Tuning for Barebow

By Rick Stonebraker

FOREWORD

This manual is a guide to basic barebow tuning and only addresses the most common styles to help archers get started tuning their bows and arrows. You should adapt the techniques described in this manual to your chosen style. More complex matters are left to the reader's experimentation.

Barebow tuning is not as straight-forward as recurve tuning due to the many different styles of barebow archery. There are significant differences in where a barebow archer anchors and where they place their fingers on the string. These differences separate Face Walkers from String Walkers and from Traditional archers. Underlined terms are explained in the Glossary on page 15. See Appendix on page 16 for various styles and advantages/disadvantages.

An important part of archery is the equipment. The skill of the archer is also important but if the bow is not properly tuned, the archer's skill is obscured. Tuning may be achieved in a short period but in most cases, will take longer. The archer that puts the most time and effort into equipment will have the most success, which will be time well spent.

There are several steps to tuning a recurve style barebow. Always set the brace height as specified by the manufacturer before you set the nock- point. Changing the brace height will affect the proper nock point, which is the starting point of tuning a bow. Use the chart on page 14 to record various information and always verify when reassembling your bow.

SECTION 1: Equipment

1A: Setting the plunger

The plunger has a spring controlling horizontal movement of the arrow. When tuned properly, the plunger will prevent the arrow from moving in past center in case of an improper shot.

1B: String Alignment

Some archers like to adjust the plunger in the Center-Shot position (figures 1,2). That is okay if you plan to use the "Tuning for Tens" method designed for recurve. Various archers learned that placing the arrow off-center by half the diameter of the arrow (figure 3) is a better start to barebow tuning. Some archers have even gone further away from center shot -- do not be afraid to experiment! Adjust center shot to adapt to your particular style. Figure 4 is for left hand archers.

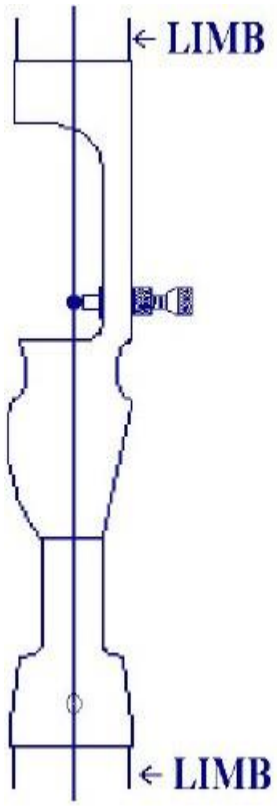


Figure 1

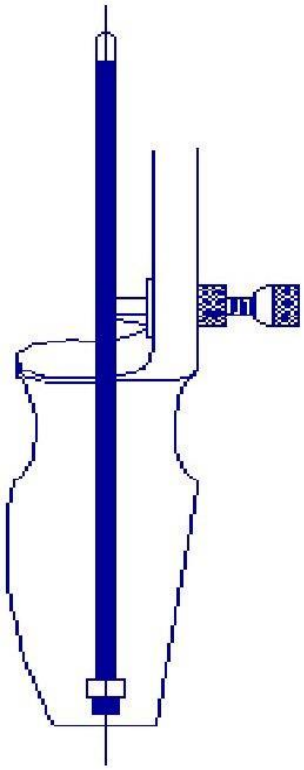


Figure 2

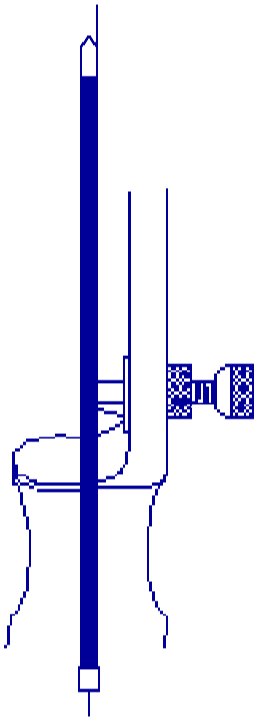


Figure 3

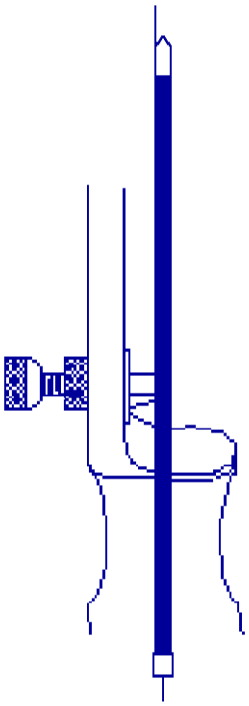
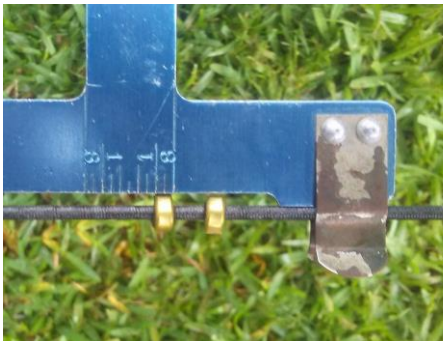


Figure 4

1C: Nock Point

The figure on the right is a starting point. Brass nock-sets can be moved up and down until the correct position is determined during the tuning process. More information on setting the nock point may be found in Section 3 on page 6.

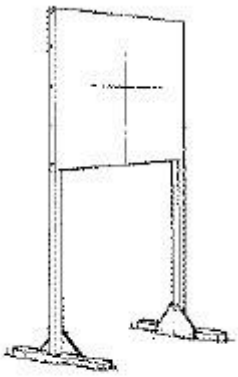


SECTION 2: Paper Tune Setup

2A: This section will:

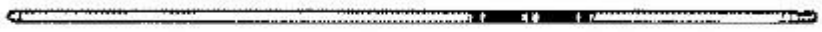
(i) Determine if the nocking point is correct. (this is correctable)
(ii) Determine if the arrows are the correct spine. (this may or may not be correctable

Why a bare shaft? A bare shaft is an arrow without fletching. If shot at short distance through paper into a target matt, a bare shaft 'may' reveal improper movements since aerodynamics will not have time to straighten-out the flight of the arrow. It will fly through the paper at an angle creating a tear indicating the tune is incorrect. Fletching would straighten out the arrow's flight and make this first stage of tuning more difficult. You may need several bare shafts to establish a pattern to evaluate before beginning the next step.



TUNING FRAME

The Tuning Frame consists of a frame holding a sheet of paper in front of the target matt. Any paper that tears cleanly will work. Move the tuning frame at least an arrow length in front of the target matt so that the arrow passes completely through the frame.



BARE SHAFT

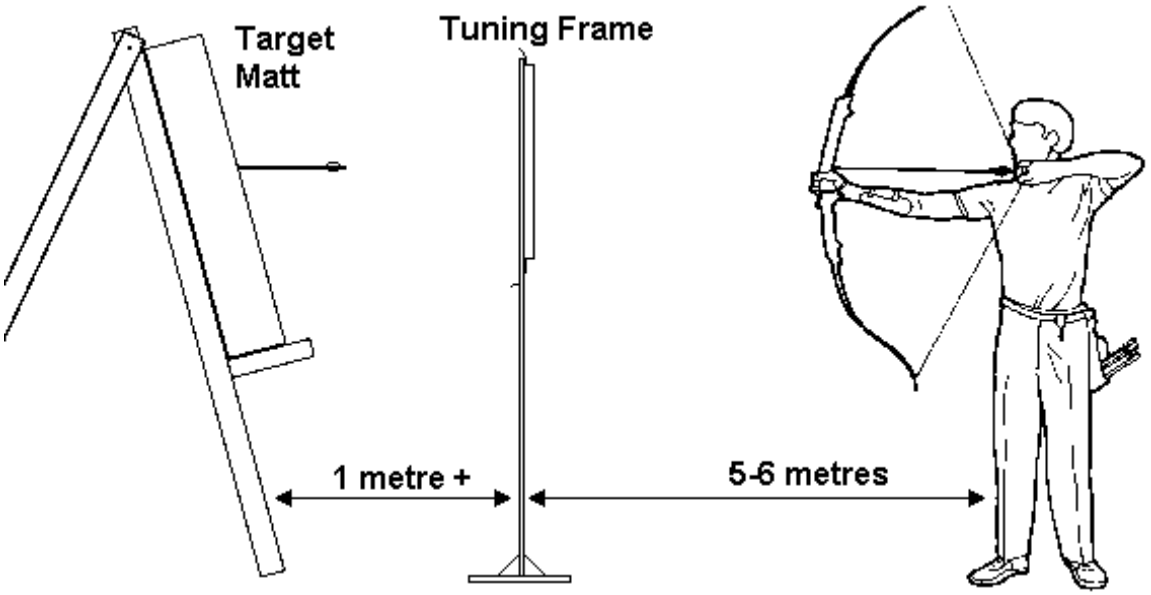
ARROW

2B: METHOD

The nock point must be set so the thrust of the bowstring pushes the arrow neither up nor down but straight-forward. Shooting too close to the frame may give improper feedback; 5-6 metres is sufficient.

The target matt should be 1 to 2 metres behind the frame to allow the bare shaft to pass completely through and clear the paper before it hits the target matt. Shoot the bare shaft though the paper about shoulder height to allow for a parallel flight. The shape of the tear in the paper will indicate the current tune of the bow.The paper-tear may also have both a vertical tear and a horizontal tear component.

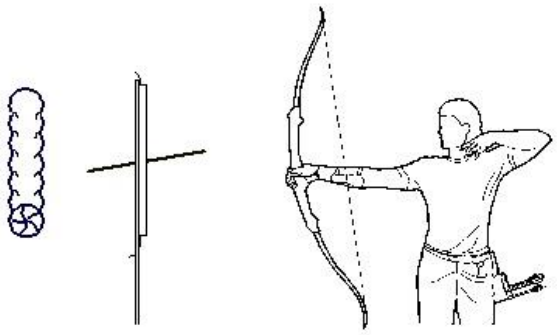
We will adjust for the vertical tear first.



SECTION 3: Setting the Nock Point

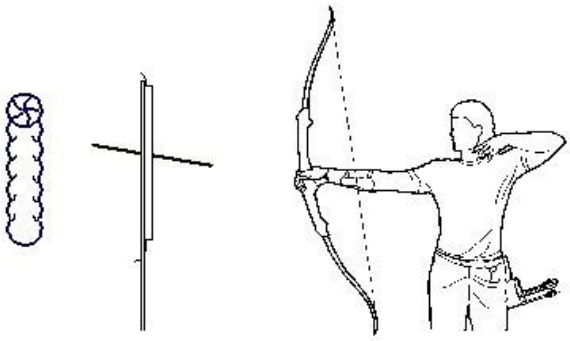
3A: Bare Shaft Tears Paper UP

TEAR is UP. The bare shaft goes through the paper with the point low and the tail high. The nock point is too high. Move the nock point lower down the bow string.



3B: Bare Shaft Tears Paper DOWN

TEAR is DOWN. The bare shaft goes through the paper with the point high and the tail low. The nock point is too low. Move the nock point higher up the bow string.



NOTE: You may also experience a diagonal tear which is common. Fix the nocking point first and the diagonal tear should mitigate to a horizontal tear. Verify your brace height, and then adjust the nock point until the tear is neither up nor down. Shoot as many bare shafts as necessary to be sure of the consistency of your results. Each step in this process should be completed before beginning the next step.

SECTION 4: Horizontal Tear

An improper release will cause the shaft to act stiffer and create a larger tear. Take enough shots that you are satisfied the release is not affecting the results.

4A: Right-Hand Archer

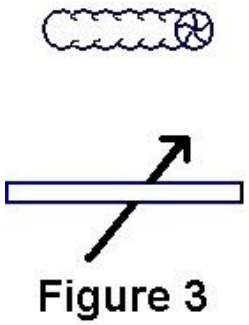


Figure 3

Figure 3 illustrates a left tear.

The arrow point entry is to the right and the nock is to the left end of the tear. The shaft is too weak.

If the tear is 1 to 3 inches, the shaft can be stiffened by decreasing the point weight, decreasing bow strength, or shortening the arrows. If the tear is greater than 3 inches, the shaft is too weak. Select a stiffer shaft.

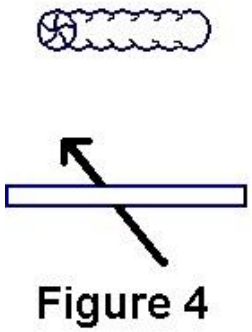
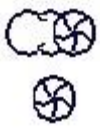


Figure 4

Figure 4 illustrates a right tear.

The arrow point entry is to the left and the nock is to the right end of the tear. The shaft is too stiff.

If the tear is 1 to 3 inches, the shaft can be weakened by increasing the point weight, increasing bow strength or getting a longer arrow. If the tear is greater than 3 inches, the shaft is too stiff. Select a weaker shaft.



A horizontal tear less than 1 inch is acceptable. A single hole is ideal for recurve archers.
For barebow, a slightly stiff arrow is better than a slightly weak arrow. Be careful trimming arrows. 3/8 of an inch can be significant.

4B: Left-Hand Archer

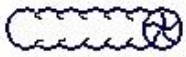


Figure 3 illustrates a left tear. The arrow point entry is to the right and the nock end is to the left in the tear. The shaft is too stiff.

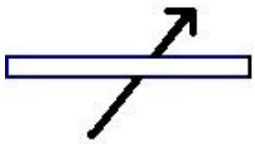


Figure 3

If the tear is 1 to 3 inches, the shaft can be weakened by increasing the point weight, increasing bow strength or getting a longer arrow. If the tear is greater than 3 inches, the shaft is too stiff. Select a weaker shaft.

Figure 4 shows a right tear. The arrow point entry is to the left and the nock is to the right end of the tear. The shaft is too weak.

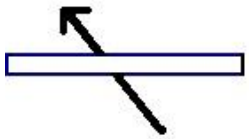


Figure 4

If the tear is 1 to 3 inches, the shaft can be stiffened by decreasing the point weight, decreasing bow strength or shortening the arrows. If the tear is greater than 3 inches, the shaft is too weak. Select a stiffer shaft.

A horizontal tear less than 1 inch is acceptable. A single hole is ideal for recurve archers.
For barebow, a slightly stiff arrow is better than a slightly weak arrow. Be careful trimming arrows. 3/8 of an inch can be significant.

4C. Checking the Paper Tune:

Shoot fletched arrows from approximately 18 metres/20 yards, then shoot a bare shaft or several bare shafts. For a right-hand archer, if the bare shaft lands to the left of the group, the arrow is stiff. If the bare shaft lands to the right of the group, the arrow is weak.

For a left-hand archer, if the bare shaft lands to the left of the group, the arrow is weak. If the bare shaft lands to the right of the group, the arrow is stiff. Within six inches either way can be an acceptable tune.

If you are shooting tight groups in the target, where the bare shaft lands may be insignificant!

SECTION 5. Plunger Adjustment

Right-hand Archer
If the arrows group to the left of the center, turn the plunger counter-clockwise weaken the spring pre-load.
If the arrows are to the right of center, turn the plunger clockwise to strengthen the spring pre-load.

Left-hand Archer
If the arrows group to the left of the center, turn the plunger clockwise to strengthen the spring pre-load.
If the arrows are to the right of center, turn the plunger counter clock-wise to weaken the spring pre-load.

Another method to move groups is to adjust the plunger in or out of center-line to move the location of the groups.

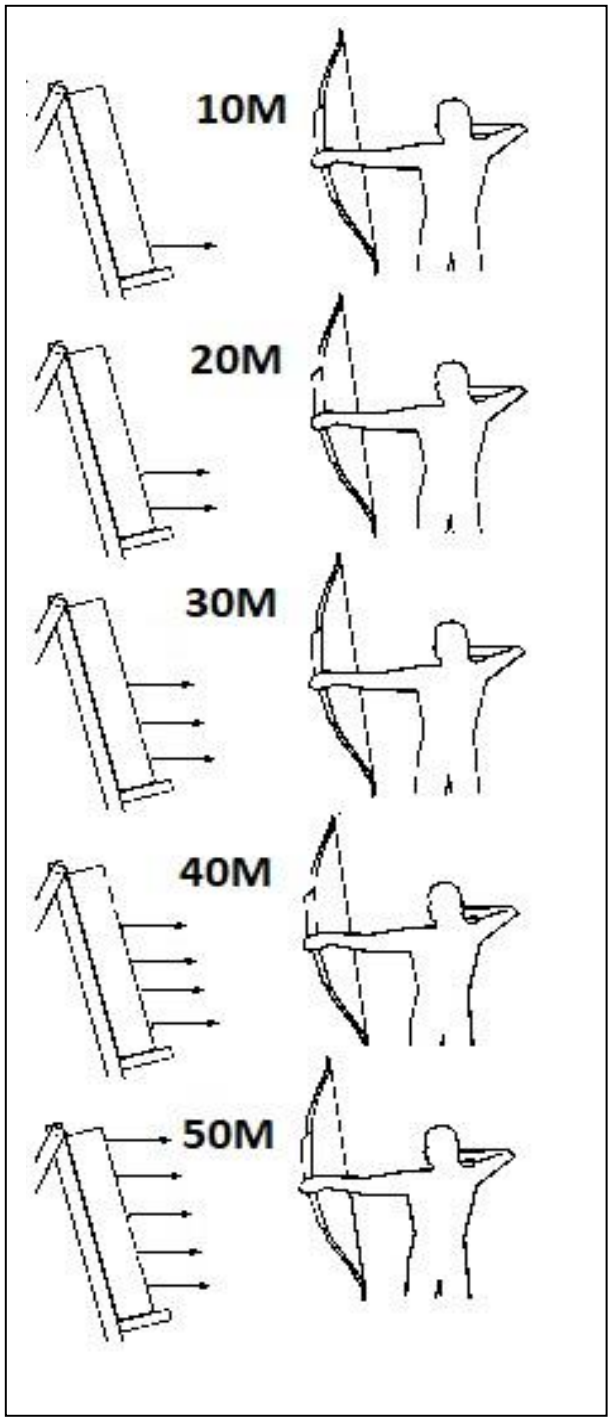
If you are shooting very good groups and neither method above works, adjusting your aim or anchor will move groups. This may change your style of aiming, which is one of the peculiar aspects of barebow shooting. Tuning barebow is not as straight forward as tuning a recurve bow. Shooting barebow is a skill in its own.

Note: Plunger adjustment provides fine-tuning relative to changing bow strength or arrow spine. It should be used when a tune is close to being good.

SECTION 6. Rise and Drop Method

6A. Rise Method.

If you have minimum space indoors or your backyard, try this method. It requires less than 10 metres/yards. The Rise and Drop method is intended for String Walking. Trad Style will not be affected by the Rise method.



Place a small target near the bottom of the target matt. Shoot from 10 metres and use your crawl method of aiming at that distance.

Shoot an end of arrows at each distance to create a reliable pattern.

Continue to shoot at the same small target at the bottom of the target. Crawl up your string at regular intervals (5-10 metres) while aiming at the target at the bottom of the matt. The arrows should impact higher up the target as you Crawl up the string.

By your 40 Metre Crawl you should still be on the target matt but be careful when you get near the top of the matt.

If the arrows drift to either right or left of center as you increase your crawl, more tuning may be required.

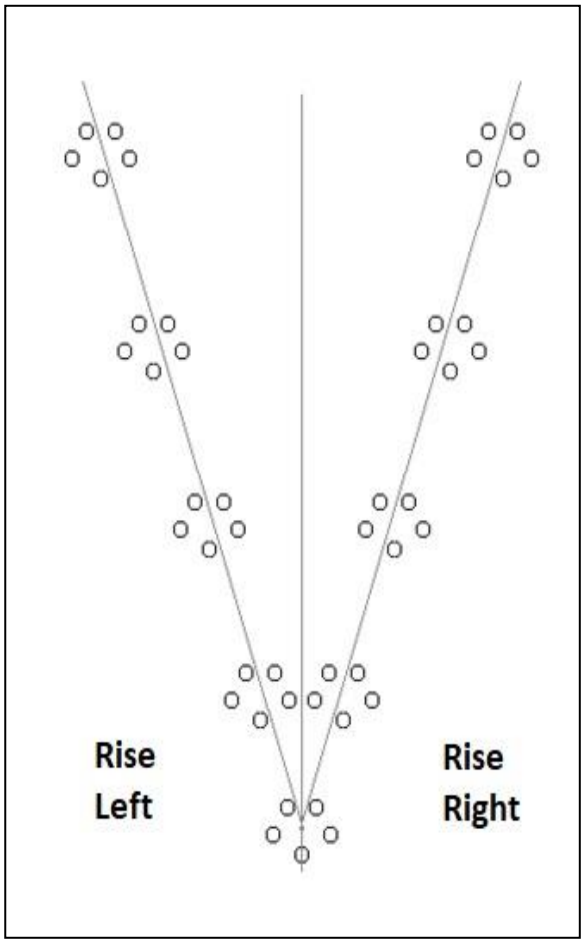
If the arrows rise in a straight line, the tune is good.

6B. Pattern and analysis of the Rise method

LEFT-HAND ARCHER

If the arrows fall left of center, stiffen the spring (CW) until the arrows are near center line or move plunger to the right of center-shot.

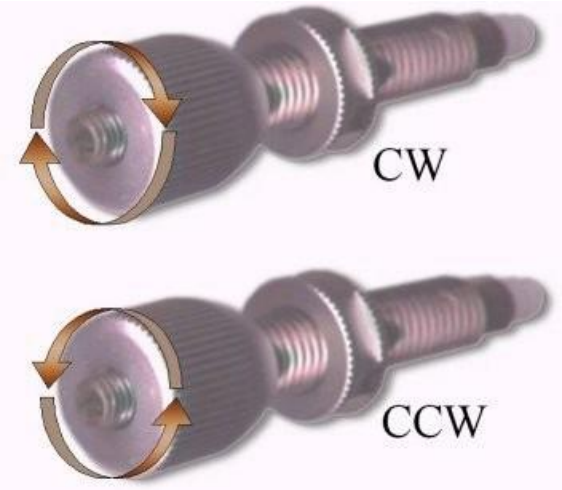
If the arrows fall right of center, weaken the spring (CCW) until the arrows are near center line or move the plunger left towards center-shot.



RIGHT-HAND ARCHER

If the arrows fall left of center, weaken the spring (CCW) until the arrows are near center line or move the plunger to the right towards center-shot.

If the arrows fall right of center, stiffen the spring (CW) until the arrows are near center line or move the plunger to the left of center-shot.



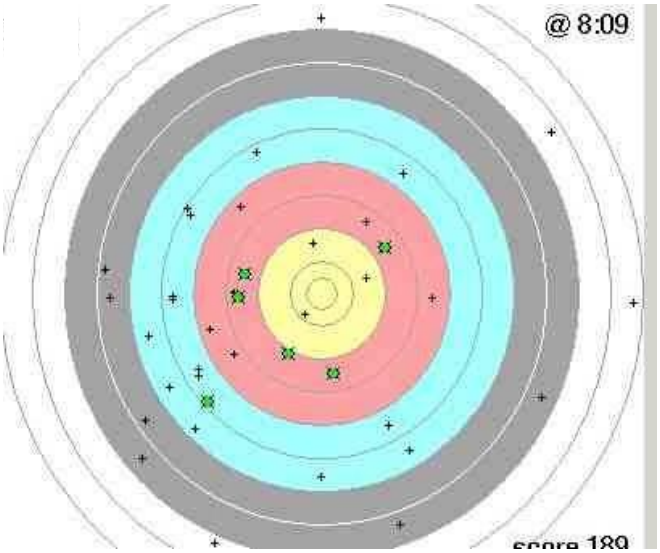
NOTE:
Approximately 1/4 turn (90 degrees) of the plunger spring will move the arrows 4 inches at 40 metres.

6B. Drop Method.
See full explanation in Tuning 4 Tens

SECTION 7: Tuning For Perfection

This is the beginning of "true" fine tuning. This can be done during normal practice but requires consistency to be effective.

Choose a long distance: 50/60 metres. Shoot 6 ends of 6 arrows. Take note of your plungers setting. Make a chart of the groups using either a drawing of the target or use an app from an App Store that visually plots the arrows location.



Stiffen the plunger (CW) 1/2 turn, shoot another 6 ends of 6 arrows, make a new chart for this group, then label it. Continue this process until the groups start to open up. Be sure to record the number of 1/2 turns on each chart.

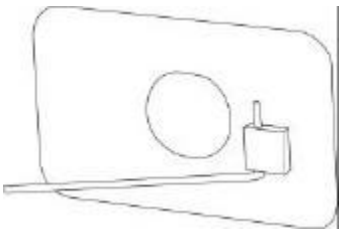
Turn the plunger back to the setting at the start of this exercise. Weaken the plunger by 1/2 turn (CCW), shoot another 6 ends of 6 arrows, make a new chart for this group, then label it. Continue this process until the groups start to open up. Be sure to record the number of 1/2 turns on each chart.

Review all the charts to find the tightest group and adjust the plunger to that groups' setting. This should be the best tune. If there is time and patience on your part, repeat the above exercise using 1/4 and 1/8 turns.

Excellence takes persistence!

SECTION 8: Indexing Nocks

Clearance issues can ruin an otherwise good tune and can give false feedback during the tuning process.



Are the arrow's vanes touching the arrow rest or a part of the shelf during a shot? Put some red lipstick on the support arm of the arrow rest. Shoot some arrows and if the vanes have red on them, they are making contact. Rotate the nock, shoot, rotate again, until there isn't any lipstick on the vanes.

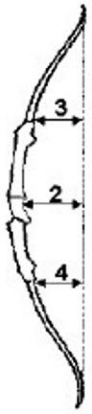
Orient nocks in the middle of the valley between fletch vanes may not be the best clearance for your arrows. You must find the midpoint away from the rest in both directions in order to determine maximum clearance. Turn the nock and shoot until the vane begins to rub. Make a mark on the shaft directly opposite the mold mark on the nock. This is where the rub starts for that particular vane.

Turn the nock in the opposite direction and repeat the process until the next vane begins to rub. Make another mark opposite the mold mark on the nock. These two marks indicate where the two vanes rub the bow. Turn the nock until the mold mark is directly in between these two marks.

This should be the point of maximum clearance. Index every arrow the same.

9. Record Important Information

DATE:	Outdoor	Indoor	Notes
Riser length			
Limb weight & length			
Upper tiller (#3)			
Brace height (#2)			
Lower tiller (#4)			
Length of string			
Number of strands			
Nock point			
Arrow brand & size			
Arrow length			
Point weight			
Type of nock			
Type of fletching			
Length of fletching			



Note from the author:
There are other methods of tuning but as a former recurve archer, I find this to be the simplest. This method tunes and gives an idea of how the equipment works. Much appreciation to Ross Elliott and Scott Williams for editing. Thanks also to Wesley Wilheim, Kim Hartman and Mark Hodges.

Rick Stonebraker

GLOSSARY

Anchor (anchor point) - Can be any specific point on the body used to anchor the archer's hand at full draw, most often a spot on the face, such as the corner of the mouth. The bow is drawn to that same location every time for consistency.

Arrow Rest - A device on the arrow shelf that holds the arrow.

Barebow - The process of shooting without any bow sight or release aid.

Bare Shaft – Absent of any fletching.

Brace Height - The distance between the string and the throat part of the bow's handle.

Centerline — A straight line through the middle of the bow handle and extends through the center of the limbs to the tips.

Centershot — The sight window is cut in or past the centerline of the bow. This may reduce the effects of the archer's paradox.

Fletching - The feathers/vanes that are utilized for stabilizing an arrow during its flight.

Gap shooting - Using the distance between the arrow point and the target as an elevation gauge

Instinctive Shooting — The most popular method of shooting traditional bows. Instinctive shooting is the ability to use hand/eye coordination to send an arrow where the archer is looking.

Nocking Point - A point on the bowstring where the archers would constantly nock the arrows.

Nock-Set — A metal crimp used on a bowstring to facilitate nocking the arrow to the same place every time. Can also be of thread, dental floss, plastic or heat shrink material.

Overspine (Stiff) — An arrow that is too stiff for the bow being used.

Plunger - Also known as 'pressure button'. Equipment used for correcting the arrow's tension during release.

Point of Aim — A sighting method where the archer uses the tip of the arrow by placing it on a certain object when shooting.

String Walking (Crawl) - Used by barebow archers. Fingers moved up and down string according to target distance.

Snap Shooting — A quick release without holding. Also a condition associated with target panic.

Spine — There are two types of spine: static and dynamic. Static spine is the stiffness, resiliency, and elasticity of an arrow shaft measured over a 26-inch span with a spine tester. In archery, it is the stiffness of an arrow: more stiffness equals greater spine. Dynamic spine is the bending characteristics of the shaft when it is shot from a bow.

Target Panic — An inability to release the arrow effectively. Releasing the string prior to full draw.

Traditional – In barebow terms, when the top finger on the string comes in contact with the arrow.

Tune — The process of getting a bow to shoot an arrow straight and quiet, removing fishtailing and porpoising

Underspine (Weak) — An arrow that is too flexible for the bow being used.

APPENDIX - Different styles of barebow anchors.


Fig. 1


Fig. 2

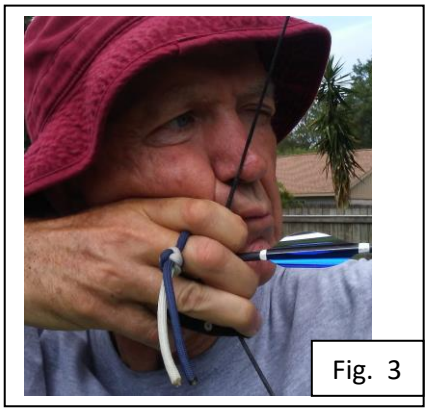


Fig. 3

Fig.1. String Walking. The distance is 20 metres with point-on center of the target. The anchor is under the cheekbone. 39# bow

Fig. 2. Traditional anchor where the top finger touches the arrow. Ideal for outdoors when reaching distance. 41# bow at 60 metres, the point of aim could be point-on center of the target. Depending on poundage of bow, aiming might be at the top of the target matt or even at the wind flag. This anchor can reach 70 metres if using the shelf of the bow riser on the target.

Fig. 3. Split finger technique to achieve distance. This anchor will reach 90 metres if using the shelf of the bow riser on the target. Gap shooting may be necessary as well.


Fig. 4

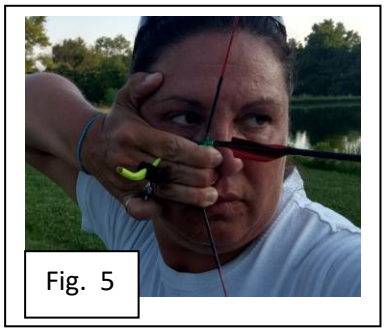


Fig. 5

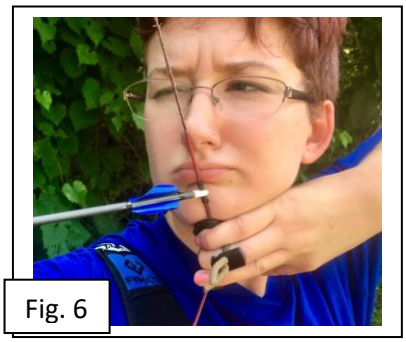


Fig. 6

Fig. 4. Another traditional style. Used indoors with large diameter shafts, heavy point weight and large fletch. Gap shooting might apply if arrow strikes above or below center.

Figure 5. High anchor, which gives excellent arrow stability. Suitable for close distances typically found indoors. Point of aim in center of target max 22 metres.

Figure 6. Under the jaw line. Would achieve long distance with a bow 40# or greater. For light poundage bows, this barebow style with point of aim would send the arrow a greater distance but due to this bow poundage of 32#, the maximum point of aim might be only 50m.