

AIR GUN RANGES

Summary of a Presentation to the National Shooting Range Symposium

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All of us in the shooting sports have been taking a new look at air gun ranges during the last decade. That is because we have been building only one indoor smallbore range for every ten that have been closed. Building even a small new indoor range that meets all the environmental and safety requirements for firearms can easily cost in excess of \$100,000.

The attraction to air gun ranges is that they can be set up nearly anywhere - at home, in schools and church fellowship halls! Before discussing air gun ranges, we should give some thought to the air gun itself.

Historically. Invented in the 1500's, air guns have been around just as long as firearms. The Austrians were the first and last to use them on a large scale as a weapon of war. They were so effective that Napoleon Bonaparte decreed that any Austrian captured with an air rifle was to be hung on the spot. Because of their quiet operation, they have been a favorite of European poachers for centuries. Lewis and Clark took an air rifle on their expedition of 1804 and made frequent entries in their diaries on its effectiveness. In the late 1860's, simple and inexpensive air guns were first produced in the U.S. The public began buying air guns for recreational shooting and they have been popular ever since.

Uses. Nearly three million air guns are sold in the U.S. annually. The powerful large caliber air guns are not, to my knowledge, made today and are mainly museum pieces. The most popular air guns are inexpensive .177 caliber pellet rifles and BB guns purchased for recreational purposes. With the introduction of air guns at the World Shooting Championships in 1966, air guns have become increasingly popular with competitive shooters. Air rifle became an Olympic event in 1984 and air pistol in 1988. Currently there are fifteen shooting events in the Olympics for which Gold Medals are awarded and five of them are air gun competition.

Most elite rifle and pistol shooting athletes around the world train with air guns even if it is not their primary discipline because of the convenience of finding a place to shoot. As a result of the shrinking number of smallbore ranges since the 1970's, more and more entry level shooting programs have turned to air guns to teach marksmanship fundamentals and to introduce junior shooters to competition. With the switch of the JROTC shooting programs to air gun over the past few years, the number of junior athletes training with air guns has surpassed those shooting smallbore.

All of this interest in air gun creates a need for air gun ranges and there is surprising little published information on the subject.

Multipurpose Space. One of the most attractive features air gun shooting is that there are so many indoor spaces that can be turned into a safe air gun range for a period of time and then returned to their primary purpose. The space for the air gun range may be small (a hallway at home) or large (a gymnasium) but the basic requirements remain the same.

Design Considerations for Indoor Air Gun Ranges

Multipurpose ranges are seldom designed primarily as a range so when the space is selected, a series of tradeoffs must be considered to come up with a safe range. The major considerations are:

Containment. One of the first considerations should be, "Will a stray BB or pellet be contained within the area." If the walls are made of sheet rock, it may be possible for a pellet to penetrate the wall. If a wall can be penetrated, you must consider what is on the other side of the wall. You may want to obtain a sample of the wall material for testing to determine penetration and bounce-back characteristics. Masonry walls are the most effective in terms of containment.

Access. Doorways and passages into the range area forward of the firing line must be blocked. Locked doorways should have a warning posted on them if they can be opened by a key from outside the range.

Pellet Traps. Working with beginning pellet shooters, I prefer a metal trap with a large surface area (24" wide x 18" high). With good initial instruction, a beginning shooter should never miss this trap and its face is large enough for a 10 bull competition target for the more advanced shooters. For bullseye shooting on paper targets, I cover the face of the trap with cardboard. This provides backing for the targets and prevents spent pellets from being kicked out of the trap (harmless but messy). NOTE: BBs should never be fired into a metal pellet trap that is not specifically designed for BBs.

BB Traps. BB traps are designed to absorb the energy of the BB and keep it from leaving the trap. Commercial BB traps usually have one or more drapes which stop the BB and let it fall to the bottom of the trap. Cardboard boxes can be used to make a simple but effective BB trap. At the bottom of the box (this will be the back of the trap) lay six or seven layers of cardboard. Then fill the box with balls of newspaper made by wadding up single sheets of newspaper. When the box is packed (snug but not too tight) with the newspaper balls, tape the lid shut and you have a BB trap that will last for several thousand shots. Again, I recommend a large surface for beginning shooters.

Backstops. If there is a concern that your shooters may miss the traps and the wall toward which you are firing must be protected, you need to consider a portable backstop. Half or 3/4 inch plywood will stop pellets; they flatten out and fall to the floor. Plywood alone, however, will bounce BBs back toward the shooter. For a BB backstop, I use the plywood leaning against the wall at a 10 - 15 degree angle and place a 2" sheet of Styrofoam insulation in front of the plywood. A stray BB would have to penetrate 4" of Styrofoam to come back toward the shooter. I have used this sort of backstop only for air gun ranges in convention centers and hotels where walls needed to be protected from stray shots and I did not know the skill of the shooters.

Target Runners. If all shooting is to be done in the standing position (pellet rifle or pistol), several firms make an excellent target runner/trap system that allows you to quickly

transport single bull targets to and from the target line. Both hand crank and motor driven systems are available. The face of the trap is about 5" square so this is not for entry level shooters unless a backstop is used.

Lighting. Proper lighting is an important feature on air gun ranges. This is also something many people neglect in their enthusiasm for keeping their air gun range simple. Overall light in the room where the range is constructed should have normal illumination for a classroom or other active indoor area. Air gun shooting ranges should never be darkened. Unless a large illumination system is used to brighten the entire target area, special lighting should be placed on each of the targets. This can be done using an ordinary 50 to 75 watt bulb with a reflector shield.

Safety. Common sense and caution are probably the most important factors to apply in the design and use of any shooting range but even more so on an air gun range. Many people falsely assume the because air guns are not as powerful as most firearms and are relatively quiet, that there is no danger in their use. Air guns can cause serious injury and air gun range design must take this into consideration. By acknowledging that fact and taking the proper precautions, we can keep shooting the safest sport in the U.S. These are some of the safety factors that must be considered:

Space Requirements. In calculating if a location has sufficient space for an air gun range and how many firing lanes can be used, the following dimensions may be used:

A. Depth of trap (and backstop if used). Determine requirement by measuring actual situation.

B. Firing distance: For pellet gun competition, the distance from the firing line to the face of the trap should be 33 feet. For BB gun competition, 16 feet, 4 3/4 inches.

C. Firing positions. In most situations you should allow at least 8 feet of depth for the firing position. Four feet is sufficient if only the standing position is to be used. Position shooting requires 6 to 8 feet.

D. Assembly area/observation area. This is not needed on a private range at home but a school or club range should have 10 feet or more for an assembly area or observation area behind the firing positions.

E. Width of firing lane. The firing lane should be 4 feet wide.

F. Height of Targets. In position shooting, being able to adjust the height of the target and the trap it is mounted on is an important consideration. Some traps are mounted on adjustable stands which facilitate making a target height change. If using a box trap or an angled sheet metal trap, setting the trap on milk crates makes for simple adjustment and easy portability. The NRA Rules proscribe the following:

• **BB Gun Rule 9.15:** Target holder shall be placed so the center of the target is not less than 1 foot nor more than 1 1/2 feet from the ground for prone, sitting and kneeling positions. The target height must not be less than 3 feet nor more than 5 feet from the ground for the standing position.

• **Position Air Rifle Rule 6.2.1 (a):** The height of the target for the standing position shall be between 47 inches and 63 inches above the ground. When using multi-bull targets, the center of the upper bull shall not exceed 63 inches and the center of the lower bull shall not be lower than 47 inches. NOTE: The rules are silent on required heights for the other positions.

• **Eye Protection.** When firing BB guns, all shooters on the firing line (and others in the range if possible) should be required to wear shooting glasses or hardened lenses. The eye is the most vulnerable part of the body.

• **Adequate Training.** Thorough training (explanation, demonstration, and dry-fire) before a shooter takes his or her first live fire shot with an air rifle will help assure that it is safely on the target and in the center of the trap.

• **Lead.** There is no problem with air borne lead pollution from air gun shooting and no special ventilation system is required. Shooters, however, should be cautioned not to put pellets in their mouth and, after handling pellets, not to eat or smoke without washing their hands.

• **Safe Range Operation.** Procedures for safe range operation should be established and followed. All of the NRA Rule Books provide a list of the standard range commands; they should be used in the control of the range.

Technical Assistance. The USST Junior Development Office (615/831-0485) will be pleased to answer general questions on air gun ranges. If you need help with specific range problems, you may contact:

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