

**May 2009**

*I need to settle an argument I have with a long time shooting colleague. He shoots a 28 inch barrel under and over shotgun and I shoot a 30 inch barrel. We both want our firearms to shoot higher at their point of impact as we intend on shooting some Trap targets. He believes that because I have a longer barrel gun I will need to raise the comb of my stock more to have it shoot as high as his. Is this correct?*

*Bill Anderson, Brisbane, QLD*

Mathematically Bill, believe it or not, your friend is correct. Ever so slightly I must add. I will try to explain this to you in the form of a simple equation based on some fairly basic assumptions. First of all you need to measure the distance from the end of your barrel (the shotguns front sight) to your eye (the shotguns rear sight). Let's keep the measurements in metric and assume for you Bill the length between front and rear sights is 100 cm which is fairly normal. Let us assume your friend has an identical shotgun apart from the 5cm shorter barrel therefore his length is 95cm. We assume also the same ammunition, eye placement above the stock, no effect of gravity on the shot etc etc. We next need to know how far out from the end of your barrel you are hitting the Trap targets. Most Trap targets are shot at around 30 metres and to keep the measurements consistent this equates to 3,000 cm. We now can calculate a simple sighting plane factor by dividing the target breaking distance by the length of the sighting plane. Bill your factor becomes 30 (3,000 divided by 100) and your friends becomes 31.6 (3,000 divided by 95). From here all we need to know is how far you intend to lift the comb of the stock to make the shotgun shoot higher. Let's assume its 3mm (.3cm). Therefore to find the point of impact at 30 metres we simply multiply the desired new comb height addition by your sighting plane factor. For you Bill it is 30 multiplied by .3 which equates to 9 and your friends will be 31.6 multiplied by .3 which equals 9.48.

In laymen's terms this means at 30 metres the longer barrel will shoot 9cm higher by adding 3mm to the stocks comb height and the shorter 28 inch barrel will hit 9.48 cm higher at the same distance. Bill to have the guns shoot identical you will need to raise your comb by 3.16mm as opposed to your friends 3mm. If you can pick the difference in comb heights then you are a better man than me!

This formula holds true and is a useful tool if you know exactly where you want your gun to shoot at a nominated distance. A good rule of thumb that this formula is well used in conjunction with is that for every 1mm you change your stock you will alter your pattern by just under 4%. Less than half a centimeter difference in your point of impact at 30 metres with a shotgun is not even a debatable point in my opinion Bill, but in answer to your question you owe your friend a beer when you are done shooting next.

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