

UNIVERSITY OF TOLEDO

SUBJECT: CANNON SAFETY PROCEDURE

Procedure No: S-08-050

PROCEDURE STATEMENT

Cannon safety procedures, as defined by this plan, shall be followed by anyone operating the cannon on any University of Toledo Campus.

PURPOSE OF PROCEDURE

These procedures have been established to ensure the safe operation of the cannon on campus. The purpose of this program is to establish requirements for operating the University's cannon to minimize the probability of personal injury and property loss. The Environmental Health and Radiation Safety (EHRS) department reviews this procedure periodically and updates as needed.

RESPONSIBILITY

This program applies to all employees and students operating the cannon on University properties. The University's cannon is operated by the Pi Kappa Phi (PKP) Fraternity at the UT Main Campus Glass Bowl Stadium during home football games.

Use of Approved Fire Arms

The following safe shooting procedure presumes the crew is firing blanks from muzzle loading artillery piece made to modern safety standards. Only use new bronze cannon purchased from Gillmor Ordnance and never the historic old cast iron cannon. Annual training is required for all PKP members involved with the cannon by the cannon manufacturer Bob Gilmore and an EHRS representative.

Safety Zone

The cannon will be used on the top of the North East (N/E) tower as this will serve a safety zone between the spectators and the cannon. No one is to be forward of the muzzle at any time. Only PKP members are to be in this zone unless escorted by a PKP member. No person under the age of 18 shall be allowed inside of or on top of the N/E tower. The maximum numbers of five (5) people are allowed on the N/E tower at one time.

Equipment Required

- Two persons minimum.
- Ammunition box with self-closing lid restricted to opening at no greater than 80-degree angle.
- Vent brush or cleaning device.
- Vent pick.
- Thumb stall.
- Heavy welders or fireproof gloves.
- Haversack for use as ammunition pass box and another for priming materials.
- Straight or tapered single piece rammer with no head.
- Wet sponge.
- Dry Sponge.
- Worm.
- Water bucket full of water.
- Primers.
- Double Hearing Protection (muffs and plugs).
- Stopwatch
- Hats

- Safety glasses
- Information pertaining to who to contact in an emergency (University of Toledo Police Department).

Storage of Ammunition

The University of Toledo Police Department (UTPD) will store the charges and bring to the Glass Bowl. UTPD will count the rounds both before and after the game to ensure that they are all accounted for.

PROCEDURE

I. Clean the Vent

Clean the vent as the first step in each cleaning, loading and firing sequence. Proceed as follows:

- A. Use a .22 caliber or appropriately sized bronze cleaning brush on a suitable rod and brush the entire vent twice.
- B. If no brush is available, the alternative method is to run the priming pick or gimlet up and down the vent twice, twisting to make sure the vent is completely free of powder bag remnants.

II. Stop the Vent

Seal the vent with thumb pressure during the entire cleaning and loading process. This means no air should escape the vent from the time the worm enters the muzzle until the rammer is removed after the projectile has been seated. Use a leather thumb stall or heavy glove to protect your thumb to protect your thumb and make a tight seal.

III. Worm the Bore

Using a tool with two sharp steel points which replicates an original cannon cleaning worm, worm the bore until all debris is removed. Turn the worm at the breech to pick up any powder container remnants and to loosen any powder residue. The worm should fit closely so the points will pick up debris easily.

IV. Wet Sponge the Bore

- A. Sponge with a wet (but not sopping) tight-fitting sponge with a head of lamb's wool or wool carpeting over a wooden cylinder affixed to a shaft at least one foot longer than the bore. The end of the sponge head should conform to the shape of the breech plug.
- B. Seat the sponge against the breech with hand pressure and give two full rotations of the shaft. Withdraw the sponge half-length, twist, then reseal against the breech and give another two full rotations.
- C. Remove the sponge. If any powder container remnants or unburned powder comes out with the sponge, repeat the entire process, starting with Step III Worm.

V. Dry Sponge the Bore

After wet sponging, the same procedure is used with the dry sponge. The dry sponge is cleaned and dried off periodically with an absorbent towel-type rag. (The purpose of the dry sponge is to remove excess moisture from the bore; if water is left in the bore it may cause incomplete burning of the next powder charge, leaving dangerously glowing residue.)

VI. Load Powder

- A. Use a plain wooden pole without a head so that it might force the hand open should premature ignition occur.

- B. Mark the rammer in advance in two places, one to show the amount of shaft which should be sticking out the muzzle when the charge is seated and the other to show when the projectile is seated.
- C. The ammunition chest should be located downstairs. Powder charges should be prepared in advance by Gillmor Ordnance only and will be wrapped in heavy-duty aluminum foil.
- D. Open the chest only long enough to remove one charge in its safety container. (Do not open chest following warning that a gun is about to fire until 10 seconds after that gun has fired to prevent hot vent debris from falling into the chest.)
- E. Carry charge upstairs to gun in fireproof safety container. Do not proceed to load unless 3 minutes has elapsed since the gun was last fired. Check your watch.
- F. Open safety container. Remove foil-wrapped charge and place it in the muzzle with one hand while wearing heavy leather gloves (see above).
- G. Wearing heavy gloves, stand to the side of barrel with as much of your body as possible behind the plane of the muzzle. Grasp rammer **underhand, with one hand, thumb to the side**. Seat the charge lightly with smooth strokes. Do not pound the rammer against the charge.
- H. Immediately upon feeling the charge reach the breech, drop your hand away, releasing the rammer. After 10 seconds and after ascertaining the charge is fully home (according to the rammer marks) remove the rammer, **one hand, underhand, thumb to the side**. This may require grasping and releasing the shaft a few times. **Never two hands on the rammer**.
- I. Upon completion of loading, person ramming shall indicate to the person holding the vent that the gun is fully loaded. The vent may then be released.

VII. Pick the Charge

- A. To insure ignition, pick the powder charge wrapper through the vent with a pick or gimlet held by the shaft, between glove protected fingers.
- B. The pick shall be constructed of a non-sparking material.

VIII. Prime

- A. Place a shotgun primer in vent – prepare to fire cannon.
- B. Hot debris is apt to be blown out the vent on discharge. Crew members should wear hats and safety glasses for protection, spectators kept at a safe distance, and all ammunition chests closed whenever any gun is firing.

IX. Fire the Gun

- A. The person designated to ignite the charge calls out "Ready to fire" in a loud voice to alert other crews on the line that a gun is about to fire and to notify the gun captain that the piece is primed. At this call, any open ammunition chests are immediately closed. The gun captain makes a quick visual inspection of the range forward of the muzzle to make sure no one is in danger and then commands "Fire". The time between "Ready to Fire" and "Fire" should be at least five seconds. The primer is then ignited.
- B. If a lanyard is used to ignite friction primers it should be long enough to allow the cannoneer to stand outside the wheels and out of the way of recoil.

X. Misfires

- A. If the primer fails to ignite, repeat step IX.
- B. If the primer ignites, but the gun fails to fire:
 - a. Command: "Do not advance, the primer has failed." Check your watch. Wait 5 minutes.
 - b. When 5 minutes has elapsed, step inside wheel from the front of the axle so you will be out of recoil path should the gun discharge unexpectedly.

- c. Do not get in front of the muzzle at any time. If gun barrel is under 5 feet this position might put you in danger of muzzle flash so you will have to work from behind the axle. Estimate recoil distance and stand well back from the axle.
- d. Wearing gloves use a gimlet to clear the vent. Grasp by shaft only. Keep head away from vent. When vent is clear, re-prime and fire.
- e. If two (2) attempts fail to fire the gun, flood bore and vent with water and worm after through soaking.

Rules of Canon Use

1. No excessive charges. Never double load. Use black powder only.
2. Use charges made by Gillmor Ordnance only.
3. All crew members should wear double hearing protection devices (muffs and plugs).
4. No person under the age of 18 permitted on the top of the N/E Tower. All persons who handle powder must have received training from Bob Gillmor.
5. No one should cross in front of the muzzle at any time - NEVER.
6. The interior of the ammunition chest shall be lined with a non-sparking material and the box itself shall be stoutly constructed of wood or metal. A copy of these safety rules should be posted inside the ammunition chest stored downstairs.
7. No projectiles or wadding shall be used at any time.
8. No drinking of alcoholic beverages or drug use at any time. Any consumption of alcoholic beverages or drug use prohibits persons from N/E tower access. (If suspected an alcohol/drug test will be administered by UT Police)
9. No smoking or open flames at any time within the safety zone.
10. Inspect your gun tube regularly for signs of stress. Existing guns shall be inspected annually by Gillmor Ordnance.
11. Sitting on the edge of the tower is a fall hazard and therefore never sit on the edge of the parapet.
12. Do not bring ammunition box upstairs.
13. Never store the cannon loaded or leave loaded cannon unattended.
14. Never get in front of, or allow others in front of the cannon.
15. Never approach a black powder cannon that did not fire.

DANGER: Remaining fire and embers in the black powder cannon will ignite your new load of black powder being inserted.

- **Make sure each crew member has knowledge of procedures and safety rules. Walk. Do not run. Work at a smooth, steady pace.**
- **If you are in doubt about ANY part of these firing or safety procedures, ASK THE EHRS Department for clarification.**
- **Anyone observed breaking any of the above rules will be subject to disqualification, removal and disciplinary action.**

Source: Safety and Health Committee

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