



Communication Barriers

Don't let technical terminology tear up your tablemates.

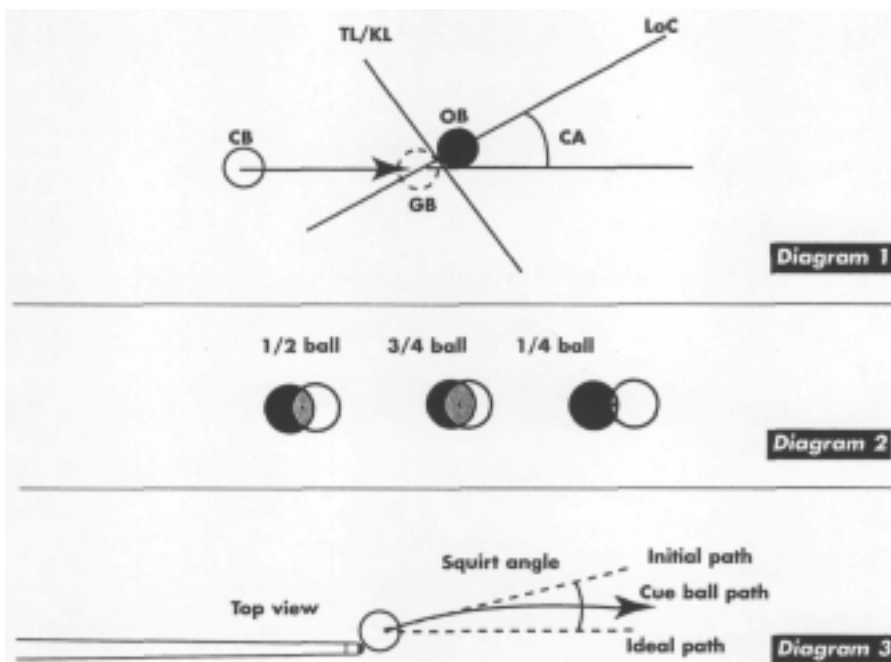
In discussing the technical details of shots, it's essential for the parties to use a single set of terms. For example, I've recently seen two new uses of the term "throw" that aren't even close to the definition below. Sometimes it's possible to see that the word is being used strangely from the context, but usually the mismatched meanings lead to gross misunderstandings. Below is a brief illustrated glossary of some of the more technical terms for the parts of billiard shots which will be used next month in examining various kinds of systems. Even old hands may find something surprising here.

Diagram 1 illustrates the parts of a simple cut shot. Can you fill in what all of the abbreviations stand for? The cue ball (CB) and object ball (OB) are easy. The ghost ball (or phantom ball) is where the cue ball will be at the instant of contact. It's drawn with a dotted line to indicate that it's not a real ball, but rather an imagined location to which the cue ball will hopefully be driven.

The line of centers (LoC) is the line connecting the centers of the ghost ball and the object ball. In an ideal world, the pocket is along that line off to the right, and the object ball will travel along it. On the line of centers is the contact point between the two balls, or CP, which is not marked on the diagram. At a right angle to the LoC is the tangent line or kiss line. The TL/KL touches both the GB and the OB at the CP, right? The tangent line is useful in play because the cue ball, after arriving at the ghost ball position, will travel parallel to the tangent line until draw or follow bends it away.

Also marked in Diagram 1 is the cut angle (CA), which is the angle between the initial path of the cue ball and the path of the object ball. This angle can be given in degrees. The example shown is about 30 degrees, and it is a "cut to the left." If there is no angle — when the object ball is being driven straight ahead — the cut angle would be zero degrees. When the cue ball barely grazes the object ball, the cut angle is 90 degrees (to the left or right).

Another way to describe the degree of a cut is shown in Diagram 2. Imagine you are watching from the point of view of your cue tip as the cue ball contacts the object ball. You will see the cue ball overlapping the object ball by a certain amount. In the first case, when the center of the cue ball is



going towards the edge of the object ball, just as in Diagram 1, the fullness of the hit is called "half ball." Also shown is the contact point, which is exactly in the center of the overlap region. It is useful to know the cut angle for these fullnesses of hit. Half ball ideally produces a 30-degree cut angle, while 3/4-full gives slightly less than 15 degrees, and a 1/4-full hit gives about a 49-degree cut angle.

Several aspects of the use of side-spin are illustrated in Diagram 3. You may have noticed that I tend to use the term "side-spin" rather than "English" when describing such shots. This is to make a clear distinction between side-spin and draw or follow. Some people use the word "English" to refer to any spin on the ball, such as "follow English" or "left English," but that can be confusing.

The ideal path of the cue ball on a side-spin shot is parallel to the line of the cue stick. Unfortunately, the cue ball refuses to behave in such a simple way, and instead starts out at an angle away from this ideal. This angle between the ideal path and the actual initial path is the squirt angle, or just "squirt." The angle varies with the amount of side-spin, the construction of the stick, the preparation of the tip, and possibly the

speed of the shot and other factors. Squirt is not fully understood, but it can be large enough to make you miss the object ball entirely if you don't compensate for it.

Swerve, curve or masse is the curving back of the cue ball towards the ideal path. Again, this effect is plenty large enough to cause an "air ball" on thin cuts, or not-such-thin shots if the stick is elevated.

A last aspect of spin shots and cut shots is "throw." When the cue ball arrives exactly at the ghost-ball location, after your careful compensation for squirt and swerve, the object ball does not obligingly go along the line of centers. Instead, friction between the surfaces of the two balls pulls the object ball off-line to the left or right. This effect is easiest to demonstrate by placing an object ball at the ghost-ball location and playing the cue ball to hit that ball full. The resulting throw is fairly predictable.

If it is the cue ball that is making contact, the problem is a lot more complicated. If the cue ball has follow or draw in addition to any side-spin, there will be somewhat less throw. Also, the cue ball may have various amounts and directions of side-spin. Consider the cut shot in Diagram 1. If the cue ball is played with left side-spin, there will be more throw of the object ball to the

right upon contact. (This is called "inside" English, when the cut is to the left and left side is used, and similarly if both are "right.")

If the cue ball is played with just the right amount of right-side spin, it will roll smoothly across the surface of the object ball and there will be no rubbing or throw at all. (This is called "outside English," when the cut and side-spin are left/right or right/left.) If a lot of outside English is used, it is even possible to throw the object ball to a larger cut angle than the ideal.

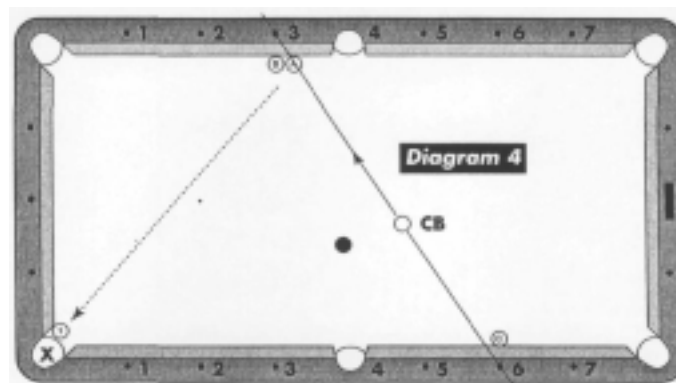
It is important to note that "throw" happens on cut shots even when the cue ball has no spin, just due to the motion of the cue ball to one side, and the resulting drag on the object ball due to the friction between them.

Here is some homework to do before next month: freeze two object balls together on the spot pointed up and down the table, and see what combination of cut angle, spin and speed gives you the most throw.

In **Diagram 4**, some points on diamond systems are shown. The goal is to send the cue ball towards pocket X. A simple numbering of the diamonds (spots on the rail) is shown for a one-cushion kick. This simple system says that if the ball's "origin" is

ball will go to the pocket. Origin in this case is the diamond number your stick will be over on the cushion when you shoot the shot. The cue ball in the example is placed perfectly on the line between 6 and 3, so the path will be "from" 6. In general, fractions of diamonds will be needed, and the cue ball origin will need to be determined by trial and error.

Some finer details: There are two ways to describe where the diamonds are. In the example, a ball coming from 6 towards 3 contacts the cushion at outline A. If the cue ball has a different origin, but is still sent towards diamond 3, it will contact the cushion elsewhere. Shooting directly towards the diamond marking is called shooting "through" or "at" the diamond. The advantage is easy sighting; the disadvantage is that the cushion is contacted at more than one place. An alternative is to shoot "opposite" the diamond; the cue ball is made to



land in position "B" when 3 is the number to contact, regardless of the ball's origin. (You can also think of the numbers as being transferred from the rail to the cloth.) The origin may also change, so the 6 origin is at outline C. Note the considerable difference in the line for the "through" shot and the line from C to B for the "opposite" shot. This second way may seem complicated, but the master billiardist, Raymond Ceulemans himself, recommends it.

Be sure to do your homework and study the above terms before *BD* November (next issue), when we will look at the technical details, strengths and faults of a half-dozen systems.