

### A Father's Advice

If a sportsman true you'd be  
Listen carefully to me ...

Never, never let your gun  
Pointed be at anyone.  
That it may unloaded be  
Matters not the least to me.

When a hedge or fence you cross  
Though of time it cause a loss  
From your gun the cartridge take  
For the greater safety's sake.

If 'twixt you and neighbouring gun  
Bird shall fly or beast may run  
Let this maxim ere be thine:  
"Follow not across the line."

Stops and beaters oft unseen  
Lurk behind some leafy screen.  
Calm and steady always be:  
"Never shoot where you can't see."

You may kill or you may miss  
But at all times think this:  
"All the pheasants ever bred  
Won't repay for one man dead."

*Mark Hanbury Beaufoy*



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# AIRGUNNING AT HOME

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## Foreword

Airgunning is a popular way to start learning about the skills required in shooting. It's a huge sport providing fun and enjoyment for individuals, families and clubs for all ages.

When given the gift of spending time at home, airgunning can be a great way of providing structured activities for individuals and families. Parents and children can enjoy spending time together, learning new skills and developing an interest in this wonderful sport.

Careful consideration of safety and neighbours will allow many happy hours on the home range.

The disciplines of safe shooting are a powerful influence on many other aspects of life. Safety is an essential part of shooting sports and should become first nature. Unsafe behaviour, wherever it occurs, must not be tolerated.

The skills of shooting – the physical aspects – strength, steadiness, psychomotor control - and the mental aspects – concentration, thought, discipline – are key life skills and are a powerful contribution to the development of responsible and socially developed young people.

In this little book we hope to be able to pass on some information about airguns and shooting to give you fun, skills and safe shooting.

All the very best with airgunning at home!

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This booklet was produced by the **Airgun Sports Trust** in association with

The Airgun Manufacturers and Traders Association and

The Gun Trade Association

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# AIRGUNS AND THE LAW

Low power air guns, although not requiring a licence in England and Wales, are subject to controls under Firearms and other Acts of Parliament.

The key points:

The legal limit for power is 12 foot pounds for air rifles and 6 foot pounds for air pistols. More powerful air rifles require a firearms licence.

It is illegal for those under 18 to buy, be given or own a airgun or ammunition. Owners are responsible for preventing under 18s gaining unauthorised access to airguns.

Under 14s can shoot airguns under direct supervision of somebody over the age of 21.

With permission, 14-17 year olds can use an air gun on private premises.

Air pellets must never cross the boundary of land where you have permission to shoot.

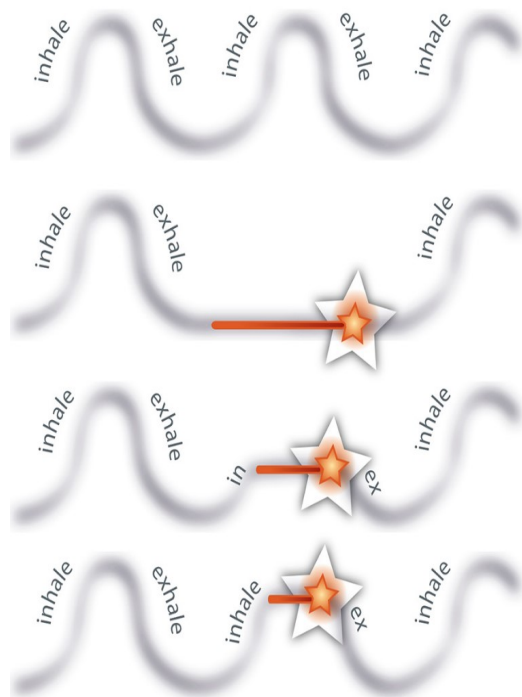
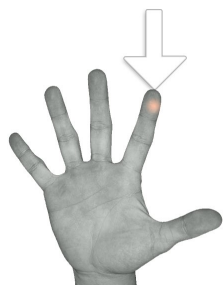
In Scotland low-powered airguns require an Air Weapon Certificate.

## FINAL CHECK LIST

- **Make sure you know the laws relating to airguns and abide by them.**
- **When you pick up any gun always check that it is not loaded.**
- **Never point a gun at anyone or anything that is not a legitimate target.**
- **Gun safety is a state of mind; never rely on a safety catch.**
- **Keep your airgun securely and away from children. Store your pellets separately.**
- **Always ensure it is safe to shoot and be certain of your target before you squeeze the trigger.**
- **Make sure there is a safe backstop behind your target to catch your pellet.**
- **Beware of bounce-back – do not shoot at wood or other smooth surfaces that might reflect pellets back in an unsafe direction.**
- **Always unload your gun when moving around, taking it indoors or storing it away.**
- **Never shoot on land without permission from the owner.**

## Breathing

As you breathe the sight picture will move across the target. At some stage you need to hold your breath and take the shot. Concentrate on your breathing and choose the moment to stop, hold your breath and squeeze the trigger. The diagram on the right shows some options. The red line shows the breath hold; the star the moment to squeeze. Again, practice and develop your own technique.



## Release the shot

Releasing the shot is about pulling the trigger. This is the most important moment. Everything should come together when you want the gun to fire. Position, sight picture, breathing and squeeze. Don't pull the trigger, squeeze it and keep holding. Use the most sensitive part of your finger. Squeeze the trigger and remember to follow through.

Try to keep your eyes open, looking at the target and think about keeping a steady position to follow through.

The objective at this stage is to ensure you can shoot consistently. What you should be aiming for is small groups on the target – wherever the groups are. Have competitions with your friends about how small you can get a group of 5 shots. Small groups are an indication of great shooting skills.

Getting it right with an airgun will allow you to progress to bigger calibre rifles if you get tempted.

## INTRODUCTION

This booklet has been written to assist more people into the wonderful opportunities provided by airgun shooting. It provides a simple guide into the basics of 'skills and drills' required to get started or develop your capabilities in a safe and efficient way.

It covers accepted **drills** required to operate safely with airguns and helps with how to develop your own personal **skills**.

It also provides a useful guide for parents and other instructors with the information they need to introduce new shots to the sport.

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We are grateful to Scottish Natural Heritage for their permission to use the diagrams in the marksmanship section.

# SAFETY

Airguns are dangerous; they are not toys.

Under UK law even low powered airguns are classified as lethal barrelled weapons - as firearms – even though a licence is not required. They are subject to various Acts of Parliament and must be treated accordingly. A summary of the law relating to airguns is included at the end of this book. It should be noted that airguns are very different from airsoft guns that have been designed to be able to fire at other people. Airguns must never be pointed at anyone.

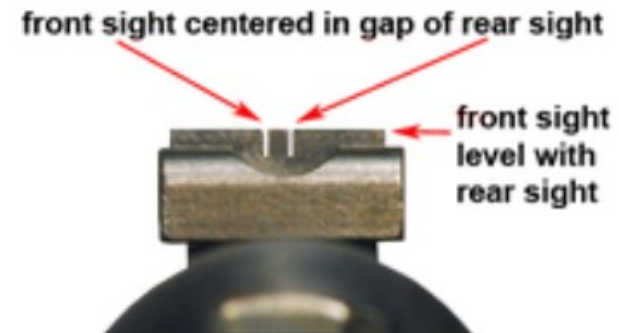
Every year life changing injuries occur in accidents with air rifles; occasionally deaths. This is unacceptable. Owners of airguns must ensure that they are only ever used in safe environments. Where there are learners, like driving, there must be proper supervision. When not attended; the airgun must be locked away from untrained or irresponsible hands.

**Every airgun owner is responsible to the entire shooting community for the safe control of their gun. Do not be the one that has to face his friends for having caused or allowed harm.**

## Sight Alignment

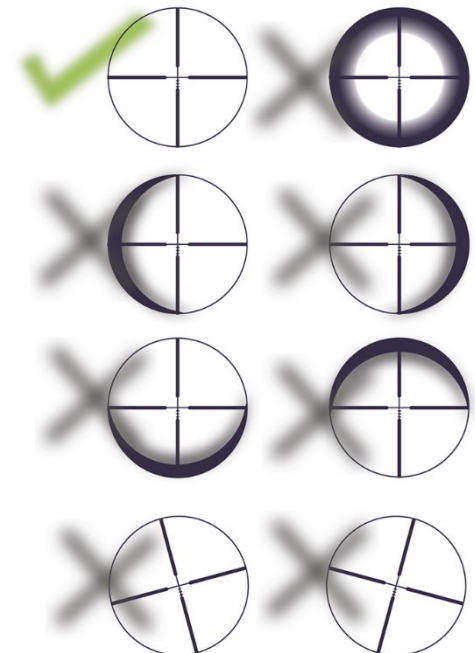
### Open sights

When using open sights the gap in the rear sight must be centred and level with the front sight and both be in line with the aiming point on the target. The trick is to be consistent. Know your sight picture and make sure you use the same picture with every shot.



### Telescope Sight

The optical telescope sight must be fitted securely on the rifle and positioned in the right place for the firer. When you look through the sight the sight picture should be clear as shown in the top left diagram. If its too close or too far from the natural eye position you will get an image like the one top right. Make sure the reticules are vertical when the gun is level.



# PERSONAL PERFORMANCE

## MARKSMANSHIP PRINCIPLES

Every shooter wants to be more accurate with every shot taken. Personal skills are the key to better performance.

In relation to the shot, the Army's Marksmanship Principles will always serve us well

- *The position and hold must be firm enough to support the weapon.*
- *The weapon must point naturally at the target without any undue physical effort.*
- *Sight alignment and sight picture must be correct.*
- *Get your breathing right.*
- *The shot must be released and followed through without undue disturbance to the position.*

### The Position and hold

When the gun is fired we need it pointing at the target in a natural manner. When the gun fires it will generate recoil and disrupt the hold.

Then think about the 3 points of contact with the rifle. Firmly in the shoulder away from the bony bits, your trigger hand pulling the rifle back into the shoulder and the front hand supporting and gently holding the fore-end.

### Weapon pointing naturally at the target

Making sure it is naturally pointing at the target will ensure it stays pointing that way throughout the shot and follow through.

Get yourself comfortable on the ground or against a support. Put your body in a position where the rifle points naturally at the target. You should not have to apply any pressure up or down or side to side to keep the rifle and sights looking at the middle of your target.

Marksmanship is about about 'drills and skills'. Drills are at the heart of safe and efficient airgun handling.

A good example from the Army are 'NSPs' or normal safety procedures. This drill is used to ensure safety whenever a gun is picked up or passed to another person.

The essential parts of the drill are:

- Keep gun pointed in a safe direction throughout
- Ensure safety catch is on
- Remove any magazine
- Open the action to ensure the gun is unloaded
- Show its clear to recipient
- Pass over

These are the essentials and can be added to depending on the type of gun.

The important thing is that it should be an instant response if somebody asks you to pick up or pass a gun. It is not optional and forms the basis for all shooting safety.

Then we should aim to develop skills – those personal capabilities that can be improved with practice – and their drills – training that builds certain specified behaviours that require no thought. Such reflex responses only come after repetitive training but once learned are never forgotten.





# DRILLS

**Safety drills are not optional. Here are the [Rules](#) :**

- Never point a gun at anyone, even in jest.
- Never leave an airgun unattended or insecure.
- Never leave an airgun loaded during periods of non-use.
- Always apply the safety catch (if fitted) until the airgun is about to be operated.
- Never rely on the safety catch to make your airgun safe, they may fail.
- Always declare whether an airgun is loaded or empty when handing over to another person.
- In cases of an unloaded airgun, this should be proven to the second party.
- Always be aware of the direction the barrel is pointing and keep it safe.
- Never fire an airgun unless you are sure it is safe to do so.

## Consideration of Neighbours

In order to be able to enjoy many happy hours of back garden shooting, you must consider those around you. Pellets must be caught safely and never cross a boundary. Noise must be minimised. Where sound moderators can be fitted to barrels that will help, as will soft materials in the pellet catcher. Scrunched up news paper, bubble wrap, even grass clippings have all been used effectively to keep the range quiet.

## POWER STORAGE TYPES

### Spring operated – break barrel

This traditional type uses the barrel as the lever to cock the spring. The barrel is ‘broken’ from the body using a downwards force and levered against the spring until the trigger mechanism holds the spring’s energy. Care should be taken while exerting the downward pressure because until the catch engages the spring can force the barrel back up against the pull.

Normally, once the spring is held, the safety catch will automatically be engaged. **You must keep clear of the trigger until ready to fire.**

Many modern guns are fitted with a ‘bear trap’ that is designed to stop the barrel / lever springing back after cocking when the trigger is pulled. This is a useful safety mechanism but stops you from releasing the spring without firing. In order to ease the spring, the rifle should be fired off with a pellet into the ground or at a target.

### Spring operated - under/side/over lever

This mechanism is very similar to the break barrel types but uses an independent lever to cock the spring. They might be a little harder to use but have the benefit of fixing sights and barrel together, reducing variability.

### CO2

The CO2 cartridge guns use either a 12g or 88g CO2 pre-filled disposable cartridge. They have the benefit over the spring type in that there is less movement in the gun on firing – there being no piston and spring travel (sometimes described as recoil-less). They are very convenient with lightweight refills for the field.

### PCP – Pre-charged Pneumatic

Pre-charged airguns are very popular today. They are more technologically advanced, so may cost a little more, but produce very consistent, accurate results. The reservoir is charged using an air bottle with dry breathing air or compressor to about 200psi and then provides the power for 40 or 50 shots. There is less ‘recoil’ like the CO2 system. They are usually magazine loaded. **NEVER OVERCHARGE YOUR GUN**

Airbottles have their own safety issues and must be kept away from children. Ensure you have proper guidance on how they are to be used and comply with the manufacturers instructions.

### Pump Pneumatic

Without the need for a re-charge from a separate source, the pump pneumatic gun requires the user to pump air into the reservoir direct by use of an in-built pump. They are pressure limited but may offer 5-10 shots with one charge.

## MUZZLE ENERGY

Without a firearms certificate (FAC), air gun ownership is limited to guns with the following muzzle energy:

Rifle: 12 foot pounds (Approx. 16 Joules)

Pistol: 6 foot pounds (Approx. 8 Joules)

**YOU MUST DO NOTHING TO TAMPER WITH YOUR AIRGUN TO INCREASE THE POWER.** If you have doubts about its performance get advice and a test with your airgun dealer.

### How is muzzle energy measured?

Muzzle energy is measured by knowing the weight of the pellet and then measuring the muzzle velocity. Kinetic energy =  $\frac{1}{2} MV^2$ . M being the mass in kilograms and V being the velocity in m/s – giving a result in Joules.

You will need a chronograph and then test a series of 10 pellets to give you a good average. There are some good calculators to help on the internet. It's worth checking to see that you are legal.

Different weight pellets will have an effect on the aiming point as well as energy. Every time you change pellet type, make sure you check your zero.



Two types of chronograph suitable for air guns

## AIRGUN TYPES

It is important to understand the different types of airguns because they operate in different ways and require different training. **Do not assume that because you used an airgun in previous years, you will know how to operate safely using a different type.** Get advice from your dealer, instructor or the internet before you try out something new. Always follow the product information guide provided by the manufacturer.

**Never point a gun at anyone, even in jest.**

**FACT - All the deaths involving airguns have been because the airgun was not being pointed in a safe direction.**

It is essential that all training and all firing is conducted with the airgun pointing in a safe direction. Whether you are cleaning the airgun, loading it, passing it to another or even firing it, the barrel must be pointing so that if the gun went off the pellet would not cause harm to anybody. Supervisors must teach this drill from the start and shooters must always handle the airgun in the proper way. Do not get complacent.

**The mark of a proficient shooter is weapon handling skills and drills**

**Never leave an airgun unattended or insecure.**

When an airgun is not in use it must be unloaded and secured.

Spring guns should have the spring released in storage.

Having been unloaded the airgun should be secured. The law requires owners to take reasonable precautions to prevent unauthorised access by those under 18. Furthermore, airguns are often valuable and you do not want them stolen.

Suggestions for security:

- In a slip for carrying around or transport
- trigger lock
- Security cord

secure location – not just out of reach but locked away. And control access to the keys!

Gun cabinet – if you have other firearms and a gun cabinet, get used to locking away the airgun in the same way.

### **Never leave an airgun loaded during periods of non-use.**

The gun must be unloaded when not being used. It is unsafe and it is also bad for the gun.

### **Always apply the safety catch (if fitted) until the airgun is about to be operated.**

Most airguns now have safety catches. If you are buying a new one – make sure it does have a safety catch. Only push off the catch when you are pointing at the target and ready to fire.

### **Never rely on the safety catch to make your airgun safe, they may fail.**

Test the safety catch regularly by pointing the gun in a safe direction and pulling the trigger. If it's not working get a gunsmith to fix it. Lives may depend on it.

### **Always declare whether an airgun is loaded or empty when handing over to another person.**

Airguns should not normally be passed to another when loaded but this can be allowed on a firing point when a supervisor has loaded the airgun for the trainee and it is passed across while pointing in the direction of the target. The safety catch must be applied.

### **In cases of an unloaded airgun, this should be proven to the second party.**

Use the NSPs. For a trainee, explain the NSPs and get them practiced in passing an airgun back and forth going through the drill. Ensure the other person really checks.

### **Always be aware of the direction the barrel is pointing and keep it safe.**

Keep the barrel of the airgun pointing in a safe direction – either at the target or at the ground. Do not point the gun in the air or wave it about. It must be kept under control. Take extra care with air pistols as they are easier to wave around.

### **Never fire an airgun unless you are sure it is safe to do so.**

When pulling the trigger, you must know where the pellet might go. Your target must be suitable. You should be aware of ricochets. Pellets bounce off hard materials and can come back towards the firer. Use pellet catchers or soft backstops like earth banks to reduce the risk. It is an offence to intentionally or recklessly kill certain wild animals and birds or kill or knowingly cause a pet animal suffering. Know the law and shoot accordingly.

The whole reputation of your sport depends on your good behaviour. With the opportunity to enjoy shooting come real responsibilities.

## **INTERNAL BALLISTICS**

Most airguns use waisted lead pellets. There may still be a very few smooth-bore 'rifles' in some homes that fire BB roundshot.

The pellet is placed in the breech before firing. The most popular pellet is 'diabolo' shaped pellet with the head holding the pellet straight while in the chamber and on its travel up the barrel. The skirt is thin lipped and is designed, under pressure of the propelling gas, to widen and provide a good seal (obturation). It then engages with the rifling and imparts spin to the pellet. It's usually made of lead which is soft and dense – this is good for the obturation and for carrying energy to the target.

The propelling gas accelerates the pellet in the barrel. The longer the barrel, generally, the more time the gas has to act and therefore greater muzzle velocity is achieved.

## **EXTERIOR BALLISTICS**

Once the pellet leaves the muzzle its in flight and new factors appear.

First is gravity. As soon as its not being held by the barrel the pellet begins to drop. The sooner we can get it to the target the better. The sights (covered later) can compensate for the fall.

Second is drag. The air has resistance and will be slowing the pellet. The best shape for a projectile travelling below the speed of sound (such as airgun pellets) is a rounded front.

Spin. The rifling in the barrel spins the projectile. Like a gyroscope, that spin gives the pellet stability in flight. It keeps the pellet on track and stops it from tumbling end over end.

## **TERMINAL BALLISTICS**

At the target we need the pellet to give up its energy. On paper targets, punching a hole is enough.

Different pellet shapes can provide help in penetration and energy transfer.

Wadcutter – flat fronted. Primarily designed for clean maximum sized hole in match targets

Pointed – for penetration

Round fronted – best all-round type with optimal aerodynamics

Hollow point – theoretically for expansion (depending on velocity).

*Enjoy experimenting with different types!*



# SCIENCE and AIRGUN TYPES

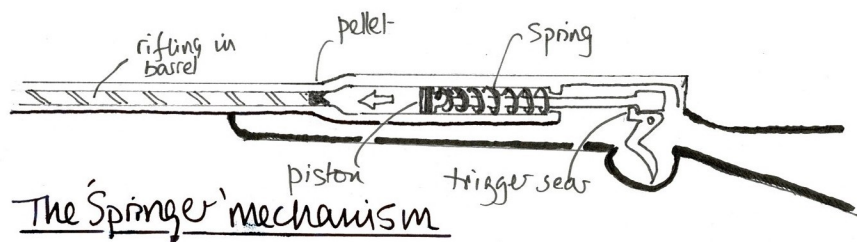
All firearms are designed to accurately move energy from one place to another in order to create an effect. An airgun uses stored energy to propel a pellet along a barrel to a point where we want to release that energy on a target. Let's look at the science.

## STORED ENERGY

### Spring Guns or 'Springers'

Traditional airguns store energy in a metal spring. The firer transfers energy from the arm into the spring by pulling down the barrel or underlever to 'cock' the rifle or pistol. The spring, usually made of a special steel, has the ability to deform while under tension and then return to its previous shape when released.

The steel spring is very efficient in storing the energy and can hold its compressed energy for long periods of time (this is however not desirable as cocked airguns are potentially unsafe and the spring may degrade over time. 'Ease springs' when not in



use.)

A more complex system uses a sealed chamber of inert gas (e.g. Nitrogen) to act as the spring. They do not suffer from spring fatigue.



Diabolo shape pellets

## Further Advice on Storage and Security

- An airgun should always be stored in an unloaded state.
- It is advisable to store an airgun out of sight as well as securely.
- Ammunition should always be stored securely and separately to an airgun.
- All airguns should be stored in a secure location e.g. a locked cupboard.
- The location of keys or access codes to firearm cabinets should be known only by the owner of the firearm.
- Keys should also be kept in a separate and secure location.
- It is advisable to use a locking device to attach your airgun to the fabric of a building or fixed feature.
- Do not store an airgun in an insecure area e.g. a garden shed.



# SETTING UP A RANGE

Setting up your range to give you somewhere to shoot safely is an absolute priority. The law requires you to ensure that pellets do not leave your land. Pellets carry potentially lethal energy and that energy must be caught safely. Having pierced the paper or hit a hard target, the pellet must be slowed down and safely retained.

## Bounce-back

As pellets can ricochet (bounce back), you need proper measures to stop them flying around. Vertical wooden boards are not ideal as pellets can bounce back. Very hard surfaces, like concrete paving slabs are better but soft materials that can catch the pellet – layers of cardboard or old carpet might be best. The aim should be to keep the target properly supported but then to catch the pellet in a soft material to reduce noise.

Hard surfaces can be used at an angle to direct pellets down to the ground.

## Targets

Penetrable (paper or card) or light, fall-when-hit targets should be used. They should be well lit and suspended at or below a horizontal line from the firer. There are lots of paper targets available on line to buy or to download and print. Likewise, specialist airgunning targets are available to buy and may include a pellet catcher.

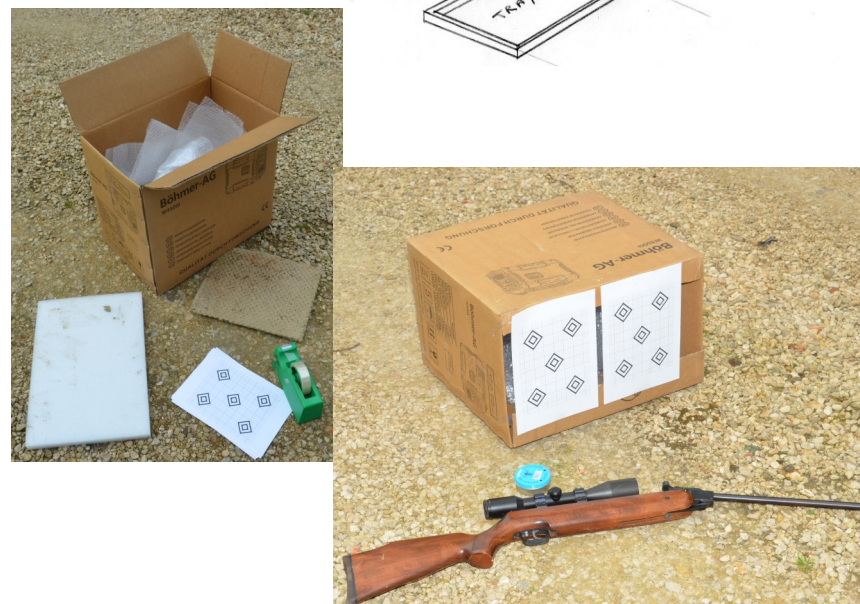
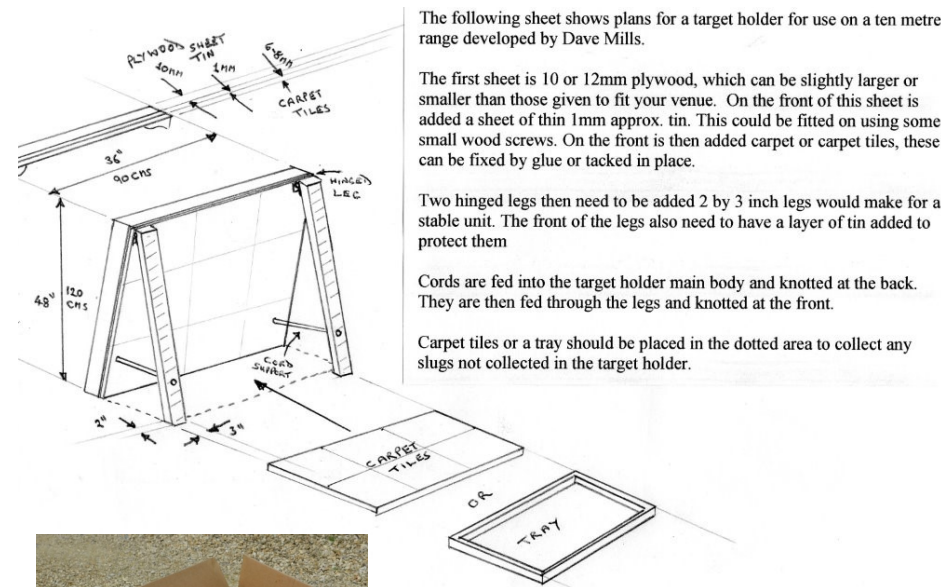
Targets should be at least 7.5m from the firer – any less presents additional risk of bounce-back. Outdoors is ideal but some indoor rooms or buildings will be suitable.

## Area

As stated, all pellets must be caught to avoid danger to the firers or others in the area. The range must be set up to ensure no person or animal can appear between the firing point, target and pellet catcher.

## Hygiene

Pellets are usually made of lead. After handling pellets at the firing point or clearing used pellets, hands should be washed to avoid contamination. Used pellets should be disposed of properly.



An easy and effective target box using old carpet and bubble wrap to safely catch the pellets and keep noise to a minimum. Placed in front of a suitable backdrop, this will set you up well for airgunning at home. Draw your own targets or print from the many available on the internet.