Pattern for perfection.

We can divide successful shot gunning into three sections. The first is our mechanics, we must have a gun that fits us and we must learn to mount it correctly. The second is target evaluation. The third is our mental ability to put all this together so that we can do this repetitively, especially in a competitive environment. All three are important but the first part, our mechanics, should be the easiest part for us to accomplish. Unfortunately, many of us get it wrong.

In top-level competition, a perfect gun fit must be combined with a correspondingly perfect mount. The mount must be a subconsciously spontaneous thing, as easy as tying your shoelaces. I have had literally hundreds of clients, over the last 25 years or so, who have shot for years and genuinely believe that their ability to mount the gun is flawless and beyond reproach. I would estimate that at least 50% of them could use some improvement. Many shooters, some of them with years of experience are less than cognizant about where their gun is pointing as they use it. Usually, the cause is erratic eye alignment due to bad gun fit or sloppy mount. A correctly fitted gun inspires confidence and the shooter will also experience subconscious tactile assurance that tells him that his master eye is where he expects it to be, in correct alignment above the rib. Good gun fit is even more important in hunting situations. Unlike clay targets, birds are unpredictable; the hardest thing to decide is what the birds will do and when they will do it and there is often no time to waste. A flawless gun mount combined with a well-fitted gun is essential for success.

The science of fitting sporting shotguns can be traced back in the UK as far as the 1830's. Early shotguns were so cumbersome with both barrel length and stock dimensions that before this there was no need to fit them, shotguns were used to take (unsporting but necessary) "pot shots" at flocks of birds on the ground. By the eighteenth century, however, flintlocks were in production that were fairly accurate and these could be used successfully for the pursuit of flying game. These guns were similar in shape to the shotgun, as we know it today. It soon became apparent that, even with these early flintlocks there was a distinct advantage in making alterations to the stock so that the gun would shoot to where the user was pointing it. Many years ago, the pattern plate was used to determine the point of impact of the shot charge so that alterations could be made to the stock dimensions to achieve a perfect fit. To understand this better, first of all let's look at the difference between point of impact and point of aim, because where a shotgun points and where it actually shoots are entirely different.

With a standard shotgun barrel, if we were to measure the distance between the center of the barrel to the top of the rib at the chamber end and then measure the distance at the muzzle end to the top of the rib, there would be a difference. You can easily check this yourself, if you sight down the bore of a shotgun at an object in the distance and then transfer your line of sight to the rib. Where the center of the bore is pointing and the rib is pointing is completely different. If we were to then to draw a straight line down the rib and another one exactly along the axis of the centerline of the bore, we would find in the majority of cases that that the barrel would be pointing up about 10 inches or so at 20

yards. This is intentional, because as the gun recoils, the force of this recoil will be in a directly rearward direction along the centerline of the bore but this will have the effect of pushing the barrels down before the shot column has left the barrel. If the bore and rib were parallel, this would make the point of impact of the shot charge higher. The difference in the angle between these two measurements varies according to what the gun is to be used for. We often hear shooters talking about "I like a flat shooting gun" or "I like to float the target" but what do they mean by this exactly? With a standard sporting clay gun, most people require a sporter to shoot with a 50-50 or a 60-40 pattern. The 50-50 gun would shoot exactly to point of aim and the 60-40 gun would shoot slightly higher than this. Some people relate this to a "figure of eight" conformation between the central and end bead on the rib as they look down the rib. With a trap gun designed for shooting mainly rising targets, the angle of the axis of the barrel in relation to the rib is very small and this makes the gun place most of the pellets well above the point of aim, about 80-20 or in some cases even more. But it is the individual who uses the gun who must know exactly where his gun shoots as he uses it and there is no doubt in my mind that a competitive shot gunner should know how to use the pattern board to check his gunfit. To do this correctly, his gun mount must be flawless. If it isn't, two things will make a difference to the point of impact. The first is obviously his eye placement above the rib but the second is the way the shooter absorbs the recoil. As the gun comes into the shoulder pocket, as the gun recoils and density of the bone and flesh mass varies as the butt of the gun pushes into this mass, so will the point of impact change. Only slightly, but down range on long targets, it can make a difference.

When using a pattern board, shots should be fired from a distance of 16 yards, using a tight choke. An area should emerge, after five or six shots, where the bulk of the shot is concentrated and for every inch that the pattern is "off" target, the stock will need to be adjusted by a 1/16 th of an inch. So, by the same rule, that ¼ inch head lift converts into the shot going 4 inches high at 16 yards, twice that at 30 yards. At 40 yards a ½ inch head lift (and believe it or not, some shooters will come off the gun even more than this!) when we also factor the shot-drop in at this greater distance, may mean that well over ½ the original payload will miss the target. And here's a word of caution. I see many clients, when using a pattern board under my supervision, concentrate hard on their gun mount and *consciously* align their eye with the rib every time. The result is a flawless point of impact printout on the board. "Ah hah"! Mr. Goodmount says triumphantly. "Told you so. Nothing wrong with *my* gun mount is there?" Then this same guy gets to the sporting clay course and under real situations, with a report pair for example, the second target a rapidly dropping chandelle, he lifts his head so far off the stock on the second target, that he might as well be shooting from the hip!

In a competitive environment, as the shot is triggered, the shooter must finish the shot and be "into" the gun and *stay* in the gun until the shot has left the barrels. Of course we all knew that didn't we? But it's amazing how many shooters don't do this or don't *know* they are not doing it. It's easy to spot on a skeet field on the double from station 6 for example. Many competitors lift their head as they shoot the second (high house) target and a miss over the top of the target is the result. But head lifting happens just as much with bird hunters in the field, or on the sporting clay course, especially with

the second target of a report pair as the shooter looks for the second bird. Usually, it will take an experienced coach to identify this problem. So exactly how important is this? Well, to illustrate the point let me tell you a story about one particular client who came to see me recently.

This guy was a master class shooter and an excellent shot but he was experiencing a frustrating lack of consistency. He had shot sporting clays for ten years or so and built up his repertoire of sight pictures during that time. However, on certain targets, as he triggered the shot, the target didn't break. I took me some time to figure it out but then, during the course of conversation over lunch, this particular client admitted that he had recently lost weight, about 25-30 lbs. Then the light came on. Some of this weight loss, as is often the case, had come off the flesh on his cheeks and now, three things were happening. The first was that his eye was no longer aligned perfectly with the rib, because his head was coming across the comb too far. This had the effect of him shooting behind the target on some of the long left to right crossing shots. The other thing was that his head was slightly lower on the stock and if he ***did*** stay in the gun, it was shooting low as a result. The third was that on long dropping targets, his head was coming off the stock. Not much, just an almost imperceptible amount, because his brain was not registering the correct target/barrel relationship that he knew from experience that he needed to break that target. He couldn't see the correct sight picture of the barrels in his peripheral vision. These three small discrepancies in his gun fit and mount were enough, at top level, for him to frustratingly whiff a few targets. Almost to add insult to injury, both this guys guns had custom stocks with very impressive wood. Now I'm not suggesting that no-one should buy a custom stock, far from it. There are lots of good custom stockers here in the US. But what I am suggesting is that if an individual is routinely afflicted by weight fluctuations (and some of us are), now your pretty custom stock is reduced to an expensive piece of firewood. An adjustable comb and butt pad are the obvious choice for these guys. This is one reason why lots of skeet shooters have adjustable combs and butt pads on their guns. Skeet is the game of perfection, and although good scores maybe shot in the 12 gauges and 20-gauge event, in the small gauges, with the reduced shot load, precision is the order of the day. Many top-level skeet tournaments are won or lost in the .410 event. A miss of a target or two can make all the difference between winning or losing and although it wasn't always like this, as the game of sporting clays progress here in the US, scores are escalating accordingly. I hastily made some adjustments to this particular clients gun with a strip of cardboard from a shell box and some electrical tape and Hey Presto! He was crushing targets again, in fact he shot in a State championship tournament two weeks later and came second.

Sometimes, a session on a pattern board can reveal a multitude of problems, not all of them simple human errors like head lifting. So here's another story. I had coached this particular client for sometime and he was developing into a good shot, hovering between AA and masterclass. He had decided that indulgence in a new gun was necessary to push him up to the next level. The gun was expensive; custom stock, pretty wood, tricked out internal dynamics, the works. His first few outings with it were disappointing and his scores dropped depressingly low, so he booked a lesson so that I could check the fit of his new toy and critique his gun mount. As we shot round the

course, sure enough, his success with the gun was decidedly "patchy" but nothing that I could put my finger on. I got him to mount the (known to be unloaded) gun a few times and it was perfect, as far as I could see by peering down the barrel. He eye was central to the rib, not a fraction of an inch to the left or right or up and down, so no problems there… or so I thought. Then I noticed that it would often be the second target of each pair that he missed. On shooting a simple, following pair from the same machine, once again the second target was "chippy" and sometimes missed completely. I tried the gun myself and the same thing happened. So what was the problem? This particular make of shotgun was an over and under with "floating" barrels. With this design, spacers (called "hangers") are used to separate the two barrels. The adjustment of these was less than prefect to such an extent that the point of impact of the lower barrel was 10 inches or so different from the upper barrel at 30 yards. Some manufactures notably Kreighoff, Kolar and Perazzi offer "floating rib" and barrel adjustments on some of their models and this is an obvious advantage the user, but once again this point of impact must be checked on the pattern board. Finally, I have also had situations arise with factory screw in choke systems and sometimes, the threads can be cut in the bore that are not quite central to the axis. Even though this may be a couple of thousands of an inch at the muzzle end, this can move the point of impact downrange considerably.

So what's the moral of the story? The only way to find out where your gun shoots is to shoot it. Peering down the barrel in front of the mirror may look good, but if you can't replicate this in real situations on the sporting clays course or in hunting situation in the field, you will have a problems. Repetitive practice is the only way to improve mechanics. But the end result is worth it and the good thing is, it won't cost you a dime.

Since 1998, Pete Blakeley was the shooting coach at one of the most elaborate and prestigious gun clubs the world, the Dallas Gun Club in Lewisville, Texas. Now in 2004 he hosts clinics at various locations throughout the US. His recently released book "Successful Shotgunning" (published by Stackpole Books September 2003) is considered by many to be the most elaborate and definitive guide to shotgunning ever written. For more information or to schedule a lesson, click on his web. site at www.peteblakeley.com or contact him at 940-321-4997.