The Coaching Eye

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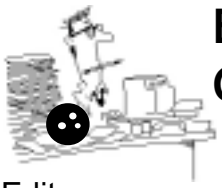

Editor's Corner:

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Well, here it is again guys. Print it out when you desire.

Place selected pages in a binder for your students. Copy selected pages and use in your classes.

In this issue:
Advanced Lane Play: Matching Up - Alignment
September Issue: Matching Up - The Ball

This month I have included an abbreviated version of **Advanced lane Play: Matching Up.** Distribute copies to your students as you desire.

The Alignment is included this month and **The Ball** will be included next month. Each part of each section (like a chapter) starts on a separate page. This allows you to cover a specific topic, one at a time with your student.

If you think of other topics pertaining to **Matching Up** and want to let other coaches know about them, please write it up, send it to me and I will review it and publish it with your name as the author. Send as a Microsoft Word file as an attachment to an e-mail to me.

And, if you have other topics or ideas that would be of use to other coaches, please send them to me. Share those ideas and we will all grow as better coaches.

Note that some of the material in this issue (Advanced Lane Play) appeared in the last issue (Top Ten Average Killers). These newsletters are designed to be read without having read previous issues. Each issue stands on it's own as a publication. Hence, some topics appear in multiple issues. (A left handed bowler version of Advanced Lane Play and back issues are available - free - upon request. Just e-mail us).

Each issue is designed to be a fund raising booklet for your local Youth Bowling Program. Excluding the cover page, make some clean copies and let the Youth Director sell them at the control desk or in the pro shop to raise money for the youth bowling program.

I encourage you to print this document out one time and make clean copies for your students. But, note that it is very long and will take about 100 pages to print out. Make sure that the printer is full of paper before you start.

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Advanced Lane Play

Matching Up: The Alignment

(Right Handed Bowlers)

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Alignment:

Strikes:

1. Line Bowling Instead of Spot Bowling
2. Strikes, Strikes, Strikes
3. Practice Balls
4. The Triple Tests
5. Oil Patterns and the Best Shot
6. Adjustments Before and During Competition
7. Watching the other Guy
8. Watch the Ball - The Red Flags for Moving

Spares:

9. The Spare Game
10. The Spare Families
11. Corner Pins for Pie
12. The Spare Ball

Extreme Coaching:

13. Extreme Decisions for Extreme Conditions

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Alignment

Line Bowling Instead of Spot Bowling.

An Example:
Suppose that you are a wild animal hunter on safari in the deepest darkest jungle in Africa. You are after the most feared creature on the face of the earth, the frowning Hyena (related to the laughing Hyena, but it lost it's sense of humor, it's one mean son-of-a-Hyena).

This particular breed of Hyenas have an incredible sense of hearing and smelling and they attack any noise with a blind vengeance. Their teeth are 1.72 inches long and they get really mad when they hear loud noises. Your only chance of bagging one is to shoot it from a distance of at least 100 yards and if you happen to miss, climb the tallest tree you can find. (The frowning Hyenas can't climb trees, but they have been known to wait for a week until the animal in the tree goes to sleep and accidentally falls out of the tree).

You happened upon a trail identified by the large frowning Hyenas droppings (small Hyena with large droppings). You see him about 101 yards ahead on the trail. You're still out of range. You very quietly go that extra yard. You lift your Red Ryder BB Gun slowly and notice that the barrel has fallen off. "Oh darn", you whisper to yourself. But, unthwarted by the supremely stupid situation you have put yourself in, you intend to attempt a shot anyway.

Meanwhile the frowning Hyena after just hearing someone say "Oh darn", turns around on the path and looks straight into the eyes of some dumb hunter with a rifle whose barrel has fallen off. The Hyena thinks to himself, "this guy is a nut, he'll never be able to hit me with that gun, it only has one sight."

The Hyena was right. You start firing the rifle, but it only has one sight, the one that is closest to your finger. You have no way to line up the shot to aim properly. The Hyena is running towards you. . . . . and . . . . there are no trees.

Finally, as a last resort, you straighten out your arm as far as you can and you look down the full length of your arm to aid the sighting of the very last BB you have in the rifle. The Hyena is now just about 60 feet from you. You rest your chin down on your extended arm, line up the shot and make that last shot. It misses, but it was a good idea; that last shot was a lot closer than the previous shots.

The Hyena attacks you, eats you alive and laughs for about three years.

The moral to the story is "be prepared from the very beginning to use at least two sighting points to be accurate in lining up the initial rolling path of your bowling ball."

The Three Most Used "First and Second Target Sights"
The three most used first and second target sights are:

1. The alignment dots about 7 feet beyond the foul line and the aiming marks (arrows).
2. The aiming marks (arrows) and the break point.
3. The aiming marks and a virtual target at or near the pin deck.

The Initial Rolling Path Direction - That Imaginary Line Defining the Swing Angle
The primary problem with simply looking at an Aiming Mark only is that it is only one point on

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the lane surface. While you are walking down the approach surface, you are only looking at that one point on the lane surface. As you walk toward the foul line, you continually look at that Aiming Mark and try to roll the ball over that one Aiming Mark. If you walk straight and your back swing and forward swing of the ball are straight and aligned with your approach walk direction, you may hit your Aiming Mark and you may roll the ball at the intended launch angle (swing angle). (Get's complicated doesn't it!) The fact that you use only one point on the lane surface to line up your shot means that it is really important that you get those other actions correct.

Do You See the Intended Aiming Mark?
Do you really see your aiming mark? When you get back to the seating area after the 1st ball, can you write down what board number the ball rolled over? Can you tell whether or not you missed your mark to the left, to the right or hit your mark? If you can't, you need to work on focusing on your aiming mark.

Seeing Your Mark, See the Line, Get the Strike
Once you are ready at your standing spot, look at the intended virtual target at or near the pin deck briefly (the virtual target can be the alignment dots, arc point or a target at or near the pin deck), draw an imaginary line back to your aiming mark. Draw that imaginary line again. Physically lower your head just a little and from that instant never take your eyes off of that mark until you have released the ball and have seen it roll over the aiming mark area.

As you begin your step sequence, keep your eyes fixed on the aiming mark. As you get closer to the foul line remember that you are going to roll the ball over that mark. During follow through, you should still remain fixed on the mark. Watch your ball roll in the vicinity of your aiming mark and judge whether or not you were accurate.

Not Looking at the Pins
This is probably the toughest thing to accomplish in the sport of bowling. We all want to quickly see results when we pursue any project. Bowling is no different. We have determined the strategy we want to use, picked the weapon from our arsenal and planned our attack on the enemy, the pins. We want to see as much of the battle as possible; we want the chosen weapon to destroy those pins. But . . . did you know that you have about 2 to 3 seconds from the release of the ball until it hits the pins?

Very frankly, you've got plenty of time to see those pins fall. After release of the ball there are two very important observations to make. The first is whether or not you hit the aiming mark you intended and the second is how the ball travels very near the end of its roll into the pocket. They are equally important and as before, they are about 2 to 3 seconds apart.

So, look at the virtual target. Draw that imaginary line to the aiming mark; draw the line again. Lower your head slightly, keep your eyes on your aiming mark. Begin the approach. Release the ball and watch the ball roll over the aiming mark and continue to watch how the ball is rolling into the pocket area.

Seeing the Mark While You're Walking
It's not that easy at first, but you can do it. While you're walking down the approach, keep your eyes on your aiming mark and imagine rolling the ball at that desired angle. As you get closer to the mark you should see it better and imagine that line better.

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Seeing the Mark During the Slide
The view of your mark during the slide is the one you should remember the most. You simply need to get in the habit of seeing that view. It's the one you will see every 1st ball of every frame of every game. It's the picture that you should try to match each time you roll that 1st ball.

Seeing the Ball Go Over the Mark
As you are focusing on that imaginary line down toward your virtual target at the intended launch angle, you roll the ball, extending your arm outward, along that line. You should see not only the mark, but the ball rolling over the mark at the angle desired.

Watch the ball as it crosses the aiming mark and beyond and check to see if you rolled it over the mark and at the proper angle along that line.

You can now raise up and relax your body.

Practicing the Line Bowling Method Separate of League Bowling
Roll some practice balls and determine where you are ending up at the foul line (what location laterally). Now go to the foul line and stand at that final slide spot. Stand in the final slide pose and swing your arm with your release and follow through motion several times (without the ball of course). Visualize the ball rolling on that imaginary line over the chosen Aiming Mark.

Now go back to the normal approach starting position and perform your approach and delivery and try to match that rolling angle and the view that you just had in the practice at the foul line.

Repeat this pair of actions several times until you begin to <u>see</u> the line at the angle that you roll the ball over the mark.

If, at your bowling center, it is easier to see the Lane Surface Alignment Dots at about 7 feet beyond the foul line, the same procedure can be followed to use those Alignment Dots instead. In most cases at well lit bowling centers, the lighting will make that row of dots almost invisible. So, be wary of learning to use only those dots. The lane surface where those Alignment Dots are located, is in the heaviest oil area, midway between the foul line and the Aiming Marks. The lighting above the lane surface lane shines onto the lane surface and reflects off the shininess of the oil on the lane surface into our eyes and we can no longer see the Lane Surface Alignment Dots.

The closer Approach Surface Alignment Dots located 2 inches from the leading edge of the foul line are not on a shiny surface. That makes it more difficult for the light to interfere with viewing those dots. The disadvantage is of course that they are kind'a close and a little more difficult to utilize effectively. Heh, life is tough; if you're gonna play, you gotta pay. In this case the price is more concentration and taking a lot more time to get things lined up properly.

Alignment Dot, Aiming Mark and Arc Point of the Ball
When you roll the ball, you roll it initially in a straight rolling path. That's how all rolling path's start out. Usually at some point during the rolling path, the ball begins to arc to the left. That's the Arc Point. It's the last point that the bowling ball remains on a straight line connected to your Aiming Mark. That arc point is another possible point to act as that second sight to be able to line up the shot. The problem is that the Arc Point is not marked onto the lane surface. It's where you "intend" the ball to start curving left. You can see the approximate area that you

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want the ball to arc but there is no mark to be able to identify it.

The big advantage of using the Arc Point is that it is further down the lane and has therefore more inherent accuracy. The closer you can get to an intended Arc Point, the more accurate you will be. It's a lot different than looking at the pins. If you were going to roll a straight ball for a strike, it would probably be okay for you to look at the pins. But you most certainly don't roll a straight ball, so you should not look at the pins.

Since the Arc Point is as far down the lane as you can look and still be looking along that imaginary line that runs from your shoulder through both Alignment Dots and the Aiming Mark and ends at the Arc Point, it is okay to do so. In fact it is recommended that you do so. The problem is being able to do so. It ain't easy.

The Viewing Problem Associated with the Arc Point

At your approach standing distance from the foul line, there is a viewing problem in seeing the Arc Point with the same view that you do at the foul line. And, is the Arc Point actually on the "line" drawn through your Aiming Mark, because what you see at the Standing Spot may not be what you see at the foul line, especially if you drift during the approach.

Lining It All Up Together Using the Arc Point

With the Arc Point at the end of the line instead of the Aiming mark, it's just a longer line. The really big difference is that you are using the Arc Point as the end of the imaginary line. But, first and foremost you must make sure that you are looking down the right line drawn from your shoulder through the Aiming mark to that Arc Point. Here's a step by step guide for using the Line Bowling Method with the Arc Point.

Step #1
First determine your Standing Spot for the chosen Aiming Mark.

Step #2
You should already have a good idea of how far down the lane your bowling ball is able to arc for the conditions that are present. It's not absolutely necessary that your ball arc at exactly that point. What is absolutely necessary is that the point you look at is at the end of your "line".

Do that now. Standing at your determined Standing Spot, draw that imaginary line through the determined Aiming Marks and out beyond the Aiming Mark to your Arc Point. It is probably a point that is at least half way down the lane and probably is at the right side of the lane.

Theoretically since that's the Arc Point, when you roll the ball on the "line," it will arc at that point toward the pocket.

What You May Have Been Told Previously

"The one thing you must do is keep your eye on your Aiming Mark and don't ever look up at the pins." But, for alignment, one of those pins may be a valuable asset in the alignment process.

Virtual Target Alignment

The reasoning in the pistol vs. rifle contrasting accuracy can be carried even further. The farthest point that you can project the end of the alignment line is of course the pins themselves. But you absolutely do not want to look at the exact target that you are aiming the ball

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for. If for example, you look at the strike pocket and then the chosen aiming mark for a breaking ball delivery, there is a likelihood that you will pull the ball toward the pocket regardless of the break of the ball. The result may be that the ball breaks high into the pocket or goes Brooklyn.

To decrease the probability that you will pull the ball across the intended target, don't look at the intended target of the ball. Instead, look at a virtual target. For example, for a strike shot, your virtual target might be the 6 pin as that second alignment point.

Note: The virtual target is a point further down the lane than the break point. Therefore, it is, by definition, more accurate than the break point. It defines the direction that you intend to roll the ball initially.

You would look at the 6 pin, draw an imaginary line from the 6 pin through the chosen aiming mark and try to roll the ball down that imaginary line. Because the ball will break left, the line is orientated so that it is the correct one for the ball to break a specific amount for it to make it back to the pocket. So, the virtual pin must be chosen carefully. But with a little practice that choice is fairly easy.

The more boards your ball breaks, the further to the right the virtual pin is.

Finding the Virtual Target that Works for You

The 6 pin works well for me. I would categorize my ball as being an average breaking ball. It is certainly not a super cranked breaking ball, but neither is it a slightly curving ball.

The procedure for finding the correct virtual target is simple but is time consuming and takes lots of practice. Remember, your objective is to find that certain pin on the right side fence row that you can use as the other "sight" to align the "line" drawn from that pin through the chosen aiming mark. By finding the correct pin you are defining the line you will roll the ball down to allow it to break left into the strike pocket. The following is the procedure for finding the correct virtual target:

1. Choose an aiming mark. That aiming mark should fit the conditions that are presently on the lane surface.
2. Choose a starting virtual target (pin). Make the choice based on what you know is the approximate line that the ball takes just after you release it for a good strike shot.
3. Get on the approach at the correct location for the chosen aiming mark.
4. Get into your normal approach stance.
5. Look down the lane at the virtual pin and draw an imaginary line from the virtual pin through the chosen aiming mark. That's the line that a straight ball would take if that's what you were going to roll. You are counting on the ball breaking enough left of that line at the end of the lane for the ball to make it squarely into the pocket area.
6. Do Not Look at the Pocket.
7. Look at the virtual pin again and draw the line again.
8. Take a deep breath and start your approach remembering in your mind that you aren't rolling a ball into the pocket, you're rolling the ball down that line. The ball will take care of going into the pocket.

Repeat all of these steps until you have chosen a virtual target that suits the amount of break that your ball has.

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Remember, you are trying to find the general direction that you want the ball to be rolled initially down the lane in the area that you want to roll the ball on the lane surface.

If you roll the ball straight down the boards, then the virtual target is at the end of the board that you intend to roll the ball down.

Looking at the Virtual Target down the Lane and Then the Aiming Mark
When you roll the ball it goes straight and then breaks across the lane toward the pocket. The initial roll is down an imaginary straight line ending up usually somewhere at the pins but it can be to the outside of the pins. For me it's the 6 pin. That's my usual virtual target. My objective is to roll the ball over my aiming mark at the 6 pin because that's where my imaginary line ends.

Look at the virtual target, draw that imaginary line, repeat drawing the line, then physically lower your head just a tad and look down at the correct aiming mark, and never look back up at the pins until after the ball is released.

The image of that line in your mind will help you roll the ball in that direction.

Just don't raise your eyes away from the aiming mark.

You must focus on the aiming mark enough to be able to write down where the ball rolled in the vicinity of the aiming marks.

What About Bowlers that Really Crank the Ball?
For bowlers that really crank the ball there is no pin on the pin deck that they can use as a virtual target. If your ball breaks too much, the imaginary straight line ends up being to the right of the 10 pin.

Heh, no problem, just find a point to the right of the 10 pin that lines up with the chosen aiming mark to give you the correct imaginary line that you roll the ball down. That will not be quite as easy as a pin as the virtual target, but it will work nonetheless.

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Alignment

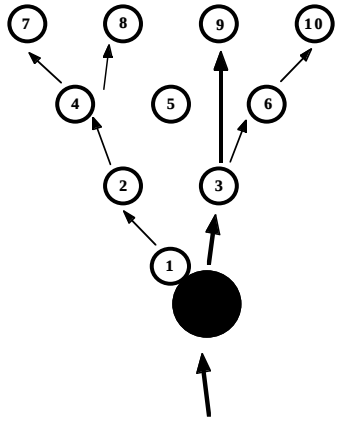
Strikes, Strikes, Strikes

The Three Controllable Bowling Variables

Angle of Attack, Ball Speed and Impact Location all act together to determine the result when a ball impacts a group of pins whether it be a strike or spare.

The Angle of Attack

The Angle of Attack is the angle that the ball is rolling with respect to the right edge of the lane as it impacts the first pin. Generally, a higher angle of attack for a strike ball is more successful in knocking down the 5 pin. A high Angle of Attack for the right side spares is not recommended. You will tend to chop the leading pins away from the set of pins. Shown below is a strike ball with a low angle of attack. It leaves the 5 pin.



Ball Speed

Ball Speed is the speed of the bowling ball at the instant it impacts the first pin in the set of pins. Generally the higher the speed of the ball, the more energy you impart to the pins. The shape of the pin causes the ball-pin impacts to rotate the pins upward. For a higher speed ball, the pins are propelled further upward.

Impact Location (Angle of Impact)

Impact Location is the location of the center of the ball at the instant it impacts the first pin. For a strike and every spare there is a specific location for the ball to ideally impact the first pin. Of course there is a range over which the ball can strike a pin and still manage to get the desired results. A split is a good example. The 5 -7 split can be converted by striking the 5 pin on the right side over a range of about 10 degrees either side of the line drawn from the center of the 5 pin through the center of the 7 pin.

Angle of Attack vs. Angle of Impact

The angle of attack should not be confused with the angle of impact. The angle of impact is the angle of the line drawn between the center of the ball and the center of the first pin to be impacted. The angle is also measured with respect to the right side gutter.

So, angle of attack is related to how the ball travels into the area of the pins and angle of impact is related to where the ball impacts the first pin.

A Ball-Pin Impact Unraveled

A very good model for a ball-pin impact is the impact of a cue ball (the bowling ball) with a pool ball (the stationary pin). The line formed by connecting the centers of the two balls defines the

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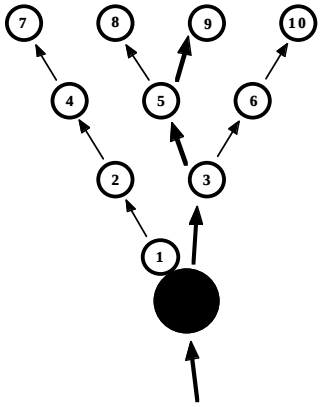
direction that the pool ball (the pin that is being impacted) will travel after the impact. That line defines a variable directly related to the Impact Location. It's called the Angle of Impact. The pool ball 9the stationary pin) is deflected away at that Angle of Impact. The speed at which the pin deflects at that Angle of Impact is defined by the physics law named the Conservation of Momentum.

The deflection angle of the ball from the ball-pin impact depends upon the speed of the ball and the speed of the pin (zero in this case) before impact as well as the angle of attack of the ball toward the pin to be impacted. If the initial speed of the impacted pin is zero, the angle that the pin deflects off the ball will always be the direction defined by that line of centers, the Angle of Impact. The speed of the deflected pin as well as the energy imparted to that pin is determined by the speed of the ball before it impacts the pin. It's very similar to playing pool.

The Ideal Strike Definition

What is the "Ideal" strike. A strike is a strike is a strike, right? Well no, not exactly. As I'm sure you are aware of, many strikes occur in very different ways. When enough energy is released to those first few impacts, the pins really fly all over the pin deck. The question is whether or not there is a combination of controllable variables that yield the highest probability of getting all ten pins to be impacted. The answer is yes. It is the combination that manages to impact all ten pins in the shortest amount of time.

That does not mean that you can increase the speed of the ball infinitely and get the pins down quicker. It means that there is a certain combination of ball speed, angle of attack and impact location that results in the quickest strike.



Initial Impact Location of the Best Strike

Using the pool ball analogy, the ball should first impact the head pin at the + 30 degree impact angle location so that the left fence row will be quickly taken down by the successive impacts of the 1-2, 2-4 and the 4-7. So, initially, it is the impact location at that first impact that is very important. (Note that the 30 degrees is the Angle of Impact, the angle of the line of centers of the ball and pin. It is not the angle of attack, the angle at which the ball path has as it impacts the pin. Angles of Impact generally vary between 0 and 10 degrees maximum where the angle of impact can be 0 to 90 degrees).

The second impact of the ball is on the 3 pin. The ideal impact location should be such that the line of centers points in the -30 degree direction so that the right fence row of pins is very quickly taken down by the successive impacts of the 3-6 and the 6-10.

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To get the ball to deflect from the head pin into the 3 pin correctly is the trick. It takes the right combination of the angle of attack into the head pin and the speed of the ball just before impact. So, assuming you hit the head pin at the right location, for a specific speed that you roll the ball, there is a specific angle of attack at which the ball must impact the head pin for the ideal strike.

The Mixer Strike

Although the ideal strike gets the pins down the quickest, it may not be the most effective strike and that specific angle of attack for the velocity that you roll the ball may not fit your particular bowling style.

The “mixer” strike is defined as one that makes the most pins go sideways and gets the most action out of that left kickback. It is very recognizable by the way that consistently a scout pin bounces off the left kickback and rebounds across the pin deck to remove any and hopefully all the pins that are left standing.

The mixer strike usually occurs when the ball impacts the head pin at an impact angle greater than the ideal +30 degree angle. Another contributing factor is a high amount of energy imparted to that head pin due to a high ball speed. So, it is a high speed light pocket hit that splatters the pins all over the pin deck.

The head pin is the key. It is the head pin that deflects off the ball, just barely impacting the 2 pin (still retaining lots of energy) and then impacting off the left kickback back across the pin deck.

The Low Pocket vs the High Pocket

Your primary objective as you are rolling the strike ball is to prevent the ball from ever going too high into the pocket.

Danger Will Robbins, Danger ! You must never go too high into the pocket area!

If you are watching the ball consistently, and you are counting your frames properly you not only should see what’s going on, you should be able to predict what’s going to happen. Those devices you have on either side of and above your nose are designed to let you input the available information about the strike ball rolling path end point to computer #1, that device you on occasion carry with you between your ears. (You view the ball path and note the reaction near the pocket),

The one most important aspect of developing a higher average is being able to see the ball as it arrives at the pocket area and gleaning the correct information from that event.

The Start of Bowling for the League

At the start of the league each night, the ideal alignment leaves you with the ball just making it back to the pocket area. As the lanes get drier and drier, the ball will work it’s way up into the pocket area a little higher as you roll the ball more and more frames. You and your Mission Impossible task is to identify when it’s time to slightly adjust that strike ball alignment. This tape self destructs in 5 seconds. It’s your turn to bowl, that last frame you rolled the ball well, you hit your aiming mark, you extended well and the ball came up high into the pocket very rapidly. If you decide to accept this mission, you will adjust now, you will not wait until next frame, you will adjust now.

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Is a Low Pocket Strike Any Different or More Powerful Than a High Pocket Strike
A rose is a rose is a rose.

Accept any strike that happens and smell the roses. Concentrate and watch the ball as it enters the pocket and you will see your garden of roses bloom with bright red X's.

The Physical Dimensions of the Pins
The widest part of a bowling pin is 4.766 inches in diameter at a height 4.5 inches from the bottom of the base of the pin.

The Physical Dimensions of the Ball
A bowling ball can be no larger than 8.595 inches in diameter (4.2975 inches radius). So the widest part of the ball as it impact the pin is 4.2975 inches above the surface of the pin deck.

Where the Ball Impacts a Pin
Note that the widest part of the pin is above the widest part of the ball, (4.5 - 4.2975 = .2025 inches).

The Location of the Center of Gravity of a Bowling Pin
The center of gravity of a bowling pin is located at a height 5.781 inches above the bottom of the base of the pin.

That means the center of gravity of the pin 1.4835 inches above the center of gravity and the widest part of the ball.

The Effect of Higher Ball Speed on the Lifting Effect
Because the ball impacts a stationary bowling pin at a location below the widest part of the pin there is a natural dynamics effect of the pin beginning to rotate forward at the base. The rotation is enhanced by the center of gravity of the pin being above the widest part of the ball and the center of gravity of the ball.

The velocity of the ball just before impact determines the amount of rotation and the translational velocity of the impacted pin. As you speed up the velocity of the ball, you also speed up the rotation of the pin. So not all the increase in energy that you put into the ball goes into moving the pins translationally toward another pin.

The Cross Sectional Area Difference Between a Standing Pin and a Rotated Pin
Every time you impact a pin, the pin rotates. If you hit it at enough velocity to rotate it 90 degrees from vertical there is a great change in the cross sectional area. When it rotates 90 degrees the cross sectional area is that of the widest part of the pin (4.766 inches in diameter).

In most cases the increase in speed is a good thing, because you impart more energy into the pins. But if the speed is so high that the pins are rotating upward too much, the cross sectional area is decreased so much that you may not get all of the required pin to pin impacts necessary in both strikes and spares.

Speed versus Rotation of the Pins Upward
If the velocity of the ball is too high, the head pin primarily will be sent to a very rotated position because of the impact. If the ball had impacted the pins at the "perfect strike" position, there

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probably would not be a problem and all the pins would still get knocked down. But, as we all know, we are no where near perfect most of the time and we kind'a count on those marginal strikes most of the time. And it's those marginal strikes that you might lose because of the decrease in cross sectional area as you roll the strike ball very fast.

When Rotating the Pins is a Good Thing

Some spares require that you bounce a pin off one of the kickbacks to be able to get a pin on the opposite side of the lanes. (They are called "wall banger" shots).

The key factors in getting that pin to deflect off the kickback correctly is the rotational position and the speed that the pin impacts the kickback. Regardless of the rotational position, the speed has to be enough to allow a little loss of energy during the impact with the kickback and then move back across the lane to impact the required pins.

Pins impacting the kickback with the bottom portion of the pin deflect better than pins hitting the kickback in the vertical position. So the combination of high speed ball resulting in high speed pin and a pin that has rotated horizontally enhances the probability that the spare will be converted.

How Few Pins Can You Get When You Hit the Head Pin?

The answer is four. And there are several ways that it can happen; here's one.

The ball barely clips the head pin deflecting it into the left gutter and the pin for one reason or another does not deflect off the kickback and return to knock down any more pins.

The ball deflects off the head pin, impacts the 3 pin just to the left of the center of the pin and drives it backward. It misses the 6 pin completely. It impacts the 9 pin and knocks that pin down.

The ball deflects off the 3 pin ever so slightly to the left and makes contact on the far right side of the 5 pin. The 5 pin deflects off the ball and goes between the 7 and the 8 pins missing them both.

The ball deflects slightly to the right and goes into the pit. Yuch!

What you have left is the 2-4-6-7-8-10 split.

There are other scenarios for leaving 6 pins, but this is the most frequently encountered one that includes impacting the head pin first.

Definition of The Oil Edge Shot

The edge of the oil is that board on the lane surface where the intensity of the oil dramatically changes. ABC has strict rules so that just after the lanes have been oiled that there be at lease 3 units of oil everywhere on the lanes. The bowling centers know that if there is a definite edge for the heavier oil, it gives the bowlers a better shot.

The Oil Edge Shot is a bowling ball path that takes advantage of the edge of the oil.

The Swing Shot is a bowling ball path that goes across the edge of the oil at an angle out toward the gutter. The magnitude of that angle determines the amount of "Swing." (the

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"Swing" angle is also called the launch angle).

The Down and In Shot is a bowling ball path that rolls straight down a board on the lane surface.

The basic premise in both the Swing and Down and In Shot is that the not perfect roll of the ball in combination with being near the edge of the oil in combination with rolling the correct ball for the conditions will result in a "Self correcting effect." When the ball is rolled a little too far inside, it will slide more with decreased breaking effect, so, even though you rolled the ball more direct at the pocket, the result will probably be less than catastrophic because you rolled the ball in the much heavier oil. If you rolled the ball a little to the right of the edge of the oil, it's in lighter oil and will break harder toward the pocket, thus, self correcting.

Determining the Right Bowling Ball for the Present Conditions
Take the ball that you normally start the league with and roll it across or down a board with an aiming mark 1/2 board to the right of the edge of the oil. That's about the right location to roll the ball to take advantage of the edge of the oil. If the ball did not make it back to the pocket, try another bowling ball or move your aiming mark another 1/2 half board to the right. If that still not enough to get the ball back to the pocket, you simply won't be able to take full advantage of the edge of the oil. That doesn't mean that you will have a disaster, it only says that you will need to be a little more accurate when you roll the ball.

Eventually the oil will dissipate on the outside boards and you will soon move left toward the edge anyway.

The Swing Angle
The angle that you look across your Aiming Mark with respect to the side of the lane is the swing angle. The most important aspect of the approach is to keep your eyes on your Aiming Mark. You can do just that and maintain a high average.

You can add another level of control by looking across the Aiming Mark in the same direction that you are going to roll the ball. So, the looking angle is actually the swing angle that you roll the ball the ball.

A "down and in" bowler automatically looks down the board that he intends to roll the ball down. The swing angle for a down and in bowler is zero.

A "swing" bowler should roll the ball at the same angle across the Aiming Mark each time he rolls the first ball of a frame for a strike. Being able to maintain that same swing angle is mostly controlled by the direction that the bowler walks toward the Aiming Mark. (Of course when it is time to make an adjustment, that angle will probably change).

If a bowler does not drift, i.e. if he walks straight toward his target, the direction he walks is the same as the swing angle. So, if a bowler does not drift, he can position himself at his Standing Spot and look across his Aiming Mark at the swing angle that he intends to roll the ball, walk toward the Aiming Mark. As he approaches the Aiming Mark the bowler visualizes in his mind swinging the ball across the Aiming Mark at that angle. Since he is in line with that angle it's a very natural process....if you walk straight.

If, however, you drift, your Standing Spot is not in line with the Aiming Mark at the intended

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swing angle down the lane. So, if you drift, you will not be able to see that swing angle until you get close to the foul line. It's not quite as easy for a bowler that drifts to be able to use the looking angle as an additional tool to improve their bowling, but it is possible.

Defining the Ideal Strike in Detail (Revisited)
There are so many different strikes that are possible, making the statement that one is better than the other is a little unfair to the great bowling gods up in the sky. But we need some benchmark to aim for when we try to knock down all of those pins. For the purposes of this book, a perfect strike is defined as the strike that minimizes the amount of time it takes to get all of the pins knocked down.

You won't get those perfect strikes very often, but when you do, you will recognize them. The instant the ball impacts the head pin, it seem like all of the pins are knocked down at the same time. That's not what's really happening at all.

The quickest strike occurs when the angle of impact with the head pin causes the 1 pin to be deflected directly into the 2 pin at the +30 degree angle of the left fence row. The 2 pin and 4 pin and 7 pin are all impacted be their neighboring pins on the fence row at that same +30 degree angle. Because that +30 degree angle defines the shortest distance between the successive pins on that left fence row, it also defines the quickest time possible for the pins to be knocked down for a specified speed of the ball.

The ball deflects from the head pin to the right toward the 3 pin. The initial speed of the ball before it impacts the head pin and the angle of attack that the ball has just before it makes that first impact determine the angle that the ball has after the impact. The perfect strike ball is deflected into the 3 pin so that the ball impacts the 3 pin with an angle of impact of -30 degrees. At that angle of impact with the 3 pin, the 3-6-10 fence row of pins will be knocked down just as the left fence row of pins were knocked down, very quickly and minimizing the time that it takes to get them all down. The 6 pin and 10 pin are all impacted be their neighboring pins on the right fence row at that same -30 degree angle. Again, it happens very quickly because the distance between the impact occurrences is the shortest it can be.

What's left of course is the 5, 8 and 9 pins. Whereas the first two impacts are fairly easy to define regardless of the unknown parameters (the rolling state and the adherence), these final impacts depend a lot on those two unknown parameters. Assuming the ball is going straight (not hooking) and the adherence is good, the ball impacts the 5 pin on it's right side so that the angle of impact angle is +30 degrees. That means that the 5 pin will travel the shortest distance to get to the 8 pin. Again, since the distance is minimized, the time for the successive impacts is minimized. The ball then deflects to the right to impact the 9 pin.

The Cue Ball Effect in Detail (Revisited)
When a bowling ball impacts a stationary pin, the direction and velocity of the deflecting pin and ball are almost exactly like that of a cue ball impacting a single billiard ball on a pool table. Because the pin is stationary, the angle that the pin is deflected is exactly equal to the angle of impact. So, it doesn't matter what angle of attack your bowling ball has as it enters the rack of pins, the impacts that the moving ball makes with the stationary pins is determined by the angle of impact that the ball makes with those pins at impact.

Remember how you would line up a pool shot by taking the cue stick and moving it to in front of the ball you were going to impact with the cue ball. You would take the stick and line it up

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with the stick pointed toward the pocket.

What you were doing is finding the angle of impact that the cue ball needed to have so that the ball would properly be deflected into the pocket. It works the same for a bowling/pin impact.

The Perfect Angle of Impact
This applies to pin deflection type spares and strikes only. The perfect angle of impact is the single one that minimizes the time it takes to knock down all of the pins. That occurs when you minimize the distance between the pins. So, for a strike, the perfect angle of impact is +30 degrees. That causes the left fence row of pins to be deflected straight into one another. The pins go down very quick.

Low vs. High Angle of Impact
If the angle of impact is much greater than the ideal +30 degrees (too low of a pocket hit), the likelihood is that you will leave a spare containing the 2 pin. If the angle impact is much less than +30 degrees (too high of a pocket hit), the likelihood is that you will leave a spare containing the 4 pin or a beeg split. So, for that reason alone a lower pocket hit is more desired.

Is the Quickest Down Time the Best Criteria for Spares?
No. The best criteria is the one that leaves you with the widest possible lateral area to roll the ball on and still convert the spare. (i.e. you ain't perfect and you probably can't get the ball to impact the lead pin exactly at a specific location. The 1-2-4-7 is a good example. If you roll the ball and intend to hit the lead pin at the +30 degree angle of impact, there is a possibility that you will miss the lead pin completely on the right side and you miss all of the pins.

If, on the other hand you roll the ball and intend the ball to deflect off the lead pin and have the ball take out the 2 and 4 and 7 pins, there is less likelihood that you will miss all of the pins.

The choice is simple. Never use a pure pin deflection method for spares unless it is absolutely required to convert the spare. Splits for example required that you use the pin deflection method of spare conversion. The 1-2-4-7 does not require the pin deflection method, so you should not choose it.

Unhook vs Hook and the Angle of attack
There is a debate among bowlers as to which is actually better, a hooking ball or a ball that is rolling straight (unhooked) as it enters the pocket. If you roll two identical bowling balls at identical racks of pins and everything else is exactly the same except that one ball is still hooking as it enters the pocket and the other has unhooked an instant before it enters the pocket, the unhooked ball has a better chance of getting a strike.

A Hooking Ball Impact
Have you ever left the 9 pin single pin spare? That is the best example of the caution connected with a hooking ball impact. If the ball is hooking too much as it enters the pocket area, when it deflects off the 3 pin and still may be hooking, it impacts the 5 pin a little too direct to deflect properly and impact the 9 pin.

There are other possibilities, but primarily the hooking ball can cause problems associated with hooking too much. As the magnitude of the "hook" decreases, the magnitude of the problem decreases, except that the probability that you will leave a 5 pin or a 10 pin increases.

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An Unhooked Ball Impact

Unhooking an instant before the initial impact with the head pin allows the ball rolling energy to be concentrated in the direction that the ball is rolling.

That's the difference. An unhooked ball has 100 % of it's energy directed toward the pocket. All the energy is in one direction.

Putting the Most Energy Where You Need It

When you release a bowling ball, you impart forward roll and sideways roll into the ball. If you impart too much sideways roll it is not dissipated by the time it impacts the head pin. It still wants to hook after that initial impact. That sideways rotational energy is wasted. It takes away from the total available at the initial impact with the head pin.

Ideally you want to impart just enough sideways rotation so that it just dissipates an instant before the impact with the head pin.

Remember you release the ball with a specific amount of total energy. If there is less sideways energy, there is more forward energy.

It's the forward rolling energy that destroys the pins, not excess sideways energy.

(i.e. you can crank all you want, but if the sideways energy doesn't dissipate just before the impact with the head pin, it's just a waste).

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Alignment

Practice Balls

The practice you take just before league is a little different than the practice just before a tournament starts in a bowling center you've never bowled in before. Practice just before league is not as critical because you bowl there every week. You know about what the shot is going to be and you are probably prepared to perform well.

Practice just before you start a tournament is a very anxious time. You can only estimate what the lane conditions are going to be from what you see that other bowlers are doing in the previous squad and what you have "heard" from previous bowlers. The practice balls you roll therefore are very important.

League Practice Balls:
There is usually an opportunity to roll about 5 or 6 practice balls just before league play. I will list the top 6 practice balls that you should try to roll in the order of their importance. It is assumed that each of the practice balls is rolled well and that you hit your intended aiming mark and released the ball in the intended direction.

1. The Strike Shot
2. The 10 Pin
3. The 7 Pin
4. The 2 Pin
5. The Strike Shot
6. The Strike Shot

Each of these shots simply verifies that the lane conditions are about the same as they were the week before. They are truly practice balls. You are only looking for verification that the lanes are about the same or that they are a little drier or that they are a little wetter.

Tournament or New Bowling Center Practice Balls:
(Breaking Ball Spare Shooter)
You are about to start the tournament in a bowling center where you have never bowled before. You have heard rumors of terrible lane conditions and you don't really know what to expect. Each one of your practice balls needs to tell you some specific information. The combination of the practice balls should give you a picture of where the oil is located.

These practice balls also should be used when the bowling center where you bowl is hosting a tournament and has changed the lane conditions.

1. **The 10 Pin** - This practice ball tells you what the condition is like on the outside boards. Line up like you do for a 10 pin shot at your home bowling center. Roll a breaking ball like you normally do for a 10 pin when you roll a breaking ball at a 10 pin in practice at your home bowling center. If the ball slides into the gutter well before the 10 pin, it indicates that the outside boards are very wet compared to the conditions at your home bowling center. If the ball breaks too hard and misses the 10 pin on the left side, it indicates that the outside boards are very dry compared to the conditions at your home bowling center.

2. **The 7 Pin** - This practice ball tells you what the condition is like in the middle part of the lane (assuming you roll the ball at the 7 pin from the right side of the lane across the middle part of the lane to the 7 pin). Roll your strike ball like you normally do for a 7 pin at your home

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bowling center. If the ball breaks into the gutter well before the 7 pin, it indicates that the middle of the lane is very dry compared to the conditions at your home bowling center. If the ball misses the 7 pin on the right side, it indicates that the middle of the lane is very wet compared to the conditions at your home bowling center.

With these first two practice balls you should know the approximate conditions. The next ball needs to test out your best estimate at a strike shot. This is not an easy task. There are lots of "if's" that dictate where to roll that third practice shot. And, some tournaments only allow two practice shots. Regardless, the first two practice balls should be as described above.

Tournament or New Bowling Center Practice Balls :
(Straight Ball Spare Shooter)
Even if you roll a straight ball at most spares, the order of the spare shot is the same as above and you should roll a breaking ball for the pins specified even though you will roll a straight ball at the spares during the game. The reason for rolling a breaking ball at the corner spares is to find out the information pointed out above. So, roll the breaking ball at practice time the first time you practice for those spares. After that you can roll the practice straight balls. So, the order of the practice balls for a straight ball spare shooter is recommended to be as follows:

1. The 10 Pin (breaking ball). See above.
2. The 7 Pin (breaking ball). See above.
3. The Strike Shot (breaking ball). See above.
4. The Strike Shot (breaking ball).
5. The 10 Pin (straight ball).
6. The 7 Pin (straight ball).

The Strike Practice Ball
This is the most important of all of the practice balls. More than 50% of the game is the strike shot, so you must establish whether or not your plan of attack for the strike shot is correct based on past records of that league.

There are a few spares that will also use the strike line rolling path. The strike line is recommended for the 5 pin and some miscellaneous spares.

The Right Side Spare Practice Ball
The right side spares usually cause more damage to a bowler's average than any other part of the game. The 10 pin is of course the primary culprit.

Stand as far left as you can with the appropriate Aiming Mark.

By standing far left you do 3 positive things. You increase the available lane area for the ball to roll on, you decrease the intersection angle between the pin line and the ball path and you increase the amount of oil that the ball rolls through.

Further improvement can be obtained by rolling a different ball for the right side spares, a ball that is harder, smoother and has a non-reactive surface, a ball that is less apt to curve at all. You release the ball in the same way as your other ball but it simply reacts less and curves less.

Last and not recommended without a vast amount of practice but highly successful with some

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bowlers is the technique of rolling that “less reacting” right side spare ball and releasing it differently. If you release that “less reacting” ball as a straight ball, you will have a greater probability of covering the right side spares.

But, there is a trade-off. Since you are not releasing this way each time, you may not be consistent in the release. (That’s why the “not recommended without a huge amount of practice” is the recommendation). If however you practice that straight ball delivery a lot and get very proficient with it, you should use it every time for those right side spares.

The Left Side Practice Ball

Except for the 7 pin, the majority of the spares that occur frequently are left side spares. More spares are left side spares because of the dependence upon the head pin impact to clear away the left side pins. If you don’t impact the head pin correctly, the spare will most likely contain some of the left side pins.

But your bowling ball naturally breaks from right to left and can easily be directed toward most of the spares in the center of the lane as well as the left side of the pin deck area.

The Aiming Mark should be near the middle of the lane surface. Roll one of the practice shots at the 7 pin.

The Far Left Side Spare Practice Ball

If you look at a list of spares you will notice that the far left side spares are only those spares that require you, a right handed bowler to roll the ball down the far left side of the lane. There are only a few spares that require this, but some of them do appear pretty often. (Mostly splits)

Choose an Aiming Mark that is at the left to far left side of the lane surface. The associated Standing Spot will then most likely be at the left side of the approach. With this combination, the rolling path should be almost totally in the left side oil pattern. It is recommended that the ball for these spares should be just as for the right side spares, very hard, smooth and a non-reactive surface. If you roll the ball for minimizing the curve of the ball, you increase your probability of converting the far left side spare.

The choice of left or strike aiming alignments for the spares near the center of the lane depends a lot on how much your bowling ball naturally curves.

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Alignment

The Triple Tests.

Finding the Initial Alignment

Sometimes it may seem almost impossible to initially line up your strike shot. That may seem so, but there set of procedures that can be followed to very quickly get aligned for both league and tournaments.

The best start is to have some historical data on what the conditions have been like before. That means that you need to have knowledge of what the conditions have been like over the past few days and possibly weeks. If you have been writing down where you have been starting for an aiming mark and a standing spot you will already have a good idea of where to approximately line up the initial shot.

But that approximate alignment is not necessarily the correct one for that night of bowling. Many things force the conditions to change slightly from week to week in league play. You have to verify that your estimated alignment fits some basic criteria.

Getting set for the correct alignment for strikes at the beginning of a league or a tournament can be a problem. Correct alignment involves passing three tests that define a method of initial alignment called The Triple Tests.

The one oil pattern characteristic that is assumed is that you have tentatively lined up at a location that has more oil to the inside, so there is less oil to the outside of where you are rolling the ball. It is also assumed that you rolled the ball properly in the usual manner and speed.

When you roll the ball, you will miss to the inside sometimes, miss to the outside sometimes and a few times you actually get it just about right. The shape of the distribution of rolling path directions form a pie (a piece of pie) shape.

Getting aligned properly involves putting that piece of pie shape at the right location so, when you miss (not if you miss), the outcome will not be tragic.

The Triple Test for an Aiming Mark

If when you roll your bowling ball for a strike, the rolling path satisfies 3 requirements, there is no reason for making a change in your Aiming Mark and Standing Spot (your alignment).

Requirement #1: Hit mark and swung correctly - the ball returns to the pocket for an acceptable pocket hit.

Requirement #2: Hit mark and swung the ball out further than normal - the ball returns to the pocket with an acceptable pocket hit, probably a light pocket hit, but still acceptable.

Requirement #3: Hit mark and swung the ball outward less than normal - the ball returns to the pocket after sliding through more oil than usual. The ball usually ends up as a high pocket hit, but still acceptable.

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Aiming Mark Incorrect - Too Far to the Right
Case #1: Hit mark and swung correctly - the ball returns to the pocket as a high pocket hit, direct head pin hit or a Brooklyn hit. The lanes, being drier on the outside boards, have caused the ball to break more than usual even though you know that you have not swung the ball anymore than usual. The Aiming Mark must be moved further inside into the heavier oil.

Case #2: Hit mark and swung the ball out further than normal - the ball returns to the pocket and zooms back to the pocket area ending up on the opposite side of the head pin, possibly even missing the head pin on the opposite side. You noticed that you swung the ball outward a little more than usual, but this kind of reaction is caused by more than the errant swing of the ball. The lanes are simply drier and more aggressive than you estimated where you rolled the ball. You must move your Aiming Mark further inside into the heavier oil.

Case #3: Hit mark and swung the ball outward less than normal - the ball returns to the pocket and hits the head pin directly and you leave a beeeg split. You know that you did not swing the ball as much as usual but the fact that the ball still went high means that the oil was not heavy enough to keep your ball from going into the head pin when you did roll it a little more inward than usual. You must move your Aiming Mark a little further inside so that when you do swing the ball a little inward, you won't end up directly on the head pin because of the heavier oil you found after you moved.

Aiming Mark Incorrect - Too Far to the Left
Case #1: Hit mark and swung correctly - the ball just barely returns to the pocket as a very light pocket hit if it makes it back at all. You know that you hit your mark and swung the ball correctly. The Aiming Mark must be moved further to the outside into the outside boards where there is less oil.

Case #2: Hit mark and swung the ball out further than normal - the ball returns to the pocket and ends up as a very light pocket hit. You know that you swung the ball more outward than usual and you expected a heavier pocket hit, but the ball just barely made it back to the pocket. You must move your Aiming Mark into the outside boards where there is less oil.

Case #3: Hit mark and swung the ball outward less than normal - the ball does not return to the pocket at all and you get a washout. You know that you did not swing the ball outward as much as usual but the fact that the ball did not make it back to the pocket means that the ball rolling path is in too much oil. You must move your Aiming Mark a little further outside so that when you do swing the ball a little inward, the ball will still make it back to the pocket acceptably.

Moving left and the Decreasing Angle of Attack
As you are moving inside trying to find that perfect location where you pass all three tests, you are decreasing the angle of attack that the ball has when entering the pocket area. There is a limit for moving inside. That limit is not just a visual one. If your angle of attack is not great enough, you will begin to get more spares that include the 5 pin. If you can see the ball as it leaves the pin deck, you will also see that the ball is leaving the pin deck to the outside of where it normally does.

Too Much Ball
If you are moving too far inside (decreased angle of attack) and you can't pass Test #2 or Test #3, because the ball keeps coming up high, the ball is simply too aggressive. The solution is

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to switch to another less aggressive ball. Since it is less aggressive, when you find the correct alignment for a strike (passing Test #1), you have a higher likelihood of passing Test #2 and Test #3.

Too Little Ball

More than likely, when moving outside, you won't have a problem with the angle of attack. If however you pass Test #1 and Test #2 but you can't pass Test #3 because the ball doesn't make it back to the pocket, it's an indication that the ball is not aggressive enough.

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Alignment

Oil Patterns and Where the Best Shot is.

Look at the Oil

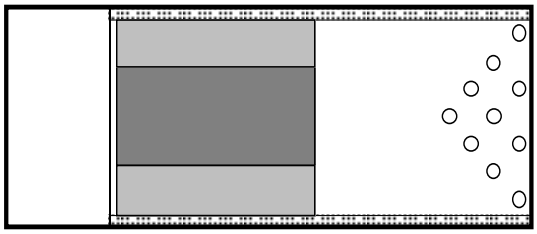
If you can take a quick look at the lane surface just beyond the foul line, you will be able to see where the oil, also called lane dressing, is applied heavily and where it is applied lightly. If you roll the ball down the "edge" of the more dense area of the oil, it will tend to stay on the edge. Assuming you roll a curve ball, if you miss a little to the right, because it is drier, the ball will curve into the edge. If you miss a little to the left, the ball simply slides longer.

The composition of the oil has changed over the years. The oil is not WD40. It was a variation of Mineral Oil for many years, but now is a composite of several compounds to give the spreading characteristics desired (and sometimes undesired effects) as bowlers roll games during league and tournament play.

The bowling establishments would like not to place any conditioner on the lane surface. Excessive oil generally causes equipment to malfunction (i.e., the ball returns don't work, etc.). But the bowlers are happier when they score higher, so most bowling establishments use the 3 unit rule to their advantage.

The Blocked Oil Pattern

The oil is at least 3 units on the outside boards (usually about 7 boards), but the "8 to 8" boards, sometimes 10 to 10, (the inside boards) are oiled very heavy.

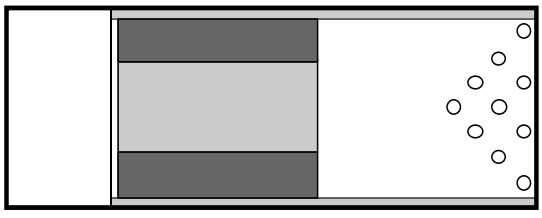


The block can vary from very wet (20 units) to very dry (3 units). The edge of the block is usually somewhere near the 10th board (the second arrow), has a significant meaning for a high scoring shot.

Simply stated, it is easier for a house to set up a block shot, and the results are excellent. It probably best satisfies the most people.

The Reverse Block Oil Pattern.

The oil is denser at the outer edge than at the center. This is a very difficult bowling condition. No one in his right mind would ever purposely setup this condition. Basically, if you roll the ball out of the dry area, it probably won't come back. That's why it's called "out of bounds."



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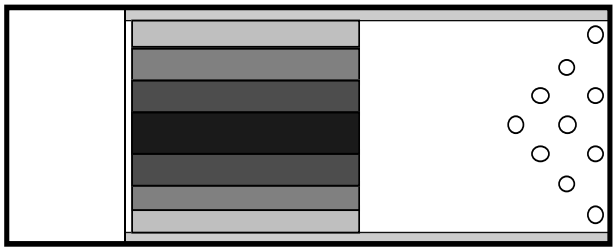
The Tapered Oil Pattern. (Lateral Taper Only)
The oil in this case has no well defined edge. It is denser in the middle of the lane and about 3 units at the far outside boards.



This is a more difficult application but it may be higher scoring for more bowlers. The overall amount of oil is usually greater in this case compared to the block oil condition. This condition can be used to advantage by both the “swing” and the “down and in” bowler.

ABC recommends that there be a slight crown in the oil application. There is a gradual increase in oil as you get towards the center board. The lane is "drier" outside to help the ball curve back when you errantly roll the ball further outside than usual. There is in effect several stages that go together to form several “block” effects.

It is very difficult for a lane conditioner machine to distribute the oil in a true taper fashion. The usual attempt at a taper pattern is to apply the oil in successive increasing discrete intensities across the lane from the outside boards to the middle of the lane. So the pattern is actually several different intensity blocks of oil. The far outside block might have about 5 units of oil from board #1 to board #4, then from board #5 to board #8, the intensity might be 7 units, then from board #9 to board # 12 the intensity might be 15 units, then from board #13 to board #20 the intensity is the maximum, what ever that value usually is, maybe 20 to 30 units.

Although the tapered pattern has less oil on the outside (tapered from the center to the outside), the intensity of the oil does not decrease down the lane except for the buff out of the oil remaining on the roller of the lane machine. So there is no well defined taper down the lane toward the pin deck.

But, compared to the purely blocked oil pattern, it is a very high scoring pattern because of it’s versatility of satisfying the way that more bowlers actually roll the ball.

The slightly tapered pattern has less of a difference in the density of the oil than the heavily tapered. Whereas a heavily tapered oil pattern might go from 3 units to 30 units of oil from board #1 to board #20, the slightly tapered pattern might go from 8 units to 20 over the same boards.

For the heavily tapered pattern the difference in the oil density from the outside boards to the inside boards is greater. The common trait to both the slightly tapered and the heavily tapered pattern is that they both make the change from the low density oil to the higher density oil gradually from the outside to the inside boards.

The tapered oil pattern is probably the most widely used for league play. It is a cross between the heavily tapered pattern and the block pattern. In a step block pattern the far outside boards have the lowest density oil (5 units for example). On about the 8th and 9th boards a

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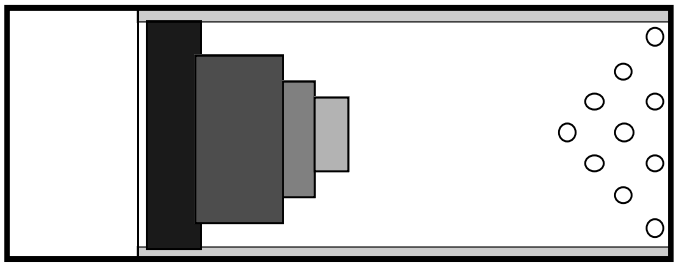
slightly heavier oil density is applied (10 units for example). Then beginning at the 10th board the heavy oil is applied (25 units for example).

The tapered oil pattern is a high scoring pattern. Bowlers that swing the ball outward across the edge of the high density oil beginning at the 10th board actually have a small tapered pattern across the 10th through the 7th boards. The more they miss there intended trajectory outward slightly, the more the ball encounters the less density oil and the greater the ball hooks in those outside boards. It promotes the idea of a self correcting delivery of the ball. The phrase used most often is that the bowler has a very wide area to roll the ball in to still get the ball back to the pocket.

Most bowling centers taper the oil laterally and down the lane toward the pin deck. Usually, the lane machines work in a two step process. The oil is applied in the first step. Oil is actually applied to wiper device that then rubs on the lane surface to apply the oil. When the desired distance of oil application is reached, the oil stops going onto the wiper device. The wiper device still has oil on it and if the oil machine continues to travel down the lane, it gradually releases the oil from that wiper device. That second step of oil application is called the "dragging" of the wiper device to release that oil. The oil then tapers from the heavy oil at that location where the oil is switched off to very little oil at all (at least 3 units), where the machine finally stops.

The Christmas Tree Oil Pattern

If the lane machine can control individual areas of the wiper device, then the oil pattern can be triangular in shape with the point of the triangle at the center of the lane. As the lane machine goes down the lane it works the same as before except that gradually the outer area oil is stopped being applied before the center area. Once the center oil stopped being applied, the lane machine still drags the remaining oil on the wiper device down the lane to where it finally stops. The result is that the lane surface has a triangular oil pattern. The further down the lane, the sooner the drier area of the lane begins further inward.



The Christmas Tree oil pattern is the highest scoring oil pattern of all. The taper of the oil laid down onto the lanes is both across the lane laterally and down the lanes toward the backend. Basically the pattern is decreasing oil density in just about all directions. It also fits just about all bowling path trajectories, from "Down and In" to "Swinging the Ball."

The Christmas Tree oil pattern is an attempt to be able to correct the errant path of the bowling ball regardless of where the bowler rolls the ball. The more the bowler misses, the more the oil pattern allows correction by the friction of the lane surface.

How to Find Out About the Oil Conditions:

Here are some tips.

1. Ask the desk person when the lanes are oiled each day. If they are oiled just before

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league starts, come a little early and observe the lane machine at work. Some of the lane application machines have lights that indicate what is being done by the machine. Usually a separate light is “on” when oil is being applied, green probably. The machine starts down the lane and the green light comes “on” almost immediately. Oil is being applied. The oil flows from an oil reservoir in the machine to a wick that rubs onto a roller covered with a synthetic carpet like material. When oil is not being applied, the wick does not rub against the roller. Usually, the machine slows down when applying oil and speeds up when not applying oil.

At some point down the lane the green light, if there is one, goes “off”. That indicates the oil application has stopped although the machine may continue down the lane. As the machine continues down the lane, the wick is no longer in contact with the roller but the roller is still in contact with the lane surface. The oil that is left on the roller is being “drug” down the lane. The oil gradually tapers off until almost no oil is applied. This means that the oil is tapered down the lane from that end point of application.

The lane machine eventually stops and starts to return. Again only that remainder of oil in the roller is being applied to the lane surface. It is still being “drug” back to end of the oil application point. The oil indication light usually comes “on” again at about the spot that it went “off” on the trip down the lane. Oil is being applied again from the reservoir through the wick onto the roller and then onto the lane surface.

The distance from the foul line that the oil is applied is important. Many establishments oil down to just past the arrows, about 20 feet and then taper another 20 feet. If you see the green light stay on farther down than usual, that means the lanes will be slicker than usual (long oil). If you see the green light turn off early, it means that the lanes will be possibly be drier (short oil).

2. Go down to the foul line just before the league starts and look at the oil on the lanes just beyond the foul line. (**Do not go beyond the foul line and do not interfere with any ongoing leagues**).

What you see is a pattern of the oil on the lane surface. See if you can notice where the edge of the oil pattern is laterally on the lane surface. You might have to look at an angle to see where the oil is applied but you can usually see a definite pattern where it is applied. ABC rules dictate that there be at least 3 units of oil everywhere on the lanes and a crowned middle of the lane is recommended.

There are many styles of bowling ball delivery and all may use the edge of the oil to advantage. In general, if you roll the ball outside of the edge, it will curve more because there is usually less oil present there. In general if you roll the ball inside the edge, it will curve less because there is more oil there.

A fairly accurate bowler can roll the ball down the edge of the oil and get excellent results. If you happen to roll the ball a little outside the edge, the lane is a little drier and it breaks more to make up for the slight error. If you roll the ball a little inside the oil, the lane is wetter and the ball will not break as much.

The edge of the oil is an excellent location to roll the ball. The effect that results is a self correcting 1st ball delivery.

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3. You can also simply ask the desk person when and under what pattern the oil was last applied. They are usually very busy and may not even be aware of the conditions, however, they may not even be a bowler.

What is Stripping the Lanes?
Since oil is applied to the lanes everyday, it builds up on the lanes. If the oil builds up, the lanes seem to get so slick that no bowling ball will perform to it's full potential, it won't curve as much because it doesn't adhere to the lanes. Too much oil also begins to foul up the operation of the pinsetting machines and the pins will start sliding laterally on the surface of the pin deck without falling down.

Stripping the lanes involves removing the oil that is left after bowling that day. So, historically the stripping is either done late at night or very early in the morning. A solvent is used to remove as much oil as possible.

The reason that stripping is done everyday is simple. The scores are higher. When the lanes are stripped everyday and new oil is placed on the lanes after stripping, the oil condition and pattern is at least reasonable. Bowlers can and do handle the conditions, they score very high.

The actual stripping process may utilize another lane machine to remove the oil. There are lane machines that will do it all, oiling and stripping. As the machine goes down the lane, a cloth wiper picks up oil and residue that is left from the night before. A water based solvent is sprayed onto the lanes and then a squeegee wipes the solvent up after which a vacuum sucks up the solvent and all debris that has been picked up with the solvent. At the distance set, the machine stops, the cloth wipe rotates incrementally to a clean section and the machine returns to the foul line.

Various machines operate in a similar fashion. The objective of all of them is to completely clean the oil from the lanes.

When Were the Lanes Last Stripped?
Every other day or so the entire lane is stripped. The complete stripping gets rid of all the oil everywhere on the lane.

Most bowling establishments now completely strip everyday. It yields a more uniform oil pattern everyday. The result is that the bowlers do not have to be surprised by a different oil pattern when they bowl on different days.

How Does Stripping the Lanes Affect Your Bowling
The importance of stripping the oil everyday is because the outside boards and the back end is where we have come to depend upon there being very little oil. That's where we want the ball to start arcing to the pocket. If oil is in that area, your ball will not "snap" at the rear part of the lane and drive into the pocket as hard, i.e.. your score will be lower.

Picking a Day That Best Fits Your Bowling.
If you like drier lanes, there are certain days that are more likely to be drier and if you like wet lanes, there are days that are more likely to be wetter. Suppose that the lanes are stripped only on Monday, Wednesday and Friday.

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If you like wet lanes, the first choice would be an early league on Sunday just after the lanes have been oiled. The second choice would be an early league on Tuesday, Thursday or Saturday just after the lanes have been oiled. The driest condition would be just after the lanes have been stripped on Monday, Wednesday, or Friday.

If the lanes are completely stripped everyday except Sunday for example, bowl on Sunday if you score higher on wet lanes.

What Does It Mean, "The oil is breaking down"
When the oil dissipates in the area that you are rolling the ball, the ball begins to curve more. When several bowlers are rolling the ball in the same area, the lanes get drier very quick. As bowlers all roll in the same area and they all wipe their ball off with a bowling towel before they bowl, the oil on the lanes dissipates very quick.

Depending on the initial amount of oil that is applied as well as the temperature and humidity, the oil can change very quickly or it can last all night. Usually you will notice some change after about one game and sometimes a major change after 3 games. Late leagues inherently start with less oil and dry out quicker than in early leagues.

Visualizing the Up-Hill on the Right Side
When you bowl, you should have some mental picture of where the oil is on the lanes. If the lanes are drier the further you roll the ball outside, the roll of the ball on those outer boards is kind'a like rolling up the edge of a hill. The further you roll the ball outward and up further on the side of the hill, the more the ball will tend to come back down the hill at a steeper angle, in this case a higher angle of attack into the pocket.

For example, let's say that the lane is much drier from board #8 to board #1. The hill begins it upward slope at board #8. The hill rises gradually (depending on how much drier it is outside of board #8) and then after board #1 is a deep canyon called the "ditch".

If you roll the ball just slightly on the edge of the hill, it will come back just as gently toward the pocket.

If you roll the ball all the way out to board #1 up on the hill, that sucker is gonna be zooming back to the pocket.

The further you roll it up the side of the hill, the steeper the angle of attack is into the pocket.

The Middle of the Lane
Unless the lanes are reverse blocked, the outside boards are at least little drier than the middle of the lanes. ABC recommends that there be a slight crown of oil on the surface of the lanes. Bowling establishments may or may not follow that recommendation. Usually there is a crown in the middle portion of the lane, but the outer boards are very near the minimum allowed by ABC.

The Left Side Spares Down-Hill
For a right handed bowler rolling a curve from right to left, the left side of the lane will hook a little more than the middle of the lane. The bowler then faces a "downhill" on the far left side. Unlike the right side hill, once you start going down hill, it ain't gonna come back. The dryer the lanes are on the far left side the steeper the hill is going down.

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The Overall Picture of the Lanes
At the right side, a hill is sloping up at a steep angle to the gutter. At the center board of the lane, the slope of the hill changes to now go down hill. At the location on the left side where the oil again changes to a minimum value, the slope of the hill changes to a more steeper down hill angle.

The Flow of the Oil
As a bowling ball rolls over the front part of the lane surface called the “heads”, some oil that is on the lane surface is deposited onto the ball surface. Just after the ball rolls through the oil, a void exists on the lane surface where the ball was rolled for a short period of time.

The void left where a ball has just been rolled does not remain very long however. Depending on the viscosity of the oil and the additives in the oil, it will flow very slowly from the surrounding area of the lane to fill that void. In doing so, the oil in the area about where the ball was rolled decreases in it’s density because a ball has been rolled in that area. That’s the primary way in which the oil on the lane surface gets drier as bowlers roll the ball in a specific area of the lane surface but not exactly at the same board on the lane surface.

The lateral flow rate of the oil is very small, but it exists nonetheless.

Oil Visualizing Models
Surface tension and viscosity are the two properties that prevent it from flowing too quickly. You can use two models to visualize the staying power of the oil. Very heavy oil can be modeled as gelatin (like Jello™ for instance). Basically, it’s there in the middle of the lane surface and when you roll a ball through it the ball picks up some oil on the surface of the ball. After the ball has passed through the heavy oil, the oily gelatin kind’a plops back together to partially fill the void. But the overall level of the oil in the immediate area of where the ball was rolled is a little less than before. There’s a small valley in the gelatin where the ball was rolled.

If more and more bowlers roll their balls in that same area, the track valley in the gelatin gets deeper until there is hardly any oil on the surface at all in that area.

How Does the Oil in the Middle of the Lane Stay in the Middle of the Lane?
The heavier the oil density and the greater the additives effect in the oil, the better it sticks to itself and the less it flows laterally (the greater is the gelatin effect). The oil does flow, but very very slowly.

If a bowling center lays down a blocked oil pattern from 10 to 10, they want the heavy oil to stay from 10 to 10 and it does. (The gelatin stays just about where it is placed).

Why Do Bowling Centers Put Oil on the Surface of the Lane?
The reason why bowling centers place lane conditioner on the lane surface is to allow the bowlers to reduce the amount of hook the ball has during the rolling path. Bowling centers would actually rather not apply any oil at all, it gums up their pinsetters and messes up their ball returns.
ABC does not require that there be any oil at all on the surface. However, if a bowling center does apply lane conditioner, it must be applied to a depth no less than 3 units.

Why Do We Move Left During a Bowling Night?
Remember the gelatin model. In a Step Block oil pattern there are usually three thicknesses of

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gelatin to contend with.

As more and more bowlers roll on those outer boards the outside gelatin is being worn away but that inside gelatin is still there and is still very thick.

The Edge of the Thick Gelatin
As bowlers move left they find where the beginning of the thick gelatin is by noticing the decrease in the hook of the ball and the increased oil track on the surface of the ball itself. (The ball rolling in the thicker gelatin has caused more gelatin to be deposited onto the ball). The high average bowler will find the correct alignment which satisfies the hooking requirements that he needs and will stay at that alignment for several frames. He is essentially rolling the ball at or very near the edge of the gelatin.

Sometimes the bowler will roll a little to the right or a little to the left, but essentially he is rolling down the edge of the oil.

Eventually, he wears down the edge of the gelatin and has to move left into a little thicker gelatin because he notices that the ball is beginning to hook more. So a bowler will usually continuously move left during a night of bowling.

Carrydown
There are situations that will cause a right handed bowler to need to move to the right. When the bowling balls roll in the oil, they pick up a portion of the oil. As the bowling ball leaves the oil, it deposits the oil back onto the lane surface. So, the dry outsides and backend areas can actually get wetter, causing the ball to break less across the lane surface. The solution is for the bowler to move to the right so that the ball will break left as it had before.

The same effect can be caused by one bowler rolling across the bowling path of another bowler. The first bowler deposits oil onto the area where the second bowler is presently bowling and sometimes very abruptly, the second bowler has little or no aggressiveness on the lane surface.

The Acceleration of the Oil Breakdown
Using the gelatin analogy, the oil in the middle of the lane is a “taller” layer of gelatin oil than the layer on the outside of the lane.

As bowlers wear away the edge of the thick gelatin oil, they create a very dry area to the right of the edge of the oil. As different bowlers swing the ball outward at different angles, the outside oil also gets worn away even more. This wearing away of the oil to the right edge of the heavy oil begins slowly but begins to increase as the match progresses. Eventually, the outside oil is almost nonexistent. During the period when the outside oil is wearing away, the height of the layer of gelatin oil in the middle is starting to decrease.

As bowlers are beginning to roll their bowling ball further inside, chasing the edge of the oil, the oil in the middle “bleeds” to the right side edge of the heavy oil where the bowlers are rolling their bowling balls.

As the bowling ball rolls down the edge of the heavy gelatin oil, the oil sticks to the surface of the bowling ball and pulls at the surrounding gelatin oil on the left side of the ball. The ball pulls the oil to the right into the “new” edge of the oil. Gradually the height of the heavy middle

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oil, the tall gelatin oil layer, gets shorter and shorter.

As the night of bowling proceeds, the right handed bowlers start to move left more often because the effect that the oil has on the ball at the edge of the oil is less because the middle layer of oil, the gelatin oil, is getting shorter and shorter. The “oil breakdown” is accelerating.

For example, a bowler might make a single move in the first game, 2 moves in the second game and 3 or 4 moves in the 3rd game.

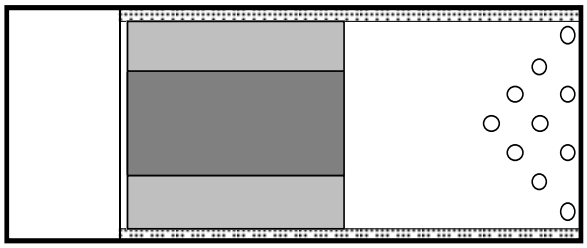
The possible stages of oil breakdown are as follows:

1. The area to the right of the edge of the oil gets worn away.
2. You start moving left as the edge of the oil moves left.
3. Gradually, almost all of the oil on the outside wears away.
4. The heavy oil starts to decrease in density.
4. The edge of the oil begins to accelerate leftward.
5. You start moving left trying to stay at the edge of the oil.

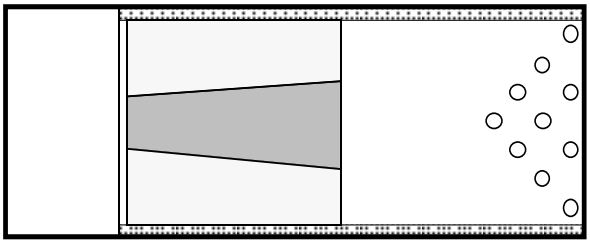
Wearing Away of a Blocked Oil Pattern

A blocked oil pattern has only two oil densities, very light and very heavy. Most of the bowlers will be rolling a path that crosses the edge of the heavy oil. Most of the wear stays near that edge of the oil. When bowlers wear out (remove all of the oil) at that edge, the edge is now at a more leftward location. The outside oil that was very light to begin with, dissipates also. Bowlers that swing the ball outward to the right remove that oil also by wiping the ball off with a bowling towel after rolling the ball.

The shape of the oil pattern changes shape also. As more and more bowlers are swinging the ball outward to the right, the “blocked” shape becomes slightly skewed toward the outside.



Above is a graphic that models the blocked oil pattern at the beginning of a league night.



Above is a graphic that models the blocked oil pattern after many bowlers have been rolling the ball along the edge of the oil and swinging the ball outward to the right (and left for left handed bowlers).

As you can see in the model, the shape of the oil begins to be a trapezoidal shape. The model also shows how the oil in the middle is decreasing in density.

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The Driest Lanes I've Ever Encountered

Once when I was on vacation I stopped at a little 10 lane bowling center in a small town in Louisiana. I got out my bowling ball and used my normal comfort zone first practice shot over the 12 board swinging the ball out to about the 9th board. The instant the ball touched the lane surface it started turning left. The ball went into the left gutter about half way down the lane. With as high an average as I have, I was shall we say, surprised. So, I started moving left with each successive ball that I rolled. I very quickly also switched to the hardest and smoothest and most non-reactive surface bowling ball I owned. It was a Roto Star drilled straight up (no side, no finger, no top, no nothing). Even with that docile ball I had to roll the ball harder than I had ever rolled the ball before.

On the left hand lane my final positioning was at board #70 counting from the right rolling the ball over the 6th arrow from the right rolling the ball as hard as I could. The right lane was shall we say, a problem. That darn ball return was to the right of where I would have stood to be able to walk straight toward the aiming mark. So I had two choices. I could either walk very crooked taking my 5 steps and wandering very far left just past the ball return or I could start in front of the ball return and modify my steps. So, what did I do?

I had some fun. I stood to the left of the left gutter and swung the ball out over the 6th arrow toward the 10 pin as hard as I could.

It's probably the most fun and most challenging situation I had encountered in a long time. After I had finished bowling the manager stopped me as I was leaving and asked me to return the next week. He had just purchased the bowling center and had not oiled the lanes in a day and a half.

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Alignment

Adjustments Before and During Competition.

Your Alignment

The combination of where you look out on the lane surface and where you stand back on the approach surface is called your alignment. Your alignment then is a set of numbers you need to carefully keep track of during the adjustment across the lane surface.

Your Eyes and Your Feet

Moving left with your Aiming Mark that is on the lane surface is called “moving your eyes”. Moving left with your Standing Spot on the approach surface is called “moving your feet.” How much you move your eyes with respect to your feet makes a difference in the manner in which the ball reacts.

Half Board Moves

It is far better to make many small moves than it is to make several large moves unless you have a specific reason to make a large move. The concept of “half-board” moves does work effectively during a league night to facilitate the adjustment of your alignment as the lane condition changes. For example: A half board move left with your eyes is a movement from the edge between two boards to the middle of the board on the left.

Increasing the Ball Path Length as You Move Left

As the league night progresses, oil that was on the lane surface is slowly being taken away from that surface. Most of the oil is being deposited on the bowler’s towels as they wipe the oil off of their bowling ball. You are generally moving left as the oil is being taken away from the right side of the lane surface.

Laterally across the lane surface you are getting closer to the head pin. Because of that, as you move left from that initial alignment aiming mark and standing spot, you need to increase the length of the ball path each move you go further left and get closer to the pocket. You need to move further left with your feet than you move left with your eyes. By doing that you are automatically swinging the ball outward more resulting in a longer ball path back to the pocket. The ratio of the feet movement to the associated eye movement, is greater than one, usually a ratio of 2 to 1.

Small Half-Board Moves with Your Eyes

It is far better to make small moves. The primary justification is that mistakes that you make with small moves are smaller mistakes. Since 1/2 board is about the most precision that bowlers can distinguish, a 1/2 board move left with your eyes while moving 1 full board left with your feet is proper (1 feet, 1/2 eyes).

The FTE Ratio

The Foot to Eye Ratio is defined as the ratio of the amount that you move your feet divided by the amount that you move your eyes when you make an adjustment in your alignment. When you make a move with an FTE Ratio of “one”, you are keeping the same Swing Angle, the angle of the imaginary line (direction) at which you actually propel the ball down the lane. When the FTE Ratio move is greater than one, you are increasing the ball path length from the previous positioning (ideal when moving left across the lane).

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Move Magnitudes, the FTE Ratio

The Foot to Eye Ratio (FTE Ratio) is the ratio of the change in the Standing Spot location to the change in the Aiming Mark location as you prepare to make a move. It should always be expressed as a ratio (for example 2 to 1 or 2.5 to 1).

In addition to recording when (what frame) that you make a move, you should also record what Aiming Marks and Standing Spots you will use for the next strike ball. This will enable you to keep historical data on the magnitude of moves that have worked in the past.

Moves may become more frequent and they may become bigger. It's not an unusual case. As the frequency of the moves accelerate, the lanes are getting really dry on the outside boards.

The increasingly drier outside boards effects the magnitude of the FTE Ratio that you use for the later moves. But since you have some historical data, you can also predict what the magnitude of the FTE Ratio needs to be for those future moves. That historical data shows what has worked well in the past.

Your First Move Point, How Much and What FTE Ratio:

After many weeks in a specific league, you might make the first move at the 7th frame. Your intent is to always watch how the ball is driving into the pocket area, but if you haven't already made a move, you intend to double your concentration on the 7th frame strike ball. If there's even the slightest indication that the lanes are now dry enough at the edge of the oil and on the outside for you to make a move, you will not hesitate to make a move. If there is no indication, you will wait until the next frame, roll the same alignment and again double your concentration efforts. If after 1 extra frame at the initial alignment, you still don't get an indication, you will take a detailed look at the tracks on your strike ball and verify that the initial oil tracks are still as visible as usual. If there is an indication of lessening oil tracking, you intend to make a small move left. Your plan is to make a (1 feet, 1/2 eyes) move.

How Often You Move, How Much and What FTE Ratio:

You also remember how many times you move "normally" during this specific league. You remember that you usually move once in the first game, twice in the second game and three times in the third game. So, you already realize that the oil will begin to accelerate left late in the match. What you really remember is not exactly when you usually move, but that it's about time to move. Regardless of the past history, you are committed to observing how the ball is driving into the pocket. If there is an indication, you are prepared to make another 2 to 1 FTE ratio move left. (1 feet, 1/2 eyes).

Finding the Initial Alignment

When you are practicing and trying to find the correct location on the lane surface where to roll the ball initially, the correct move across the lane should have an FTE Ratio of "1". That means that you move equal amounts with your eyes and your feet. (You're keeping the same Swing Angle (launch direction) that you are accustomed to when you normally roll the ball).

You line up initially based on what you see is the oil pattern observable by looking out over the foul line. Your alignment is probably somewhere near the observable edge of the oil.

If you roll that first ball of the night and it impacts the left side of the head pin, a large move left is needed. A move of 2 and 2 left is probably a good idea. Remember that you lined up initially based on the observable oil conditions. You can't really tell anything about the density of

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the oil.

So, you roll the next practice strike ball and it still comes into the pocket a little high. You would probably do well to make a move of 1 and 1 left.

Now the proper thing to do is to perform The Triple Tests (described earlier in this document)

By moving equal amounts with your feet and eyes, you have kept the same FTE Ratio and the same Swing Angle for the moves until you find a general location that results in a strike.

Your Comfort Zone

With today's wide open lane copnditions it's fairly easy to get into a mode of always rolling the ball at the same location every game and every series at just about every bowling center. And yes, Patricia, there is a Santa Claus. He is the laneman that determines what the lane conditions will be. Santa claus is, however getting very narrow minded. He only puts out one shot, the same shot each and every night. So we all get accustomed to the same location every night. And guess what happens when we go to a state tournament or some other somewhat more difficult lane condition?

"Heh, what's going on! I'm having to move way inside of where I usually bowl and I'm very uncomfortable here. I don'tt like to bowl here. Help, help, I'm scared! Oh darn, what am I going to do, I'm really lost way over here. Maybe if I bad mouth the lane conditions, they won't do that anymore."

Yeah . . . right.

Well, it simply doesn't work that way. There is never any guarantee that the lane conditions will be anything but bad. If they are such that you can bowl where you are the most comfortable, then go for it.

The solution is therefore to become at least able to perform and have some degree of confidence just about anywhere with respect to the alignment. Getting to that level of ability is not easy. It takes dedication and the ability to try new things and go beyond the usual, all the way to the extreme.

And, of course it takes finding some tough lane conditions. Sometimes that's not easy. Try late Saturday night after a full day of linage on the lanes or just after a large scratch league just about any night. An early day time is difficult to find, but if you want some really different lane conditions, try bowling just following a bumper bowling league of a senior ladies league. There will be just a tad of "carry down."

Regardless, you must practice on some very different lane conditions. And, you must not keep score. Make an effort to work on your performance. Make that your goal. Score doesn't mean a thing when you are working on performance.

General Concepts

As you swing the ball across the edge of the oil, the more your rolling path is to the right of the edge, the more the ball breaks left. As you roll the ball a little further left, the ball stays a little longer in the heavy oil and comes out of the oil a little further down the lane. The ball breaks less.

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The Angle of Attack that the ball enters the pocket at, with respect to the right side of the lane, influences greatly the ability to knock down the 5 pin after deflecting off the 3 pin. It also affects 10 pin. A little too much Angle of Attack or a little too small Angle of Attack and you leave the 10 pin.

The Angle of Attack into the pocket is influenced by the Swing Angle during the delivery of the ball. The more you swing the ball outward over your aiming mark, the more the ball will angle back toward the pocket at a higher Angle of Attack.

The increased Swing Angle at the release of the ball also increases the length of the rolling path. This comes in handy as the lanes begin to dry out.

Drying Lanes

As the lanes begin to dry out, your movements left need to have a FTE Ratio greater than one. Here's the reason why. As the lanes dry out, you are moving left as the edge of the oil moves left on the lane surface. The further you move left, the closer you are to the pocket laterally across the lane. Depending on the style of strike you usually have, the pocket is actually located with the ball at about the 17th board laterally. Later in the league night the lanes tend to get drier, not wetter. So, if you don't want to change balls or roll the ball differently, you only have one choice, swing the ball more outward to create a longer rolling path to compensate for the closer lateral position at the release point at the foul line.

If you are keeping track of how the ball is rolling into the pocket, your moves need to be an effort to anticipate the ball coming high into the pocket. So your moves for drying lanes should be a series of small 2 to 1 FTE Ratio if you are keeping up with the drying lanes. About the smallest move you can make that has a 2 to 1 FTE Ratio is a move of 1 board with the feet and 1/2 board with the eyes (1 feet, 1/2 eyes).

The Two Extra Practice Balls

It is the 3rd ball of the 10th frame of the 1st or 2nd game and your team is well ahead of the other team. You are rolling the ball well but you would like to know whether or not the next least reactive ball in your arsenal would work well now or whether or not you can make a small move at the beginning of the next game. In these situations you essentially have an extra practice ball. You are trying to anticipate changing lane conditions. You are always trying to roll the ball that best fits the conditions that are present now and in the near future. If you are getting close to the left side of your comfort zone, the 3rd ball of the 10th frame is an ideal time to find out if that next ball in your arsenal will work well now.

If you are not close to the left side of your comfort zone, the 3rd ball of the 1st or 2nd game is an ideal time to check the lane conditions if you were to make a small move to the left of your present alignment. If the ball behaves well and you are within about two frames of your normal moving point, you might consider a move at the beginning of the next game.

The Changing Oil Pattern

There are many different oil patterns that are possible. One predominates above all the others however. Most bowling center managers will put down the very best oil pattern they can. It makes sense because the bowler's score higher and therefore have more fun. The exact number of units of oil varies from center to center but generally the oil pattern of choice is the tapered pattern. The taper is both across the lane laterally and down the lane toward the

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backend. If the bowling center has a proper lane machine, the prefered oil pattern is the Christmas Tree oil pattern that tapers in both directions.

The tapered pattern has very little oil on the outside boards and heavy oil in the middle part of the lanes. How quick the oil tapers from the light to heavy oil varies from center to center. At most bowling centers the heavier oil will start somewhere between the 8th and 10th board.

When bowlers start a league night, they generally roll the ball just outside the heavier oil. So, at the beginning, the oil is being taken away from those near outside boards (8 - 10).

As the oil goes away (onto bowling towels mostly) bowlers will move to the left so that the ball will roll through more oil and curve less thereby compensating for the drier outside boards. As you roll the ball over an Aiming Mark, you should be watching how the ball is coming into the pocket. That's one of the most difficult things to do in the game of bowling. In all the excitement of the game, can you remember what your ball did the previous frame?

Viewing that many times gives you an idea whether or not you need to move left some more. But, sometimes that's not enough. Sometimes, you will roll several balls at slightly different swing angles and not really catch the fact that you should move **now**.

What can happen of course is a disaster. By not moving soon enough your next ball may come up a little too high. The question is whether or not you can anticipate a needed change another way. The answer is yes.

Standard Move Points and Magnitudes - Timed Moves

What you can do is determine your standard Move Points and Magnitudes for that league under those oil conditions. The Move Points are the specific points in the night of bowling that you usually make a move. After bowling in a league with about the same oil pattern you will find that your moves are at about the same frames each week. You will probably make that first move at about the same point in the game, probably the first game.

Let's say you stayed at that first location 7 frames. And, you will probably remain at that second location about a certain number of frames. Let's say you were at the second location 6 frames. A third move might come 5 frames later. The usual moves after 7, 6 and 5 frames establish a pattern if those moves are successfully repeated week after week.

The Move Magnitudes are defined as how much you move at your Standing Spot and your Aiming Mark and how much more you move at your Standing Spot than at your Aiming Mark. The Move Magnitudes are a little more difficult to establish but can be tracked from week to week.

The Practice of Applying an Oil Pattern at Bowling Centers

Most bowling centers will apply the same oil pattern and amounts of oil every week that you bowl. The only change might come when temperature, humidity and previous lineage effects the amount of oil. Mostly the oil pattern and amounts will be about the same. (Believe me, the center manager wants to do everything he can to get the most consistent conditions he can).

Establishing Your Probable Move Points

As you bowl in the same league under about the same oil conditions each week, you will probably move left at about the same frame. So, that's a benchmark you need to establish.

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You need to establish the Move Points during regular league play. It cannot be done during practice on Saturday or Sunday. It will take about 3 weeks of bowling to establish a meaningful set of Move Points. Here's how to do it.

Using a piece of paper or a form, keep a record of what your Aiming Mark and Standing Spot are and what frames you use that combination.

Suppose I use the initial alignment until the 8th frame of the first game (7 frames). I use the next alignment until the 4th frame of the second game (6 frames). I used the 3rd alignment until the 10th frame of the second game (6 frames). I used the 4th alignment until the 6th frame of the 3rd game (5 frames). I finished the league with the 5th alignment.

A little bell should be ringing right now.

If approximately that set of Move Points works occurs for the next two weeks for about the same conditions, you may have a tool you can work with to help you anticipate when to make a move in future games for those conditions.

Bingo!

That's it. If you know what has worked well in the past because you've kept some minimal records, you will have a benchmark to base future moves.

The reason that this works is simple. It's about the same conditions each week. It's about the same number of bowlers each week. And, you probably use the same ball each week for those lane conditions in that league at that time of the day.

Do You Move Exactly at Those Move Points?
No, but remember, you're keeping historical data on the Move Points and history shows that you would probably move about now. But, we all know that we roll the ball a little differently each week and the other bowlers around you roll the ball differently each week. That, along with the slightly changing lane conditions, may delay or speed up those Move Points.

The Move Points are not absolutes. They are probable points in the game when you will make a move. When you get to one of those change points and you're still rolling the ball well hitting your Aiming Mark and the ball is not coming into the pocket very high, you probably shouldn't move.

A Basic Law of Bowling
One of the basic laws of bowling is that you should not make a change unless you have a valid reason. Historical data **is** a valid reason. It is data that shows you that if you want to you can make a move left at general points in a game prior to making a mistake by not making a move in time. So, the reason for making the change is to keep from making an error.

But if it is only historical data that prompts a move, make it a small move.

Quicker Changes Later in the Game
Note that in the example data, the change points happen more frequent later in the game. Here's the reason why.

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The lane starts with a certain amount of oil on the lane. As bowlers roll their bowling balls over the same near inside area, the oil gets removed from the lane surface and is mostly put onto the bowling towels. The oil is also being pushed down the lane surface a little and some goes into the minute cracks in the surface itself.

All bowlers do not move left at the same time for their first change. And bowlers will move at different rates, at different points in the game. But as the game progresses, more and more of the bowlers on that pair of lanes will move further left.

As more bowlers move left, you will need to move further left because that location is getting drier because more bowlers have moved into that area and are removing the oil in that area. And because you moved left, you use up part of the oil in that area and the other bowlers will move further left.

Get the picture? The leftward movements start to accelerate as the game progresses.

The Best Initial Alignment
For exactly the reasons stated above, if you are initially aligned further left than the rest of the bowlers, you are in control of your own destiny. When you move left, you can almost always count on there being a little more oil on the left to adjust your bowling ball trajectory to get the ball back into the desired pocket area. But, that means that you must roll the ball in such a way that it takes advantage of the edge of the oil and gets a satisfactory angle of attack into the pocket.

Moving Too Quickly and Recovering and Delaying the Move
Sometimes you will err and move left too soon. The result is that the ball very lazily may make it back up to the pocket area, if at all. The other probably event is that the 5 pin or some spare containing the 5 pin will be left.

The solution is to move back to where you were last successfully located.

The Balls Rolled Ball Back at the Previous Alignment
Be very careful to observe how the ball is coming into the pocket area. Make sure that you don't let up on the speed of the ball. Remember, that previous move may have been only one or two frames premature. You may only roll one frame at that previous mark and then move left again. The decision on when to make that move left again is a tough one. You need to be very observant and confident that it is the correct action to take.

Positioning Yourself Prior to Practice Just Before a League or Tournament
You have learned that bowlers in the league just prior to your league are complaining because of all the oil on the lanes. Also, you observe that a bowler that you know and watch bowl each week is rolling the ball to the right of his normal comfort zone. You suspect that the lanes are indeed wetter than usual and you decide to position yourself a little to the right of your normal starting position. You plan to use your normal Swing Angle and position yourself to roll over a specific Aiming Mark and stand on a chosen Standing Spot. That is your plan of attack to start practice with. It could and probably will change during the practice period just before league begins. But, at least you have a definite Plan of Attack.

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Positioning Yourself <u>During</u> Practice Just Before a League or Tournament
You begin to practice using the plan of attack. During this period, you must decide whether or not your plan of attack is satisfactory or a modification is needed.

You roll the ball twice over the 8th board and the result is that the ball goes high into the pocket. Hmmmm...they're not as wet as you estimated. You decide to move left "1" board to check out the conditions a little further inside. (1 feet, 1 eyes)

You roll the ball again. You perform well and roll the ball over the intended mark. It hits the pocket and leaves the bucket (the 2,4,5,8). Hmmmm...the ball is not driving through the pocket well at all. You decide that an increased angle of attack might be the adjustment to make to get the ball to drive through the pins better. You increase the angle of attack by one board left. You move (1 feet, 0 eyes). You roll the next ball. Bang, it's a strike, you're probably ready for league. If you have time, you perform The Triple Tests described earllier in this document.

Adjusting Positioning and Swing Angle During League
It's the 9th frame of the first game and you remember that in the 8th frame the ball came up a little high in the pocket. You decide to move a little left into the oil 1/2 board (1 feet, 1/2 eyes). You roll the ball. Bang, it's another strike . . . . good decision.

In the last frame of that game, your team is so far ahead it's ridiculous. You leave a 10 pin the first ball and you pick it up. Hmmmm ...it would be a good time to experiment with another small move. You decide to check what another 1/2 board move will do (1 feet, 1/2 eyes) You roll the ball. Bang, it's another strike . . . . another good decision.

By experimenting in a sensible place, the third ball in the 10th frame, you have gained some knowledge. When you want to you can move left another 1/2 board and still get good results. You decide to go ahead and keep that last 1/2 board move. Your objective is to try to anticipate as much as possible the changing lane conditions.

You begin the 2nd game. Great start, 8 strikes in a row! That 8th strike was a "Trip Nine" and they just barely fell. The previous two strikes were also kind'a high, but heck, they were strikes! You reach down into the deepest part of your guts and decide that you need to make another small change, it's a gutsy decision indeed. The oil is beginning to go away and if you don't move, and you roll it into the nose, you'll regret it for a long time. You move another 1/2 board move (1 feet, 1/2 eyes). You roll the ball. Bang, another strike, another good decision! (On purpose I won't tell you what you finished that second game with, I know you did well).

You become rich and famous and live happily ever after. . . .

Increased Probability - The Self Correcting Rolling Path
You cannot roll the ball with exactly the same speed, direction, lift and loft every time. What you would like to have is the best chance of the combination of whatever you do to the ball ends up with approximately the desired results. You want the highest probability of success.

Bowlers use three very different bowling ball rolling paths:
the point shot - pointing the ball toward the pocket area from the far right side,
the down and in shot - rolling the ball down a specific board toward the pin deck, and
the swing shot over the edge of the oil - swinging the ball outward toward the gutter and letting

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the ball curve back toward the pocket.

Remembering that normal lane conditions are defined as drier outside boards and wet inside boards, which shot has the greatest probability of success under normal lane conditions. For today's Christmas Tree oil pattern, the swing shot is the clear winner.

Making the Error to the Outside

First and foremost, when you swing the ball outward, you are swinging the ball out over a drier area of the lane. The further you swing the ball outward, the drier the lane surface is and the greater the break of the ball is coming back to the pocket. You as the delivery system, intend to roll the ball with a specific swing angle, but you as the delivery system malfunction on a regular basis. You swing it a little less and you swing it a little more sometimes. The trick is to get that median swing angle where you can err to a greater or smaller swing angle and still get the same results. The primary reason why the swing shot gets the #1 rating is that it constrains the error to mostly being made to the outside. The other shots will allow you to more easily make an error to the inside of the intended release direction. (Not a good thing).

The Self Correcting Aspect of the Swing Shot

The swing shot is self correcting on normal Christmas Tree oil pattern lane conditions. The trajectory of the ball has the same characteristics of a projectile being fired down range by a cannon. (Looking at the rolling path of the ball from above). You want the projectile to end up at the chosen target, for bowling, it's the pocket.

When you fire the projectile, there is more than one firing elevation angle (swing angle of the bowling ball) that allows the projectile to hit the intended target for the same muzzle velocity of the cannon (the release velocity for a bowling ball). For a bowling ball and the appropriate lane conditions, there are an infinite number of angles, all of them pointing outward from the point of the release of the ball. The further you swing the ball outward, the more it breaks back inward. The projectile ends up at the same target down range (the pocket).

The Drying of the Lanes and the Speed of the Ball

Generally the lanes get drier as a league night progresses. As the lanes get drier, your bowling ball will hook more and more and more. The first game of an early league there might be a lot of oil on the lanes. During the third game of a late league, the lanes may be like sandpaper.

Adjusting after your ball is crossing over the head pin is too late. You must anticipate the changing lane conditions. And, as you bowl more games, your speed will naturally go down a little because you get a little fatigued. Another late occurring problem is that you start rolling the ball a little earlier (closer to the foul line) than at the start of a league. The ball rolls longer and thus hooks more. When all three occur, increasing dryness, decreasing speed and early rolling, you ball begins to hook more.

The "Light to Pocket Hit" Criteria for Changing Position

As you practice before league, you decide what standing spot and aiming mark you will use for a strike and spares. If you choose an alignment such that the ball goes high into the pocket, you're asking for trouble. Try to pick the initial positioning that gets your ball no higher than the pocket and be satisfied when it only comes up light.

A better choice would be to find initial positioning so that the ball gets to the light pocket hit consistently. As the lanes get drier, your bowling ball will hook more. When you notice that

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the ball is starting to get higher into the pocket, adjust by moving your standing spot left and your aiming mark left into the oil more.

Cautions About Deciding to Change

No change to your positioning should be based on a bad ball. If you are concentrating properly, you should be able to tell whether or not you rolled the ball over the intended aiming mark in the intended direction. If you pulled the ball to the left and the ball went high into the pocket or Brooklyn, do not make a positioning change. (You might consider relaxing and focusing more so you can hit your mark).

If you did roll the ball over your mark in the intended direction, and you went high into the pocket, consider a change based on how high you went.

Ordinarily between successive frames, the lanes will not dry out so much that your ball will switch from a light hit to a Brooklyn hit. So, you probably rolled a bad ball if that happens. Don't make a change based on a bad ball.

The "light to pocket" targeting criteria allows you to see the change in the lane conditions before disaster occurs. You are letting the lanes come to you; you're letting the lanes dry out and the ball come up to the heavier pocket hit, not past the heavy pocket hit.

Many bowler's use the "light to pocket hit" targeting criteria very effectively.

Positioning Using the "Light to Pocket" Criteria

If you're using the "light to pocket" criteria, the first move should be a small one since you haven't gone very high into the pocket or Brooklyn yet. Moving the standing spot 1 board and aiming mark 1/2 board to the left is probably satisfactory (1 feet, 1/2 eyes). And, if in the next frame, your ball still goes up into the pocket higher than you want, move your standing spot another 1 board and aiming mark 1/2 board to the left (1 feet, 1/2 eyes).

If the ball changes from a light to very heavy pocket hit and you know that you hit your mark, you might consider moving your standing spot 2 full boards to the left and aiming mark 1 board left (2 feet, 1 eyes).

Positioning and Getting Strikes

What if you're going very high and getting strikes?

With respect to score, it certainly matters if you're getting strikes. It doesn't matter how or where the ball does it, a strike is a strike is a strike. Should you move at all when you're successful getting strikes even though the ball is either coming up very high or going Brooklyn?

Yes, you do. You move at the first indication based on a good ball rolled and a missed target at the pin deck.

Regardless of what the score is now it could get a lot worse if you don't move and, you may only be able to get more strikes if you do move. (More on this in the Extreme Decisions - Extreme Conditions Section).

When Lane Conditioner is Applied

Usually, lane conditioner is applied just before the early nighttime leagues begin. Overnight or

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very early in the morning, the lanes are stripped and a new coat of lane conditioner is applied for the morning and daytime leagues, if any. If there are not any daytime leagues, the application of the lane conditioner may be delayed until about an hour before the night leagues start. If there are daytime leagues and or if there is a lot of open play on the lanes, an additional application of lane conditioner may occur. Leagues that usually begin at around 6:30 PM may have the conditioner applied about 5 PM.

Move in the Direction of the Error

The general rule for adjusting simply stated is "Move in the direction of the error". So, if you are missing to the right (if the ball is failing to make it up to the target, you move both your eyes and feet to the right and if the ball is going past the target to the left, you move your eyes and feet to the left). There are few exceptions to this rule.

The Importance of Damage Control

Note that in the previous examples, the impetus was to move unless there was an indication not to move. When the oil is going away, that's called "damage control". In that late part of the match, if you know that the edge of the oil is going to accelerate left, your objective should be to have a reason not to move. The lanes are changing so fast that your anticipation of the changing conditions needs to be in a manner that prevents the ball from arriving high in the pocket. To accomplish that, you plan of attack is required to be less conservative during that last game if the oil condition usually accelerates left during that period.

The Plan of Moving Back to the Previous Mark

If you, for one reason or another, make a move and the ball just barely makes it back up to the pocket, your plan is to understand that you made a move a little too soon and immediately move back to the previous mark at least one frame and observe how the ball enters the pocket again. You are again looking for that slight indication that fulfills the criteria that it is time to make a move. And, as long as it is early in the match, you stay at that alignment until there is such an indication.

Adjustments in a Late League

When the lanes are dry, adjustments should be greater than for wet lanes. Moves of (4 feet, 2 eyes) are not uncommon.

Changing Oil Conditions in a Late League

First and foremost, determine the kind of bowlers that bowl on the pair of lanes that you are scheduled to bowl on that night. If the bowlers are high average bowlers, the lanes will in general be drier in the area that you roll the ball, probably between the 8th and 11th boards. Take a quick look at the bowlers. You'll probably recognize whether or not the league is a scratch league or a handicap league. If it's a scratch league, their averages are probably fairly high. If it's a handicap league, check to see what the averages of the team members are that are bowling on your lanes. You may recognize the high average bowlers but check out the team names on the monitors and then check their league standings sheet. You could also simply watch where they are rolling the ball, and whether or not a majority of the bowlers on that pair are wiping their ball after each delivery. The higher average bowlers will usually wipe their bowling ball each time they roll the ball when the lanes are really wet and some wipe their bowling ball regardless of the oil on the lanes.

Of the principal causes of drying lanes, evaporation, seepage, bowlers pushing the oil down or out to the right, and bowlers wiping their ball after each delivery, the last one, wiping the oil off

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the ball impacts the drying more than the others. That's why scratch leagues tend to dry the lanes out more than handicap leagues. The high average bowlers pay a little more attention to their ball preparation and try to start with a "fresh ball" each delivery.

Oily Heads and a Stripped Back End

Oily heads means that the first 20 feet or so of the lane is heavily oiled. Stripped back ends means that the lane has been completely cleaned of all oil on about the last 20 feet or so. When this condition exists, the ball will slide very far down the lane before the ball hooks, but it will tend to really snap at the back ends.

As the lanes get drier on the heads, the front part of the lane surface, the ball will tend to adhere to the lane a more and the ball will start breaking earlier.

Oil Being Pushed Around on the Lane Surface

After the lane conditioner is applied to the lanes, where it ends up later in the bowling night depends upon where the bowlers bowl. The strike ball is greater than 50% of each bowler's game and rolling those strike balls cause the most change in the initial positioning of the oil. And, because of that, most of the oil is tracked down wherever most of the bowlers are rolling their strike ball.

Oil adheres to some balls better than others. The very porous bowling balls will really soak up the oil. The newer resin surface bowling balls are less porous and oil consequently does not adhere to their surface as easily, but is still an appreciable amount. Both type balls however will retain a track of oil and you will need to wipe that oil away with your bowling towel.

Different oil conditioners have different "pushing" characteristics. Depending on their viscosity and additives primarily, the oil conditioner may not be pushed around at all. Some oil conditioners may turn out to score fairly well during early leagues but may get pushed so far down the lanes that back ends are not in their freshly stripped state and the ball begins to hook less rather than more.

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Alignment

Watching the Other Guys.

Watching the Other Guys

Are you keeping track of where the other bowlers are rolling their bowling balls? If you don't, you may regret it when the lane start drying out later in that league night.

If you are rolling the ball over the 11th board and 4 other bowlers are rolling the ball over the 12th board, they are using up the oil ahead of you. When you see that the oil in your area is signaling that you should make a move left, when you make that move, you are moving directly into a drier area, and area that is going to make your ball break more, not less.

Whoever said this game was easy?

If you happen to not see it coming and you roll that ball into that drier area and escape alive by simply coming up high into the pocket, you probably need to keep on moving the next frame.

First verify that there are other bowlers causing the problem for you. If that is the case and if it was not just a badly pulled ball left into the head pin, make another adjustment. Make a 2 to 1 FTE Ratio move, but this time make it 4 boards with your feet left and 2 full board with your eyes left (4 feet, 2 eyes). If that doesn't solve the problem make another 2 and 1 move left (2 feet, 1 eyes).

You've got to find that suitable alignment where the ball is just making it back to the pocket without too much overdrive. You want the lane to dry out further from that alignment and coax the ball even further up into the pocket.

Rolling Along with the Rest of the Guys

The swing shot allows you to roll the ball further inside. The more you swing the ball, the further inside you can roll the ball. With the more powerful resin surface bowling balls, you can roll the ball further from inside across the edge of the oil. And that's where you want to be. Here's the reason why.

If you roll your bowling ball at the same general area that they are, you'll be able to adjust and anticipate moving in a timely and correct manner. If you can roll the ball left of where they are rolling the ball, you now have the advantage. You are forcing the other bowlers (when they make a move) to roll their bowling ball in the area that you use up. By doing so, you control your own destiny instead of being dependent upon or imposed upon by the other bowlers.

Editor's Note:
Although this is only one page for this topic, it is just as important as the other topics.

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Alignment

Watch the Ball - The Red Flags for Moving.

Having a Reason vs. Anticipation for Adjustment During a Series of Games

There are lots of reasons to move your “eyes”, your aiming mark and or your “feet”, your standing spot. And, there are also some criteria that can be used to base a reason for moving. (Note: It is assumed that you have rolled the ball over the intended aiming mark at the intended direction and that the delivery was normal, i.e. no abnormal release of the ball, no pull, no push, no abnormal loft, and no abnormal sound made by the ball hitting the lane. It is also assumed that there is a tapered oil pattern with less oil on the outside than at the middle of the lane).

1. <u>The ball never makes it to the pocket.</u>
   Either the incorrect ball has been chosen or the lanes are too wet for the ball that was chosen. Move your aiming mark and standing spot to the right in equal increments. How much depends upon how much the ball missed the pocket. If the ball didn’t even get close to the pocket, make a gross adjustment by moving your eyes and feet to the right by at least 2 boards (2 feet, 2 eyes). If the ball just barely missed the pocket, move your feet and eyes to the right one board (1 feet, 1 eyes).

   The most frequent indicator is a washout. If you rolled the ball well and you got a washout consider moving to the right.

2. <u>The lazy arrival at the pocket.</u> (The trajectory kind’a fades out near the pocket). When the ball arrives at the pocket without enough drive, you leave some pins you didn’t expect.

   The most frequent indicators are leaves like the 5 pin, the bucket (the 2,4,5,8), and the bucket without the 8 pin (the 2,4,5).

   Either the ball does not have enough adherence to the lane near the pocket of there is more oil than you expected near the trajectory that you rolled the ball. In either case, you need to get the ball to an area of the lane where it has less oil so that it can get a steeper angle into the pocket so that you will not leave the above mentioned pins.

   One solution is to move both your eyes and feet to the right. If the lanes are drier on the outside the ball will naturally curve more and this will give you more angle into the pocket. However, the lanes may be too dry to move your present trajectory to the right. Another and most frequently used solution is to move your feet to the left about one board but keep your eyes at the same aiming mark (1 feet, 0 eyes). What this does is swing the ball out to the drier part of the lane while keeping your general trajectory in the same area. It just modifies the trajectory to make it curve more at the end. (This is a case where the general rule of moving in the direction of the error is not strictly adhered to but necessary to get the proper angle into the pocket to drive through the 5 pin and associated pins).

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3. The quick arrival at the pocket.
   With a little experience, you will be able to detect when the ball is beginning to hurry to the pocket. This means that during the last few feet before the pocket the ball really breaks toward the pocket in a hurry. There's nothing really wrong with that ... if you can maintain that line. In most cases you will not be able to very long.

   The best indicator other than simply noticing that the ball is driving a little harder into the pocket is that for some reason you roll a ball a little to the right of the aiming mark or you swing the ball a little to the right and the ball when it curves back to the pocket goes very high or Brooklyn.

   If it does, it means that you have now lost your range in your trajectory. Ideally you want to roll the ball in such a way that when you do swing the ball a little to the right, it will swing back to the pocket but not high or Brooklyn. The solution in both cases is to move both your eyes and feet to the left a small amount and observe the ball again when you next roll the ball to check it's trajectory characteristics. This move may be as little as (1 feet, 1/2 eyes). But if the same trajectory characteristics occur, you must keep moving until it ceases. Only then will you be in the proper range for the trajectory of your ball.

4. The ball goes Brooklyn or very high into the pocket.
   Actually, this should never happen. If you are properly observing how the ball is moving into the pocket, you should adjust before the ball ever goes Brooklyn. In fact, one way to determine whether or not you are observing and anticipating properly is whether or not the ball ever goes Brooklyn on a well rolled ball.

   The most frequent indicators are splits of the worst kind like the 7-10 and the 4,6,7,10, the Greek Church.

   You should move to the left at least (4 feet, 2 eyes).

Adjusting The Angle of Attack into the Pocket

The angle of attack into the pocket is one of the major factors in getting strikes and leaving less 10 pins. When the angle of attack is too shallow, you will leave a lot of 10 pins and some splits, and when the angle is too great you will leave a lot of 9 pins and 10 pins and some splits. It's very difficult to identify what the optimum angle of attack is for an individual bowler using a specific ball, style of bowling and trajectory type. About all you can do is to make a small change and observe the results. If there are less 10 pins and you still are getting to the pocket adequately, you did a good thing. Otherwise, another change might be in order.

To get a greater angle of attack, move your feet to the left but do not move your eye position. This swings the ball out a little further and allows the ball to get to an area that is a little drier. The ball will adhere better and will break harder toward the pocket. The angle of attack will be greater.

To get a lesser angle of attack into the pocket, move your feet to the right but do not move your eye position. This swings the ball out a little less and keeps the ball in a wetter are of the lanes. The ball will break with a decreased angle of attack toward the pocket.

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Anticipation of Changing Oil Conditions

If you're striking frequently, should you move?

The answer is neither "No" or "Heck No". The answer is "Well, ... it depends".

In almost every case, a high average bowler is constantly analyzing the characteristics of the trajectory that the bowling ball makes and he bases a slight change in either the aiming mark or standing spot or both on those observations. There are other considerations also. If over the past recent history of the lane conditions (the past few weeks of bowling), the lanes have begun to deteriorate rapidly in the latter games, that has to be a prime consideration when analyzing the past few frames, or even the last frame.

Here's the biggest problem of all. If you don't make a small move and the ball does adhere a little better because of drying lane conditions, and the ball moves at a little steeper angle or further into the pocket, a tragedy can occur. It can happen at any time if you are not properly anticipating changing lane conditions. But the opposite can occur. If you try to outrun the changing lane conditions too much, the ball will lose it's drive into the pocket, but it will probably still hit the pocket and it has high probability of getting a strike because it may result in a light pocket hit.

Which has more probability for disaster, moving early or not moving? The answer is that not moving may result in a high pocket hit, a situation that could leave a split. Moving early will result in a light pocket hit, a situation that could also leave a split, but not near as often. More likely, the light pocket hit will result in a strike.

There is a caution in utilizing this criteria for moving. Make sure that the move based on anticipation is small, no more than (1 feet, 1/2 eyes).

Examples:

Example #1: It is the first game that night in an early league. The lanes are tapered and kind'a wet as usual. You are rolling a small swing shot over the 9th board, swinging out about 2 boards. Everyone else is rolling about the same area, the 9th or 10th board. You have strikes in the first 4 frames. The ball is still not jumping up to the pocket or going high and one of those strikes swung a little more to the outside but still made it back and clipped the head pin to get a pin splattering (garbage) strike. The last strike was a sweeper strike. You remember that last week you moved a little after about 4 frames. You are still bowling at the initial eye and foot position that you started the night with. Should you move in the 5th frame?

Answer: If you move, it should be to the left (1 feet, 1/2 eyes) because the lanes are wet. If you move (1 feet, 1/2 eyes) and you notice that the ball makes it to the pocket and maybe gets a strike, but kind'a fades a little at the end, you may have moved prematurely you should probably move back where you were. Remember, another indication of fading is the bucket or 2,4,5 spare (or just about any spare with the 5 pin). If that happens, even though you hit the head pin, it's an indication that your ball is not driving through the pins and you should probably move back. If however, the ball reacts properly and still has about the same trajectory characteristics, you made a good move.

Example #2: You are striking frequently and sparing consistently in the first game. You are now in the 8th frame. By mistake, you swing the ball a little too much and the ball seems to come back to the head pin a little quicker than usual. But you are fortunate and it only results in a high pocket hit and a single pin spare. Although it is the 8th frame, you are

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still at the initial starting eye and foot position. In this league, the first move is usually about this time. Should you move in the 9th frame.

Answer: Yes, remember that coming back harder than usual into the pocket area is a criteria for moving. Move (1 feet, 1/2 eyes) to the left. In this case, since it's the 9th frame, if the ball fades into the pocket using the moved positions, you should probably stay with the new location and let the lanes continue to dry out and as they do your new position will become even better. It is the 9th frame and you already remember that you usually move by now.

Example #3: You are leaving a lot of 10 pins and your score is suffering badly. The ball is coming up to the pocket each time but that darn 10 pin doesn't seem to want to go down with the rest of the rack. You have just finished the 3rd frame of the 2nd game and you have moved 2 times already trying to stay up with the drying lane conditions.

Answer: The recurring 10 pin is a tough problem. Other than rolling a different ball for strikes, you might try changing the angle of attack into the pocket. If the ball is coming into the pocket at a shallow angle, move your feet to the left (1 feet, 0 eyes). This will swing the ball a little further out and give it a little more angle of attack into the pocket. If however, the ball is already coming in at a very steep angle, do just the opposite. Decrease the angle of attack by keeping the same eye position and moving your feet to the right 1 board (1 feet. 0 eyes). For the initially steeper angle of attack ball, another choice would be to move your eyes to the left one board and feet only 1/2 board (1/2 feet, 1 eyes). Since you have moved your feet less than your eyes, the angle of attack should be decreased and the 10 pin leaves may be curtailed. If you still have a steep angle of attack, move the same amount again.

Five Pin Spare the Previous Frame

If you leave any spare that includes the 5 pin, you need to increase the Angle of Attack into the pocket just a little without altering many of the other variables. Make a small move with your feet left but do not move your eyes. A 1/2 board move with your feet left is probably sufficient (1 feet, 0 eyes). Remember you are so close to the pocket that you don't want to change very much.

This small adjustment in the alignment will keep you near the pocket and also increase the Angle of Attack into the pocket.

Ten Pin Spare the Previous Frame

A ten pin leave can be caused by the 6 pin going to the left or to the right or over the top of the 10 pin. You are so close to getting a strike when you leave the ten pin that you don't want to change the alignment very much. For that reason only very small moves should be performed. Either make a 1/2 board move to the left or a 1/2 board move to the right with your feet only. That means that the resulting Angle of Attack will either increase or decrease. That will influence the direction that the 6 pin takes in the vicinity of the 10 pin.

Seven Pin the Previous Frame

In the same way that the 6 pin is the culprit for a 10 pin leave, the 4 pin is the culprit for a 7 pin leave. Again, you are so close to the pocket that you don't want to change very much.

The removal of the 7 pin is greatly affected by the initial impact location. That impact location determines the Angle of Impact, the angle defined by the line drawn between the center of the bowling ball and the center of the stationary pin being impacted. It's like a cue ball impacting a stationary pool ball. The direction of that impacted pool ball is determined by the Angle of

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Impact. You want to drive that head pin into the 2 pin at an Angle of Impact of 30 degrees. That results in the 1 taking out the 2 and the 2 taking out the 4 and the 4 taking out the 7 pin all at the magical Angle of Impact of 30 degrees. (Doesn't happen that often or that easy, but we try and we try and we try).

Usually the solution for getting to a different impact location and changing the resulting Angle of Impact is to make a small move left or right with a FTE Ratio of 1 to 1. The actual move should be the smallest you can make. Move right 1/2 board with your eyes and 1/2 board with your feet (1/2 feet, 1/2 eyes). That means that you are shifting right with your rolling path into slightly heavier oil. Your angle of attack will not change that much but your impact location will be slightly higher onto the head pin.

Nine Pin Spare the Previous Frame

Your bowling ball is driving through the pocket with a tad too much Angle of Attack. The ball after deflecting off the 3 pin is driving so hard that it goes a little too direct at the 5 pin and does not deflect off the 5 pin to the right to take out the 9 pin and the 3 pin misses the 9 pin on the right side. And the ball swishes by the 9 pin on the left side.

Decrease the Angle of Attack into the pocket by making a 1/2 board move to the right with your feet only (1/2 feet Right, 0 eyes)

Consistently a High Flush Pocket Hit

Be careful. Watch how the ball is approaching the pocket area. If it is a shallow rolling path that makes it to that high flush pocket hit, an adjustment may not be necessary. If however the ball is racing back to the pocket to get to that high flush location, you might consider a "drying lane" move as described above. If you find that the ball is racing back to the pocket more than usual, make a (1 feet, 1/2 eyes) left move.

Consistently a Light Pocket Hit

Don't move. Don't do a thing. Let the drying lane coax the ball gradually higher into the pocket. Ideally, for league bowling where the lane conditions are changing, this is where you want to be.

Once you are at that alignment that's giving you a consistent light pocket hit, keep track of how the ball arrives at the pocket. If the ball starts to get a little higher of if the ball starts driving a little harder than before, a small "drying lane" type move might be prudent to anticipate the drying nature of the lanes.

Time to Switch to Another Ball

1. You are at the left side of your comfort zone and you have noticed that the ball is starting to return to the pocket with a vengeance. Records show that for this league, you haven't done well if you keep moving left out of your comfort zone.
2. You have any doubt at all about the feel of the ball on your hand. It must feel right or must be adjusted to feel right otherwise, you must switch balls. It's like playing with a loaded gun. You simply don't do that.

This means that in all cases you must have at least 3 balls. (Strike ball, spare ball and backup strike ball).

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Alignment

The Spare Game

How Many Different Aiming Marks Should You Use?

Usually a bowler has one Aiming Mark for a strike ball. The choice of that Aiming Mark is directly dependent on the lane conditions and the ball choice. Sometimes if the lane conditions are different on two lanes, a different strike ball Aiming Mark will be used for the other lane.

For spares, historically bowlers have used one Aiming Mark for the left side spares and another Aiming Mark for the right side spares and maybe a third one for the middle spares.

Choice of Aiming Marks for Strikes and Spares

Generally spares on the right side have a higher probability of being converted when you stand at the far left side of the approach. And, correspondingly, spares on the left side have a higher probability of being converted when your standing position is on the far right side.

The premise is that you have more lane to work with in each case. So, how far right is “far right” and how far left is “far left” ? Well it’s as far as you can stand and not be encumbered in any way by either the ball return or a sticky or slick area on the approach.

You should stand no closer than about 2 inches away from the ball return regardless of your chosen Aiming Mark.

The Four Primary Spare Alignments

To increase the probability that you will consistently convert spares, you can develop a plan of attack that uses four different aiming marks. Each aiming mark is chosen to cover a particular area of the lane surface.

Left Side Aiming Mark

The Left Side Aiming Mark is chosen for the best chance to convert the 4 and 7 pin family of spares. The basic requirement is that the aiming mark be as far to the right as possible and that you stand very far to the right to accommodate the alignment. The far right alignment gives the bowler the maximum lane surface to work with and the highest positive angle of attack possible for a straight ball.

Right Side Aiming Mark

The Right Side Aiming Mark is chosen for the best chance to convert the 6 and 10 family of spares. The basic requirement is that the aiming mark be as far to the left as possible and that you stand very far to the left to accommodate the alignment. The far left alignment gives the bowler the maximum lane surface to work with and the highest negative angle of attack possible for a straight ball.

Center Aiming Mark

The Center Aiming Mark is chosen for the best chance to convert the middle lane area family of spares. Those spares include just about every other spare except those covered by the left and right side aiming marks. Preferably, the Center Aiming Mark should be the very center of the lane surface, board #20. By using the center of the lane as the Center Aiming Mark, the ball is rolled very nearly down the direction of the boards for most of the spares that are in the middle of the lane.

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Strike Ball Aiming Mark

The Strike Ball Aiming Mark is chosen for some centrally located spares, but only when the lanes are not too oily or too dry. Although the strike ball is rolled over 50% of the time at the central portion of the lane, when the lanes are very very dry or very very wet, it may be more advantageous to roll a straight ball over the Central Aiming Mark with the proper alignment for converting the centrally located spare. If the lane surface is very very dry and you roll an adjusted strike ball shot at, for example, the 2 pin, the slightest error may cause the ball to miss the spare. The same problem can occur with very wet lanes and the ball misses to the right. But, if the lane surface is neither very wet or dry, the Strike Ball Aiming Mark may be the best choice.

Breaking Ball Spares (Additional Alignment)

The fifth spare alignment is not a single aiming mark; it is many aiming marks any one of which may be used when the situation dictates. It is the high angle of attack aiming mark. Some spares can best be converted when the ball impacts the set of pins with a high angle of attack. The 2-7-8 is a good example. There are two ways to convert the spare. If the ball impacts the spare on the right side of the 2 pin, it must have a high angle of attack. Unless you have a high angle of attack when the ball impacts the 2 pin, the ball cannot impact the 8 pin.

The other way to convert the spare is to impact the 2 pin more direct so that the 2 pin deflects into the 8 pin. The ball then deflects to the left into the 7 pin if the angle of attack is high enough.

The location of the high angle of attack aiming mark is probably very near the strike ball aiming mark. In most cases, if you swing the ball over the strike ball aiming mark, outward to the right, the ball will break harder back toward the pocket area. Because you are familiar with the strike ball aiming mark, the high angle of attack aiming mark could usually be chosen near that aiming mark.

The alternative is to use the left side aiming mark since almost all of the left side spares are high angle of attack spares.

Why You Miss More Right Side Spares

The main reason why you miss more right side spares is that the left side spares are better aligned with the rolling path of the ball. The right side spares are not.

For left side spares the path of the ball is nearer to the same angle as the front row of pins, the 1-2-4-7 and the second row of pins, the 5-8 pins. As a natural consequence of your ball curving right to left, if you get to the left side of center of the lead pin of most of the left side spares, your ball will probably knock down the rest of the pins.

But the angle of the right side spare rows of pins, the 1-3-6-10 and 5-9 rows, are probably not very close to the angle that your ball path has as it intersects the pins. And, that's why you miss the spares on the right side. It's because the probability of chopping is greater on the right side. The closer the ball path angle is to the angle of the right side rows of pins, the less the chance of chopping. The more your ball curves in the neighborhood of the pins, the greater the chance of chopping. So, ...don't do that.

To enhance the probability that you will convert the right side spare and not chop, the angle of the path of the ball must be closer to the angle of the rows of pins, the pin line angle. To do

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that, if you pick an Aiming Mark closer to the left and stand much further left, you will get a much better match of the pin line angle. A by product of lining up for right side spares in this way also gives you more lane area to work with.

Recommended Rolling Paths

All spares can be categorized by the rolling path associated with picking up that spare and the general area of the pin deck that the spare is located. The four types of spares can be divided into these four categories.

Far left side spares:
Spares that are splits with the most forward pin on the far left side (like the 4 -10). A straight ball is usually the best rolling path that can consistently convert the spare.

Left side spares:
Spares that have a left side fence row or part of a fence row as the most forward pins in the spare set. These spares require a positive angle of attack. They can also be thought of as ball deflection spares. The intent is for the ball to deflect off of the leading pin and impact most of the rest of the pins.

Strike ball spares:
Spares that require a rolling path very near the strike ball. These spares are usually in the middle portion of the lane.

Right side spares:
These spares are generally to the right of the head pin. They require the least angle of attack possible. (Negative would be perfect but it's difficult to roll a backup ball just for the right side spares. So a straight ball gives you the least angle of attack without rolling a backup ball).

Bowlers vary in the number of different Aiming Marks that they utilize to shoot at those spares but for this scenario the logical number is four different Aiming Marks, one for each of the different types of spares.

The rolling path recommended for each of the different types of spares generally implements the idea that the more lanes area you have to work with, the more you will pick up the spare. The recommended rolling path for the left and right side spares are ones that attempt to maximize the middle of the lane in order to interact with the oil as much as possible and use as much of the lane area as possible. This may allow you to roll the same ball for those spares that you do for the strike shot. It also reduces the break of the ball which reduces the error factor both right and left.

Spare Making Techniques
(To Break or Not to Break, That is the Question)

There are two primary combinations of spare shooting rolling paths that are used to convert the many spares. They are described as the "dry" and "wet" approaches.

The "dry" line technique utilizes the strike line and right outside area as much as possible to utilize the drier part of the lane to get the ball pointed in the right direction of the left side spares. The general idea is to direct the ball around the heavier middle of the lane oil pattern when shooting at the left side spares. The rolling path for the right side spares is from the near left side, through a minimal amount of the middle heavier oil with a majority of the rolling path

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again on the drier right outside boards. Thus, the “dry” technique generally uses a breaking ball methodology; the ball curves on almost every spare shot.

The “wet” line technique utilizes the oil as much as possible for all spare shots regardless of whether the location is the left side, strike or right side spares. The objective is to reduce the break of the ball as much as possible in almost every case.

Bowler’s learned long ago why they need a breaking ball for a strike shot. It’s because the strike ball needs to enter the pocket area at an angle of attack that is simply not attainable with a straight ball rolling path.

But, do you need and do you even want a breaking ball for most spares? The answer should come from a determination of the accuracy in the dry area of the lane versus the wet area of the lane. When rolling a bowling ball in a dry area, that dry area acts as an amplifier of any error you make. It doesn’t matter whether the error is to the left or right, that error is amplified because the ball is breaking more in that drier area of the lane. In a wetter area of the lane, however, an error is not amplified because of the heavier oil in the wetter area of the lane. If you make an error to the left or right, it is just that amount of error, nothing more. So, it is the belief of this author, and many many bowler’s, that the more you make use of the heavy oil in the middle of the lane, the more accurate your spare shooting will be.

The “wet” line technique utilizes the heavier oil methodology. For the left and right side spares the rolling path is chosen so that it passes over the maximum amount of oil so that the break of the ball is minimized. For the right side spares, the technique is further augmented by rolling a harder, smoother, non-reactive surface bowling ball. With that right side spare ball, the different surface characteristics counteract the tendency for the ball to curve when finishing the rolling path on those drier right outside boards.

Fine Tuning the Wet Line Spare Making Technique

If possible, both the Aiming Mark and the lay down point should be in the heavier oil pattern in the middle part of the lane. If you start the rolling path in a dry area of the lane and then travel through the heavy oil, that first little dry spot may have influenced the trajectory of the ball. It may have tugged the ball a little left. If you can keep the ball completely in the wet area, the rolling trajectory will be more predictable.

The key to keeping both the Aiming Mark and the lay down point in the middle oil pattern is knowing where the middle oil actually is. If before the league starts, you go down to the foul line and look at the oil on the lane surface, you can see where the heavier oil starts on both the left and right sides. Bowling centers usually don’t change the location of the heavier oil, they just change the amount of oil in that middle area. So, if you see that the heavier oil is from 8 to 8, it’s probably going to stay at 8 to 8 for the entire league. And you should try to keep both your Aiming Mark and lay down point within that range of boards (left of 8 on the right side).

Duplicating the Strike Shot Mannerisms for Spares

One of the major problems that causes lower spare conversion probability is not rolling the ball the same for a spare as you do for a strike (assuming that you’re not rolling the ball as a straight ball delivery). Remember you roll the strike ball over 50% of the time. If you can relax and duplicate those same mannerisms that you have for a strike ball, your spare conversion percentage will rise.

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Just as for a strike shot, the further you get down and the more consistent the release and the follow through are, the better the results will be.

Slowing Down the Approach Speed

Just as for a strike ball, generally, the slower your approach speed is, the more accurate the delivery will be. For spares that is especially important, and it fits well with the recommendation that the ball curve less with a smoother surface ball at some spares. And, if you roll a straight ball at spares, it doesn't make sense to roll it fast unless you've practiced it a lot. (A higher speed smooth surface ball will break less but may be difficult to consistently roll accurately).

Overcoming Your Past "Comfort Zone" for Your Spares

"But I've always shot at the 10 pin by rolling the ball over the second arrow and I've done fairly well."

My answer to that remark is, "Okay go ahead."

If however you see the logic in what has been presented over the past few pages, maybe you should try to develop some confidence in a different trajectory of the ball toward that 10 pin and just maybe you will be more accurate. Remember that each time you miss that 10 pin, it costs you 3 pins in your average that night. If you do that most nights you can see the effect of just that specific spares costing you probably 10 pins in average over a season.

Go out on a Saturday or a Sunday afternoon and practice that far left side approach for those right side spares and the far right side approach for the left side spares. Build up your confidence and your consistency before trying it in league play. Let me say it again, "practice, practice, practice." Get comfortable with it. The payoff is a higher average at the end of the season.

Developing the Left Side Spare Shot

Other than the right side 10 pin shot, the majority of the spares that occur frequently are the left side spares. Seems odd doesn't it that you are rolling the ball from right to left ending up with the ball impacting the pocket area with the ball going toward that left side and still you get those left side spares. It's the pins that do most of the impacting on the left side after a strike ball is rolled.

It's probably more from the fact that the ball impacts the rack of pins more to the right than the left. The release of energy is closer to the right side than the left side. In fact none of the left side pins are impacted directly by the ball except the head pin. Whatever the reason, you've obviously got to be ready to convert those left side spares.

The key to consistent spare shooting on the left side of the lane is the heavier oil in the middle of the lanes. Almost all bowling balls will react a lot less in that heavier oil. Your ball path will be much straighter.

Pick an Aiming Mark just to the right of the center of the lane, probably somewhere between the 3rd. and 4th, arrows. Since the heavy oil is usually between the 10th board and the 30th board, that Aiming Mark will be in the heavy oil.

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Order of Difficulty of Spares

There are at least eight different kinds of spares. They are listed below in the order of increasing difficulty.

1. Left Side Ball Deflection
   These left side spares involve the ball deflecting off the forward most pin and into most of the rest of the pins.

2. Left Side Pin Deflection
   These left side spares require that one of the pins, usually the most forward pin, be deflected into another one of the pins.

3. Right Side Ball Deflection
   These Right side spares require that the ball deflect usually off the forward most pin into most of the other pins.

4. Right Side Pin Deflection
   These right side spares require that one of the pins, usually the most forward pin, be deflected into another one of the pins.

5. Left Side Pin Point Split
   These left side spares, usually splits, require that one of the pins be impacted at a very precise impact location.

6. Right Side Pin Point Split
   These right side spares, usually splits, require that one of the pins be impacted at a very precise impact location.

7. Left Wall Banger
   These left side spares, usually almost impossible splits, require that one of the pins, usually the most forward pin on the left side, be deflected off of the left kickback to the right side of the pin deck where the rest of the pins of the spare are located.

8. Right Wall Banger
   These right side spares, usually almost impossible splits, require that one of the pins, usually the most forward pin on the right side, be deflected off of the right kickback to the left side of the pin deck where the rest of the pins of the spare are located.

How You Look at the Aiming Marks and Standing Spots with Respect to Counting Them

When you look at an Aiming Mark, you usually look at the center of an Aiming Mark. But where is that “looking” actually located on the lane surface?

The middle of the 20th board is actually 19.5 boards from the right side of the lane. The middle of the 15th board is actually 14.5 boards from the right side of the lane. The same holds for the other Aiming Marks.

Usually the standing spot is tracked in full board locations. When you choose a Standing Spot, you place the right edge of your left foot at the location chosen. If you choose to stand on the 20th board, you stand with the right edge of your left foot just covering the 20th board. So

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actually, although the center of your body is only 19 boards from the right side, for convenience sake, we say that we are standing on the 20th board. The Aiming Marks are a little bit different. We pick an aiming mark based on the middle of a particular board. The middle of board #10 is spoke of as aiming at board #10 although it's only 9 1/2 boards from the right gutter. The left edge of board #10 is spoke of as 10 1/2 boards from the right although it is 10 boards from the right side gutter.

Using the Straight Ball for Some Frequent and Very Difficult Spares and Splits

The Pin Location Table:

Here's a table of the Pin locations specified in inches and boards from the right side of the lane (assuming a 42 inch wide lane and pin deck surface).

Pin Location Table

Pin #	Inches	Boards
10	3.0	2.78
6	9.0	8.35
3,9	15.0	13.93
1,5	21.0	19.50
2,8	27.0	25.07
4	33.0	30.64
7	39.0	36.22

Now let's compare that information with the Aiming Mark and Standing Spot Location Table.

Aiming Mark and Standing Spot Location Table

Spot #	Inches	Boards
5	4.85	4.50
10	10.23	9.50
15	15.62	14.50
20	21.00	19.50
25	26.38	24.50
30	31.77	29.50
35	37.15	34.50

You mean that if I roll the ball straight down the arrows, the ball will not hit the center of the associated pins?

Yes, that's exactly what I mean.

And, if you know that and your opponent does not, you have a slight advantage.

The Breaking Ball Split Conversion Viewing, Rolling Path and Parallax Problems

If you try to roll a breaking ball at for example the 4-10 split, you will ordinarily stand on the right side as if you were rolling the ball at a 7 pin. You slightly adjust from the 7 pin alignment so that the ball rolls slightly left of the 7 pin rolling path. Since you are standing on the right side of the approach surface, you can't actually see where the ball will impact the 4 pin. And, because you are rolling the ball from the right side, the path of the ball is directed mostly away from the intended target on the left side of the 4 pin. The slightest little tug on the ball will result in missing the spare on the left side, with the ball rolling away from the 4 pin. Even if you

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choose a more left side approach position and roll the breaking ball at the 4-10 split, the ball will still be breaking away from the intended impact location on the 4 pin.

The second problem associated with rolling a breaking ball at some spares and splits is getting the proper alignment. "Making a slight adjustment from the 7 pin alignment" sounds like an estimate to me. There's absolutely nothing wrong with estimating, we do it almost every ball we roll in the sport of bowling. That's exactly why this sport may be more difficult than any other sport. We are constantly called upon to make judgements (estimates) on what to do for about 220 different frequently occurring spares and splits. The different alignments combined with the varying lane conditions make it a very difficult and challenging sport.

The third problem is that of parallax, the visual effect of looking down the lane, whose sides are parallel, but you are trying to roll the ball at an angle not parallel with those sides. Deep down inside that little brain of yours is the desire to "stay within the lines" as you were taught to do with crayons and a coloring book "several" years ago. A bowling lane surface has all 39 boards pointed straight parallel to the sides of the lane. What you really pick up on is not the boards; it's the edges between the boards, the dark interfaces between the boards. Your little brain, as well as my pea size brain, remembers those dark lines all parallel to the sides of the lane surface. Your brain wants to roll the ball straight down the same direction as those lines.

Simply said, it's easier for your brain to handle walking straight down the approach boards and rolling the ball in an initial path that is straight down the boards. The terminology used in engineering is "Keep It Simple Stupid" or the KISS principle. That's why deep down inside you really want to roll it straight down the boards, it's just easier.

Choosing the Straight Ball for the 4-10 Split

If you roll a straight ball at the 4-10 split, it makes a difference which lane you are on, the left or the right. If you are on the left lane you can align yourself and stand very far left and roll the ball straight down the boards on the far left side of the lane. If however you are on the right lane, that stupid ball return will be in the way most likely and you will not be able to align yourself properly, Because of the ball return, if you try to roll a straight ball at the 4-10 split by rolling the ball straight down the boards, you might need to walk a crooked path to get to the proper alignment for the release at the foul line. That's not a good thing to do. So instead of rolling the ball absolutely straight down the boards, you roll the straight ball at a very small angle across the boards. You are still retaining as good a view of the impact location as possible (from as far left as you can get on the approach comfortably) and still rolling the ball with a rolling path that does not break away from the intended impact location, a non-breaking ball trajectory.

The question is, of course, "what is the proper alignment?".

Straight Ball Alignment for the 4-10 Split on the Left Lane

The exact alignment for the conversion of the 4-10 split is such that the ball will impact the 4 pin at a location defined such that a line drawn between the center of the ball to the center of the 4 pin can be extended to the center of the 10 pin. That impact location results in the deflected 4 pin travelling toward the center of the 10 pin.

If you know the exact location that the ball needs to be to be to impact with the 4 pin, you also know what board the ball was rolled straight down to get to that impact location. If you know the board to roll the ball down, it's just a matter of moving left the appropriate number of

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boards to account for your personal bowling parameters like your bowling width, the distance from the center of your body to the center of your ball when you release it at the foul line. (Bowling width's vary but they are usually in the range of 5 to 10 boards).

As difficult as it may sound, you can roll the ball down that far left side of the lane. You obviously need to practice the shot. And that is the fundamental key to rolling a "second shot." You need to practice, practice, practice.

But, Why Do I Need to Do All of This Just to Pick Up a 4-10 Split?

Here are some very good reasons:

1. The lanes are extremely dry.
2. The lanes are extremely wet.
3. You have no idea what oil condition now resides on the left side of the lanes.
4. It is a close match, you are the anchor bowler and you absolutely need to convert this split to win the match. Your teammates are depending on you to make the very best effort you can.

The Emphasis on the 4-10 Split

It's just an example. All of the other splits, washouts and difficult spares can use about the same method.

Having a Plan of Attack for Alignment and Adjustment

For league play, in a specific league, at a specific bowling center, the lane conditions "ordinarily" will be about the same each week. You, however, cannot count on them being the same each week. The most you can do is to have a plan of attack for the initial alignment for the strike shot and some specific spares.

Since you bowl in that league each and every week, you gradually get a pretty good idea of where to initially roll the strike ball. You also have a ready alignment for the 7 pin and the 10 pin spares.

Since those 3 alignments (7, 10 and strike ball) are your "key" alignments, You would use those alignments as your default alignments at that bowling center if you don't have any indication that the lane conditions have changed.

For example if you arrive extremely late and don't get any practice and it's your turn to bowl. Your best action is to turn to someone on your team that is a high average bowler and ask if the lane conditions are about the same. If they indicate that the conditions are about the same, your best initial alignment is your "key" alignment for the strike ball.

Example Test of Your Initial Plan of Attack

The practice balls you roll should be chosen to test your plan of attack for the 3 key alignments. Here is an example practice scenario and the resulting alignments adjustments derived from those practice balls.

You roll the strike practice shot and observe that the ball rolls a little higher into the pocket area. You deduce that the lanes are a little drier than usual in the strike line area of the lane surface. You decide to adjust your strike alignment to the left 1 board with your eyes and feet (1 feet, 1 eyes).

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You roll the 7 pin practice shot and notice that the ball just barely clips the 7 pin on the right side. You deduce that the oil in the middle of the lane is a little heavier than usual. You decide to adjust your standing spot for the 7 pin to the right by 1 board and keep the same aiming mark. If you get enough practice balls, you will check out this new alignment.

You roll the 10 pin practice shot (breaking ball) and are satisfied with the results. It's about the same amount of oil as you are accustomed to. You will roll a straight ball and the lane conditions on that far right side don't ever effect the straight ball shot you have developed for the 10 pin and the far right side spares.

You roll another strike shot practice ball and are satisfied with the new alignment.

You roll another practice ball at the 7 pin to verify the new alignment and it checks out okay.

Finally, practice is over and you are satisfied that you are well prepared and have tweaked the plan of attack just enough to get the best chance at a good performance.

Left Side Breaking Ball Spares

The left side spares are defined as those spares that are generally on the left side of the pin deck and for which you normally position your standing spot on the right side of the approach surface. Releasing the ball with the normal strike ball release gives you the highest probability of a proper release. Since you utilize that release much more often, you are more likely to release the ball and roll the ball over the proper aiming mark and down the intended rolling path trajectory.

For left side spares, the ball rolls through the heaviest oil in the middle of the lane. There are two common methods for converting the left side spares. They are called the "Rolling Path Rotation" Method and the "Aiming Mark Shift" Method.

The Path Rotation Method for Left Side Spares

This method of adjustment is based on the KISS principle (Keep It Simple Stupid). The "normal" or "usual" aiming mark for left side spares can be utilized and adjustment can be made by rotating the trajectory about that aiming mark. When you rotate the trajectory of the rolling path about the aiming mark, you move your standing spot to correspond to that spare. The trick is to rotate the correct number of boards.

For example, suppose that the 11th board is used for the left side aiming mark. And, you usually stand on the 15th board and roll the ball over the 11th board for the 7 pin spare conversion. Through trial and error you have determined that you need to stand on the 19th board and roll the ball over the 11th board to knock down the 4 pin. And, to knock down the 2 pin, you have determined that you should stand on the 23rd board and roll over the 11th board. That set of numbers 15, 19 and 23 are a set of numbers to remember.

For the other left side spares you intend to rotate a little less or a little more from one of those alignments depending on where you want the ball to end up for the first impact location.

You have practiced those alignments and they work well for you and your personal bowling parameters like your bowling width and the drift that you have. It is important to note that those alignments are the set of alignments for that league on that day of the week at that time of the day at that time of the year. The alignments may change slightly from week to week and during the changes in the weather during the year, but for the most part they will hopefully be

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about the same. They must, however must be verified each week with the 7 pin practice ball.

The Path Rotation method for Right Side Spares

The Path Rotation Method can just as easily be used for the right side spares. You choose an initial aiming mark near the center of the aiming marks, the middle of the 20th board. You keep that same aiming mark for the 10 pin throughout the night of bowling regardless of the lane conditions.

The basic idea is to use that aiming mark as a pivot point about which to rotate your alignment as the lanes get drier. Early in the night of bowling you will be rolling across heavy oil and the ball will not break very much. As the lanes get drier, the right side will start getting drier and consequently, you will start rotating your alignment so that you are increasing the angle that you roll the ball across that aiming mark.

This method also takes practice. As before, determine a time on a Saturday or Sunday afternoon that the lanes will be drying out pretty rapidly. Line yourself up visually as though you were going to roll a straight ball, shift left with your standing spot to take into account your bowling width, then shift left some more to account for the break of the ball. As the lanes start getting drier and drier, you will need to gradually shift left even more with your standing spot. And, all of this time you are keeping the same aiming mark, for example the middle of the 20th board.

If you have chosen the right time to practice, your shifting will be about the same as for the league in which you participate.

The Path Rotation Method and it's Simplicity

The KISS Principle is used in engineering. KISS is an acronym for Keep It Simple Stupid. Usually, the simplest design turns out to be the overall best design. The same can probably be said for the rotation method. It's simple because you only need to remember what aiming mark you are going to use for the 7, 4 and 2 pins.

The Left Side Aiming Mark Location (LSAML)

Using the Path Path Rotation Method for alignment for the left side spares requires that you have a good choice for the aiming mark. The question is whether or not there is a best location for that aiming mark. The problem is whether or not the "usual" location is where there is a high density of oil.

If the LSAML is first in the heavy oil, then the lanes dry up and the edge of the oil shifts left so that the LSAML is now in the dry area, the break of the ball will increase because it will begin to turn during the early part of the roll of the ball in the drier area.

If the LSAML stays in the heavy oil, the left side spare shot will not be affected as much by the decreasing amount of oil on the right side of the lane that affects the strike shot tremendously. And it therefore becomes easier to use the "usual" left side alignment.

If the LSAML stays in the dry area, the ball will always roll in the dry area, through the middle wet area, and finally through the dry area at the end of the rolling path.

I choose door #2.
Choose the aiming mark so that it stays in the heavy oil.

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The Path Shift Method (Shift Method)

The other method used for the left side spares is the Shift Method. It is an attempt to make sure that your left side LSAML is always in the heavy oil in an effort to keep the break of the ball about the same for all of the left side spares. It is by definition a more complicated method because the LSAML needs to be tied directly to the location of the edge of the heavy oil that is most likely shifting left, sometimes very rapidly.

As mentioned previously, the problem is that during a night of bowling, the edge of the heavy oil may shift across the chosen LSAML. As the heavy oil edge shifts left past the LSAML, the ball will start to break a little more left. As the oil edge shifts further left, the left side spare shot will start to break even more left.

Using the "Shift" left side spare conversion method, the LSAML should be no further right than two boards to the left of the edge of the heavy oil.

Example: Suppose that initially the LSAML is chosen as the 11th board and the 7 pin standing spot is at the 15th board. When you roll the 7 pin shot, you are facing the 7 pin (slightly rotated body position facing the 7 pin while standing at the 15th board).

At about the middle of the second game, the oil edge has shifted to the 9th board. (This is deduced by the fact that your strike ball aiming mark is now the 9th board). From that frame until the end of the night of league bowling, your LSAML should be 2 boards to the left of the edge of the oil aiming mark that you are using for your strike shot. The LSAML is now at the 11th board, so from this point until the end of the night's bowling, any change in the aiming mark for strike ball must be accompanied by a change in the LSAML.

And, since you are laterally closer to the left side spares, you cannot roll the same "facing the target" alignment as before. You must start to rotate the alignment to the right to make the path longer so that the ball will still get to approximately the same location at the target on the pin deck. The rotation of the left side spare alignment is much the same as the rotation of the strike ball alignment as the strike ball aiming mark shifts left laterally closer to the pocket area. So, you may need to adjust the path direction in the same way that you do for a strike ball rolling path.

The Path Shift Method of Adjustment for Right Side Spares

For left side spares, if you choose to move both your standing spot and aiming mark to the left of the edge of the oil so that your bowling ball slides over more oil on the front end of the lane, you must first have a really good idea about where the edge of the oil is located. If you have been properly observing the oil tracks on the ball when it returns to the ball return after each 1st ball of each frame and you have been gradually moving left, you are familiar with the number and density of the oil tracks when you are rolling the ball near the edge of the oil. And, as long as you keep near that edge of the oil during a night of league bowling, the miscues you have to the left and right will not be as damaging because you are at the best overall alignment to enhance the "self-correcting" aspect of the oil pattern.

In the same manner, for right side spares, when rolling the ball at the 10 pin, you also want to take advantage of that "edge of the oil." By moving both your aiming mark and standing spot to the left, you are on purpose locating the rolling path of the ball so that it will slide more thereby cutting down on the break of the ball. The move must be a significant one. The little half board move you make during the night of bowling to compensate for gradual adjustment of

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the drying oil will simply not be sufficient.

When you roll the ball, you sometimes roll it a little to the right of the aiming mark and sometimes a little to the left of the aiming mark. By making a large move left, hopefully you are going to stay in that oil longer when you roll the ball at the 10 pin. The move should be about 3 to 4 boards to the left of where you estimate the oil is located.

Now you need to align yourself properly. Let's assume that you have moved 4 boards to the left of the edge of the oil as the chosen aiming mark. Remember, the objective of moving left into the oil more is to cut down on the break of the ball, regardless of the reactivity of the ball surface.

There are two ways to align yourself. The easiest way is to simply use your best judgement and line yourself visually. The 10 pin and the chosen aiming mark give you two points to line up with your correct standing spot back on the approach at your standing distance from the foul line. At that standing distance, move left on the approach until that imaginary straight line drawn from the 10 pin through the chosen aiming mark is in line with the center of your body (the right edge of your left bowling shoe). You are now lined up for an absolutely straight ball at the 10 pin. But, you know that your ball is reactive and is going to break so you must compensate. From that visually determined straight ball alignment move your standing spot left. That leftward move from that straight ball alignment must compensate for the break of the ball toward the 10 pin.

After you have practiced this alignment method, it will become apparent that the final move left will be about the same number of boards, once you find the correct value. That's where practice comes to center stage. You must practice this method of adjustment during some Saturday or Sunday afternoon when the lanes are getting drier and drier. Practice it, then and you will be able to determine that final move left.

This "path shift" method of adjustment does provide some degree of self correcting. If you happen to roll the ball to the left of your intended aiming mark, which is purposely chosen to be well into the oil, the ball will slide more before breaking left. If you happen to roll the ball a little to the right of the aiming mark, but still in the oil, the ball will slide a little less, but since you are a little more to the right side, the ball will break a little more to the left.

The Path Shift Spare Shot Summarized (Left Side Spars - LSAML)
(Similar for Right Side RSAML)

1. During practice determine where the edge of the heavy oil is located. Designate your LSAML as 2 boards to the left of that aiming mark.
   Example: The edge of the heavy oil is at 10 full boards from the right edge of the lane surface. That means that you will roll the ball at the left edge of the 10th board for the strike ball shot. The LSAML is then the left edge of the 12th board.

2. Practice your 7 pin shot and determine the correct alignment for the determined LSAML.
   Example: Your best estimate for the lane conditions, your personal bowling parameters and your bowling style sets the standing spot at 17 (standing 17 full boards from the right side). You will stand on the left edge of the 17th board, facing the 7 pin and roll the ball over the left edge of the 12th board.

3. When the oil starts breaking down, for every move that you move left with your strike ball

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aiming mark, you adjust your LSAML left by the same amount.
Example: That first move that you decide to make is a 1/2 board move to the left with your eyes and a full board left with your feet. That means that for a strike shot you will now be aiming for board #10.5 (10.5 boards to the left of the right edge of the lane surface, the middle of the 11th board). Although you do not need to immediately shoot at a 7 pin, you note the new alignment nonetheless. The new LSAML is 12.5 boards from the right side. That means that you would now be rolling the ball over the middle of the 13th board and standing at the left edge of the 18th board.

The Basic Difference in the Two Adjustment Methods
The difference in the two adjustment methods is fairly clear. The “shift left” method guarantees that you will always roll the early part of the trajectory will be in the front end oil. But the initial alignment is complicated and depends upon knowing where the edge of the oil is located.

The “standing spot rotation” method does not guarantee that you will always be in the early oil, but if you choose the aiming mark far enough inside, at about the middle of the 20th board, you will most likely have the same guarantee. The standing spot rotation method is simpler to implement.

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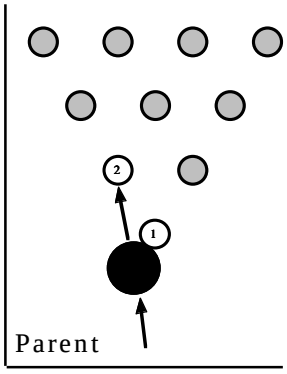
Alignment

The Spare Families
(Single Pin Spares are not included in this Booklet)

The 1-2 Spare Family

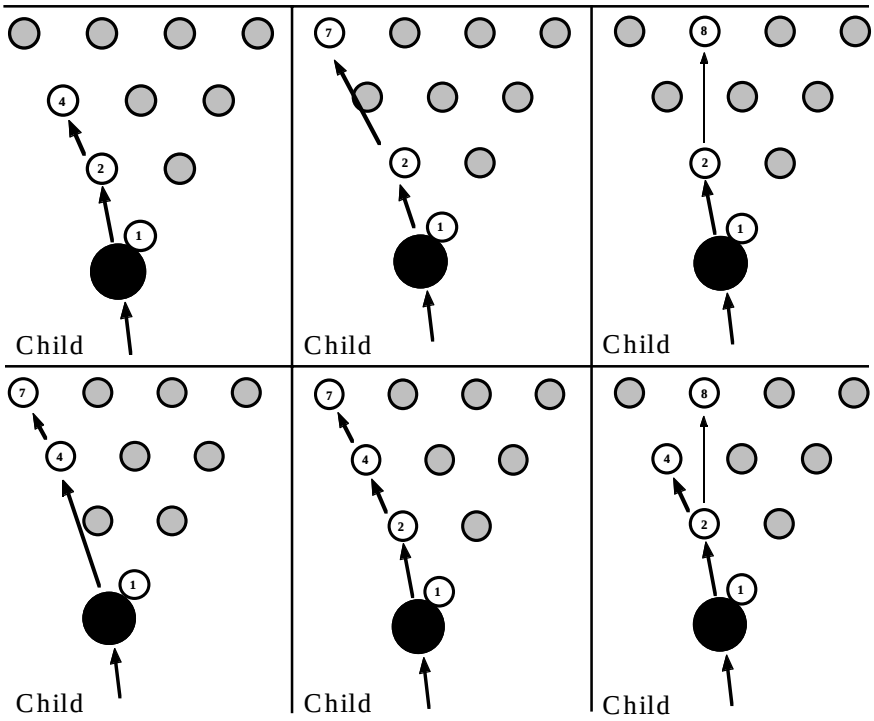


Key Pins: = 1-2
Type of Spare: Ball Deflection - Left side.
Standing Position: Right side.
Angle of Attack: Strike ball (as positive as possible).

General Description:
If you roll a straight ball at this spare, make sure that you roll it from the far right side so that you lessen the possibility of chopping the 1 pin away from the 2 pin. You want the ball to be directed to the left of the 1 pin. Adjust your standing spot position and/or aiming target position so that the ball will end up rolling just to the left of the front of the head pin.

The tendency is for a right handed bowler to roll a right to left breaking ball from the strike ball alignment at this spare. That's actually a good idea. It gives you the right angle of attack. **Do not** try to convert the spare by rolling a normal strike ball alignment. For right handed bowlers, the 2 pin family spares are probably the most often left spares after the 7 and 10 pin spares. The same thing can happen for this spare. So, you already do that a lot. Don't do it for this spare.

Make sure you adjust your alignment from the strike alignment so that the ball hits the head pin on the left side.



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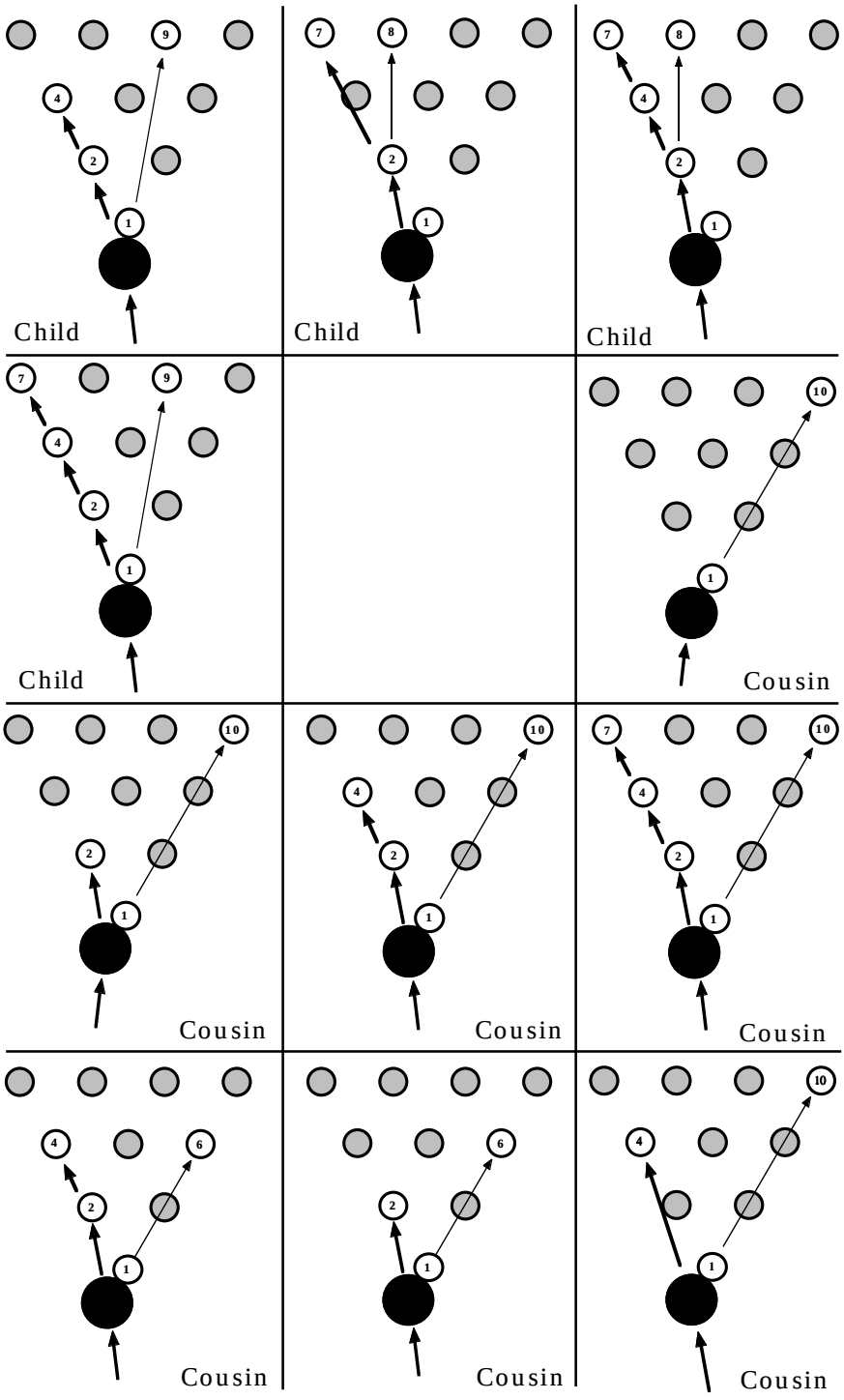

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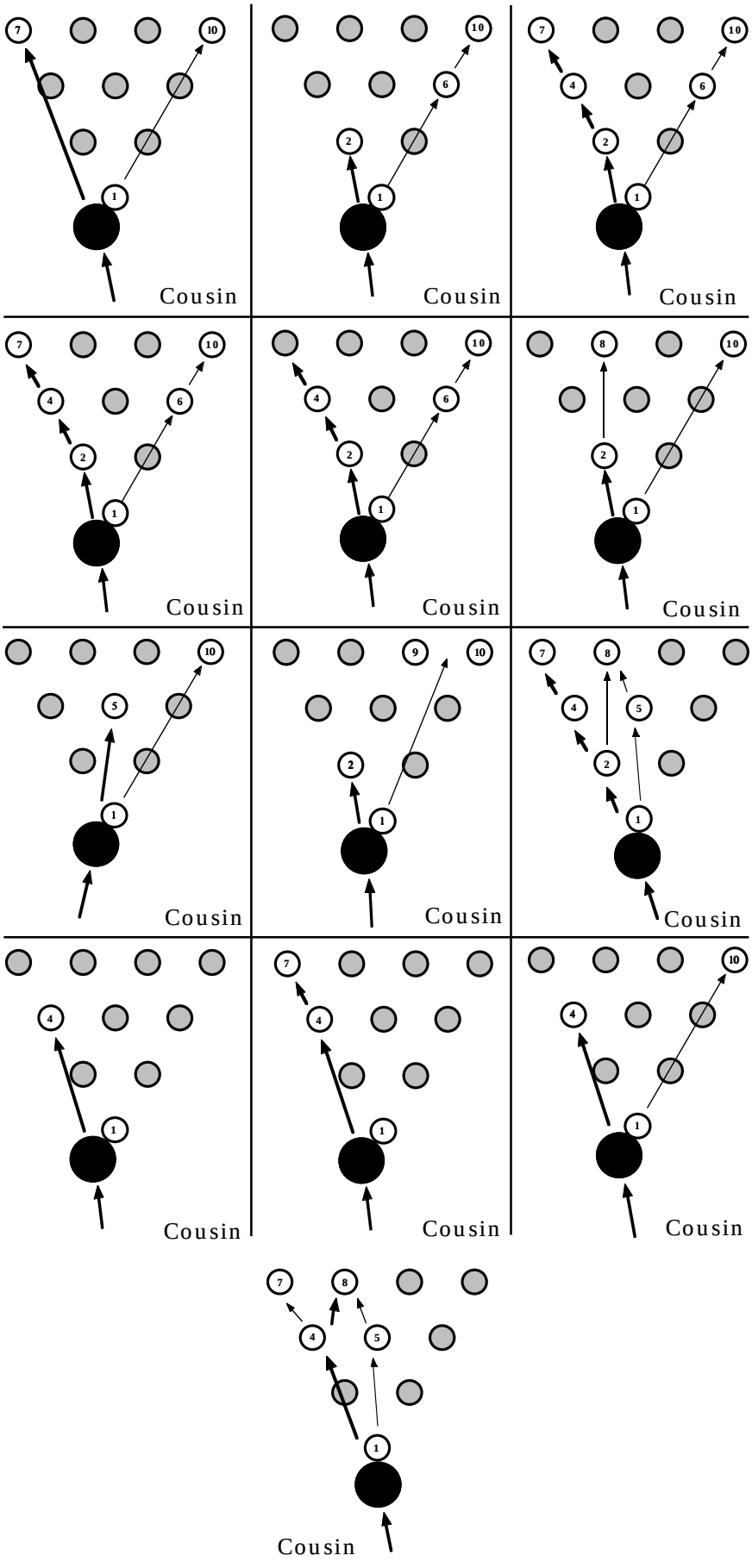

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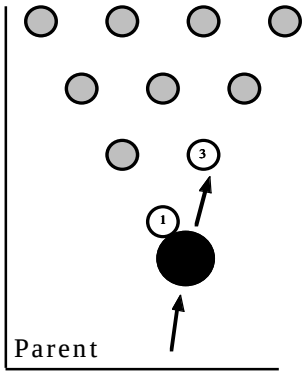
The 1-3 Spare Family



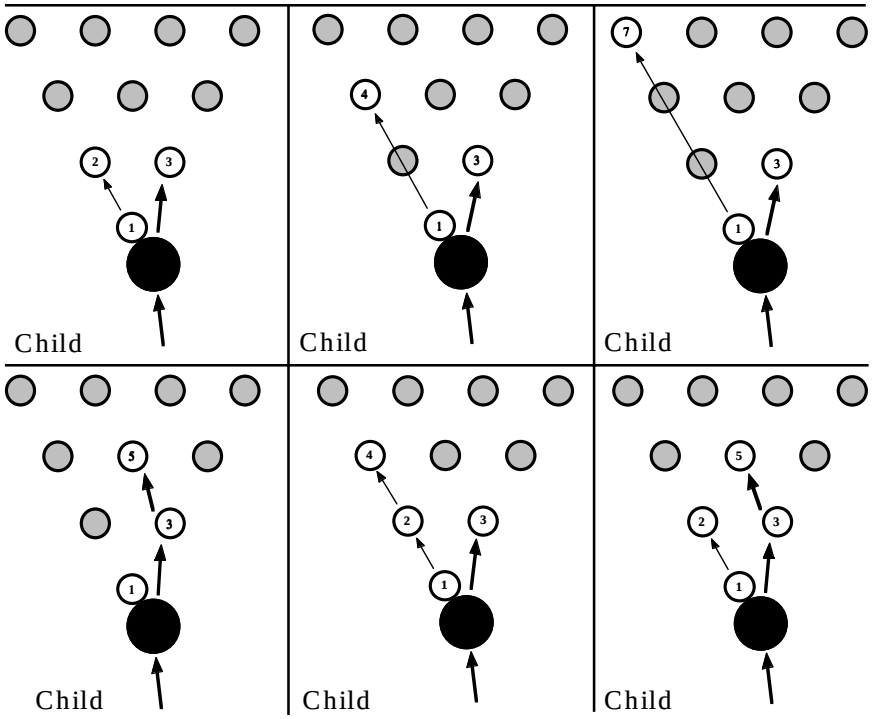
Key Pins: = 1-3
Type of Spare: Ball Deflection - Left side.
Standing Position: Left side.
Angle of Attack: As negative as possible.

General Description:
The graphics show a straight ball rolling path.

If you roll a straight ball at this spare, make sure that you roll it from the far left side so that you lessen the possibility of chopping the 1 pin away from the 3 pin. You want the ball to be directed to the right of the 1 pin. Adjust your standing spot position and/or aiming target position so that the ball will end up rolling just to the right of the front of the head pin.

The tendency is for a right handed bowler to roll a right to left breaking ball from the strike ball alignment at this spare. That's actually not a good idea. If you do, the tendency will be for the 1 pin to be chopped away from the 3.

For right handed bowlers, the 3 pin family spares are probably the most often left spares after the 7, 10 and 2 pin spares. Have you ever left the right fence row? If so, you choped the 1 pin away from the 3 to leave that spare. The same thing can happen for this spare. So, you already do that a lot. Don't do it for this spare.



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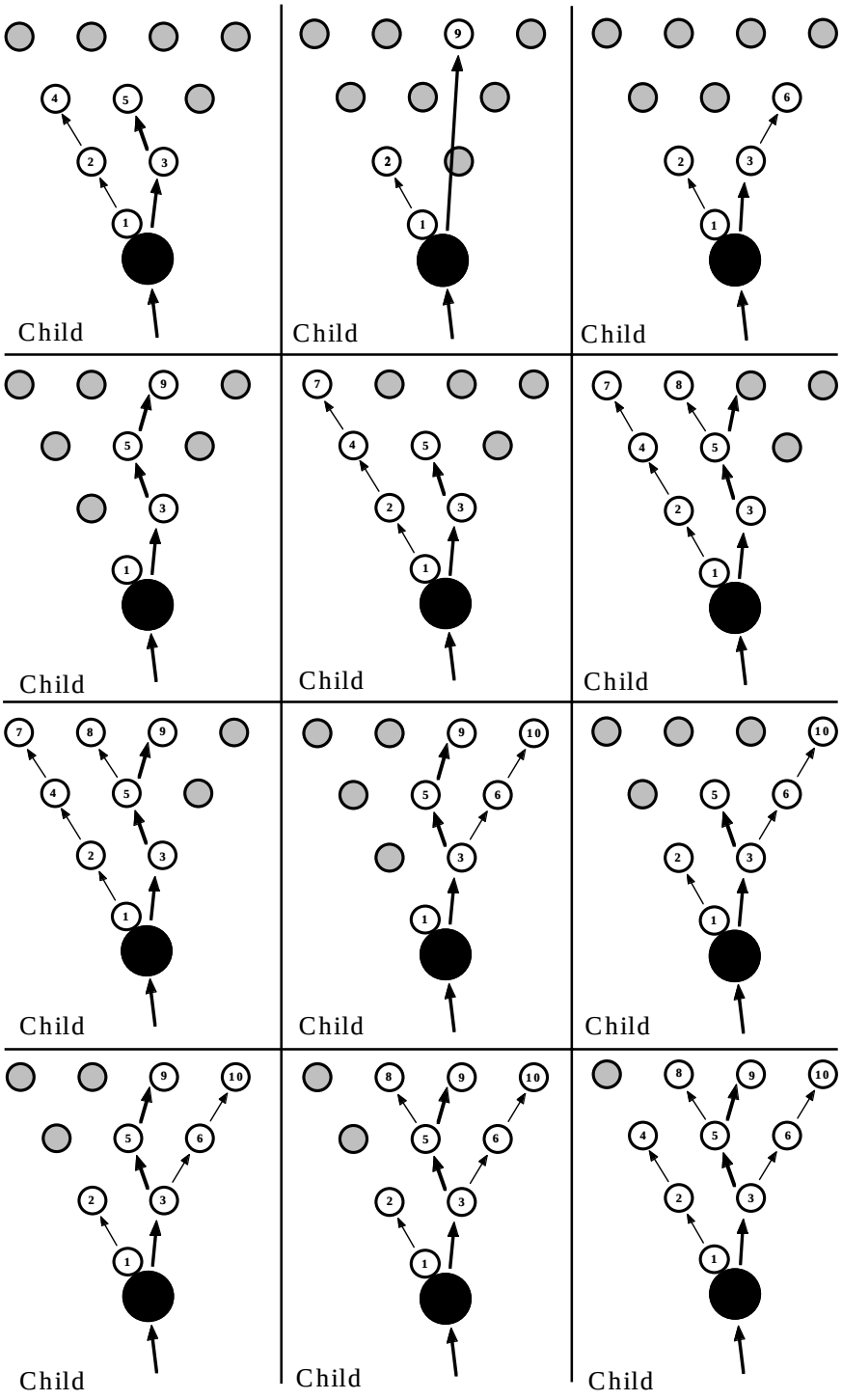

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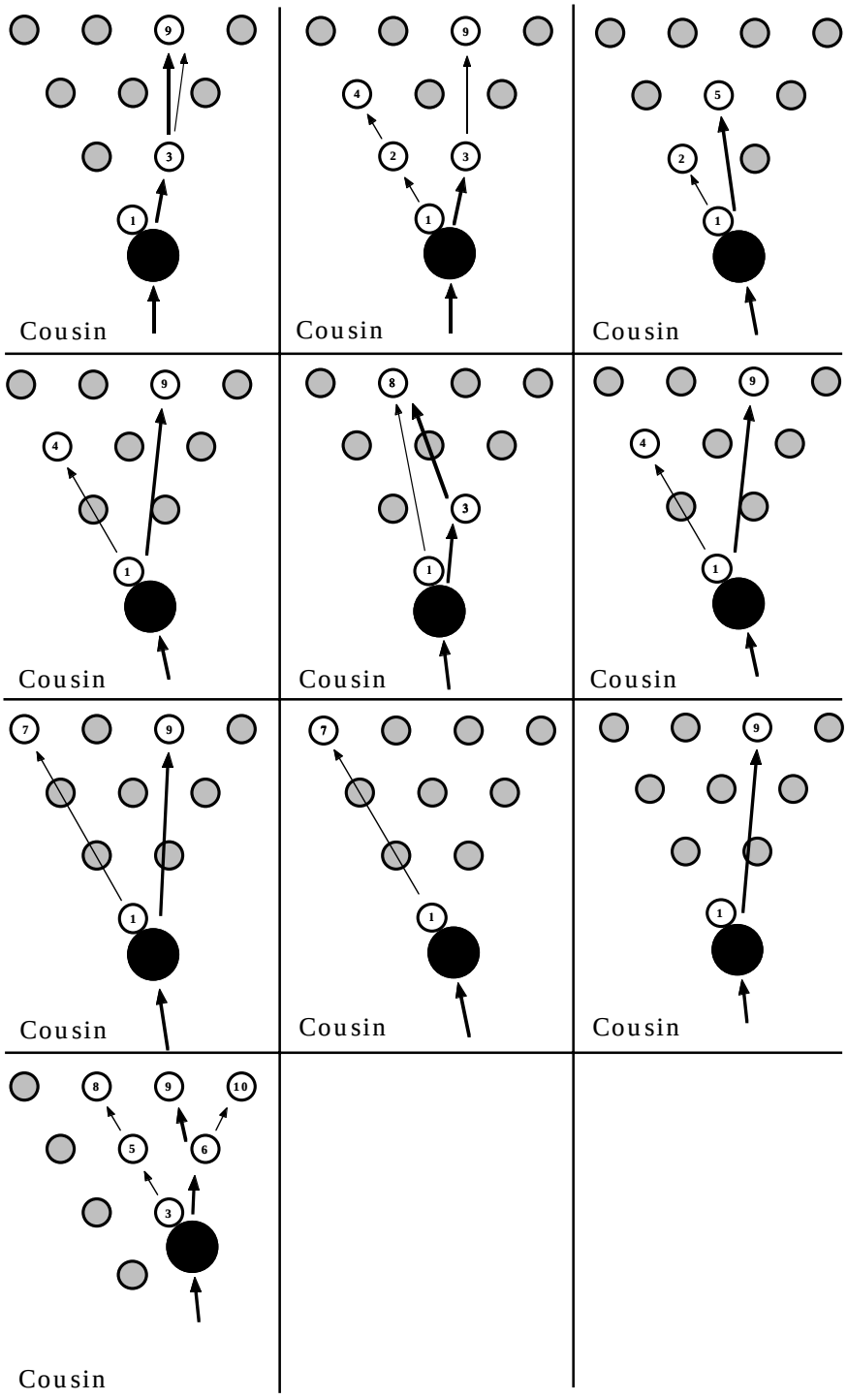

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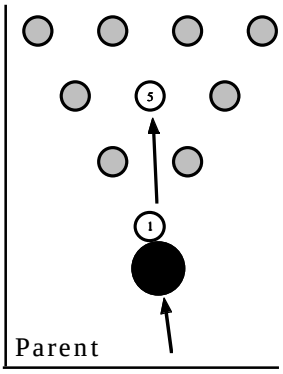
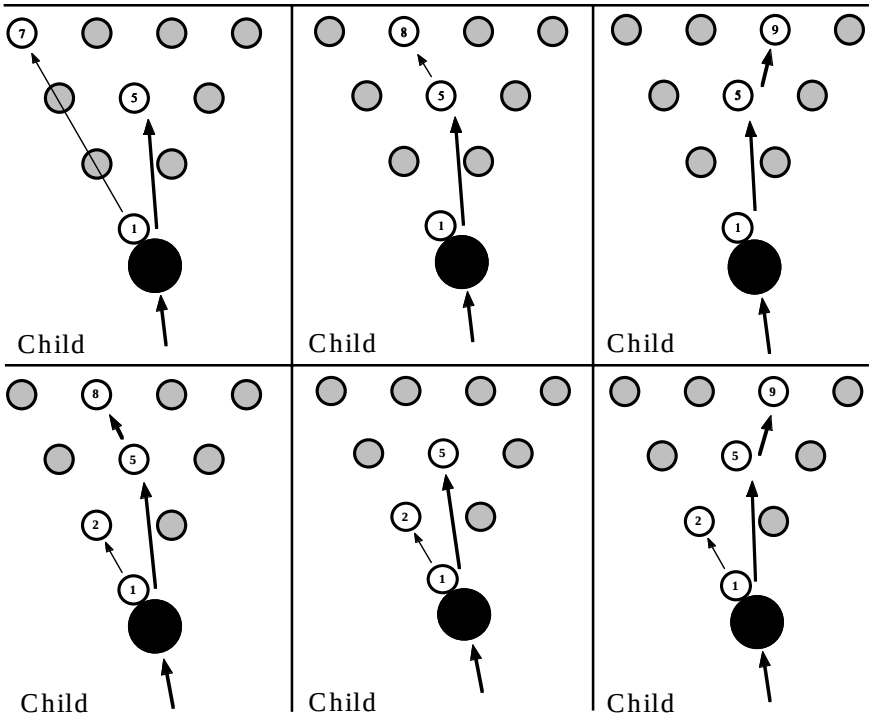
The 1-5 Spare Family



Key Pins: 1-5
Type of Spare: Adjusted strike shot.
Standing Position: Adjusted strike shot.
Angle of Attack: Increased strike shot.

General Description:
The graphics show a straight ball rolling path.
If you roll a straight ball at this spare, make sure that you oll the ball from the far right side.

If you roll a right to left breaking ball at this spare, adjust your strike shot so that the ball will have a slightly higher impact location in the pocket area. Usually, if the lanes are drier on the outside boards, you can move your aiming mark and your standing spot a little to the right into the drier area, the ball will roll higher into the pocket area. Relax and forget that it is a spare and go through whatever preparations that you normally do for a strike and imagine that there is a full rack of pins and roll the ball with all the same mannerisms that you do for a strike ball.



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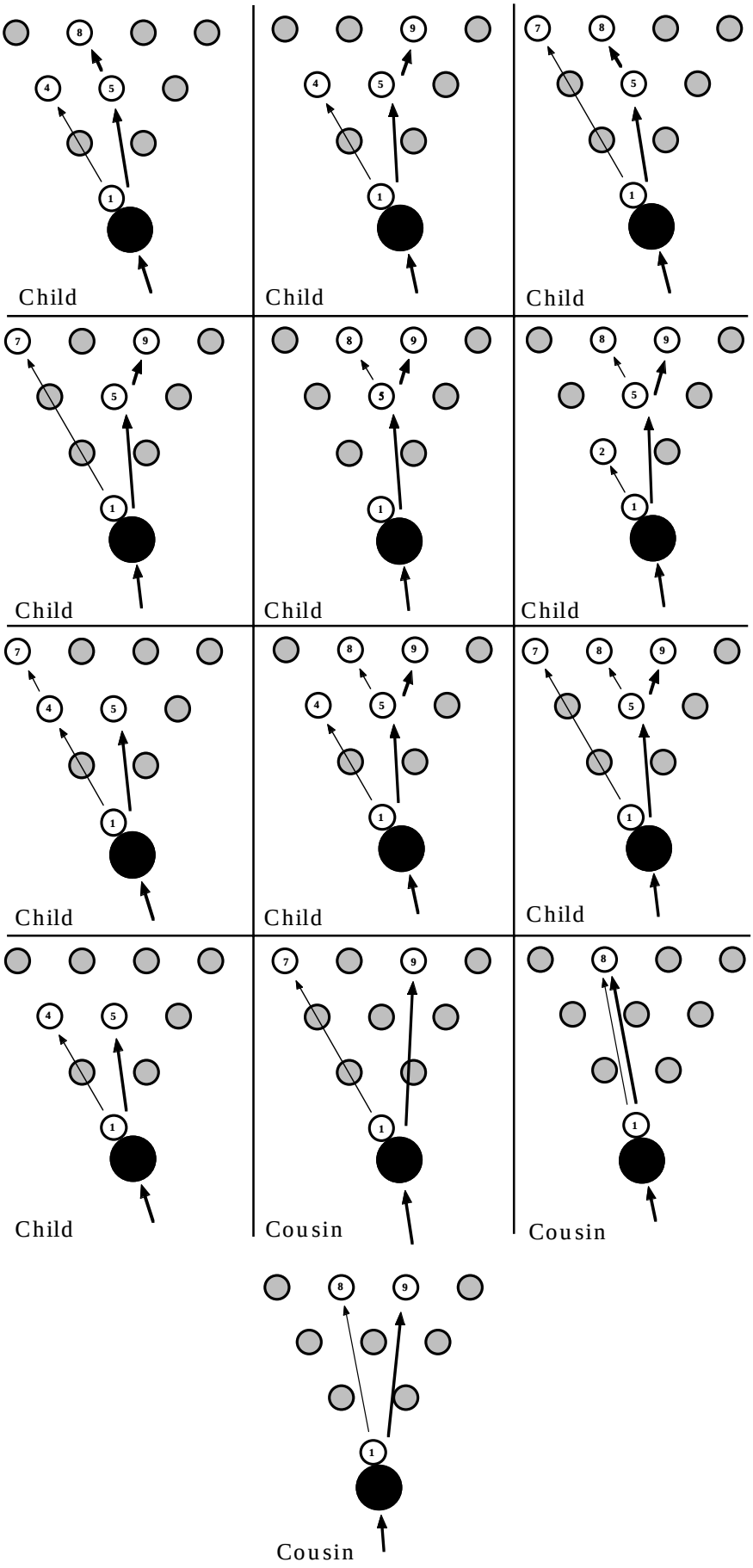

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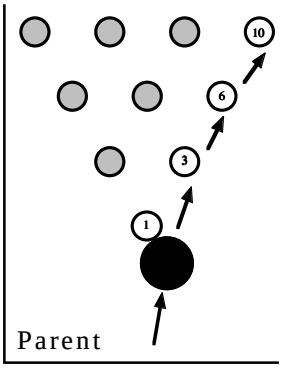
The 1-3-6-10 Spare Family

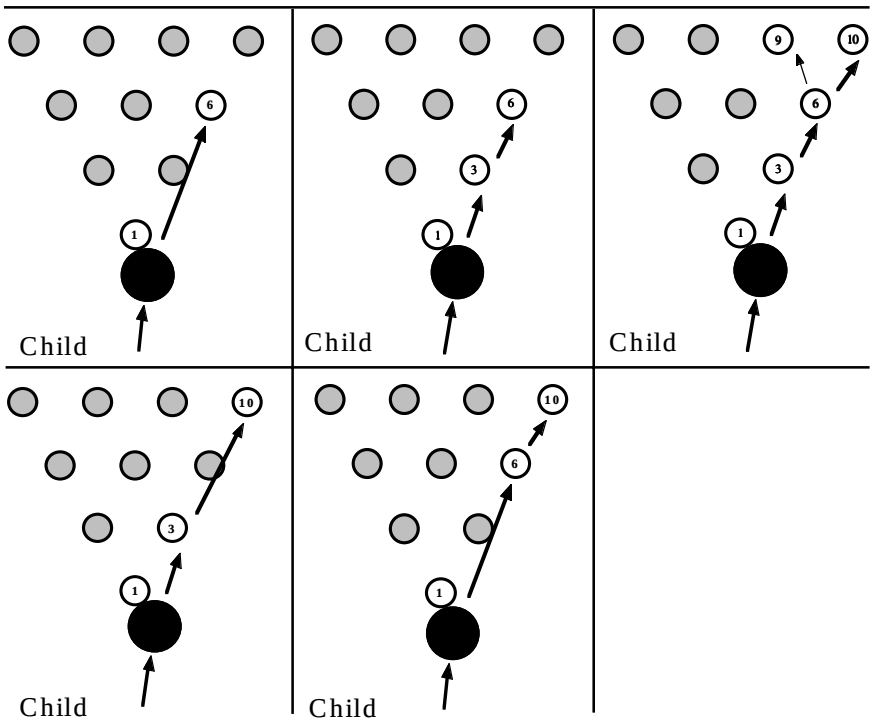


Key Pins: 1-6
Type of Spare: Right side ball deflection.
Standing Position: Far left side.
Angle of Attack: As negative as possible.
General Description:
The graphics show a straight ball rolling path.
This is a right side ball deflection spare shot. Try to impact the right side of the head pin. Roll the ball from the far left side so that the angle of attack is as negative as possible. This will lessen the probability that you will leave the 10 pin in the same way that you leave the 10 pin for a strike ball.

Most 10 pin leaves are due to the ball entering the 1-3 pocket more directly at the 3 pin and just barely impacting the 1 pin on the far right side. And that's exactly what you should do for this spare, impact the 1 pin on the far right side. The difference is that you need an angle of attack as negative possible. So a straight ball is preferred. If you roll a straight ball at this spare, make sure you stand on the far left side of the approach.

For that reason, do not roll your strike shot at this spare. Rolling the strike ball with a positive angle of attack increases the probability that you will chop pins away from the spare set.

If you choose to roll a breaking ball at this spare, make sure that it is mellow coverstock and dynamics (doesn't break very much). Roll the ball through as much oil as possible and make sure that you roll the ball from an extreme left side to decrease the angle of attack as much as possible.



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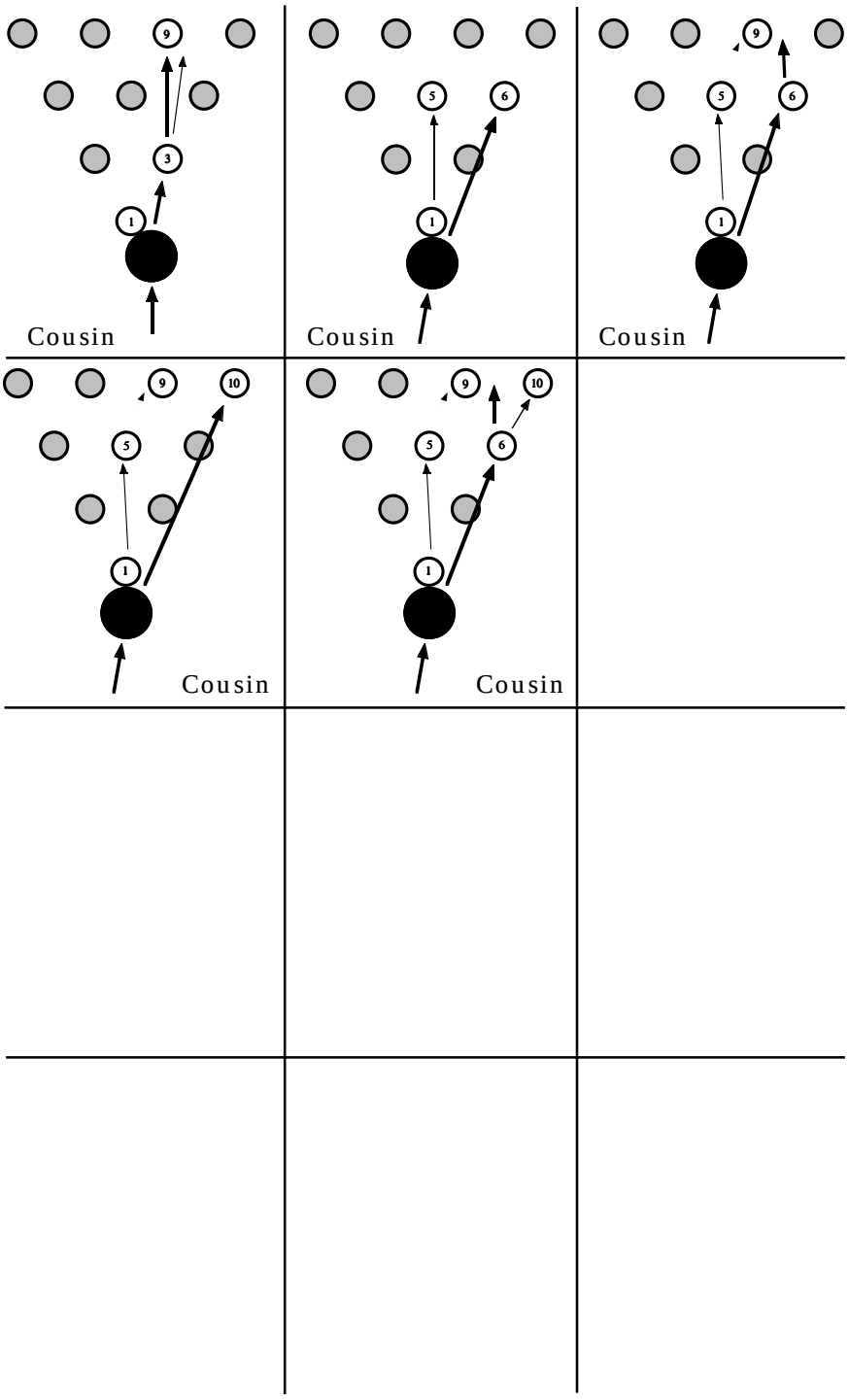

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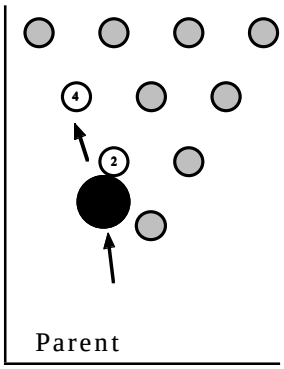
The 2-4 Spare Family

Key Pins: = 2-4
Type of Spare: Left side Ball Deflection.
Standing Position: Right side.
Angle of Attack: Strike ball.

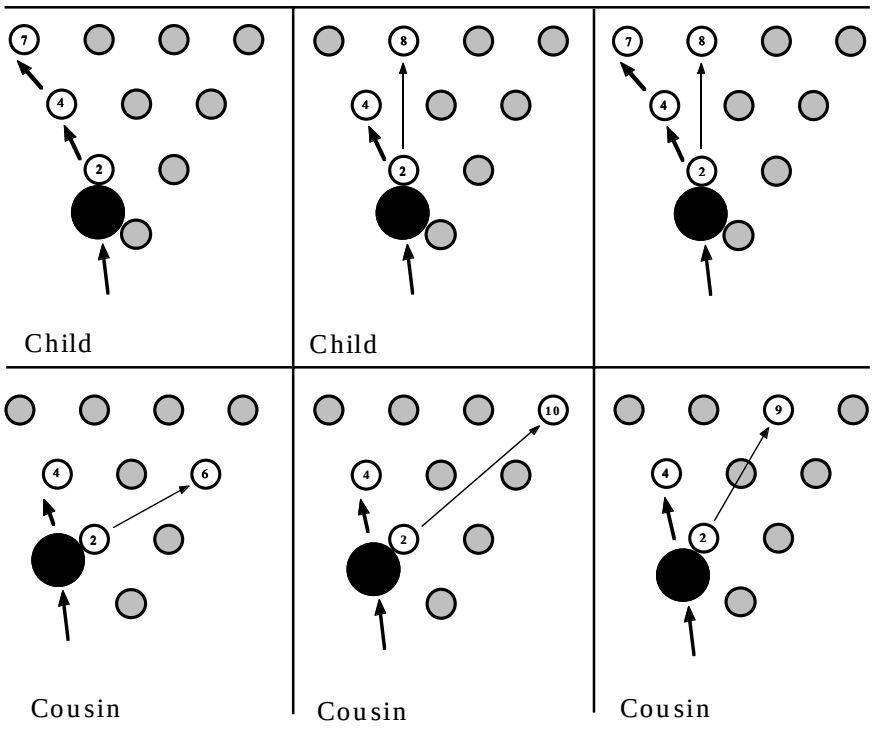


General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact to the left of the front of the 2 pin.

If you roll a straight ball at this spare, make sure that you roll it from the far right side so that you do not chop the 2 pin away from the 4 pin.

The recommended rolling path is the strike ball. Use a normal strike ball release from a position that is adjusted from your strike ball alignment so that the impact is to the left of the center of the 2 pin with as positive an angle of attack as possible.



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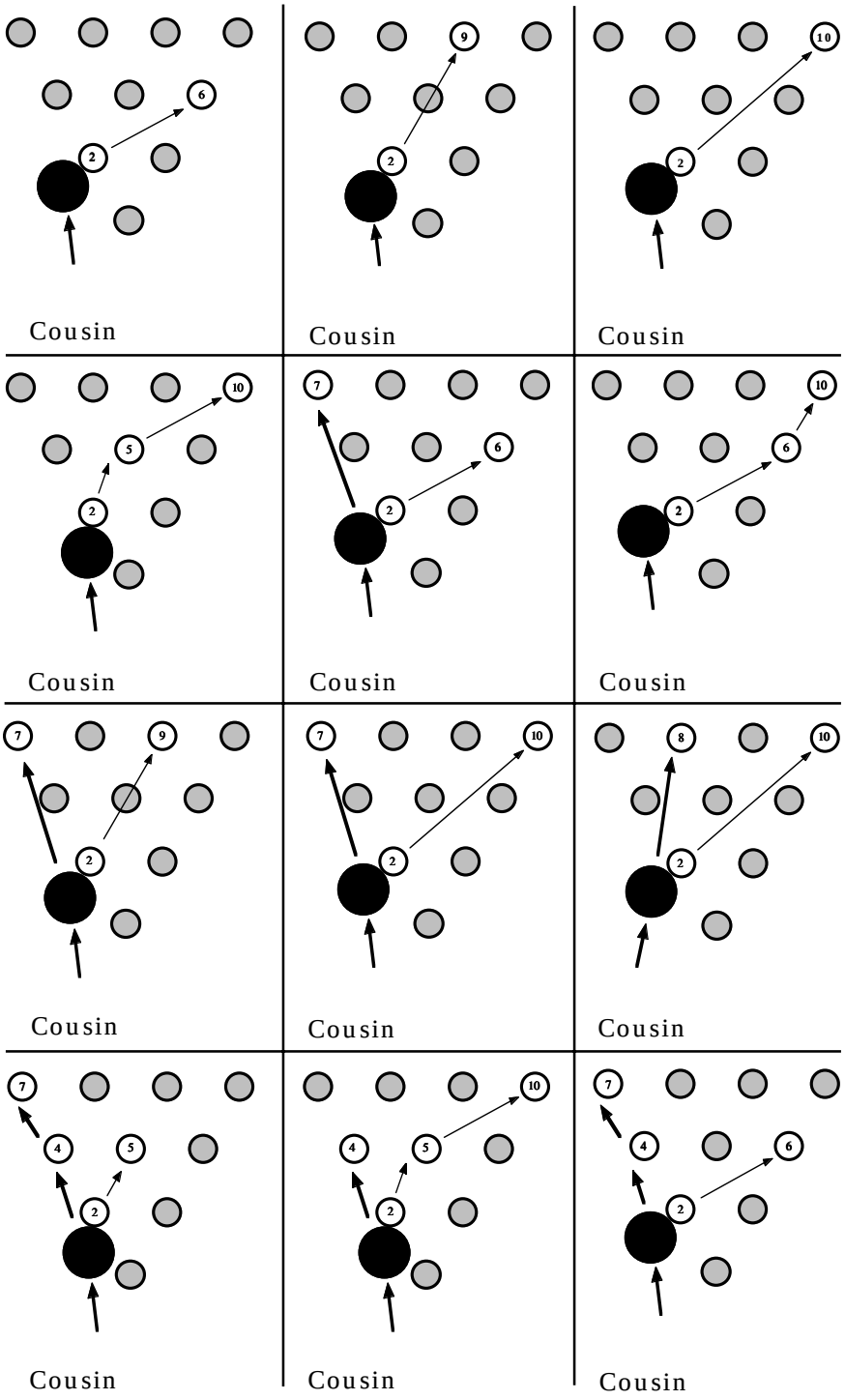

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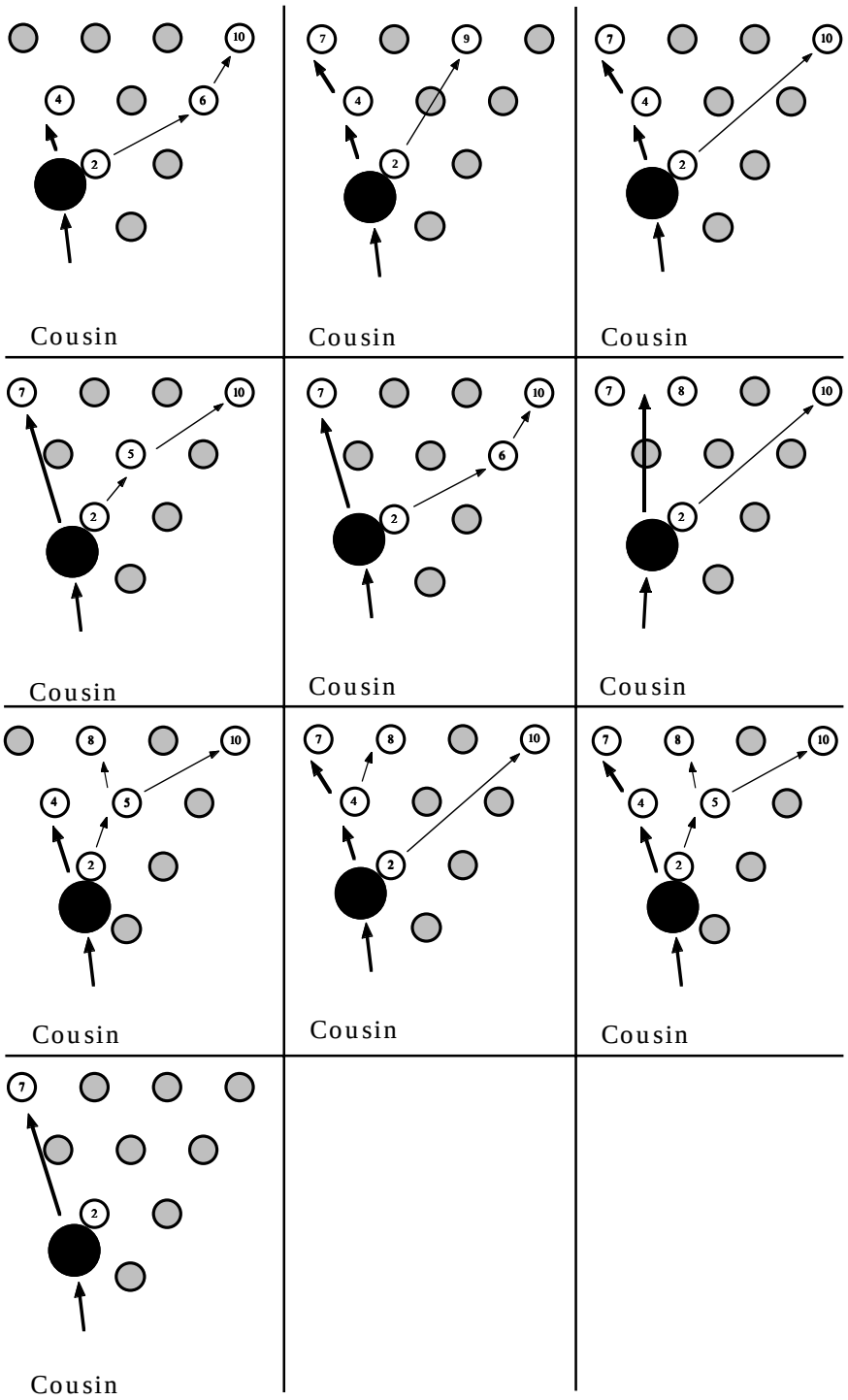

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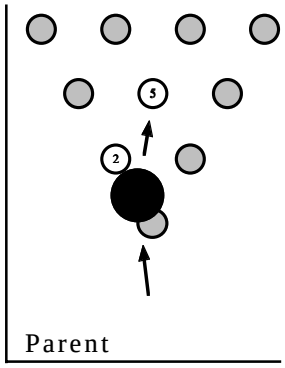
The 2-5 Spare

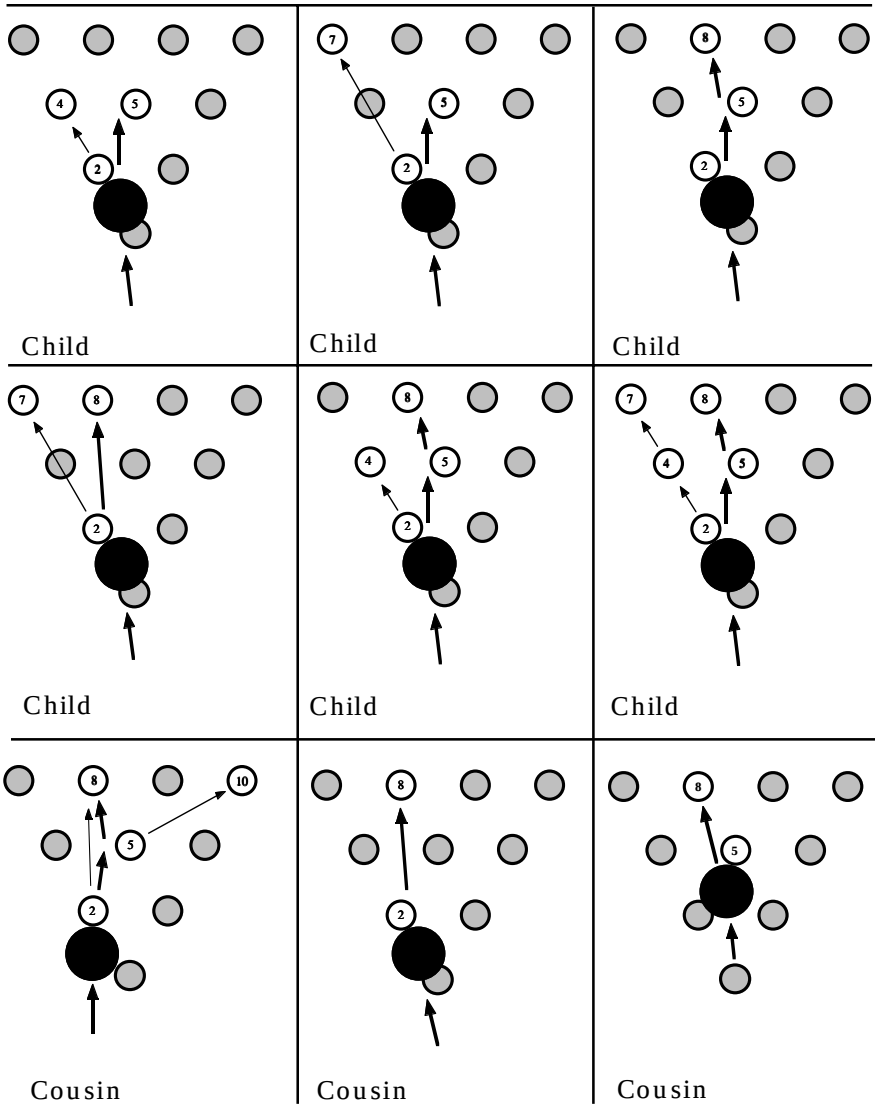
Key Pins: = 2-5
Type of Spare: Left side.
Standing Position: Middle of the approach.
Angle of Attack: Low angle of attack.



General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact to the right of the front of the 2 pin. The key to converting this spare is the angle of attack. The angle of attack should be a little less than the strike ball angle of attack. That will lessen the probability that you will chop the 2 pin away from the 5 pin. ideally you should attempt this spare from the far left side to decrease the angle of attack as much as possible, but that is a very uncomfortable position and would need to be practiced often.

Rolling the ball in the middle heavier oiled area of the lane surface will aid you in decreasing the angle of attack to the impact with the 2 pin. So if you roll a breaking ball at this spare, make sure that the ball is rolled through the heavy oil in the middle of the lane. (If you have a special “middle spares” aiming mark in the middle of the lane, use it for this spare).



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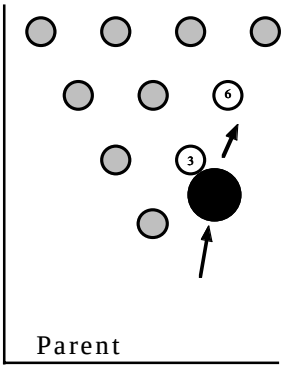
The 3-6-10 Spare Family

Key Pins: = 3-6
Type of Spare: Right side ball deflection.
Standing Position: Left side.
Angle of Attack: As negative as possible.

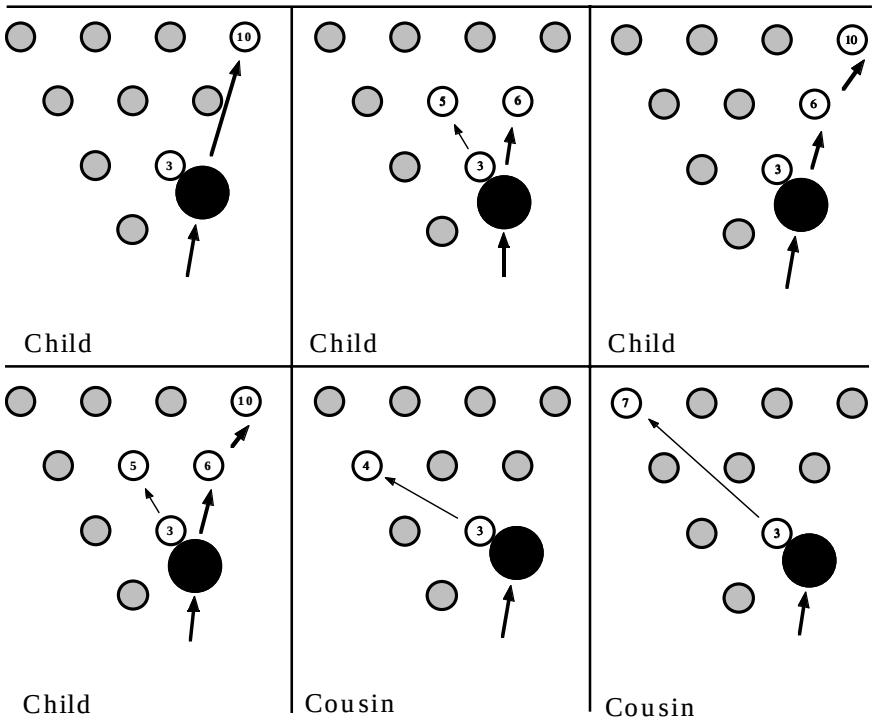


General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact to the right of the front of the 3 pin.

If you roll a straight ball at this spare, make sure that you roll it from the left side so that you can decrease the probability of chopping the 3 pin away from the 6 pin.

If you roll a breaking ball at this spare, roll it through the middle heavy oil so that the angle of attack is decreased as much as possible.



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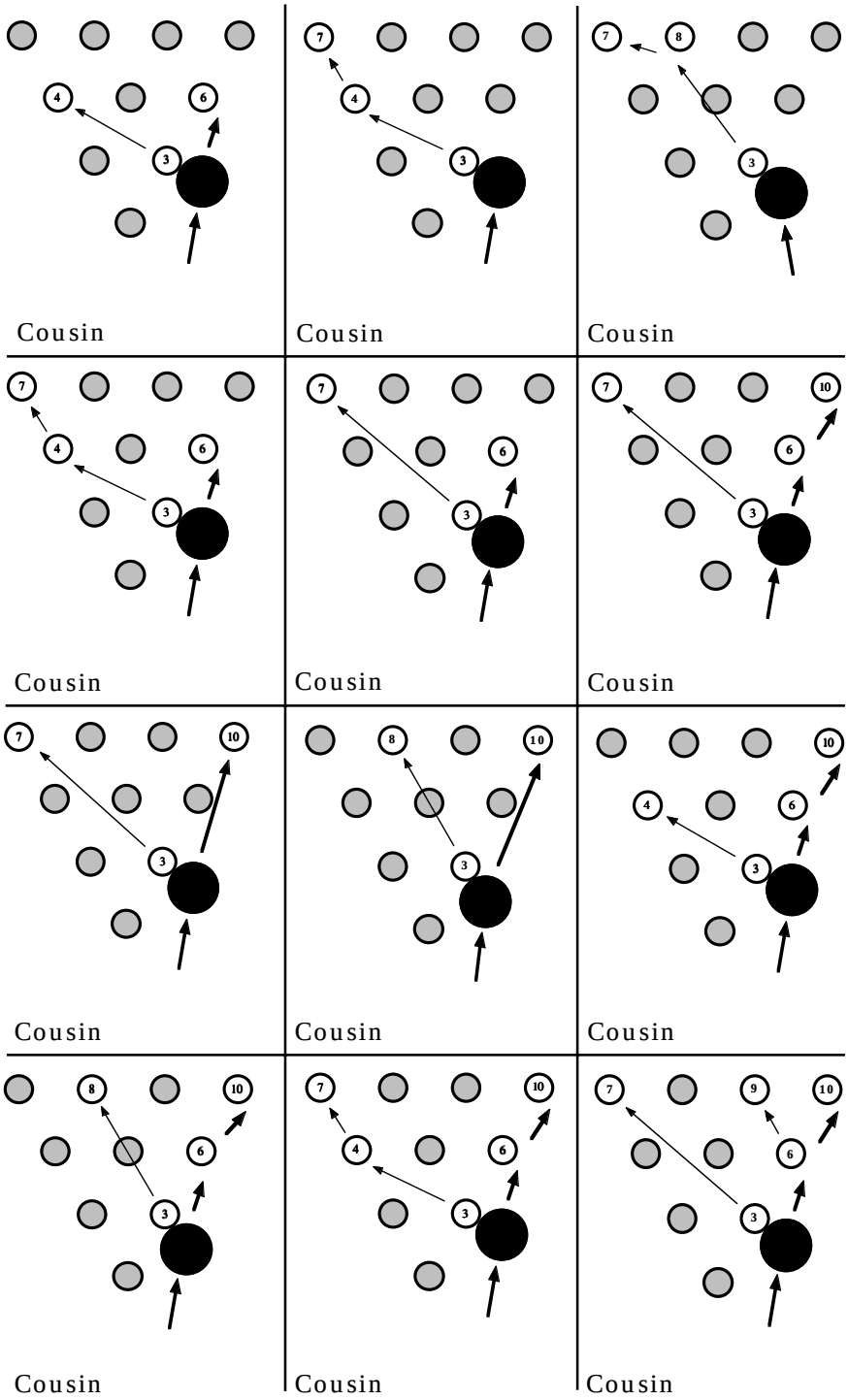

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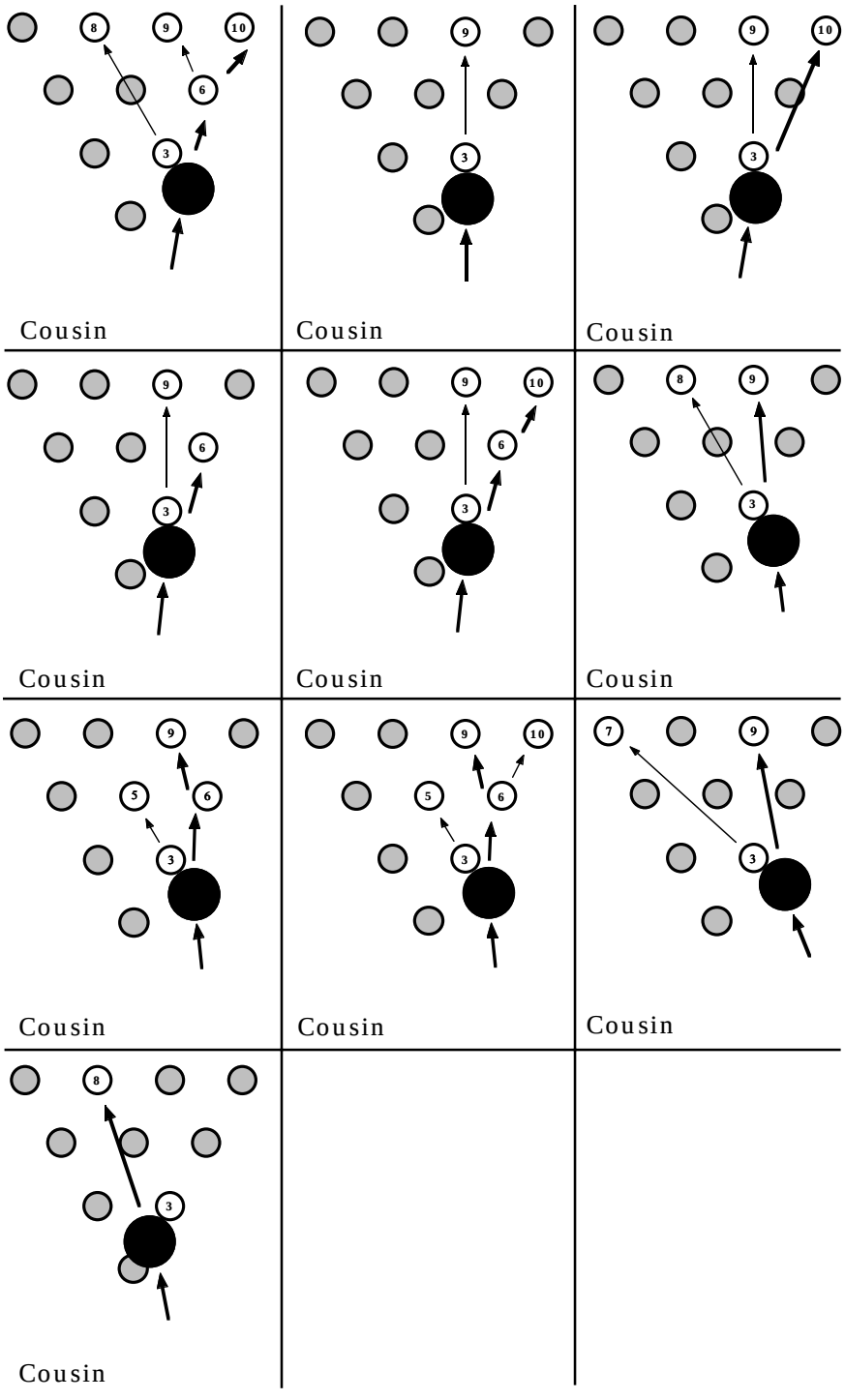

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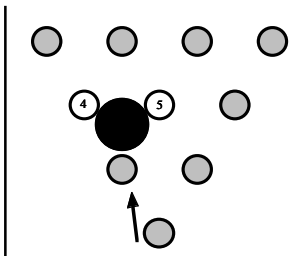
The 4-5/4-6 Split Family

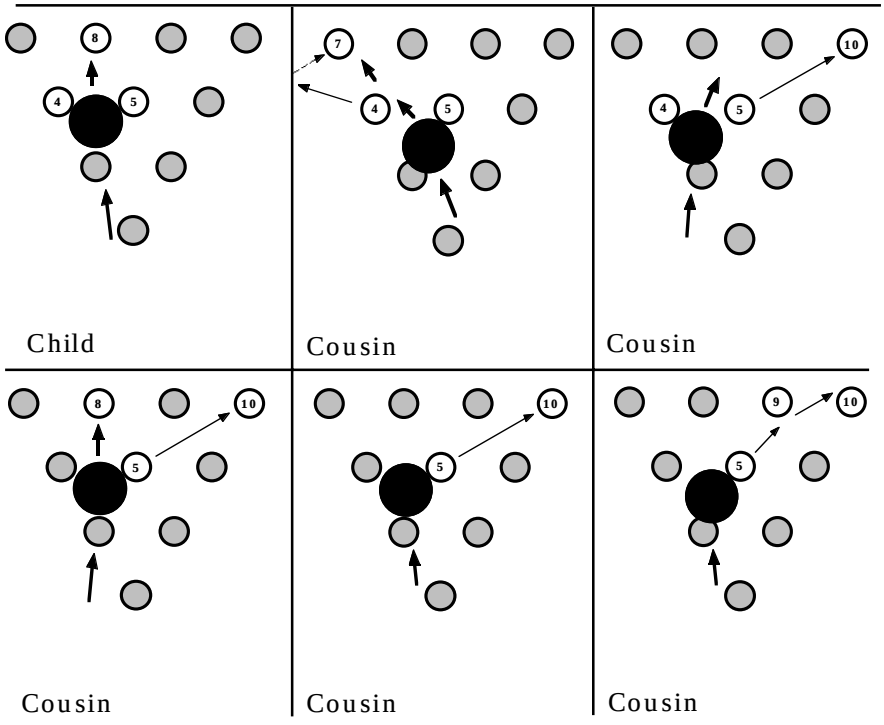
Key Pins: = 4-5
Type of Spare: Left side precision pin deflection.
Standing Position: Left side.
Angle of Attack: Zero.
General Description:
The graphics show a straight ball rolling path.



Parent

Adjust your standing spot position and/or aiming mark position so that the ball will impact at the mid-point between the two pins. The key to converting this spare is to imagine that the spare is the 5-10 split which you leave more often although it is about as difficult. Impacting the 5 pin first allows the deflection of the ball from the 5 pin to knock down the 4 pin. And, in the same manner, if you impact the 4 pin first, the deflection of the ball ever so slightly to the right might be enough to knock down the 5 pin. Since you want equal opportunity for that first impact to deflect the ball ever so slightly into the other pin, it is better to roll the ball from the left side so that the ball enters the spare area with almost a zero angle of attack. If you roll a straight ball at this spare, make sure that you roll it from the far left side position.

If, however you choose to roll a breaking ball at this spare, roll it from an adjusted strike position so that you do just the opposite as described above. Get as much positive angle of attack as possible. You are counting on a slight deflection off of the 5 pin into the 4 pin, so a greater positive angle of attack is recommended. Slightly adjust your strike ball position and roll your strike ball at this spare.



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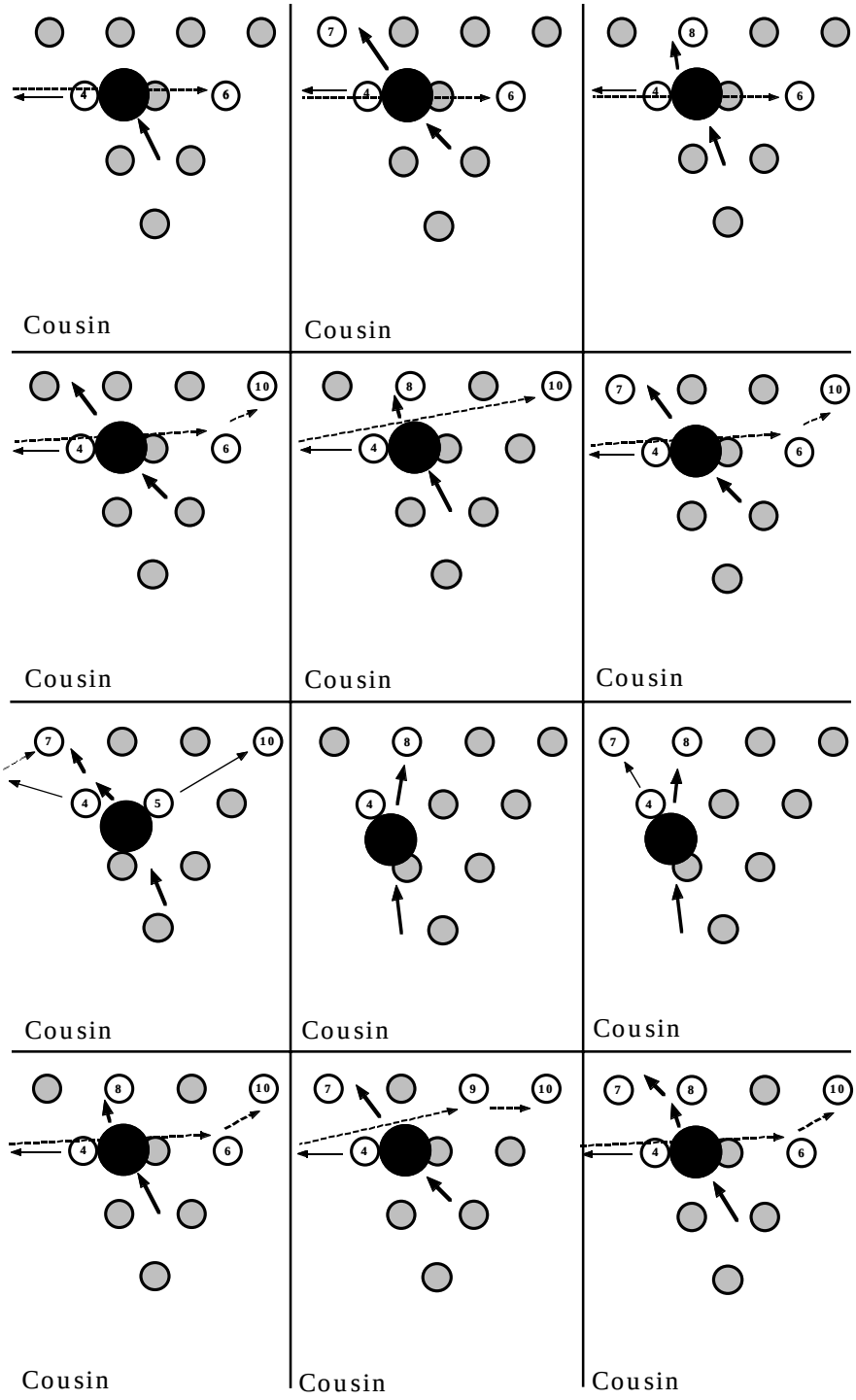

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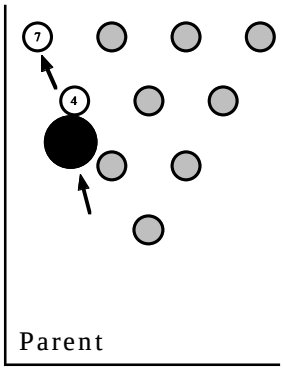
The 4-7 Spare Family



Key Pins: = 4-7
Type of Spare: Left side ball deflection.
Standing Position: Right side.
Angle of Attack: Strike shot.

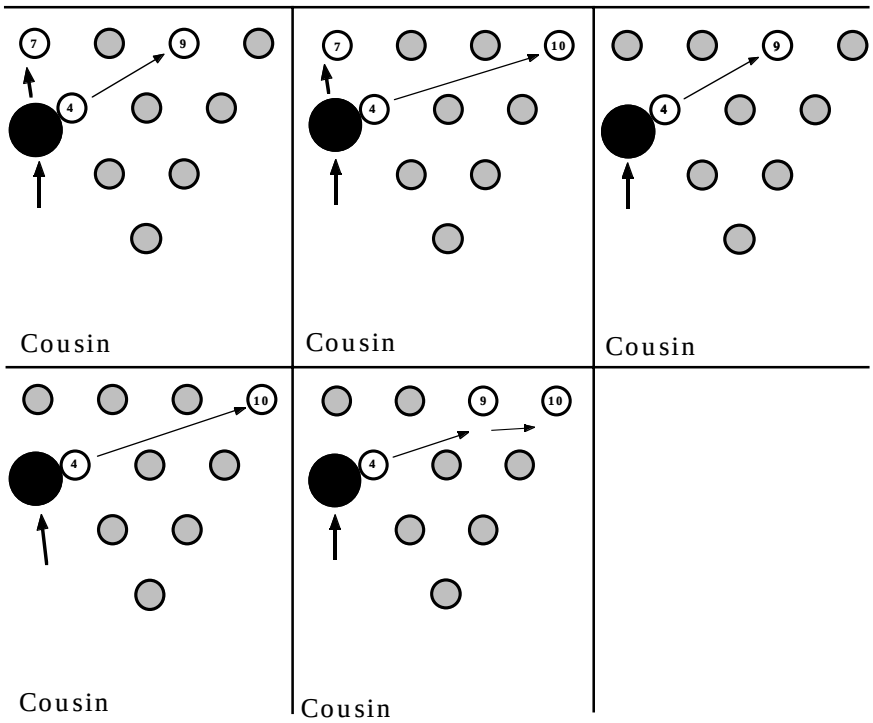
General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact slightly to the left of the front of the 4 pin

If you roll a straight ball at this spare, make sure that you roll it from the far right side position so that the chance of chopping the 4 pin is decreased.

If you roll a breaking ball at this spare, make sure that the angle of attack is as that for strike ball. The key to frequent success with this spare is to roll the ball as if only the 7 pin were left as the spare. The 7 pin spare rolling path is just about perfect for converting this spare.

The other spares in this family need a slight adjustment so that the ball impacts the 4 pin further on the left side.



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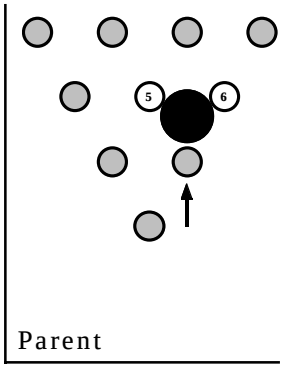
The 5-6 Baby Split Family

Key Pins: = 5-6
Type of Spare: Right side precision ball deflection.
Standing Position: Right side.
Angle of Attack: Zero.

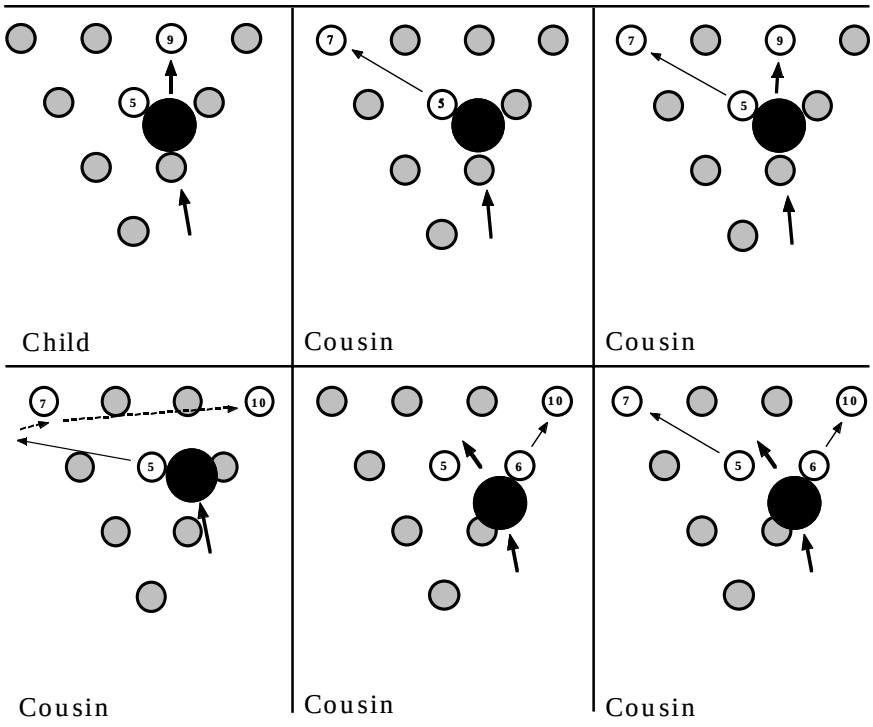


General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact at the mid-point between the two pins. The key to converting this spare is to imagine that the spare is the 5-7 split which you leave more often although it is about as difficult. Impacting the 5 pin first allows the deflection of the ball from the 5 pin to knock down the 6 pin. And, in the same manner, if you impact the 6 pin first, the deflection of the ball ever so slightly to the left might be enough to knock down the 5 pin.

Since you want equal opportunity for that first impact to deflect the ball ever so slightly into the other pin, it is better to roll a straight ball from the right side so that the ball enters the spare area with almost a zero angle of attack. If you roll a straight ball at this spare, make sure that you roll it from the right side position.

If, however you choose to roll a breaking ball at this spare, roll it from the left side and imagine that the 6 pin is not there. In your mind attempt the 5-7 split. Roll the ball through the heavy middle oil so that the angle of attack is decreased as much as possible.



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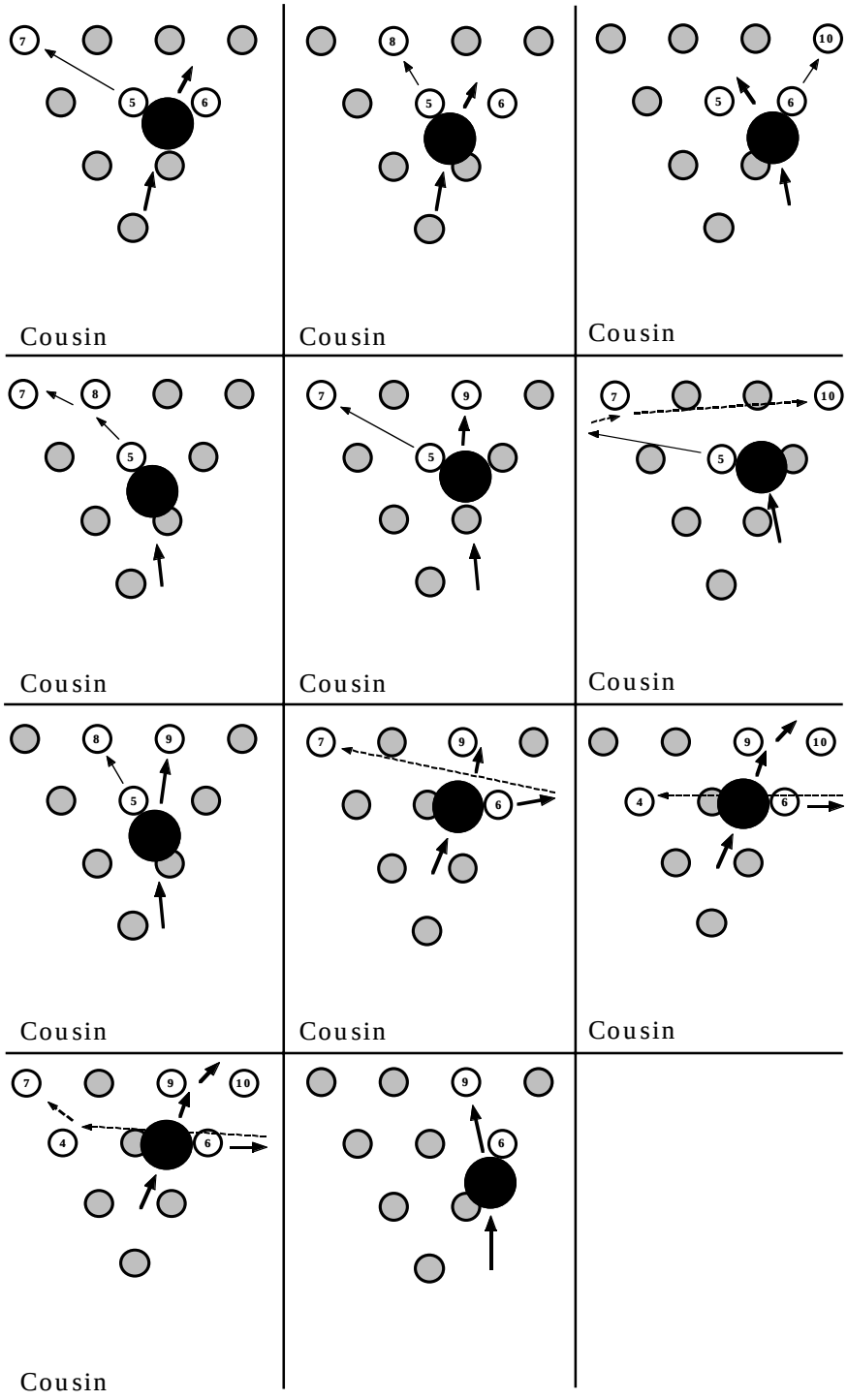

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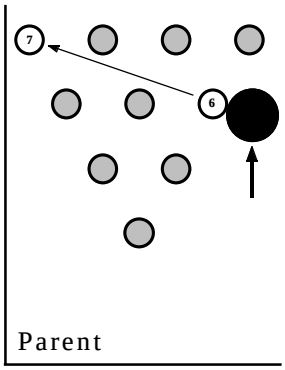
The 6-7 Split Family

Key Pins: = 6-7
Type of Spare: Right side precision pin deflection.
Standing Position: Right side.
Angle of Attack: Zero.

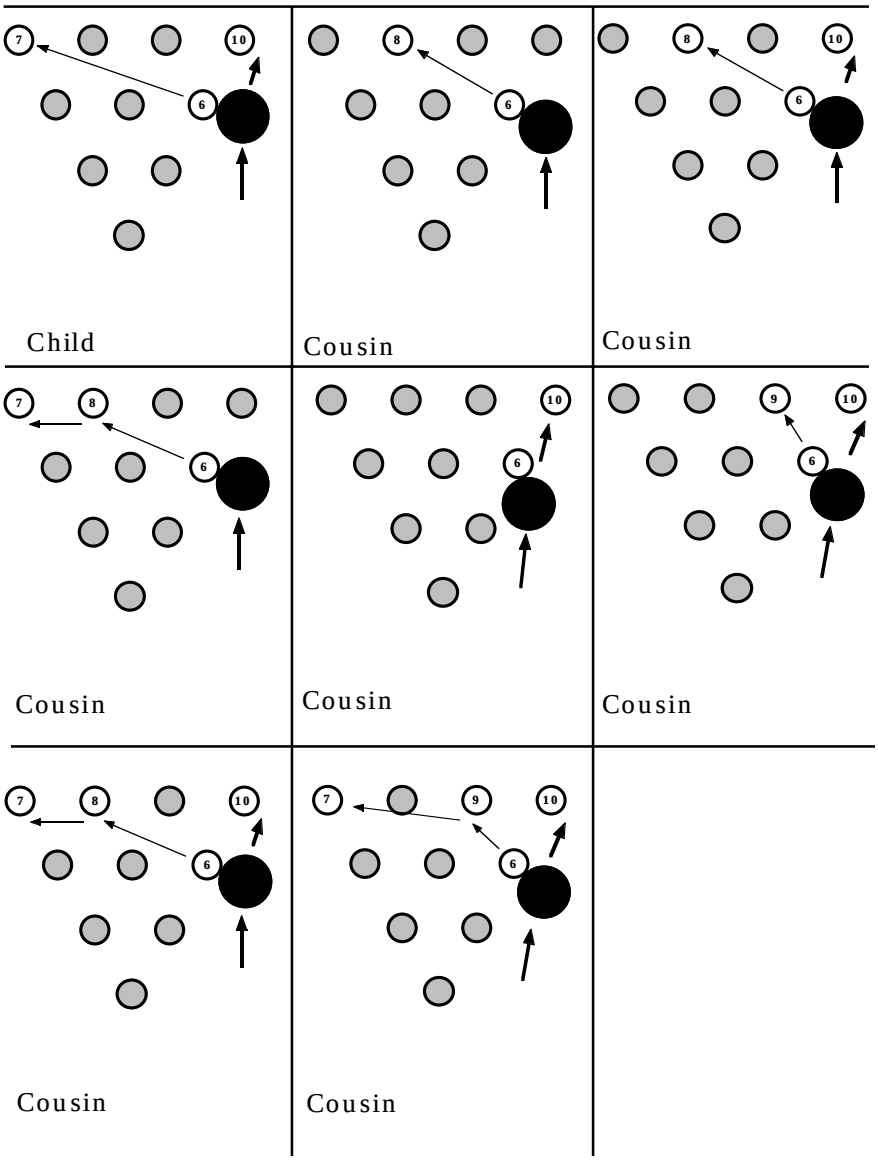


General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact to the far right side of the 6 pin.

If you roll a straight ball at this spare, make sure that you roll it from the right side position so that you can get a better look at the impact location on the 6 pin.

The key to converting this spare however, is to imagine that this is a 10 pin spare only. The 6 pin is not there. Adjust a small amount from your normal 10 shot so that the ball would be a little to the right of the normal 10 pin shot. It really doesn't matter if it is a breaking ball or a straight ball. Rolling a 10 pin spare shot at this spare is the highest probability because you roll the ball at the 10 pin more than any other spare.



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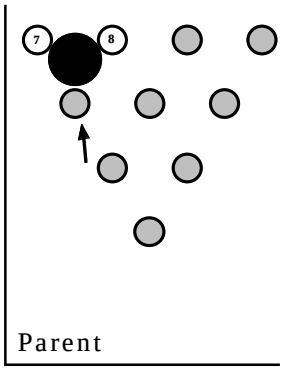
The 7-8 Baby Split Family

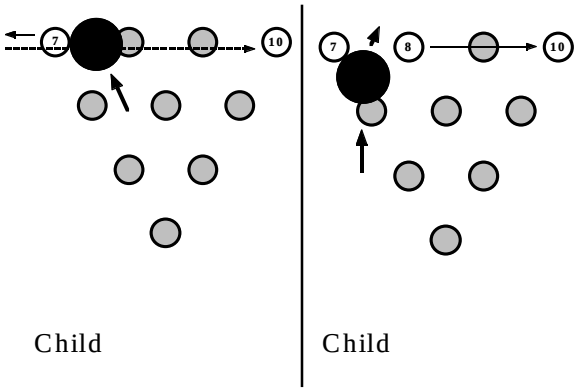


Key Pins: = 7-8
Type of Spare: Left side precision pin deflection.
Standing Position: Left side.
Angle of Attack: Zero.
General Description:
The graphics show a straight ball rolling path.

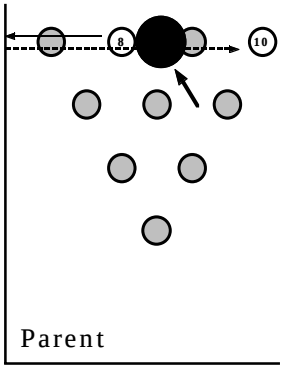
Adjust your standing spot position and/or aiming mark position so that the ball will impact at the mid-point between the two pins. The key to converting this spare is to imagine that the spare is the 7 pin only and rolled from the far left side straight down the left side. Slightly adjust from the far left side alignment for a seven pin.

Rolling a breaking ball for this spare will be difficult but not impossible. Do just the opposite as described above. Roll with a very high angle of attack and count on the ball deflection from the 8 pin to be enough to impact the 7 pin.

The other spares in this family are slight adjustments from this spare alignment. The 7-8-10 in particular requires that you impact the 7 pin first and for the ball deflection into the 8 pin be just enough for the 8 pin to deflect into the 10 pin. So, an extreme far left side straight ball shot is required.
The 7-10 split conversion requires maximum positive angle of attck, maximum speed and a lot of luck. Good luck!



The 8-10 Split



Key Pins: = 8-Wall
Type of Spare: Left side wall banger (left wall).
Standing Position: Far right side.
Angle of Attack: Maximum positive angle of attack.

General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact at the far right side of the 8 pin. The key to converting this spare is to get the 8 pin to deflect off the left kickback to deflect onto the pin deck and knock down the 10 pin.

To increase the energy imparted to the 8 pin when the ball impacts, roll the ball at an increased speed. It will enhance the probability that you will convert the spare if you can maintain control of the ball at that increased speed.

The keys to converting this spare are a very high angle of attack from the far right side and the increased speed.

If you roll a straight ball at this spare, make sure that you roll it from the far right side position.

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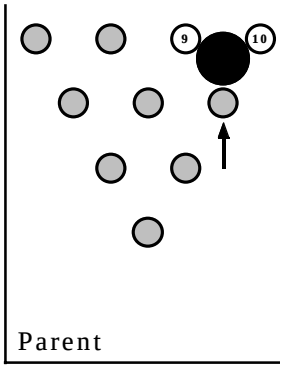
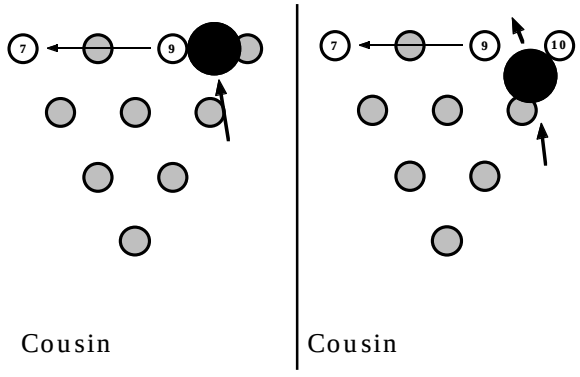
The 9-10 Baby Split Family



Key Pins: = 9-10
Type of Spare: Right side precision ball deflection.
Standing Position: Left side.
Angle of Attack: Zero or negative (for the 9-10 only.
General Description:
The graphics show a straight ball rolling path.

Adjust your standing spot position and/or aiming mark position so that the ball will impact at the mid-point between the two pins. The key to converting this spare is to imagine that the spare is the 10 pin only and rolled from the far left side straight. Slightly adjust from the far left side alignment for a 10 pin so that the ball is intended to be impact the 10 pin on the left side.

The other spares in this family may utilize a breaking ball. They need a positive angle of attack and the ball needs to impact the 9 pin on the right side.



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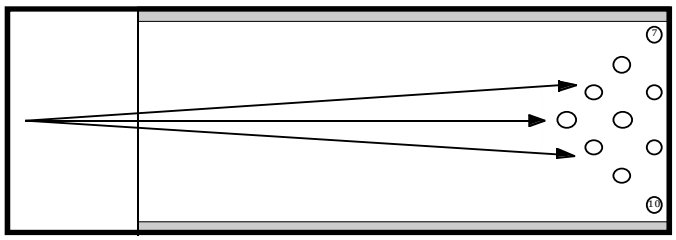
Alignment

Corner Pins for Pie

Converting the Ball Side Corner Pin is Easy If You Like Pie

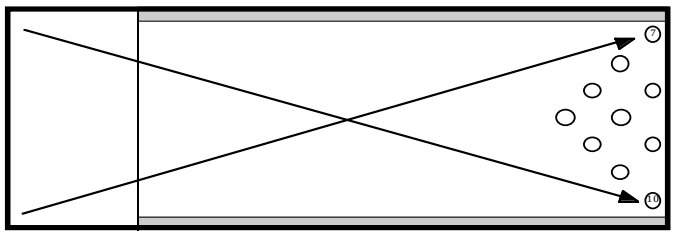
When you roll any ball straight ball, curve ball, whatever, you will sometimes miss left and sometimes miss right That shape of probable rolling paths is like that of a piece of pie.

Shown below is a “slightly exaggerated” path pie for attempting to convert the one or the five pin spares. (Hopefully your path pie is a much smaller piece of pie.

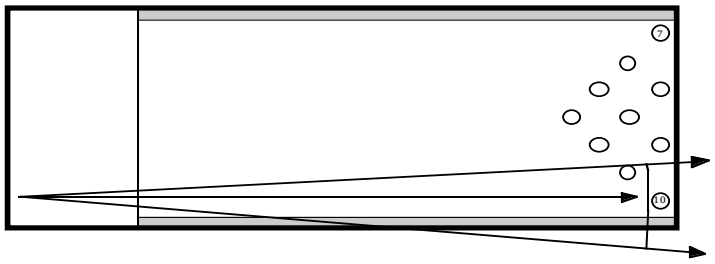


As you can see, sometimes you will miss your intended path to the left or to the right.

The greatest impact to converting more corner pins is accepting the fact that the alignment for those corner pins is at the opposite side of the approach. For the 10 pin stand on the left side of the approach and for the 7 pin, stand on the right side of the approach.



Let’s suppose that you attempt to roll the ball straight down the right side of the lane to convert the 10 pin. As you can see from the figure below a major portion of the piece of pie is in the gutter. You only get about half a piece of pie to work with.



The more pie that hangs over the edge of the lane, the greater the probability is that you are going to miss the corner pin.

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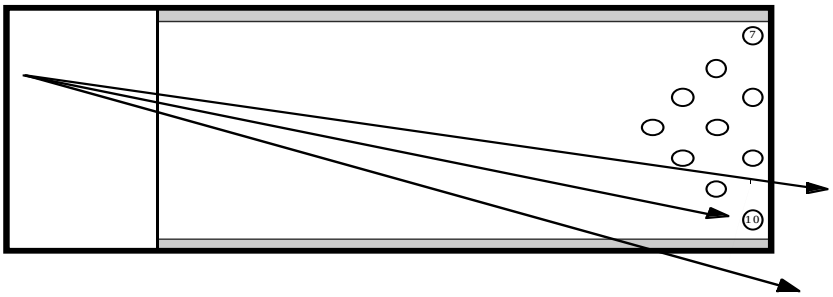
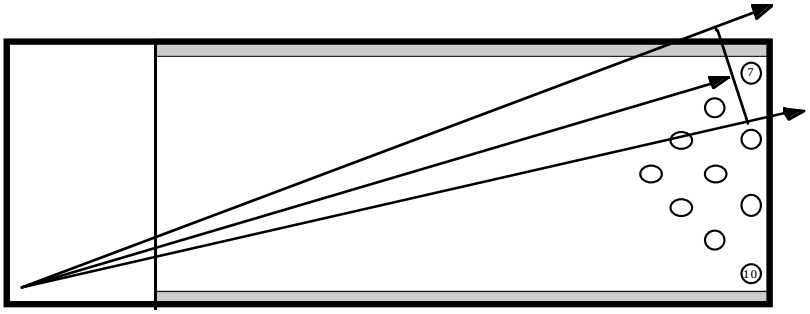
So, you want to position that piece of pie so that most of the pie is on the lane surface. That means more lane to work with to convert the corner pin.

As you move the initial approach starting position to the left side of the lane, you get more pie. The 7 pin shot works the same way; stand on the opposite side of the approach.



So, if you want a bigger piece of pie, stand on the approach side opposite to the corner pin.



Okay, now you know where to stand to get the highest probability of converting the corner pins. The probability can be increased by choosing the correct ball and release for those corner pins.

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Alignment
The Spare Ball

Probably the best recommendation that any coach can make concerning a bowler's arsenal for advanced lane play is to have a spare ball. The reason is simple; it takes the lane conditions out of the equation.

Taking the Lane Conditions Out of the Equation
When the lane surface is very dry and the ball surface is very aggressive, any little miss to the left or right is amplified and the probability that you will miss the corner pin is increased. If however you choose a smooth hard surface, non-reactive ball with very little core effects the ball will tend to go straight regardless of the type of release that you have. And, if you choose to release the ball with decreased side ways rotation, the probability of converting the ball side corner pin is even greater.

The whole idea is to take the lane conditions out of the equation. Once you find the correct alignment for rolling a straight ball shot at the ball side corner pin with you specific style of bowling, you will most likely never need to change that alignment. Hence, regardless of whether you are at you "home" bowling center with very wet lanes or a bowling center 1000 miles away with very dry lanes, the alignment is the same. You are going to roll that straight ball shot with the ball designed to go straight and you know where to roll the ball.

So, if you don't have a ball designed to go straight; get one from your neighborhood Professional Bowling Pro Shops International (PBPSI) Certified Pro Shop.

The Second Ball
You probably have a second ball for shooting spares. If you don't; get one. The spare a bowler leaves most often is the bowling side corner pin (the 10 pin for right handed bowlers). When you roll a bowling ball with no surface effects and very little core effects, it will by design tend to go straight down the lanes. Rolling a straight ball at those right side spares can have the greatest impact on raising your average.

Why Roll a Straight Ball at those Ball Side Spares?
(Why Do You not Roll a Breaking Ball at those Ball Side Spares?)

That's a good question and the answer is very simple. Regardless of the lane conditions, you will have the same approximate alignment at all bowling centers . . . . . forever.

Most of the ball side spares are not converted because of the tendency of the ball to hook to the inside and away from the pins. That leads to "chopping" the leads pin or pins away from the others in the set of pins.

A straight ball shot decreases the probability that you will chop pins away. The trick is to get aligned properly from the correct area of the approach and get the correct precise alignment for rolling the straight ball and becoming deadly accurate. You must the practice the straight ball 10 pin shot until it is your most consistent shot.

The key word is practice. These paragraphs describe variations of hand position and swing styles, all of which work well for a successful 10 pin shot. You, as the delivery system, are required to try all of the variations and find out which works best for you. Once that decision is

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made, you need to practice it until the 10 pin shot becomes your favorite spare. You should get enough confidence such that if you don't get a strike, you hope the spare will be a 10 pin because it has become your most consistent shot and you have the best chance of converting the 10 pin spare regardless of the lane conditions or the bowling center.

The Three Types of 10 Pin Shots:
There are primarily three ways that bowlers release the ball when rolling at the 10 pin and many other spares, a breaking ball, a killed breaking ball and a straight path. Each has their own characteristics and methods of release.

The Breaking Ball 10 Pin Shot:
If you choose to roll a breaking ball at the 10 pin, you had better be very accurate in the alignment. The ball needs to end up rolling into the center of the pin, not clipping the pin as it curves away from the pin.

If you choose to roll a breaking ball at the 10 pin, try to choose a ball that breaks very little and is little effected by the drier outside boards near the 10 pin. Release the ball like you do with your normal strike shot and follow through normally. What you are counting on is that you have lined up properly and that the ball will not break left more than anticipated.

The Killed Breaking Ball 10 Pin Shot:
A little better shot is the killed breaking ball. You may be able to roll the ball that you are using for the strike shot if you kill the ball enough. If you notice in practice that the ball still breaks too much, try another less reactive ball.

You can kill the ball a little by using the handshake grip during the forward swing so that the fingers and thumb release at about the same time.

If that is not enough "kill", try opening up your wrist and hand so that your thumb is rotated to about the 3 o'clock position at the release of the ball. Make sure that you follow through with your wrist and hand opened up. Generally, the more open your hand and wrist are, the more you kill the right to left break of the ball.

The Straight Ball 10 Pin Shot:
This rolling path is the preferable one for the 10 pin. You need to open your wrist as much as possible and assure that your hand is directly behind the ball at the release and that it is maintained at that orientation throughout the follow through.

Along with the rotated wrist, you must also do everything else opposite to what you are trained to do to get the ball to break. One is not to follow through completely; chunk the ball.

Note: If you have a proper 10 pin straight ball, it doesn't really matter how you release the ball unless the lanes are really dry. Because the ball is a hard, smooth surface, non-reactive resin, nonporous plastic ball, it's going to tend to go straight. But, since drier lanes do occur, releasing the straight ball shot for the ball to go straight even on dry lanes is a good thing.

General Straight Ball Spare Conversion
If you can roll a straight ball consistently and you can roll it where the greatest amount of oil is located, you will have the best chance of picking up single pin spares. The greater the percentage of the path that is in the oil, the less the lane will effect the roll of the ball when you

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miss your Aiming Mark slightly.

Releasing the ball for a straight ball delivery is a little different than rolling a normal release. Some bowlers have difficulty in releasing the ball for a straight ball. And, if you roll the same ball for strikes and spares but just release it differently, you may be headed for disaster when you release the ball not so straight for the spare. If you cannot roll an absolutely straight ball, maybe you can roll an “almost straight” ball.

The Difference Between An Almost Straight Ball and a Straight Ball
A straight ball is rolled with a different ball release method than an almost straight ball. For a ball to go as straight as possible, two things must happen. You must release the ball in such a manner that the fingers are released directly in back of the ball with an intent to have the track of the ball go directly over the thumb hole and between the finger holes.

The other equally important factor is the weight distribution of the ball. The best straight ball is one that has zero side weight, zero thumb weight, zero finger weight, a surface that is smooth, non-reactive and is hard as a rock. So, with everyone of these parameters being opposite to what is usually recommended for curving the ball, a separate straight ball spare ball might be a good idea.

An “almost” straight ball is rolled normally with a regular release. The surface characteristics and the weight distribution determine the total break of the ball. You should choose a ball that is very hard and very smooth and as non-reactive as possible.

The advantage of rolling an “almost” straight ball is that you release the ball just as you do every other time. You’re depending on the non-curve characteristics of the ball to get the right results. The fact that you don’t need to learn a different release for shooting at some spares is a distinct advantage.

The Almost Straight Ball Spare Conversion
If you roll a ball that is a smoother surface less reactive ball that is drilled to hook less, you may be able to release the ball normally and rely on the ball doing what it’s designed to do, go almost straight.

If you cannot roll a straight ball consistently but you have a ball as described that goes really straight in oil conditions, choose that ball and roll it on a path that crosses the most oil and your probability of covering the spare will increase.

So, for left side spares, the better Aiming Mark is one that is in the oil more in the middle of the lane. The rolling path of the ball will finish in the drier left side, but remember that left side gets drier less quickly than the right side if there are fewer left handed bowlers.

The right side spares are not much different, but rolling from the left to right for the right side spares puts the ball in the drier outside boards at the end of the rolling path of the ball. And, since the majority of your fellow bowlers are right handed, that right outside area will get drier a lot quicker. Depending on the chosen Aiming Mark, the ball can be in the outside drier boards most of the rolling path of the ball.

Using the same logic as before, rolling a straight ball at the right side spares would be best, but next best is an almost straight ball. And, as with the other spares the Aiming Mark should be

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chosen so that the oil is used to advantage. Since the edge of the oil is moving left as the league night proceeds, your Aiming Mark needs to be very far left to take advantage of the oil in the middle of the lane. If you are able to use one of the middle Aiming Marks for the right side spares, the ball will be in the oil for a much greater distance and the ball will correspondingly be straighter.

The Shots in Your Game
In addition to a breaking ball strike shot, you must develop a spare shot that enhances your probability that you will convert the spare. As the lane surface dries out during a night of league bowling or in a tournament, it becomes more difficult to convert both the right and left side spares. And also in the opposite sense, when a lane surface is very wet it may also be very difficult to convert the spares using a breaking ball spare shot.

The Decision on Whether or Not to Develop a "Second Shot" for Your Game
Okay, let's be realistic, how much can that brain and bodily control system handle. And, are you willing to put out the effort that it will take to develop an entire new way to roll the ball after you have rolled it another way for many years.

The question really is "how much do you really want an increase in your average." If you want it bad enough, you should make the effort and develop a second shot, the straight ball shot.

Note that this second shot is not a killed curving ball rolling path; it is a true straight ball. The path is straight.

Developing a Straight Ball Spare Shot:
Patience, patience patience is what it takes when developing any shot that you have never had before. It doesn't seem to matter whether you have bowled for 30 or 40 years or just 2 years. It's difficult in all cases.

If you see the value of rolling a straight shot at many of the spares that come up often in the game of bowling, that may be the impetus that drives you to developing and sticking with a new spare shot.

First and foremost, trying to develop a straight ball shot after years of trying to make the ball break as much as possible under varying lane conditions is not going to be easy and it's not going to happen overnight. But, the reward is a higher average and the respect of your fellow bowlers for being willing to listen, learn and implement improvement to your game.

Rolling the First Few Straight Ball Shots:
Step onto the approach with your bowling ball. Grasp the ball and rotate your hand to the open position with your hand at the straight ball position. (This will probably feel very uncomfortable at first, but be patient, it's going to work).

After getting into the proper stance position, start your approach and don't think about anything but keeping your hand open during the entire forward pushaway, backward swing, forward swing, release and follow through. Depending upon how much you have cranked the ball in your breaking ball delivery, the backswing will feel very very different. It is important to remember to maintain that locked open position.

Reach Out with Your Hand Opened Up

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As you release the ball, really concentrate on extending your opened hand out onto the lane. Get the feel for how that opened hand feels like after the ball has released from your hand and it is out there in front of you. It should look as if you were reaching out your hand to someone very tall with an open hand asking for a handout. In this case you're asking for the ball to give you a little help and not to curve.

Trying to Roll Your Strike Ball for a Straight Ball 10 Pin Shot
Don't do it. Yes, you can actually kill the ball a huge amount by keeping your hand open during the entire release and follow through, but if you make the slightest error it will be costly because of the surface characteristics of your strike ball. It is a far better idea to always use two bowling balls. Be prepared for the changing lane conditions and match those changing conditions by moving left as the oil begins to dry up on the outside boards. And, regardless of the lane conditions, roll the straight ball at the those spares that don't require the break of the ball.

Practice, Practice, Practice
That's actually an understatement. Practice the straight ball spare shot until your confidence is very very high. Only then should you use it in league play or in tournaments.

The Ball:
The idea behind rolling a straight ball at spares is so the lane conditions don't interfere with the consistent conversion of spares. The ideal bowling ball for a straight ball 10 pin shot has the following attributes:

1. Very hard surface.
2. Very smooth surface.
3. Nonporous surface.
4. Non-reactive surface.
5. Slightly lighter weight.
6. Drilled so that there is no static imbalance in any direction. That means no side weight, no finger weight and no thumb weight and as little top weight as possible.

Confidence in the Left Side of the Approach
There are several problems associated with the 10 pin shot related to the approach surface. If you go down to the approach near the foul line and rub your hand laterally across the approach surface, you will feel a slight valley in the middle of the approach surface. The middle of the approach surface is used much more and is therefore, usually a lot smoother. That means that the far left side where you may end up with your 10 pin shot slide, may have a little different slide characteristics.

During practice, verify that the far left side of the approach is usable. If it is too sticky or too slick, fix it immediately. If it is too slick and cannot be fixed, back up on the approach during the alignment (remember, your ball is going to go straight, so it doesn't really matter where you roll the ball with respect to the standing distance from the foul line). If it is too sticky, slow down your overall approach stepping speed and timing.

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Alignment
Extreme Decisions for Extreme Conditions

The All Straight Ball game
Help! I've fallen and I can't get up!

Well . . . . it feels like that sometimes when you are bowling and over a period of two or three frames, you get completely lost. For whatever the reason, you can't seem to find the right combination of alignment and ball and execution to get the ball consistently and the lane conditions are extreme (very wet, very dry or very wet/dry or very dry/wet).

Most of the time this happens when extreme conditions occur, for example, very wet or very dry conditions.

In those cases you need to have one more trick up your sleeve. Remember that spare ball talked about so much that goes absolutely straight regardless of the lane conditions.

Great idea, but very difficult to implement without a tremendous amount of practice.

Criteria for Switching to the All Straight Ball Spare Game.
When the lanes are very dry, the ball seems to start breaking toward the pocket the instant it impacts the lane surface. Spares are very difficult because the ball breaks so much and because the standing position for some spares is so far to the side that you are very uncomfortable and the approach surface in that area might be different. You will tend to miss the spares to the inside when the lanes are very dry.

When the lanes are very wet, the ball seems not to want to hook at all. It tends to go 60 feet and not even wrinkle. You will tend to miss the spares to the outside when the lanes are very wet.

When the lane oil pattern is severely wet/dry (very wet in the middle and very dry just to the right of the oil) it is very difficult to control the ball. Your misses will random, some left, some right.

When the lane oil pattern is reversed blocked, your misses will also be random, some left and some right.

So, there are many situations when an all spare ball straight ball game is preferred.

The trick is to practice it until you are confident that you can switch to that game instantly.

Practicing the All Straight Ball Spare Game
It will take a lot of time to develop this alternative way to bowl. And, what it takes in the very beginning is the commitment that this is a viable attack plan for some situations. You must have the confidence and experience to make it work.

Remember the idea of a straight ball is that on almost all lane conditions and bowling centers, the alignment will be approximately the same. That means that regardless of when and where you bowl, the alignments will be about the same.

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So, you need to determine what those alignments are for every single pin spare. All the rest of the spares are simply variations of those spares. In fact some of the singles pin spares are very close to being the same alignment.

Where are the Standing Spots and Aiming Marks with Respect to the Pins?
There are 7 rows of pins that make up the triangle of pins, the 7 pin, the 4 pin, the row of the 2 and 8 pins, the row of the 1 and 5 pins, the row of the 3 and 9 pins, the 6 pin and of course the cursed 10 pin.

The Aiming Marks and Standing Spots are located on boards number 5, 10, 15, 20, 25, 30 and 35. The question is . . . do the Standing Spots and Aiming Marks line up directly with the rows of pins on the pin deck? Drum roll please . . . . . .

No. Except for the 1 and 5 pin row of pins, none of the other pins are in direct alignment with either the Aiming Marks or the Standing Spots.

Here's a table of the Pin locations specified in inches and boards:

Pin Location Table

Pin #	Inches	Boards
10	3.0	2.78
6	9.0	8.35
3,9	15.0	13.93
1,5	21.0	19.50
2,8	27.0	25.07
4	33.0	30.64
7	39.0	36.22

Now let's compare that information with the Aiming Mark and Standing Spot Location Table.

Aiming Mark and Standing Spot Location Table

Spot #	Inches	Boards
5	4.85	4.50
10	10.23	9.50
15	15.62	14.50
20	21.00	19.50
25	26.38	24.50
30	31.77	29.50
35	37.15	34.50

So, the only pins directly aligned with the standing spots and aiming marks are the 1 and 5 pins! All the rest of the pins are just a little skewed away from the associated standing spot and aiming mark.

Look very closely at the tables. There is some information that can be used easily. For instance, the 3 and 9 pins are almost directly aligned with the right side of the 15th board, the 3rd arrow. And likewise, the 2 and 8 pins are almost directly aligned with the left side of the 25th board, the 5th arrow.

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So, lets review so far.
The 1 and 5 pins are straight down the 20th board, the middle (4th) arrow.
The 3 and 6 pins are straight down the right edge of the 15th board, the 3rd arrow.
The 2 and 8 pins are straight down the left edge of the 25th board, the 5th arrow.

So what's left are the 4 and 7 pins on the left and the 6 and 10 pins on the right.

There are two very distinct methods for completing the list of straight ball spares.

The right side pair (6 and 10) are just as difficult as the left side pair (4 and 7). The question is whether or not you go with the time tested method of moving very far left to shoot at those far right side spares and move very far right to shoot at the far left side spares. By moving far to the opposite side, you are in fact giving yourself a greater chance of staying on the lane surface by not being so close to the side that the pins are located.

That means that you would develop a separate alignment for the 10 pin spare (shooting from the far left side) and then adjust a little for the 6 pin shot.

Likewise, you would develop a separate alignment for the 7 pin spare (shooting from the far right side) and then adjust a little for the 4 pin spare.

The other alternative is to use an adjustment from the 3 or 9 pin alignment on the right side for shooting at the 6 and 10 pins. Remember that the alignment for the 3 and 9 pins are straight up the right edge of the 3rd arrow. So, you need to make a small adjustment for the 6 pin from the 3 pin alignment. Move your feet about 3 boards left and still roll the ball over the right edge of the 3rd arrow in the direction of the 6 pin. Bingo! Down goes the 6 pin.

In the same manner, if you move your feet about 6 boards left and still roll the ball over the right edge of the 3rd arrow in the direction of the 10 pin, you will have a great chance of scattering the remains of that cursed 10 pin all over the pin deck, the backend of the lane area and partly out the back door. . . . . hopefully.

And for the other corner spares, the alternative is to use an adjustment from the 2 or 8 pin alignment on the left side for shooting at the 4 and 7 pins. Remember that the alignment for the 3 and 8 pins are straight up the left edge of the 5th arrow. So, you need to make a small adjustment for the 4 pin from the 2 pin alignment. Move your feet about 3 boards right and still roll the ball over the left edge of the 5th arrow in the direction of the 4 pin. Bingo! Down goes the 4 pin.

In the same manner, if you move your feet about 6 boards right and still roll the ball over the left edge of the 5th arrow in the direction of the 7 pin, you will knock down the 7 pin.

So, you have a choice. You can use the lane area to advantage (shooting from the far opposite side) or you can use the KISS Principle (Keep It Simple Stupid) adjusting from the 2,8 and 3,9 alignments.

Note: The more you drift, the more you should tend to choose the far opposite side approach method. But you can try both. They work equally well if you execute properly. Hmmmmm . . .

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. . . did I really need to say that.

The Rest Of the Spares
All of the rest of the spares in this universe can be adjustments from those single pin spares just defined.

Remember that there are only 3 basic straight ball alignments.
The 1-5 pin alignment straight down the middle arrow.
The 3-9 pin alignment straight down the right edge of the 3rd arrow.
The 2-8 pin alignment straight down the left edge of the 5th arrow.

The 6 and 10 pins are adjustment from the 3-9 alignment (still rolling the ball over the right edge of the 3rd arrow in the direction of the target pin).
The 4 and 7 pins are adjustments from the 2-8 pin alignment (still rolling straight over the left edge of the 5th arrow in the direction of the target pin).

So, you really only need to remember the 3 basic alignments.

Heh, this game is easy! . . . . . .Yeah . . .right.

Now the Hard Part
Listening to the explanation of what to do is far simpler than actually doing it. It is certainly true in this case. It's very difficult to get your mind to accept that this is indeed the proper way to proceed during league or in a tournament.

The key is practice.

You must practice this on a very regular basis. That means about once a week.

Find a time when there is not a lot of activity in the bowling center and practice the alignments. Don't keep score. Don't even turn the scoring system on if that is possible.

Pick a time when the lanes are very wet and then the next time practice when the lanes are very dry.

Remember there are only 3 basic alignments. You can do it.

Ah Yes, But What about the Strike Ball?
Well . . . . that is a little more difficult to swallow . . . and a horse of a different color . . and very bad tasting medicine. But, like so many of those very bad tasting medicines, they work fairly well. The trick is to just do it.

The problem with the straight ball is that it is difficult to get enough angle of attack to properly get the ball through all of the basic impacts to get all of the pins down. The other and most difficult problem to contend with is the lack of traction that the spare ball has with the lane surface.

If you try to stand at the far right side and point the ball at the 1-3 pocket, 3 things can occur and two of them are bad. First you make impact the right side of the head pin and get a good pin count. That's the only good outcome.

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Second, you may miss the head pin completely to the right and leave a washout. Not a good thing.

Thirdly, you may miss to the left and get a split. Also, not a good thing.

Remember you are trying to roll the ball at a severe angle across the boards at the 1-3 pocket. You're not rolling down the boards or anything even close to down the boards. You've lost any resemblance of alignment with the direction of the boards. So, rolling at an extreme angle is by definition going to be less accurate because you don't have any help at all from the direction of the boards.

Okay hold onto your hats, I'm about to make a suggestion that goes opposite to just about everything that you've been taught in bowling. I want you to develop an alignment for getting a straight ball Brooklyn strike. That means that you find an alignment adjustment from the 2-8 alignment so that the ball consistently impacts the left side of the head pin.

The adjustment is a small movement (very small movement) of your feet to the left and still roll the ball over the left edge of the 5th arrow toward the Brooklyn pocket. You may not even need to move at all. The alignment for the 2-8 pins places the right side of the ball at just about the right place for the strike shot on the Brooklyn side.

But I Can't Stand on the Far Left Side on the Right Lane and Roll Straight at the 2-8 Alignment!

Okay, here's another small change that will help you. Since you are right handed, I agree that aligning for the 2-8 on the right lane may be difficult (it certainly is for me. I'm overweight and I drift, so it's just simply difficult. So for the right lane, roll at an adjusted 3-9 alignment for the 1-3 pocket.

So, that means that on the left lane, where I have a lot of room, I will roll down the adjusted 2-8 alignment for the 1-2 pocket. (I have plenty of room and I want the cursed 10 pin to be knocked down by successive impacts after the impact of the ball on the left side of the head pin). And for the right lane, where I can barely get to the right positioning for the 2-8 alignment, I will roll down the adjusted 3-9 alignment for the 1-3 pocket.

Is that a great plan or what?

A plan is only as good as the practice you spend to make it work for you.

But Want If Leave a Lot of 5 Pins?

Yes, but they are simple spares to pick up. It's straight down the middle arrow.

So, What are You Going to Do?

The advantages of this alignment are many. First if you miss to the inside, you just get a higher pocket hit. If you miss to the outside, you simply leave the fence row.

The other huge advantage is that (for the 1-2 pocket choice) by impacting the head pin on the Brooklyn side, you are more likely to knock down the 10 pin by the collisions of the pins travelling to the right.

This of course takes practice.

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But it is a pure joy to be able to have another plan of attack when the lane conditions get tough.

Moving Up = Moving Left

When the lane conditions are very dry, the right lane becomes difficult. The ball return gets in the way. You can't move any further left. So, you have several options, some of which are undesirable.

Option #1 - Walk crooked.
You can walk straight forward and then walk left after the end of the ball return. Boy, is that difficult or what?

Option #2 - Walk straight down the right edge of the ball return, but open up your upper body (turn it to the right) so that you purposely swing the ball behind your back intending to project the ball to the right. This is also difficult to get exactly right.

Option #3 - Move up on the approach.
Moving up on the approach is equivalent to moving left on the approach. The objective is to get the correct viewing angle of the imaginary line that you will roll the ball down. And, it is essential that you maintain the correct view of that imaginary line.

The only execution change that you have to incorporate is taking smaller steps and adjusting the ball height stance to keep proper timing.

The Last Thing to Remember

You now have an edge over the other bowlers. You have another way to bowl when the conditions get tough. While they're bitching and moaning, you are still able to get reasonably good score and stay in the competition.

If you want to win, have a good plan of attack.

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