David Alciatore, PhD ("Dr. Dave")   **ILLUSTRATED PRINCIPLES**
"VEPS GEMS - Part V: Banks and Kicks"

Note*: Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, and technical proofs (TP), and all of my past articles, can be accessed and viewed online at* **billiards.colostate.edu**. *The reference numbers used in the article help you locate the resources on the website. If you have a slow or inconvenient Internet connection, you might want to view the resources from a CD-ROM or DVD. Details can be found online at:* **dr-dave-billiards.com**.

This is the fifth article based on the "*The Video Encyclopedia of Pool Shots (VEPS)*," an instructional DVD series I recently created with past BD columnist and good friend Tom Ross. VEPS contains over 750 shot types within 50 main categories and 5 major areas. Many clips in the series are also designated as "gems," indicating shots or concepts important to know as a pool player, whether understood explicitly or in a more intuitive way. An outline of the entire VEPS series, the complete list of shot types in each major area, the gem designations, and video excerpts from each DVD can be viewed online at: **dr-dave-billiards.com/veps**. Last month we looked at some gems from the third DVD: "VEPS III: Safety Play and Strategy." Over the next few months, we'll look at selected gems from the fourth DVD: "VEPS IV - Banks, Kicks, and Advanced Shots."

Let's start with some basic terminology for bank and kick shots shown in **Diagram 1**. With a **bank shot**, the goal is to rebound an **object ball (OB)** off a cushion into a pocket. Some aiming systems assume that the **rebound angle** is the same as the **approach angle**. However, as you acquire experience with bank shots, you soon come to realize that the rebound angle can vary quite a bit with cut angle, English, speed, and distance to the cushion. Some aiming systems require the angles to be measured relative to the **rail groove**. This is the line where a ball sits when in contact with a cushion. Sometimes our aim point will be defined in the rail groove. In those cases, we'll refer to the correct aim point as "**across from**" a certain diamond location. Other aiming systems require the aim point to be the diamond itself, which we'll refer to as "**through a diamond."**

Diagram 1 Bank shot terminology

The rail diamonds, whether the target is the diamond itself or across from it, can be very useful for aiming bank and kick shots. In the case of the equal-angle system, for example, we just need to make sure there are equal diamond distances on either side of the aim point. A shown in Diagram 1, the aiming line through the OB passes through point "a" in the lower rail groove, which is across from the side pocket (4th diamond). Thus the aim point "b" is across from the 2nd diamond in the upper rail groove. If the **cue ball (CB)** and OB were lined up along the line from going from a to b, with proper shot speed, the OB will head two diamonds to the other side of the aim point and into the corner pocket (point "c"). See **NV B.81** (VEPS shot #'s 472 and 482), for a demonstration of the shot. With a cut angle, as shown in Diagram 1, an adjustment would need to be made for a small amount of clockwise spin imparted to the OB. Without an aim adjustment, the rebound angle would be shortened as indicated by the red line in the diagram. For more information on this and other bank and kick effects that require adjustment, see "effects and factors to consider" under "bank and kick shots" in the FAQ section of *billiards.colostate.edu*. Also, see NV B.81 for several methods that can be used to find the equal-angle-bank aiming line in different situations.

Diagram 2 shows a **kick shot**, where the goal is to rebound the CB off a cushion into an OB. In this example, we'll assume the CB is fully rolling before contacting the first rail. As such, we now aim through the diamond instead of the point across from it (rail groove). This helps account for the fact that the rebound angle will be larger than the approach angle with a rolling CB. In the diagram, the CB is being aimed directly at (through) diamond 2, which will bring it in contact with the cushion ahead of the equal-angle position in the rail groove. This compensates for the fact

that topspin on the fully rolling CB will cause it to bank a little longer than the equal-angle rail-groove system predicts. When determining the necessary line of aim, we also measure distances along both rails at "through-diamond" points, and not along the rail grooves. In Diagram 2, the line of action of the CB goes through point "a" at the 4th diamond on the bottom rail and through point "b" at the 2nd diamond on the top rail. The CB should then head in a direction through point "c", to pocket the OB. Note that we are still using an equal-angle method, but our reference points are now measured at the diamonds themselves. For more information and examples of how to use this system in different situations, see **NV B.82**. The through-diamond technique also works for bank shots as long as the OB is fully rolling as it reaches the first cushion, which will be the case at slower speeds and when the OB is not resting too close to the cushion.
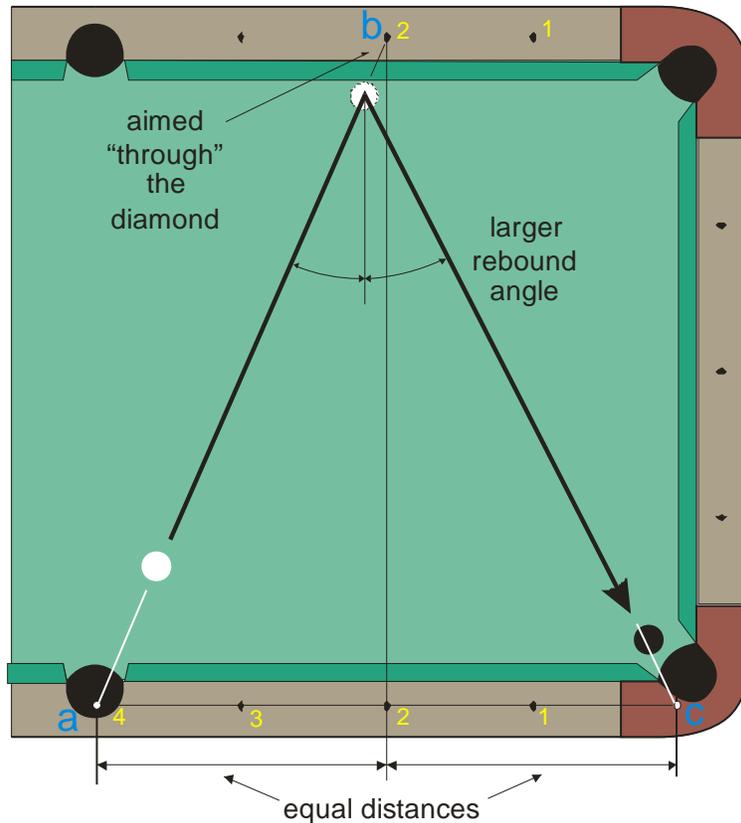
Diagram 2 Rolling-CB, through-diamond kick shot system

When measuring diamond distances along a rail, it is sometimes important to know exact diamond locations at a corner pocket. As shown in **Diagram 3**, if measuring horizontally along the bottom rail, the diamond is located in-line with the right-rail cushion nose (diamond "a"). And if measuring vertically along the right rail, the diamond is located in-line with the bottom-rail cushion nose (diamond "b"). With some "diamond systems" (e.g., the Plus and Corner-5 systems we will look at in future articles), a single diamond is assigned to the pocket and is located at the intersection of the cushion-nose lines (diamond "c"). In **NV B.81** at the end of shot # 472, we show how you can use your cue to measure diamond distances beyond a rail. When making such measurements, it is important to know precisely where the corner-pocket diamond is located.
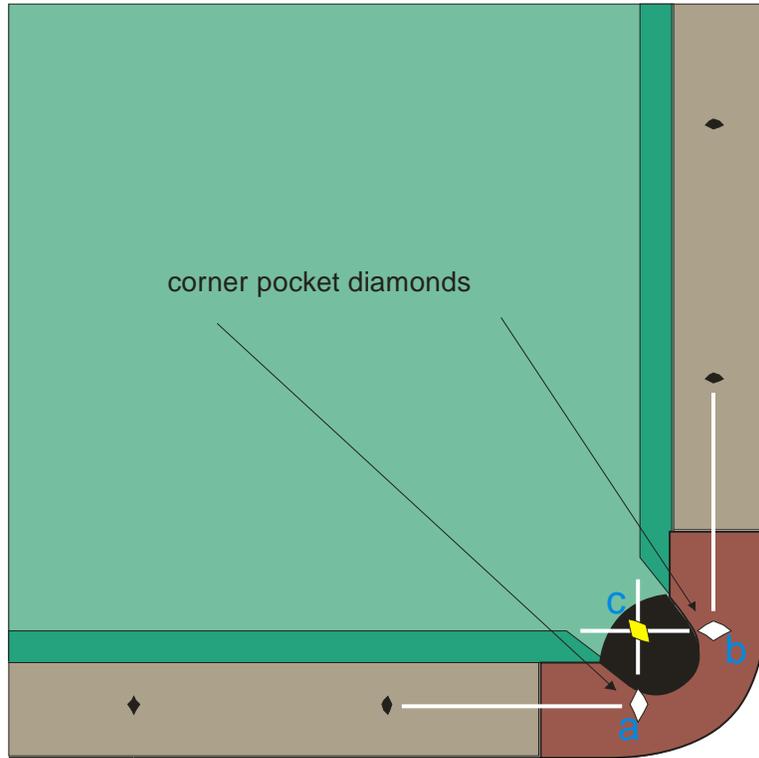
Diagram 3 Corner pocket diamond locations

Have you ever wondered why great bankers frequently hit the ball hard? There is a reason ... actually there are several reasons. For the details, see "advantages of fast speed" under "banks and kicks" in the FAQ section of *__billiards.colostate.edu__*. The main benefit of faster speed is that the rebound angle is less sensitive to speed changes, making the angle more predictable. The downside is that the effective size of the pocket is smaller at faster speed, but rebound-angle consistency is a more important factor in successful banking. Most great bankers don't really use "systems" to aim their shots. Instead, they rely on the "feel" they've developed through years and years of practice and success. But we mere mortals can certainly benefit from a little "systems" help. If nothing else, a system can at least give you a reference aim with which to begin. You can then adjust relative to the reference as you gain experience and intuition. **Diagram 4** (VEPS Shot # 533) shows an example system that works quite well for fast-speed banks. You begin by determining the equal-angle aiming line as previously illustrated in Diagram 1. Here, the equal-angle line through the OB is again from across 4 to across 2. Then, on most tables, an adjustment of about 1/3 of a diamond along the origination rail (top rail in Diagram 4) is necessary. This is accomplished by simply shifting the butt end of the cue, establishing a new the line through the OB. Then smack it just like the top bankers. The ball will usually go to the hole, provided you've also compensated for any cut angle and English. Yes, banking ain't easy ... it takes lots of practice. But the techniques offered here should help to limit the guesswork, as well as the frustration.
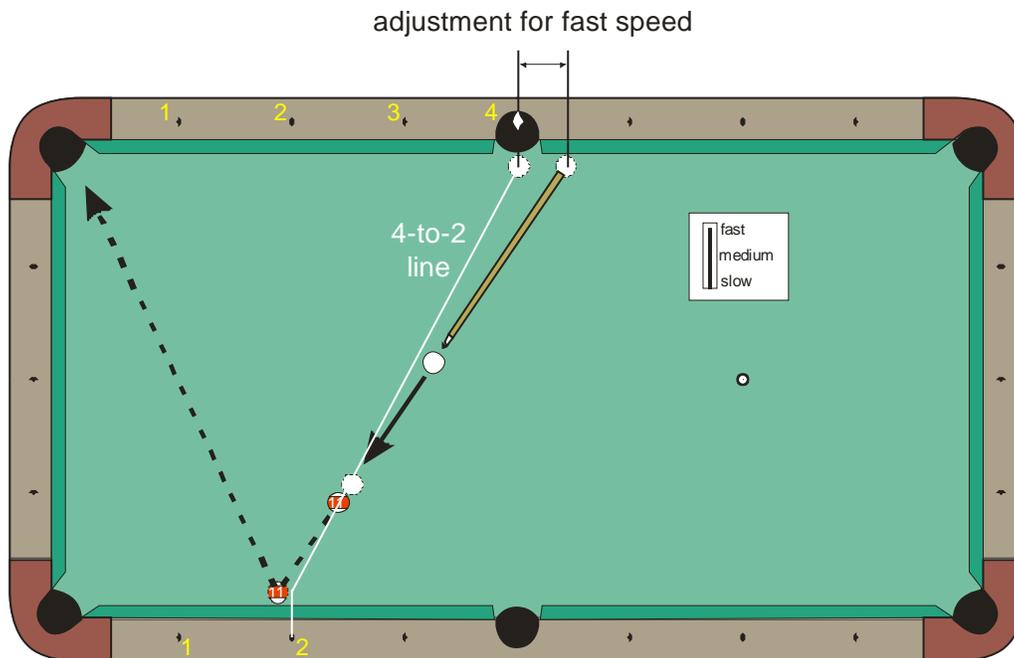
Diagram 4 Fast-speed equal-angle adjustment

Example gems from the fourth VEPS DVD, including the ones discussed above with many more examples, can be viewed on the VEPS website or at ***billiards.colostate.edu*** under **NV B.81** through **NV B.86**.

NV B.81 – Bank and kick shot terminology and basics, from VEPS IV
NV B.82 – Rolling-cue-ball through-diamond kick-shot aiming system, from VEPS IV
NV B.83 – Shallow-angle contact-point-mirror-image kick-shot aiming system, from VEPS IV
NV B.84 – Plus System for aiming two-rail kick shots, from VEPS IV
NV B.85 – Corner-Five System for aiming three-rail kick shots, from VEPS IV
NV B.86 – Cut-induced throw (CIT) and spin-induced throw (SIT), from VEPS IV

Well, I hope you enjoy and benefit from my series of articles highlighting shots and gems from the "*Video Encyclopedia of Pool Shots (VEPS)*." Next month, we'll look at more gems from the fourth DVD dealing with banks, kicks, and advanced shots.

Good luck with your game,
Dr. Dave

PS:

- I know other authors and I tend to use lots of terminology (e.g., squirt, throw, stun, ball-hit fraction, etc.), and I know not all readers are totally familiar with these terms. If you ever come across a word or phrase you don't fully understand, please refer to the online glossary on my website.

- I want to thank Jim Valasina. He graciously proof-reads my articles every month to help find errors and make suggestions. My article quality is better as a result of his efforts. Thanks again Jim!

Dr. Dave is author of the book, DVD, and CD-ROM: "[The Illustrated Principles of Pool and Billiards](#)," the DVD Series: "[The Video Encyclopedia of Pool Shots](#)," and the DVD: "[High-speed Video Magic](#)."