

# AIR RIFLE RANGE MANAGEMENT

JROTC Marksmanship Instructor  
Course, Section IV

## JROTC Marksmanship Instructor Training Course

### Section IV: AIR RIFLE RANGE MANAGEMENT

This section covers specific procedures that Range Officers and shooters must follow when live fire activities are conducted.

#### Resources:

1. ***Air Rifle Range Safety Rules*** (Poster produced by CMP)
2. ***JROTC Standard Operating Procedures (SOP) For Air Rifle Safety and Air Rifle Range Management***
3. ***Range Officer Operating Procedures***, (Script and instructions for ROs)
4. ***Safety Briefing for Air Rifle Shooters*** (sample safety briefing)
5. ***GUIDE TO LEAD MANAGEMENT FOR AIR GUN SHOOTING***
6. ***CO<sub>2</sub> Air Rifle Cylinder Filling Procedure*** (Poster produced by CMP)
7. ***Fill Procedures for the Daisy M887 Air Rifle***, (Video posted at <http://www.odcmp.com/Videos/09/887fill2.wmv>)

# Air Rifle Range Management

## Section Objective:

To prepare JROTC instructors to manage air rifle ranges and conduct live fire activities safely



## 4.1 Air Rifle Range Management:

The objective of this Section is to teach JROTC instructors how to manage air rifle ranges and how to conduct safe air rifle range live fire activities. Range management starts with establishing the physical conditions for safe range operation. A major part of range management is working as a “range officer” to properly and safely conduct live fire activities on the range. A concluding phase of range management concerns dealing with special situations that arise before, during and after live fire activities.

## Range Management Performance Objectives

- ⊙ Plan and set-up a safe air rifle range
- ⊙ Teach safety and range procedures to cadets
- ⊙ Safely and properly conduct live fire on air rifle ranges
- ⊙ Control special situations that arise during live firing
- ⊙ Properly store and secure unit air rifles and equipment
- ⊙ Properly care for the unit's shooting equipment

### **4.2 Range Management Performance Objectives:**

This list identifies the performance objective or capabilities that JROTC instructors should have in order to establish and operate air rifle ranges for JROTC cadets at their schools. The performance objectives are:

- 1. Plan and set-up a safe air rifle range.** This starts with finding a place to shoot, obtaining safe backstops and setting up the range so that the range area is safe and secure.
- 2. Teach safety and range procedures to cadets.** Perhaps the most critical function in assuring safe air rifle activities is properly training the cadets who will use the range for their marksmanship activities.
- 3. Safely and properly conduct live fire on air rifle ranges.** Instructors must know and consistently use proper procedures and commands when conducting live firing.
- 4. Control special situations that arise during live firing.** A big part of assuring safety is properly dealing with special situations that occur during live firing.
- 5. Properly store and secure unit air rifles and equipment.** Air rifles must not be accessible to unauthorized persons.
- 6. Properly care for the unit's shooting equipment.** Equipment that continues to work right makes the marksmanship more effective and safe.

# Air Rifle SOPs

- ⊙ Reference: JROTC SOPs for Air Rifle
- ⊙ SOPs cover:
  - ⊙ Air Rifle Range Layout and Construction
  - ⊙ Safety Instruction for Cadets
  - ⊙ Range Supervision & Live Fire Conduct
  - ⊙ Air Rifle Storage
  - ⊙ Health and Hygiene
  - ⊙ Air Rifle CO<sub>2</sub>/Air Cylinders

## 4.3 JROTC Air Rifle SOPs:

The ***JROTC Standard Operating Procedures (SOP) For Air Rifle Safety and Air Rifle Range Management*** as adopted by the Army Cadet Command and Navy Education and Training Command are a basic document that guides the establishment and operation of JROTC air rifle ranges. The SOPs have six numbered sections.

1. Air Rifle Range Layout and Construction
2. Safety Instruction for Cadets
3. Range Supervision and Life Fire Conduct
4. Air Rifle Storage
5. Health and Hygiene
6. Air rifle CO<sub>2</sub> and Compressed Air Cylinders

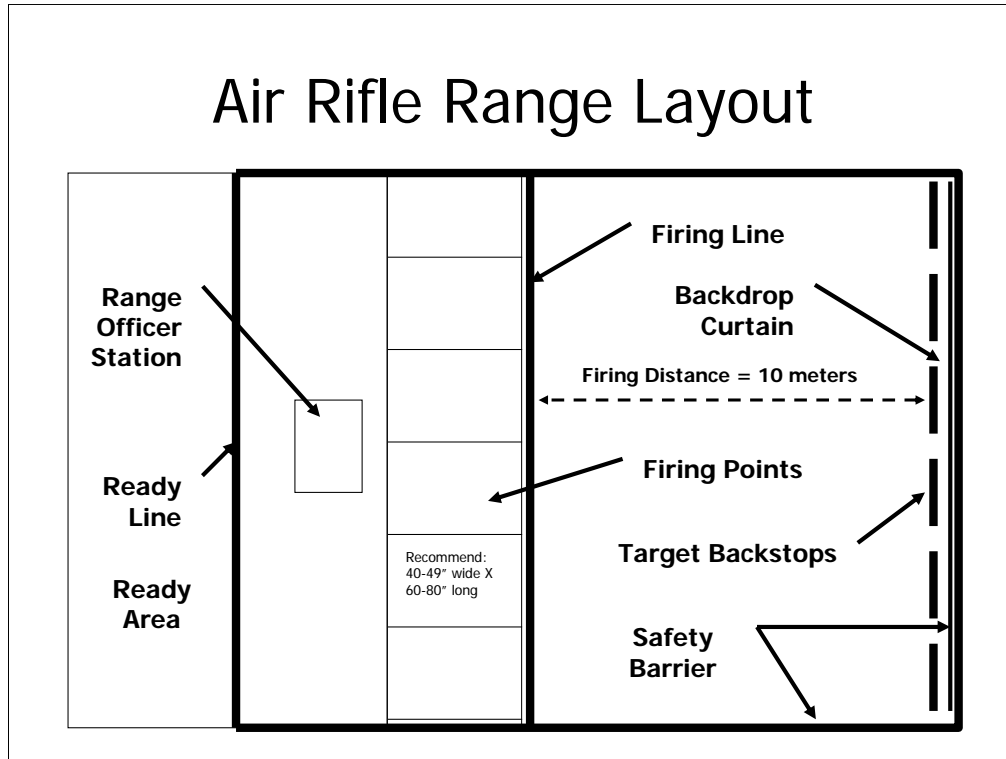
## JROTC Standard Operating Procedures (SOP) For Air Rifle Safety and Air Rifle Range Management

Item	Standard	Notes
<b>Air Rifle Range Layout</b>		
<b>Range Walls or Perimeter</b>	The side and front walls (as you look downrange) of the room used for a range must be secure or capable of being secured from inside the range. These walls must also not have exposed windows or other areas that could be damaged by a stray pellet. Any doors forward of the firing line must be locked to prevent entry and a sign posted on the outside of the door stating "Caution—Do Not Enter—Live Firing in Progress."	No one should be able to enter the range area from outside the range during firing under any circumstances.
<b>Target Holders</b>	A frame made of wood or other material should be utilized to hold the targets at the required heights (20 in. for prone, 55 in. for standing, 32 in. for kneeling, as measured at the center of the target). The target frame must have a pellet catcher or backstop if the range does not have a backstop of its own.	A key feature of the target holder is that it be made of a material that does not cause pellets to bounce back if the frame is struck.
<b>Target Backstops</b>	Target backstops must be capable of capturing and retaining all pellets fired at the targets. 1/8 in. galvanized steel is commonly used as a backstop material. The key is to have target holders that effectively capture 100% of the pellets fired at the targets mounted on the target holders. Any material that effectively captures all fired pellets may be used; even boxes filled with old newspapers have been used in an emergency.	If steel is used as a backstop, it must be hard enough that frequent shots in the same location will not dent it.
<b>Firing Line</b>	The firing line must be visibly marked with a tape or paint stripe that is a contrasting color with the floor. Firing points or lanes corresponding with the spacing of the targets should be marked with a tape or stripe of a different color. The recommended width of each firing point is 1.25 meters (49.2 in.) wide. The width should never be less than 1 meter (40 in.) wide.	The firing line designates an absolute limit to the forward movement any person may make while firing is taking place. Wider firing points are particularly desirable to facilitate instruction and control safety.
<b>Range Officer Stand/Table</b>	A Range Officer stand or table should be located immediately to the rear of the firing points, approximately 10 feet to the rear of the firing line. The Range Officer should have clear visibility of all firers from this point.	The purpose of the Range Officer stand is to provide a specific point of control for firing activities on the range.

### 4.4 JROTC Air Rifle SOPs:

This is a copy of the first page of the current SOP. A complete copy of the current version of the SOP is printed in the Instructor Notebooks as a resource for this section. Be sure to refer to this document as you go through this instructional session.

# Air Rifle Range Layout



## 4.5 Air Rifle Range Layout:

Air rifle range management begins with setting up a range that meets established standards for safety and compliance with the rules for air rifle firing. Evaluate your air rifle range that will be use to be sure it complies with these standards:

**Target Backstops.** Target backstops or target holders corresponding to each firing point are placed at the front of the range. They must hold targets at proper heights and capture all fired pellets. There may also be a **backdrop curtain** to stop any pellets that are accidentally fired outside of the target holders. For proper target height, the target center must be positioned 19.5 in. (measured at the target center) above the floor for prone or supported prone, 55 in. for standing and 31.5 for kneeling. A tolerance of +/- 4.0" is permitted (+/- 2.0" for standing) as long as all targets are at the same height.

**Firing Line.** A designated firing line with marked firing points must be clearly visible to all firers. A red line approximately 2.0" in width is recommended.

**Firing Distance.** The distance from the target backstops (measured from the face of the targets) to the firing line must be 10 meters or 33 feet.

**Firing Points.** Sections of the firing line are designated for each shooter or firer to occupy while firing. Firing point width is determined by target spacing. Target backstops and firing points are numbered from left to right and must have corresponding numbers.

**Safety Barrier.** Ranges must have a safety barrier on the two side walls and front (behind the target backstops) of the range that can prevent any pellet fired off the target backstop from exiting the range area.

**Range Officer Station.** The Range Officer must have sufficient space in the area immediately behind the firing points to move behind all of the firers.

**Ready Line.** If possible, a Ready Line should be established to limit the forward movement of spectators, visitors and persons waiting to fire. The area behind the firing line is designated as the Ready Area.

# Conducting Live Fire Activities

- ⊙ Definitions and Range Commands
- ⊙ Preparing to Fire
- ⊙ Hanging and Retrieving Targets
- ⊙ Starting and Controlling Live Fire
- ⊙ Handling Special Situations
- ⊙ Stopping Fire, Clearing Rifles
- ⊙ Closing the Range

## 4.6 Conducting Live Fire Activities:

The proper conduct of live fire activities on air rifle ranges is governed by these procedures:

- **Instructions and Range Commands.** The proper conduct of live fire activities begins with learning standard instructions for firers and range commands and working with a script to apply them correctly.
- **Preparing to Fire.** Actions that must be taken to prepare the range and safely bring air rifles and equipment to the range.
- **Hanging and Retrieving Targets.** Going downrange creates safety exposures that must be fully mitigated by correct procedures.
- **Starting and Controlling Live Fire.** Standard commands and procedures must be learned and used to properly control all live fire activities.
- **Handling Special Situations.** The potential for accidents is greatest when something out of the ordinary occurs. Range officers must know how to control special situations that can occur on the range.
- **Stopping Fire, Clearing Rifles.** Properly stopping firing and clearing rifles at the end of a firing exercise is another point where proper procedures assure safety.
- **Closing the Range.** Instructors must also know how to safely remove rifles and equipment from the range.

# Range Supervision

- ⊙ **JROTC Instructor (For AJROTC, NJROTC):**
  - ⊙ Must be in charge of range; responsible for safe conduct of all live fire activities on JROTC unit ranges
  - ⊙ Must be present during JROTC firing activities
- ⊙ **Range Officer (RO):**
  - ⊙ In direct control of range firing; gives range commands
  - ⊙ May be qualified adult or senior cadet appointed by Instructor
  - ⊙ RO must be certified by completing JMIC or Coach Course
- ⊙ **Assistant Range Officers (ARO):**
  - ⊙ Work under supervision of RO
  - ⊙ Advanced Cadets may be AROs
- ⊙ **RO/ARO-Shooter Ratio:**
  - ⊙ Maximum—1 RO/ARO to 10 shooters
  - ⊙ For new shooters—recommend 1 to 1, 1 to 2 or 1 to 3, depends on experience level of shooters

## 4.7 Range Supervision:

**JROTC Instructor Supervision.** For JROTC unit ranges, a JROTC instructor must be present on the range and be in charge of any range firing activity.

**Range Officer (RO).** A JROTC instructor may act as the Range Officer or he/she may appoint a qualified adult who can act as the Range Officer under the Instructor's supervision. The Range Officer is the person on the range who directly controls the range firing activity by giving proper commands and instructions. Anyone who serves as a Range Officer, must be "certified" to conduct air rifle range live firing by having completed either the JROTC Marksmanship Instructors Course (JMIC) or the Rifle Coaches Course (2-day).

**Assistant Range Officers (ARO).** Assistant Range Officers are appointed by the Instructor or Range Officer to assist in conducting range firing activities. They work under the direct supervision of the Range Officer. AROs do not have to be adults or be certified, but they must be experienced in actual air rifle range live fire activities. JROTC cadets with marksmanship experience can serve as ASOs.

**RO/ARO-Shooter Ratio.** When experienced shooters are firing, the minimum ratio of range officers to shooters is 1 RO/ARO to every 10 firers. When new or beginning shooters are firing, additional AROs must be appointed to assure that all firers have adequate supervision and assistance. With beginning shooters, this ratio may be as high as one to one or one to two.



# Range Officer Operating Procedures

- ⊙ Procedures for conducting live fire
- ⊙ Provides Instructions and Commands
- ⊙ Always use range commands
- ⊙ Always start with a script
- ⊙ Consistent, clear commands enhance compliance and safety

Range Officer's Operating Procedures  
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Command/Action Step	Procedure
Before firing begins:	<b>Step 1—Range and Equipment Preparation:</b> Before firing, the Range Officer must prepare or supervise the preparation of the range for firing. Check to be sure target holders and backstops are in place and that the necessary supplies such as shooting mats, pellets and targets are available. Cadets may be assigned to bring these items from the storage area to the range. Cadets should not take positions on the firing line until they are called to their firing points by the Range Officer.
Before firing begins:	<b>Step 2—Assign Firing Points:</b> Divide cadets who will be firing into groups or relays with one cadet assigned to each available firing point in each relay that is required.
<b>RELAY NUMBER 1, MOVE TO THE FIRING LINE or (MOVE YOUR RIFLES AND EQUIPMENT TO THE FIRING LINE)</b>	<b>Step 3—Call Relay to the Line:</b> Call the cadets who will fire next to the firing line. Give the cadets on that relay an opportunity to move their rifles and equipment to the firing line if the necessary equipment is not already there. Be sure that all air rifle actions are open before moving rifles to the firing line.
<b>GROUND YOUR RIFLES, GO FORWARD AND HANG YOUR TARGETS</b>	<b>Step 4—Hang Targets:</b> After finers are on their firing points, instruct them to ground their rifles (place them on the shooting mats or floor) with the rifle actions remaining open. Issue targets to each cadet and instruct them to go downrange and hang their targets.
<b>THE LINE IS HOT. YOU MAY HANDLE YOUR RIFLES AND GET INTO THE (PRONE, STANDING, KNEELING) POSITION</b>	<b>Step 5—Preparation for Firing:</b> When all cadets on that relay have returned from downrange, the Range Officer announces the beginning of a preparation period. During this period, cadets may handle their rifles and assume their firing positions. Help any cadets who need assistance in getting into a correct firing position. Once the cadets are in position, you may instruct them to dry fire by closing the bolts on their rifles (without charging them with air) so that they can practice the technique of firing before actually loading their air rifles. Later, if the cadets enter competitions, they will be given a formal "Preparation Period" of ten or five minutes when they may get into position, close their rifle actions and dry fire.

## 4.8 Range Officer Operating Procedures:

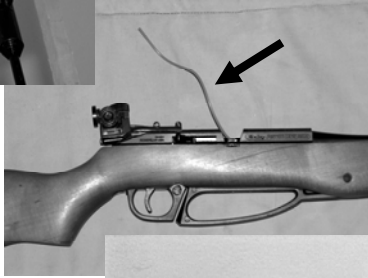
A document called ***Range Officer Operating Procedures for the Conduct of Air Rifle Live Fire Activities*** is provided with this JMJC section. The document has two columns. One is headed “**Command/Action Step.**” This column identifies stages in the live fire activity or gives commands and instructions that the Range Officer must use at that stage in the activity. The second column is headed “**Procedure.**” That column gives detailed instructions for what must be done during that step in the procedures.

**Always Use Range Commands.** Formal, standard range commands should always be used to conduct live fire activities. Commands assure proper control of each step in the live firing activity because shooters know what to expect when they hear standard commands.

**Always Start with a Script.** Even experienced Range Officers have scripts for the range firing activities they conduct. After they learn their script, they may not have to use it, but they always have it available for reference. Start your range firing supervision by using the ***Range Officer Operating Procedures*** as a script.

**Consistent, Clear Commands Enhance Safety.** Commands not only assure proper control, but they convey the seriousness with which everyone on the range is expected to take their responsibilities for safety and discipline

# RO Safety Equipment



- ⊙ CBIs, Clear Barrel Indicators (Orange fluorescent)
- ⊙ Safety Glasses (as needed)
- ⊙ Cleaning Rod or 1/8" dowel rod
- ⊙ PDC: Pellet Discharge Container

## 4.9 Range Officer Safety Equipment:

Prior to starting an air rifle range live fire activity, the Range Officer should have these items of equipment available:

•**CBIs.** Clear Barrel Indicators or CBIs must be inserted in all air rifles that are brought to the range. CBIs are made from brightly-colored, round, .065" - .095" monofilament grass trimmer cord (.085" is the optimum size) CBIs should be fluorescent orange or a similar bright color so that they are readily visible. Cut them to a length that allows 3-4" to protrude out both the breech and muzzle ends of the barrel when inserted. Make bends in the CBIs about ½ inch from the ends that are inserted in the breech to make them easier to insert. Instruct cadets to keep CBIs off of the floor when they are removed to prevent them from picking up grit and putting it in the barrel. *Tip: Some units solved this problem by attaching small alligator clips to one end of the CBIs so they can be clipped to the clothing while firing.*

•**Safety Glasses.** The use of safety glasses is required on Navy JROTC unit ranges. Other programs may wish to provide safety glasses if there are any indications that pellet fragments may bounce back from the target backstops. Personal eyeglasses may be worn during air rifle shooting as safety glasses.

•**Cleaning Rod or Dowel.** A .177 caliber air rifle cleaning rod or a wooden dowel rod that is small enough to fit inside an air rifle barrel should be available on the range for use in clearing pellets out of malfunctioning rifles so that they can be safely removed from the firing line.

•**PDC.** A PDC or pellet discharge container is used to safely discharge a loaded rifle after a **STOP** command is given or to discharge a possible double load (two pellets). PDCs can easily be constructed by using a small tin or plastic can with an open end, a 3' long stick and some duct tape. Stuff the can with shredded paper and cover the open end with tape. Tape the can to the stick and the PDC is ready for use.

# Safety Conditions

- ⊙ **Line is Hot:**
  - ⊙ No one forward of firing line
  - ⊙ Ready for firing
- ⊙ **Preparation Period:**
  - ⊙ OK to remove CBIs
  - ⊙ OK to close bolts and dry-fire or do aiming exercises
  - ⊙ Charging gas or loading is not authorized
- ⊙ **Unloaded Rifle:**
  - ⊙ Action open
  - ⊙ No pellet in barrel
  - ⊙ CBI inserted
- ⊙ **Grounded Rifle:**
  - ⊙ On floor or bench
  - ⊙ Unloaded w/CBI inserted
- ⊙ **Firing Line is Clear:**
  - ⊙ Rifles are unloaded, grounded and checked
  - ⊙ No one handles rifles

## 4.10 Safety Conditions:

Instructions or declarations given by Range Officers in conducting live fire include certain terms that must be consistently and clearly understood by all firers. These terms are:

**Line is Hot.** Prior to beginning a firing activity, the Range Officer checks the line and makes the declaration, “the Line is Hot.” This declaration cannot be made until all air rifles are on the firing line and have been grounded on the firing points and all personnel are behind the firing line.

**Preparation Period.** After telling shooters to take their positions on their firing points, the Range Officer instructs shooters to handle their rifles and begin “preparation” for the next firing activity. This means that shooters may remove CBIs from their air rifles, get into the prescribed firing position, close the actions on their rifles and dry fire, if their air rifles can be dry fired. Shooters may do aiming exercises with other air rifles. Charging or discharging gas or loading an air rifle with a pellet is not authorized during preparation.

**Unloaded Rifle.** To be “unloaded,” an air rifle must have its action open with no pellet in the barrel and have a CBI inserted in the barrel.

**Grounded Rifle.** A “grounded” air rifle is unloaded with a CBI inserted and must be placed on the floor, shooting mat or bench, with its muzzle ahead of the firing line.

**Firing Line is Clear.** After a firing activity is completed, the Range Officer checks the line to be sure all air rifles are grounded with CBIs inserted. He/she can then declare that the “Firing Line is Clear.” No one may handle rifles after the firing line has been declared clear.

# Basic Range Commands

## ⊙ **LOAD**

- ⊙ OK to charge gas mechanism
- ⊙ OK to insert pellet
- ⊙ OK to close action
- ⊙ Not OK to fire

## ⊙ **START**

- ⊙ OK to begin firing
- ⊙ OK to continue firing
- ⊙ When firing is complete, open action, insert CBI, ground rifle

## ⊙ **STOP**

- ⊙ Immediately stop attempting to fire shot (finger off trigger!)
- ⊙ Open action
- ⊙ Firing no longer authorized
- ⊙ Follow RO instructions

## ⊙ **UNLOAD**

- ⊙ RO must confirm unloaded condition--RO assistance required to unload loaded rifle

*ISSF "international standard" range commands*

## 4.11 Basic Range Commands:

All range firing must be controlled by a Range Officer who uses a series of "basic range commands" and instructions. The range commands used in JROTC and three-position air rifle range firing activities are ISSF (International Shooting Sport Federation) "international standard" commands. The ISSF requires these commands to be given in English. They were adopted by the international governing body of shooting so that there could be standard range commands understood by anyone in the world regardless of language skills. These commands were also adopted by the National Standard Three-Position Air Rifle Council and USA Shooting for competitions governed by those bodies.

**LOAD-START.** These commands are given together to authorize the start of live firing. Once the START command is given, shooters can continue loading and firing until they finish the target or firing activity.

**STOP-UNLOAD.** These commands are also given together and mean that firing is no longer authorized. As soon as the STOP command is given, anyone who is still attempting to fire a shot must immediately remove their finger from the trigger and open the rifle's action.

# Preparation for Firing



- ⊙ Set up range for firing
- ⊙ Bring equipment to range: Air Rifles, pellets, targets, mats, etc.
- ⊙ Assign Cadets to firing points & relays, give instructions & Safety Briefing prior to firing
- ⊙ Call Shooters to firing line
  - ⊙ Set up equipment
  - ⊙ Move rifles to firing line and ground them (move rifles and equipment to line separately)
  - ⊙ Issue targets

## 4.12 Preparation for Firing:

The first steps in conducting a range firing activity involve things to do to get ready for firing.

**Set Up Range.** Most JROTC ranges are not permanent ranges where target holders remain in place all the time. Before firing can begin, it is necessary to set up target holders and backstops, secure any entrances to the range area and set up lighting, if supplemental lighting is used.

**Bring Equipment to Range.** Cadets are usually tasked with bringing the necessary shooting equipment to the range. This includes air rifles, pellets, shooting mats, slings, gloves and targets. Air rifles must always be brought to the range with actions open and CBIs inserted.

**Assign Relays.** When there are more shooters than there are available firing points, shooters are divided into the required number of relays prior to firing.

**Conduct Safety Briefing.** After the range is set up and shooting equipment has been brought to the range, assemble the cadets to give them instructions regarding the firing activity they will do and to give a safety briefing. The safety briefing can be detailed or short and brief, depending upon the experience level of the shooters, but there should always be a safety briefing. A sample 'long form' safety briefing is included as a resource for this section.

**Call Shooters to Line.** After everyone is ready to begin, call the shooters on the first relay to the firing line. If they need to move equipment and air rifles to the firing line, be sure they move their air rifles and equipment to the line separately. Shooters must ground their air rifles on their firing points immediately after they bring them to the line. Issue targets in preparation for shooters going downrange to hang them.

# Hang/Retrieve Targets



1. All rifles must be grounded with CBIs inserted
2. RO checks line, declares "***LINE IS CLEAR***"
3. Instruct shooters to go forward to hang/retrieve targets
4. No air rifle handling when anyone is downrange!

## 4.13 Hang/Retrieve Targets:

On almost all JROTC ranges, manual or electric target carriers or electronic targets are not available and it is necessary to walk downrange to hang or retrieve targets. When this is necessary, there are a few simple steps that must be followed to assure that target hanging or retrieval is safe.

**No Air Rifle Handling When Anyone is Downrange.** A fundamental rule for going downrange to hang or retrieve targets or for any other reason is that all air rifles must be grounded with CBIs inserted before anyone may go downrange. This also means that no one is permitted to handle an air rifle while someone is downrange.

**Grounded Rifles.** Before giving instructions to go downrange, the Range Officer must check the firing line to be sure all air rifles are properly grounded on the firing points with CBIs inserted.

**Line is Clear.** After making sure all rifles are properly grounded, the Range Officer declares, "the Line is Clear."

**Going Downrange.** After declaring that the Line is Clear, the Range Officer gives instructions to go downrange to hang, replace or retrieve the targets.

# Preparation--Start--Stop

- ⊙ RO confirms that everyone is behind firing line
- ⊙ RO declares **LINE IS HOT, YOU MAY HANDLE RIFLES & GET INTO POSITION** (followed by short pause)
- ⊙ **PREPARATION BEGINS NOW**—informal or timed—shooters may remove CBIs & dry fire—correct firing position problems during preparation if possible
- ⊙ RO commands **LOAD – START**, firing begins
- ⊙ Monitor firing—watch gun muzzles 1<sup>st</sup>, technique problems 2<sup>nd</sup>—resolve problems as required
- ⊙ Confirm completion—check grounded rifles--DOES ANYONE NEED ADDITIONAL TIME?
- ⊙ RO declares **STOP - UNLOAD**

## 4.14 Starting and Controlling Live Fire:

The steps involved in starting and controlling live fire must follow the script in the Range Officer Operating Procedures. Those steps are summarized here.

**Range Officer Check.** After preparing for firing, bringing equipment to the line and hanging targets, the Range Officer checks the line to make sure everyone is behind the firing line.

**Initial Instructions.** After checking to make sure everyone is behind the line, the Range Officer declares the “Line is Hot,” instructs shooters to move to their firing points and authorizes shooters to handle their rifles.

**Preparation.** The Range Officer then gives the shooters sufficient time to prepare for firing. In competitions a formal, timed preparation period is used, but in practice the preparation period may be longer or shorter depending upon how much time the shooters need to get ready. After the Range Officer instructs shooters to begin preparation for firing, they may remove CBIs from their rifles, get into the firing position and dry fire. Loading the air rifle or discharging gas during the preparation time is not permitted.

**LOAD—START.** These commands authorize the start of loading and firing.

**Monitor Firing.** During firing the Range Officer must continually observe the shooters; the highest priority must be placed on monitoring safety—watch gun muzzles first and shooting positions or firing techniques second.

**Confirm Completion.** As shooters complete firing, they must open their rifle actions, ground their rifles and insert CBIs. Normally, the shooters will be instructed to step back from the firing point after they insert CBIs in their rifles.

**STOP—UNLOAD.** After the Range Officer checks the line to confirm that everyone has completed firing or when a time limit expires, the commands to stop firing are given.



#### **4.15 Monitor Firing:**

During a firing activity, the Range Officer must remain on the range and be located just to the rear of the firing line where he/she can continually monitor the actions of all shooters on the firing line. If one shooter has a problem, it is necessary to go to that shooter to resolve the problem, but even when assisting one shooter, it is important to continue to observe the other firers.



## Giving Corrections/Instructions



- ⊙ Whenever possible, use preparation period to give corrections or instructions
- ⊙ During Firing: Giving corrections to one shooter
  - ⊙ Wait till shot is fired
  - ⊙ Approach shooter on right (right-handed shooter)
  - ⊙ Give instructions
- ⊙ During Instructional Firing: Giving corrections two or more shooters
  - ⊙ Instruct shooters to fire shot and STOP, open actions
  - ⊙ Give instructions/corrections
  - ⊙ Resume firing: LOAD, START

### 4.16 Monitor Firing—Giving Corrections/Instructions:

An important Range Officer responsibility is to give corrections or instructions to shooters on the line in ways that will assure both safety and learning. Firing activities should be positive learning opportunities for the cadets so it is important to give corrections or instructions when they are needed. Corrections sometimes are needed to assure safety, for example, when a shooter carelessly swings the muzzle too far back while charging and loading the rifle.

**When to Give Instructions.** The best time to give corrections or instructions is during the preparation period, before the shooters start to load and fire. If a shooter needs to make a position correction, this is the best time to do that.

**During Firing—Giving Corrections to One Shooter.** If, after firing begins, it is necessary to give instructions to one shooter, approach that shooter on the right side (right handed shooter). Unless a serious safety hazard is involved, never interrupt a shooter while he/she is trying to fire a shot. After the shot, give the instructions so that other shooters are not disturbed or distracted and wait long enough to assure that any change is successfully made.

**During Instructional Firing—Giving Corrections to Two or More Shooters.** If it is necessary to give corrections to two or more shooters during a firing activity involving inexperienced shooters, it is sometimes safer to give the command **STOP**, have all shooters open their rifle actions, give the instructions and then resume firing with **LOAD—START**.

## Emergency **STOP** Situations

- ⊙ **STOP** Command may be called for emergency/special situations (when firing exercise is not complete)
  - ⊙ Safety emergency
  - ⊙ Need to give special instructions to firers
  - ⊙ Need to remove malfunctioning rifle from line
- ⊙ **RO Commands STOP-STOP-STOP (Three times)**
  - ⊙ **Or anyone may command STOP if they observe a safety emergency**
  - ⊙ Firers immediately stop attempting to fire shot (remove finger from trigger)
- ⊙ RO instructs shooters to **OPEN YOUR ACTIONS** and gives other instructions appropriate for situation
  - ⊙ "Keep muzzles pointed downrange"
  - ⊙ "Ground rifles without inserting CBIs"
  - ⊙ Or other instructions as appropriate

### 4.17 Emergency **STOP** Situations:

There may be a time when it is necessary to command **STOP** in an emergency or because of a special situation. If a safety emergency occurs, **STOP** must be commanded immediately. Sometimes it is also necessary to stop firing on the line in order to give instructions to a group of firers, to remove a malfunctioning rifle from the line or for another special situation.

To stop firing in an emergency, the Range Officer must command **STOP** three times. Since the emergency **STOP** is given when shooters are not expecting this command, it is given three times in succession. All shooters should have their trigger finger off the trigger and outside the trigger guard by the time the RO reaches the last **STOP** command.

If someone else on the range observes a safety emergency, they may also command **STOP**. If they do not give the command three times, the RO must follow this command with **STOP-STOP-STOP**.

As soon as the emergency **STOP** command is given, the RO must take positive action to minimize the danger caused by the unsafe situation by instructing "open your actions." Rifles on the line can be in several different conditions, unloaded and not charged to loaded and charged! Due to the many different situations that can occur, the RO must use his/her judgment and give shooters instructions appropriate to the situation. This could include "place the rifles on the mat" if firers are in the prone position or "point all muzzles up" if they are in standing or kneeling positions. The RO must maintain positive control until the unsafe situation is corrected.

# Malfunctions



- ⊙ Shooter keeps muzzle pointed downrange, raises hand
- ⊙ Go to shooter, examine rifle
  - ⊙ Option if required-STOP all firing
  - ⊙ Check: bolt closed, safety off, air charge, etc.
  - ⊙ Attempt to continue firing, or...
- ⊙ Clear rifle and remove from line
  - ⊙ Open action, remove pellet w/cleaning rod, insert CBI or...
  - ⊙ Instructor removes rifle from range

## 4.18 Malfunctions:

A malfunction occurs when a rifle fails to fire as intended. Possible causes of malfunctions are 1) failure to fully close the action or bolt, 2) inadvertently engaging the safety, 3) failure to charge the gas system, 4) placing a pellet in the bolt slot and not in the loading port (Daisy M853/753/888/887 actions) or 5) mechanical failure of the rifle. A shooter may sometimes report that they have loaded two pellets.

**Shooter's Response.** If a shooter has or thinks he/she has a malfunction, they must keep the air rifle muzzle pointed downrange and raise their hand so the Range Officer can see it.

**Range Officer Actions.** As soon as possible, the Range Officer must go to the shooter to resolve the malfunction. The Range Officer can take the rifle to examine it (standing position) or may ask the shooter to hold it while he/she checks for quickly correctable malfunction causes that are listed in #1 through #5 above. If one of those is possible, the Range Officer may instruct the shooter to recharge the rifle or close the bolt and attempt to fire again. If two pellets were loaded, use a cleaning rod to remove the pellets. If a mechanical failure is involved, the rifle must be removed from the firing line.

**Clearing and Removing Malfunctioning Rifle.** After determining that a malfunction is due to a possible mechanical failure, the rifle must be unloaded before it can be removed from the firing line. Do this by opening the action and inserting a cleaning rod or dowel from the muzzle end of the barrel (may only be done by the Range Officer). After pushing the pellet out of the barrel, a CBI must be inserted and the rifle may be grounded or removed from the line. In the rare instance when the bolt cannot be opened and the pellet removed, the rifle can only be taken from the line by a Range Officer.

# Firing Completed

- ⊙ When Shooter finishes firing he/she must:
  - ⊙ Open bolt
  - ⊙ Ground rifle
  - ⊙ Insert CBI
- ⊙ At end of firing RO declares ***STOP – UNLOAD***
- ⊙ If shooter has loaded rifle, the shooter must:
  - ⊙ Stop attempting to fire shot
  - ⊙ Open bolt
  - ⊙ Request RO assistance (see next slide)
- ⊙ RO checks all rifles to confirm that the ***LINE IS CLEAR***



## 4.19 Firing Completed:

When a firing activity ends, there are also some important steps to follow:

**When Individual Shooters Finish.** In most cases, individual shooters will finish a firing exercise at different times. When each individual finishes firing, they must 1) immediately open their rifle action, 2) place the rifle on the ground, mat or bench and 3) insert a CBI. It is usually safer and easier to insert the CBI in a rifle that has been placed down rather than in a rifle that is still being held. On most ranges, shooters will be instructed to step back from the firing line after they have grounded their rifles and inserted CBIs.

**When Range Officer Commands STOP.** If a Range Officer must command ***STOP-UNLOAD*** before all shooters have finished firing, it is likely that one or more of the shooters will still have a loaded rifle. See the next slide for specific procedures for clearing loaded air rifles.

**Clearing the Line.** After all rifles are unloaded and grounded with CBIs inserted, the Range Officer checks the line and declares the “Line is Clear.”

# Clearing Loaded Rifles

- ⊙ Shooter: Remain in position, keep muzzle pointed downrange, raise hand, declare **LOADED RIFLE**
- ⊙ RO: Go to shooter (with PDC)
- ⊙ Instruct shooter to discharge rifle into PDC or open backstop
- ⊙ Shooter opens bolt, grounds rifle and inserts CBI



## 4.20 Clearing Loaded Rifles:

If there is a shooter on the firing line with a loaded rifle after the command **STOP** is given, these procedures must be followed:

As soon as the command **STOP** is given, any shooters on the line with loaded rifles must stop attempting to fire any more shots. They must remain in position with the muzzle pointed downrange and raise their hands so the range officer can see them.

The Range Officer must then go to the shooter, usually with a PDC, and give instructions for discharging the loaded air rifle.

After the loaded rifle is safely discharged, the shooter must then follow normal procedures by opening the action, grounding the rifle and inserting the CBI.

## Changing Targets/Changing Relays

### ◎ **Retrieve or Replace Targets**

- ◎ All rifles must be grounded
- ◎ RO checks line, declares "**LINE IS CLEAR**"
- ◎ Instruct shooters to go forward to hang/retrieve targets
- ◎ Shooters may not return to positions/handle rifles

### ◎ **Next Stage of Firing/Next Relay**

- ◎ RO confirms that everyone is behind firing line
- ◎ RO gives instructions for shooters to take positions or for next relay (firing group) to move to firing line
- ◎ RO declares "LINE IS HOT"
- ◎ RO begins preparation period or "change-over" (competitions only)

### **4.21 Transitions—Target and Relay Changing:**

After the line is cleared at the end of a firing exercise, a transition or change to the next firing exercise must be accomplished.

**To Retrieve or Replace Targets.** Once the line is clear, the Range Officer can instruct shooters to go downrange to retrieve their targets or replace them. Shooters may not handle their air rifles or get into firing positions on the firing line while this is taking place.

**To A New Firing Stage or Relay.** As soon as target changing is complete and everyone is back behind the firing line, the Range Officer can declare that the "Line is Hot." Shooters are then instructed to return to their firing points and handle their rifles to prepare for the next firing exercise or position. In competitions, this period is called a "change-over" period. Competition change-over periods are normally five minutes. During a change-over period, shooters may do the same thing they can do in a preparation period. In a practice session, instructors should again give shooters sufficient preparation time to get back into firing positions and be ready for the next firing exercise. If a new relay is called to the line, they should start in the same way with a new preparation period.

# Gun Cases

- ⊙ Common means of air rifle storage and transport
- ⊙ Behind firing line—keep rifles in closed cases
- ⊙ Bring closed case to firing line with muzzle oriented downrange
- ⊙ After opening case—open action and insert CBI
- ⊙ Remove rifle from case, ground rifle, remove case from firing line
- ⊙ After firing—replace rifle in case on firing line—CBI may be removed, action closed and trigger released before closing case



## 4.22 Gun Cases:

Gun cases that hold one or two or sometimes more air rifles are a common means of storing air rifles and transporting them to and from the range. When gun cases are used, there are some rules or procedures that must be followed to assure the highest level of safety.

1. **Behind the Firing Line.** When air rifles are brought to the range in cases, the cases should remain closed when they are behind the firing line.
2. **Bringing Cases to the Firing Line.** When the Range Officer gives instructions to bring rifles and equipment to the firing line, bring the rifle to the line with the case closed. Place the case on the line with the muzzle pointed downrange.
3. **Opening Gun Cases.** When the gun case is opened to remove the rifle, immediately open the action and insert a CBI in it. You can then remove the rifle from the case and ground it on the firing point. The gun case should then be reclosed and removed from the firing point. If a gun case has two air rifles in it that are pointed in opposite directions, remove one rifle with the muzzle pointed downrange, then close and turn the case to remove the other air rifle.
4. **After Firing.** When firing is completed and the Range Officer has given instructions to remove rifles from the firing line, bring the case back to the line and replace the air rifle in it. At this point, it is OK to remove the CBI, close the action and release the trigger so that the hammer spring will not remain under tension while the air rifle is stored. Close the case and remove it from the firing line.

# Air Rifle Storage

## Storage & Security

- ⊙ Air rifles may be stored in gun cases or a locked store room
- ⊙ Storage room locks should be controlled by JROTC instructors
- ⊙ Rifles come to storage area unloaded, with CBI inserted, or in a gun case
- ⊙ CBIs may be removed, bolts closed, triggers released during storage



## 4.23 Air Rifle Storage:

Proper procedures for storing air rifles used in JROTC Marksmanship include:

- **Storage.** Air rifles may be stored in gun cases or in a suitable gun rack in a locked store room.
- **Security.** Air rifles should, if possible, be kept in storage by using a double lock system. JROTC instructors should control the locks.
- **Removal from Storage.** When air rifles are taken from a storage area, they must come to the range in an unloaded condition, with actions open and CBIs inserted. They may also be brought to the range, in an unloaded condition, in a gun case.
- **Return to Storage.** When air rifles are placed in a storage area, they must be brought to the storage area, in an unloaded condition, with actions open and CBIs inserted. Once in the storage area, the CBIs should be removed and the bolts closed and triggers released. Releasing the trigger on a stored air rifle makes it possible to store the rifles without leaving tension on the hammer spring, a condition that over time can reduce the strength of the spring.



# Air Rifle Care & Maintenance

## ⊙ Required Equipment

- ⊙ .177 cal. cleaning rod or **pull-through**
- ⊙ Jag and cleaning patches and/or .177 cal. bronze brush (short)
- ⊙ Non-petroleum based solvent or bore cleaner

## ⊙ Cleaning:

- ⊙ Clean air rifle barrels every 1000 to 2000 shots
- ⊙ Clean barrel with bronze brush and/or dry patches
- ⊙ Clean barrel with solvent and patches
- ⊙ Lubricate D853 air chamber piston with 30w motor oil



## 4.24 Air Rifle Care & Maintenance:

Air rifles used in JROTC marksmanship undergo considerable use and must be properly maintained in order to maintain their accuracy and velocity. Experienced target shooters agree that air rifles that are periodically cleaned will maintain their accuracy better than barrels that are never cleaned.

**Required Equipment.** Cleaning equipment that should be available at the unit includes a .177 cal. cleaning rod or a pull-through cleaner (can be made from heavy monofilament), a cleaning rod jag and bronze brush (must be short enough to fit in Daisy M853/888/887 loading port) and a commercial bore cleaner that acts on lead or a non-petroleum based solvent (TSI 301 is recommended). A small supply of 30 weight motor oil (for sealing air chamber pistons) is also needed for maintaining the air chamber piston seals on Daisy pneumatic air rifles (M853/753).

**Cleaning Procedures.** Air rifle barrels should be cleaned every 1000 to 2000 shots. The purpose of cleaning the barrel is to remove any lead deposited by the pellets. Some experts recommend cleaning them dry with a short bronze brush and dry patches. Others recommend using solvent and patches. It is also important to place a few drops of solvent or motor oil on the air chamber piston of Daisy M853/873 air rifles to help them maintain their seals.

# Air Rifle Care & Maintenance

## Air Rifle Maintenance and Repair Resources:

- ⊙ **Daisy Video, *Model 853 Repair***
  - CMP Coaching Resources:  
[http://www.odcmp.com/Competitions/Coaching/Downloads/853\\_Repair.ppt](http://www.odcmp.com/Competitions/Coaching/Downloads/853_Repair.ppt)
- ⊙ **CMP Publication: *Tom Johnson's Sporter Tips***
  - Order from CMP
- ⊙ **Repair Centers:**
  - Daisy Manufacturing
  - Pilkington Competition Equipment
- ⊙ **CMP \*.PPT Presentation: *Daisy Trigger Modification Instructions***
  - Created by Keegan Singleton, CMP Junior Rifle Camp Armorer
  - Posted on Internet at:  
<https://umdrive.memphis.edu/ksingltn/public/>



## 4.25 Air Rifle Care & Maintenance:

Air rifles used in JROTC marksmanship undergo considerable use and must be properly maintained and repaired in order to sustain their accuracy and velocity. A particular problem exists with sporter air rifles with worn pistol seals that now shoot pellets at very low velocity. It is necessary that these rifles be reconditioned so that their muzzle velocity returns to the factory standard of >450 fps.

**Maintenance & Repair.** When repairs or rebuilds of the rifles are required, AJROTC instructors should first check with their support installations to determine if they can do the work. Excellent resources for learning how to do repairs and simple gunsmithing work are the Daisy air rifle maintenance video and ***Tom Johnson's Sporter Tips***. The latter publication is provided with the instructor notebooks. Repairs or rebuilds can also be ordered through Daisy Manufacturing (they can provide a list of authorized repair centers) or Pilkington Competition Equipment (see resource list).

**Trigger Modifications.** The triggers on many sporter class air rifles have long, inconsistent trigger movement or engagement that is a deterrent to good marksmanship. Keegan Singleton's presentation on Daisy Trigger Modification and Tom Johnson's Sporter Tips are both excellent resources that are in a position to develop a skilled team armorer who can make these modifications.

# Filling CO<sub>2</sub> Cylinders

- ◎ Resource: *CO<sub>2</sub> Air Rifle Cylinder Filling Procedure* poster at: [http://www.odcmp.com/Programs/CO2\\_Poster\\_11x17.pdf](http://www.odcmp.com/Programs/CO2_Poster_11x17.pdf)
- ◎ Resource: *Fill Procedures for the Daisy M887 Air Rifle* video at: <http://www.odcmp.com/Videos/09/887fill2.wmv>
- ◎ Prior to filling: Weigh cylinder (*mark empty weight, weights vary = 390-440 grams*)
- ◎ *Normal fill will add 70-75 grams of CO<sub>2</sub> liquid; enough for 250-300 shots*
- ◎ Fill cylinders outside of the range; wear gloves and eye protection
- ◎ Cylinders must be filled by Instructors or be filled under their direct supervision



## 4.26 Filling CO<sub>2</sub> Cylinders

JROTC Instructors at units with Daisy M887 or M888 CO<sub>2</sub> air rifles need to know and practice proper procedures for filling the cylinders that power these rifles. While there are many steps and details to this process, it is not difficult to do once the procedure is mastered. Here are some preliminary details that require attention before starting with the fill procedures listed in the next page.

1. Be sure all of the necessary equipment is available: 50-pound or 20-pound CO<sub>2</sub> tank with a siphon or dip tube, scale for weighing cylinders, refill station to connect the tank and cylinder, gloves and eye protection.

2. There are two excellent resources that should be reviewed prior to starting the fill procedure. The fill procedures poster is posted at <http://www.odcmp.com/CO2poster.htm>. A copy of this poster also is provided with each JMJC Notebook. The fill procedures video is available at <http://www.odcmp.com/Videos/09/887fill2.wmv>.

3. Prior to starting the fill process, weight every cylinder (must be empty) and mark that weight on the cylinder. A normal fill is 70-75 grams of CO<sub>2</sub> liquid. Calculate what the filled weight should be for each cylinder so you will be able to identify under and over filled cylinders.

4. Set up a refill station away from the range. All cylinder filling must be done by an Instructor or by someone trained by the Instructor who work under his direct supervision. Be sure refill tanks are chained to a wall or solid support to prevent tipping.

5. A 70-75 gram fill will allow a Daisy M887/888 air rifle to fire approximately 250 shots.

Note: Special fill stations with lever-operated tank open-shut valves may be purchased from paintball suppliers. They will speed up the refill process. One source of these valves is found at [http://www.p3-paintball.com/products\\_co2fillstation.asp](http://www.p3-paintball.com/products_co2fillstation.asp).

## CO<sub>2</sub> Cylinder Fill Procedures

1. Attach Fill Station to main tank (keep purge valve pointed down, tighten with wrench)
2. Start with chilled cylinder (refrigerate or fill & purge 2-3 times)
3. Attach cylinder to Fill Station (hand tighten) with purge valve open
4. Close (tighten) cylinder valve, close purge valve after cylinder is completely empty
5. Open tank valve, pause for fill (10-15 seconds), close tank valve
6. Open cylinder valve, open purge valve (to bleed gas from line)
7. Remove cylinder and weigh, should weigh 70-75 grams more than empty cylinder weight
8. *If fill is insufficient, reattach cylinder and go back to step #3*
9. *If fill is excessive, reattach cylinder, close purge valve, tighten cylinder valve, open purge valve 1-2 seconds, remove cylinder and reweigh, repeat if necessary*

### 4.27 Filling CO<sub>2</sub> Cylinders

This slide lists the procedure to follow in properly filling cylinders for Daisy M887 and M888 CO<sub>2</sub> air rifles. The steps listed in the slide are self-explanatory. Just be sure to follow each step in order.

## CO<sub>2</sub> Cylinder Refill Issues

- ⊙ Attaching and Removing CO<sub>2</sub> cylinders
- ⊙ Tightening CO<sub>2</sub> cylinders in Daisy air rifles
- ⊙ Lubricate cylinder threads
- ⊙ O-ring replacement
- ⊙ Refill station gaskets
- ⊙ Burst discs



### 4.28 CO<sub>2</sub> Cylinder Refill Issues

While the use of CO<sub>2</sub> cylinders in Daisy M887 and M888 air rifles is safe and relatively easy to master, there are some details that can ensure the highest degree of safety and efficiency in refilling and using these cylinders.

•**Attaching and Removing CO<sub>2</sub> Cylinders.** Attaching and removing any compressed gas cylinder should always be done with care. When inserting and removing CO<sub>2</sub> cylinders in Daisy M887/888 air rifles, always keep the air rifle and cylinder pointed in a safe direction, away from any persons in the area.

•**Tightening CO<sub>2</sub> Cylinders in Daisy Air Rifles.** When attaching cylinders, the final seating must be done with a small flat wrench furnished by Daisy. Tighten the cylinder until it reaches a stop. **DO NOT OVER TIGHTEN!** If a larger wrench is used, place only two fingers on the wrench to avoid over tightening.

•**Lubricate Cylinder Threads.** Occasionally put a drop of lithium grease on the cylinder threads to prevent galling the threads during cylinder attachment and removal.

•**O-Ring Replacement.** Have a supply of spare cylinder O-rings available as these rings will break. These can be obtained from large sporting goods retailers that sell paintball supplies.

•**Refill Station Gaskets.** The gasket that fits in the female end of the refill station must be used to ensure a non-leak attachment to the main tank. Daisy advised that replacements can be obtained from auto parts stores (OD = 0.7155, ID = 0.2625, thickness = 0.0880).

•**Burst Discs.** The burst disc on the end of the CO<sub>2</sub> cylinder is designed to “burst” if heat or other conditions create excessive pressure. This is rare, but you may want to have one or two replacement burst discs; these can be obtained from paintball suppliers.

# Compressed Air Cylinders

- ⦿ Used with Daisy XS40 & Precision Air Rifles
- ⦿ Resource: *Guide to Compressed Air Usage, Pilkington*
- ⦿ Secure scuba tanks to prevent tipping over
- ⦿ 3-tank system is most effective
- ⦿ Follow Inspection Instructions
- ⦿ Gas/CO<sub>2</sub> Cylinders
  - ⦿ Refill cylinders outside of range
  - ⦿ Cylinders must be filled by Instructors
  - ⦿ Do not point cylinders at anyone during refilling/insertion/removal
  - ⦿ Handle cylinders with care
  - ⦿ **DO NOT OVER-TIGHTEN CYLINDERS** in air rifles (hand tighten only)



## 4.29 Compressed Air Cylinders:

Cylinders using compressed air are the means of propulsion for many air rifles used in JROTC marksmanship. Some units have Daisy XS40 or Air Arms T200 rifles that use compressed air. Many rifle team members use precision air rifles that utilize compressed air cylinders. The compressed air in these cylinders is contained under very high pressure (3000 psi) so special precautions must be followed to assure the safety of cadets and instructors.

If your unit has these types of rifles it is essential that they read the manufacturer's instruction manual and the resource material on compressed air cylinders before attempting to do anything with them.

The filling of air rifle cylinders should not be done on the firing line or range, but in a separate area set up for doing this.

Fire Marshall regulations in most areas mandate that high pressure gas tanks (refill tanks) must be secured so they cannot be tipped over.

It is critically important that the cylinders, which attach to the air rifles, be handled with care and that they not be over-tightened. Hand-tighten only when attaching compressed air cylinders to air rifles. When filling cylinders or inserting/removing them, it is important that they not be pointed at anyone. Be sure to take note of inspection requirements for both the refill or scuba tanks and the air rifle cylinders.

# Health & Hygiene

- ⊙ Lead is toxic, must not be ingested
- ⊙ No food items permitted on range
- ⊙ No open beverage containers
- ⊙ Wash hands after firing
- ⊙ Cleaning pellet traps—to be done only by instructors and/or adults
- ⊙ Floor cleaning--use shop vacuum & wet mopping

## 4.30 Health and Hygiene:

The only air rifle pellets that produce sufficient accuracy for target shooting are made of lead. Lead is, however, a toxic substance so it must be handled with care. Fortunately, medical research done at the U. S. Olympic Training Center and in Germany on air rifle shooters has proven that when shooters take the necessary precautions while firing air rifles, they do not face any health risks from this limited exposure to lead (see the Fact Sheet on Lead in the Instructor Notebooks). These precautions include eating no food on the range, not having open beverage containers on the range and immediately washing your hands after every range activity. Hands should preferably be washed in cold water.

**Lead Management on Air Gun Ranges.** Testing done by USA Shooting and the CMP has proven that no airborne lead is generated by air rifle target shooting so special ventilation is not required on air gun ranges. Lead is deposited in pellets traps and the removal of that lead should be done only by instructors. During air rifle firing small deposits of lead residue are deposited on the range floor in front of the firing line and in the vicinity of the targets. These deposits can be cleaned with a shop or industrial vacuum followed by periodic wet mopping (Tri-sodium Phosphate solutions may be used to improve the effectiveness of wet mopping). The **GUIDE TO LEAD MANAGEMENT FOR AIR GUN SHOOTING** provides detailed procedures for air gun range cleaning.

# Closing Range



- ⊙ All rifles must be unloaded with CBIs inserted
- ⊙ RO checks all rifles to confirm ***LINE IS CLEAR***
- ⊙ RO gives instructions to place rifles in cases or take rifles to storage

## 4.31 Closing the Range:

When CBIs are inserted in air rifles after each firing exercise is completed, clearing rifles off of the range is easy and simple to do. As soon as the Range Officer checks the line to confirm that all rifles are grounded with CBIs inserted and that all personnel are behind the firing line, he/she can give instructions to cadets to place their rifles in gun cases or take them directly to the storage room. Air rifles that are returned to gun cases can have the CBIs removed, but air rifles that are carried from the range must have CBIs in them until they are placed in the storage room.