focus

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## It's Not Just About Archery

There's a very old saying "the way you do anything is the way you do everything." Maybe that's why some of the people we respect most also happen to be archers. The thoughtful attention to detail, patience, self-knowledge, and fun-loving spirit that improves their scores also makes them the best people to have as friends.

We dedicate this issue to two dear friends we recently lost. Lee Groghan, who shot as beautifully with his camera as he did with his bow, and Linnie Washburn, who helped lay out and create our home club's field range and who once shot the Las Vegas tournament in red high heels; we love and miss them both.

There's something about archery that feeds the multidimensional soul. The kid, competitor, scholar, historian, or techno-nut within us gets to get into the act. Pushing 60 (Shhh, the surprise birthday party is in October.), Steve felt like a kid while taking on traditional archery and competing at the NAA Nationals among some of his idols (see page 39). In this issue alone, we go from learning modern tools for getting into the elusive "zone" to an ancient Japanese approach to achieve much the same state, from bow documentation to the mechanics of the predraw, and the effects of self-imposed pressure. The world of archery is constantly surprising us with its diversity-and we're happy that we get to explore it with you.

*Claudia*



*"Got Arrows? Awwwk."  
Buddy the parrot is our newest archery friend who cheered on Steve at the Traditional Nationals (see page 39). He's posing here with the gold medal won by his owner, Janet Dykman.*

Jason Butler

# Hot Hookups

*Your string nocking system may be more important than you think!*

*A quick, self-serving string nocking point is darned near bordering on dirty pool. If you have such a thing you: (1) are serious about accuracy; (2) have tried them all, canned the losers, and gone with your gut on a winner; (3) can hookup to it with utter ease and control, then draw and shoot - just like that - no frills, no fluff. Sad to say many bowhunters have never enjoyed the sheer bliss of a plush nocking point. It seems many bowhunters simply don't consider them a hot topic.*

If you consider your nocking system to be the least of your worries, shame on you. Think about it. Everything on your bow, including the string accessories should be shuffled through with open eyes. Don't disregard your string nocking point as too minute to harp on; it's not. There's always room for improvement in arrow groups. Alternating to a different nocking point may raise the bar for you. Luckily for finger shooters the choices are not so complex. But if you draw and launch the string with a release aid (as most of us do), open your eyes and fiddle a bit, a little dab might just do you. You'll be happy you did.

## **Brass Nocks**

Clamp-on brass nocking points have stood the test of time. They've been around practically since Moses parted the Red Sea. Chances are you've toyed with this style a bit. The normal nocking point setup usually is as follows: Two clamp-on nocks fastened one above the other. You clip the arrow below this and clip your release aid below the

arrow nock either directly or non-directly. The latter in which case you may place a rubber eliminator button or pinch of extra serving to lessen contact between the release aid and arrow nock and this somewhat decreases the amount of pressure between the two.

While this all sounds hunky-dory in theory, this type nocking system is not nearly as celebrated as it once was. It's far less than perfect, particularly by today's standards. Consider this: clamping a release aid directly onto the string (metal jaws or rope release) creates constant upward pressure (pinch) to the arrow nock. Larry Wise is former world field archery and national target archery champion, a top-level international archery coach who presents seminars nationwide and in other countries, has also penned several informative books on tuning and shooting the compound bow, and is one of the best archery technicians in the world today. He told me that he shied away from this



*It seems most every bowhunter has tried this hookup—a brass nocking point (or two) and an eliminator button, with the release latched right onto the string.*

Bowhunting

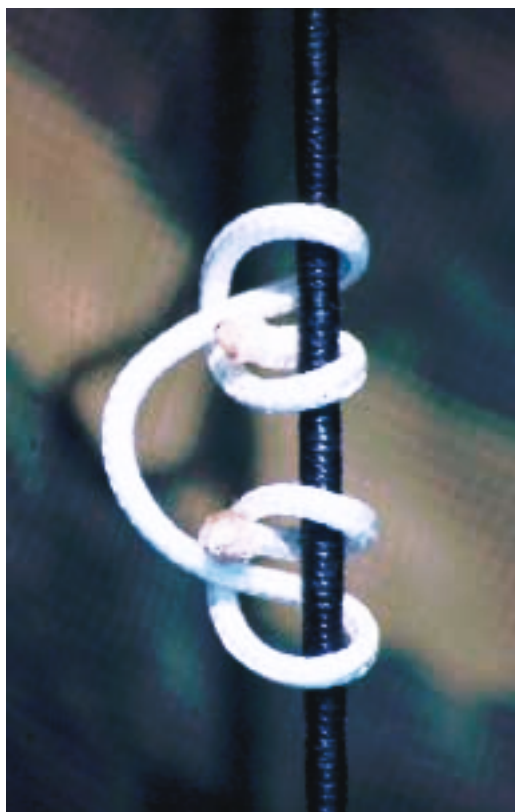
type nocking method years ago. "I was never really satisfied with this style of nocking system to be honest," Wise said. "There is always at least a little pressure crowding the bottom of the arrow nock and this is never constant. In my testing this has often created a tendency for the rear of the arrow to travel downward during the power stroke of the shot. Archers who shoot bows with a shorter axle-to-axle length (under 38-inches or so) are at even more disadvantage with this style of arrow nocking system," clued Wise. "The angle of the string is so acute that the arrow nock is practically sliding down the string when fired. You need to be able to 'trap' that arrow nock on the string somehow or another. If it moves as the bowstring springs forward then you should look into an alternative method."

There are ways to check this if you are using a clamp-on style nocking method with a rubber eliminator button. When you shoot consecutive shots on the target range examine the eliminator button after every shot. See if it looks like it has moved at all. If it has slid down the string even a smidgen you know that you've got some arrow nock travel as you shoot. This shouldn't go unnoticed.

Derek Phillips, the man who heads up the Mathews Archery Field Staff program, is a top-rated tournament shooter and a dead serious bowhunter. He's also one heck of a nice guy. He told me that he no longer dabbles with this style of nocking method either. "I turned the other way on this string nocking setup long ago. There are just too many variables for me to contend with using this style anymore," directs Phillips. I don't know about you, but when people as seasoned as Phillips and Wise say something like this, I'm all ears!

### String Loops

Nowadays considered the cream of the crop, a string loop is simple but greatly effective. It's a breeze to install and will last thousands upon thousands of shots.



*This photo of how to tie a string loop from my last article is worth repeating. String loops (as easy to tie on as indicated in the photo) have big advantages in the field.*

According to Larry Wise he shoots a string loop 100 percent of the time, for target archery and hunting. "You can't beat a string loop in my opinion," replied Wise. "I'm sold on them. I started using them years ago and I haven't looked back since. String loops can be so advantageous to every release aid archer out there." Just a few reasons: for one, you get zero nock pinch from your release aid. Second, serving wear is eliminated from the jaws of a release aid because the release head never touches the center serving. Third, depending on the type of peep sight you shoot you can affix the string loop in such a manner so that your peep sight aligns to your eye every time

you draw the bow.

Another, and most important, reason is accuracy. Arrow groups and arrow flight, particularly with broadheads, seem to tighten noticeably when shooting a string loop. Why? Derek Phillips says you are not twisting (creating torque on) the bowstring or pinching the arrow nock whatsoever and the arrow comes off of the string more uniformly each and every time. Is that enough to make a difference? "There is no question that a loop of some kind will improve your accuracy. Without a shadow of a doubt it will upgrade your arrow flight and bulls-eye groups consistently," Phillips said matter-of-factly.

"I use a string loop in two different ways," adds Phillips. "On some bows I use the typical D-style loop, one knot above the arrow nock and one knot below. On others I slide both knots of the string loop together and seat the arrow above this then rig a top nocking point from a piece of waxed leather string (available at any local leather store) in a half-hitch type knot and shoot my bow this way. I'm still attaching to a loop and reaping its benefits just in a slightly different (below center) manner. Some of my bows tend to tune/shoot better this way. I would say that it's beneficial to those setups that can stand more downward pressure against the arrow rest. Experiment with paper tuning for best

*Continued on the Next Page*

results.”

You know, I’ve seen some hunters belittle string loops for hunting just for the fact that they think it makes it more difficult to “hook up” a release aid quickly. I say, “Not so fast.” So does Derek Phillips. He says that with plenty of practice fumbling to latch the release head onto the loop will be nothing less than a distant memory. He does admit, however, that he’s shot so much that it’s completely second nature to him. “If you don’t practice much, you may find the latching onto the string loop to be a bit slower,” Phillips adds. “But if you’ve practiced hard and shot one a while, I seriously doubt it.”

Here’s another thought: if you want more proof, have two experienced archers, one with a string loop, and one who attaches directly to the string stand side by side on the range with an arrow loaded. On your mark watch them “hook up” their release aids and see if there is a difference for yourself. You can draw conclusions from there.

An experienced string loop shooter is usually at no disadvantage once he or she masters the art. Attaching a release aid to this after time becomes completely a fluid action not a thought out, controlled, timely

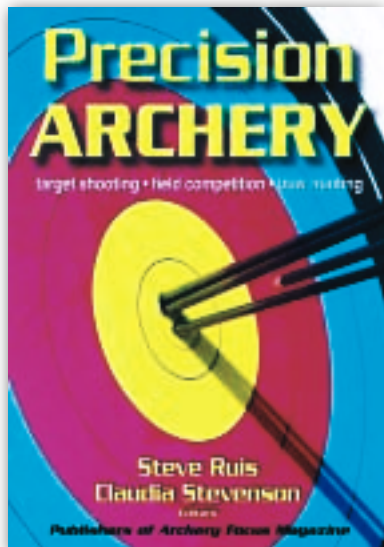
response. Almost all of the pro shooters I’ve seen shoot string loops for competition and hunting. And in certain tournaments where shots must be quick I’ve never seen one of these guys fumble trying to load up their release aid onto a string loop. Not once.

Even during tense, soul-stirring encounters with big game animals almost all of these guys will tell you they feel just as confident “hooking up” to a loop even under these circumstances. Why? Because they’ve done it a thousand-and-one times! Get the “feel” of one and you will be able to clip onto it without haste.

### All-Metal Loops

Not quite as popular as their related-member, the string loop, but they’re not wasting away in the shadows, either. “I prefer the string loop,” Wise said. “You get a little twist (play) with the loop material and I like that a lot. So hands-over-fist I favor the string loop.” Derek Phillips had a similar opinion. “I’ve never really tested the water with the all-metal loop either. Rope loops work some kind of nice for me so that’s what I use.” To each his own.

## Everything You Need to Know to Become a Better Archer!



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### Release Aids for Perfection

A good, smooth jarring release aid is essential for bow accuracy. "I use a T.R.U. Ball Sweet Spot back tension release aid for all of my target shooting and 3-D events," said Wise. "For hunting, I use a T.R.U. Ball pinkie-style trigger release aid called the Pinkie Boss. I don't use forefinger-style or thumb-activated release aids. It really all depends on personal preference." Derek Phillips says he uses a Carter Colby 2 back tension release aid mostly for competitive events and, at times in the field, hunting big game.

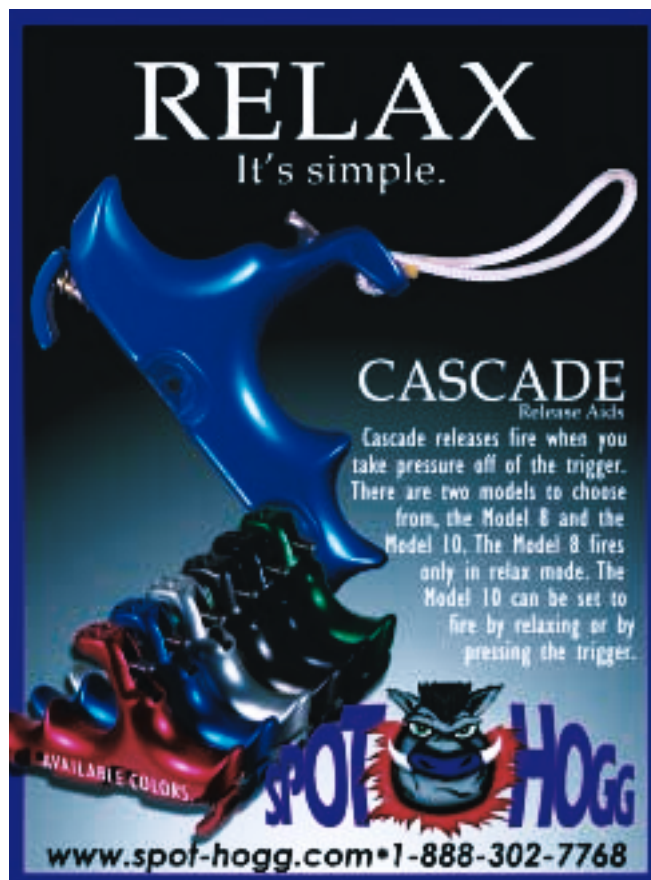
"The accuracy is just there with a back tension release aid over any other once you become deeply familiar with it. I'll hunt animals with it in situations where shots tend to be much more rehearsed and deliberate. For instance, a pronghorn antelope hunt out of a pit blind where you can watch the animal approach from a good distance and ready yourself completely is a good example.

Let's flip the coin and say I'm chasing an animal like the elusive mule deer on foot, a situation where shots can spring at the drop of a hat then I feel I need to be able to have more control of the shot and the ability to shoot quickly then I'll use the caliper-style Carter One Shot."

### Conclusion

When you consider your options and weigh the pluses and minuses, choosing a sound hookup point to your bowstring isn't black magic, but it is something you should give considerable thought to. Allow yourself time for general trial and error, fussing and musing, to pick what you want. The wrong nocking point can create no end of trouble trying to tune and shoot effectively. The proper one will make tuning a breeze, and shooting a snap.

In theory, there are really many different ways that you could tweak the aforementioned nocking methods and change them up a bit if you so wished. But it seems the most practical and practiced ways lie somewhere in the mentioned methods. That's good, it keeps things simple. Simple's always good. Anytime you juggle equipment choices keep a watchful eye on your bowstring; remember that dead-center of it lies an accessory with great effect on your success as a hunter or target shooter. Mull over your choice and watch 'em fly!



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**Jason Butler** is a freelance outdoor writer and photographer who lives in Richmond, VA. As much as Jason likes writing about the outdoors, he'd rather be there.

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

**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).

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.

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

***“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.

**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.

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

*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

***“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.”***

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:

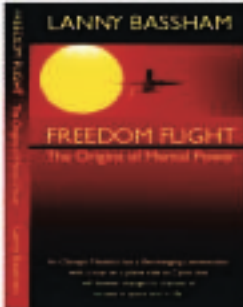
- a. Load an arrow on the string and then draw the bow back to the stops either with your release aid or use a crank board and mark a long arrow at where the arrow and the vertical line match up. Do this three times to ensure it is the same each time. If line "moves" then you are not pulling consistently 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

*Continued on the Next Page*

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.



# Buying a Bow—What Matters?

# Special Feature

*Archers from around the world were asked to list, in order, their criteria for choosing a bow. Their criteria were then ranked and sorted into 15 general categories. One hundred and twenty-four archers from 17 countries participated through archery websites, including: Mathewsinc.com, ArcheryTalk.com, WildernessArcherySite.com, ArcheryWorld.com and BenPearson.com. There are many factors for an adult archer to consider, but I have narrowed it down to the Top Ten. In the previous two installments (Last two issues. Ed.), we looked at the size of the bow, the way the bow feels in the hand and the quality of its construction. In the second installment, we examined the functioning of the bow and the reliability of the company that made the bow.*

*In this final installment, we will discuss the final three points that archers feel are important to consider when buying a bow.*

### The Last Three Points

In this series we have been looking at These points are as important as the first ones, but they are generally considered later in the process. In a way, the last two points are tie-breakers for some archers; if the first eight points are the same, the last two will tip the scales to a particular bow.

### 8. Consistency and Accuracy

When you get to

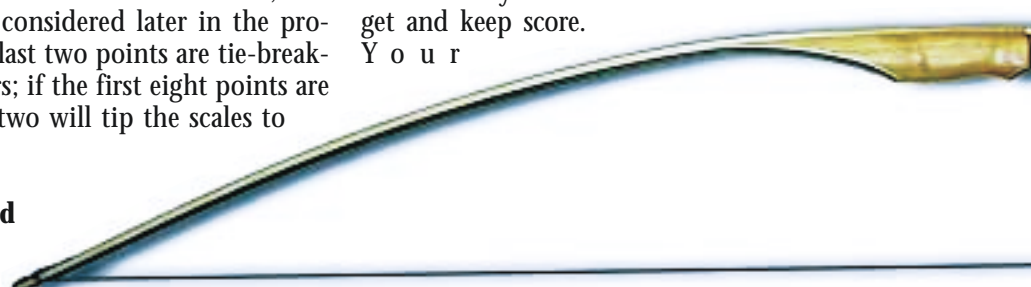
the line or in the tree stand, you want to know that your bow is going to behave the same way every shot. When you release the string, you need to know that your arrow is going to go where you have aimed it. None of us likes to admit that a missed shot was our own fault, but we certainly do not want it to be the bow's fault!

The advent of carbon limbs, machined risers, single cam bow designs, and modern synthetic string materials have had a profound impact on the consistency and accuracy of bows. Technology has created much better bows in recent years.

- Limbs are more stable.
- Risers are lighter in weight, yet stronger.
- Strings are faster and have less stretch.
- Cams on compounds are more efficient.

When trying out a bow, after you know that it fits and that you feel comfortable shooting it, shoot a game or two. The ideal distance is 20 yards, but shoot at 10 yards if you are not yet consistent with your own shot. Use a fresh target and keep score.

Y o u r





hole pattern will tell you a lot about the consistency of the bow (round is good). Your score will reveal the accuracy.

### **9. Price**

(Note Low end equipment will not have all the innovations of their more expensive counterparts, thus may not meet the criteria listed in points one through eight and will not be addressed in this section.)

Price is a deal-breaker on many a bow. You may find a perfect bow for you in every way, except for the price. Now what? There are a few options you can consider other than getting a second job or taking out a second mortgage on your home.

***“As you might expect, buying a bow for a child is completely different from buying a bow for an adult.”***

Buying a used bow is a great way to get quality equipment for a lower price. If you know the owner of the bow personally, you may know how the bow was maintained. Bows that have won multiple tournaments, or were owned by a top shooter, are desirable used purchases. Just keep in mind that you will probably not have the benefit of a warranty on it.

If a new bow is the only way you will go, then you have some work to do. You may be able to find the bow at another retailer for a lower price. But, if you buy the bow at Shop A because it is priced less, will you lose that savings by having to pay Shop B to work on it? Make sure you find out what is included in the sale before price shopping. A shop that has good technicians, and does free work on bows bought from them, is often more than worth the extra money you pay on the bow.

Ask your shop owner about their lay-a-way policy. Most will have some sort of plan and some will even allow you to set up and shoot the bow in the shop; you just cannot take it home until it's paid for. The average lay-a-way is half down and paid off in thirty

to sixty days. Do not even touch the subject of in-store credit. Unless you go to a national retailer (who probably does not carry the bow you want, anyway) you will not be successful.

If you are ordering a bow, then you may have some more leeway. Some of the more popular bows can take a month or more to arrive at the shop. That is just more time to save up.

Finally, one way to create good feelings between you and the shop owner is to pay with cash or check. The fees that shops have to pay on credit really takes a bite out of their profits and cuts down on the amount of merchandise they can buy for the shop. Plus, by not using credit, you are not paying the interest that makes the bow cost even more!

### **10. Maintenance**

This point is cited more with regard to older compound bows and bows using a two-cam system. Older bows were noted for the maintenance issues of cracked limbs or bent axles and risers. Two-cam bows were listed with concerns with their timing.

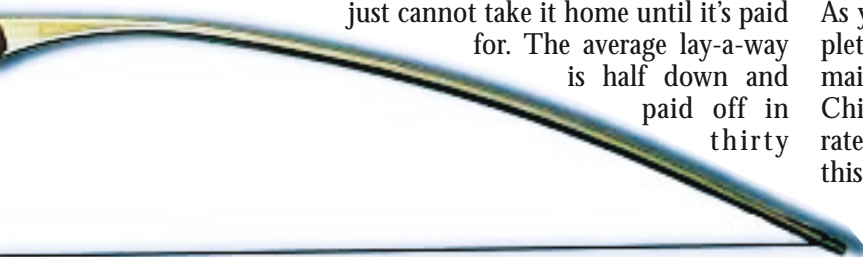
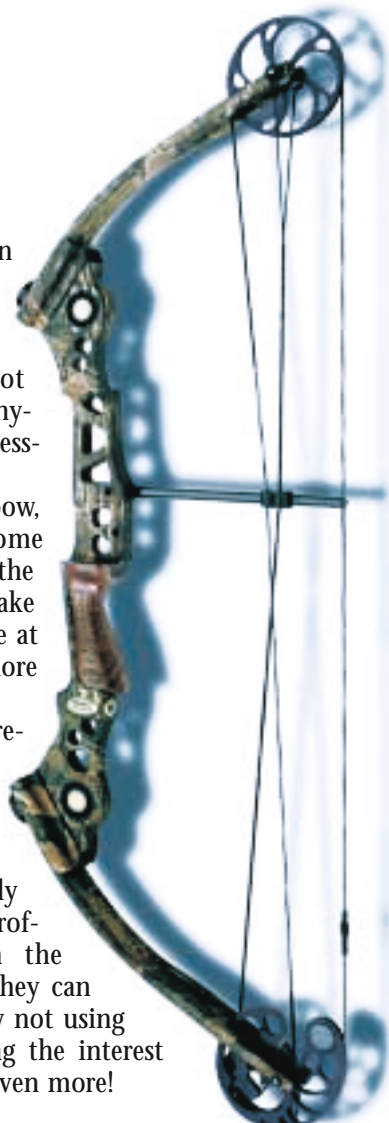
All bows experience some modicum of string stretch and should be checked on a regular basis for axle-to-axle distance and brace height changes. If you are completely sold on the bow, but not the string or cables, change them out for ones you prefer.

### **Buying a Bow for a Child**

As you might expect, buying a bow for a child is completely different from buying a bow for an adult. The main point to consider with a child is their growth. Children get taller and stronger at almost alarming rates. Bows that worked great last month may not fit this month.

Recurve archers have the issue of limb weight and length. As children gain strength, heavier weight

*Continued on the Next Page*





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limbs need to be purchased. Growth is an issue, but only after a child has grown a significant amount. At that time, longer limbs are in order, followed by a longer riser. Once the child gets to the point of needing a longer riser, they are usually looking at upgrading into a higher quality competition bow.

Compound archers are affected equally by growth and strength. Most compound bows have a set draw length range and you have to purchase new cams every time the child grows at a cost of \$50-\$100 each time. There are several bows on the market that have adjustable draw lengths of anywhere from five to ten inches. These bows are great for children who grow like weeds, but do not gain in strength as quickly.

Compound bows, generally, have ten to twelve pounds of draw weight adjustments. If you are able to purchase a bow that your child can comfortably shoot at the lowest weight, then you have all that strength they can gain before anything else need be done. Before you buy a compound bow for a child, ask about the upgrade policy of the manufacturer. You may be able to send the bow back to the manufacturer, with a modest fee, and have the limbs replaced with heavier limbs when the child outgrows the current set.

Finally, when buying a bow for a child, never buy more bow than the child can handle. If the child can only handle 25 pounds, do not buy them a 40-pound bow and assume that they will grow into it. Over-bow- ing children puts them at risk for shoulder and back injury and is one of the reasons that children give up the sport. Buy a bow your child can comfortably shoot without stress or strain on the bones and muscles. A lit-

tle inconvenience in having to upgrade sooner than planned is worth having a safe, happy, and healthy child.

### Take With You

Below is a handy list you can take with you when you go on your next bow-shopping trip. See if your criteria match those who's opinions contributed to the data collected for this series.



*Ava McDowell is an elementary/middle school music teacher in New Haven, Michigan. She coaches in the Royal Oak Archers JOAD program in Lake Orion, MI, in charge of the Senior Division and compound archers. Currently she is working on a Level 2 coaching certificate as well as developing a comprehensive curriculum for the program. Ava is an avid student of the sport, competing at the state level with plans to move into national competition in 2006.*

### Qualities to Look for in a Bow

- 1 ATA/Brace Height/Length/Fit
- 2 Feel/Balance/Grip/Weight
- 3 Quality/Workmanship/Finish/Appearance
- 4 Smoothness/Draw Cycle/Let-off
- 5 Speed
- 6 Customer Support/Manufacturer Reputation/Warranty
- 7 Noise
- 8 Consistency/Accuracy
- 9 Price
- 10 Low Maintenance



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Lorretta Sinclair

# Collegiate Archery

*Springtime is when the collegiate outdoor season begins.*

The big tournaments for the collegiate divisions are U.S. National Indoors, which must be attended in order to qualify for all-American and U.S. Archery Academic teams, and U.S. Intercollegiate Archery Championships (USIAC), which are held in May each year. The USIAC tournament is required as the second requirement to qualify as an All-American. The two scores, indoor and USIAC, are combined and the top ten men/women qualify as All-Americans, except in women's compound, where the top eight qualify.

To qualify as a member of the U.S. Archery Academic Team, an archer must finish in the top 25% of their division at U.S. National Indoors and maintain a 3.0 grade point average or higher. In 2005-06, there were 22 collegiate archers who qualified. Seventeen of those were also among the 38 All-Americans.

This year the University of California, Los Angeles (UCLA) hosted the USIAC tournament. It is the first time in the history of USIAC that the tournament was held there. The participation level was the highest level ever at the USIAC. I expect the participation level to continue to climb for this tournament since there have been many new clubs formed in the past year.

There are other tournaments that have collegiate divisions. According to the Collegiate Archery Handbook, each region is expected to host a regional collegiate championship. Collegiate archers who attend the Arizona Cup shoot in the Men's Senior Division, but then a separate break out is made for the college archer standings. The same is done at the Texas Shootout.

In 2005, we attended the Western Regional Championship in Long Beach and had the best time we have ever had at a tournament. For 2006, the Western Regional was hosted by Biola University (CA) in April. The Eastern Regional Championship was held in Williamsport, PA also in April.

Attending the USIAC tournament was the highlight of our tournament year in 2005. Not knowing exactly what to expect at an All-Collegiate tournament, we arrived and found that UCLA, Stanford, James Madison University, Texas A&M, among others, had brought large teams with many archers very new to the sport. In addition to these large college teams, there were several smaller and even one-man teams. In college archery, all are welcomed!

The fun begins with the attitudes of the collegiate archers. For my son, Dakota, being a one-man team at USIACs quickly turned into being part of the Dine' and Stanford teams. Both groups of archers welcomed new people to their groups, welcomed fun competition, and along with UCLA, provided a fun environment to shoot in. The four-day event is complete with FITA and OR elimination rounds, with the elimination round providing the year's collegiate champions. The awards also included the Rookie of the Year for each division, which is an important part of collegiate archery as many of these archers learn the sport while in college.

At the board meeting held at USIACs each year, I was appointed to a two year position as collegiate publicist. In an effort to promote college archery, my husband and I developed the U.S. Collegiate Archery website with the sole purpose of providing information to all collegiate

Special Feature

archers in the country. The website can be found at [www.uscollegiatearchery.org](http://www.uscollegiatearchery.org). Our goal is for this website to be the one-stop information site for anyone interested in collegiate tournaments, results, club info, forms, the U.S. collegiate Archery handbook, pictures, and articles. We link to USA Archery for information they have posted for the collegiate clubs.

We welcome articles, pictures, tournament information, and results. We hope that this effort will help new archers find the information they need, as well as provide information to those already involved in the collegiate division. A "Where are they now?" section is being created to post updates on past All-Americans and USIAC Champions. If you know of, or are, a past All-American or Champion, please contact me so we can add you to the growing area of 'History' in the college division.

It has been an honor to work on behalf of the collegiate archers. In 2005, we created the website, acquired equipment sponsorships from Easton, Alpen Outdoors, Doinker, and Sure-Loc and created a poster featuring 30 of the 38 2005-06 All-Americans with sponsorship from Easton, Clarke Sinclair Memorial Archery Scholarship, and Arizona Archery. These posters were available for the cost of postage/handling to any JOAD club, archery club, archery shop, and university in the country.

There is no doubt that college archery is growing. Collegiate archers are a great group of people to shoot and compete with. The teams enjoy each other's company as well as welcoming one-man teams and new archers. If you're new to college archery, come have fun and attend some of the many tournaments that have a college division. For more information, contact me at [lzsincclair@yahoo.com](mailto:lzsincclair@yahoo.com) and visit [www.uscollegiatearchery.org](http://www.uscollegiatearchery.org).

**Lorretta Sinclair** is the mother of Dakota, Clarke, and Barrett Sinclair. President of Clarke Sinclair Memorial Archery Scholarship ([www.clarkesinclair.org](http://www.clarkesinclair.org)) and collegiate division publicist ([www.collegiatearchery.org](http://www.collegiatearchery.org)).



## 2006 All-American Team

### Men's Recurve

Dakota Sinclair, Saddleback College  
 Jacob Wukie, James Madison University  
 Brett Lazaroff, Atlantic Cape Community College  
 Nathan McCullough, U. of Colorado, Colo. Springs  
 Tyler Benner, Claremont-McKenna College  
 Ted Harden, Arizona State University  
 Kevin Barker, Texas A&M  
 Tim Meyers, Texas A&M  
 Brian Christensen, Colorado State University  
 Alden Harris, Texas A&M

### Women's Recurve

Lindsey Pian, Arizona State University  
 Lindsey Carmichael, University of Texas  
 Tina Jeon, Yale  
 Carissa Dragan, Cal State Long Beach  
 Danielle McCullough, Westminster College  
 Robin Liang, Columbia University  
 Marie DeRegnacourt, Michigan State  
 Sara Mancini, Columbia University  
 Ali Wood, University of Arizona  
 Katrina Weiss, James Madison University

### Men's Compound

Braden Gellenthien, James Madison University  
 Logan Wilde, Idaho State University  
 David Roth, Michigan State University  
 Jedd Greshock, James Madison University  
 Stephen Schwade, James Madison University  
 Joshua Binger, Texas A&M  
 Michael Ashton, James Madison University  
 Christopher Glass, Michigan State  
 Trevor Siedel, Texas A&M  
 Patrick Parsons, Texas A&M

### Women's Compound

Brittany Lorenti, James Madison University  
 Anna Stratton, Texas A&M  
 Jessica Grant, Texas A&M  
 Amanda Raffaelli, Texas A&M  
 Cassie Raffaelli, Texas A&M  
 Jessica Fasula, James Madison  
 Joayn Fleury, James Madison  
 Michelle Wright, Penn College  
 Xiao Hui Chin, Columbia University  
 Brenda Temperly, Texas A&M

# Teaching or Coaching?

*Some people teach archery and some coach; there is a difference. I was recently watching a “coach” work with a student and after a few minutes it dawned on me that he was not coaching but teaching. Oops, my foot went through the soap box I was about to climb up on.*

I watched as a student was told to take ten shots and place them all in the gold while the “coach” walked outside to smoke a cigarette. He later came back in and was obviously upset with the shots. I couldn’t believe my ears when I heard him say “If you can hit one ten, you can do it every time; you just ain’t trying hard enough.” What a novel coaching philosophy. I wanted to ask if he was really a coach, but I was afraid I’d hear, “No, but I slept in a Holiday Inn Express last night.”

Anybody with some hands-on experience can teach. How hard can it be? “Put the arrow on the string, pull it back, point it at the target, and let go. That’ll be 25 dollars please.” It’s kinda like paying some guy who just watched an instructional video to take out your appendix.

I’ve watched these “coaches” come and go. They usually have some experience on the range, won a shoot or two (locally), do fairly well and decide to coach for a little extra cash and some recognition. They get a few students together and within a month or two, their students lose interest. Usually with the excuse of not having enough time. Oh yeah, they also brag a lot about their own equipment and push their students to buy more and more and more.

On the other hand, there are plenty of people out there just teaching and doing a great job at it. They enjoy the sport so much that they just want to help someone else feel what they feel. They don’t call themselves coaches, and to their credit, they aren’t charging for their advice. They are just spreading the joys of archery. I’ve picked up many good tips from these types of archers and am very thankful of their existence and willingness to help.

Charging . . . oops, the C word. . . . Before you

get all twisted up, I’m not saying someone shouldn’t charge for their time. I’m just implying that if you are going to charge, at least be worth it. Most coaches I know have spent a ton of time and money to learn their craft. They have gone to schools, taken classes, earned the right to be called a coach, and have the desire and the capability to help someone else succeed.

Coaches are constantly learning and growing. They know they have to stay current in everything concerned with their sport. When was the last time you saw someone teaching archery tell their student that they need to warm up with a few exercises before starting shooting and explain why? Ever see a teacher use an arrow plotting chart? I’d be willing to bet if you asked what his students’ average score was he’d tell you his last score.

Coaching is so much more than just teaching a skill. It’s explaining the correct way to execute that skill, the proper movements, the breathing techniques, and the mental aspects; not just providing you with the ability to know you made a mistake, but the ability to know why you made that mistake. A coach knows that there will be mistakes and helps you through them.

Getting back to my example, I overheard the comment, “If you want to win you’re going to have to get better than you are now.” Well, duh! That’s fortune cookie material for sure. A good coach understands that his students can’t shoot any better in a tournament than they did in their last few practice

***“I overheard the comment, ‘If you want to win you’re going to have to get better than you are now.’ Well, duh!”***

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averages. Expecting more than that is just unrealistic. There are times I stand and bite my tongue, wanting to intrude, but knowing better.

I sometimes work with groups that just want to have some fun for an hour or so. I consider this teaching. I get them on the range and shooting as quickly as possible, have some fun, and send them on their way. I get to introduce them to the art and they get to shoot. That’s what they came for. If I made a good impression, they’ll be back and then the coaching begins.

One thing I’ve noticed most often is that someone teaching tends to be a bit commanding. Do this, do that, this way. This is the way I do it and it will work for you. All they’re doing is passing on information. It’s like a real teacher telling a class full of students to read chapter one and tomorrow there will be a test. It’s up to you to figure out what you need.

Good coaches listen. They learn to read body language and understand that silences are just another way of communicating. They work closely with the parents as well as the child. Their attention is always with their student. A coach knows that working with an adult is greatly different from working with a child. I have seen archery teachers working with children completely ignore them for minutes on end when an adult comes into the room asking for advice. Unfortunately, the student gets a little better over time just from shooting rather than from being coached and doesn’t realize he is being cheated.

I was practicing at the range recently and a guy was there shooting quietly. He didn’t really say much but was intent on shooting a three-spot target. I watched as he desperately tried to put an arrow in each spot, his frustration building. I couldn’t help myself, I butted in. It’s my nature, it’s what I do.

I asked how long he had been shooting and he told me only a few weeks. I asked why the three-spot and he told me because his coach told him to shoot it. The reason was to keep from shooting his own arrows due to the accuracy of the compound he was using. (I’m not crazy, I wrote down the name of the bow . . . it comes with its own accuracy built in. I have got to get one.) He admitted he was having a real problem focusing on the target. After talking a bit more he told me that he had bought the bow mainly for recreation and had no interest in hunting.

There were some 60 cm multi-colored targets on the target butts left over from JOAD class and I suggested he shoot one of them. After several minutes he began to keep his groups in the red. His attitude changed. He even had quite a

few in the gold. I shot a little, packed my gear and left. Several weeks later I ran into the same guy at the range and he couldn’t wait to tell me how his shooting had progressed. He was hooked. He even had a new sight ordered.

He had told his “coach” that he no longer wanted to shoot the three-spot and had decided to concentrate on the multi-colored targets as a way

to strengthen his focus skills. He told me his “coach” was disappointed and couldn’t help him if he didn’t want to take his advice. He thanked me for my advice from that night at the range and wanted to know if he could pay me for my coaching. I explained that at that particular time I wasn’t coaching, I was teaching, and he owed me nothing.

He asked me the difference and I explained. “I taught you the difference between a three-spot and a single spot. I taught you the difference between enjoyment and frustration. I taught you that you don’t have to limit yourself to one style. I taught you that I understood what you were going through even if you didn’t. I taught you the difference between teaching and coaching. Now that you know the difference, the real coaching can begin.”

**Tim Scronce** and his wife **Sandi** are both NAA Level 3 Coaches. Tim has been involved in archery since around the age of seven. He shoots compound, recurve, and occasionally longbow. He competes regularly, when time permits. Sandi and Tim teach and certify Level 1 and Level 2 instructors, work with Girl and Boy Scouts thru archery, coach in a JOAD program, and have a range at home to teach privately.

In the past three years, they have used archery to raise money for the American Cancer Society, the Union County Lions Club and the Sun Valley Community Fair supporting five schools in the area. Tim does commercial heating and air conditioning. They have two children (Crystal and TJ) who both shoot recurve and compete as well. They are proud to add that Crystal spent two years working on getting an archery club going in her high school which became a reality in February 2002. She now attends North Carolina State where she plans to help reinstate the college’s archery team.



Steve Ross

# Putting Your Form Under Pressure

*When engineers search for a weak link in a mechanical system they often put the system under stress or pressure. By increasing the level of stress beyond what would normally be encountered, weaknesses can be found. Could the same concept apply to one's archery form and shot execution? After some consideration and testing of this concept I believe this is a fertile area for improving our archery game.*

Being an engineer by trade I have worked with what I will call the *pressure principle* for many years. It wasn't until this year that I discovered its true usefulness in improving my archery form.

My first encounter with the pressure principle was when I increased my draw weight from the transition from shooting indoors to shooting outdoors. In the past I have slowly increased my draw weight over time to bring the peak weight of my compound bow from the 37 pounds I shoot during the indoor season, to the 47 pounds I use for the outdoor season. This year, due to time constraints, I did something that defies all logic, I increased my bow's draw weight by six pounds in one session. I worked with this increased draw weight at close range in front of a blank bale and struggled mightily, as one would imagine. Little did I know at the time, but I was applying the pressure principle to my archery form. This large increase in draw weight stressed the biomechanics of my draw and hold. With the added pressure, several weaknesses became apparent to me. For one, my bow arm and shoulder were not aligned properly, so I worked on my alignment and a more efficient draw technique to accommodate the increased draw weight. Finally I was able to achieve the stability I was accustomed to. It occurred to me if I had increased my draw weight slowly, as I have done in the past, I

would not have noticed my inefficient bow arm alignment. I would have continued to use my inefficient form because I could get away with it. The pressure principle, however, makes a weakness in form obvious.

Another method of putting your form under pressure that I have worked with is holding at full draw for extended periods of time. Drawing my compound bow I can hold for about one minute, if I am in reasonable shape. Inefficient skeletal alignment will make holding a bow at full draw much more difficult than using good straight alignment.

Although he doesn't say this explicitly I believe the NAA's new national archery coach, KiSik Lee, uses the pressure principle as well. In his book *Total Archery* and on his website [www.kslinternationalarchery.com](http://www.kslinternationalarchery.com), Coach Lee describes a series of exercises he calls SPT. These are holding exercises much like I describe above. Mr. Lee promotes these exercises to build archery-specific muscles. I suspect a side benefit is that the archer will find an efficient biomechanical position as well.

In thinking further about the pressure principle it is not hard to see other ways it can be applied; some of these may be familiar to you. A high level professional archer I know practices with a differ-

***“Want to take your shooting to the next level? Adding a little pressure to your practice routines may be one way to do it.”***

Special Feature





ent mechanical release aid from the one he uses in tournaments. His practice release (of the back tension variety) is setup a little slower than his tournament release. In other words, his practice release requires more back tension or conscious pulling action to get it to fire. I asked him about this and he told me he needs to work on pulling through the shot and his practice release forces him to do this. If he settles for a weak shot, his release simply will not fire. I believe this is another form of the pressure principle. If an archer is weak on pulling through the shot, slowing the release down will reveal this in dramatic (and at times frustrating) fashion. I have tested this myself and can say I now shoot stronger shots by slowing down my release.

Perhaps more familiar than physical forms of pressure are the mental aspects of pressure. Nearly all athletes who compete experience some form of mental pressure. Lanny Bassham has written extensively about this in the pages of *This Magazine*. What I am addressing is using mental pressure to, again, probe for weakness in our archery form. How can mental pressure show flaws in our form? Let us count the ways! Ever notice that shots may go smoothly with little effort at close range but at longer distances you struggle? From what I can tell this is a very common problem. At a certain large, national field shoot I attend every year a long back-up always seems to occur behind a target that is 101 yards away. Every year I observe archers changing their shot timing, holding two or three times longer on this difficult target. What I attribute this to is increased mental pressure breaking down the archer's shot execution on this difficult target. What we need to learn (and this is difficult to do) is to trust our archery form and shot execution and not let the sight picture occupy more of our conscious minds than it needs to. Longer distance target shooting will test your form and execution. How well is your shot sequence ingrained in your subconscious? Shooting difficult targets will be a good indicator. If your shot routine is not automatic, mental pressures will derail it.

Another way to increase mental pressure is head-to-head competition. Challenge your shooting buddy to a few arrow competition. Pretend you are shooting for the world championships and it has come down to the last arrow! The editor of *Archery Focus* and I once had a practice competition of shooting a 14 target field round . . . from the Cub stakes. Talk about pressure, neither of us thought we would miss, which led to overaiming, over-

holding, and more than a little nervousness! Many tricks can be used to simulate pressure and the best archers have a toolbox full of them. Good archers learn to handle the pressure and not vary their shot routines. Archery professionals learn how to react to pressure and learn coping mechanisms to deal with it. I recently read a story of a professional

level archer who was having difficulty making a tournament winning shot. He let down twice then grabbed a different release from his quiver. He went on to win the tournament. Many will assume that this archer may have switched to a release with a lighter trigger. In fact he switched to a heavier trigger. This archer understood that the added mental pressure was forcing him out of his shot routine. The release with a heavier trigger sends a message to the brain that stronger focus on execution is what is needed. If the mind is focused on execution, thoughts about score will be pushed aside.

Want to take your shooting to the next level? Adding a little pressure to your practice routines may be one way to do it. The best athletes are always challenging themselves and archery is really no different. If you are not satisfied with your current performance give yourself a challenge, add a little pressure and build a stronger shot on what you find.



**Steve Ross** is a Level 2 coach, a NASP teacher, and assistant coach for the JOAD team, the Gold Team of Nevada County. He shoots, coaches, and lives in Northern California with his wife, Mary, and his two sons, Miles and Gabe.

Lanny Bassham

# Mental Skills

## Dealing with Distractions

Part 1 of 2

*Consistency occurs when an archer performs both technically and mentally within their practiced plan. If this plan is a good one and if the shooter is skilled the arrows go in the center. Today we are going to look at three things that tend to distract us and pull us out of our mental game and what we might do about them—extreme weather, score, and people.*

Most distractions occur because they are the extremes of things that occur normally. The weather, for example, is always there but does not become a possible distraction until it is severe. Ever try to shoot in extreme temperatures? It makes little difference which end of the thermometer you shoot in: severe cold or blazing heat. How about extreme wind? It not only displaces arrows, but it can blow archers and their mental games around as well. Weather can distract you if you are not prepared for it. So, how do you keep weather distractions to a minimum? I feel that most severe weather related distractions are solved by proper preparation. Make certain that you are dressed properly for cold weather shooting and have trained in your cold weather outfit. Summertime in my part of the country requires

shorts and sun screen and plenty of water. Dehydration is a big deal and most venues keep the water jugs full for the shooters. Make certain you make use of them. Packing your own water is not a bad idea just in case.

Extreme weather creates special mental distractions as well. The most common ones are “the pulling of focus” and “giving up the ship.” Extreme temperatures may cause your focus to be pulled away from your planned system of thinking. You are still thinking about your frostbitten fingers as you nock an arrow. Perhaps you should have brought those gloves. Shooters who are not used to shooting in heat get distracted by sweat drops on their glasses. Even if you have planned for these issues, you must be careful to run the same mental program that you run when the weather is moderate. Change something and you always get different results.

Okay! The wind is howling and your sight is bouncing into the next state. Don't *Give Up the Ship!* Giving Up the Ship is a mental error which triggers technical ones. Weak and inexperienced shooters think that the conditions are so bad anyway that it doesn't matter whether they perform correctly on a shot. “We



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will probably miss anyway!" Your courage as a shooter is being tested. Stay tough! Stay with your system. Top shooters know that horrid conditions test the will of shooters and normally gives veterans an advantage. Scores may fall today and yours may fall a bit as well. Remember everyone will lose some points. Stay with your ship! When you encounter extreme weather think, "This is great! I love to shoot in bad weather. It gives me an advantage because I will stay with my system when others are distracted and give up."

Another example of an extreme distraction can be score related.

Under typical weather conditions, you score between 80-90 percent of the available points on an average course. Today you score in the center on the first half of the event and as you enter the next end the score monster begins talking to you. If you have no plan to meet this type of distraction head-on you could lose a lot of points on the last half of the course. ruining your

day. I think it is almost impossible to avoid this potential distraction. Sooner or later this is going to happen to you even if you have good technical and mental form and are following a good training system.

My suggestion is to have a plan that you rehearse over and over to turn this potential distraction into a great score. Rehearse this very thing happening to you and when it does imagine that you calmly and decisively shoot the darned center out of the target. We tend to repeat what we rehearse. Do this and you will be ready for the great score when the time comes. This is called *contingency planning rehearsal* and you

can use it for many things. How about rehearsing that you beat your opponent in a shoot-off? Rehearse how you want to feel, see the arrows grouping in the center of the target and imprint the win in your Self Image. A good time to do this kind of rehearsal is while you are doing something else: exercising, sitting on an air-

*Continued on the Next Page*

***"Have a plan that you rehearse over and over to turn this potential distraction into a great score."***

plane, or waiting for an appointment to start.

Now, let's look at one of the most interesting potential distractions: your competition. People are funny, weird, extreme, and some are down-right unbelievable. Just when you think you have seen it all, you go to a shoot and someone does something that is a potential distraction to you and your mental game. Let's look at a few common people distractions.

**People Distraction Number One: The Uninvited Helper** He is on your point and so far he has kept his mouth shut, but just after you shoot your first end you hear this: "Your draw length is too short." Now, you did not ask for help. In fact, you only met this guy today. He is not that good of a shot, but he is good at one thing. He's loud. Now don't get me wrong, I think one of the best things about our sport is that people are quick to help one another. The only thing that we ask is to please wait until we ask. The key to dispatching this kind of distraction is to understand that this is a social game and it needs people to grow, all kinds of people. We must be able to focus when we are on the line, blocking out the people, the noise, the stray thoughts, and the comments from our mind by running a smooth, simple mental program while executing a precise pre-shot routine. Your uninvited helper is helping you practice focusing.

***"Distractions bounce off of prepared people. Distractions are deflected by the self-confident and melt at the feet of the mental manager."***

**People Distraction Number Two: The Score-teller**

These guys come in two varieties—malicious and benign. The benign guy has just come from the leader board and passes you on the range. You are walking by and he says, "Boy, are you shooting great! If you finish strong you will win this thing!" Thanks a lot, Bubba! This guy means well and is just trying to congratulate you. The malicious score-teller, on the other hand, is not looking out for you. He is hoping that telling you where you are will unhitch your wagon because he is right behind you in the event. If you are an elite shooter, you had better get used to this and be ready for it.

***"I think one of the best things about our sport is that people are quick to help one another. The only thing that we ask is to please wait until we ask."***

The best thing that you can say to either one of them is "Hey, Thanks." It will make the benign guy feel important and it will drive the malicious guy crazy. You cannot avoid the leader board and you never know when the score-teller is going to show up.

Distractions bounce off of prepared people. Distractions are deflected by the self-confident and melt at the feet of the mental manager. How are you doing with them? In the next issue we will look at more people distractions and how to handle them. See you then.

**Lanny Bassham** is an Olympic Coach and an Olympic Gold Medalist. He is a member of the Olympic Shooting Hall of Fame, ranks third among all shooters in total international medal count for the USA and is one of the most respected mental trainers in the world. His book ***With Winning in Mind*** and his ***Mental Management***® concepts are used and endorsed by Olympian and World Champion shooters. You can reach him at 1.800.879.5079 or at [www.mentalmanagement.com](http://www.mentalmanagement.com).



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# Towards an Understanding of the Predraw

*One of the prerogatives of editing a magazine is the opportunity to use the publication as a platform for inquiry and dialogue. Such is the case with Archery Focus editor Steve Ruis' exploration of the predraw in the recurve shot sequence. The gauntlet having been thrown, I will attempt to address his observations on the subject of the predraw with the goal of enlivening the discussion.*

The abundance of new information, research, and practical experience have brought new focus on the process of making the archery shot. Coach KiSik Lee's book, *Total Archery* is a step-by-step guide to an approach that is coming to be known as the Biomechanically Efficient Shooting Technique or BEST Method. In an un-credited article in November-December 2005 issue of *USA Archery* magazine, the BEST Method was also described. With *The Heretic Archer* Vittorio and Michele Frangilli have offered their own views.

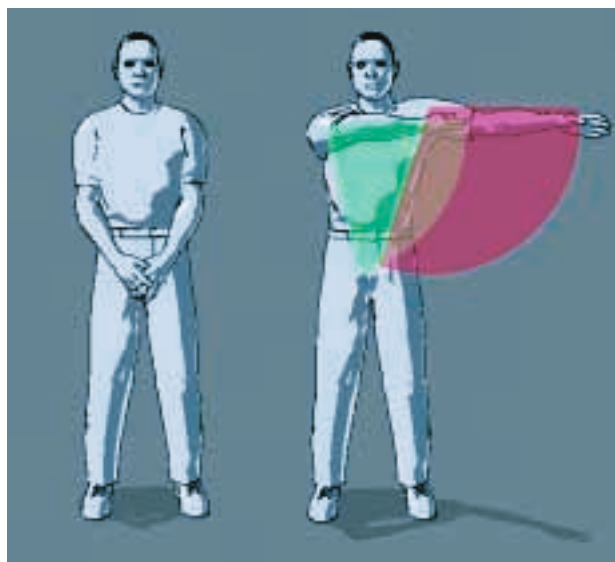
This new information is added to the literature of established techniques described in books such as Rick McKinney's *The Simple Art of Winning* and Ray Axford's *Archery Anatomy*. It's easy to be confused both as a coach and as an athlete. There is some value, I believe, in looking at various shooting methods with the goal of finding an approach that works optimally for each athlete.

The predraw is the stage of the shot sequence during which the bow is raised from a low position, with the arrow pointed towards the ground, to an elevated posi-

tion in preparation for the draw. The goal of the predraw is to position the bow and body in such a way that the draw can be executed with minimum effort and maximum consistency.

The core of the geometric problem of the predraw movement is that the shoulders of the left and right arms are separated by the rib cage and chest. This separation, averaging about 16"-18" in an adult, means that hands as the bow is raised, the arcing path of the bow arm and draw arm pivot around two different axes. Given that there is an average brace height of 8"-9" on a typical recurve bow, the difference in these two dimensions needs to be resolved in some fashion (see *Figure 1*). Each of the predraw

*Continued on the Next Page*



*Figure 1 Raising both arms to one side causes the hands to be separated by the approximate width of the shoulders.*

techniques described addresses this problem in a different way.

To explore the geometric relationship between the bow and draw shoulders try this exercise. Stand straight up and place your hands together below your waist directly in front of you. Raise your bow arm as if towards a target while allowing your draw hand to slide along the bow arm as it moves. When your bow arm reaches a horizontal position to your side, your draw hand will be resting on your bow arm with your fingertips at about your bow arm's elbow. You may observe that your draw arm is bent at the elbow as it passes in front of your chest. The distance between the fingertips of your bow hand and your draw hand will be about the same as the distance between your two shoulders.

This exercise illustrates that all skeletal motions are angular in origin, rather than linear. All the joints of the body pivot about a point. The cascading of joints in a limb (arm or leg) permit the end of the limb (hand or foot) to move linearly but the action causing that movement is a combination of angular deflections. Any discussion of the body's movements in an archery shot needs to be viewed in the light of this angular movement.

### The Traditional Predraw

The traditional shot sequence is illustrated in McKinney's book on pages 12-15. The predraw is initiated with the bow arm down and the draw arm bent at the elbow. The upper body is rotated towards the target and the draw shoulder is pulled well across the chest in order to bring the draw hand to the string. As the bow is raised, the string is slightly drawn to make up for the angular distance between the two shoulder pivot points. When the arrow is level, the chest remains slightly open towards the target. As the draw arm begins the draw, the chest is rotated so that the

***“For adult archers with some experience, there is always something new to learn. Look at each of these approaches to shooting technique, both traditional and newly developed, and see what works best for you.”***

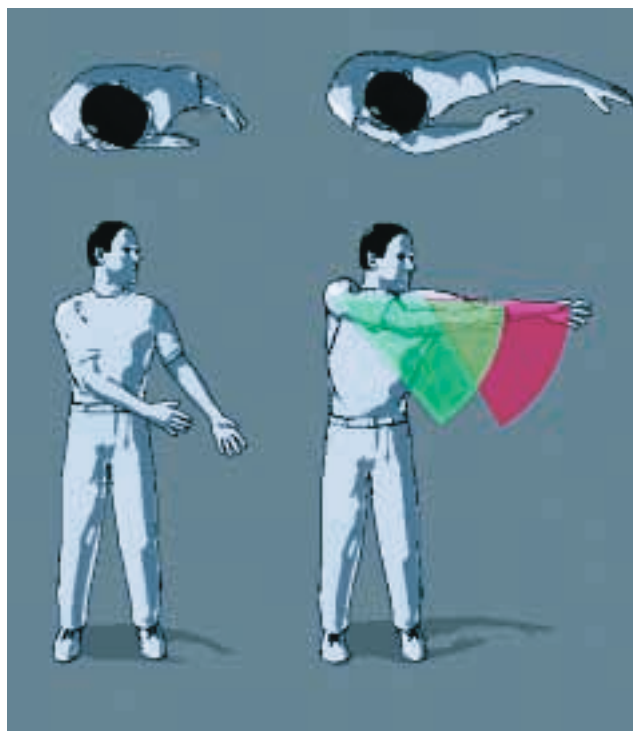


Figure 2. The pivot points in the shoulders of the bow and draw arms are moved closer together through a combination chest rotation and the movement of the draw arm shoulder around the rib cage. Note that the arcs of the two hands separate somewhat as the bow is raised causing a slight draw of the bow.

shoulders align along the path to the target (see Figure 2).

This shooting approach uses a combination of chest rotation about the spine, forward movement of the draw arm shoulder and a slight drawing of the string during the rise of the bow to make up for the difference in space between the pivot points of the bow and draw arms.

The advantage of this approach is that the motion is intuitive and minimizes the stress of the body during the setup phase. There is also very little motion of the arrow on the arrow rest during this predraw, helping to keep the arrow on the arrow rest.

The disadvantage is that there is a lot of movement of the shoulders and chest during the predraw and draw. The combination of movements in the torso combined with attempting to set the bow shoulder under load can lead to inconsistency from shot to shot and has the potential to cause injury from repetitive motion.

Predraw postures need to address the positioning of the draw arm elbow in anticipation of the draw. Remembering that all skeletal motion is angular, the

upper draw arm pivots around the shoulder joint, causing the elbow to travel in an arc towards the side of the body. Traditionally this arc is in a plane parallel to the ground with the elbow moving in an arc away from the body. Axford proposes, on pages 96-99 of *Archery Anatomy*, that moving the draw arm in an upward arc, perpendicular to the ground, keeps the forces in a line towards the target and minimizes the rotation of the torso.

Larry Wise illustrates on pages 36-42 of *Core Archery* that compound shooters draw with the elbow moving in a plane parallel to the ground. The linear motion of the draw hand, caused by the angular motions about the draw shoulder and draw elbow, is directly in line with the force along the arrow.

### Coach Lee's Approach

The National Archery Association's National Coach, KiSik Lee, resolves the differential dimensions between the shoulders in a different way. The predraw that Coach Lee calls "Setup" is illustrated on page 50 of *Total Archery*. Coach Lee advocates a distinct open stance with the hips rotated open to the target. The effect of this stance is to increase the body's resistance to lateral wind forces. The shoulders are kept in a line

towards the target during the initial phases of the shot. The resulting spiral in the torso also stiffens the shooting platform and reduces core body movement (*see Figure 3*).

Once the hands are on the bow handle and string, the two arms rotate about their respective shoulders to raise the bow without moving the angular position of the draw elbow. The result of this action is that the bow is about half drawn by the time the arrow is parallel with the ground. It's important to note that the draw arm is only moving upward and that the angle of the elbow remains constant during the entire predraw. The raising of the bow is completed when the top of the draw hand is level with the nose.

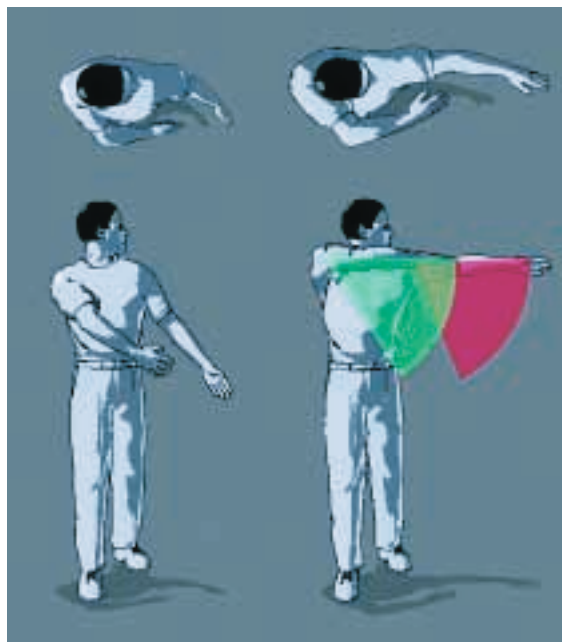
The draw proceeds with the draw hand moving on a downward path towards the collar-bone. At the completion of the draw, the draw hand is then raised to a position along the jaw. The objective of this draw path to the jaw is to keep the head steady during the entire shot. Drawing directly towards the chin will usually require some head movement to bring the string to its anchor point. A downward draw path also allows the archer to use the back muscles more effectively to aid in the drawing process, and helps to keep the draw side scapula low on the back.

Coach Lee emphasizes that both shoulders need to be kept down during the entire shot sequence. As the draw is completed and the load is transferred into the back muscles, the draw arm shoulder and scapula are lower than the bow arm shoulder.

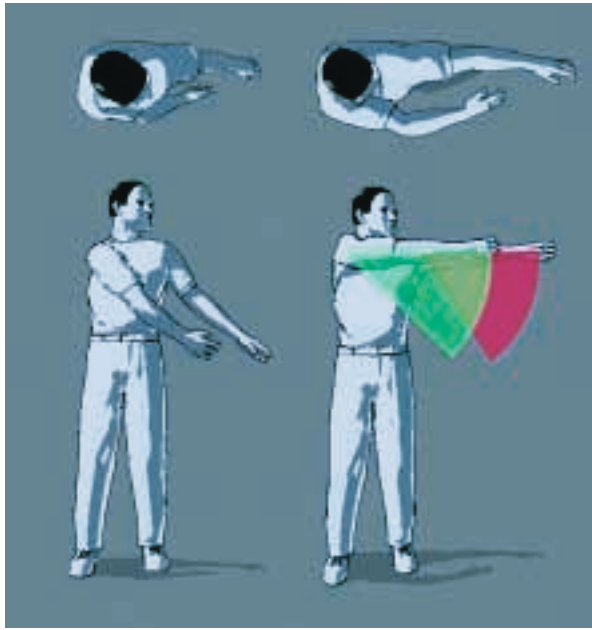
The advantage of Coach Lee's approach to predraw is that the torso is kept very stable and that the relationship between the bow shoulder and the rib cage remains constant during the predraw and draw. In addition, the downward path of the draw hand towards the collar-bone during the draw phase further emphasizes the lowering of the draw arm shoulder. This motion also allows more of the draw load to be carried by the *latissimus dorsi* muscles in the back. The draw motion itself is as much a movement of the draw shoulder around the rib cage as it is a bending of the draw elbow.

The disadvantage of this approach to the predraw is that there is a lot of arrow motion on the bow as it is raised. It takes discipline to only raise the bow without adding an additional pulling movement of the draw arm. Teaching this approach to the predraw will require lots of practice with a string bow and then a stretch band to isolate the correct motions and elimi-

*Continued on the Next Page*



*Figure 3 In Coach Lee's approach to the BEST Method, both the bow and draw shoulders are in line with the target prior to raising the bow. The resulting separation of the two shoulders causes a substantial difference in the paths of the two hands, causing a partial draw as the bow is raised.*



*Figure 4 In this approach the bow arm shoulder and torso are pre-set in line with the target. The draw arm reaches for the string by bringing the draw arm shoulder well in front of the chest. The resulting arc of the two hands as the bow is raised separate a bit more than the traditional approach but not as much as Coach Lee's.*

nate unnecessary movement. Combined with the open stance, beginners will have a long period of adaptation to this method.

It is also notable that the half draw, created by the geometry of the movements of the bow and draw hands in Coach Lee's approach, is not appropriate for compound shooters. The resulting position of the hands at the conclusion of the pre-draw in this approach is at or very near the peak draw weight of a compound bow.

### **The Frangillis' Approach**

The approach to the pre-draw illustrated by the Frangillis appears to be something of a combination of the Lee and traditional approach. The stance of the feet is strongly open and the hips are open to the target as well. The torso is rotated above the hips in order to put the shoulders, especially the bow shoulder, in line with the target. As the bow is raised, the draw arm shoulder moves laterally around the rib cage to minimize any drawing of the bow prior to setting the bow arm (*see Figure 4*).

Once the bow is raised, the bow arm shoulder is set and stabilized using the *latissimus dorsi* muscles in the back and the chest muscles in front. There is minimum muscle tension in the bow arm itself and the wrist is

relaxed. It is also interesting to note in the photograph on page 85 (picture 71) of *The Heretic Archer* that the draw arm elbow position of each of the three archers pictured is at a different height.

The draw is accomplished by moving the draw arm shoulder around the rib cage by activating the *latissimus dorsi* and *rhomboid* muscles on the draw side combined with the action of the biceps to close the angle of the elbow. Again the draw action is downward with the draw hand coming up to the chin once the draw motion is fully complete. At the conclusion of the draw the two shoulders are in line with the path to the target.

The advantage of this approach is that the bow arm shoulder is firmly set before taking on the weight of the draw load. There is minimum movement of the arrow on the arrow rest during the pre-draw reducing the tendency of the arrow to come off the rest. This approach requires considerable flexibility in the draw arm shoulder to permit the shoulder to move towards the front of the rib cage as the bow is raised.

The disadvantage of this approach is that archers lacking shoulder position mobility will have difficulty in raising the bow without causing excessive draw during the raise. Some may also argue that the motion of the draw shoulder from pre-draw to draw makes it difficult to achieve consistent shoulder alignment at the holding and aiming phase of the shot.

### **Conclusions**

So, what's to be learned by this exercise in form analysis? Is one approach right and the others wrong? Is there an elusive combination of approaches that is the Holy Grail of pre-draw?

If there is one universal skill included in all of the various approaches to the pre-draw it is the ability to raise the arms without raising the shoulders. Archers should practice this movement with a string bow doubled over to produce a hand to hand distance of about 12"-14". Raise the hands together in a parallelogram motion to just above shoulder height. If necessary, have a coach or colleague hold the archer's shoulders down during this exercise until he is comfortable isolating the movement of the arms from any movement of the shoulders.

A second, near universal truth of the pre-draw is that any draw of the string should only be caused by the geometry of the arm-shoulder movement and not by the action of the draw arm biceps causing the draw arm elbow to bend. Drawing while raising the bow is a



common problem for beginning archers. Coaches should be on the lookout for any drawing motion during the predraw.

Finally, the bow arm elbow should be rotated outward to provide clearance for the bowstring. This rotation should occur before the shoulder is placed under load. Usually, the rotation happens just before the bow arm is raised.

The optimum predraw is the one that works best in the system that the archer is shooting. Body type will play a role in choosing the correct predraw approach. For example, archers with barrel chests will have to accommodate a larger radius of movement around the torso than archers with slim profiles.

Joint movement and flexibility are also a factor in choosing a predraw approach. Even with the fittest of athletes, there is a wide range of motion flexibility around the joints. Athletes with very tight shoulder muscles will not be able to move the shoulder joint around the rib cage as required in some predraw techniques.

The predraw is only one part of the shot sequence. Each of these experts has developed a shot sequence that works as a system. Coach Lee has emphasized that a systematic approach to the shot sequence has benefits both for the individual archer and for developing a pool of top competitors. For the talent pool, a systematic approach, based on scientifically-based shooting techniques, helps each athlete develop their skills quickly, without a lot of trial and error. For the individual competitor, shooting systematically improves consistency in competitive situations. The body will remember what the mind has blanked out.

Which system approach to choose? For the young recurve archer, and the coach of young recurve archers with visions of the USAT and the Olympics in 2008 and 2012, Coach Lee's version of the BEST method is going to be a strong choice. Unless a recurve archer is consistently shooting 1380s and above with another technique, it is unlikely that USA Archery will choose a team member who is not shooting with the BEST approach.

For adult archers with some experience, there is always something new to learn. Look at each of these approaches to shooting technique, both traditional and newly developed, and see what works best for you. Change may come slowly and experienced archers will have to unlearn old habits and build new ones in order to improve.

So, Steve, is the picture any clearer?

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# Pluck, Pluck, Pluck, . . .

*There seems to be an epidemic of plucking. Here a pluck, there a pluck, everywhere I look a pluck.*

I recall the Coach Kim seminar at the Chula Vista Olympic Training Center a year ago last spring. Here were dozens of archers willing to spend a considerable sum to have a gold medal winning Korean coach comment on their form. As Coach Kim walked the shooting line taking short video clips of each archer I saw pluck after pluck. Recurve bows, compound bows, young archers, old archers, relative beginners, elite archers all plucking. Virtually all of the archers there were plucking. I wonder what Coach Kim thought about that.

I walk down the shooting lines at the NAA Nationals and see most of the Junior archers plucking (many of the Senior/Adult ones, too). Some of the compound/release archers pluck, too.

I remember when my coach and mentor, Rusty Mills, was teaching me my first arrows and he said, "You're plucking." My reply was, "I am what?" If you do not know what plucking is, it is your release hand moving out away from your body upon loosing the string. The term is an allusion to the plucking of a string on a stringed instrument like a guitar. Proper form dictates that your draw hand should move straight back away from the bow, not fly outward away from the string plane.

Most of the people I talked to about this consider plucking to be a flawed release, but the more I think about it, the more I disagree. As a beginning coach I emphasized that it was important to "let the string go; don't let go of the string" and that "the release was the hardest part of the shot to master." Now I realize that the release is not all that difficult; you see, I had it wrong.

## **To Pluck or Not to Pluck**

In order for an archer to pluck, he must be creating forces to open his draw arm. In a pluck, the forearm swings outward, hinging at the elbow. Since the *biceps* muscle is primarily involved in bending the arm, the fact that the arm is flying open at least tells you that you haven't engaged the *biceps* (Behind every cloud is

a silver lining.) What opens the arm is (primarily) the *triceps* muscle. So, why would the *triceps* muscle be engaged? Because the load of the draw hadn't been transferred to the muscles in your back.

Contrary to popular opinion, a bow cannot be drawn without engaging muscles in the arm and shoulder, but those muscles have to pass the load onto back muscles so they can then relax. If they don't relax . . . pluck. (It also hurts. I know this because I tried to teach myself how to shoot with a recurve bow.)

So, the key to a fluid release is the transfer of the draw load to the back muscles. How is that done? The simplest approach is to focus on attaining full extension in the shot. In the old days, people talked about archers having "good line." This is the same thing . . . but different. Having good line means good body alignment, the key part being a draw elbow straight back, such that at full draw (just prior to release) a line drawn through the arrow would exit through the bottom of the elbow. The elbow can be higher (and must be for people with certain physical structures), it may also wrap around further toward the back, but it must not be lower or stick out in front of the string plane.

If you look at a lot of people shooting and extend imaginary lines back from their arrows, you will probably see those lines exiting under their forearms somewhere. The telltale sign of a plucker is a flying draw elbow (*see Figure*).

I was working with a student just this morning who wasn't getting fully extended and was noticeably plucking (which, of course, is a major cause of poor groups leading to poor scores). We took a practice bow, lighter in draw weight than his competition bow, and put a clicker on it. I asked him to come to full draw and anchor (without the clicker) with his eyes closed. Three repetitions of this exercise gave me a good feeling for where his conception of full draw was. I then set his clicker about 3-4 mm ( $\frac{3}{16}$ " ) closer to the bow. We had already talked about how to use the clicker (and the concept of full extension, and how to get there, etc.), so I asked him to draw and anchor, this time with his eyes open so he could watch his clicker as he settled in. I then touched his elbow and



A "fly away elbow" leads to a . . . . . pluck.

asked him to move it in an arc backward. When the clicker fell from the point, he executed an excellent release and followthrough with a little gasp. The gasp wasn't for nothing. I had asked him to not shoot the arrow.

Now this young man had quite good archery form, had done myriad clicker checks, etc., but I don't think he had ever experienced the power of his shot from full extension. He executed shot after shot (blank bale) with good line, full extension, no pluck, and a good followthrough. He also was smiling through the entire exercise. This was not a "miracle cure." I know everyone (including me) wants a miracle cure, but as in all things worth doing, lots of work will be done before he has fully integrated what he learned into his shot.

An archer's shot has many parts. If it is practiced without being complete, the result is practice frustration. A correctly set clicker is one of those points necessary for a complete shot. (Why do you think the most accurate recurve archers all use one?) A clicker set too far out will prevent a comfortable draw and anchor which then can be followed by a short extension resulting in a shot going off when the elbow is in line, the back muscles engaged, and the arm muscles loose. Now, this student is still young and growing like a proverbial weed, so it is understandable that he had "outgrown" his clicker setting. What I want to elevate is the importance of getting full extension, in which the clicker playing just one role.

Coach Kim mentioned that once a month all of the young Korean archers in a school club stand up against a wall and have their full spans marked on the wall. Any archer whose span had changed more than a little needed at least a clicker adjustment, and possibly longer arrows, etc. You won't see Korean archers plucking.

If you are a young archer and have a coach, ask him/her to check your line and adjust your clicker accordingly on a frequent basis. If you are fully grown, get a coach to help you get to full extension. If you don't have a coach, use a video camera and record yourself shooting. Then sit down with the tape and your playback unit and have a good discussion with yourself about the importance of getting full extension.

### Compound Pluckers?

I have already indicated that compound bow archers can have plucking problems, too. The story of my early plucking experience as a beginner (above), was with a compound bow and finger release. In fact, because of the compound bow's letoff (its greatest asset as it provides more time to aim) it is easier to pluck a compound bow than a recurve. A recurve archer has his full draw weight in hand at full draw. A compound archer has only 20-40% of the peak draw weight in hand at full draw.

If, and it is a Big If, you have your bow set to your correct draw length, because of the low holding weight there is a form flaw that you can fall (slide, wiggle) into. Because the power of any particular recurve bow is determined by its draw length, one wants to draw it as far as good form allows. If you were then to rotate your navel toward the target the bow will rip the string from your fingers (because you would lose a lot of the bone-to-bone alignment of good archery form). The power of a compound bow is determined by the shapes of the eccentrics, the cabling scheme, etc. consequently one doesn't have to pull it into the equivalent of recurve bow form and most do not. This coupled with a low holding weight can allow you to rotate your torso until your navel is pointing between straight out from your body and toward the target. This rotation prevents any kind of good alignment or full extension and puts undue stress on the bow shoulder.

The cure for this I learned from Bob Romero (Yes, I was afflicted!), team coach of the bemedalled 2003 World Championships U.S. National Compound archery team. His recommendation to me was to add a step to my shot sequence: namely, "point your navel" or "rotate your torso" back away from the target so that I had good shoulder alignment to the target. My release now flies straight back again and I no longer find myself plucking.

Whether you are an archer or a coach or both, I hope this article has brought to your attention the role getting to full extension plays in getting a clean release and consistent followthrough. Now, let's go shoot some arrows!

**Steve Ruis** is Editor of *This Magazine*.

# Shoot Better with NLP

*Sports people talk about being 'in The Zone' almost with a sense of reverie. When you ask them what they did to achieve this almost mystical state of being, they'll often say "I don't know; it just came upon me." The top archers can achieve this state more easily and they use it to their best advantage, but for the most of us, it isn't that simple.*

*Isn't it true that some days of shooting are better than others? Some days it all just comes together as we want, does it not? Then, there are the other days, the days when we couldn't hit the side of a barn if we stood inside it. What's the difference between those times? What do we do differently on the days when it 'all just comes together' for us? We try using will power to get it back, but more often we just hang around and hope that those exceptional days come back again soon, especially on the day of our next competition.*

*How useful would it be for you to be able to switch off and on this mystical trance-like state of being 'in the zone' at will? Well, the good news is that you can and I'm going to tell you how to do it.*

The secret to access to The Zone is *state* or *mood*. The state you are in profoundly affects how you perform at anything. By learning to control your mood and having the ability to access specific moods or states at will, you can achieve far greater scores consistently.

Reaccessing emotional states is a relatively simple process and gets quicker and easier with regular practice.

Our behavior is dictated by our states. Our states are altered by how we use our bodies and also by the focus of our minds, hence archery instructors will tell you to 'concentrate solely on the gold,' or to 'think only of hitting the gold.' How many times have you shot badly and then gave yourself a hard time about it by calling yourself every name under the sun and then gone and done the self same thing again? These kinds of thoughts affect our bodies because the mind and body are inescapably linked: what affects one, affects the other. Therefore there are two ways of controlling our moods: one is through the focus of our minds and the other is through the use of our bodies.

In NeuroLinguistic Programming, or NLP, there are techniques for accessing specific moods and being able to anchor them so that we can reaccess them again quickly and easily. An anchor is a stimulus that triggers an unconscious response. Think of a favorite song; when you hear it, it takes you back years to another time and place, Recall the smell of freshly baked bread; where does that take you? You don't have to think about being transported to another time or place; it just happens. Well the

song and the smell are anchors.

What you are going to do is access a peak state of performance and attach a trigger to it so that whenever you want to reaccess that peak state, you simply have to fire off the anchor or trigger and straight away, you are there.

You can use the exercise as described below and if you can remember a time when you felt you were in the zone, add that in as well as the states of confidence, etc.

You might want to record the instructions onto cassette and then play it back for you to follow along. Alternatively, ask someone to read it to you slowly so that you take all the time you need to follow the instructions fully.

### The Exercise

Find yourself somewhere quiet where you can remain undisturbed for a while. What I want you to do is to take a few deep breaths in through your nose and out through your mouth and allow yourself to relax as fully as you can while standing up. Now, begin to walk around the room as if 'you owned it.' Ask yourself "How will I walk if I feel totally, incredibly confident?" Begin to walk in that way. Ask yourself, "How will I breathe? How will I hold myself (your posture)?" Adopt that way of breathing and that posture as you continue to move around the room for a couple of minutes until you feel those feelings in your body and mind. Ask yourself "How will I walk if I feel totally in control? How will I breathe and what will my posture be like?" Adopt those mannerisms too and, again, walk around for a couple of minutes as you feel those feelings as well. Ask yourself "How will I walk if I feel absolutely invincible? How will I breathe and hold myself?" Now adopt those mannerisms and walk and feel those feelings as before. Ask yourself "How will I walk, breathe, and move if I feel totally fantastic as if

***How useful would it be for you to be able to switch off and on this mystical trance-like state of being 'in the zone' at will? Well, the good news is that you can and I'm going to tell you how to do it."***



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I had just won the National Lottery or the National Championships?" Walk, move, and breathe as you would when you feel all these fantastic feelings coursing through your body. Now, close your eyes and remember a time when you did something exceptionally well and received the recognition you rightly deserved from it. Step back into that time and place and see what you saw there, hear what you heard and feel how absolutely and utterly fantastic you felt. Allow yourself to go back into those feelings fully, so that you feel them again now, as strongly in your body as you did the last time. Now, imagine a circle on the floor in front of you about three feet across, give it a color, and it will be a color that for you represents all those powerful feelings of total, incredible confidence, absolute invincibility, being totally in control, and feeling absolutely fantastic.

Now, step into that circle and take fully all those incredibly powerful feelings with you so as you stand in the circle, you have the feelings of total incredible confidence, total control, absolute invincibility, and

*Continued on the Next Page*

feeling totally fantastic coursing through your body. Give these feelings a color and see this color spinning all around you. Give it a sound, just as when something is incredibly powerful it has the hum or buzz of power to it. Crank these incredible feelings all the way up until your body is almost vibrating with the intensity.

Now, step back out of the circle and leave all those feelings spinning in there. Imagine the sound of them as they spin around and around; see the color of them there in the circle. Step back into the circle once more and feel those feelings immediately begin to course through your body and mind, making your skin crackle with their intensity. Now, step back out of the circle again, once again leaving the feelings spinning in there.

Now, physically bend down and pick up the circle with all those feelings spinning around inside it. Imagine holding the circle in front of you and hear the sound it makes with its power. Now imagine that you are shrinking it down, down, down until it's the size of a bracelet and as it gets smaller, the intensity of those feelings within it get concentrated and even more powerful and stronger. Now, hold the bracelet with all those powerful feelings still inside it, in one hand and physically go through the motions of slipping it over your other wrist like you would a bracelet. As you do so, feel once again all those incredibly powerful and strong feelings coursing through your body as you gently squeeze the bracelet onto your wrist.

Now, let go of your wrist and take a deep breath, open up your eyes and come on back out to the real world. Take hold of your wrist where you are 'wearing' the bracelet and gently squeeze and you will feel these incredibly powerful feelings begin to come back into your body and mind. Hold onto your wrist gently until those feelings of total, incredible confidence, incredible invincibility, being totally in control, and feeling absolutely fantastic peak again and again.

That combination of feelings is now firmly anchored onto your wrist and all you have to do to reaccess them fully is to gently squeeze your wrist in the same place with the same pressure as before.

The next time you go to the shooting range, shoot a few rounds of arrows and notice your accuracy and score and then gently squeeze that wrist, and allow all those feelings to come back fully. Then shoot a few more rounds of arrows and compare the two results. Don't think about it, just do it. Fritz Perls, the devel-

oper of Gestalt Therapy used to tell his clients "Stop thinking about it and come to your senses."

Combine this exercise with the ones from *Shoot Better with NLP, Part 1* and prepare to be truly amazed.

*Shoot Better with NLP, Part 1* appeared in the previous issue of *AFm*. Ed.



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Lessons from the Martial Arts

# SAME (Se-meia)

## —The Ability to Project Oneself to the Target

*If you have read the book Zen And The Art of Archery by Eugen Herrigel, he refers frequently to how the Japanese Archer or Kyudoka has the ability to project himself onto the target. Herrigel believed that it was an almost supernatural ability, some type of astral projection that made the master archer such a deadly adversary in combat as well as competition.*

*Herrigel did not completely understand that this is a learned skill that anyone can master. It is not from the realm of black magic or Zen transcendence. In his book, his teacher tried and tried to teach this principle to Herrigel, the only problem was that Herrigel was an academic and therefore was always seeking a logical explanation or reason. To the Samurai warrior, there is no time to ponder the logic or rationality; men of action do not have the luxury to over think many things. You just learn that you do what the teacher teaches. Nothing more, nothing less. Enlightenment is a luxury of surviving to old age and pondering how and why you got there.*

***“These concepts work. There is a 2000-year history of their effectiveness.”***

This skill has a name. The Japanese call it *same* (se-meia). Same is a term used most frequently in the arts of sword combat. It means to project your *ki* energy or your life energy literally right through the opponent. *Ki* is basically the life force that flows through all living things. (Sounds a lot like George Lucas’s “the Force.”) The martial artist learns to tap

into this energy within his own body and move it from limb to limb or body to weapon. Your *ki* is centered in the area the Japanese call the *hara* about 1-2 inches below your navel. When the Karate practitioner punches a stack of bricks and miraculously shatters them without breaking even a single bone in his hand, he had just focused all of the energy in his body to travel out through his fist into the target.

Many times *same* is viewed as a swordsman who is strong or to project a strong presence. It is the projection of inner energy that wakes up a crowded room and silently announces that you have arrived. Everyone who sees it cannot help but to recognize it.

In the realm of sword skills, *same* is directed from the *hara* out through the eyes beyond the opponent. This gaze is called *enzen no menske* or “to gaze at a distant mountain.” The common mistake people make is to stare directly into the eyes of their opponent. If you fix your vision there, you cannot see what the rest of his body is doing. It is like staring out through a window screen. If you focus your vision on the screen, you lose sight of everything else. If you gaze through the screen you see peripherally out to about 140 degrees, out to the horizon, and things immediately at your feet. *Enzen no menske* gives your *ki* energy a path to follow. Have you ever

Recurve Tech 200

heard about aiming your bow about three feet beyond the target? It is the same thing.

In archery, we endlessly discuss whether we should be looking at the sight or looking at the target. *Enzen no menske* along with *same*, brings the target to you and your energy to the target. I believe that this is the true meaning of following through on the shot or on the sword cut. The real object is to tap into your inner energy give it direction and let it loose. Everyone who has shot a bow for some time has felt this. It is when you have one of those shots that just happens almost by surprise and when the arrow hits the target the whole shot just feels right, strong, and perfect.

So how do I develop *same* and learn *enzen no menske*?

It is actually quite easy. When you are ready to begin the shot sequence just concentrate and feel the energy of your body building up in the *hara* and exploding up your body and out through your bow hand through the center of the target and beyond the horizon. Work on gazing through the sight through the center of the target to the same point you have directed your *same*. You can also practice these skills without your bow, using mimetics and practicing the motions and actively visualizing that you are shooting the perfect shot utilizing *same* and *enzen no menske*.

When I tested for my second-degree black belt in *Iaido* (swordsmanship), I failed my first attempt. The *kata* or skills were perfect, but my *enzen no menske* was off and my *same* was not in the right place. The whole test came down to not what my body was doing but where my eyes were and where my *ki* energy was directed. That misdirection of energy forced my cuts with the blade to be off target by a few inches.

These concepts work. There is a 2000-year history of their effectiveness and many thousands of written pages in both the ancient and modern martial arts worlds attesting to their importance and relevance.

The modern western equivalent is "being in The Zone." You can see it in the eyes of athletes. That purposeful, powerful gaze that tells everyone around you that you are here and you are performing at 100% or higher. In this state your mind, spirit, and body are in perfect balance. In Kendo the term is *ki ken tai ichi* (spirit, sword, body as one). The hands and arms do not direct the sword; the sword is a part of the swordsman just as his mind, body, and spirit are all parts of the whole. The swordsman directs his focus and energy and the sword follow. No thought, no hesitation, no mistakes.

Archery is the same. Direct your focus and energy to

the target and the bow shoots itself. The arrow finds the desired target; it is not forced to it. The bow, the arrow, and the target all become an extension of the archer just as the sword becomes a part of the swordsman. The hand does not hold the sword or the bow, the sword or the bow become the hand.

The Zone is a very elusive place; it only exists in the spirit of the individual. The only way to get there is to train with all your heart, be pure in thought, action, and intention in every aspect of your life and *ki ken tai ichi, same*, and The Zone become a part of who you are and not just a gimmick or tool to be used on competition day. I believe that you can develop yourself to the point that you live in the zone every minute of every day and everything that you do will have purpose and meaning beyond just living and doing.

This is my personal quest. To live my life where every action, every thought, every moment has meaning and that nothing is taken for granted. It is a huge struggle for me to be that attentive to even the most mundane daily activities like grocery shopping or brushing my teeth. It is much easier to be in The Zone when stress levels are high like working in the *dojo* with a razor sharp sword where the risk of serious injury is always present or on the archery field shooting a single elimination match. The challenge is to balance those aspects of life, the ordinary and the extraordinary, and have that presence, that *same* always.

*Ki yumi tai ichi* spirit, bow, body as one.

*Enzen no menske* to gaze at a distant mountain.

*Same* focus and direction of internal power with the external world.

*Ichi go ichi* I one encounter, one chance.

**John Vetterli** says, "I live in Salt Lake City Utah. I have been a professional Firefighter since 1987. I am married and have a daughter and son. My martial arts history began in 1984 with Osaka Sensei in the Karate form of Wado Ryu (the way of peace or harmony). Osaka Sensei instilled in me the desire to always know why we do things not how. I began the study of Eishin Ryu Iaido (the art of the Japanese sword) in 1998 with Harris Sensei. A Zen Buddhist Priest who finally taught me how to focus. This has been a profoundly life changing experience. I am a partner in the Zen Bu Kan Dojo with my two friends Dick and Jason. We teach Iaido and Kendo."





Steve Ruis

# Traditional Archery

## A Newbie Does the Nationals

*It is one of archery's best hidden tournaments and I was invited to compete. I am talking about the NAA's Traditional Nationals.*

This year's event was the tenth year of this tournament, which was created for traditional archers to test themselves against the rounds that had been shot throughout the long history of the NAA. From the NAA's founding in 1879 until well into the 1940s, everyone shot longbows. And the rounds shot were the traditional English rounds: the York Round, the Hereford and Columbia Rounds, and even an occasional American Round or two. The new tourney's classifications have been Traditional Longbow (backed or selfbow but no fiberglass or modern laminates), Modern Longbow (laminated longbows), and Traditional Recurve (one piece or take down, but all wood). This year the Traditional Recurve division was expanded to allow short stabilizers, sights (if directly fixed to the bow-no extenders), and aluminum arrows but no more modern materials (carbon, modern string materials) and no clickers.

The tournament is held on the weekend immediately prior to the NAA Nationals which were in Colorado Springs, CO this year. It

rained during the 'main event' but we had absolutely gorgeous weather for the traditional tournament.

Official practice was available Friday afternoon and I took advantage of it to check my points of aim (you are allowed artificial points of aim but I couldn't get them into the trees behind the targets). I am really glad I did check my points of aim as all of them were different from those I had worked out in California! (Was it the elevation? The thin air?) Please real-



*The shooting line for the Clout Round.*

ize that I am primarily a compound bow shooter and I had never shot a longbow in earnest. At last year's championship, Brian Luke talked me into competing this year and we agreed he would build me a bow to my specifications (well, he actually talked me out of what I wanted into something that had a chance of success). The new bow came just two months prior to the competition, so I didn't have a huge amount of time to practice. Having been known to need a backup bow from time to time, I purchased an inexpensive longbow as a practice/backup bow, so I did have more than the two months to prepare.

I now have even more respect than I used to have for those archers who choose to shoot traditional equipment. The rounds we shot were a York Round on Saturday (72 arrows at 100 yards, 48 arrows at 80 yards, and 24 arrows at 60 yards) followed on Sunday by an American Round (30 arrows at 60 yards, 30 arrows at 50 yards, and 30 arrows at 40 yards) and a Clout Round (36 arrows at 165 yards). Yes, I said yards, even though the meter goes back to the 1700s, it is a more recent innovation in archery.

I have to tell you that shooting wooden arrows out of a selfbow at a four foot round target 100 yards away is a test! One of my better ends of six arrows found two arrows in the grass directly in front of the target, one arrow in the little sign under the target (the target number), one arrow in the target, and two arrows in the grass behind the target—all lined up in a row; I had good line but lousy control over my draw length! Now this is the standard FITA 122 cm target (122 cm = 48 inches by the way), but we used the



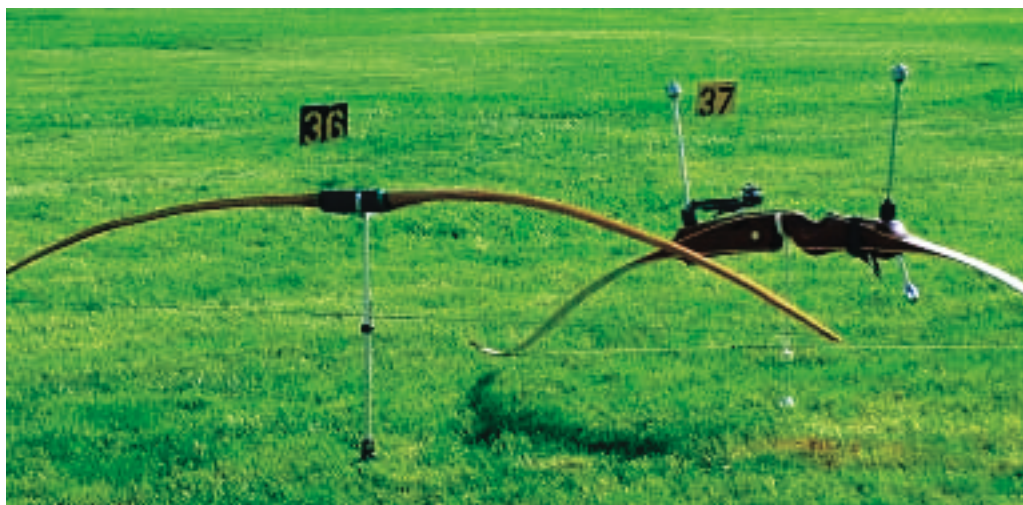
*Our hardworking Judge was the inestimable and indefatigable Jane Johnson.*

old scoring system (9 for gold, 7 for red, 5 for blue, 3 for black, and 1 for white). This enables you to compare your score with the scores from the “old days.” I won't tell you my score (it is posted on the NAA's web site, but I am not going to make it easy for you) but I would have been in the middle of the pack . . . in 1879.

From someone who has a goal of “holding the red” at 90 meters in a FITA round with my compound setup, this was a humbling experience . . . and about as much fun as I have had at a tournament in decades!

Sunday morning the American Round went by amazingly quickly and after the lunch break I found that I was, well, pooped. I hadn't shot in competition in a while and, in case you don't know, there is no letoff on a longbow. Having 35 pounds “in hand” (at 32 inches) was about twice what I was used to. But since everyone knew I was from California and I didn't want to be accused of being a ‘girly man,’ I agreed to have a fling at the clout.

The men's clout flag is 165 yards out and you have to get within 20 feet of it to score. With my 35 pound draw weight, it was clear I didn't have enough oomph to score, even with my lightest arrows, so I pulled out a longbow I had brought along just to show. It was an



*New this year was the Traditional Recurve featuring sights, and short stabilizers, but no clicker.*



A happy group of traditional archers. (That's Brian Luke playing peek-a-boo with the camera!)

English longbow, complete with horn tips, but it also had a 45 pound bow at 28 inches, clearly out of my league. I somehow managed to pull it to almost full draw and score some arrows (most of my misses were too far!).

By the end of the two days, I was . . . let's just say 'quite tired' . . . and happy. I had a ball. I would be remiss if I didn't mention that Norm Graham and Brian Luke doubled up and shot two styles. This means they shot a *double* York, a *double* American, and a *double* Clout Round. Now, they had a real excuse for being tired!

A small medal ceremony followed in which Darryl Pace, then NAA President and a two-time Olympic gold medalist, handed out the medals. Now that doesn't happen at too many field tournaments.

This is a tournament that is challenging, interesting, and a blast. I was a little fearful that people might be, well, . . . a bit stuffy (period costumes *are* allowed) but that feeling was allayed immediately before the first arrows on Saturday when a participant said there was a tradition of a couple of side competitions: one for the "ugliest score of one" and one for the most arrows "in the green" (green = grass). I am not afraid to say that I was very competitive in both of those competitions: I had an outside-in line cutter for a score of one that got me a share of first place in the "ugliest one" contest and I took the "most greens" award outright. Norm Graham, former NAA President and guiding light behind this tourney is making up a trophy for the

"most greens" competition of a piece of Astroturf with miniature arrows embedded. I intend *not* winning the award next year!

I invite all of you traditional archers out there to join us at the Traditional Nationals in 2007. It will be, once again, in Colorado Springs, the weekend before the NAA Nationals. Check the NAA's website, [www.usarchery.org](http://www.usarchery.org), for dates and forms.

You will have fun; I promise.

**Steve Ruis** is a newbie traditional archer who also happens to edit this Magazine.

See the next page for "Scoring the Clout Round" Ed.

*Continued on the Next Page*

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# Scoring the Clout Round

The Clout Round was developed as a test of archers shooting over castle walls. And, as you can imagine, the arrows (six per person per end) are scattered over quite a wide area. I imagined that scoring each end was going to be interminable, but it wasn't. Each end took less than five minutes to score. Here is how it was done.



The key to scoring the Clout Round is a rope or cable attached to the flag. It is marked off in four foot lengths. If you get within the first four feet of the flag you score a five, in the next four feet, you score a four, and so forth for three, two, one, and zero.

One person attends each scoring zone on the rope while the rope is swept through a 360° circle. Each person pulls those arrows whose impact points are in their zone (*see below right*). Once the circle has been swept and all of the scoring arrows pulled, the arrows are laid on the rope for scoring and retrieval (*see below left*).



When the scorers call your name, you walk the rope and claim your arrows, calling out the scores they achieved (under the watchful eyes of your competitors, of course). That's me, background right, looking for my nonscoring arrows. (It's gauche to call them "misses," don't you think?)

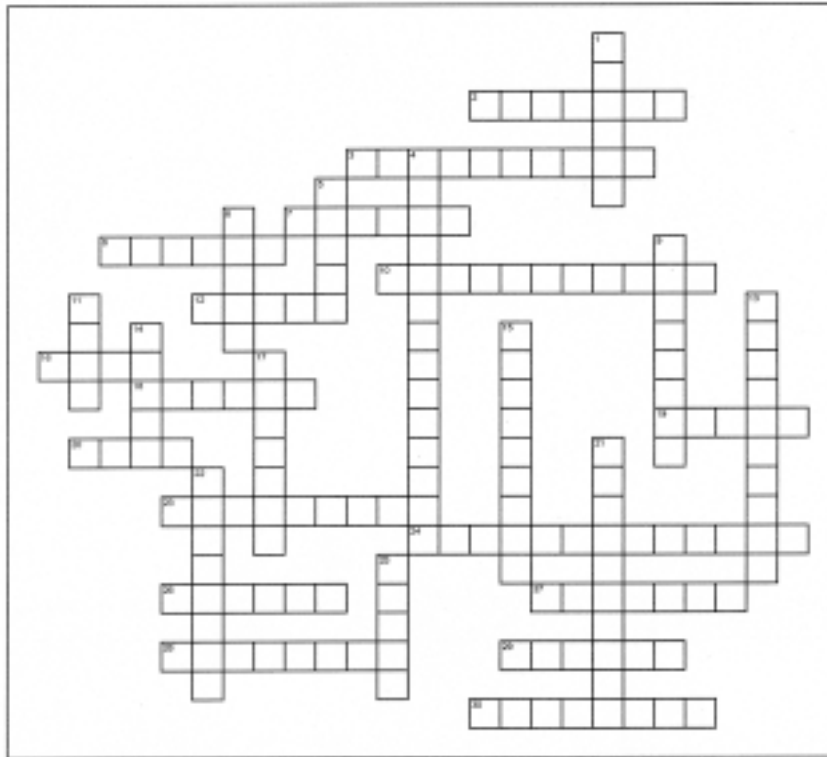
I think this would be a fun round for youth archery programs (the target butts and faces are quite inexpensive)!

# THE BARE(BOW) FACTS CROSSWORD

Over the years, the number of archers in the NFAA Barebow Division has declined. That is not to say that the expertise and dedication of those who still endeavor to compete in that style of shooting have changed. There may not be many barebow archers at tournaments, but the competition among them is as intense as any other division in archery. Test yourself by trying this crossword puzzle and learn a little bit about the world of barebow archery.

Solve the crossword using the list of words and the clues. There are no apostrophes, accents, or dashes.

See Page 44 for the Key!



memorized  
anchor  
vertical  
onehalf  
pointon  
higher  
servingstrands  
instinctif  
Marshall  
Travis  
fishtailing  
below  
drawlength  
thumb nail  
rear  
crawl  
Kibel  
porpoising  
sansmire  
Shelley  
lowers  
tilt  
forty  
Korby  
larger  
stringwalking  
onecolor  
ontop  
Hughes  
Clem

## Across

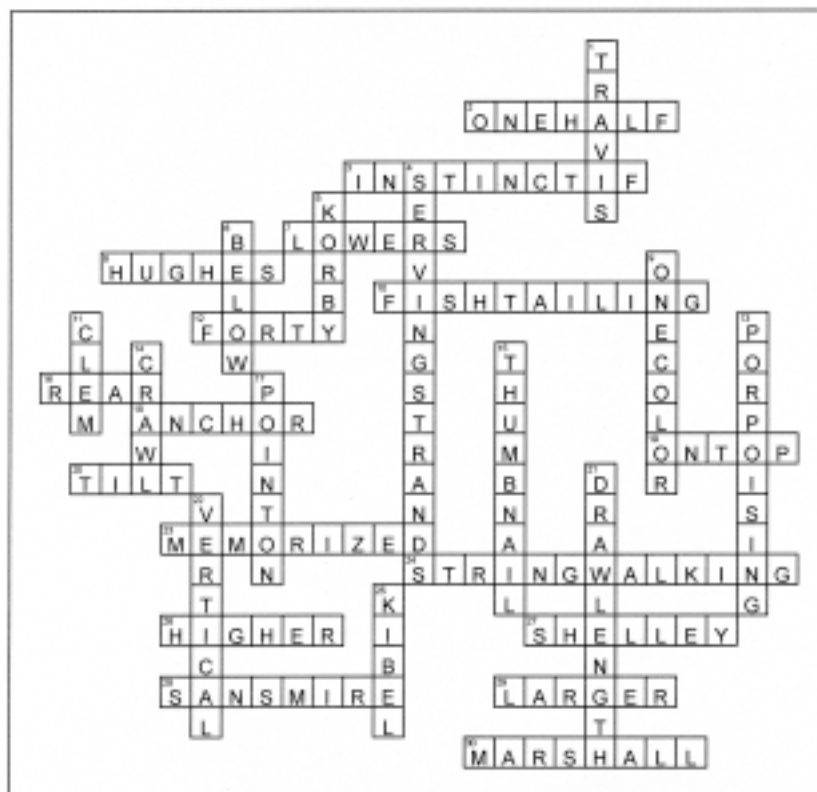
2. To "balance" the cams/eccentrics for barebow shooting you should move down the string \_\_\_\_\_ of the max distance you shoot for.
3. French for "barebow".
7. Increasing the tiller on your compound bow \_\_\_\_\_ the nocking point.
8. American barebow champion of legend.
10. this can be eliminated when tuning simply by adjusting the poundage up or down.
12. For best "arrow flight", most barebow shooters tune at \_\_\_\_\_ yards.
16. "sight" which barebow shooters are setting when moving up and down the string with their tab.
18. Common barebow \_\_\_\_\_ is to place first finger at the corner of the mouth.
19. The "spot" normally sits in this position relative to the tip of the arrow.
20. The three "T"'s are head turn, tip, and \_\_\_\_\_
23. written memoranda is forbidden for barebow shooters, therefore all their "information" must be \_\_\_\_\_
24. You are \_\_\_\_\_ when you are moving your tab up and down the string for each distance shot.
26. if you hit LOW, you move your tab \_\_\_\_\_ on the bowstring.
27. American barebow couple, Bruce & Gloria \_\_\_\_\_
28. French for "unsighted" (really two words)
29. to shoot barebow, one should select cams/eccentrics one to two sizes \_\_\_\_\_ than their drawlength calls for.
30. IFAA Barebow champion many times over, Brad \_\_\_\_\_

## Down

1. Long-time barebow shooter from Indiana, Louis \_\_\_\_\_
4. what stringwalkers "count" when determining the distance the move up or down the string from the nocking point.
5. Barebow teacher of numerous barebow champions, Byron \_\_\_\_\_
6. Location of bubble and any draw check mechanisms must be \_\_\_\_\_ the arrow
9. bowstring for shooting barebow must be all \_\_\_\_\_ (two words)
11. Longtime barebow competitor. Won the 2006 NFAA Indoor Men's Senior Barebow title.
13. up and down movement of the arrow while in flight is called \_\_\_\_\_
14. barebowers call the distance they move up or down from the lower nocking point their "\_\_\_\_\_"
15. This is allowed to grow by most stringwalkers.
17. When you are against the nock and you are hitting dead center, this distance is your \_\_\_\_\_ distance. (actually two words).
21. When stringwalking with a compound, this can vary as much as one inch.
22. Most important feature for arrow rest flex when shooting barebow is the \_\_\_\_\_ flex of the rest.
25. Won the Championship Barebow title at the 2006 Vegas Championships.

# THE BARE(BOW) FACTS CROSSWORD KEY

See Page 43 for the Puzzle!



memorized  
anchor  
vertical  
onehalf  
pointon  
higher  
servings  
instinctif  
Marshall  
Travis  
fishtailing  
below  
drawlength  
thumb nail  
rear  
crawl  
Kibel  
porpoising  
sansmire  
Shelley  
lowers  
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larger  
stringwalking  
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ontop  
Hughes  
Clem

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For an index, go to [www.archeryfocus.com](http://www.archeryfocus.com) or see Vol.5, No.1 for an index through the year 2000.

*There are limited numbers of issues available from AFm's first four years.*

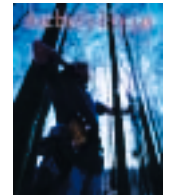
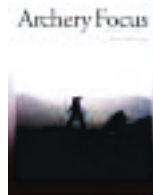
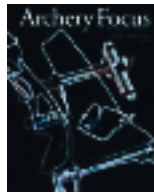
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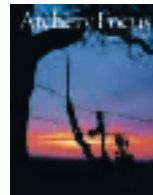
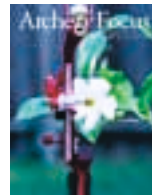
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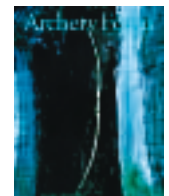
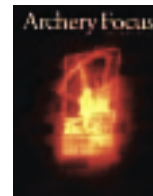
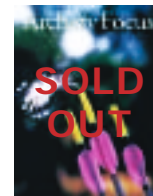
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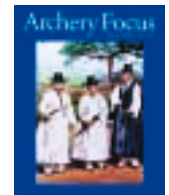
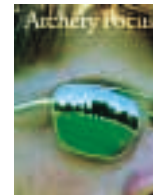
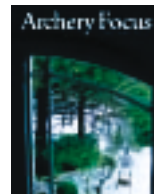
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**2000** Volume 10, No. 1,2



