Dear Colleague

**Avoiding movement of the muzzle at shot release**

**The Problem:** a small number of rifle shooters (TR) group within the 1 MOA V-bull whenever wind conditions allow. Likewise, among F Class shooters there are many who are able to group entirely within the 1 MOA 6-ring, although, grouping within the 0.5 MOA X-ring is a little harder.

Some of these shooters do their utmost to encourage others to use the necessary techniques to shoot like this. However, so few try seriously that it is like leading a horse to water when it does not want to drink.

This article describes how a shooter may utilise the pre-World War One trigger-release technique, to group within the V-bull or X-ring.

**Discussion:** every fullbore rifle shooter silently experiences a bodily rush of adrenaline just before releasing a shot. This causes the muzzle to move at the moment a projectile departs, resulting in a group wider than 1 MOA, usually the width of the bullseye, i.e. 2 MOA.

The central nervous system of every shooter on the firing point is aroused at the thought of the explosion and loud noise when a shot occurs. An increase in the concentration of adrenaline in the bloodstream enables a person to apply the energy needed for an emergency movement. The increase in concentration of adrenaline in the bloodstream is only minor, but enough for muscle tissues to exhibit minute tremors. When a shooter experiences this during shot-release, then it must be expected that release of a shot would be affected.

The adrenaline response has been studied in great detail by medical researchers. The changes in concentration of adrenaline which occur under different circumstances are well known and able to be anticipated. This enables shooters to avoid the tremors associated with increased concentrations.

**Practical:**a scorer kneeling behind a shooter about to release a shot is able to observe minute vibrations of the shooter’s head, hat, shoulder and hand on the pistol grip. The shooter can be quite unaware of these tremors, which are far different from the more exaggerated tremor experienced when a new shooter about to fire a rifle involuntarily jags the trigger.

When a shooter is alerted to the possibility that he/she is experiencing minute tremors, a simple test can be undertaken to ascertain whether this will affect a shoot. If the shooter loads with a dummy round and carefully watches the foresight (or scope element), relative to the target, it will be observed at the moment of release that the foresight and target move. However, if the next dummy round is released after a longer period of two or three seconds, a degree of movement can still be seen. Upon repeating the dry-shot, four to five seconds after the trigger starts to bite, it will be found that the foresight and target do not move at all. All that occurs is the click of the action, with no movement of the foresight (or scope element) and target. This should alert the shooter to the fact that the reason for the movement, which can affect shot release, may completely disappear through a small delay in shot release.

A shooter who undertakes this test may also conclude that the time of shot release may affect the size of a group fired with live rounds.

An observer standing behind TR and F Class shooters at the 2019 Canberra Queen’s Prize Meeting, was as a result not surprised to find that a shooter who scored 50.10, did this holding his breath for nine to ten seconds before shot release. This shooter frequently had to stop and start breathing again when flags indicated a change of wind velocity and/or direction. On the other hand, several other shooters who scored 1 MOA groups, were observed to hold their final breath only 4 to 5 seconds before shot release.

At the Arn Hammond Team’s Match at 500m (Hornsby, 23 Nov 2019), a relatively new F Class shooter delayed the release of each shot for 4 to 5 seconds. In his 15 shot shoot he scored 89.11/90. A team of six TR shooters from another club produced 5 scores of 75/75. One of these shooters scored 14 V-bulls from 15 shots. That shooter was observed to hold his breathe for 4 to 5 seconds.

On 30 Nov 2019, several individual shooters at 300m at Hornsby tested the technique and released all their shots with a 4 to 5 second delay. One TR shooter scored 74.13. That is, when the trigger was felt to start its bite, the shooter held the sight picture completely still and counted 4 to 5 seconds to the moment of release.

**Conclusion and Recommendations:**  it appears there are many shooters with the potential to shoot scores of 50.10 and 75.15 (TR) or 60.10 and 90.15 (F Class). Unfortunately, many are used to a 2 MOA group and as a result, use techniques which enable them to simply put their shots within the bullseye.

By observing all shooters, most (TR and F Class) can be seen for example, not performing the trigger-release technique with the care needed to avoid vertical and sideways shots within the bullseye and out into the inner ring. The majority of TR shooters do not support the rifle with a vertical forearm. Many persist in using a smallbore hand-stop, which for a RH shooter sends shot high-left and low-right. Many have beautifully carved pistol grips with inlets for thumbs (sends shots to 7 o’clock), while others have cheek-pieces which encourage pressure between the face and butt (sends shots to 9 o’clock). Most shooters wriggle their legs and body for comfort, unaware that this changes their natural point of aim, seen as a split group.

It is recommended that all TR and F Class shooters should upon reaching the point where the trigger is felt to bite, count 4 to 5 seconds before shot-release. As well, each of the above and all other techniques should be relearned and practised until there is a single group within the V-bull or X-ring.

In very strong and changing wind conditions, the shooter will need to keep an eye on the flags and instead, count the changing wind velocity in MOA, e.g. at 1000x, 16, 19, 23, 25, 22, 19, 20, with a final release at 22 MOA. This often occurs at Stickledown, Bisley, where flags do not remain constant for 5, much less 10 seconds.

Whether the shooter is counting time before release, or wind velocity changes, a very important technique is also satisfied, known as follow-through. Counting or reciting wind changes is a way of ensuring that the mind is actively engaged throughout shot release. That is, it does not wander and think of future tasks, e.g. to look at the electronic screen to verify where a shot hits the target.

Best regards

Geoff