



# *Setting up an Archery Range*

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# How to set up an archery range

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## Introduction

Archery is practiced all over the world. As with other sports, a special area is needed for practice and competition. Bow and arrows are part of the equipment of an archer; an archery range on a flat level field is needed for the safe practice of target archery. In field archery the ground is mostly far from level, however in this discipline there exist special rules for range layout. The specialist disciplines of clout and flight archery have other requirements.

It is not sufficient to install a target somewhere and start shooting arrows. The range layout, the procedure of shooting and the presence of a qualified supervisor are essential for the safe conduct of our sport.

*Note: This guidance has been prepared by Archery GB, the UK Governing Body, based on yardage measurements. In the UK, metric rounds and rounds recognised by World Archery, the International Federation, are also shot and for these the targets are set at metric distances.*

*This publication is guidance only and should not be considered as the Rules of Shooting. The following guidelines are based upon Archery GB and World Archery recommended standards.*

## Rules for designing a safe target archery range

Safety dictates the range layout. On a target archery range we erect one or more targets and determine the place where the archers stand and from which to shoot their arrows. Between the archer and the target is the so-called shooting range. It is obvious that during shooting, the range has to be free of people, pets, and obstacles.

Around the shooting range, it may be possible to use the terrain to alleviate many safety concerns, particularly in providing natural backstops and buffers.

In practice we want to shoot safely on a range that allows more than one archer to shoot close alongside each other and at the same time.



To design an archery range that makes it possible to conduct archery safely, we have to recognise the following prerequisites:

**Point 1:** There is a clearly visible straight line on the ground, called the shooting line. Archers must shoot their arrows only when standing on or astride this line. Never allow people to stand ahead of the shooting line. In target archery there is only one shooting line for all archers, even if they are not shooting the same distances; targets may be placed at different distances for different target lanes. There should be **no** access ahead of the shooting line while shooting is in progress.

**Point 2:** Archers shoot at the target directly opposite their shooting position.

**Point 3:** There is a definite time-slot for shooting and the archer may not raise the bow arm to shoot until the signal to start shooting is given. Then there is a period for archers to go to the targets, score and collect arrows. This pattern is then repeated throughout the session.

The way to create time-slots for shooting is to use sound signals, for instance a whistle or an electronic timing system. There should be one sound signal to go to the shooting line and to start shooting, and two sound signals to stop shooting and to collect the arrows.

**Point 4:** Shooting will be in one direction only – at the designated target.

**Point 5:** Archers should aim continuously toward their target when drawing their bow. The bow must not be drawn in such a way that if the string was accidentally released the arrow would fly out of the safety zone.

These rules have to be followed at all times, whether practicing or at a tournament. They are the preconditions for safe archery.

### Outdoor shooting grounds

Operating standards contribute to the creation of a safe environment. They include minimum spatial standards, site orientation, backstop, overshoot area, grass length, public access, changing facilities and secure storage – all described in Archery GB and World Archery guidelines.

Outdoor shooting grounds should have the following as a minimum standard:

- 1 •A grass sports field at least 124y long and 41y wide, where a back stop net is not used. Where a back stop net is used at least 43y and 21y wide
- 2 •Grass that is flat not sloped, short, well kept and well drained
- 3 •A field that does not allow access to the general public except at specific and defined points
- 4 •A fully accessible changing room, or club house which has toilets. This should be heated
- 5 •A notice board or sign post where the archery club can advertise their activities
- 6 •A secure storage area where archery equipment can be kept overnight

## Outdoor field orientation

In most cases, once a ground has been identified for use as an archery field, the range orientation will be obvious and determined by the size and shape of the ground, the access point, buildings and the like. However, if possible, the field orientation should prevent the archers from shooting with the sun in their eyes. Ideally, in the northern hemisphere the shooting line should be on the south side of the range and the targets on the north side, within +/- 20 degrees. This is to allow the sun to be behind the archers most of the day.

Keep in mind that there are right-handed and left-handed archers, they face different ways when on the shooting line. So the sun position during early morning or late evening shooting must be considered.

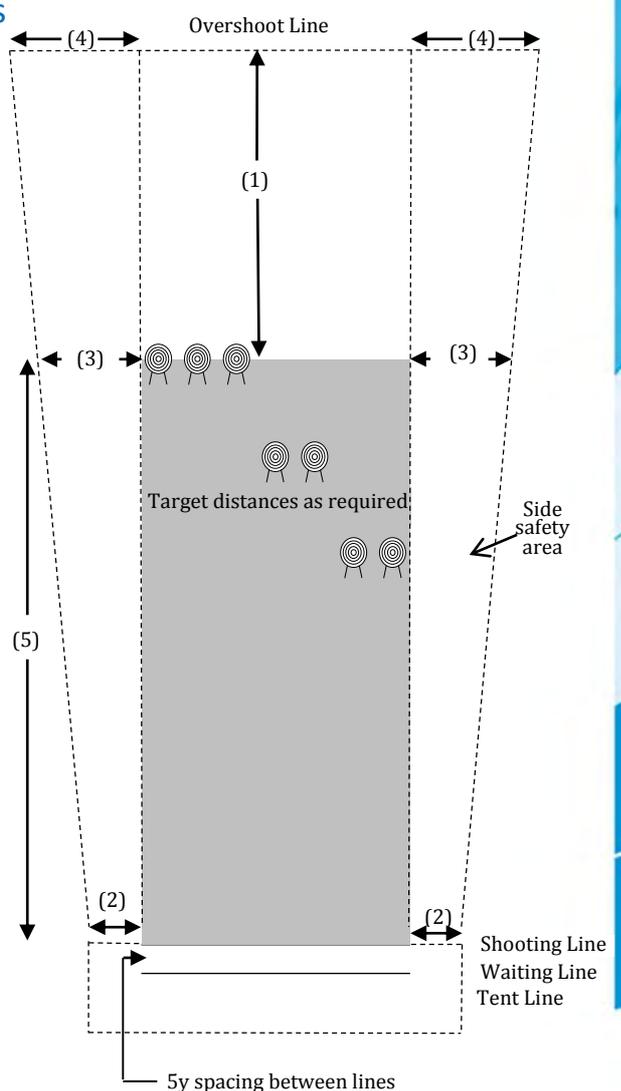
## Outdoor field of play layout, with safety zones

Figure 1 shows a practice archery field layout. (Additional markings are required for tournaments.)

If archers are shooting different distances the targets must be staggered not the shooting line;

- There should be a 5y space between the shooting line and waiting archers;
- The measurements for the safety zones shown on each side of this field are for experienced archers and novices under instruction.

- (1) Overshoot distance, always at least 50y. In addition the total distance from shooting line to overshoot line must be:  
At least 110y if targets are set at 60y or less.  
At least 150y if compound bows are used.
- (2) 10y exclusion measurement to side of the shooting line.
- (3) 20y exclusion measurement to side of range at 100y.
- (4) Side safety zone width increases linearly to overshoot line
- (5) Normal maximum target range is 100y.



**Figure 1**

There should be no dead ground in the overshoot area, which must always be clear during shooting. Be aware that archers may still be behind the targets looking for arrows that missed the target. Always check this before the signal to start shooting is given.

The exclusion areas each side of the range must be kept clear from all obstacles which could obscure any potential danger.

Outdoors, the spacing between the targets should be 8ft or more, allowing space for 2 archers to shoot comfortably side by side.



Each archer stands with one foot either side of the

shooting line (or both feet on the line) to shoot their bow when the signal to start shooting has been given.

Whilst archers are waiting to go to the shooting line they must stay behind the waiting line until the signal is given to advance to the shooting line. When the archers have shot their required number of arrows they must return back behind the waiting line. They wait there until the signal is given to advance to the targets to retrieve their arrows. Never run on an archery range; always walk to and from the targets to avoid any accidents or injuries.

### Outdoor field of play with reduced safe zones

In a very few cases an archery field with the required measurements for safety is not available. It may be possible however to reduce the exclusion zones beside and behind the archery range by introducing physical barriers. In some cases we can use the natural features of the field to reduce these areas.

From experience it is found that a barrier behind the target line does not have to be higher than 4 yards. When the distance between shooting line and target line is 100y, the further the barrier is behind the targets, the lower the barrier can be. It is sometimes possible to use a natural hill

or embankment behind the target line. A 4 yard high barrier is high enough. BUT it is essential that the arrows cannot pass through this barrier.

### Indoor shooting range

Sometimes an archery club can use a gymnasium or any similar convenient hall for their practice. The usual advantage of an indoor venue is the comfort of the archers during the winter, although once established, the area can be used any time. Sometimes a small surrounded safe outside area can be used.

Indoor shooting venues should have the following as a minimum standard:

- 1 •A heated, well lit hall at least 25y long and 21y wide
- 2 •A fully accessible changing room, or club house which has toilets. This should be heated
- 3 •A notice board or sign post where the archery club can advertise their activities
- 4 •A secure storage area where archery equipment can be kept overnight

The most common indoor shooting distance is 20y (18m); the maximum distance recognised for indoor shooting is 32y, but this may not be possible in all venues. The waiting line is normally 5y from the shooting line; this distance may be reduced to 3y if the space available is restricted, but safety must not be jeopardised. Behind the waiting line we need space for the archers' shooting equipment. Therefore the minimum total length required for an indoor range is about 30y.

Behind the targets there should be a safe arrow stop device, normally special backstop netting. A backstop net is often used to 'catch' arrows and thus to protect both arrow and wall from collision damage. This is obviously important in convincing venue managers/owners to make

their premises available. Irrespective of the presence of a backstop net no-one must ever enter this zone while shooting is in progress.

The netting should be attached along the top edge only, and hang loosely. This will give greater stopping ability. Never rely on backstop netting to stop arrows if there is any activity going on behind it. These curtains do deteriorate and with some high powered bows now available arrows have been known to pass through them.

The following recommendations for an indoor venue should be observed.

- Access to the range must only be possible from behind the shooting line. Any other access should be locked during practice.
- There must be access to all emergency exits, but if some are in front of the shooting line entrance into the hall through these must be restricted.
- There should be no windows or glass in the wall behind the target line that can be hit by an arrow that misses the target.
- An appropriate arrow stop can cover these windows.

In some multi-sport venues areas are separated by divisional curtains. It is unlikely that these would stop an arrow. Either impenetrable barriers must be installed or there must be the same side safety distances as use outdoors. **Under no circumstances should there be any human activity taking place behind the target area even if backstop netting is being used.**

The number of targets indoors is usually dictated by the available width of the activity hall. Each archer will need a minimum of 80cm of space when on the shooting line.

The normal target faces used indoors have diameters of 40cm and 60cm. The target butt should be bigger than the target face, so that any arrows that just miss the face will still land in the target butt.

## Field, Clout and Flight archery

These forms of archery have different, specialist requirements and those needing to set up ranges for these disciplines are strongly recommended to consult archers with appropriate experience.

The discipline of **field archery** differs from target archery in the sense that many different shooting lanes are set out along a course spread out over the natural terrain, often within woodland.

The shooting lanes must be set so that any arrows that miss the target will not travel into areas that could be populated with other archers or spectators.

Targets should not be placed on top of a rise where an arrow that misses the target can travel to an area that is not readily in view of the archer when they are standing in the shooting location.

The course must have safe paths to allow the officials and working staff to be able to move around the field of play with safety.

Only those persons who have been given permission will be allowed on the course when shooting is taking place, and they must keep to the safe paths at all times.

Field archery offers wonderful opportunities for archery, when there is no level terrain available.

An archer should have some moderate experienced of shooting at a close target set on level ground before turning to Field archery. Field archery clubs should have a safe and well defined practice area.

**Clout archery** has some similarities with target archery: it is practised in a flat field with something to aim at. In comparison with target archery:

- The target range is greater - up to about 200y



- The side safety and overshoot distance requirements can be up to 75y
- The target is a marked area of ground marked with a small flag

An archer must receive some specific training before clout shooting.

In **Flight archery** the intention is simply to shoot an arrow as far as possible. This naturally requires a large controlled area, such as might be found in enclosed rural estates or inactive airfields. If specialist flight bows are to be used, the range must be over 1000y long.

### Setting out a competition target archery range

Competition ranges must be set out with accurate measurements. The range must also be square. That is, the theoretical line between the mark on the shooting line and the centre of the target must be perpendicular to the shooting line. If this is not the case, the archers will soon tell you!

This squareness can be achieved with specialist equipment such as a theodolite. However, a tape measure and a bit of basic geometry are all that is really needed, given the fact that any triangle in which the sides are in the ratio 3:4:5 will have one angle that is a right angle.

For an outdoor range, look over the ground, pacing the distances to get a rough idea where the range will sit.



Figure 2 shows the marking layout as described below.

Set out the shooting line with a string and a peg at each end. Call the pegs A and B. Pegs should be easy to see.

Starting at peg A, measure 30y along the shooting line and fix a peg at that point, peg C.

Again starting from peg A, measure down the range 40y and temporarily put down a peg, peg D. Keep a tape measure between pegs A and D.

Set another tape between pegs C and D. Adjust the position of peg D until the distance A-D is 40y and the distance C - D is 50y. You now have a right angle at A.

Put a temporary string from A through D and along the range as far as the longest target distance required. Using peg A as the zero point, measure along the range and put a peg in at each distance required – pegs E, F, G etc.

Repeat the process from peg B at the other end of the shooting line, putting in pegs H and I to establish the right angle and then pegs J, K and L etc. along the range.

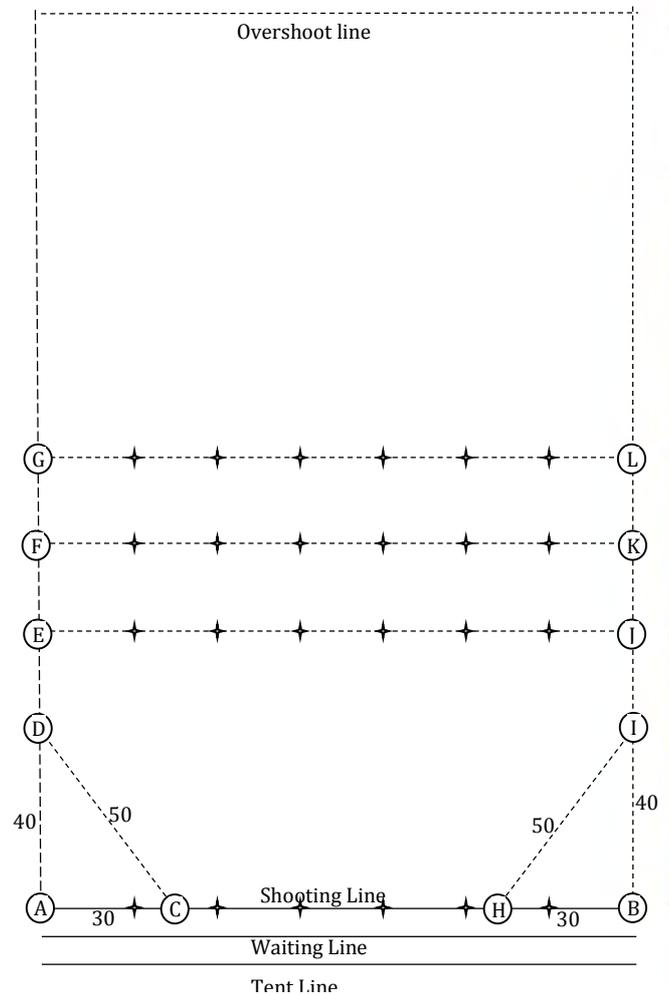
Put temporary strings across the range at each of the required target distances between pegs E and J, F and K, G and L.

Now mark the target positions and shooting positions. Work from one side of the range, say line A-G. Measure along the shooting line and along each target line and mark the shooting and target positions, normally every 10ft with pegs, paint or other marker.

Other lines across the range, either in front of or behind the shooting line positions, can be positioned by simple measurement from the shooting line.

The shooting line, waiting line and tent line must be marked, usually with proprietary white liner paint or similar. If strings are used as the line marker or otherwise retained on the range, they must be pegged at intervals to prevent a trip hazard.

Although there is no requirement to actually mark the target lines continuously across the field, this does make setting up the targets easier.



**Figure 2 - Example layout**

- ✦ T S
- Marked line
- - - Line need not be physically marked

Overshot and side safety distances are not marked on the ground, but there may be a need to rope these areas off.

For higher level competitions, additional lines may be required.

An indoor range can be set up in the same way, using chalk, floor tape or other markers. However, buildings are often square to start with, and floor patterns are often available to achieve the required square accuracy.

### Further reading

- Rules of Shooting, Archery GB
- World Archery (FITA) Constitution and Rules
- Archery GB Code of Practice - Have a Go's
- Archery GB Code of Practice - Archery Demonstration
- Archery Facilities: Guidance and Specifications
- National Target Archery Facility Strategy 2012-14



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## Archery GB

Lilleshall National Sports Centre  
Newport  
Shropshire  
TF10 9AT

General Enquiries:  
Tel: 01952-677 888  
Email: [enquiries@archerygb.org](mailto:enquiries@archerygb.org)

[www.archerygb.org](http://www.archerygb.org)



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