

## **Key Elements in World Record Discus Technique**

Vésteinn Hafsteinson - National Throwing Coach Denmark

### **The Swing**

It is very important to find your own stance for your feet in the start of the throw before you start swinging the discus back. How do you find your stance? You find your strongest position, where you feel comfortable and strong. An easy way to find this position is to jump up in the air and see how you land. Many throwers have their feet too close together at the start, which will make it harder to develop tension and torque in the throw. In the starting position, have your toes point out in the stance and both feet on the ground with slightly bent knees.

You can then start to swing the discus back. It is very important that this key element is done correctly, as it is crucial to the rest of the throw. If you are a right-handed thrower, swing the discus from left shoulder high where you support the discus with the left hand and make sure that the lowest point of the discus is straight in front of you. Then swing it up again to a shoulder height in the back. The main factor is the low point. Many times this is done incorrectly, even by top-level throwers. Make sure the low point of the discus is in front of you. However, the lowest point of the discus is only one foot lower than the highest point of the discus in the backswing.

Swing the arm as far as it goes, not further. You are never going to get dynamic moves from an overly long backswing.

The feet in the back of the circle are very important, as well as how you make the swing of the arm in relation to the feet. Then you start the back swing from the left shoulder and swing the arm down so the lowest point of the discus is right in front of you then you have your feet fixed. Then the discus goes back and you keep your feet almost fixed, but a slight turn with the left toe and the left knee is possible. Make sure that you have contact with the circle with your left foot. The right foot stays fixed during the whole backswing.

The weight is kept over the left foot to begin with, shifts between the feet when discus is in front of you and slightly gets over to the right side when the discus is all the way back. Concentrate on having the weight more in between your feet rather than shifting too much.

The shoulders should be level at all times, without dipping in any way at the start or in the back. It is very important not to break your hips when the discus is all the way back during the backswing. Stay tight with your hips when you are all the way back with your arm, as if you would be able to do squats in this position. That means that you do not bend too much forward in the backswing. It is important to stay square and bend your knees.

In the swing the arm is always loose from your body and never held back with triceps flexed. As your arm is going back you breathe in, which will make you build up tension and give a long, smooth swing. Make sure to keep the separation between your arms. John Powell teaches to stretch both arms back, which is an interesting concept, but very hard to copy. Rather I prefer to keep tension between the arms so the left arm does stay long and in front of you in the backswing.

Your head should follow your shoulders at all times. Do not look too far back or down.

### **Key Aspects of the Swing**

1. Find your comfortable stance.
2. Make sure the low point of discus is straight in front of you.
3. Keep feet fixed during the backswing.
4. Weight is shifted from left to right, but is mostly centered between feet.
5. Shoulders are leveled at all times.
6. Make sure hips are strong and stable.
7. Arm is loose.
8. Breath in at the end of the backswing.
9. Separation between arms is very important.
10. Head follows your shoulders.

## **The Turn**

You start your turn on the left foot when you have the discus as far back as possible. Do not over-extend, but rather be naturally long and back and make sure the arm is loose. Turn the left foot on the ball of the foot. Do not roll around the edges of the foot. If you do not do this well, you should learn it. It is one of the most important technical points in the discus. When this is done the weight shifts towards the left side and presses down on the knee.

At the same time the right foot stays fixed as long as possible and just before leaving the circle it goes up on toe so the hip thrusts out and you build the reverse V position that is one of the key elements in the throw. If you look at this from the back of the circle it looks like the thrower is hugging a tree. Jurgen Schult taught it that way. Feel like you're hugging a tree that you turn your right leg around.

When the right leg comes off the ground in this way, the foot is kept open in a Wolfgang Schmidt style. This makes the right leg go really wide which is the most important element in the throw; lead with the inside of the thigh.

The right leg lifts at the back of the circle so the fall and movement of the left knee is easier to execute. It is hard to jump up if you do that and easier to keep contact with the circle. At the same time that this is happening, the left foot continues to turn and stays on the ball of the foot and the knee goes down towards the circle. This combination is difficult to perform, but is an extremely important factor of the throw.

At the same time as this happens, it is good to let the whole body fall backwards, just slightly. It is called the backwards turn. You turn around the left foot with the knee really low and you have a very wide right leg with the foot open at the same time as you fall in.

## **Key Aspects of the Turn**

1. Start turn on left foot when the discus is comfortably extended backwards.
2. Turn the left foot. Do not roll around it. Stay high on your toe.
3. Right foot stays fixed.
4. Create a reverse V position in the back of the circle.
5. Get on the toe of the right foot and thrust the hip out.
6. Lift the right leg slightly up at the back of circle.
7. Lead with the inside of the right thigh.
8. The left knee goes down towards the circle.
9. Fall slightly backwards.

## **The Sprint**

The four key factors of the sprint are (1) the relationships between turning on the left foot (2) with a high wide right leg (3) while and keeping the left shoulder axis back and (4) getting off the left leg at the right time.

The left shoulder axis, as I call it, is when you hold the left shoulder in front of you as long as possible at the same time as the left knee is dropping down and the right leg is wide open. This develops extreme torque and power. You recall what Schult mentioned before. Instead of hugging a tree, you can imagine having a pole that goes through your left shoulder or a wall that is built straight through the circle.

This creates the second reverse V in the sprint phase when you lean toward the direction of the throw, falling backwards, going under your left shoulder. The masters of this have always been Mac Wilkins as well as Wolfgang Schmidt. One more legend to mention is Knut Hjeltnes of Norway. Of the modern throwers, according to Adu Krewald, a biomechanics from Estonia, Vladimir Dubrovchic of Belarus, was the best one on this left shoulder axis movement. He had the arm really swung away in the first part of the sprint, and then came back with a tremendous reaction in the second part of the sprint. Zoltan Kovago of Hungary is also very good on this, in combination with his great wide right leg.

When turning on your left foot, and at the same time having a wide right leg and a left shoulder axis that is kept constant, then you get off the left foot automatically. The toes of the left foot are then pointing towards the direction of the throw. That means that you get off the left early. At the same time it cannot be done too early because of the risk of jumping up and away from the circle, which results in less speed and power. This is very important because of the reactive movement of the left foot towards the power position stance.

In the sprint phase the focal point is towards the left sector line. That means the low point of the discus is behind your back right in line with the left sector. That means the high point of the discus is also towards the left sector line in the power position. This is done very well by Schmidt, as well as by Schult and Powell. Of modern throwers, Virgilius Alekna of Lithuania was very good on this in 2000 when he threw his technical best. This aspect of the throw is very important, and I am surprised how many throwers do this incorrectly. Even among top-level throwers. Mac Wilkins did not do this well, and that was the only element in his throw that I do not like.

You can push off with the left toe when getting off the left and the reaction is going to be very fast, but then you risk jumping up and losing speed and control. Instead, you should build up torque and tension that make the foot come off automatically, if you execute the three big points prior (left foot turn, wide right leg, left shoulder axis). You build up a rhythm that makes this happen without forcing it. Just be high and strong on the toe, and then you are going to get a tremendous feeling from the left foot at the same time as the knee is thrusting down.

The right leg then; is it active? Yes, but mostly wide. Keep it wide at the same time as left shoulder is held back towards the throwing direction. It can work really well to thrust the hip forward because the body is supposed to lean slightly backwards in the sprint phase. Nobody has been close to Wolfgang Schmidt when it comes to this movement.

Make sure that the left shoulder is in front of you and do not keep it too high since it makes you jump up and lose speed and power. If the body tends to drop down a little in the sprint phase, allow it to do so. If the left shoulder goes away, we have a problem. If the arm swings away and comes back with a reaction in the second part of the sprint, then we are doing well.

The head follows the shoulders and leans back a little. Mac Wilkins was great on this. The sprint phase is not at all related to Al Oerter or Erik De Bruin of The Netherlands. It is a totally different technique with the left leg staying very long, and the upper body turning all the way around with a pre-turn on the right foot. There is nothing wrong with that technique; the concept of mine is just different.

When the left leg comes off the circle, there are very different concepts of how you move it to the power position. I have concentrated less on this point for the last few years because I think it is very individualistic and is mostly caused by automatization, and not much by position. You have your move there, even if it is with a low long radius as Powell says, or with a heel up reaction and close between legs as Wilkins says. It all depends on getting off the left foot after building tension in the start with left foot turn, wide and high right leg, as well as keeping left shoulder axis back. The third reverse V position is created during this part of the throw.

### **Key Aspects of the Sprint**

1. Left shoulder axis in relationship with left foot turn and wide right leg.
2. Create the second reverse V position.
3. Go slightly backwards into the sprint.
4. Focal Point at left sector line, head follows shoulders, keep it a little back.
5. Get off the left early and automatically.
6. Get a natural reaction of the left arm in relation with getting off the left foot.
7. Stay high on your toe on the left foot.
8. Thrust your hip forward with a very wide right leg.
9. Left leg moves quickly in an automatic fashion toward the front of the circle.
10. Keep right arm down in the sprint face. Lift it up so it is highest in the power position when aligned with the left sector.

### **Power Position**

When landing in the power position the right arm is back. The high point of the right arm is towards the left sector line as mentioned earlier. The left arm is slightly bent, as through the whole throw, and in front of you. The left foot has come off very fast from the back of the circle and lands open and flat with the whole sole in the circle.

The right foot is high on the ball of the foot. The right knee is bent as much as you can. There is tension in the fourth reverse V position that is created in the power position. The sight line is horizontal and never down because that makes your hips break. The hip is tight under the body and you are ready to explode from this position. This power position is the release builder of the throw. It is very often referred to as the rubber band effect, where everything is twisted up with tremendous tension, ready to be released.

### **Key Aspects of the Power Position**

1. Land with arm back and high point towards the left sector line.
2. Left arm slightly bent and in front of you.
3. Left foot lands open with the whole sole of the shoe in the ring.
4. Right foot high on the ball of the foot.
5. The fourth reverse V position is created here within legs in a dynamic position.
6. Look horizontal.
7. Hip is under you, no breaking.

## **The release**

If everything is done well in the Swing, Turn, Sprint and Power Position phases, then the Release is totally automatic. You build torque and tension during the throw that are released at the end of the throw. You release the discus at the right angle, height and most importantly, with maximum speed.

The most important part of the release is automatic right leg turn and push. But you cannot forget the importance of the left arm that is actually leading the way before the legs move. This is very often hard to train, but can be executed very well naturally by some throwers. If this is done correctly, then you get much more lift at the release. After turning the right foot on the ball of the foot and lifting left shoulder up to build tension between your shoulder blades, you hit a "brick wall" (Mac Wilkins style). Fight the reverse by thrusting your hip forward with both legs on the ground as long as possible. Wolfgang Schmidt was a master of this.

Make sure that the discus pathway is going to be away from your body and wide away from the direction of the throw. This means that you have to bend your legs. The right leg is pushed up from this position and as much vertical lift as possible is generated. At the same time you push up with the left leg as Schmidt was so good at. The reverse happens as late as possible and the right leg lands where the left used to be, with the thrower being as upright as possible.

The main thing is automatization as Wilkins said. You do not need to think about what you do here; it just happens. The main thing during the release is to think how you get in to the power position. Maximum torque and tension are important. You should feel like you just released the discus easily, but with a lot of power and at maximum speed. Tony Washington was outstanding at this.

## **Key Aspects of the Release**

1. The release should be automatic.
2. Torque and tension is built up during the throw to be released at the end.
3. Maximum speed is most important at the moment of release.
4. Right leg turn and push, in that order, is the most important factor.
5. Left arm movement is hard to train, but is actually the first move of the release phase.
6. Hit the brick wall with your left side.
7. Fight the reverse by standing long on the ground with both legs.
8. Discus is kept away from body.
9. Push up with right leg, and left leg.
10. The Reverse happens as late as possible.

**Finally;**

The discus is so simple, but so complicated. After I threw my best throw ever in a competition, it felt so simple, but the way towards it had been long and hard. I guess it is like with everything else in life; it is hard until you learn it. And you can only learn it by doing it and thinking about it. There is no right or wrong technique; only your technique. It takes you a long time to develop it. The most important thing is to throw the discus and do a lot of repetitions. You are only going to be good on throwing the discus by throwing the discus.

You get tired by throwing a lot, but you throw yourself into throwing shape. It can be worth being tired for months because of lots of throwing, since it is going to get you to another level. After you get there you will be able to throw much more with a much better technique and also much farther.

Do not spend a lot of time throwing heavy or light implements or turning backwards or throwing with your opposite arm. It is fine to do, but do not get carried away and let that take over your training. You only get good by doing what is most important; throwing the discus.

Rhythm, acceleration and maximum release speed is very important. Every bit is as important as the positions. You are the way you are. Sometimes it is very hard to change positions, particularly at a certain age. Then you can throw twice as much and get the body to do your moves more often. That makes your speed better in the circle. You will be able to execute your moves rhythmically with better acceleration as well as speed during the release. This can only be done with a lot of repetitions.