**Dear Colleague**

**Uniformity of release of a string of shots and the groups that result**

**The Problem:**most shooters ensure they support their rifle dead still, followed by a very slow trigger pull during the imagined second stage. However it is common for both TR and F Class shooters to still produce small groups of shots well apart from one another.

TR groups are often larger than the V-bull. Shooters with groups small enough to fit into the V-bull, often find they are not easily centred and as a result some shots overlap into the bullseye ring. Such groups often contain no tremor shots, shown by the absence of shots around the perimeter of the bullseye (TR). Most shooters are pleased with this, because their groups score from about 50.5 to 50.9. It is often better than any group the shooter has produced before.

F Class shooters with stability guaranteed as a result of the rifle rest, find their groups consist of shots across the whole 1.0 MOA area of the 6-ring. Most shooters are pleased with this, because they score 60.5 to 60.9. This is often better than the scores of others in a match.

At the time of writing, there are TR shooters who are able to group a high percentage of shots in the X-ring. By comparison, there are F Class shooters who are able to group nearly all shots within the X-ring. These TR and F Class shooters appear to be using techniques which are better than those of shooters who score small numbers of tremor shots. However, most shooters agree that the answer is to ensure that all 10 shots are released uniformly.

This article describes the means of ensuring that every shot in a shoot is released exactly the same. It is clear that shooters who regularly score 50.10 or 60.10 must be doing this. Most shooters who set up such a routine find it is not easy.

**Discussion:**the previous article was concerned with ensuring the shooter does actually hold the rifle dead still, followed by a slow trigger pull. These two techniques can enable shooters to avoid generating tremors, providing all other techniques are performed successfully.

Unidentified disturbances commonly occur during recoil, reloading, dismounting and reassembly of the aim position. Shooters freely acknowledge the need to ensure that shot to shot uniformity is strictly preserved. However, it is unusual to find shooters who attempt to achieve uniformity for all of the following:

* body position (TR)
* tension and placement of the butt against the shoulder (TR and F Class)
* sling position on the forearm and upper arm (TR)
* tensions of the forward hand (TR)
* wrist distortion and tension (TR)
* arm muscle versus skeletal tension (TR)
* tension of the hand holding the pistol grip (TR and F Class)
* placement and tension of muscles of the hand against the pistol grip (TR and F Class)
* anchoring of palm muscles on the pistol grip (TR and F Class)
* placement and tension of the thumb at the pistol grip (TR and F Class)
* positioning and tension of the fingers on the pistol grip (TR and F Class)
* placement of trigger at the first joint of the trigger finger (TR and F Class).

Some shooters have concluded that memory alone is insufficient to detect, adjust and achieve uniformity for all items on this list. As well, many shooters have found there is a need to routinely search and adjust changes in factors as they occur. Some factors must be given a higher priority, because they are common and result in the most damaging effects e.g. change of body position. Its occurrence must be monitored with corrections made as soon as a change occurs.

**Practical**:   watching shooters on a firing point will quickly reveal those who:

* go straight into a shoot without discharging a dummy round beforehand (TR and F Class)
* position the forward elbow to one side of the rifle (TR)
* rest the rifle on the palm instead of the large thumb muscle positioned above the elbow (TR)
* position the hand on the pistol grip without all three of the largest palm muscles in contact with the pistol grip for every shot (TR and F Class)
* use a thumb-hole stock, firmly gripping it with the thumb (TR)
* have a carved inlet around the rear of the action in which the thumb absorbs recoil (TR)
* pull the trigger using one of the muscle pads on a finger, instead of the first joint (TR and F Class)
* move a leg or the pelvic girdle without concern as to any effect this might have upon a shoot (TR)
* move one leg sideways, then another which is bent forward (to shift the natural point of aim sideways) (TR)
* bend a leg at the knee, straighten and then bend it again to aim another shot (TR)
* slide the whole body forward or backward during a shoot (TR)
* move the forward hand back to the original position on the stock after each shot (TR)
* wave the barrel around when reloading, trying to keep both elbows on the ground (TR)
* find the butt slips down to a new position on the shoulder, then re-set it at the shoulder with the loading hand (TR)
* turn around to engage in conversation with those behind the shooter (TR and F class)
* quickly look at the screen upon firing a shot (TR and F Class)
* shoot using the pinch technique, where the trigger is forced back against the trigger guard (F Class)

Shooters have devised anecdotal techniques, in need of testing by a large number of users, to overcome any non-uniformity for every shot in a shoot. Several anecdotal techniques which should be of interest to club members seeking to achieve uniformity are:

* ensure the forearm is underneath the stock and vertical to the elbow (position the elbow under the dotted line between the eye and the target)
* move the total weight of the forward part of the body onto this elbow (raising the other elbow a small amount should barely disturb the aim)
* use a dummy round before a shoot, to ascertain the degree of care required to release a shot without a tremor being seen to move the foresight or scope element
* use the dummy round again to confirm the shooter's memory of how the trigger feels on attaining the degree of care
* for every shot routinely aim with the eye half-closed to see where the rifle will automatically aim according to the shooter's body position, then adjust the position by moving the left foot a cm or so then bring the navel forward or to the rear a cm or so
* test sling tension and adjust before a shoot (come onto aim, suddenly allow the muscles of the arm to go limp and if the foresight drops, the sling needs tightening)
* confirm wrist tension does not affect the rifle, with the hand in direct line with the wrist and not bent
* ensure there is maximum feeling on the palm of the hand, to ensure the stock does not move across from the thumb muscle to the centre of the palm, i.e. shoot without a glove
* ensure the sling supports the rifle with tension around the forearm, not the wrist or the hand (the sling is the means of preventing the hand from moving forward along the stock)
* the arm muscles must be consciously directed to become limp, so that the skeletal structure only supports the rifle (not arm muscle tissue)
* the butt is against the shoulder with such tension that it requires the thumb of the loading hand to position the butt, as if using a shoe-horn.

If this list is applied for every shot of a shoot, then uniformity has been found to be achieved. For example, an F Class shooter will find that instead of producing four or five 0.2 MOA sub-groups, only one sub-group will appear within the X-ring.

A colleague described his routine: when I release a bad shot, I reposition and adjust for the effects of recoil, which can throw me a little off kilter. So I re-establish all the degrees of care. All are completed in a cycle, checking: position/wrist/sling support of rifle, no use of arm muscle power; then I fire at least TWO dummy shots to fix the factors in my mind and body before loading a live round. After a few shots the rifle may move a little further on the left hand, straying to the middle of the palm.  This causes the next shot to move horizontally, towards 3 o' clock.  I check this after every shot in my automatic sequence of errors.  It is much easier to spot and feel this when shooting without a glove, as I recently discovered.  A glove tends to mask this movement.

**Conclusion:**  uniformity is needed to ensure that every shot in a string of shots is the same for a wide list of factors. There are too many items which can be forgotten and cause shots in a group to widen. Memory is not good enough. A shooter should set up a routine for search and adjustment without having to think about it.

Best regards

Geoff