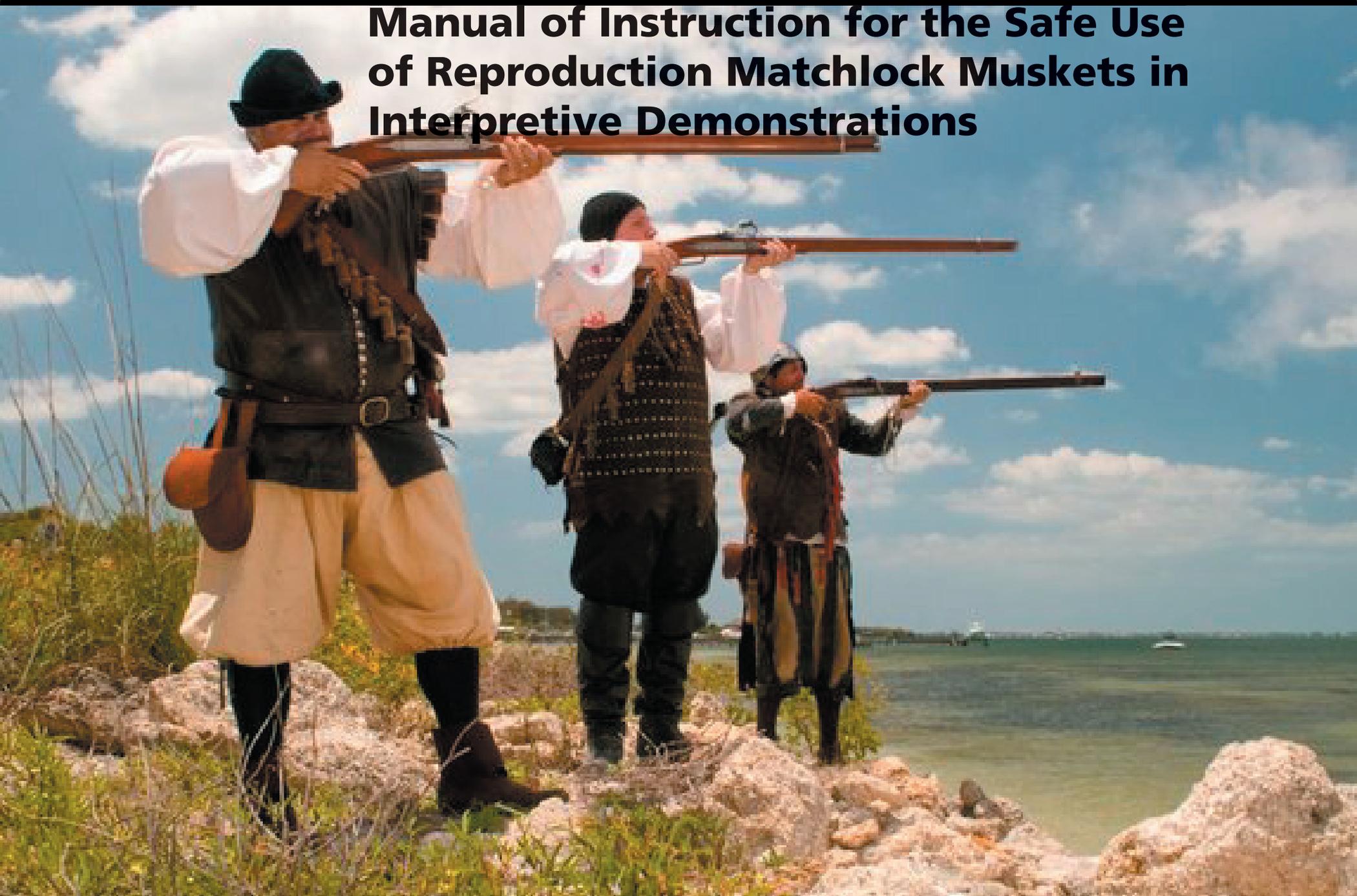


## Manual of Instruction for the Safe Use of Reproduction Matchlock Muskets in Interpretive Demonstrations





## TABLE OF CONTENTS

	Page
Part I: Introduction	1
Part II: Nomenclature	2
Part III: Inspection and Maintenance	5
Part IV: Drill	8
Part V: Misfire Procedures	24
Part VI: Laboratory	27
Bibliography	30



## PART I - INTRODUCTION

This manual sets forth the procedure that must be followed by persons demonstrating matchlocks, to the public in areas administered by the National Park Service. It also provides instruction on proper maintenance, inspection, and repair procedures. This manual must be used in conjunction with the National Park Service-wide Directors Orders DO-6, Interpretation, and Historic Weapons Safety Standards.

The information in this manual largely comes from primary resources from the period during which the weapon described was used. Several generations of National Park Service historic weapons supervisors and interpreters have modified these original texts to: improve demonstrator and visitor safety, make the original texts more comprehensible, and to incorporate knowledge gained from years of actually using these weapons in the field.

The park's Certified Historic Weapons Supervisor is responsible for the training and safety of demonstrators as well as the safety of the visitors.

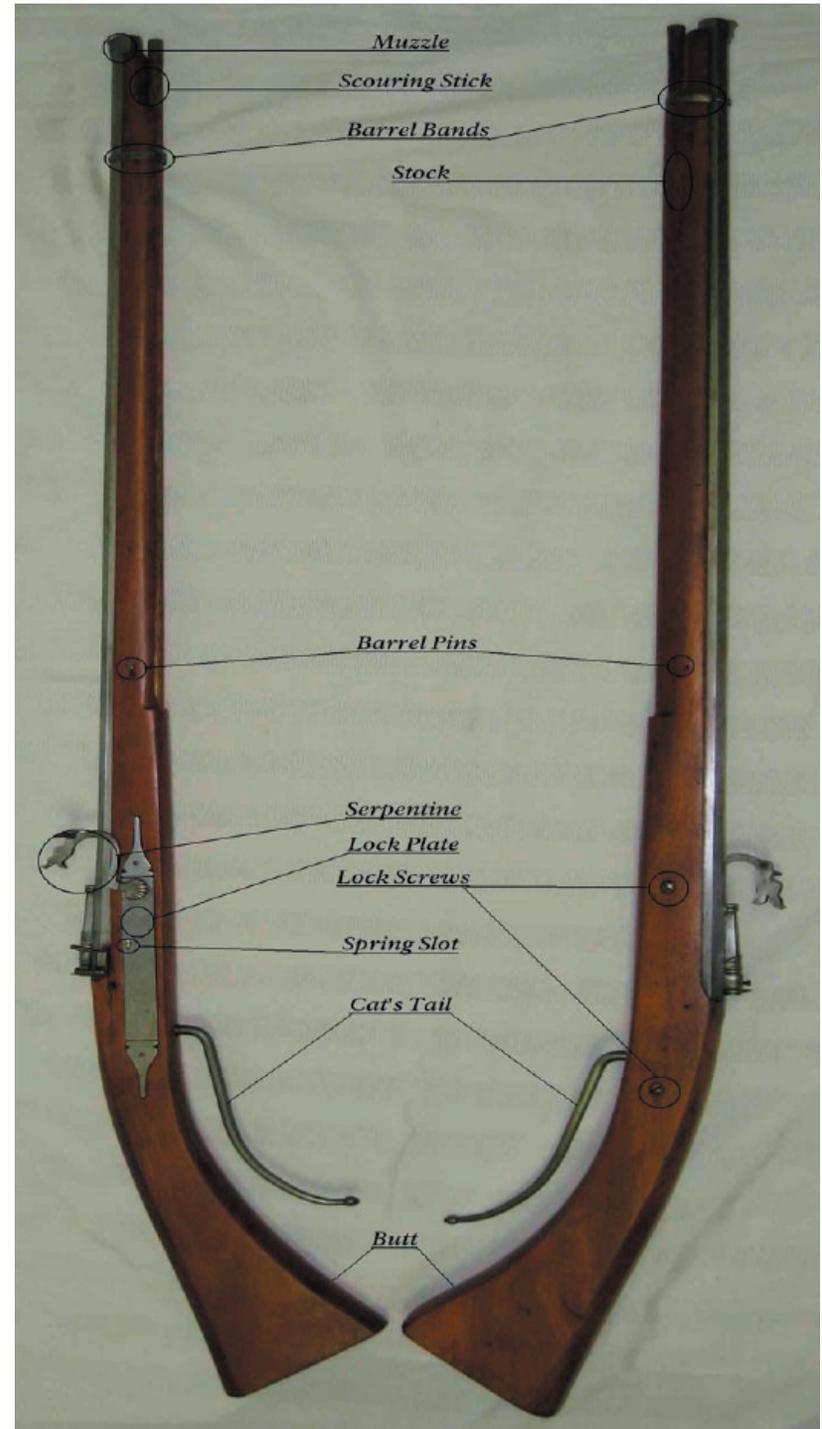
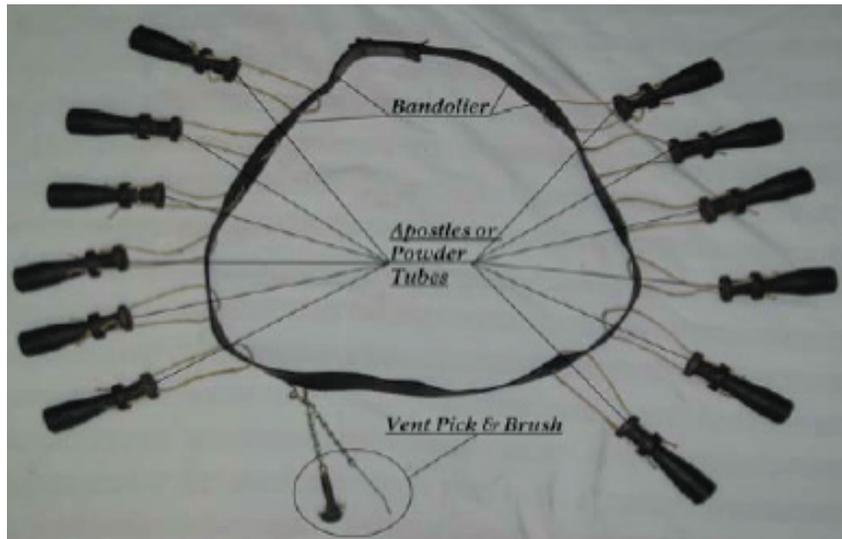
The following criteria will help determine when a demonstrator has been adequately trained:

Demonstrators must be:

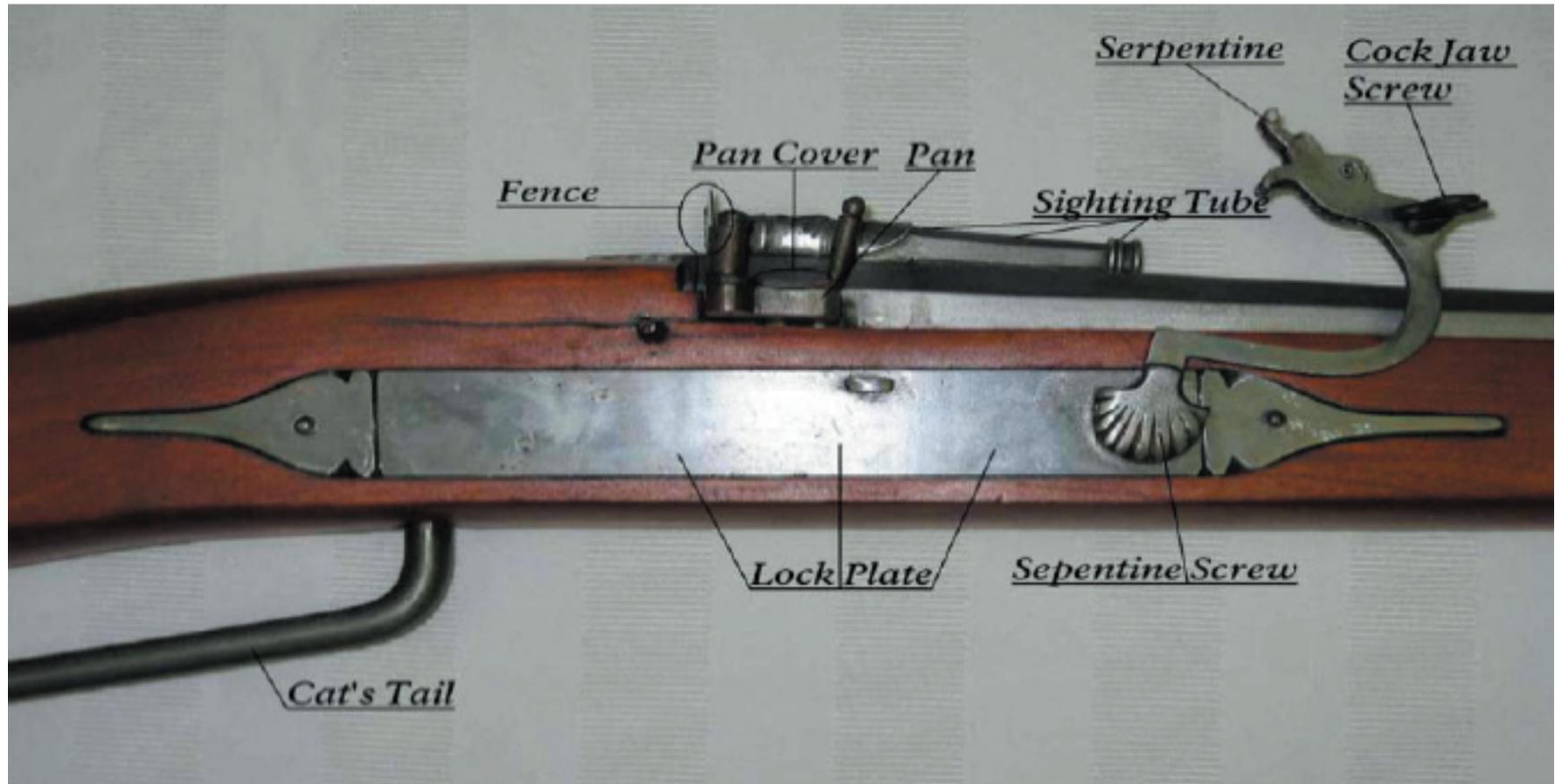
1. Able to execute the required manual of arms without error.
2. Competent to perform the appropriate misfire procedures without mistake.
3. Instructed in a proper manner to present demonstrations with maximum safety to themselves and the visitor.
4. Proficient in methods of cleaning and storing firearms and other historic weapons.
5. Knowledgeable in the methods of storing, handling, and transporting black powder within the Park.
6. Proficient in the manufacture of cartridges.
7. Familiar with the nomenclature of the firearms and historic weaponry they use.

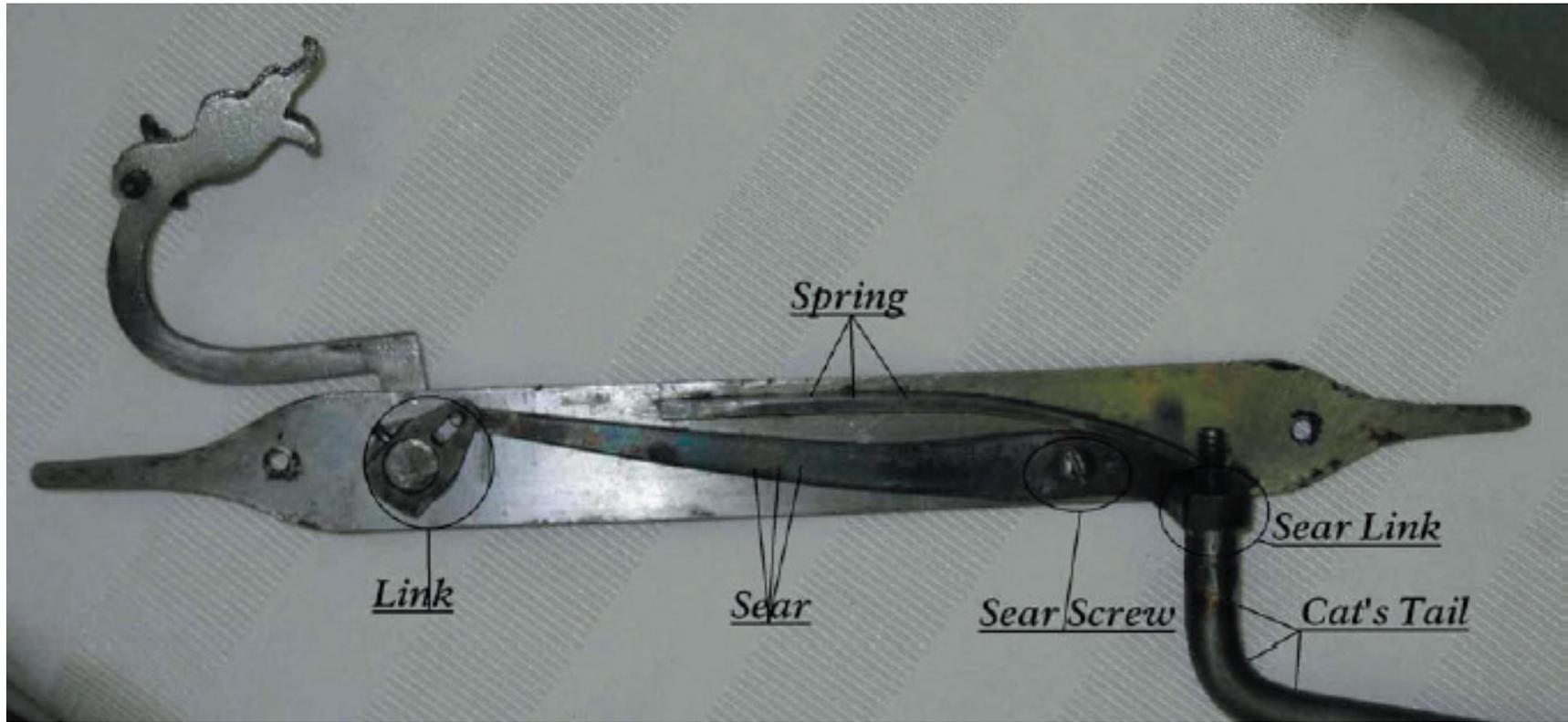
Park staff and volunteers will NOT be allowed to demonstrate historic black powder weapons unless they can meet the above listed requirements.

## PART II - NOMENCLATURE



THE LOCK





### **PART III - INSPECTION AND MAINTENANCE**

The matchlock or arquebus is a firearm, and as a firearm must be cleaned and maintained to ensure proper and safe operation. When retrieving an arquebus for the day's demonstrations all living history personnel must sound the weapon when handling it for the first time. To sound the weapon the demonstrator withdraws the pieces' scouring stick and drops it down the barrel (ramming head first). The demonstrator should here a metallic "ping". This sound means that the piece is unloaded and there are no obstructions down the barrel that could make the weapon unsafe. If the demonstrator does not hear this "ping" they should immediately follow the level two misfire procedure.

After sounding the weapon the demonstrator should visually inspect the weapon. Demonstrators are looking for new flexing cracks or splits in the wooden stock. Look for excessive "shininess" on metal parts (this denotes excessive wear or fatigue), cracks, dents or wear on the gun barrel. Is the guns overall appearance clean and free from corrosion or rust? Included on the following pages is the NPS inspection checklist for matchlock arquebus. If any discrepancy is found report it immediately to the Historic Weapons Officer on duty. If there are any noticeable cracks in the barrel and stock, if the weapon's appearance is dirty and corroded, or if the flash pan cover is missing, the weapon receives an automatic failure and cannot be used.

Most major work and maintenance to the matchlock will be done by the Historic Weapons Supervisor. No historic weapons demonstrator should have to disassemble the weapons. If at any time during a firing demonstration the demonstrator feels that their weapon is not functioning properly, end the demonstration immediately and take the gun out of service. If the drill had progressed past loading the weapon immediately follow level II misfire procedures. be replaced.

## CHECKLIST FOR ARQUEBUS INSPECTION

- Make sure the weapon is unloaded.
- Is the overall impression of the gun favorable or unfavorable?

### The Stock

- Is it cracked or split?
- Are there any burrs on the butt plate, screw heads, lock plate or any other metal components?
- Are pins all there and tight or is the wood around the pins chewed up or splintered so they are loose?
- Is the stock burned around the top of the lock or pan?
- In general, are there any splinters or rough edges?

### The Lock

- Does it work smoothly?
- Do the jaws of the serpentine grip tightly on the match cord?
- When the trigger or cat's tail is pulled does it come up smoothly and without snagging?
- Is the trigger pull proper, not too heavy or light?
- Does the lock fit properly into the stock?
- Is the pan clean and in proper relationship with the touch hole on the barrel?
- Does the pan cover fit snugly over the pan?
- Do the pan and pan cover form a proper seal?

### The Barrel

- Does it fit the stock properly?
- Is it free from visible dents, cracks, wear and rust?
- Is the serpentine striking the barrel?
- Is the vent clear and of acceptable size?
- Is there any sign of corrosion around the vent hole?
- Do the barrel bands hold the barrel securely?
- Is the scouring stick straight? Does it fit into the stock properly?

## CLEANING THE MATCHLOCK MUSKET

*Note: Prior to disassembling or cleaning small arms, the piece must be confirmed to be unloaded by springing the rammer in the barrel.*

### Recommended List of Tools

1. Pliers
2. Cleaning rod with attachments for gun worm and bore brushes.
3. Funnel
4. Penetrating oil, gun oil, olive oil.
5. Cleaning patches

### Steps for Cleaning

After firing, the weapon should be cleaned as soon as possible. Different people and different parks have their own way of cleaning weapons. The most important thing is to make sure that the weapon is clean and free of black powder. Areas to watch for are inside the barrel, the pan, the lock plate, and the stock. Here are some general guidelines and methods to ensure proper cleaning.

1. Open the pan cover.
2. Make sure the vent hole is plugged. A Q-tip is the best item for this.
3. Pour warm water down the barrel 2-3 times to loosen residue powder. Try to get as little water as possible on the stock.

4. Add dish detergent to warm water, pour down barrel. Use cleaning rod with brush attachment to clean the breech of residue powder.
5. Rinse out barrel 2-3 times with clean warm water.
6. If an excessive amount of water seeps under the barrel please alert the HW officer, because the weapon needs to be disassembled.
7. Run cleaning patches dipped in rubbing alcohol down barrel to help dry excess water.
8. Run several clean patches down barrel until barrel is clean and free of fouling.
9. Use damp cloth and/or small toothbrush to clean the pan, pan cover, lock, and outside of the barrel.
10. Lightly oil interior of barrel with an oily patch (use a small amount of gun oil only). Also oil the guns exterior with gun oil or olive oil.
11. The stock should be oiled with an application of olive oil. This is the traditional Spanish method and the least invasive to the weapons' form. Wipe away excess oil from the stock and barrel.
12. Store weapon with scouring stick down the barrel to show weapon has been cleaned and is unloaded.

## PART IV - MATCHLOCK DRILL

Arquebusiers in the 16th Century did not yet have a standard drill for firing the arquebus in ranks. The weapon was being widely used throughout Europe and the New World, but every musket unit had its own drill or step to fire. In 1607, Jacob de Gheyn developed the first standard drill for caliver and musket. With De Gheyn's drill European armies had a standard and easy method to train matchlock units. This was an important breakthrough due to the fact the European armies were generally made up of men from many different countries. With a standard method of drill, language no longer became a barrier.

Unfortunately *The Exercise of Arms* (1607), written by De Gheyn, does not include several standard positions found in most modern manual of arms. In the 17th Century most men at arms were concerned with just loading and firing your weapons as fast as possible. For living history demonstrations we have added in several basic manual of arms commands, to standardize the manual of arms with that of what other reenactors and Park Service employees use at their Parks.



Early 16<sup>th</sup> Century Plate of European Explorers in the New World

### MATCHLOCK DRILL COMMANDS

	English	Spanish	NPS Variation	NPS in French
1	Shoulder arms.	Armas al hombre.	Shoulder your piece and march.	Portez vos arquebuses et marchez.
2	Right hand to the weapon.	La mano derecha al arma.	Un-shoulder your piece, and with the right hand hold it up.	Enlevez vos arquebuses et levez les avec la main droite
3	Present arms.	Presenten las armas.	In your left hand take your piece.	Prennez vos arquebuses dans la main gauche
4	Blow out your pan.	Soplen la cazoleta.	Prime your pan and Close your pan.	Amorcez vos bassinets et fermez vos bassinets
5	Handle your priming flask.	Tomen el frasquillo.	Shake off your pan.	Secouez vos bassinets
6	Prime!	¡Ceben!	Blow off your pan.	Soufflez vos bassinets
7	Close the pan.	Cierren la cazoleta.	Turn about your piece and to your left side let it sink.	Passez l'arquebuse du coté de l'épée
8	Cast off excess powder.	Sacudan el polvorin.	Open your charge.	Ouvriez vos cartouches
9	Blow off pan.	Soplen la cazoleta.	Charge your piece.	Chargez vos arquebuses
10	Cast about your weapon to the left side.	Pasen las armas al lado espada.	Your scouring stick, draw out.	Tirez les baguettes
11	Handle your charger.	Tomen el frasco.	Your scouring stick, take shorter.	Diminuez vos baguettes
12	Put the powder down the barrel & load the ball.	Pogan el polvora en el canon y cargue su bola de mosquete.	Ram your powder.	Bourrez votre charge
13	Draw out & shorten your scouring stick.	Saquen y acorten la baqueta.	Your scouring stick, draw out your piece.	Tirez les baguettes
14	Ram!	¡Ataquen!	And take it shorter.	Diminuez vos baguettes
15	Draw out, shorten & put up your scouring stick.	Retiren, acorten y guarden la baqueta.	Put up your scouring stick.	Remettez la baguette en fon lieu
16	Present arms.	Presenten las armas.	With your left hand bring forward your piece.	Avec la main gauche avancez vos arquebuses
17	Take the match in your right hand.	Tomen la cuerda en el mano dercha.	In the right hand take your match.	Prennez vos méches dans la main droite
18	Blow on the match.	Soplen la cuerda.	Hold well your match and blow it off.	Soufflez sur vos méches
19	Set your match.	Pogan la cuerda en la serpentine.	Cock your match.	Armez vos méches
20	Test your match.	Probaren la cuerda.	Try your match.	Eprouvez vos méches
21	Aim!	¡Apunten!	Blow your match and guard your pan.	Soufflez sur vos méches et gardez vos bassinets
22	Make ready! (cover your ears)	¡Hago listo! (Cubra sus oídos)	Present your piece.	Présentez vos arquebuses
23	Fire!	¡Fuego!	Give fire.	Feu
24	Take down your arms.	Retiren las armas.	Take down your piece and in your left hand hold it well.	Abaissez vos arquebuses et les prenez dans la main gauche
25	Uncock your match.	Pongan la cuerda en el mano Izquierda.	Un-cock your match and join it between your fingers.	Désarmez vos méches et les joindrez entre vos doigts
26	Blow out your pan.	Soplen la cazoleta.	Blow out your pan.	Soufflez vos bassinets
27	Shoulder arms.	Armas al hombre.		
28	Salute!	¡Saludo!		

The following is the step by step breakdown with pictures of demonstrator executing the command. Listed is the NPS description of the step as well as any safety precautions that must be followed with the step.

The drill is begun with a clean, unloaded weapon with an open pan lid. Demonstrator has proper hearing protection in place.

### “Shoulder Arms”

Use this posture to enter and exit the demonstration area. The weapon is sloped on the left shoulder. The left hand supports the weapon on top of the butt. The trigger is by the left shoulder where the weapon balances well on the shoulder. The pan is open and the gun is unloaded. The demonstrator does not carry a match, it is held by the interpreter.



*Safety Note: The matchlock is not loaded while marching. The weapon is on the left side with the pan and lock facing away from your body. The pan is open so the demonstrator can see there is no prime left in the weapon. Muzzle is pointed in safe direction while marching. Match is not held by demonstrator.*

### “Right hand to the weapon”

Drop butt of weapon so that it is at a vertical 90 degrees. Bring right hand up to the small of the stock.

*Safety Note: Muzzle of weapon pointed downrange.*



### “Present arms”

Let the weapon fall into the left hand just forward of the lock. Your left elbow is resting on left hip for stability. The end of the muzzle is held above the level of your eyes. The right hand is grasping the stock near the trigger but not touching it.

*Safety Note: Muzzle is pointed downrange. Your right hand is not touching the trigger.*



“Blow out the pan”

Raise the weapon to shoulder height with barrel pointing upwards at 45 degrees. Turn the weapon slightly on its side away from the body and blow any loose grains from inside the pan.

*Safety Note: Keep muzzle pointed downrange. Keep weapon away from your body. Do not lean your head over the pan when you blow.*



“Handle your priming flask”

Handle the top flask marked “P” on your bandolier. Open flask and pull it away from your body.

*Safety Note: Keep muzzle of weapon pointed downrange. Keep open flask away from your body. Cover flask opening with your thumb. Ensure no open flame is nearby.*



“Prime!”

Pour priming powder into pan.

*Safety Note: Avoid overfilling the pan; there should only be enough for 2 misfire primings left in the flask.*



“Close the pan”

Close the pan with the right forefinger.

*Safety Note: Make sure the pan lid is completely closed over the pan and it is a tight fit. Keep muzzle elevated and pointed downrange.*



“Cast off excess powder”

Turn the weapon on its side and shake off any loose powder grains.

*Safety Note: Turn the weapon away from you so that any loose powder falls on the ground. Make sure there is no loose powder on the pan or the pan cover.*



“Blow off the pan”

Raise the weapon to shoulder height with barrel pointing upwards at 45 degrees.

Turn the weapon slightly on its side away from the body and blow any loose grains from around the pan.

*Safety Note: Keep muzzle pointed downrange. Keep weapon away from your body. Do not lean your head over the pan when you blow.*



“Cast about your weapon to the left side”

Step forward with the right foot and turn left, bringing the weapon towards the left side. Let the weapon trail to your left side, in your left hand with your left arm extended out and the muzzle elevated towards the front.

*Safety Note: Watch the position of the muzzle relative to your face and the crowd. You can have the butt of the weapon either suspended in trail position or rest it on the top of your left boot.*



“Handle your charger

Take third flask down from top marked with a “C” and pull it away from body. Take off the top. Position over the stock, and bellow the muzzle opening.

*Safety Note: Make sure open flask is away from body. Cover the opening with your thumb. There should be no open flame present. Keep hand clear of muzzle opening.*



“Put the powder down the barrel & load your ball”

Pour charge into the muzzle of the weapon using the thumb and forefinger of the right hand. Keep all other fingers clear of the weapons muzzle. Watch the powder flowing out of the bottle into the muzzle of the barrel to ensure the powder is going down the barrel. After powder is in load a paper wad from hip pouch down barrel, using only your thumb and forefinger. Do not use finger to sink wad down the muzzle.

*Safety Note: Keep fingers away from muzzle. Load powder from bandolier or paper charge, not from large powder horn. Keep muzzle elevated and away from face and body.*



“Draw out & shorten your scouring stick”

Using only the thumb and forefinger of the right hand draw the scouring stick half out. Then seize the scouring stick back-handed. Use only the thumb and forefinger to finish drawing out the scouring stick. When the stick is fully withdrawn extend the stick and right arm out straight with the fat end of the stick pointing out. Push fat end of the scouring stick against your body and move your hand down half way. This is to ensure that you have proper control over the scouring stick while ramming the charge



*Safety Note: Keep hand away from the muzzle while drawing out the scouring stick.*

“Ram”

Using the thumb and forefinger, insert the stick into the barrel and ram down the barrel. Take hand off of stick after ramming and await the next command.

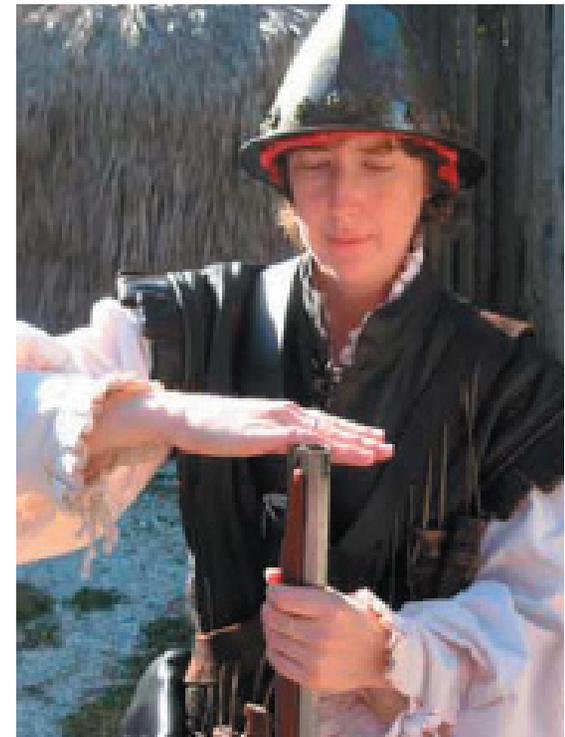


*Safety Note: Do not put your hand over the rammer or the muzzle.*

“Draw out, shorten & put away your scouring stick”

Using only the thumb and forefinger begin to draw the stick out of the barrel. Seize the scouring stick back-handed and withdrawal the stick from the barrel. Turn your hand and point the fat end of the stick away from your body. Push the narrow end of the stick against your body and move your hand down towards the narrow end of the stick. Return the scouring stick to its original position on the gun stock using the edge of your hand.

*Safety Note: Keep hands and fingers away from the muzzle.*



“Present arms”

Bring your weapon toward your right hand with your left, holding the weapon straight up, at the same time step back with your left foot, pivot on your right foot and face to the left. Grab the weapon with your right hand behind the lock. Place your left hand on the stock underneath the lock. Keep the muzzle to the front in an elevated 45 degree position pointed downrange.

*Safety Note: Watch muzzle relative to your face and the visitors. When motion is complete muzzle of weapon should be pointed downrange and elevated away from your body.*



“Take the match in your right hand”

The demonstrator extends his right hand behind him and receives the match from the interpreter. The match is only lit at one end. The arm holding the match is kept in an extended position away from the weapon and the lock.

*Safety Note: Only one end of the match is burning. The match is held at an extended position away from the pan behind the demonstrator.*



“Blow on the match”

Turn your head to the rear and bring the match near and blow the coal to life.

*Safety Note: Double check that the pan has no powder leakage. Keep the match away from the pan. Turn your head towards the match but do not bring the match to your face. Keep muzzle elevated and downrange.*



“Set your match”

Coming up from underneath the weapon, place the match into the jaws of the serpentine. Push the match into the jaws, loosen or tighten the jaw screw if needed.

*Safety Note: Do not over tighten the jaw screw. Make sure you bring the match up from underneath the weapon staying clear of the pan. Maintain the muzzle at an elevated position pointing downrange.*



“Test your match”

Keeping your hand underneath the serpentine and pan, tip the serpentine forward to ensure the burning match will touch the pan when the trigger is pulled. Adjust the match if needed.

*Safety Note: Do not touch the pan with the lit match, only bring it forward enough to ensure contact will be made. Keep your hand away from the pan as much as possible. Do not use trigger to lower match towards pan. Keep weapon muzzle elevated and pointed downrange.*



“Aim!”

Raise the weapon to the shoulder keeping your hand away from the cat’s tail trigger. Keep the muzzle elevated to retain charge down the bore. Bring weapons butt to left shoulder. Bring the right foot forward with the knee slightly bent; the left leg is kept straight. Do not open pan until the command “make ready” is given.

*Safety Note: Keep hand away from cat’s tail trigger. Ensure lock and pan is facing away from your body. Muzzle is elevated and pointed downrange.*



“Make Ready!”

Check downrange to ensure there is nothing in your line of fire. Open the flash pan cover with the forefinger of the right hand. Interpreter will ensure visitors will cover their ears in preparation of the weapon firing.

*Safety Note: Check downrange to see if it is clear. Open the pan, keeping your hand behind the pan using only the forefinger of the right hand. Do not touch trigger until the command of fire is given.*



“Fire!”

Pull the cat’s tail trigger slowly with even pressure. Watch for burning match to make contact with priming. Watch for flash in pan and fire from the muzzle.

*Safety Note: Press trigger with even pressure. Do not jerk the trigger this could put out the match. Hold weapon steady for the next command. Be aware of any misfires.*



“Take down your arms”

Bring the weapon down from the firing position into the present arms. Step forward with the left foot, holding the weapon to your right side.

*Safety Note: Do not bring the weapon down unless you are certain that it fired. Check the match and make sure that it is not burning in any other places, besides the tip.*



“Uncock your match”

Unfasten the match from the serpentine and hand it to the interpreter.

*Safety Note: Make sure the match does not burn your fingers. Keep muzzle elevated and pointed downrange.*



“Blow out your pan”

Bring the weapon to shoulder height and blow the pan.

*Safety Note: Do not lean over the pan.*



### “Shoulder arms”

Bring your left foot slightly forward and face in the direction you were firing at. At the same time let go of the weapon with the left hand and with the right hand grasp under the pan hinge at the small of the stock. Bring the weapon pointing muzzle up across your body to the left shoulder and bring left foot forward even with the right. The weapon is sloped to the left shoulder. The left hand supports the weapon on top of the butt. The trigger is near the shoulder at a point where the weapon balances well on the shoulder. Release the weapon with the right hand, holding it on the shoulder with just the left hand. The pan is open.

*Safety Note: Mind where the muzzle points when you are moving.*



### “Salute!”

Step forward with the right leg. Bend at the waist and sweep out with right hand. After the salute is completed, come back up to full standing position. This was used to signify to the Sergeant at Arms that entire gun line had fired.

*Safety Note: Mind where the muzzle points when you are moving.*



## Inspection of Arms

Inspection of arms should take place before and after each demonstration.

Inspection ensures that the weapon is in a safe condition and is unloaded.

Begin the inspection with the demonstrator holding the weapon on their left shoulder (“Shoulder Arms”).

## Inspection of the Priming Pan Commands

“Right hand to the weapon”

“Present arms”

At this point the inspector or interpreter can check the demonstrator’s pan to insure it is open and free of any priming. The inspector can also check the match to ensure it is dry and burning only on one end.

## Inspection of the Barrel Commands

“Cast about your weapon to the left side”

“Draw out your scouring stick”

“Shorten your scouring stick”

“Sound your piece”

At this point the inspector should listen to the sound of the scouring stick hitting an empty breach. Listen for the “ping” sound and also notice the distance the scouring stick shows outside the barrel. If more stick appears than normal it is an indication that a foreign object may be down the barrel.

## Bringing Back to Shoulder Commands

“Draw out your scouring stick”

“Shorten your scouring stick”

“Put up your scouring stick”

“With the left hand bring forward your piece”

“With your right hand hold it up”

“Shoulder Arms”

## Prime and Load

As you could tell the drill for firing an arquebus was long and not practical for combat situations. On the battlefield the Sergeant at arms would generally give an order to prime and load. This would cue the musketeers to automatically prime and charge the weapon to fire and save time.

To do a prime and load command, after the “shoulder arms” the interpreter will give the command to “Prime and load”. The demonstrators will go through steps 2 -20 ending at the “Present arms” command. At that point the rest of the drill will proceed as normal through the match, aim, and fire commands.

During special demonstrations and charges permitting it is up to the interpreter to call another “prime and load” at the “shoulder arms”.

## PART V - MISFIRE PROCEDURES

Each park shall develop a written Misfire Plan to address the action necessary to render a firearm safe in the event of a Level I or Level II Misfire.

### TYPES OF MISFIRES

A “Level I Misfire” is defined as a misfire that can be cleared on the demonstration area and the demonstration can continue.

A “Level II Misfire” is defined as a misfire that cannot be cleared at the demonstrations area without disrupting the demonstration. Specialized equipment is needed to render the firearm safe.

### CAUSES OF MISFIRES

No Ignition - Match fell out of serpentine, pan cover was shut, match did not touch priming, and primmer fell out due to open or loose pan cover.

Flash in the Pan - This is when the primmer ignites but the charge in the barrel does not go off. Potential causes: Vent hole is clogged and no charges down the barrel.



## Level I Misfire Procedures

### NO IGNITION

1. Yell “misfire” and keep weapon pointed down range during the entire procedure.
2. Count to 10 slowly to allow for hang fire.
3. Close pan cover
4. Remove match and inspect thoroughly. Sometimes the match goes out, or gets snuffed out if slammed into priming.
5. If the match was the problem, have interpreter relight the match and continue the firing sequence.
6. Check priming powder to see if it had fallen out or blown out of pan while charging the weapon. Also check to see if too little primer was used.
7. Re-prime the pan if the primer was lost.
8. Close pan cover.
9. Take match from interpreter making sure it is burning properly.
10. Place match in serpentine.
11. Complete firing sequence and fire the weapon.

If weapon misfires again repeat the above steps 2 more times. The demonstrator has up to 3 trigger pulls to fire the weapon. After three tries if the weapon has not fired proceed to a level II misfire. Have the interpreter explain what has happened to the audience and have visitors leave the demonstration area. Go through the procedure of a level II misfire.

### FLASH IN THE PAN

1. Yell “misfire” and keep weapon pointed down range for the entire procedure.
2. Count to 10 slowly to allow for hang fire.
3. Close pan cover.
4. Remove Match and hand to interpreter.
5. Open the pan cover. Using a pick clean the vent and wipe out the pan.
6. Re-prime the pan.
7. Close the pan.
8. Take the match from the interpreter making sure it is burning properly.
9. Place match in serpentine.
10. Complete the firing sequence and fire the weapon.

If weapon misfires again repeat the above steps 2 more times. The demonstrator has up to 3 trigger pulls to fire the weapon. After three tries if the weapon has not fired proceed to a level II misfire. Have the interpreter explain what has happened to the audience and have visitors leave the demonstration area. Go through the procedure of a level II misfire.

## Level II Misfire Procedures

1. After interpreter removes visitors from demonstration area begin procedure. Important to not leave demonstration area, you are carrying a loaded and potentially dangerous weapon!
2. Remove match and hand it to the interpreter.
3. Dump any remaining powder out of pan.
4. If no wadding or ball was used, point muzzle to the ground and allow powder to fall out. Keep muzzle pointed down range for entire procedure.
5. If a CO2 misfire kit is available (in pouch on apostle bandolier), insert needle into vent and use CO2 to blow the charge out of the barrel.
6. If a CO2 kit is not available, carefully lower butt of musket to the ground keeping muzzle pointed away from your body.
7. Pour a small amount of water down barrel without placing your hand over the muzzle. Wait five minutes.
8. Remove weapon to a safe area (Behind palisade wall or HAM area) always holding the muzzle up and away from any person.
9. Pour water out of barrel. Remove charge from barrel using cleaning rod or worm.
10. Clean weapon immediately, and notify HW officer of level II misfire.
11. Do not use weapon until it has been inspected by HW officer.

All misfire procedures have been designed to minimize the potential danger to demonstrators and visitors. Please follow all procedures and take your time. Remember that the most important procedure is to keep the muzzle of the weapon away from you and anyone else.

## PART VI - LABORATORY

### A. BLANK CARTRIDGE MANUFACTURE BRITISH STYLE

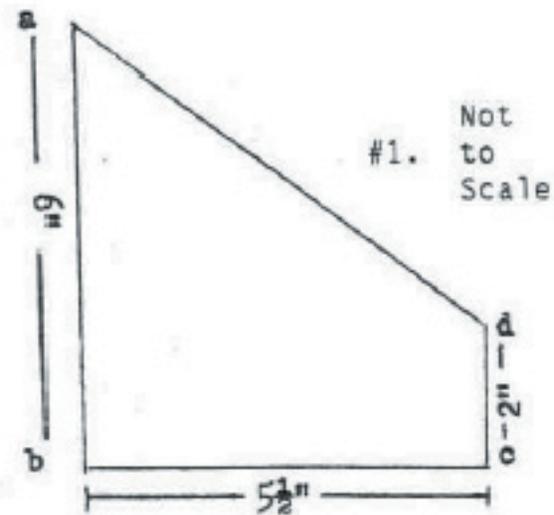
Before firing demonstrations one cartridge can be loaded into an Apostle, to simulate period accurate loading and firing. The maximum amount of ffg powder allowed for charges is 90 grains.

#### MATERIALS NEEDED

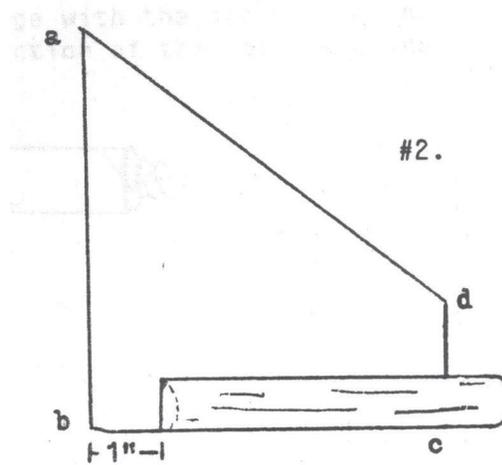
1. Paper cut to specific dimensions (indicated in illustration). The paper should be light, strong, and able to be folded or twisted without being easily torn. 40 lb Kraft paper is fine, and can be obtained locally or from GSA.
2. Scissors or paper cutter.
3. Former: A six-inch wooden dowel slightly smaller than the bore of the weapon. If you are going to make cartridges with a ball, one end of the former should be slightly concave to fit the ball.
4. Powder measure & FFG Black Powder

#### PROCEDURE

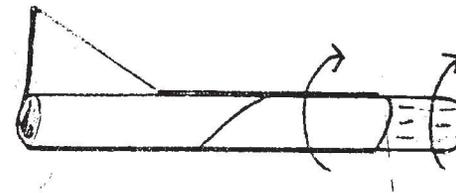
1. Using scissors or paper cutter, cut cartridge paper into proper shape, as indicated in illustration #1.



- Keeping point "a" in the upper left hand corner, place former on "b-c" portion of cartridge, leaving at least one inch distance between the cupped end of the former and point "b".



- Roll the paper all the way around the former by rolling the former away from you, bringing the paper around with it.

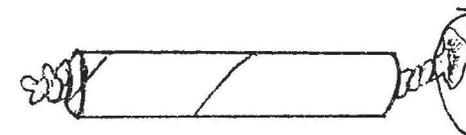


- Twist the rolled cartridge end in the same direction as you rolled it. It must be twisted tight enough to form a seal without leaking any powder, but not so tight that the paper is torn.



- Remove former and using powder measure, pour proper amount of powder in cartridge.

- Twist the top of the cartridge in the same direction of the roll, again twisting tight enough to seal cartridge.



## SAFETY

- When handling black powder keep in mind that it is an explosive and can cause severe bodily harm if mishandled.
- When using loose powder make sure that the date shows on the bottle less than 2 years old.
- Do not use cartridges that have been torn; this could cause a black powder leak that could be set off with a potential spark.
- When handling powder and cartridges make sure you are not around open flames or sparkable situations (i.e. campfires, lighters & lit matches).
- Dispose of loose powder immediately by water immersion; loose powder + carelessness = mishaps.
- Do not allow unauthorized or uncertified personnel to handle black powder, even if it is a friend or family member.
- The demonstrator controls the demonstration; if you feel that conditions are unsafe at any time stop the demonstration.
- If anyone is caught breaking any of these guidelines their black powder privileges will be revoked until they are re-certified.

The first and most important thing to understand is that any type of gunpowder is an explosive material. All are capable of exerting great destructive force!

## **BIBLIOGRAPY**