Dear Colleagues

**Reducing the sizes of groups, 2.0 MOA to 1.0 (TR) and 1.5 MOA to 0.5 (F Class)**

**The Problem:**target rifle shooters routinely produce a group about 2.0 MOA, the size of the TR bullseye. F Class shooters often produce a group about 1.5 MOA, a little larger than the 6-ring. Try as they might, reducing these groups down to the size of the V-bull and the X-ring appears for many shooters to be nearly impossible.

When observing a large number of shooters, some of whom appear to effortlessly shoot a 50.10 (TR) or a 60 with 7 or more Xs (F Class), other shooters are left wondering how they do this. Those who cannot produce larger groups as a result of:

* small numbers of shots on each side of the V-bull or X-ring (hand tension on the side of the pistol grip) (TR, F Class)
* approximately equal numbers of shots above and below the V-bull (tension from unrelaxed arm muscles) (TR)
* small (often 0.2 to 0.5 MOA) and widely-spaced sub-groups upon splitting of a group (tremor effect; varying hand position on pistol grip) (TR, F Class)
* a near circle of shots around the 6-ring or bullseye ring (tremor effect) (TR, F Class)
* two or more sub-groups, typically at the centre and 4 o’clock, often 1.0 or 2.0 MOA apart (tremor effect) (TR, F Class)
* centering of a group on one side of the V-bull or X-ring (ineffective group adjustment) (TR, F Class)
* an off-centre group which does not respond to sight-centering adjustments (change of the natural point of aim) (TR, F Class)
* 1, 2 or more stray shots, well away from the central group (mentally commencing a further technique; renewed effort to control arm muscle tension; movement of limb muscles; mind-wandering before shot release) (TR, F Class)
* shots appear 1 to 2 MOA on the left of the group by a RH shooter (cheek-piece absorbing tension, instead of being a guide to positioning of the head) (TR).

This article describes how shooters in each discipline can reliably avert each of these types of groups and as a result, reduce their group sizes; frequently scoring 50.10 (TR) or 60 with many Xs (F Class).

**Discussion:** when shooters watched Perce Pavey (c1924 to c1975), it was common to be left wondering how he was able to group as well as he did. Perce was famous for intentionally holding a group on one side of the bullseye. When an anticipated 1.0 to 1.5 MOA wind change occurred, he would continue his shot-release rhythm, because he intended the affected shot should fall within and on the other side of the bullseye. He had studied the wind pattern beforehand and hence, knew a particular wind change was likely to happen.

There were always observers standing behind Perce, none of whom knew what was in his mind. For example, he overcame the effect of mind-wandering while releasing a shot. He had a number of activities to keep his mind active which overcame distraction due to thinking of moving the head to see where the shot went, or thinking of moving the hand to open the bolt. For example, he set his mind to repeatedly reading wind values from flags (to aid follow-through) or estimating how long a particular shot release had been progressing, until suddenly the surprise release happened (facilitates follow-through). Observers particularly failed to notice: Perce’s routine check and minute foot-and-navel adjustment of the natural point of aim immediately following raising the rifle to aim. As well, observers speculated incorrectly, that his cheek muscle exerted a stabilizing tension against the butt. Shooters found this when they tried to do it themselves.

Perce Pavey’s shooting illustrates the fact that many difficulties occur which must be managed at the same time. Few shooters do this, concentrating instead upon a couple of less critical factors, allowing others to widen the group. It is necessary for example: to first practise keeping all parts of the body dead still, then performing it automatically (TR). Likewise the hand that moves to and from the pistol grip must be practised, to ensure that the same tension is applied to the grip (TR, F Class). The TR shooter should also practise allowing muscles of the supporting arm to remain limp, requiring the sling to do all the work.

Most importantly, the shooter (TR, F Class) has to routinely centre the group by statistically adjusting the rear-sight or scope sight for every shot (altering ½ MOA for a shot on the edge of the bullseye, ¼ MOA on the edge of the 6-ring or V-bull and 1/8 MOA on the edge of the X-ring). The shooter who aims off is kidding himself; often becomes lost and over-corrects poor shots. Many shooters tend to regard a group as being on the move and hence, subject to many more factors than the mind is capable of thinking about at the same time.

**Practical:** each of the above should be memorised and practised, rather than carried out so as to interrupt a shoot. For example, the follow-through technique or ensuring the mind is fully applied to trigger-release right up to the point of release, should remain in the background memory and performed automatically. If brought to the fore then unexplained shots occur.

Once several factors are retained in the memory, without having to think about them, a shoot may consist of techniques which really need the shooter’s attention. Overcoming the tremor effect (a 1.5 MOA F Class group or 2.0 MOA TR group) and monitoring the flags should be uppermost in the conscious mind, i.e. acted upon immediately.

The trigger-release technique to avert the tremor effect needs to be performed at the same time as techniques that ensure the rifle is held dead still. It cannot be performed until the TR rifle is dead still. The F Class rifle is of course dead still, but this can be upset by the way the trigger is released. The TR shooter needs to support the rifle with the elbow directly underneath it so that the forearm is held vertical. Then the arm muscles are consciously relaxed in order to go limp, enabling the position to depend entirely upon the sling. The shoulders and upper body should be positioned partly over that elbow, so that it and the weight of the rifle balance one another. With this, the foresight can appear dead still.

Trigger-release in both TR and F Class needs to occur with the hand on the pistol grip. The dead still foresight or scope element should be positioned to ensure that as tension of the trigger finger is increased, no trace of movement occurs in the sighting system. The mind is occupied estimating how far the trigger release has progressed. Surprisingly, release occurs with the mind having watched for no movement, i.e. ensuring the aiming mark is exactly where it should be, in the exact centre of the dead still foresight or scope element. Upon release the mind should quickly scan the flags, ensuring they are still in the required position.

The critically important requirement is for the foresight ring or scope element to be exactly centred when release occurs. No thought should occur, that if the foresight or element moves across the aiming mark at the critical moment, then it should hit the V-bull or X-ring. Such a shot can be expected to result in a 2.0 MOA group (TR) or a 1.5 MOA group (F Class).

**Conclusion:**  there are many factors which lead to a 2.0 MOA (TR) group or a 1.5 MOA (F Class) group. Most precautions can be performed automatically, avoiding distraction when thinking about them. Hence, conscious mind activity must ensure that a shot is released without coinciding with a bodily tremor and as well, that the flags are as required before and after release.

Conscious thinking should be reserved entirely for: supporting the rifle dead still (TR) while releasing the trigger (TR and F Class). The mind should be fully occupied ensuring that release occurs with the aiming mark and foresight ring (or scope element) both perfectly still. With practice, release can occur at shorter and shorter time intervals, down to about 3 seconds (from the start of the imagined trigger second stage). Automatic positioning of the aiming mark or scope element, then enables the group to be confined within 1.0 MOA (TR) or 0.5 MOA (F Class).

Best regards

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