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## The Perpendicular Reference

Very often I talk about pool's complexity, how much there is to learn and all the time it takes for most of that learning to occur. A lot of our knowledge involves certain techniques that are easy to explain quickly and concisely as in those matters where we might tell the whole story saying, "hit the cue ball here with firm speed." Other aspects of pool are more abstract and much harder to articulate, such as learning to process what we see. How, for example, can one describe the certain knowledge that the ball we're shooting will go into the pocket? What exactly do we see and what makes it so different from the picture associated with a near miss? Another abstract element of vision is our relationship to all the possible angles that we encounter with each shot we face.

Experienced players employ their knowledge of angles to run racks with consistent speed, matching up the next shot with the one beyond it to leave an angle that will yield good position with comfortable speed. The ability to look into the future and produce little, three-ball runs with comfortable speed is, in reality, a lot more difficult than it sounds and requires a good deal of experience and memories relating to position play. Another aspect of position play related to the shot's angle, and one that sounds even simpler than speed control, is the ability to look at a shot and determine what's possible with the cue ball based on the shot's angle. Although that sounds rudimentary, I have observed that learning and recognizing what a shot will offer is a relatively long process based on many experiences and memories. It's very common to see committed but inexperienced players take shots where they obviously believe that the cue ball will move in a way that's impossible for that shot. Eventually however, everyone who's put in enough time learns what can and cannot occur with nearly every shot.

Naturally we cannot discuss all of the angles we will face and the possibilities associated with each one, or even touch on a small fraction. So, I want to discuss one common, important shot and a specific cue ball path associated with it to make it familiar. In the diagram we have a shot that we shall play with straight follow and no english to produce a specific, repeatable result. Again we see that we cannot learn and remember all of the myriad possibilities on a pool table, so we must operate with a set of references that we can use as benchmarks to place the different shots into various groups and help us see the strange and new as something familiar. The reference illustrated with the diagrammed shot relates to a cue ball rebounding from a rail on a path perpendicular to that rail to yield the greatest benefit associated with any shot, namely a cue ball that cannot scratch. After we can recognize the shot we see in the diagram and master the perpendicular track, adjustments to that benchmark become easy. First we must shoot the reference shot.

Set up the diagrammed shot and shoot it a few times with a high ball and a smooth follow stroke with no english. The cue ball should move straight toward the top rail and straight out down the table on a path that's perpendicular to the top rail. If the cue ball does not rebound on that track and you know that you are stroking it properly

without any english, fiddle with the cut angle until it rebounds on the track indicated with the dotted line. The rule of thumb for this shot states that the cue ball will move on a line that's 30 degrees to the left of the aiming line, indicated by the solid line. If that 30-degree line goes into the rail perpendicular to it, a cue ball hit with no english should rebound on a perpendicular track. Once we become familiar with that 30-degree principle we will recognize this shot in many forms into any pocket.

Adjustments to move the cue ball off of the perpendicular track can be accomplished in several ways. Moving the cue ball from the rail and to the left can be managed by adding punch to the stroke, left hand english or a combination of both. Since we are hitting the shot with the best possible follow, we must use some inside english, left in this case, to make the cue ball rebound to the right from the top rail. Master the reference track then experiment with adjustments to that reference to hit precise tracks on the left and right side of the dotted line. You should find that hitting a specific track in the context of an adjustment to your reference is much easier than looking at the shot and plucking a position track from thin air.



