

## CHAPTER X COMBINATIONS AND CAROMS

Combinations and caroms involve three discs. Displacement of the third disc, usually off the board, is the objective. When the cue disc strikes a target disc that, in turn, becomes a moving disc and strikes another target, the play is a combination; but if the cue disc strikes a target and continues on a different course to another target, the play is a carom.

### COMBINATIONS

**Line of Centers.** Which way do two discs move after impact? If disc X (Figure 50) is shot from point A in the starting area, striking disc Y on its circumference at T, disc Y will move in the direction of BD, which is an extension of the line of centers BC. Line segment BC also passes through T, the point of contact of the two discs. And disc X will move in the direction of BE, which is perpendicular to BC.

Angle CBE, the angle between the combination and the carom, is always 90 degrees. The size of this angle and the direction that each disc moves have no relationship whatever to the point from which disc X was shot. Whether shot from A<sub>1</sub> or A<sub>2</sub>, the angle between the combination and the carom will be 90 degrees; and if disc X strikes disc Y at T each time, the discs will fly away in the same directions each time. The difference is in their comparative speeds. When disc X is shot from A<sub>1</sub>, more energy is transmitted along line BE than if X had been shot from A<sub>2</sub>. Therefore, when shot from A<sub>1</sub>, disc X will move faster and go farther after

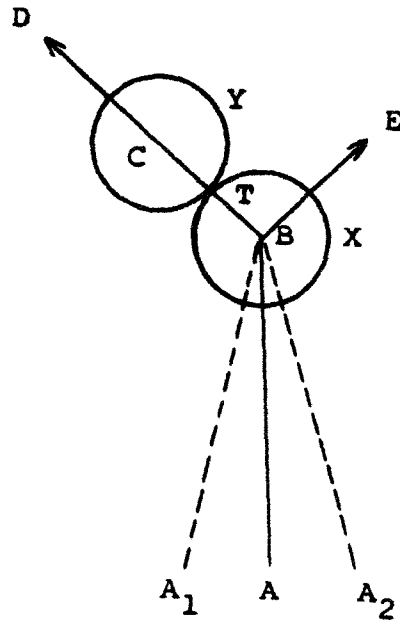


Figure 50

impact than when it is shot from A<sub>2</sub>; and disc Y will move more slowly and will travel a shorter distance after impact if the shot is made from A<sub>1</sub>.

**Finding the Aiming Point.** Shufflers use various methods to make their combination shots. Whatever method is used, a successful shot is, at best, the result of a keen eye and a good estimate. Suppose the problem is to strike disc B in Figure 51a with disc C (not shown) so as to cause B to strike disc A. How shall C be shot to accomplish this?

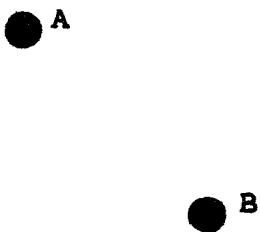


Figure 51a

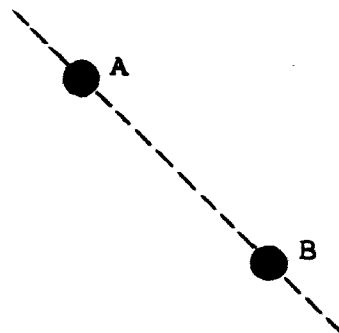


Figure 51b

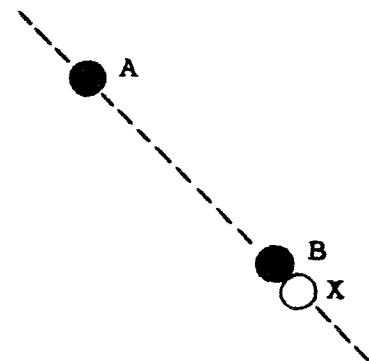


Figure 51c

Imagine a line drawn through the centers of A and B, as in Figure 51b. Now, as in Figure 51c, imagine another disc, such as X, placed so that it touches B with its center in line with the centers of A and B. The position of the imaginary disc X is the exact spot where the real disc C, the cue disc, must be when it strikes B to cause B to strike A. This is true regardless of the position from which the cue disc is shot. Disc B will always travel along line XB, the line of centers of discs X and B. If this line, when extended, also passes through A, or misses A by less than one-half the width of a disc, then disc B will strike A.

**The Error Is Magnified.** Why are combinations so difficult? Figure 52 shows why a combination shot is difficult to make. Notice that a disc that is shot from A, in the direction of AD, will cause disc D to move toward B; and a disc shot from A, in the direction of AC, will cause disc D to move in the direction of DE. The very small shooting error, equal to angle DAC, will cause the greatly magnified error in the direction taken by disc D, which is equal to angle BDE.

If it is desired that disc D strike the disc at F, then a high degree of precision will be required when shooting from A. Combination shots are highly uncertain when the two targets are more than two feet apart. The beginning player should not attempt a combination shot in a serious game unless the outcome of the game depends on that particular shot. The advanced player will practice these shots along with other difficult shots and will use them whenever his judgment dictates.

**Reliability of the Combination Shot.** Figure 53 illustrates an important principle. The combination shot is most reliable when it is made along the line passing through the centers of the cue disc C and the target T.

Point A represents the starting position of the cue disc. Notice that the angles at A are not equal in size. They become smaller as the cue disc strikes the target at a greater angle of combination (at T). Yet these angles have been drawn so that the change in the target direction is the same in each interval, 10 degrees. From the drawing it can be seen that the margin of aiming error (at A) becomes very small as the angle of combination increases to near its limit of 90 degrees. Above 45 degrees the reliability

of the combination shot becomes so low that this play should be used only when there is no alternative. In other words, a head-on combination shot has a greater chance of success than a shot that causes the target to glance sharply to one side.

But it is not always desirable to make a head-on shot, since such a shot causes the cue disc to stick when it strikes the target. If one is using a combination shot, as in Figure 54, to remove Black's score in the 8-area that is well guarded by the St. Pete, a head-on shot from A would leave another guard as effective as the original one; and if the player fails to remove the scoring disc, he is faced with the same problem on his next shot. Of course, this situation is not a problem when the player is shooting his last disc, but at other times the player must shoot from a position near B to glance his disc away from the St. Pete position toward the edge of the board.

Usually a fast shot should be used when one shoots a combination, even though the fast shot tends to be more difficult to aim accurately. A slow shot has two faults that one wants to avoid in a combination shot: It is more susceptible to any drift that may be present in the court, and it often lacks the energy that is needed to clear both discs off the court.

**The Bunt Shot.** Opportunities to use combinations are numerous. Many shots of this kind do not involve three discs. The simple act of bunting another disc to a desired position on the board uses all the techniques of a combination shot, and it demands more skill than most three-disc combinations because of the great control of distance that is needed to make a successful shot. The kitchen shot is the most common example of the bunt. Whereas the kitchen shot often requires less precision in direction than a three-disc combination, almost always it demands a greater precision in distance. If, however, a kitchen shot is to be made against a backstop, the shot must be more precise in direction, while distance judgment is not so important since any excess energy will be absorbed by the backstop.

Kitchen shooting as a bunt shot should now be reviewed in the light of the foregoing principles of combinations. Figure 55 illustrates how a kitchen shot can be made when two discs are lying close together almost as easily as when the shot is made at a single target. The shot works very well even when there is a distance of several inches between the discs; only a bit

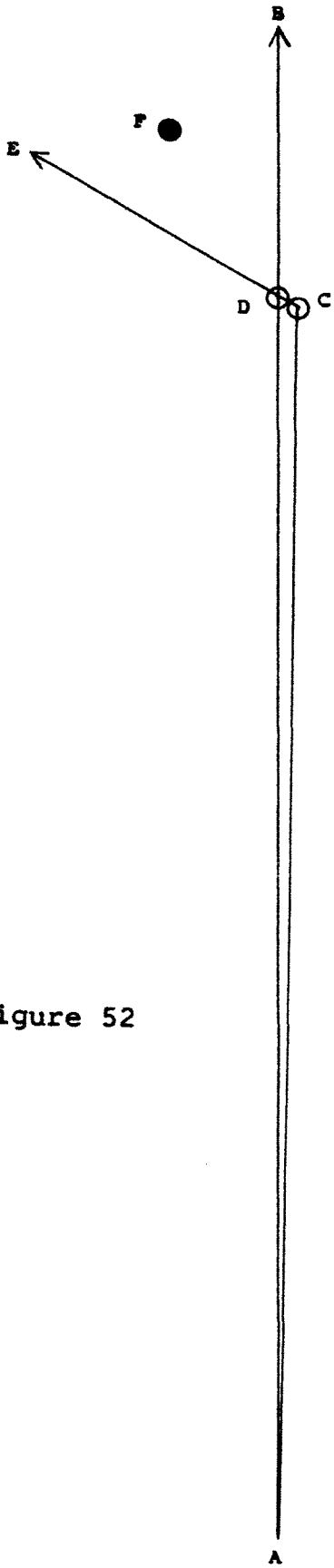


Figure 52

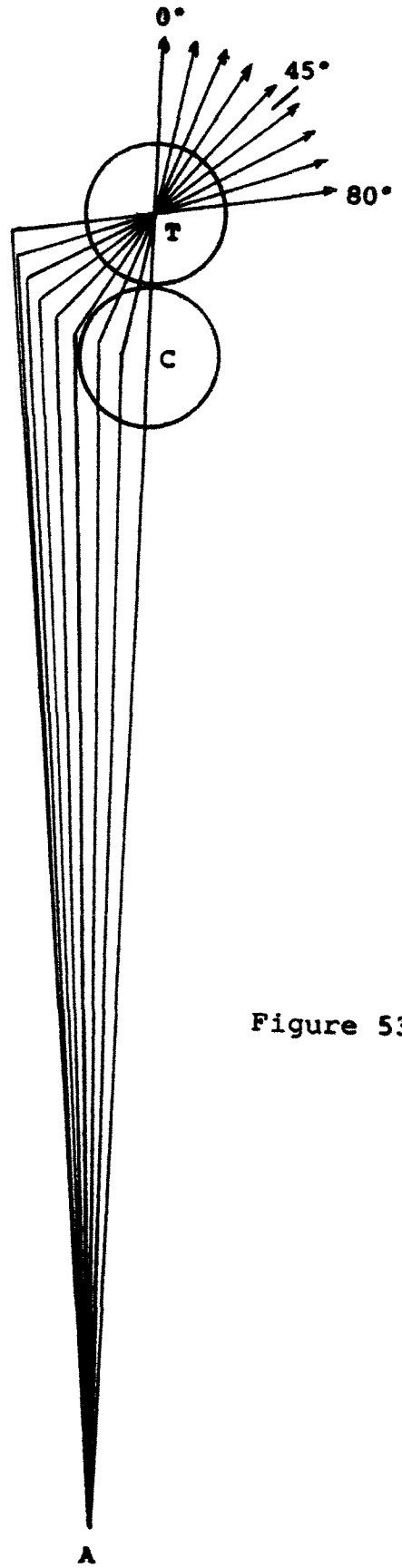


Figure 53

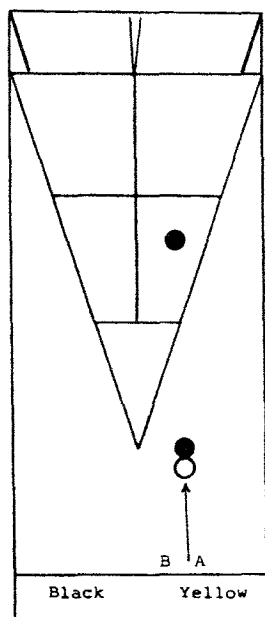


Figure 54

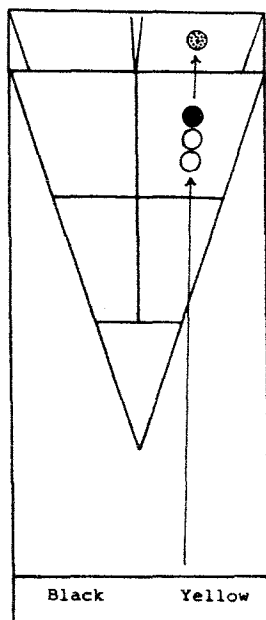


Figure 55

more accuracy is needed. When making this shot, the player remembers that kitchen speed is a mathematical constant of the court, so he does not shoot harder in this situation than he would if he were shooting at a single disc.

Bunt shots are, in effect, an extension of the player's shooting arm. He can reach out to the opposite end of the court and deftly adjust a stray disc, placing it in a desired position on the board, whether it be his own disc to score or his opponent's, for the kitchen. Bunts may also give the player a second chance at scoring a disc, and they are used occasionally to complete a two-step play to get a score on the board beyond a substantial guard.

A bunt is quite often useful in gaining a needed 10 score when the opponent has blocked the 10-area during the half round to prevent the player from shooting for his score. If the player has managed to place a disc close to the 10-area among the opponent's blocks, with his hammer shot he will attempt to bunt his disc into the 10-area. This play can be useful with disc No. 7, too, if the disc can be placed in the 10-area where it is even partially guarded.

#### ANALYSIS PROBLEM (FIGURE 56)

The reader may check his understanding of the principles of combinations by working this little problem. The answer is given at the end of this chapter.

(a) Draw these discs on a sheet of paper, and show by arrows the direction each disc, X, Y, and Z, will move as the cue disc strikes disc X at A.

(b) Make another drawing to show how the same discs will move as the cue disc strikes disc X at B.

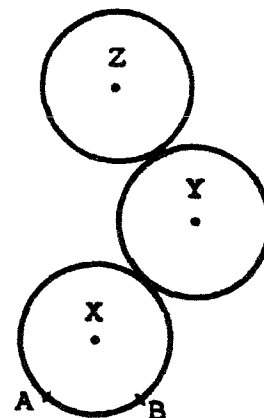


Figure 56

## MULTIPLE SCORING SHOTS

The chief reason for keeping the board clear during a game is to prevent one's opponent from scoring several of his discs with one shot. In normal play this kind of shot is kept at a minimum by the preventive action of both players. Nevertheless, opportunities for making these shots do occur frequently.

**The Double.** The double is a shot in which a player scores both his cue disc and his own target disc that is lying on one of the lines of the shufflegram. Doubles have distinct characteristics, depending on whether the target disc lies on a crossline (Figure 57) or on the centerline (Figure 58). A crossline double usually leaves the two discs lined up, vulnerable to a combination shot; whereas, a centerline double often leaves the discs widely separated in different scoring areas. The crossline double requires a head-on hit for its completion, and it is the easier of the two shots to perform. The centerline double can be tricky, demanding more planning and considerably more skill in its execution. To shoot a centerline double successfully, the player must apply the principles of combinations, and it is important to control the distance that both discs travel since neither disc should stop on a line.

As compared to a kitchen shot, however, most doubles are comparatively easy to shoot. The percentage of success with either kind of double is high enough to warrant the selection of this shot whenever it appears, unless some other shot deserves priority. Even when a shot for a double fails, the result is often the scoring of one of the discs.

But there are some dangers lurking in these shots. Shooting for a centerline double in the middle of the 7-area, or deeper, is not safe because of the risk of sending one or both of the discs to the kitchen. The player must be careful to avoid the 45-degree hit in this case (Figure 19). A player may even tempt his opponent to take this risk by ignoring the opponent's disc on the centerline in the deep 7-area in preference to making a desired shot of his own.

Scoring a double frequently leaves both discs unprotected. When this happens, although one of the scores is lost, the value of the double lies in the player's chance to cover the other disc with a guard, which he could not have done if the disc had been scored by itself.

In certain situations the hammer is an excellent shot to use for shooting a double, because

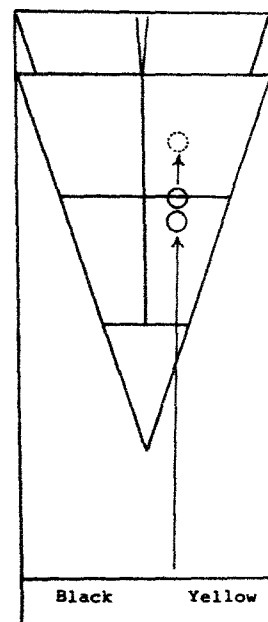


Figure 57

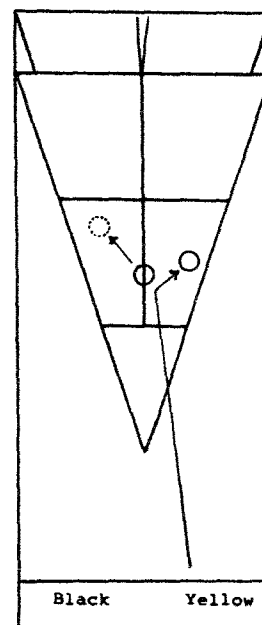


Figure 58

both scoring discs are safe from the opponent's attack. But the hammer should not be used on a centerline double below the 7/8 line, since the player will have no more discs to use in the event one of the discs stops in the kitchen.

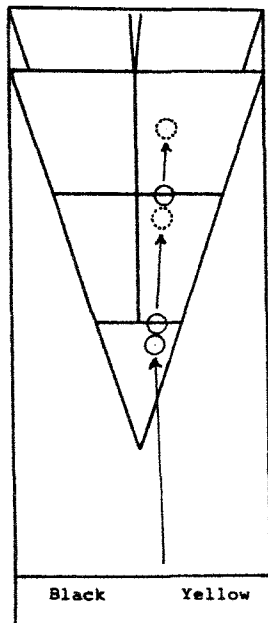


Figure 59

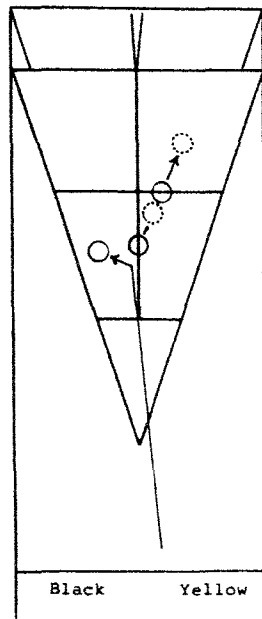


Figure 60

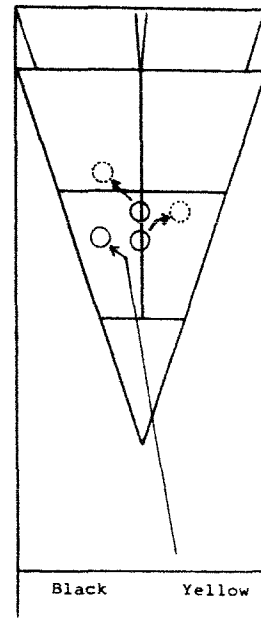


Figure 61

Discs resting on the sideline on the player's side of the board occasionally can be doubled, but all of these shots are difficult and uncertain. To insure even a fair degree of success, these shots should be started from position 3, and the liner should be more than half its width inside the scoring area.

**The Potential Double.** A disc lying on a line, where it can be scored along with the scoring of the cue disc, is known as a potential double. Normally, the spoiling of the opponent's potential double is rated in importance only slightly under the spoiling of a score. The automatic response is to spoil the opponent's potential double whenever it appears, but whether spoiling should have priority over hiding a score, depends, as always, on an analysis of the scoreboard and the situation on the shufflegram.

If the player has a good chance to hide a score and the potential double has little chance of success, the choice is not a difficult one to make. More difficult are the decisions based only on the player's urgent need for a score. In these situations, a very important consideration is whether the player has the hammer shot, or even an extra disc to shoot, with which he can deal with at least one of the scores if the opponent succeeds with his double.

**The Triple.** Triple shots — that is, the scoring of two discs besides the cue disc—are seldom planned. These shots are difficult and they fail more often than they succeed. Their value lies in the good chance the player has of scoring at least one of the discs, often two, with some chance of scoring three. Opportunities for a triple shot may occur in the course of a game when two of the player's discs are on the centerline, or near the intersection of the centerline and a crossline (Figures 59, 60, and 61). In these drawings the solid circles represent the discs which were on the board before the shot was made.

## CAROMS

For the same reason that a combination shot has more chance for success when the two target discs are in line with the cue disc, carom shots are more successful when the cue disc glances sharply to one side. This is true because the angle between the carom and the combination is a right angle.

Two discs that are abreast on the board can be knocked away with a carom shot, and if they are not too far apart, the shot is fairly reliable (Figure 62). Although it is possible to strike two discs abreast on the opposite sides of the board,

something like picking up a split in bowling, the reliability of such a shot is extremely low.

Carom shots are more difficult than combinations. When the cue disc glances sharply in a carom, the first target absorbs most of the energy of the cue disc; therefore, a high-speed shot is needed to insure that the small amount of energy left with the cue disc will be sufficient to make the remainder of the shot successful.

When the cue disc glances at an angle of 45 degrees, the chances of success with a combination and a carom are about equal. At, or near, this angle the player's choice of shot will depend on considerations other than the mechanics of the shot. For instance, he will consider the possibility of a disc sticking as it strikes the second target, and he will play a carom or a combination according to whether he prefers his own disc or his opponent's disc to remain on the board.

**A Fundamental Principle.** A combination leaves the opponent's disc on the board if a disc sticks (Figure 63). A carom leaves the player's disc on the board if a disc sticks (Figure 64).

**The Glance Shot.** As the bunt is an incomplete combination, so the glance is an incomplete carom; and, as such, the principles of the

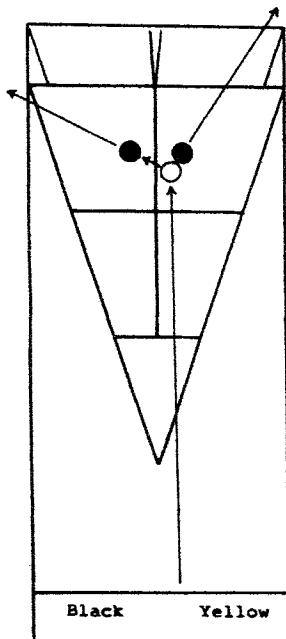


Figure 62

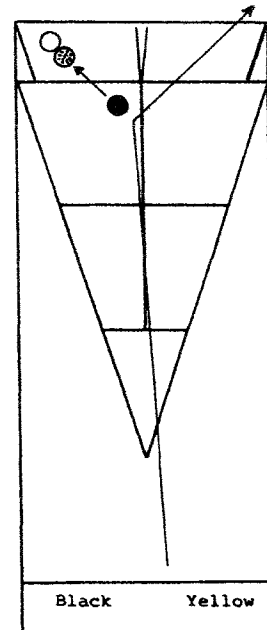


Figure 63

carom apply to glances. A knowledge of these principles helps one to judge the feasibility of a particular shot.

Glances provide another method of hiding a scoring disc. Often, as in Figure 65, another disc lies on the board in a suitable position for a hide. The value of the shot, in this particular case, is increased by the fact that the liner belongs to the player. If it belonged to the opponent, he could reply by doubling and spoiling the glance score with the same shot. Opportunities for this shot are common, and it should be used when the distance of the glance is not great, say 18 inches. If the player is behind in score to the extent that he is seriously thinking of going on the board, he can use a glance shot when the distance is much greater. If the cue disc fails to hide, he has simply made a kitchen-bait shot.

In Figure 66, the glance was made beyond a double guard. The double guard increases the value of this shot, since it would be difficult to control the glance so as to place it securely beyond a single guard, though sometimes it may be necessary to attempt the play.

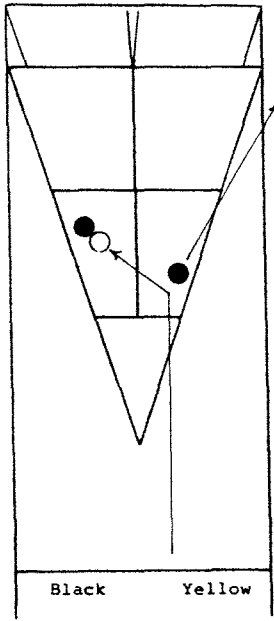


Figure 64

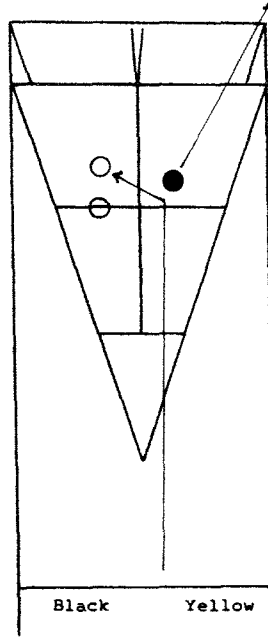


Figure 65

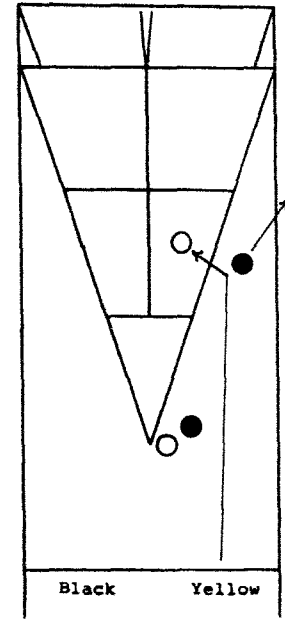


Figure 66

Answer to Analysis Problem (Figure 56).

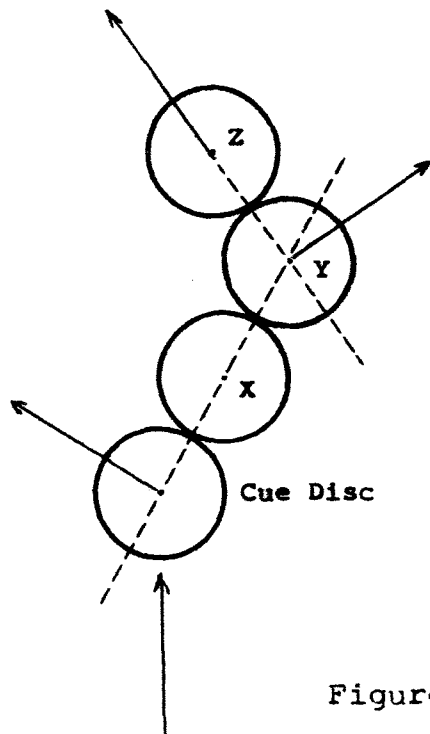


Figure 67a

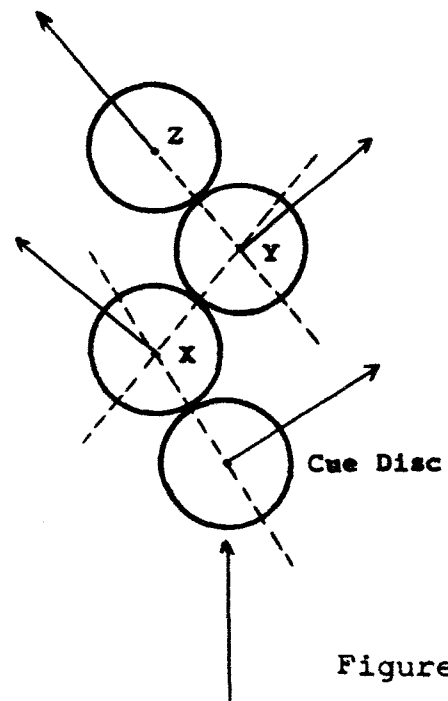


Figure 67b