

So THAT'S why there are screws on my rear sight!

I really thought I had written this article before, but looking over the past postings, I don't see it, so we'll put it down now and be done with it. As with many of these notes, they are inspired by clients or shooters seeking advice. We will cover two subjects actually but, as they are related, it shouldn't cause us to go too far afield.

Two separate incidents in the last month prompted me to wonder if what seemed obvious might not be: First a young junior pentathlete's mom related how, during an event out of the country, a medal was lost by disappointing results in the "shoot". It seems the groups shot were fine but were "inexplicably" low and right. "What could have happened?", they wanted to know. Then, about a week later we get a call from a middle-aged, 20 years of experience, shooter who had a "disastrous" indoor sectional match - his groups were not centered even though he had "sighted in carefully at my home range before the trip". Both of these individuals seemed a bit amazed at the discussion that followed which, in short, reminded them of what those funny knobs and/or screws on the rear sight were intended to do. When I told them that I often changed the sight settings during the match as well as within the sighting period, they gasped! What incredible daring, they seemed to think.

This type of thinking is pretty much confined to pistol shooters, I've found - rifle shooters are taught about sight changes from the first shots they take and expect to make them as appropriate. Whole industries are formed around rear sights for rifles with have from 20 to 40 clicks per revolution, built in filters and diaphragms, rotatable bodies, levels, anti-backlash features, etc. Pistol shooters for years had to use "Micro Sight" sights which you HATED to adjust because what if you got a "big" click when you wanted a "small" click?! Maybe this is where the fear of adjusting sights came from. Of course, pistol sights are better now - still a bit primitive compared to rifle sights - but actually adequate for the task.

OK, why do we need to adjust our sights and become confident in our ability to do so? Let us count the whys.

1. Light.

This is probably the biggest reason that adjustments will need to be made by the pistol shooter. Not only do the lighting conditions vary from range to range (especially indoor ranges), but they will vary during the match (outdoors especially.) Even indoor ranges with windows to the outside will see varying light during the hour or two of a match. And, there is an old adage: "The group will follow the light." One common occurrence on outdoor ranges is for the sun to cross from right to left(left to right) on north(south) facing ranges. And, yes, your group will move across the target with it. The reason this occurs is that light refracts off the sharp edges of the front sight, tending to create a "halo" effect there and blurring or making indistinct that edge toward the light source. Then, you center the apparent black bar (which is now thinner than it would be without refraction) and voila! - the group has moved in the direction of the light.

Another effect of changing light is the apparent change in size of the black aiming area. When the target is brightly lit, the bull will appear smaller. This is due to a "bleed over" effect on the retina of the eye. The rods and cones at the demarcation line of the black image and the white background are over-stimulated by the amount of light entering the eye and some cells will "fire off" when they shouldn't, blurring the boundary and registering "white" instead of "black". Obviously, this will result in high groups.

Light is the major external cause of shifting groups, but another one is wind. While rifle shooters are very skilled at 'reading' wind, pistols shooters often ignore it. One can get away with this when it is possible to wait for lulls and only shoot during them, but sometimes wind is more or less constant and from primarily one direction and then it should be obvious that a sight change to compensate for the effect on the projectile and the shooter is needed.

2. The shooter.

More subtle, but often just as important, effects on grouping are internal or shooter based:

A. Body position or stance. If you change your body position in relation to the target, the group will shift. Back in the "Micro Sight" days, if you wanted a 'small' click adjustment from right to left, instead of adjusting the sight you simply moved your left foot in the direction you wanted the group to go and it obligingly WOULD move!

B. Head position. A sub-set of body position often changed unwittingly is the position of the head. I have seen shooters who, during the delivery of the shot, let their heads gradually droop toward the chest. As long as this droop is absolutely consistent, it will matter little. But, if the head position changes from shot to shot or string to string you will either see a shift in group or a much wider group than normal.

C. Grip Pressure/Position. One of the advantages of "orthopedic" grips is that theoretically they will reduce variation in how the gun is held in the hand. This is, of course, good. A very important factor not always getting the attention it should is consistency in grip pressure. It should be obvious that if, under stress, you grip the gun more tightly than 'normal', the group will shift. And, gripping more loosely will cause a shift as well, of course.

D. Fatigue. In the course of a long match such as Free Pistol or Air Pistol, there WILL be fatigue. This can cause changes in A,B, and/or C above. When I was at my peak, I regularly saw my shots in Air Pistol "walk" across the 10 ring from right to left as the match progressed. It took about 8 shots to go from the right hand edge to the left! I just accepted this and took one click to the right every 8 shots or so. Another element of fatigue is the loss of eye focal accommodation and acuity. Fuzzier sights may easily cause the group to change.

Well, now lets discuss coping strategy. First, one needs to become aware of the characteristics of your gun's sights. What happens when you take one click? What

happens when you take 10 clicks in one direction? What happens when you take 10 back? Did the group go back to the original area? Is there "backlash" in the mechanism? With some sights, you might have to take "two forward and 1 back" to get 1 forward as just taking 1 forward might not do anything! And, you need to know how far the shot group center will move per click. Once you feel you "know" your sight, you will be much less hesitant about changing the setting, knowing what the effect of any number of clicks will be. Also, sight "blackening" with fine soot from candles, camphor, carbide lamps or the newer, convenient lighters such as the "Black Match" can help reduce refraction effects.

When to change? One does not want to "chase" each shot, but rather consider the center of the "group". (This presumes you GET a group when you shoot! A "group" should be defined as a cluster of shots into an area equal to your present hold area - hopefully no bigger than the 9 ring or 8 ring.) A group should be at least three shots and probably 5 shots is better. In ISSF events you get a sighting target(s) and can pretty precisely determine your group's center and adjust it before going to record. In NRA shooting you don't have this luxury, so you must assess your skill level and decide how many shots you need to be SURE you need a change. Very skilled shooters can use one shot, but perhaps a few more would be wise for most of us. Look at the group and draw an imaginary circle that encompasses it and then quarter the circle with vertical and horizontal lines. Where they cross is the center of the group. (It is quite correct to look a cluster of, say, 5 shots and see 4 of them very close together and a fifth "flier" that you KNOW is the result of a poor execution and exclude it from the 'group'!) Next, estimate the distance that the center of the group must be moved to put it in the center of the target (where the printers almost always put the '10 ring'!) From your study of how far 1 or 10 clicks on your sight moves the group at any particular distance, calculate the number of clicks needed **AND THEN TAKE THEM ALL!** (No tentative, chicken-hearted 'sneaking' into the center with two or three changes - that just wastes points.)

Related to the above are a couple of other questions: "What should my sight picture look like?" and, "Where should I hold?" While these are pretty much subjective things, some principles can be used as guides. First, you MUST have some light around the front sight when it is centered in the notch of the rear sight! Even young shooters with eyes "like an eagle" need to have easily discernable bands of light to allow the brain to make judgments as to the quality of the alignment. A good starting point for adjusting the width of the rear notch is to have light bands on either side of the front sight equal at least to =BD the front sight's apparent width. I feel the advocates of very narrow light bands are mistaken for physiological reasons: This type of sight picture fires only a few rods and cones in the retina and gives the brain only minimal information. And, as you age, some of these cells don't work anymore making it even worse. This why wide sights are sometimes called "old f---" sights. ("folk's" - "folk's" - what did you think?) (See the 3/99 "Note" titled "What about sights?" where this WAS discussed before and has some illustrations.)

As to "where to hold", the best natural hold is the "center hold" as it is well established that the eye will seek the center of a circle subconsciously. However, this hold has one

fatal drawback: It is hard to see black sights against a black background. This can be mitigated with added "plus" spherical correction in the shooting glasses to make the aiming mark blurred and gray, but still it is deficient in good definition. The absolute worst hold is the infamous "6-O'clock" hold! It has two main drawbacks: There is only ONE correct hold (top of front sight tangent to the lower edge of the aiming mark) which sets up terrible psychic stress: You are almost always "wrong"! So, you try harder and harder to get the "right" picture and then punch the trigger when it is fleetingly achieved. There is also an optical drawback: The refraction referred to above at the top of the front sight creates a halo there, making the intersection of the aiming mark and the sight indistinct and making it even more difficult to get it "just right".

So, we are left with the best compromise: The "sub-6" hold. Here we use an "area aim" technique like the Center Hold, but now our sights are clearly outlined in the white area of the target. We can let them float there without concern about exact position to the aiming mark and instead concentrate on their alignment. How much below the aiming mark to hold? Start with about the same amount of white as around the front sight when centered in the rear notch. Then let your subconscious pick what it finds is comfortable and quit worrying about it.

OK, enough "school"- lets go shooting!

Don

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