Dear Colleagues

**Sight adjustment to move a group**

**The Problem:** as a young shooter the writer often received messages of advice given to club shooters:

* in the 21st century, a practice advocated before 1900 has reappeared, where shooters intentionally shoot with a group only 1.0 MOA, the size of the V-bull (TR). Each shot is released without being affected by movement of the muzzle under the influence of an adrenaline tremor
* in the 1950s at 900x, we were told moving the sight by 0.5 MOA is a waste of time, particularly at long range. Since the bullseye at all ranges was about 2 MOA, then any sight adjustment needed to be at least 1 MOA
* correct for wind upon the appearance of a shot on the target, but not upon a change in flags
* in modern times, many F Class shooters aim off to avoid the need for a scope-sight correction. These shooters later find that they have acted as if their groups were as small as the diameter of the projectile!
* in modern times, some coaches in teams’ matches believe they can ascertain the size and position of a group, simply by leaving shots at one position near the edge of a bullseye. They incur a risk by not moving the group toward the V-bull or X-ring

A shooter therefore needs to consider a quite different sight correction to centralise a much smaller group, i.e. 1.0 MOA (TR) or 0.5 MOA F Class).

This article describes the sight adjustments which should be made by a shooter trying to record his/her best possible score.

**Discussion:**before considering the advice from shooters with better skills, there is a priority need to consider the change in intentional group sizes, where modern-day shooters have returned to an important technique used before WWI. This technique enables the tremor due to adrenaline in the bloodstream to be overcome, allowing the shooter to hold a 1.0 MOA group at all ranges. Smallbore shooters used the trigger-release technique throughout the 20th century, enabling them to always group smaller than 1.0 MOA.

The TR shooter who actually holds a 2 MOA group:  these shooters constitute more than 90 percent of TR shooters, who on a good day score 50.3, with shots over the whole area of the bullseye. Closer examination will show that many shots appear to have almost followed the circular bullseye ring. On an off-day, these shooters may find their outermost shots hit just outside the bullseye ring, scoring say 45.1 These shooters appear to have never been taught to avoid shot-release when the muzzle is moving under the influence of an adrenaline tremor. In particular, they have not been taught to perform the trigger-release technique correctly, as is demonstrated today by many F Class shooters. It led to the story that some Australian shooters who went to Gallipoli in 1915, took these techniques with them along with their military-issued range rifles. When they did not return it was thought the techniques had been lost. In fact they were still taught by a small number of coaches after WWI.

The F Class shooter who is only able to hold a 1.5 MOA group:   F Class shooters who cannot group within the X-ring or the 1.0 MOA 6-ring are very similar to TR shooters, who have not mastered the trigger-release technique needed to enable them to group within the 0.5 MOA X-ring. A shooter needs to be taught to use the trigger-release technique in order to group as small as this.

Shooters in the 21st century who hold a 1.0 MOA (TR) or 0.5 MOA (F Class) group:   these TR shooters group within the V-bull, while the F Class shooters group within the 0.5 MOA X-ring. Clearly, when grouping as small as this, the shooter needs to know how far a ¼ or ½ click sight adjustment will move a group.

The F Class shooter who aims off, thinking he can hold a group the diameter of the projectile:   this shooter has succumbed to the idea that a shot on the edge of the bullseye can be put into the centre by aiming at the opposite side of the bullseye. There is justification for aiming off, but only if the true size of the group is known, so that the desired result may occur. The real risk is that the shooter will tend to shoot without thinking of the actual size of the group. After releasing several such shots the shooter has a good chance of becoming confused and lost.

**Practical:**  the techniques cited here were first used when rifle ranges were equipped with target frames designed to support two targets. Upon raising one target for a shooter to fire at, then pulling it down for marking raises the second target for the shooter’s partner. This meant that a shooter needed to remember the prevailing wind direction and velocity. The system has been largely retained in the UK, although pulling the target down raises a frame bearing the value of the previous shot. In Australia today, few rural shooters fire alternately, instead release a string of shots. The Australian shooter also fires using elapsed time instead of the 45 second per shot rule, which still exists in the UK.

Hence, an Australian will correct upon the positions of shots on the target, rather than the changes of flags, because they inherently contain a much greater error of assessment. UK shooters on the other hand, still correct the sight on the basis of changes in flags.

Most importantly, when shooting a string of shots, an Australian shooter should wait a little for the flag to return to the same position before releasing each shot. Otherwise the shooter is forced to alter upon a flag change, when it may not have returned to the same position within the elapsed time. An Australian shooter in wildly changing conditions, forced to alter the sight upon flag changes, may call this a sighter shoot. That is, each shot is like the first sighter of a string of shots.

Nearly all TR or F Class shooters who work with a coach express an interest in learning to group as small as 1.0 MOA (the V-bull) or 0.5 MOA (the X-ring). They must master the trigger-release technique if they are to avoid muzzle movement. These smaller groups require the following sight adjustments to be made by each type of shooter:

* for a shot close to the 2 MOA bullseye ring, move the iron or scope sight by ½ click (i.e. 0.5 MOA)
* for a shot close to the 1 MOA V-bull or 6-ring, move the iron or scope sight by ¼ click (0.25 MOA)
* for a shot close to the 0.5 MOA X-ring, move the scope sight by 1/8 click (0.13 MOA).

If the next shot is still close to the ring, then the sight is moved the same amount for the next shot. Note that each of these sight movements will statistically move the group by ¼ of the distance across the respective ring, so that it will be most unlikely to overcorrect.

A coach who today still leaves a group to form with 3 shots close to the bullseye line, is using a technique from much earlier times. This can be costly. After several shots wasted in this way, such a coach may then consider it is time to move the apparently high group closer to the centre. The desire by this shooter to produce his/her best score in the teams’ match would appear to have been forgotten by the coach. A shooter who has learned to group within 1 MOA, will soon find that ¼ and ½ MOA adjustments can be made without risk of overcorrection.

**Conclusion:**  Most shooters are now able to recognise competitors who group at 1.0 MOA (TR) or 0.5 MOA (F Class). More and more TR shooters at the 2019 Sydney Queen’s were doing this, as a result of their excellent body positions and corrections of the natural point of aim. Many (TR and F Class) were also using the correct trigger-release technique, with great care not to allow a foot or the hand on the pistol grip to change to different positions within a shoot.

It is now only a matter of time before shooters in both TR and F Class attain their much smaller groups (1.0 and 0.5 MOA in TR and F Class), adjusting their sights for every shot unless it is exactly in the middle of the X-ring. That is, the sight corrections shown here enable a central group to be accurately moved into the centre of the V-bull (TR) or X-ring (F Class).

Best regards

Geoff