Dear Colleagues

**Intending to shoot a V-bull or X-ring group**

***The Problem*:**fullbore shooters who try to follow advice and shoot a V-bull or X-ring group, may be more successful if a partner coaches and/or plots the shots. Others who do not arrange for this assistance can expect to have to try longer. This is because the vast majority of shooters appear to be unable to believe they could ever shoot a string of V-bulls or Xs.

Last Saturday, the writer coached a lady who was under no constraints and was prepared to shoot 70.10 if this appeared likely to occur. That is, I had convinced her that a possible of Xs was well within her capability. I had also been telling her that her smaller hands were more sensitive than those of a male shooter and hence, could help in the trigger-release technique.

This article describes the experience of the lady at Hornsby, NSW, on a day when the temperature was 45 degrees. Many shooters suffered even though shooting under an awning. It was clear that their hearts were beating too fast, which led some to release shots that only surrounded the V-bull. On the other hand, the lady shooter managed to put many of her shots into the X-ring. Her shooting appeared to not be affected by the temperature at all.

***Discussion*:**   the first objective in coaching this F Class shooter was to ensure she performed techniques to:

* *prevent* adrenaline tremors from causing *movement of the muzzle* at the moment when a projectile departs (from the start of trigger bite, a delay of 4 seconds occurred before shot release) [if release occurs within 4 sec then the group is 2 MOA, if after 4 secs then the group is 0.5 MOA, i.e. within the X-ring]
* immediately *centralise the sight after each shot*, i.e. if a shot is not close to the centre of the X-ring (if a shot is close to the bullseye line, move ½ MOA; if a shot is close to the 6-ring or V-bull line, move ¼ MOA; if a shot is close to the X-ring, move 1/8 MOA)
* watch the flags to ensure *each shot is released at the same wind velocity* and flag angle.

As secondary coaching objectives, the shooter was encouraged to simultaneously:

* *uniformly* *position the loading hand at the pistol grip* for every shot, *via* fingers that position the hand evenly, *via* the three large muscles of the palm, *via* loose placement of the thumb and *via* the index finger which releases the trigger at the first joint
* use *uniform hand tension against the pistol grip* [for a RH shooter, greater tension sends shots to the 6-ring, bullseye or inner on the right; but if less tension, shots go left]
* be aware of *light refraction* (invisible bending of light rays down the range), which suddenly changes visible target height, sending shots to a high bullseye, inner (or even a magpie at Kalgoorlie and Broken Hill), otherwise, shots may go underneath or above
* *tension due to cheek against the butt* (if slightly more for a RH shooter; then shots go to the inner or bullseye at left)
* *follow-through* (occupy the mind for the full period of trigger release, e.g. by reading changes in wind readings indicated by the flags).

***Practical*:**it was found that the lady shooter was like all people, i.e. unused to performing several tasks at the same time. However, her 3 shoots at 700m each recorded 5 Xs. This was mainly because she found it difficult to release every shot at or after 4 secs. She would need to practise the trigger-release technique so that every shot was released after 4 seconds. In these shoots she released only 50 percent of shots after this time, i.e. without the muzzle moving. Hence, if she were to improve this performance, she could soon score 80 and then 100 percent Xs (and score all 6s or V-bulls).

Two of her shoots were not released with enough care to ensure she only released when the flags had all returned to the same position. Before the shoot we watched and saw that the flags spent most of their time at zero, although they (3 key flags) could spend 30 or 40 seconds blowing harder and likely to send a shot out to an inner or a magpie. She quickly realised that it was easier to wait a minute or so until the flags returned to zero, then spend 4 seconds releasing the next shot. Before starting the shoot, we found that waiting for the flag did not exceed the elapsed time.

As well, the shooter had not been used to altering the sight immediately after each shot was released. Instead, she had been taught like most, to release one or two shots to see where the group was centred. In fact, the rapidity of wind changes and also elevation shots (due to light refraction) encouraged her to release shots statistically, so that they would not overdo the correction and send the next shot clear through the other side of the X-ring. The statistical correction for the X-ring actually moved the projectile a safe 25 percent of the distance across the X-ring. Hence, if the shooter had made an error, or a shot was not due to light refraction, then the next shot would not go right through and out the other side of the X-ring. There was instead a greater chance that the 1/8 MOA correction would need to be followed by another move of 1/8 MOA, which could move the group closer to the exact centre of the X-ring.

The misguided shooter who aims off, has no chance of making such a group correction, because there is an inherent assumption, that the group is the width of the projectile. Of course, this has never been known to occur.

In her 3 shoots were 2 or 3 elevation shots (actually in the corners) which could have been caused by light refraction. The shooter learned to immediately alter ¼ MOA elevation, which resulted in well-centred Xs. However, neither the shooter nor the coach would really know whether light refraction was the true cause. This is the way refraction occurs, shifting the whole group. Since the shooter cannot see any other indications of light refraction, then a decision to accept this as the most likely factor, will only ever be rewarded by a return to the X-ring or nothing. Failure to accept that a shot is due to light refraction would result in another elevation shot, right alongside the first high or low shot.

This was my first coached shoot with this lady. She now needs to practise shooting this way, i.e. shooting when the flag returns to the same wind strength, centering after every shot that is not in the X-ring and altering statistically on every suspected light refraction change. It will take several weeks for her to master these factors so as to score an X for every shot when conditions allow.

Correcting after each shot to centralise a group and each possibility of light refraction, has been proven by the most skilled shooters since 1918. Perce Pavey was taught in 1923 by a highly-skilled coach at the Port Melbourne Rifle Range. He learned for example, that the hand on the pistol grip included several of the most sensitive techniques described here. As well, he learned to release a shot after about 4 seconds. These techniques apply to both TR and F Class shooters as described.

***Summary*:**  The lady shooter had on one day been coached in the use of simultaneous techniques. It will take several more shoots before she finds she can each time release 100 percent of shots, allowing 4 seconds for each and scoring an X each time. In this she will become used to altering the sight immediately, instead of waiting until a couple more shots have been released and the location of the group has been confirmed.

The end result will be a noticeable increase in her self-esteem, which can be seen from her quiet thinking as she gets down to the firing point for each shoot. When she soon finds she can score 10 Xs, even twice on a shooting day, her composure will become noticeable to everyone.

Best regards

Geoff