ADVANCED SHOOTING TECHNIQUE

Recurve or Compound

Understanding the Process

Archery Australia Inc
Coaching and Standards Committee

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INDEX

	Page
Introduction	**3**
Elements of Shooting	3
Step 1 Stance	**4**
Step 2 Nocking the Arrow	**8**
Step 3 The Drawing Hand	**9**
Step 4 Bow Hand, Bow Arm and Predraw	**12**
Step 5 Drawing the Bow	**19**
Step 6 Alignment and Anchor	**29**
Step 7 Holding, Aiming, Expansion and Release	**38**
Step 9 Follow Through	**44**
Step 10 Recovery	**45**

INTRODUCTION

The following shooting process is the only shooting process recommended by the Archery Australia Coaching and Standards Committee.

The process has been developed using the most efficient biomechanical model and is the shooting technique recommended for all disciplines of archery.

Elements of Shooting

There are 5 factors that effect good performance

- **Equipment Set Up**

  Ensure the equipment is set up correctly- refer to Archery Australia Recurve Set-Up and Compound Set- Up procedures.

- **Aim Steady**

  Having the ability to aim steady is totally related to the shooting technique using the correct biomechanical technique, although this is covered in the document, further information can be found in the Archery Australia coaching document - Biomechanics.

- **Release while aimed**

  You must maintain the focus on aiming as you release, it is common for the mind to wonder from aiming onto the release, as this happens the archer is no longer aimed correctly.

- **Shooting Technique - Drawing and holding the bow correctly and consistently**

  This subject is fully covered in the document, further information can be found in the Archery Australia coaching document - Biomechanics.

- **Ensure arrow has a clear path of travel from the string past the bow**

  This refers to creating clearance problems with the arrow either related to technique, anchor, release or equipment set up. This subject is fully covered in the document, further information can be found in the Archery Australia coaching document - Biomechanics, information on setting up equipment can be found in the Archery Australia Recurve Set-Up and Compound Set- Up procedures.

STEP 1 STANCE

The body can be divided into 2 parts the upper body from the hips up and the lower body from the hips down. The upper part of the body must maintain consistent position from shot to shot and must not change position as you change distance or shoot on uneven ground such as in field archery or clout.

The stance is the foundation of the shot and the stable platform for the upper part of the body. The upper part of the body must be able to change orientation (upper body angle) using the pelvis when changing distances or shooting on uneven ground. Moving at the hips which will allow the entire upper body to change orientation while maintaining alignment and ensuring the spine remains straight at all times.

The stance must be a consistent, repeatable and comfortable.

The stance should be such to ensure there is no twisting action of the body when coming to full draw. Any sideway twisting of the hips creates unnecessary tension particularly in the legs which is undesirable.

Ideally heels should be positioned just wider then the hips with the toes turned outwards to assist with balance, by varying the position of the feet can change balance.

At **full draw** the body's weight should be evenly distributed on both feet with 60%-70% of body weight taken on the balls of the feet and 30%-40% on the heels.

The spine must be straight, if a line was drawn down the centre of the body this line should pass down the neck and spine, through the centre of the pelvis, this position should be maintained throughout the entire shot sequence.

SQUARE STANCE

New archers usually start archery using the square stance. It is easy to achieve and requires the student to have feet, hips and shoulders square to the target. This stance also allows almost no additional tension in the leg muscles.

Square Stance – Rear View

Square Stance – Side View

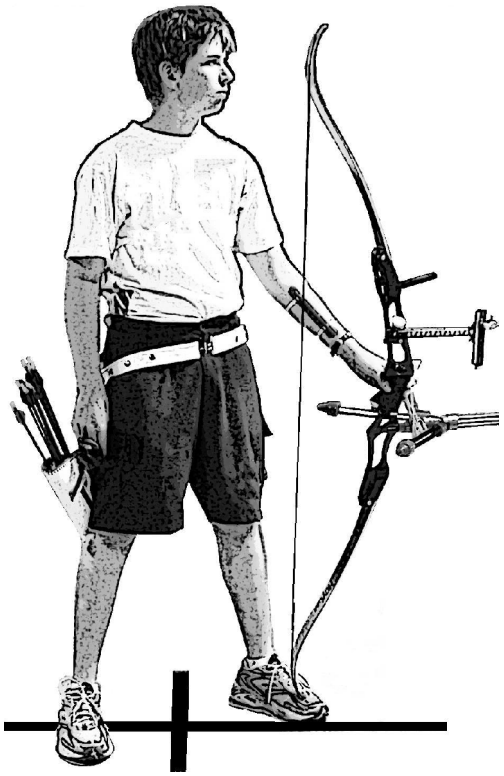
OPEN STANCE

This has become the most popular stance with the more experienced archers. The open stance has the rear foot positioned in front of the centre line to the target, which opens the body to the target. Care should be taken by the archer to not rotate their hips toward the target when drawing as this rotation will create additional tension in the lower body which will lead to fatigue.

The angle of the stance is a personal preference but should be somewhere between 0^{o} to 15^{o} of the target centerline (greater for some people), the angle depends on the archers preference and comfort levels.

What is important is that the feet and pelvis must remain in a constant position until the completion of the shot/s.

Open Stance – Rear View



Open Stance – Front View

Many people consider the open stance provides greater stability when shooting

Remember

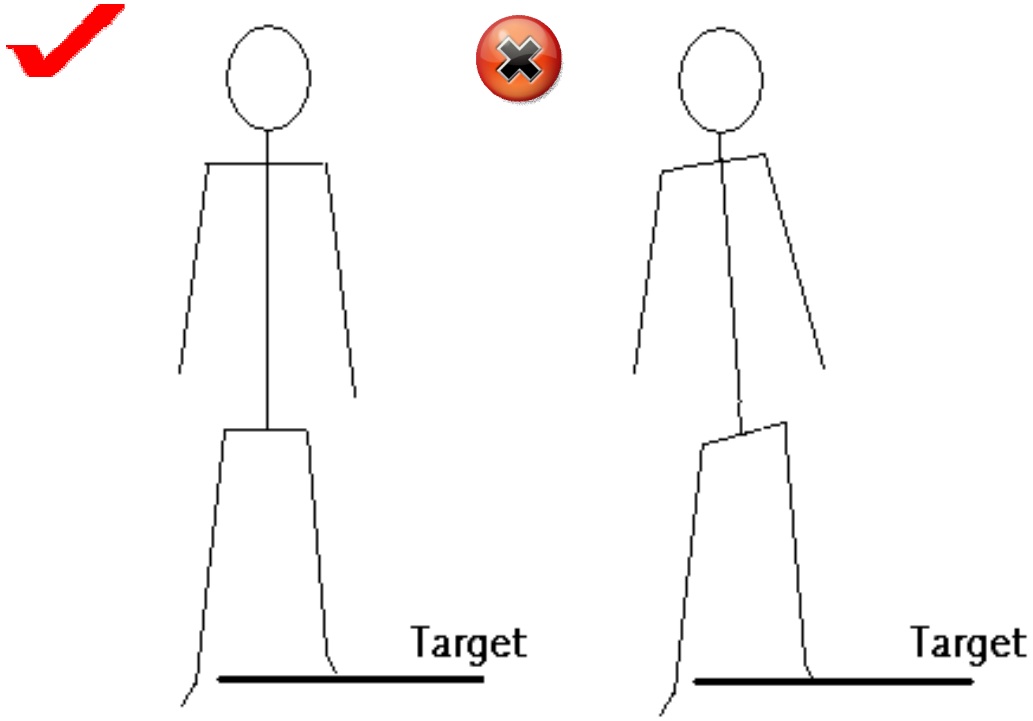
At **full draw** the body's weight should be evenly distributed on both feet with 60%-70% of body weight taken on the balls of the feet and 30%-40% on the heels.

The spine must be straight. If a line was drawn down the centre of the body this line should pass down the neck and spine, through the centre of the pelvis. This position should be maintained throughout the entire shot sequence.

BODY WEIGHT

It is imperative that the archer stands upright with their body weight evenly distributed on both feet when at full draw.

It is common for people to transfer their body weight to their back foot as they draw the bow; this is particularly common if the person is using a bow which is “too heavy” for them in draw weight or if they are using a compound bow the “draw length” of the bow is too long.



At full draw this will result in poor alignment, high bow shoulder and the unnecessary and excessive use of muscles to control the body. It will also affect the position of the bow arm elbow and hand position on the bow.

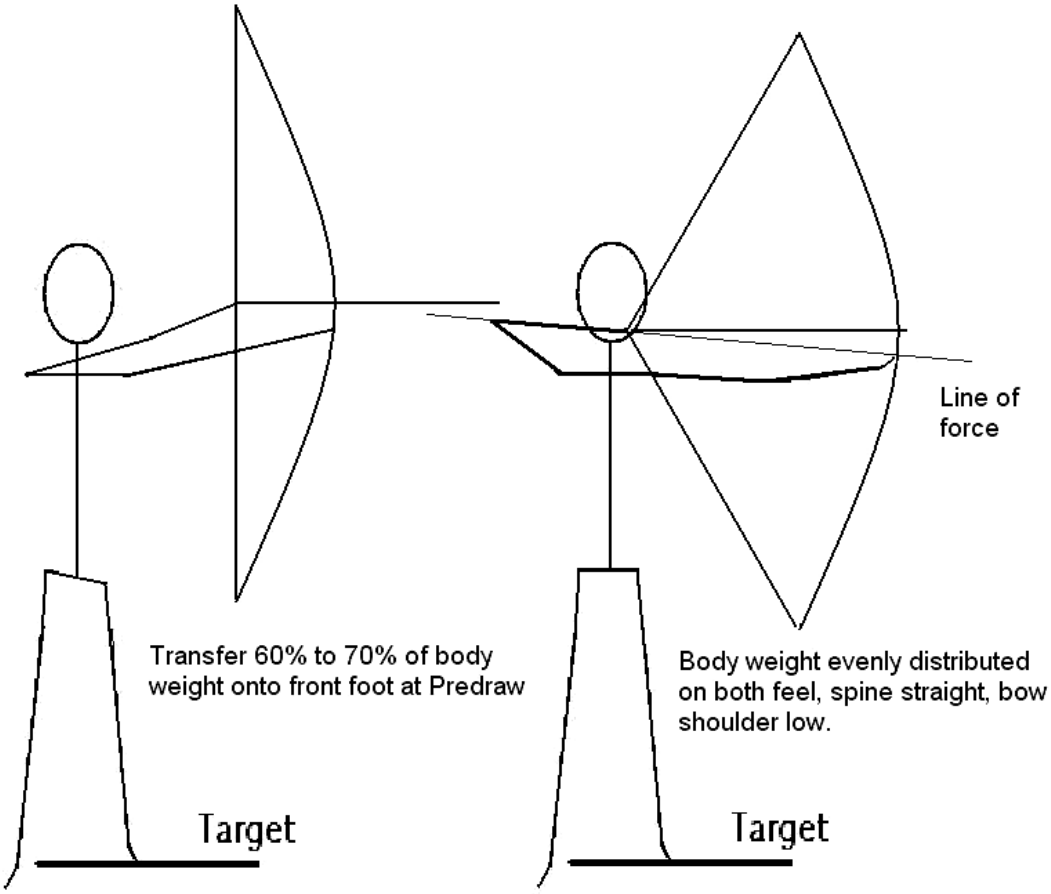
High bow shoulder and poor alignment results in the unnecessary and excessive use of muscles; which creates fatigue, progressively affecting shooting form and the score, long term it can lead to injury.

To overcome this problem, consider:

1) Changing the draw weight of the bow to a lighter draw weight or in the case of a compound bow shortening the draw length.

2) During the draw the natural tendency is to transfer the bodies weight to the back foot, resulting in an uneven distribution of body weight. To overcome this, at “predraw”, transfer 70% to 80% of body weight on to the front foot which will result in an even distribution of body weight when full draw is achieved.

It is acceptable if there is a small amount of forward body lean (toward the target) but there should never be any backward lean of the body.



PREDRAW **FULL DRAW**

Knees should be fully extended, not bent, as this would result in loss of stability, the muscles at the back of the legs should be tightened, do not lock the legs, unnecessary muscle use creates fatigue.

Stand upright and at ease, but do not attempt to stand with a straight back. The spine has a natural curve and this should be maintained during draw and hold. Later we will discuss the subject of the “Chest down” technique.

FOOTWEAR and GROUND CONDITIONS

Always wear footwear with heels to assist in transferring the majority of the body weight forward on the feet. The footwear should also have firm flat soles and ideally ankle support e.g. work or hiking boots. Casual shoes or joggers have low heels, usually soft flexible soles and usually no ankle support and although popular are not recommended.

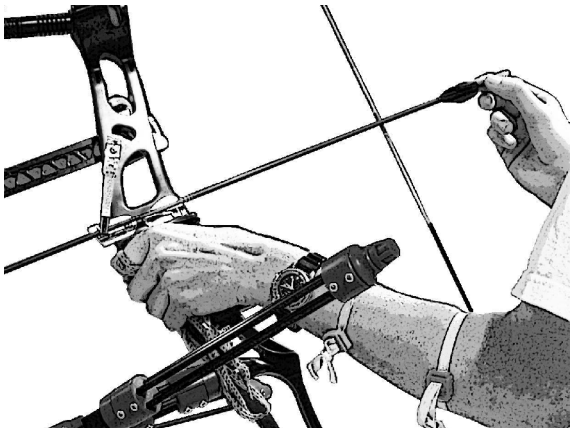
Always check the lay of the ground, ideally always stand on flat ground, uneven ground can change the standing position which will affect the upper body and weight distribution, this point needs to be considered when shooting on uneven ground such as in field archery.

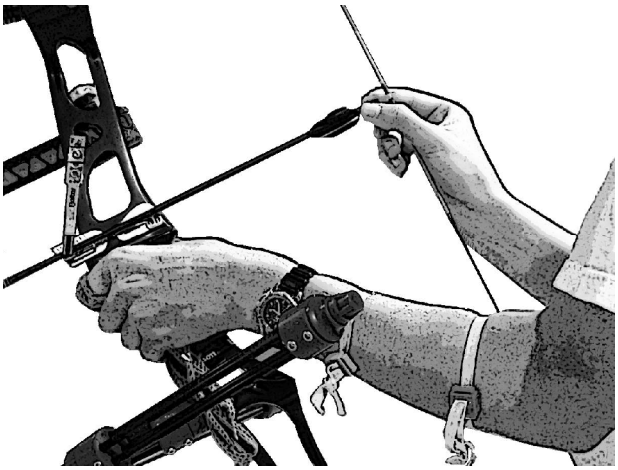
STEP 2 NOCKING THE ARROW

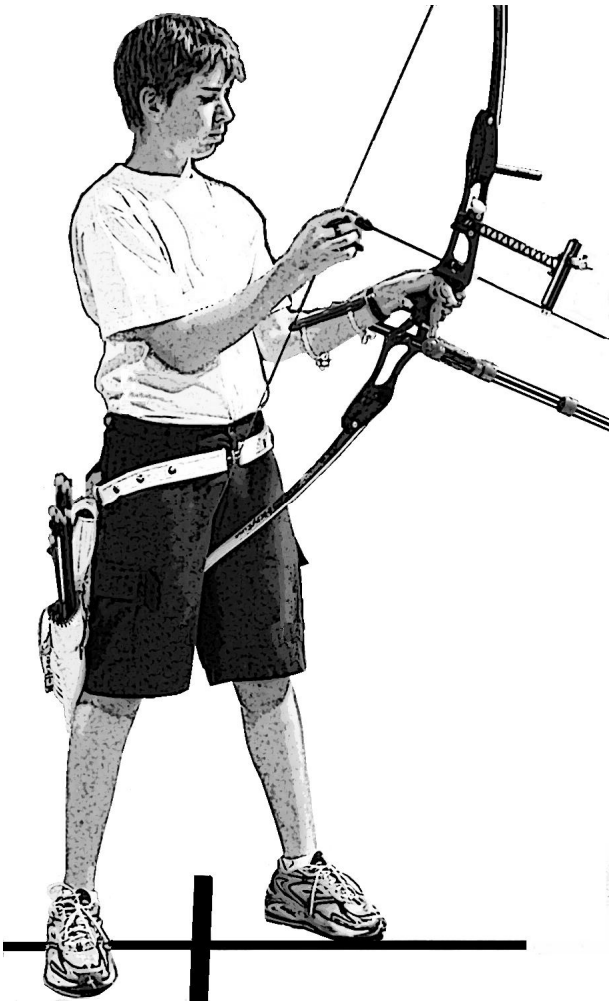
The archer should develop a smooth, uncomplicated process for placing the arrow on the string.

This step should be used as the starting step of the shot sequence; usually a person does not move their stance from shot to shot during an end.

In Match Play and in particular Team Match Play where time limits are very tight, having a complicated process for nocking the arrow is stressful and wastes time.







Many people adopt a method that is slow and complicated that proves to be detrimental particularly to time sensitive events such as Match Play and Match Play Team events.

It is common to see people take as much as 5 to 8 second (and sometimes longer) to load the release device onto the string.

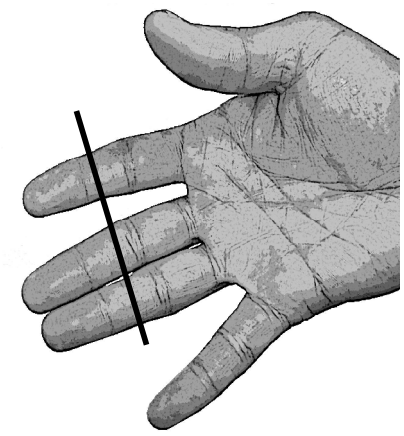
STEP 3 THE DRAWING HAND

SHOOTING WITH FINGERS

Take a deep hook with the drawing fingers; ideally when at full draw the fingers should be in or just behind the first joints of the three fingers. As the middle finger is usually longer than the other two fingers, the string should sit further behind the middle finger.

To commence, place the string on the three fingers between the first and second joints usually toward the second joint and take a deep hook, the fingers should be hooked and pointing back toward the archer.

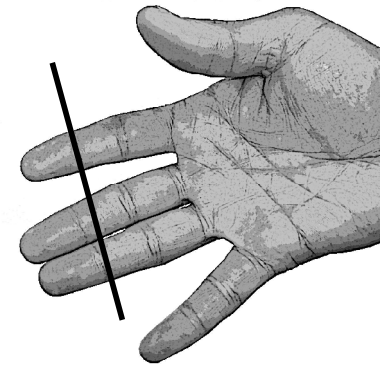
Keep the hand relaxed, the knuckles on the back of the hand must be flat, if not, this will cause the hand to form a cup and create unnecessary muscular tension.



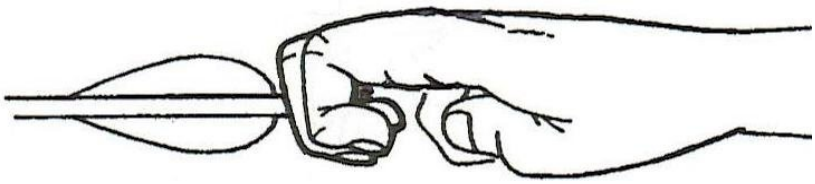
Starting position

As tension is taken on the string, the string will roll forward settling itself in or just behind the first finger joints.

As tension is taken ensure the wrist and forearm are straight and there is a straight line from the elbow to the fingers.



Final position



From above

As the middle finger is usually longer than the top and bottom fingers, the string should sit behind the first joint in the middle finger and in or behind the other two fingers.

Avoid allowing the string to sit on the tips of the fingers this will cause calluses and will create soreness in the fingers.

The finger tips are very sensitive and are designed for touch. The brain can sense any movement or pressure on the finger tips which can lead to anticipation of the release.

Ideally the middle finger should take about 50% of the overall pressure of the string, the top or index finger takes 30 to 40% with the third or lower finger taking only 10% to 20%.

Anchor Plate – YES or NO

The “Anchor Plate” attaches to the finger tab and is used as a reference point to assist with anchoring under the jaw.

The use of an anchor plate is a matter of personal preference, many top archers shoot using an anchor plate while others choose not to use an anchor plate.

The shape and height of the plate should be considered. Some anchor plate designs can force the drawing hand to twist or rotate, this twisting or rotation when at full draw places increased and unnecessary muscular tension in wrist, forearm, upper arm muscles and drawing shoulder, creating increased muscular tension which leads to fatigue and long term may lead to shoulder injury.

Some archers set the anchor plate low on the tab and rest their thumb on the plate. This gives a large surface area with the top of the hand, index finger and thumb to place under the jaw for a more positive anchor.

Finger Separator – YES or NO

Finger Separators are recommended for everyone, as the name implies they separate the first two fingers apart to ensure consistent nock clearance when at full draw, without a separator you can not be consistent with your finger spacing.

Ensure the spacer is thick enough to prevent any touching but not too thick to load additional pressure on the fingers.

Thumb and Little Finger

What to do with your thumb and little finger? In the past it was common to touch the tip of the thumb and little finger into the palm of the hand until they touch. To do this creates a lot of tension in the hand and wrist.

Ideally the little finger should be relaxed and slightly hooked the same as the other three fingers. The thumb should be positioned straight and beside the first finger and used to anchor under the jaw. Positioned in this way the thumb and little finger are relaxed and create no tension in the hand or wrist.

SHOOTING WITH A RELEASE DEVICE

Take a deep grip with the fingers on the release device, while keeping the fingers flat and relaxed.

Ensure the back of the hand is flat and the knuckles on the back of the hand and the wrist and forearm are straight. Ensure there is a straight line from the knuckles through the wrist to the elbow.

Do not excessively twist or rotate the release device at anchor. This twisting or rotation when at full draw places increased and unnecessary muscular tension on the wrist, forearm and drawing shoulder, creating increased muscular tension which leads to fatigue and long term may lead to shoulder injury.

Archer displaying good deep grip and minimal rotation of the hand resulting in relaxed wrist and forearm.

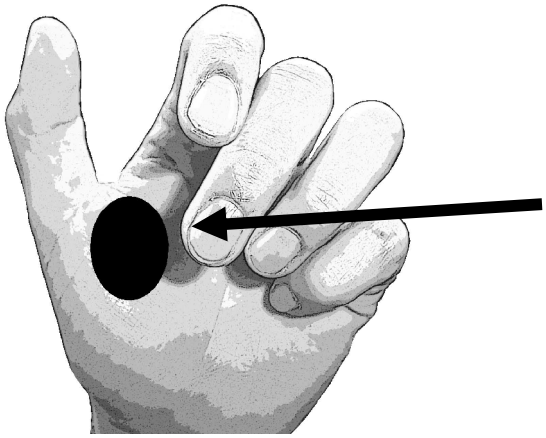
STEP 4
BOW HAND, BOW ARM and PREDRAW

BOW HAND

The hand is placed on the bow handle so pressure is along the Thenar Eminence – otherwise known as the thumb muscle.

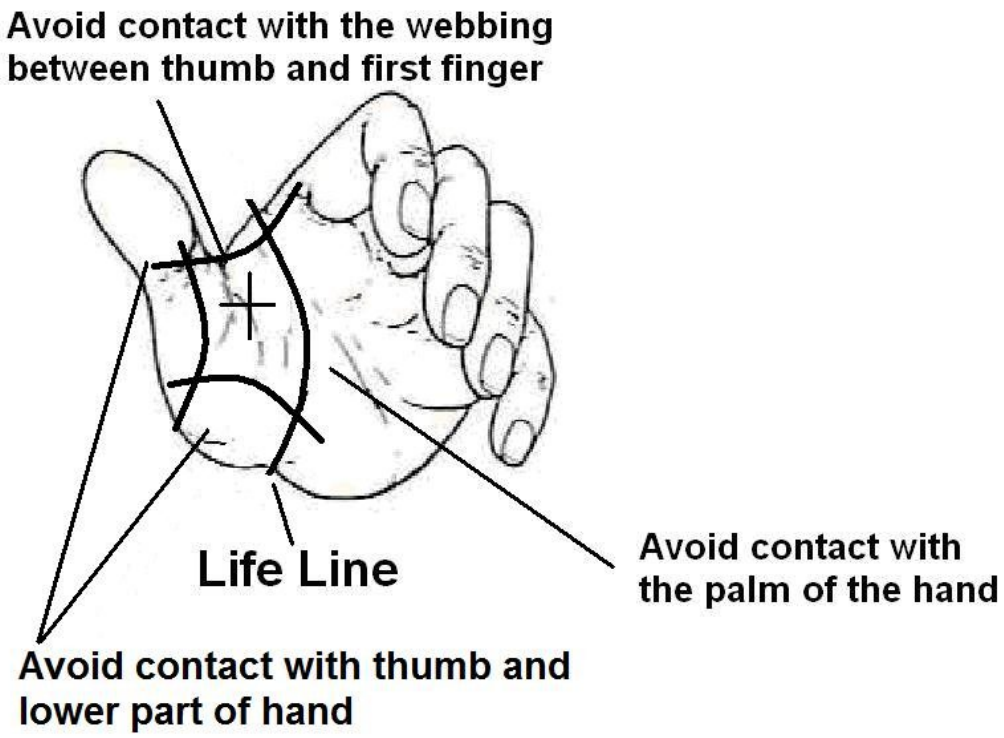
Ideally all fingers should be relaxed, slightly curled over in a natural position, not tucked in or curled around gripping the bow and not held straight.

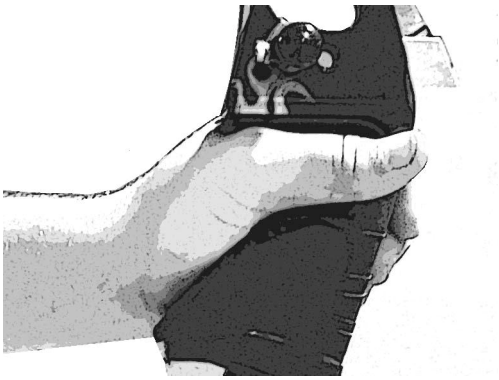
Straight fingers increases tension in the hand, and the temptation to grab the bow upon release



The bow hand should be positioned directly behind the centreline of the bow.

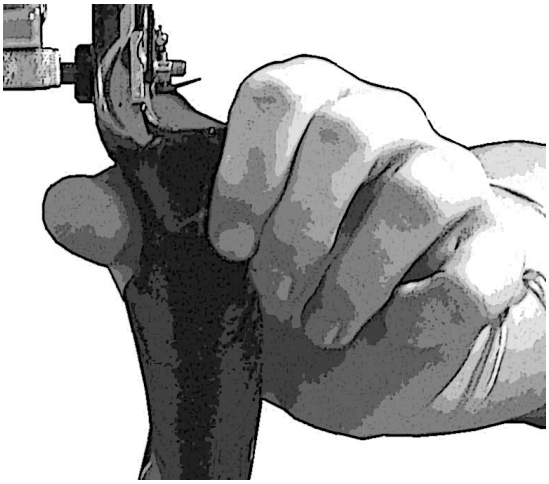
Place hand on the bow grip so the pressure point is as high as possible into the pivot point of the bow.





The thumb should be relaxed and point toward the target

Fingers should be relaxed and slightly curled.

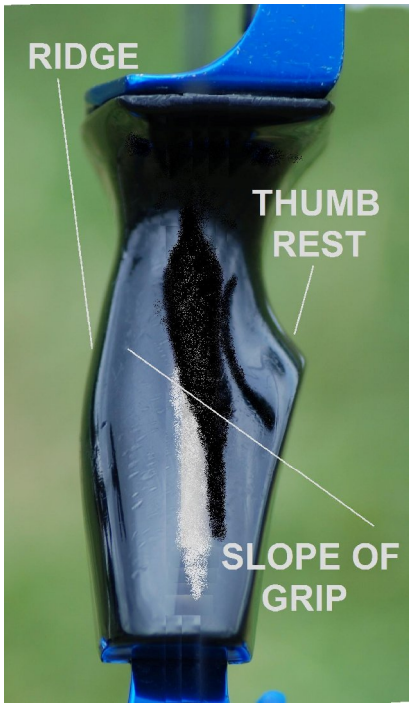


Fingers should sit at 45^{o} angle

BOW GRIP DESIGN

Recurve Bows

Most recurve bow manufacturers design their grips to give you the correct hand position, when you apply tension to the bow the hand will want to find its natural position.

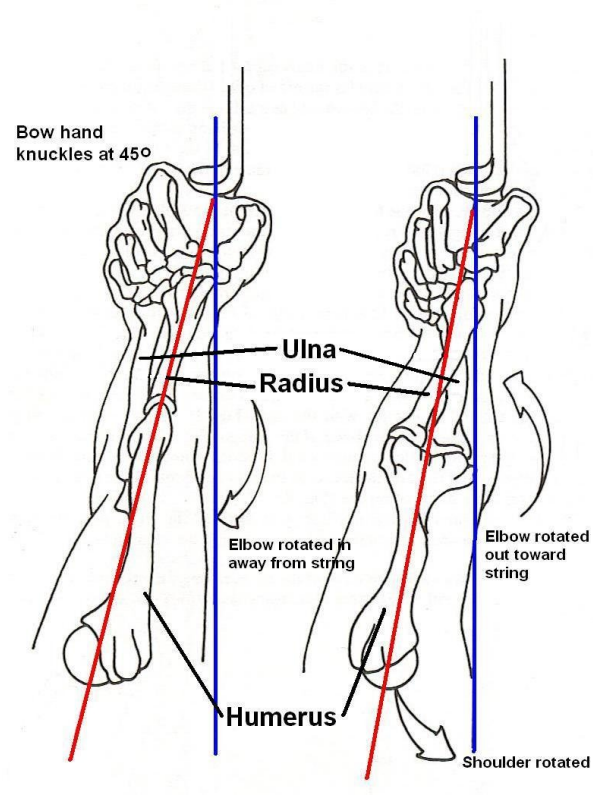


A recurve bow grip (right handed grip) should have a ridge to the left hand side of the grip with the grip sloping away to the right. The grip is designed to have the life line of the hand sit along the ridge and the upper portion of the thumb muscle resting on the grip. The grip is sloped to allow for the bulk of the thumb muscle. It should be noted the higher the grip is made the less slope to the right and the lower the grip the greater the slope.

When purchasing a new bow check out the design of the bow grip, most bow manufactures get it right, there are companies who make custom replacement grips for bows, in many cases these grips are not made correctly, the grip is flat without any slope for the thumb.

Ideally when at full draw the hand should be positioned so the knuckles are at 45^{o} with the index finger positioned higher then the thumb. Picture A.

The “Line of Force” should be over the wrist joint where the ulna joint meets the hand.



Picture A Picture B

The radius and ulna should be straight; this aligns the elbow and shoulder and gives need for only minimum muscle use. As the forearm is flat and rotated in away from the string this gives good string clearance Picture A.

If the grip was flat and not sloped off to the right (right hand grip) or the hand is not placed correctly on the bow (which is a common problem), the bow hand will be forced into an unnatural position with the thumb square or higher than the index finger. It is common to see archers place material around the bow grip, many don’t understand why they are doing this they are just following a popular trend.

This will force the bow hand into a vertical position resulting in the unnecessary and excessive use of muscles. The thumb would be under excessive tension creating side ways bow torque upon release which will result in poor arrow clearance past the bow.

The other resulting effect would be poor bone alignment in the arm. The forearm bones (radius and ulna) would be twisted causing the elbow to be out of alignment resulting in the need to use muscles to control the elbow Picture B.

The shoulder joint will also be out of alignment as the upper arm bone (humerus) will be forced out resulting in the unnecessary need to use muscles to control the shoulder.

The elbow will be rotated out into the path of the string creating clearance problems.

Compound Bow

Up until the late 1990's, compound bows used recurve bow grips. Then compound bow manufactures looked closely at bow grip design. Although the same general principles apply with compound bow grips the bow grip is designed slightly differently to recurve bows.

The design of the compound bow grip has become very important as compound bow performance and the amount of "let off" has increased.

Bow torque is a major factor in good arrow flight and clearance made even more critical with high "let off" compound bows. The lighter holding weights increase the possibility of bow torque at full draw and upon release, so bow grip design and bow hand position is critical for accurate and consistent shooting.

Modern compound bow grips are usually very thin and flat and do not have the ridge for the life line of the bow hand and are not sloped away for the thumb muscle.

By reducing the bulk of the compound bow grip this helps in reducing the possibility of bow hand torque. The hand should, like a recurve bow, contact the bow between the life line and the thumb muscles but the excess thumb muscle should not make any contact with the bow grip.

Thumb Angle

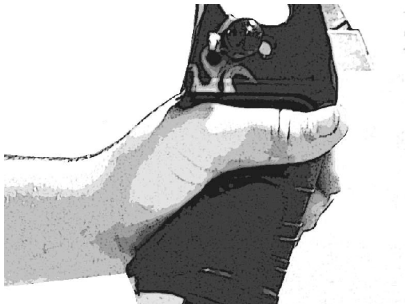
The position of the thumb on the bow grip is critical to ensure consistent pressure on the bow during draw, hold and release. Ideally the thumb should be horizontal pointing toward the target when at full draw. Having the thumb straight and pointing toward the target ensures the bow hand is released and most importantly that there is even and consistent pressure behind the bow.

If the thumb is pointed up this creates excessive tension in the bow hand and moves the pressure point of the hand lower onto the bow grip, also if the thumb is pointing down this also creates excessive tension in the bow hand while raising the pressure point on the bow grip.

You can easily test this, stretch out your arm and position your hand into the bow grip position, with the knuckles at 45^{o} with the thumb position lower than the fingers and pointing straight, you will find the hand relaxed with no tension.

Now raise the thumb and you will immediately feel an increase in tension in the hand and there will be a tendency to rotate the bow toward a vertical position. Now point the thumb down and again you will feel an increase in tension in the hand and in particular the first finger. This increase in tension will also increase side torque on the bow grip upon release which will have a negative effect on arrow clearance past the bow.

A tense bow hand will also increase the tendency to grab at the bow upon release. Ideally the bow hand should be as relaxed as possible with no tension at all.



Preparation Position

Once the fingers have been positioned on the bowstring and the bow hand positioned on the bow, a slight tension is taken up on the string. You then begin to focus for the shot and relax in preparation for the shot. This is known as the preparation position.

You should stand with your head held upright directly over your spine. The head is turned to look directly at the target, drop your chest and shoulders in preparation for the draw.

Use the preparation position to begin to focus mentally and ready yourself for the shot you are about to take.

Focus and Concentration

At the Preparation Position Stage use this time to “Switch On” and focus, to do this clear your mind and focus on the target.

Being able to switch on and focus is important as it narrows the archer’s concentration removing external distractions and allows you to only think of the task at hand.

This must not be confused with the narrowing of your focus at the aiming step, which comes much later in the process.

During the shooting sequence you should maintain a focus on the target while also being aware of each step of the drawing / shooting process.

Predraw Bow Arm and Bow Shoulder

Raise the bow arm and drawing arm together above shoulder level ideally around eye level.

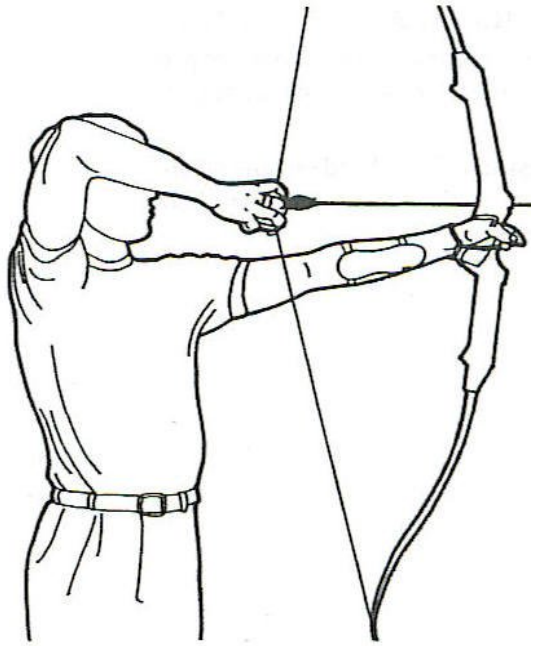
This lowers the bow shoulder into a natural position

Take a deep breath while raising the bow into the Predraw position.

The drawing hand should be relaxed with the back of the hand flat with the back of the hand, wrist and forearm in a straight line behind the line of the arrow.

The bow arm should be straight and pointed toward the target.

You can also transfer 60% to 70% of your body weight onto your front foot; this enables you to transfer your body weight evenly on both feet as you draw the bow.



Bow Arm Elbow

At "FULL DRAW" the archer should be standing upright with body weight evenly distributed on both feet. There should be between 60% to 70% of body weight toward the front of each foot and only 40% to 30% on your heels.

If there is a backward lean to the body this may indicate, the bow may be too heavy in draw weight or in the case of a compound bow the draw length is too long, although the most common cause is the tendency to transfer the body weight onto the back foot upon drawing the bow to overcome this issue:

1) Change the draw weight of the bow to a lighter draw weight bow or in the case of a compound bow shortening the draw length.

2) During the draw the natural tendency is to transfer the bodies weight to the back foot, resulting in an uneven distribution of body weight. To overcome this, at "predraw", transfer 70%to 80% of body weight on to the front foot which will result in an even distribution of body weight when full draw is achieved

It is vitally important that the bow arm elbow is straight and not rotated put toward the path of the string. The position of the bow hand, bow elbow and bow shoulder are all linked. The position of the bow hand directly effects the position of the elbow. As mentioned on page 13 the radius and ulna should be straight as these aligns the elbow and shoulder and gives need for only minimum muscle use. As the forearm is flat and rotated in away from the string this gives good string clearance.

When the bow hand is positioned so the knuckles are at 45^{o} with the index finger positioned higher than the thumb, the elbow is rotated away from the string.

Alternatively if the bow hand is not positioned correctly this will force the forearm to rotate into the path of the string the resulting effect would be poor bone alignment in the arm. The forearm bones (radius and ulna) would be twisted causing the elbow to be out of alignment resulting in the need to use muscles to control the elbow.

The shoulder joint will also be out of alignment as the upper arm bone (humerus) will be forced out of alignment resulting in the unnecessary need to use muscles to control the shoulder.

Archer with good bow hand position and elbow rotated square

Poor bow hand resulting in the elbow being rotated out toward the string. This will require the unnecessary use of muscles to control the shoulder.

STEP 5 DRAWING THE BOW

BOW SHOULDER

It is imperative that the bow shoulder remains low throughout the draw and the bow arm extends towards the target.

DRAW

To utilise the benefits of “biomechanics” and ensure the minimum use of muscles to draw and hold the bow, the bow hand and drawing hand should be raised to around mouth/nose/eye level in the Predraw stage.

By raising the bow hand and drawing hand above shoulder level into a high Predraw position this lowers the bow shoulder into the correct position with the “collar bone” sitting onto the ribs and sets up the rest of the body for the draw and shooting process.

The draw is then achieved by drawing back the string and rotating the drawing shoulder back and around into the anchor position while at the same time ensuring the bow shoulder is kept low and the bow arm is extended toward the target.

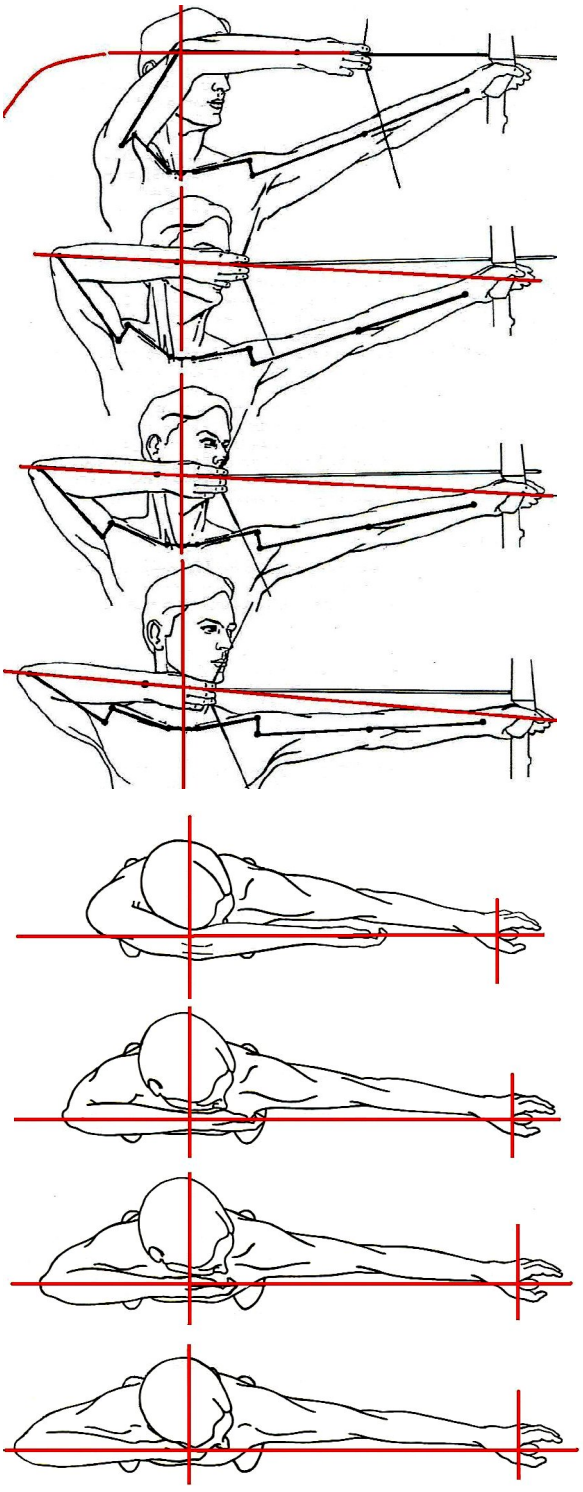
The draw must finish with bow hand, drawing hand, arrow and draw arm elbow in line behind each other.

It is imperative that during the drawing process as the drawing arm moves back toward the anchor position, the bow arm shoulder is kept down and the bow hand extended toward the target through the pivot point of the bow.

The string should be drawn back to the head, never move the head to the string.

Once the drawing action has commenced, most of the work must be done by the muscles in the back and shoulders, with very little tension remaining in the biceps and forearm.

The draw must be along as straight a line as is physically possible, drawing back close to the bow shoulder, finishing with bow and hand, arrow and draw arm elbow in line behind each other.



Observe the predraw and drawing process from Park Sung Hyun 2004 Athens Olympic Games Gold Medalist, perfect biomechanical style.

Predraw – Bow shoulder down and bow arm extended toward target

Draw commences

Draw continues

Draw continues

Under jaw coming into anchor position

Anchor position – Bow shoulder still down and bow arm still extended toward target

Park Sung Hyun displaying the correct biomechanical technique from the rear

Raising the bow into Predraw

Predraw position

The draw commences

Under jaw coming into anchor position

Anchor position – elbow in line with arrow and bow

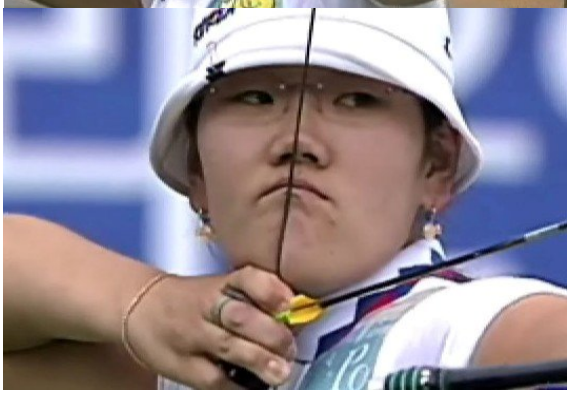
Release

Follow through

Park Sung Hyun biomechanical technique from the front view








Im Dong Hyun from Korea also displaying perfect biomechanical technique


Coming to predraw


Predraw


Draw Commences


Under jaw coming into anchor position


Anchor


Release


Follow through

Incorrect Drawing Technique

As mentioned earlier to achieve correct biomechanical technique predraw should be set up above shoulder height preferable with the bow hand and drawing hand around eye level.

But it is common for an archer to start the draw process at shoulder height as in Diagram 1 or below shoulder height as in Diagram 2.

Both techniques require unnecessary and excessive muscle use to draw and hold the bow, the most common muscles being the biceps and triceps of the drawing arm. These muscles cannot be relaxed at full draw which prevents the drawing elbow coming into alignment.

Also, as the archer draws the bow, the bow shoulder is forced high. The shoulder cannot be lowered as it is now under excessive pressure from the draw.

Both these techniques place excessive forces on the joints causing fatigue and possible long term injury.

Diagram 1

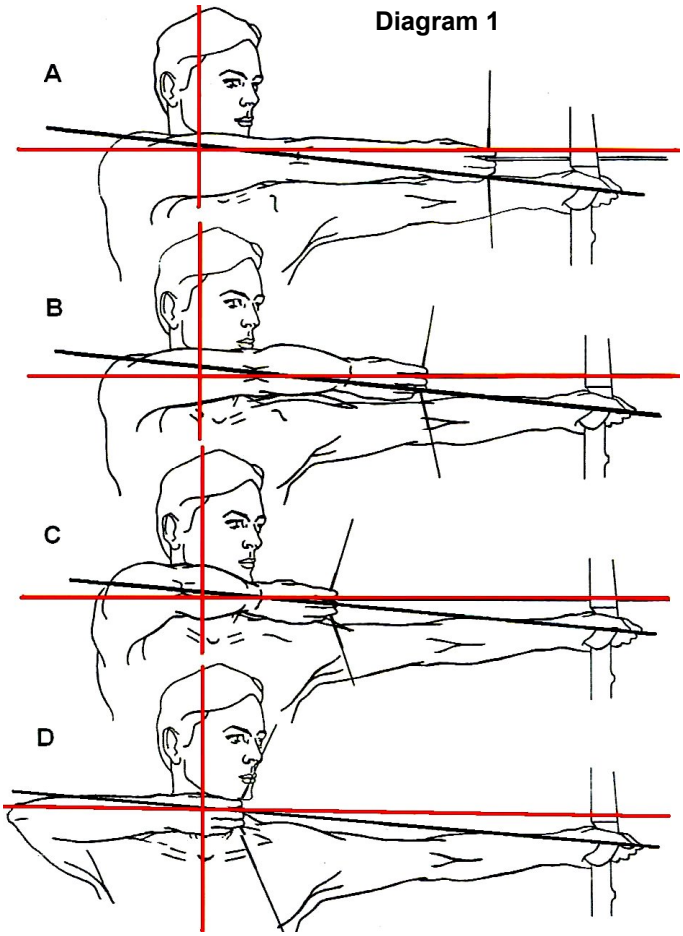
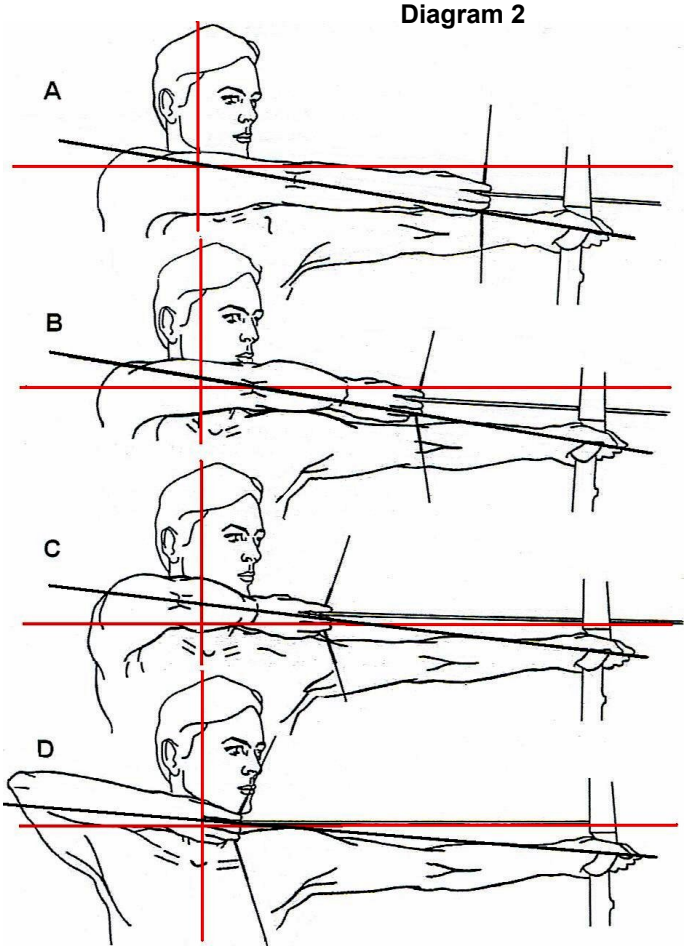


Diagram 2



Whilst observing diagrams 3 and 4 from above, to achieve the draw, the drawing arm must do all the work being forced to rotate out of alignment, as mentioned earlier this requires the use of the biceps and triceps of the drawing arm.

The distance between bow shoulder joint and arrow is excessive and as the bow arm and shoulder are now under force the bow shoulder cannot be moved in toward the arrow.

At full draw the shoulders are not aligned with the line of force which should be pointing to the right of the bow (right hand archer). This creates excessive forces on the shoulders again creating fatigue and possible long term injuries.

Diagram 3

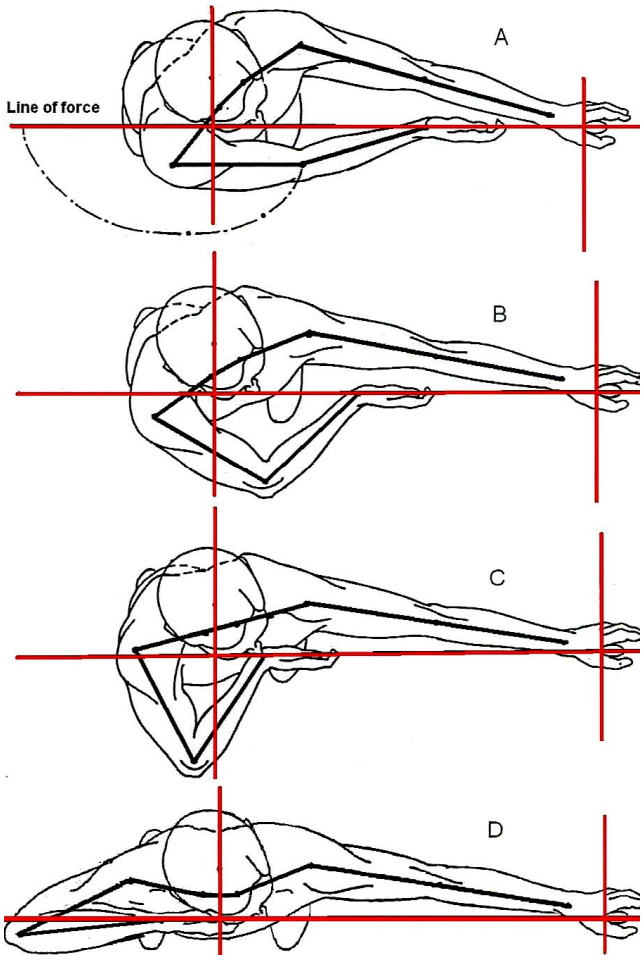
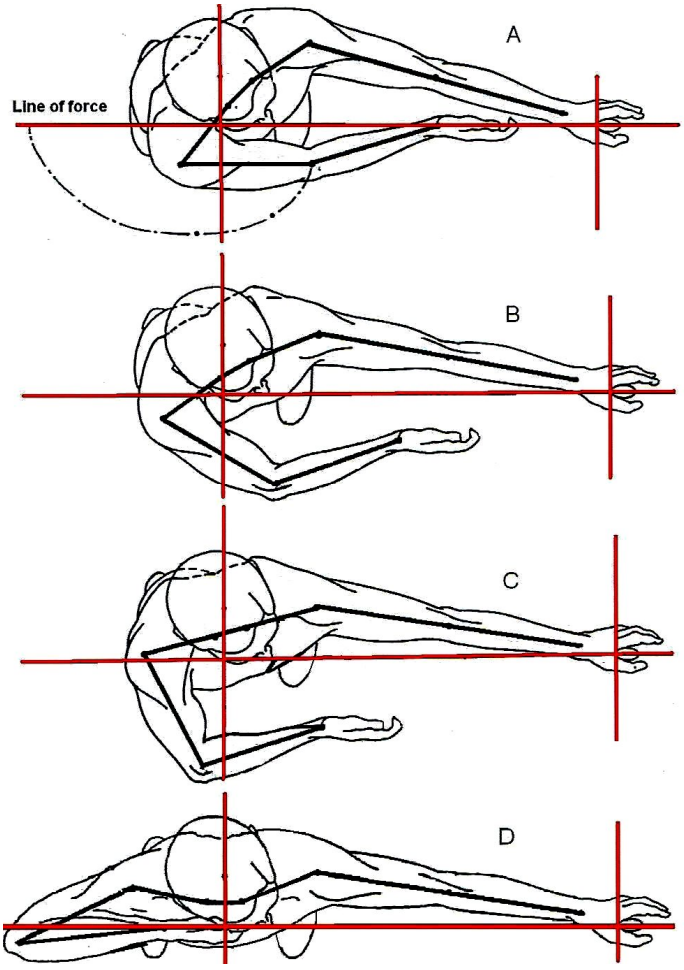


Diagram 4

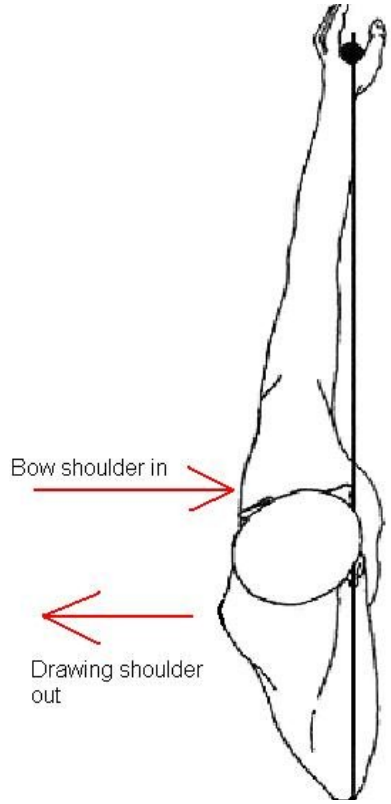


ROTATION OF DRAWING SHOULDER

It is imperative that the archer understands and develops the process not using their drawing arm biceps and triceps to draw the bow but to draw by rotating their drawing shoulder; this ensures the arm muscles are totally relaxed throughout the entire process of drawing, holding and release.

Never stop and restart the drawing process, continue to pull throughout the entire draw, hold and release process. If the pulling process is stopped it will require the use of other muscles to continue the pull / push process to get through the clicker and activate the shot.

The drawing shoulder must remain low throughout the entire draw /shooting process while maintaining the forward extension toward the target through the pivot point of the bow.



The bow shoulder should be pushed in toward the arrow, never rotate shoulder toward the arrow.

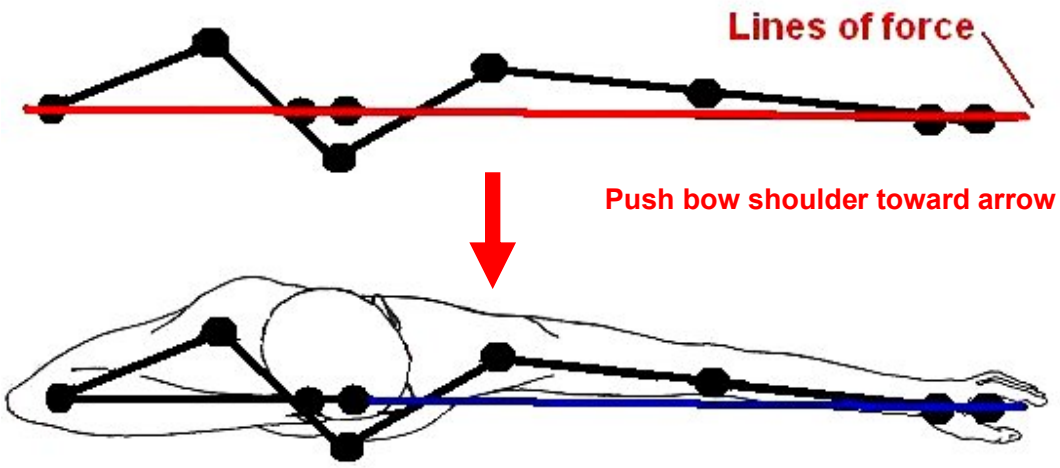
The bow arm

We cannot have the elbow and shoulder joints in the line of force, if we did the string would need to travel down the middle of our arm.

As we cannot have the line of force along the elbow and shoulder joints we then need to use muscles. If we need to use muscles then we must use the least amount of muscle as possible.

The way we do this is to push the bow arm shoulder in toward the arrow as far as it will go.

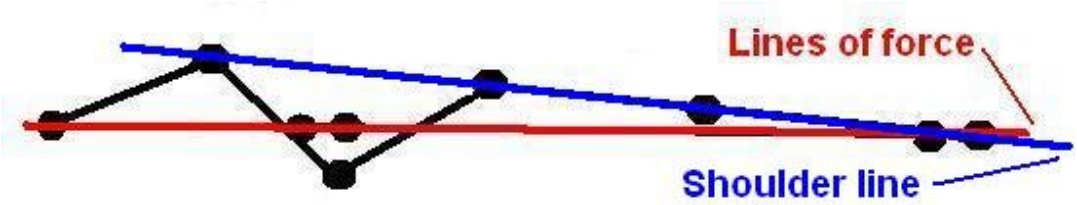
But be aware of a common mistake many people make, that is to **roll** the shoulder toward the string. Never do this. The shoulder must be **pushed** toward the arrow. To roll the arm requires the use of a number of muscles which will cause fatigue. You must also use some of the smaller muscles in the shoulder to roll the shoulder which can lead to long term injury. The most common injury is to the “rotor cuff”, which is very painful and requires a long time to repair.



The shoulder has a lot of movement left to right so it's easy to push the shoulder toward the arrow, but depending on body shape you may run out of clearance with the forearm and the string. So learn how far you can push the shoulder in and still maintain bow arm clearance.

If a person has their shoulder pushed in as far as possible toward the arrow the natural reaction is for the drawing shoulder to move back away from the body, this then gives a straight line between both shoulder joints, the bow arm elbow and bow wrist and requires minimum use of muscles.

If we were to draw a line between shoulder joints this line will point to the right of the target (for a right hand archer).



BREATHING

At the commencement of the draw, take in a deep breath, as the bow is being drawn slowly breathe out so at full draw the lungs are at about 1/3 capacity.

Hold this breath during the hold, expansion, aiming, release process, this will ensure you are relaxed, your lungs are not over expanded at full draw and you have achieved a natural state, hold the breath until the follow through.

Having your lungs at 1/3 capacity allows you to naturally settle assisting in the aiming process.

STEP 6
ALIGNMENT and ANCHOR

ALIGNMENT

At full draw

The elbow joint of the drawing arm should be in line with the nock of the arrow and the pivot point of the bow

Excellent Alignment

The back of the drawing hand must be flat, three fingers in contact with the string, the bow shoulder down, the bow arm straight with the elbow rotated away from the bowstring and extending through the pivot point toward the target.

Poor Alignment

Excellent Alignment

Stance

Stand upright, with weight evenly distributed on both feet, it is acceptable if there is more pressure on the front foot than the back foot but NEVER more pressure on the back foot.

The spine should be straight and the head directly over their spine.

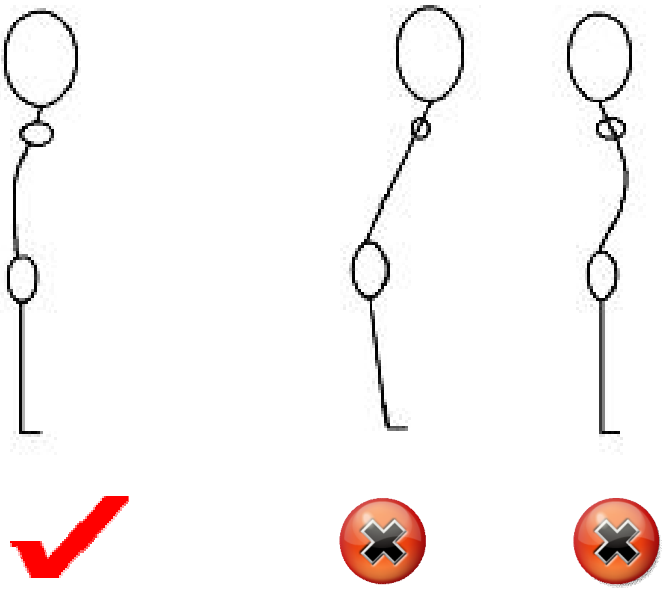
Rear View

Stand upright with a straight spine, there should be 60% to 70% of their body weight distributed forward on the balls of their feet and 40% to 30% on their heels.

It is common for archers to have shooting technique that transfers the majority of the body weight onto their heels. This will cause the lower back to be arched backwards, causing a hollow back and moving the centre of balance behind the archer.

Ideally the body's centre of balance should be below the archer's spine toward the front of their body.

By not standing upright and keeping the spine straight, long term this can cause injuries as well as affect the archer's development.



The correct posture is the first drawing above, with the tick.

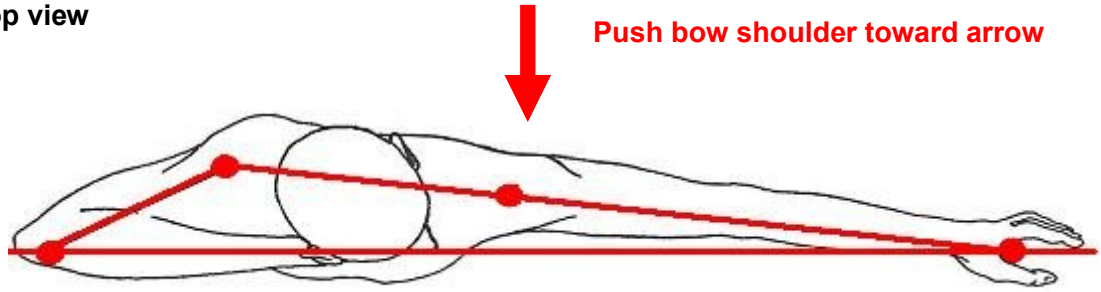
This is also called the ‘Chest Down” technique. This is an excellent technique and not only helps to assist with stance but also assists to -

- Bring the bow shoulder closer to the arrow at full draw
- Bring the drawing hand into a more vertical position without the need to force any rotation of the forearm and hand
- Assist with bringing the drawing elbow into alignment with the drawing hand and bow

The “Chest Down” technique uses the abdominal muscles to pull the chest down to the hips. Not to be confused with sucking the stomach in, rather, just flexing the abdominal muscles. This technique also helps to straighten the lower spine. Never bend forward at the waist thinking this is the “Chest down” technique.

The lower spine should be straight; this should not be confused with standing straight. The spine has a natural curve as it comes from the upper body into the waist and then joins the hip. This natural curve needs to be maintained throughout all phases of shooting.

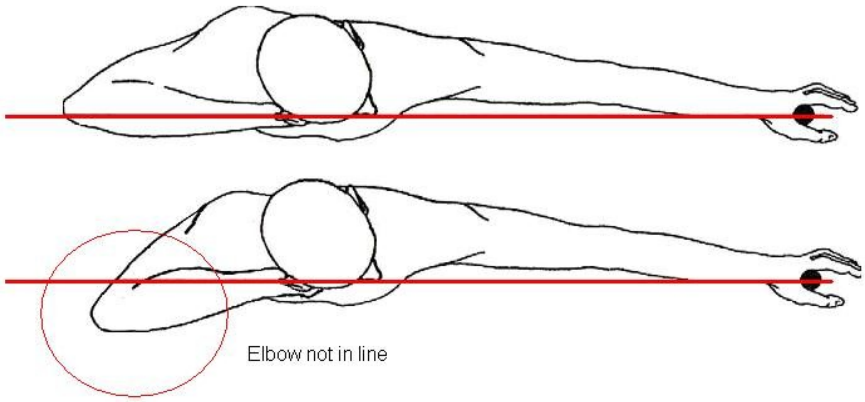
Top view



All key body joints are in line eliminating the need for unnecessary use of muscles.

Ideally the drawing elbow should be in line with the arrow and pivot point of the bow, while the shoulder joints, drawing elbow and wrist joint are also in line.

If not, this will result in the need to use excessive muscular effort to hold the bow at full draw, and will result in fatigue.



ANCHOR

The anchor is the term used to describe the position where the drawing hand makes contact with the face.

RECURVE

A consistent and repeatable anchor-point is vital as the anchor acts as a rear sight.

The best anchor position has the index finger of the drawing hand making solid and full contact under the jaw from the second joint onwards to the palm area of the hand.

The string then makes solid contact with the chin and then lightly touches the tip of the nose. This gives a positive anchor position but allows the arrow to move forward from the face without side ways face contact created by the natural flexing action of an arrow upon release.

It is common for a well tuned arrow to move as much as 15 mm into the face upon release as part of the natural flexing action (Archers Paradox) upon release.

An anchor position along the side of the face ("Side of Face Anchor") although a popular method of achieving drawing elbow alignment, this position can result in excessive face contact with the string upon release which will create clearance and tuning problems.

An anchor to the front of the face is strongly recommended to eliminate the risk of any face / string contact upon release.

A good anchor should give you three contact points to keep a consistent anchor from shot to shot.

Note – The back of the hand should be flat, the knuckles must not be protruding outwards (cupped hand). The wrist and forearm should be straight and relaxed.

There is a natural tendency for the drawing hand to rotate out from the body as your draw the bow and come to anchor. The result, if the drawing hand is rotated out from the body at full draw and the drawing hand not held in a vertical position is:

- **Inconsistent pressure on the fingers particularly on the bottom finger.**
- **Increase tension in the wrist, forearm and shoulder leading to possible long term injury.**

- **String torque and effect the way the arrow leaves the bow.**

It is ideal that the hand be as vertical as possible at full draw as this provides even tension on the fingers, relaxes the wrist and forearm and does not cause side interference to the string upon release.

Never attempt to force the hand into a vertical position when under load; this will further increase tension on already tense muscles.

By slightly rotating the drawing hand in towards the body at Predraw and when commencing the draw, you will find as the hand naturally rotates during draw and when you reach full draw the hand will be in a vertical position with no added tension in the muscles.

Rotated wrist and poor contact with string

ANCHOR FOR THE COMPOUND ARCHER

Unlike a recurve anchor, which has a solid position under the jaw making string contact with the chin and nose, the compound anchor floats and varies at different distances.

As the peep sight is always in the same location and the same distance above the nocking point, the angle of the archers head varies to enable the archer to see clearly through the peep sight at different distances. This means the position of the hand position (holding the release device) against the side of the archers face varies at different distances.

Some top level archers have two bows, one with the peep sight set for long distances and one with the peep sight set for short distances

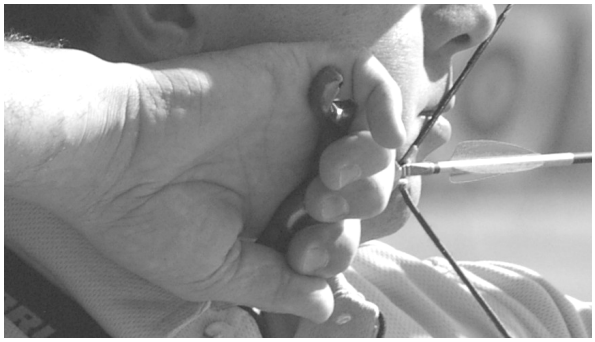
For the average archer it is best to set the peep sight up at an intermediate distance such as 40 meters. As you shoot longer distances the anchor moves lower and as you shoot shorter distances the anchor will move up the face.

Never us a kisser button and peep sight kisser combination. The kisser will force your head and anchor to remain in a stationary position and not move with the distances.

As your anchor moves from distance to distance it is not as critical using a compound bow to have an anchor with face contact points as with a recurve bow.

Ideally there should be little or no face contact with the string when at anchor; any face contact can interfere with the string upon release causing clearance problems with the arrow.

Ideally the anchor position should be a relaxed and natural position without excessive twist or rotation of the hand. There may be a small amount of natural rotation of the hand but this must not be forced or excessive. Excessive rotation of the drawing hand requires the use of shoulder muscles usually the rotor cuff muscles which are easily fatigued and injured.



Hand Held (Rotating action) Release Device - Relaxed natural position, deep grip and with little string face contact with the string.

Hand Held (Thumb action) Release Device – Relaxed natural position, deep grip and with little face contact with the string, with a deep thumb location

Wrist Type release Device – Draw length too long resulting in poor anchor position and excess face contact with string.

Use of finger tip to activate release.

Hand Held (Thumb action) Release Device – Displaying a shallow grip on the release device and excessive rotation hand resulting in increased tension in wrist and forearm, also a low elbow bring the elbow out of alignment with the arrow and bow.

Wrist Type Release Device – Displaying excessive hand tension, hand not aligned with arrow and elbow, excessive tension in hand and wrist, release set up too long, requires finger tip to activate release.

Remember, the peep sight is your main reference point for the anchor; you should make contact with the side of your face or jaw with your hand but remember this position will vary between distances.

Some people also like to touch their nose with the string giving them a reference point this is not necessary or in some cases possible, particularly with short axle to axle bows.

CLEARANCE

The most significant factor effecting high scores is arrow clearance. These clearance problems can be caused by the arrow (fletches usually) making contact with the bow as it passes by, even only minor contact can create clearance problems.

To check for clearance problems associated with the arrow hitting the rest or bow window as it passes by use the “Powder test” to detect any arrow/rest/bow contact.

To do this purchase from a chemist or supermarket a spray can of powder foot spray, spray the powder on the rear of the arrow and around the arrow rest and plunger, allow the powder to dry and shoot a test arrow.

If there is any contact of the arrow, fletch or nock with the rest, plunger or riser you will see a strike mark.

This may indicate the wrong size arrow or you may need to change the position of you fetches on the arrow as the arrow moves forward. The easiest way to do this is to rotate the nock of the arrow maybe a ¼ turn which changes the fletch position as the arrow passes the bow.

But the most significant and most overlooked cause of clearance problems is string contact with the face and chest.

For a recurve archer a good anchor is achieved when the drawing hand is under the jaw and the string makes solid contact with the chin and the nose but we give little consideration to what effect string contact with the face may have upon release particularly if the archer has a “Side of Face” anchor.

We know that arrows shot from a recurve bow develop a natural flexing action called the “Archers Paradox” upon release.

The initial movement of an arrow upon release from a recurve bow is about 15 mm in toward the archers face. This face contact will interfere with the arrow forward movement creating significant clearance and tuning problems. Many archers unaware of the problem place tape on their face to prevent rubbing of the string unaware of the effect is having on the accuracy and efficiency of the arrows.

This problem can be worse on a compound bow due to the let-off associated with compound bows. The temptation may be to set up the bow with a longer than required draw length which brings the string into a more side of face anchor and creates face contact with the string.

The other important point to note is the natural reaction of most release devices is to move the arrow slightly off to the side (depending upon design) usually moving the string in towards the face (about 3mm to 5mm depending on release device design).

Due to the let-off of compound bows, archers are holding a very light weight (12lb to 18lb) making it easy to distort the bow string, this coupled with face contact and the released device moving the string in toward the face, can create greater clearance and tuning problems then encountered with a recurve bow.

Another signification clearance problem is string contact with the chest and/or armguard, if you have chest clearance problems you can –

a. Check your clothing is not loose or interfering with the string, particularly important in cold and wet conditions when you wear bulky clothing.

b. Wear a “Chest Protector” but make sure it is tight fitting and smooth and will not create further interference to the string.

c. You may be leaning back when at full draw, causing the string to come into contact with your clothing and chest.

   Go back to the basics look at you stance and where the pressure is on your feet at full draw. Your body weight should be evenly distributed on both feet or with 5% to 10% more on your front foot and with 60% to 70% of you body weight on the balls of your feet and 40% to 30% on your heels.

You can even try and load up the weight on your front foot (about 70% of your body weight) at Predraw, when you draw back you will find your have evenly transferred your weight onto both feet and are now standing upright.

STRING ALIGNMENT (RECURVE)

A consistent string alignment must be maintained during aiming. String alignment is the relationship between the blurred image of the bowstring and the bow or sight pin.

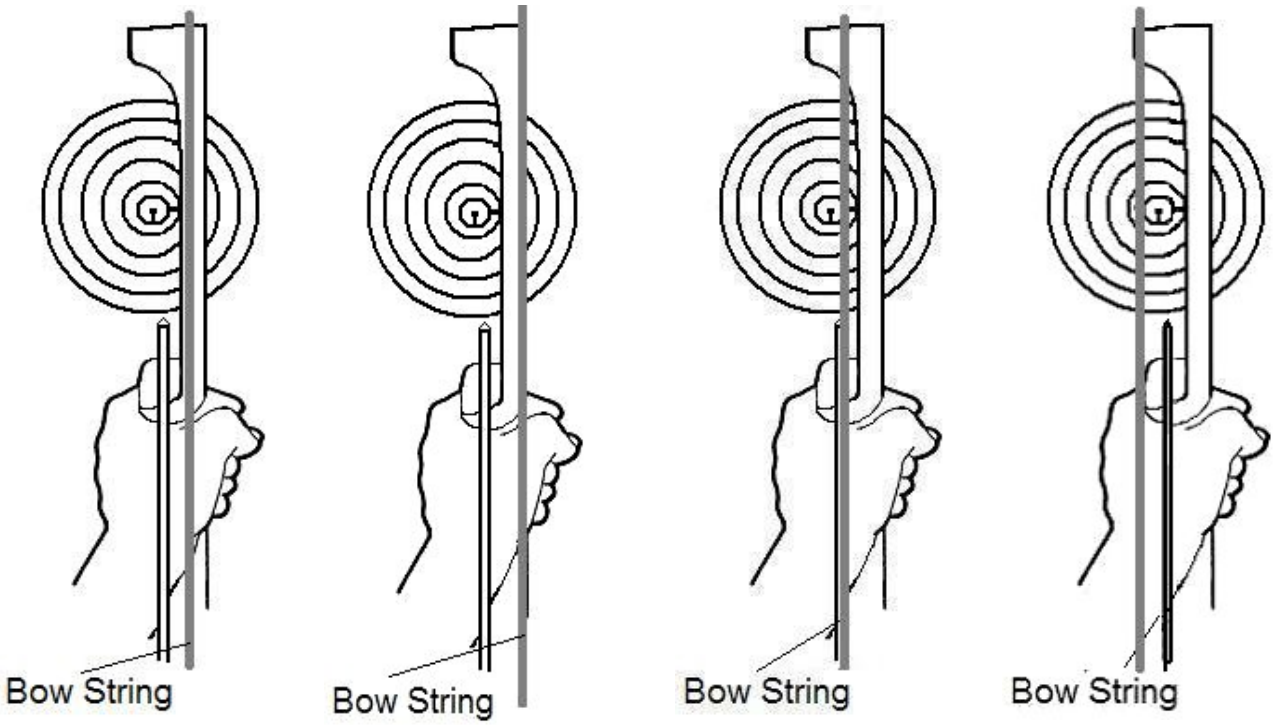
You can align the string with the bow handle, or sight pin which ever feels comfortable.

You can also change the angle of the head by changing the string alignment position.

Any variation in string alignment will show as a change in left/right arrow placement.

If all is correct and a consistent, anchor and string alignment has been obtained, the line of sight (aiming) may be established.

VARIATIONS IN STRING ALIGNMENT



ALIGNMENT (COMPOUND)

With a compound bow you have the addition of a peep sight, which must be set up to the appropriate height on the string so you can clearly see through the peep without the need to tilt or move the head at anchor.

You still need to align the string using peep sight; you do this by aligning the ring of the peep sight with the ring of the sight scope.

You must maintain a straight line of sight between peep, sight and target.

STEP 7
HOLDING, AIMING, EXPANSION and RELEASE

HOLDING AND EXPANSION

Previously it has been mentioned that the draw is achieved not using the drawing arm biceps and triceps to draw the bow but to draw by rotating their drawing shoulder; this ensures the arm muscles are totally relaxed throughout the entire process of drawing, holding, expansion and release.

If you use the biceps and triceps during the drawing, holding, expansion and release, then a poor forward release will result. As you will be under a great amount of muscular tension you will have difficulty in holding steady, this will result in over-aiming. Over-aiming is where you over tense the muscles in an attempt to hold steady.

It is imperative that the archer never stops and restart the drawing process, continue to pull throughout the entire draw, hold and release process. If the pulling process is stopped it will require the use of muscles to restart and continue the pull / push process to get through the clicker and activate the shot.

If the correct drawing process is used the archer's body maintains resistance against the natural forces that would cause the technique to collapse. (That is, the drawing arm wants to be pulled forward and the bow arm, wants to be pushed back toward the archer's body).

The holding expansion steps should be like shooting a rifle as compared to shooting a pistol. In the proper alignment the drawing elbow, arrow and bow hand will be a single unit, completely in line, we try to duplicate the long barrel rifle using the body's skeletal structure.

AIMING and EXPANSION

The aiming process starts after full draw has been achieved and the holding and expansion stage is commenced.

If the aiming process is started too early, then you become more focused on the outcome rather than keeping the focus on maintaining a consistent technique that must always feel the same.

You now switch to a very narrow focus and all attention and concentration should be directed to aiming.

Aiming must be done by your subconscious mind and you must remain relaxed and allow the sight pin to float on the target staying fluid without any tension or anxiety

You must never be tempted to hold the sight pin still. This is a sign of over-aiming.

Your focus during the aiming process must be on the gold (or where you want the arrow to go), having the sight pin as the principle point of focus will create major problems and there is the temptation to attempt to hold the sight pin as steady as possible forcing you to over aim. Attempting to hold the sight pin still is not necessary and in all cases will increase stress and tension in the archer's body.

It is almost impossible to hold the sight pin steady, there will always be movement usually caused by breathing and heart beat, you should be aware of this and learn to simply relax and allow the pin to float, focus on the gold (or where you want the arrow to go) and allow the subconscious mind to take care of the aiming process.

In time, with practice and confidence the movement of the pin is reduced to the point where it is minimal.

RELEASE

The release should be a continuation of the drawing process and should never be treated as a separate step in the shooting process. The archer must develop a technique where they release while still maintaining their focus on aiming.

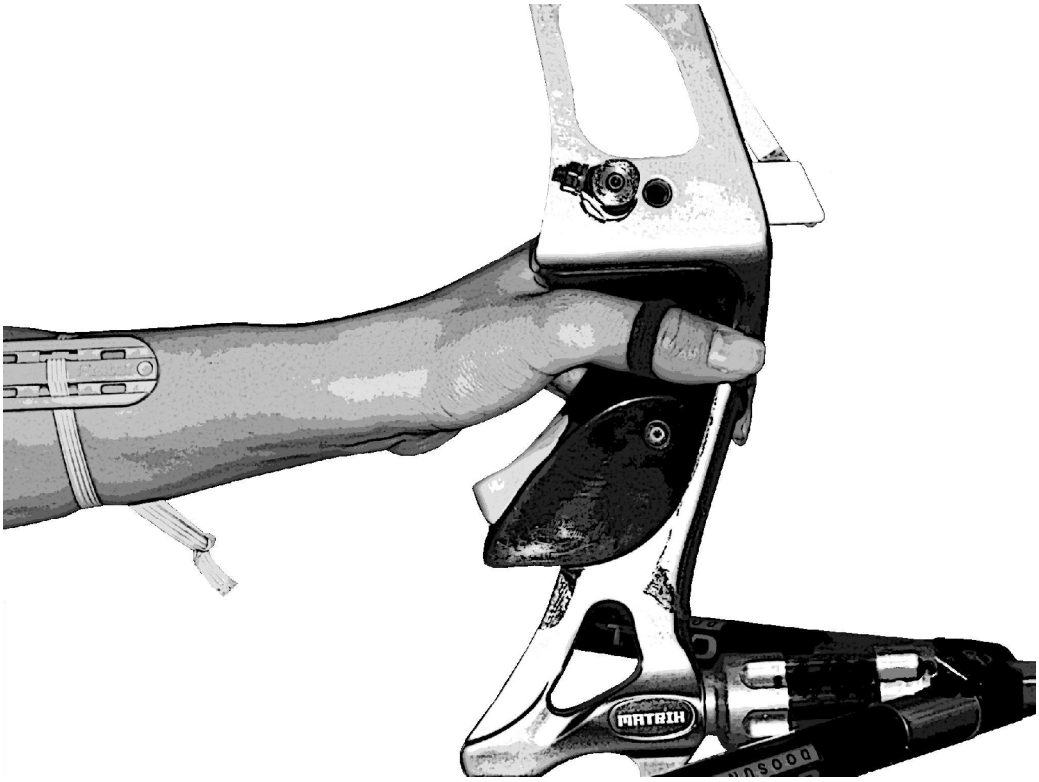
It is very common for a person to aim and when ready move their entire focus to release. When this happens as they are releasing they are no longer aiming, the focus on aiming must not change during the release.

For recurve archers the release is achieved by relaxing the muscles in the drawing forearm, this relaxes the drawing fingers, allowing the weight of the bow to pull the string from the fingers. The resulting reaction being that the drawing hand moves slightly backwards.

When releasing the arrow, you must make sure the push / pull process is maintained thus ensuring the release hand stays close to the face.

Ideally, during release the bow should move forward without any interference or side to side (torque) pressure on the grip.

The bow hand should be relaxed during release so it is advisable to use a bow, wrist or finger sling to prevent the bow's falling to the ground.



FOR THE COMPOUND ARCHERS

The method used to release will vary slightly depending upon the design of the release device you are using.

In principle the release device is designed with a handle or some method that allows you to grip the device.

The release is achieved by firmly placing either (depending upon release device design) the finger (around the second joint) around the trigger mechanism or in the case of a thumb release placing the trigger mechanism into the base of the thumb.

In the case of the rotating (so-called back tension) release devices, these operate by changing the angle of the release by applying backward tension which initiates the release.

To activate and release the device you simply apply increased backward tension during the hold/expand/aim process.

This increased tension will either rotate the release into the triggering finger or thumb or in the case of rotating release devices, rotate the release off vertical, which then creates the release.

It does not matter how you achieve this release, the method varies between people, the important point is not to trigger or force the release.

The release for a compound bow must be achieved so it is a surprise and requires no anticipation or physical action on the part of the archer. **The release must be a total surprise**.

Of course while you maintain the backward tension to achieve the release you must maintain your sight and alignment on the target.

NEVER

Physically trigger the release, this is called punching (or banging) the release and although some archers do shoot good scores with this method it is difficult to maintain performances from shot to shot and day-to-day.

This is a common error with users of wrist style releases but many users of hand held and the back tension release also “bang” the release.

What usually happens is the archer starts to aim high above the target and allows the sight to drop when at full draw. As the sight drops down and the sight pins passes the centre of the target the archer physically triggers the release. As mentioned some archers can shoot very high scores using this method but performances can be very inconsistent and with some very erratic shots.

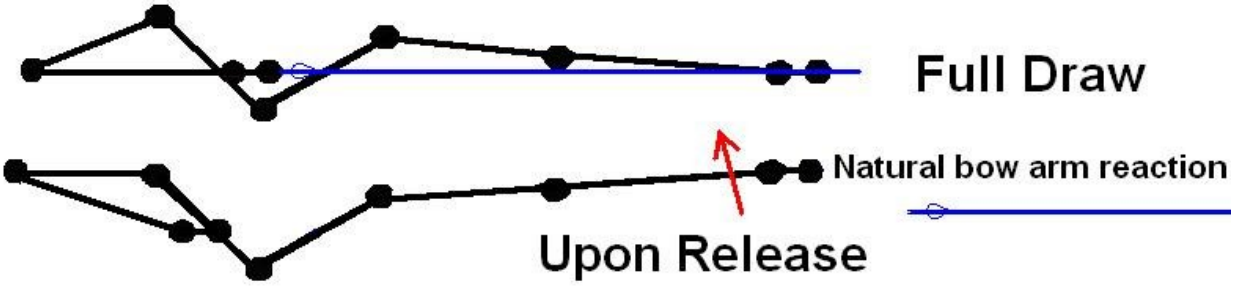
It is very common for archer’s especially using hand held release devices to excessively rotate the drawing hand off vertical at anchor. This should be avoided and the hand should be held as close to horizontal as possible to avoid tensing the wrist, forearm and shoulder.

STEP 8
FOLLOW THROUGH

The follow through occurs after the arrow has left the bow and is travelling toward the target. It is a perfect time to analyse the shot as the final position of the bow and bow arm will provide instant feedback as to the set up and excitation of the shot.

Focus should be kept on the target until the arrow has hit the target.

Ideally the bow should move forward in the hand as a natural reaction to the shot with the bow arm and bow moving off to the left (for a right hand archer) in a natural reaction to the shot. If it does not move in the fashion this indicates that a biomechanical technique has not been used and the shot has been controlled by the excessive use of muscles.



There was an old belief that the bow hand should remain up and pointing toward the target until the arrow has hit the target. To do this would require the archer to think about the process and to use muscles to achieve this, which is contrary to the principle of biomechanics and a relaxed flowing shot.

Following release, the drawing hand should remain close to the face in line with where it was when you released the arrow. This position is held until the arrow hits the target (about 2 seconds is all that is needed).

STEP 9
RELAXING and RECOVERY

After the arrow has hit the target, lower the bow arm so that the bow is across the front of the body or with the limb tip resting on the foot, and the drawing hand is down at your side

This is the time to relax and recover from the shot, analyse the shot and prepare to shoot the next arrow. This time should take longer than the act of shooting the arrow.

Written and images by Jim Larven
Technical information and Research by James Park and Jim Larven

Reference material – Archery Australia Shooting Technique – Biomechanics
Archery Australia Introduction to Archery
Archery Anatomy by Ray Axford