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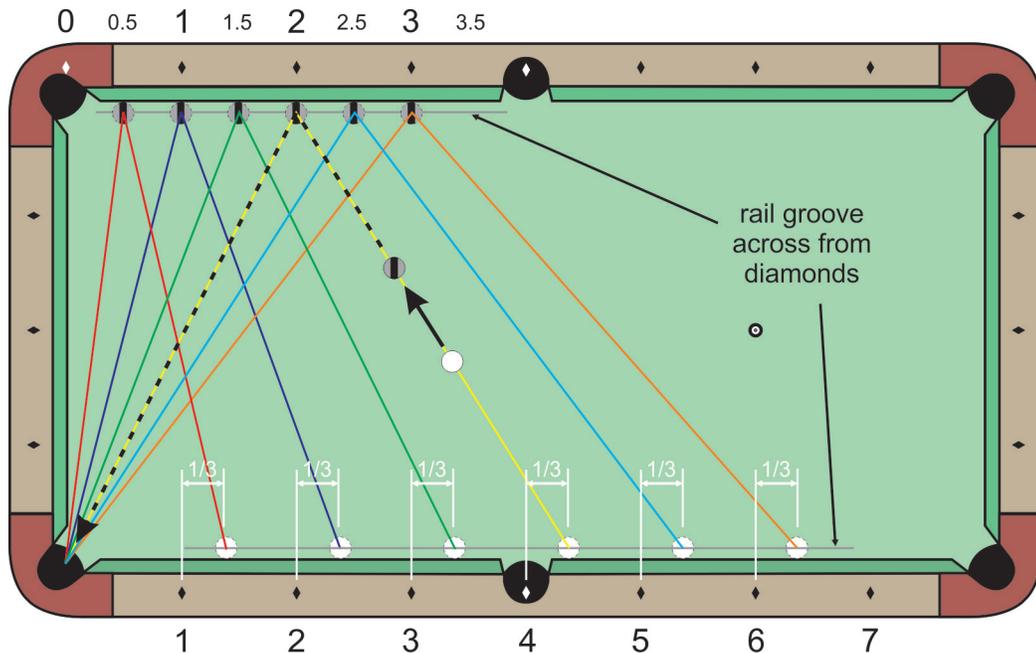
*Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, technical proofs (TP), and all of my past articles can be viewed online at [billiards.colostate.edu](http://billiards.colostate.edu). The reference numbers used in the articles help you locate the resources on the website. 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](http://dr-dave-billiards.com).*

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There are many different “systems” commonly used to help aim kick and bank shots. If you want to learn about them and see video demonstrations, visit the “[bank and kick shot aiming system](#)” resource page in the FAQ section of my website. A good summary of the basics along with some commonly-used systems can be found in **NV B.81**. Regardless of what system you might use, or even if you just aim by “feel,” you need to be able to make adjustments for different speeds, distances, and cut angles. See my [February ’13 article](#) and **NV C.14** for more information.

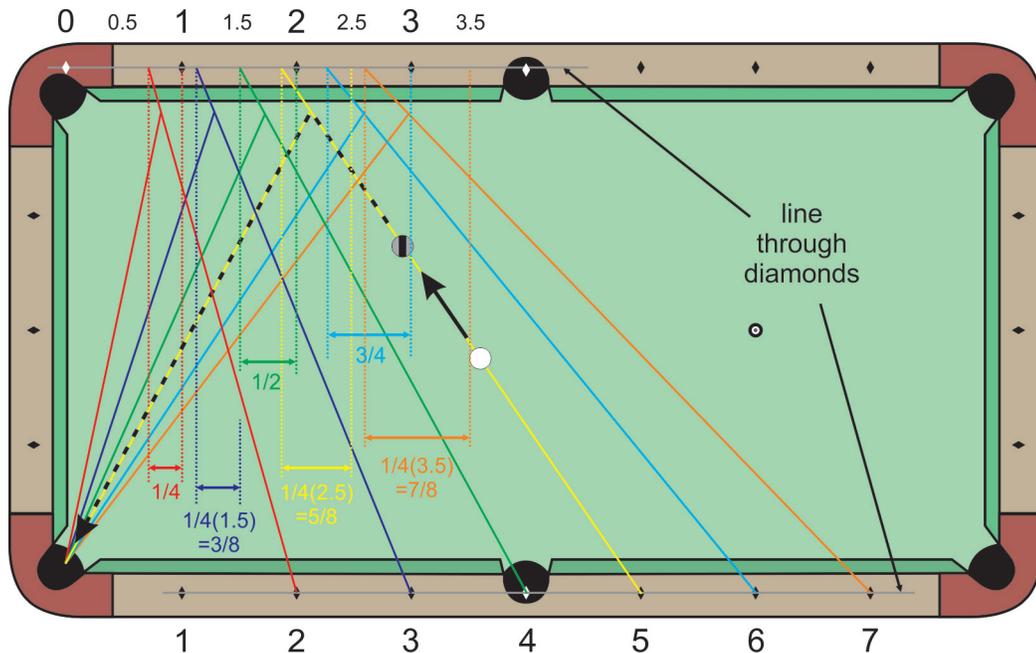
Have you ever wondered why great bankers frequently hit the balls hard? There is a reason ... actually there are several reasons. For details, see the “[banks and kicks – advantages of fast speed](#)” resource page in the FAQ section of my website. The main benefit of faster speed is that the rebound 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 (see Bob Jewett’s May ’13 and June ’13 articles and the “[pocket size and center](#)” resource page in the FAQ section of my website for more info), 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 successful experience. But we mere mortals can certainly benefit from a little “systems” help. If nothing else, a system can at least give you a useful reference from which to adjust.

**Diagram 1** illustrates one useful system for aiming fast-speed banks from [Disc IV](#) of the [Video Encyclopedia of Pool Shots \(VEPS\)](#). I call it the “1/3-more-than-twice the distance” system. The diagram shows several reference tracks that illustrates how the system works. The aim points for the reference lines are measured in the rail grooves across from diamond locations. The “rail groove” is where the base of a ball sits when it is frozen to the cushion. It is sometimes visible on a worn table. With each reference line, the point at which the line of aim crosses the near rail is 1/3 of a diamond above the 2x distance point predicted by a true mirror aim. The system can be summarized concisely as:  $(2x + 1/3)$  to  $x$ . For example, to bank the object ball (OB) shown, it needs to be sent along the reference line from a 1/3 of a diamond above the 4<sup>th</sup> diamond to the 2<sup>nd</sup> diamond since 4 is twice 2.



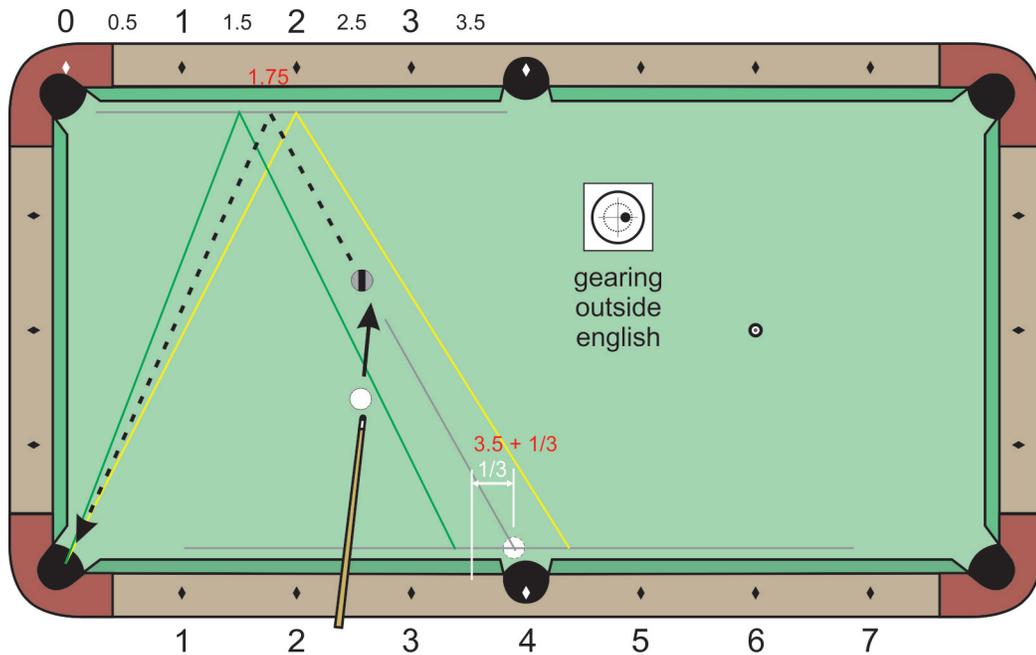
**Diagram 1** “ $(2x + 1/3)$  to  $x$ ” across-from-diamond system

**Diagram 2** shows an alternative system proposed by Ralph Eckert. It can be concisely summarized as the “ $2x$  to  $3/4x$ ” through-diamond system. The diagram shows several reference tracks that illustrates how the system works. The aim points for the reference lines are measured in the lines through the diamonds (instead of across from the diamonds in the rail grooves as above). With each reference line, the point at which the line of aim crosses the banking-rail diamond line is  $3/4$  of ( $1/4$  less than)  $1/2$  of the diamond point on the near rail. For example, to bank the OB shown, it needs to be sent along the reference line from 5 to  $3/4$  of 2.5 since 2.5 is half of 5. Therefore, the distance the aim is shifted below the 2.5 point is  $1/4$  of 2.5 which is  $1/4 * 5/2$  or  $5/8$ . The math is a little more complicated for this system, but if you memorize the reference lines, you don’t need to do the math. A video demonstration of how the system works at the table can be found in the [“banks and kicks - fast-speed mirror-system adjustment”](#) resource page in the FAQ section of my website. If you compare the reference tracks of the two systems (see Diagrams 1 and 2), and visualize shots between these tracks, you will see that both systems predict a very similar line of aim for banks of all angles. You just need to decide which system you think is easier for you to apply at the table.



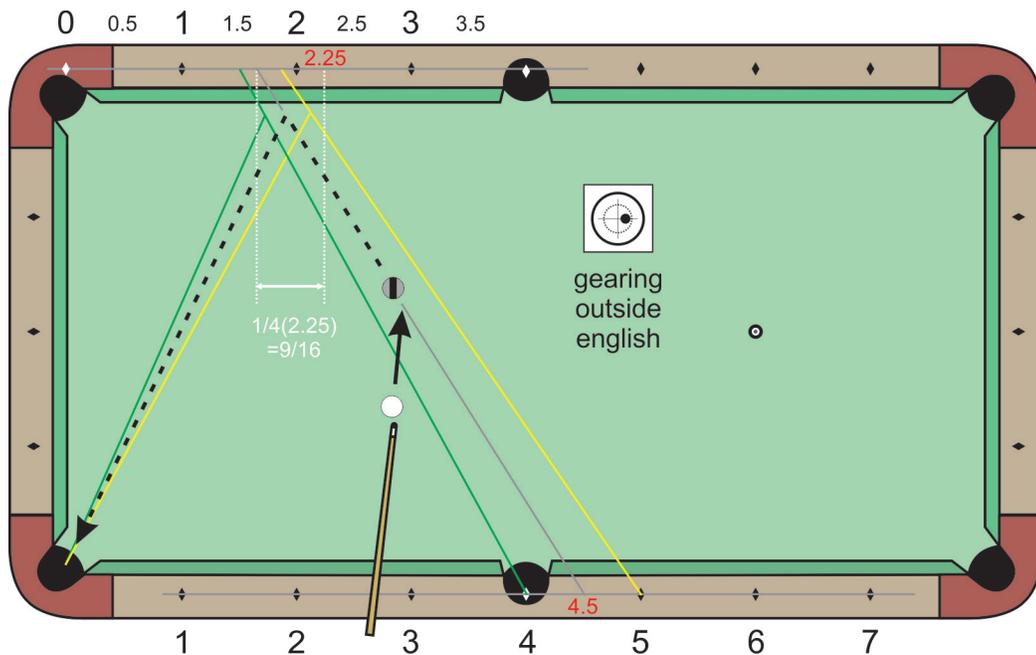
**Diagram 2** “2x to 3/4x” through-diamond system

In game situations, the OB won't always be sitting conveniently on one of the banking system reference lines (as shown in Diagrams 1 and 2), and the cue ball (CB) won't always be lined up with the necessary line of aim for the bank. You can still use the systems in these cases, but they require a little more work and adjustment. **Diagram 3** shows an example of how to apply the “ $(2x + 1/3)$  to  $x$ ” system. First, decide which reference tracks the OB is closest to. The two nearest tracks for this example are  $(3 + 1/3)$ -to-1.5 and  $(4 + 1/3)$ -to-2. If the OB is close to a reference track, you can just make a small adjustment relative to that track. If it is in between two tracks, you just need to visualize a line through the OB between the reference tracks. If you want to be more precise, you can check the numbers where your chosen line of aim crosses the rail-groove points to see if they satisfy the system. If they don't, you can make a small correction. Here, the required line of aim goes from  $(3.5 + 1/3)$  to 1.75, which satisfies the system since 3.5 is twice 1.75. An alternative way to determine the required OB line is to ignore the reference tracks and just take a guess at the line of aim (especially if your bank intuition is good) and then check the numbers and make a slight adjustment if necessary. Regardless of how you determine the ideal line of aim for the OB, you still need to make adjustments based on the CB location. If there is a cut angle, you either need to make an aiming correction for cut-induced spin, which changes the OB rebound angle (see **NV C.14** for more information and demonstrations) or you need to use gearing outside english to prevent cut-induced spin (see the “[gearing outside english](#)” resource page in the FAQ section of my website for more info and demonstrations).



**Diagram 3** “ $(2x + 1/3)$  to  $x$ ” system example

**Diagram 4** shows an example of how to apply the “ $2x$  to  $3/4x$ ” system. Again, first decide which reference tracks the OB is closest to. The two nearest tracks for this example are 4-to- $3/4(2)$  or 4-to-1.5, and 5-to- $3/4(2.5)$  or 5-to-1-and- $7/8$ . Here, the required line of aim is in between the two reference tracks and goes from 4.5 to  $3/4(2.25)$ , which is 4.5 to  $(2.25 - 1/4(2.25))$ , which is 4 to  $(2.25 - 9/16)$ . This satisfies the system, since 2.25 is half 4.5. Again, you don’t need to do all of this complicated math if you memorize the reference tracks and just visualize in between them.



**Diagram 4** “ $2x$  to  $3/4x$ ” system example

When using either of the systems described above, just smack the ball just like the top bankers. The ball will usually go to the hole, provided you've also compensated for any cut angle and English effects (see **NV C.14**). Yes, banking ain't easy ... and it takes lots of practice. But the systems offered here should help limit the guesswork and speed your learning process if you're not a top banker already. Give them both a try and decide which you like better. The downside of "2x to 3/4x" system is that the math is too tricky forcing one to memorize the reference tracks. The advantage is that the aiming is through the lines of the diamonds which many people prefer to the across-diamond rail-groove measurements. I personally prefer the "(2x + 1/3) to x" system because I don't need to memorize or calculate weird numbers, and it's easy for me to visualize a 1/3 of a diamond.



[NV B.81](#) – Bank and kick shot terminology and basics, from VEPS IV  
[NV C.14](#) – Bank shot cut-angle-effects drills, from VEPP IV

Good luck with your game,  
Dr. Dave

PS:

- I know other authors and I tend to use lots of terminology, 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.

*Dr. Dave is author of the book, DVD, and CD-ROM: "[The Illustrated Principles of Pool and Billiards](#)," and co-author of the DVD Series: "[Video Encyclopedia of Pool Shots \(VEPS\)](#)" and "[Video Encyclopedia of Pool Practice \(VEPP\)](#)."*