David Alciatore, PhD ("Dr. Dave")   **ILLUSTRATED PRINCIPLES**
**"End-of-game frozen-rail shots"**

Last month, I illustrated a rail cut shot where squirt aim-compensation is important. The shot layout is shown in **Diagram 1**. The 8-ball is frozen to the end rail, and the cue ball (CB) is near the center of the table. This is a fairly common end-of-game situation that can come up in 8-ball or 9-ball. This and similar situations can also come up mid-game in 9-ball, so it is important to think about and practice various options. In this article, I present several options for you to consider.

the 8-ball is
frozen to
the rail

the cue ball
is close to
the center
of the table
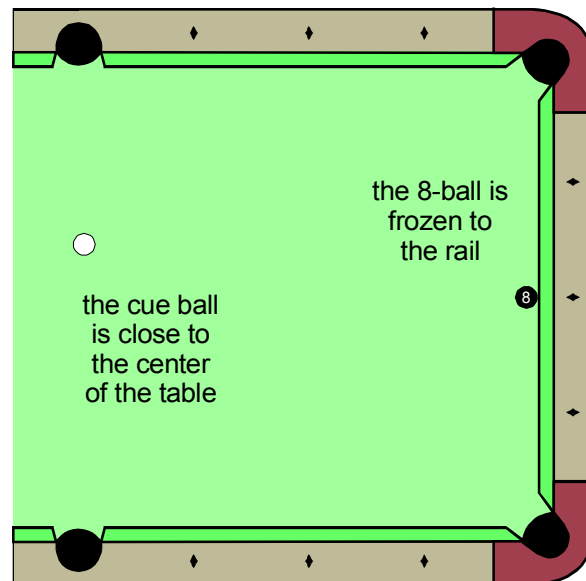
Diagram 1 Shot layout

Diagram 2 shows the offensive option discussed last month ... the rail cut shot. Running English makes the shot much easier than it appears, provided you adjust your aim for squirt (see last month's article) and contact the rail first. **NV B.11** shows demonstrations of the shots and explains various concerns. In general, with rail cut shots, there is a surprisingly wide range of possibilities for the CB path, while still making the shot (especially if the 8-ball were closer to the pocket). My new high-speed video DVD has a feature on this. A good summary of CB control options, and how to achieve them, can be viewed in the DVD excerpts I have posted under the **HSV DVD** link on my website. The final CB path depends a lot on whether the CB hits the OB before, during, or after rail contact. With the shot in Diagram 2, it is difficult to create various CB paths while still pocketing the 8-ball because of the distance and angle involved, but the CB path shown in the diagram can be achieved fairly consistently, as long as you hit the rail first.
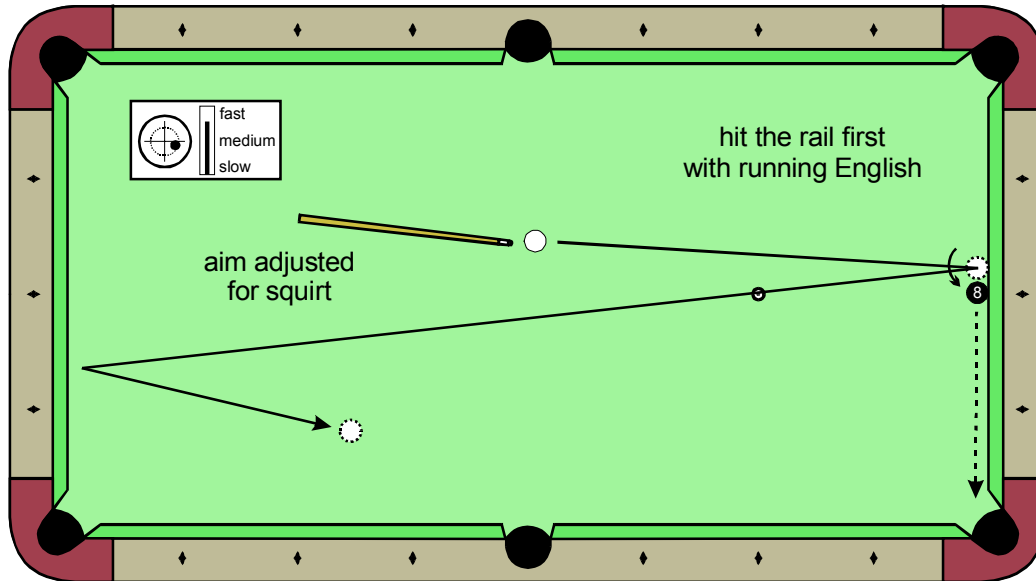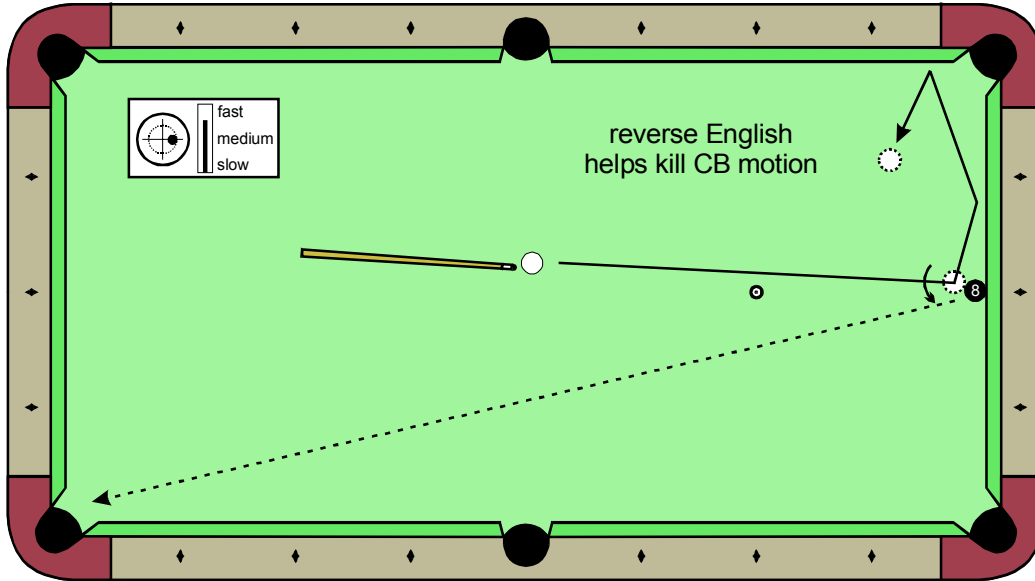
Diagram 2 Rail cut shot offensive option

NV B.11 - End-of-game rail cut shot offensive option

normal video

    Diagram 3 shows another offensive option that is probably more aggressive (lower percentage) for most people. In this option, as demonstrated in **NV B.12**, the 8-ball is banked into the bottom-left corner pocket. As described in the video, a double-kiss is a concern, depending on how far the CB is from the center of the table. The video explains and illustrates how faster speed can be used to help avoid the double kiss. I also use right English in the video (as shown in Diagram 3). This isn't required to pocket the 8-ball, but it does help kill the CB motion, with reverse English off the two rails. Without right English, there is a chance for a scratch in the bottom side pocket. I thank "Jal" on the BD CCB online forum for making me think about the right English more than I did at first. Another option would be a reverse bank to the top-left corner pocket. I thank "JoeW" on the BD CCB online forum for pointing this out. A disadvantage with this shot would be more CB motion and an increased possibility for a scratch. Also, a reverse bank can be tougher for some people to aim. The advantage is there is no possibility for a double kiss. Regardless of which bank you might choose, a bank is probably not a high-percentage option in this case for most people, especially on a table with "tight" pockets.
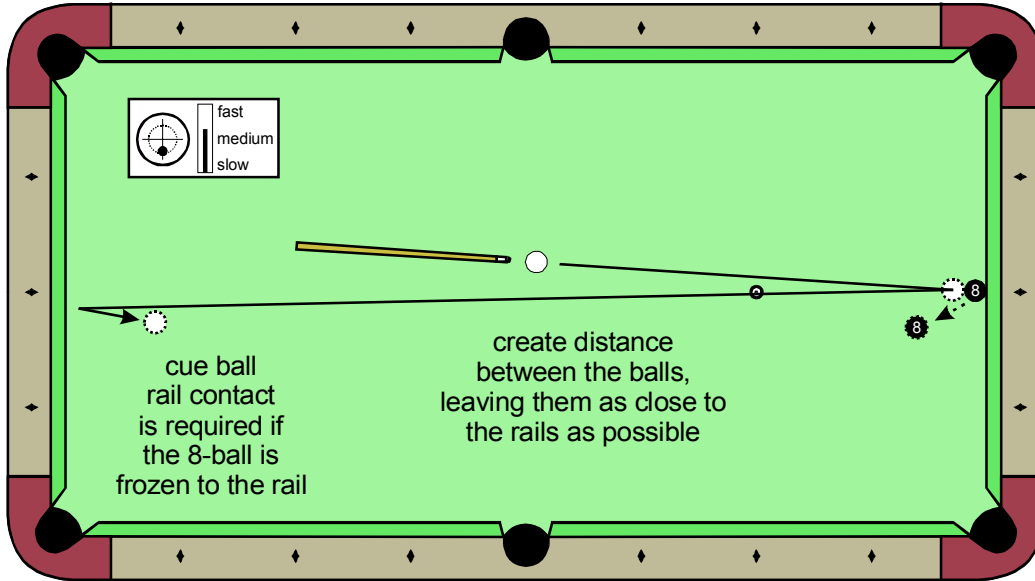
Diagram 3 **Bank shot offensive option**

normal video

NV B.12 - End-of-game bank shot offensive option

Diagram 4 shows a defensive option called a kiss-back shot. As demonstrated in **NV B.13**, you must hit the 8-ball fairly squarely with draw. The 8-ball double kisses the CB and remains close to the foot rail. With appropriate speed, the CB can end up close to the head rail. This shot option can leave your opponent in an even tougher place than you faced originally. If the 8-ball is in fact frozen to the end rail (i.e., there is no gap between the ball and cushion at all), you need to make sure you use enough speed to have the CB touch the head rail. If it doesn't, the shot will be a foul (because the rules require a ball to make new contact with a rail after ball contact) and your opponent will get ball in hand. The 2nd shot in NV B.13 is actually a foul. I thank "BigRigTom" on the BD CCB for pointing this out. The possibility for a foul makes the rail-frozen kiss-back shot a little less desirable as an option. With a small gap, there would be no risk of this type of a foul, and the shot would still work as demonstrated. However, the larger the gap, the more accurate you need to be with the squareness of the hit.

fast
medium
slow

cue ball
rail contact
is required if
the 8-ball is
frozen to the rail

create distance
between the balls,
leaving them as close to
the rails as possible

Diagram 4 Kiss-back shot safety

normal video

NV B.13 - End-of-game kiss-back safety option

    Diagram 5 shows another safety option. Here, you use a soft cut shot to create separation between the CB and 8-ball on opposite sides of the table. Ideally, you can leave the CB frozen to or close to the rail. NV B.14 demonstrates and discusses the shot. If the 8-ball were away from the rail some, a half-ball hit would be used to get similar deflected angles and speeds for both the CB and 8-ball (see **TP A.16** for the math and physics details). Because the 8-ball is frozen on the rail, you need to use a little less than a half-ball hit to achieve the desired separation. With the final ball locations shown in Diagram 5, your opponent is left with an attempt at a fairly difficult bank or return-safety shot. Your opponent certainly has fewer options than with the original layout in Diagram 1.
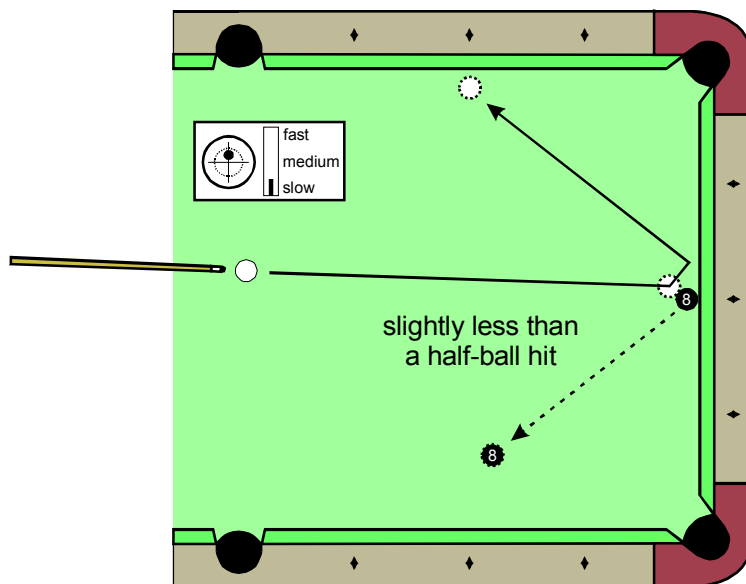
Diagram 5 Cut shot safety

NV B.14 - End-of-game cut shot safety option

normal video

TP A.16 – Final ball speeds and directions for natural roll shots

technical proof

Which option would you choose if you were faced with the shot in Diagram 1? You should think about it some and then practice all of the options above ... and then think about it some more. Personally, I would usually prefer the running English rail cut shot option, especially if I were playing a better opponent. In that case, I think it is better to try to win the game on this shot rather than give my opponent the chance to make a good bank shot or play an even better safety on me; although, if I were playing a lesser opponent, I would most likely choose one of the safety options instead. Rail conditions and consistency, and pocket "size" can also play a big part in the decision, especially with the bank-shot option. The exact CB position might also be important in the decision. For example, the running English rail cut shot is much easier with more approach angle into the rail (i.e., if the CB is farther from the center of the table), and gets a lot tougher as the CB gets closer to the center of the table.

I hope you now have a better awareness and appreciation for end-of-game options when the final ball is frozen to a rail.

Good luck with your game,
Dr. Dave

Dr. Dave is a mechanical engineering professor at Colorado State University in Fort Collins, CO. He is also author of the book, DVD, and CD-ROM: "The Illustrated Principles of Pool and Billiards," and the DVD: "High-speed Video Magic."