Dear Colleagues

**Plotting a group from behind the shooter in order to observe changes in technique**

***Introduction*:** this is a procedure for a learner or an advanced shooter to routinely become aware and rectify technique difficulties, of which shooters can be entirely unaware. It may be utilized in both club practice or in serious competition, because it fully complies with the rules of shooting.

***The Problem*:**in previous articles a medium-level shooter was described as unknowingly experiencing technique changes, particularly those which result in shots outside a 1 MOA (TR) or 0.5 MOA (F Class) group. A team coach or partner is recommended to work as an observer to assist in overcoming a shooter’s technique difficulties. If the shooter releases shots too quickly this can be independently timed by the observer. Likewise, wide shots, splitting of a group and even movement of a whole group to one side of the bullseye, can be recorded by the observer.

An experienced coach can as a result perform an absolutely necessary service, watching for elbow position and movements of the body, leg and foot, of which the shooter can be completely unaware. After the shoot they may confer, enabling the shooter to learn perhaps for the first time, about unknown bodily factors correlated with shots out of a group. In this way, shooters (TR and F Class) may understand that many unexplained wide shots are due to body position and the nervous system, as well as unseen atmospheric conditions.

However, there are unseen atmospheric conditions, e.g. due to changes in the refraction of light, of which a shooter needs to be aware. An independent observer may assist the shooter to first learn about his/her own bodily changes, before assuming atmospheric factors are accepted as the primary cause of wide shots. That is, independent assistance is needed to distinguish these two factors.

This article describes a coach seated behind a shooter (TR or F Class), who observes, records bodily and atmospheric changes, together with the shots that occur due to each.

***Practical*:**in every shoot, several factors must be considered at the same time as releasing a string of shots. A change in wind velocity or direction, will clearly indicate a need for the shooter to get shots away while the flags remain unchanged. As a result, shots may be released without waiting for a temporary increase in the concentration of adrenaline in the shooter’s bloodstream to return to base level. Expansion of a group may then occur, particularly if the shooter’s body position contributes to the foresight wandering while trying to aim. These situations illustrate the need for a shooter to avoid having to consider too many factors at the same time.

An observer seated behind a shooter may record visible features of a shooter (in black):

1. the shooter’s **minimum time for shot-release**, compared with dry shots measured just before the shoot e.g. 4 seconds measured from the start of trigger bite until release; a shorter time than this produces a wider group, i.e. 2 MOA (size of the bullseye) instead of 1 MOA (size of the V-bull or 6-ring) (TR, F Class)
2. a degree of sight wandering or arm movement, resulting from **instability of the rifle not supported by the elbow (as fulcrum) located directly under the rifle stock** (TR)
3. lack of dead still support of the rifle (achieved through mentally commanding arm muscles to go limp, ensuring the sling does all the work), often appearing as **sub-groups appearing just above and below the V-bull ring** (TR)
4. **shots just above and below the bullseye**, often in a group 1 MOA wide but 2.5 MOA high (due to insufficient sling tension requiring arm muscles to support the rifle) (TR)
5. **change of the natural point of aim, splitting or relocation of a group in any direction across the target**, often out in the inner ring (due to change in bodily tension during a shoot), i.e. anywhere in the body (**a foot**, **an elbow**, the **pelvic girdle** or through **sliding the trunk forward or backward between shots** 1 to 10) (TR, F Class)
6. awareness of the need for the **hand on the pistol grip to be stabilised using the three large palm muscles, thumb, trigger finger and the locations of fingers 3-5**, leading to **wide random shots that accompany a small group** (TR, F Class)
7. **sub-groups of shots at 3 and/or 9 o’clock outside the bullseye ring** due to varying tension against the butt, from the face and/or loading hand (TR, F Class)
8. **splitting of a V-bull group into 2 or 3 sub-groups**, typically < 1 MOA, often located above one another and within the bullseye (**due to pulsation from unequal tension of the sling around the upper arm**) (TR)
9. **increase in size of a group** due to a larger **diameter of the foresight ring and width of its annulus** (TR)
10. **a 2, 3 or 4 MOA group** due to selection of an **incorrect diameter for the rear aperture**; **the smallest diameter should just allow ambient light intensity to enter the eye**, which will cause the pupil to acquire the same diameter (TR)
11. a group as **wide as the bullseye or inner ring**, indicated by **fuzziness (rapid changes in refraction) of light observed around the centre of the F-Class target** (F Class)
12. changes in the refraction of light, i.e. changes in the paths taken by light rays, measured as **differences in elevation of shots found upon releasing two sighters at two different wind velocities**; this leads to **wider corner shots in the target when wind velocity is greater** (TR, F Class).

***Recommendations*:**while plotting a shoot, the partner seated behind observes and records changes in the shooter’s technique. During a shoot, no details of remedial action to correct a group should be passed between the shooter and partner, mainly because of the risk of distraction and a need to comply with the rules of shooting.

***Conclusion*:**  a procedure where a shooter is assisted by a silent partner, is a means by which a learner or middle-level shooter may learn about the most often-encountered reasons for a group that becomes wider. However, it is also a means by which an experienced coach may work individually with members of a future team. In 2020, from the list shown here, there are many more group-widening factors than changes in wind velocity, which was considered to be the major difficulty in 1900. Today, this coaching preparation system can be used to assist a shooter to produce the smallest group and score 50.10 (TR) or 60.10 (F Class). The first sign of success is enhancement of a shooter’s self-esteem, which leads on to further changes.

Please regard me as the contact for any details when implementing this tried and proven procedure to assist a shooter to achieve a 1.0 MOA (TR) or 0.5 MOA (F Class) group.

Best regards

Geoff