Shot Put

The throw is made from a 2.135 metre circle with a 1.22 metre stopboard (10 cms high) at the front. The thrower must commence the throw from a stationary position and leave the circle under control from the rear half after completing the throw. The shot must fall within a 40 degree sector at the front of the circle. The shot must be put from the shoulder with one hand only and be kept in close proximity to the chin during any preceding movements.

The Grip

The shot should be placed at the base of the first three fingers, which should be evenly spread but not stretched, with the little finger and thumb supporting the shot. The shot is then be placed under the chin with the elbow held high.

To test the grip and give the athlete confidence - stand with feet shoulder width apart, facing the direction of the throw. Using the arm only, push the shot out, ensuring that the elbow is kept high. The next step is for the athlete to twist his/her upper body to give further force to the shot and then move onto flexing the legs as well.

The Stance

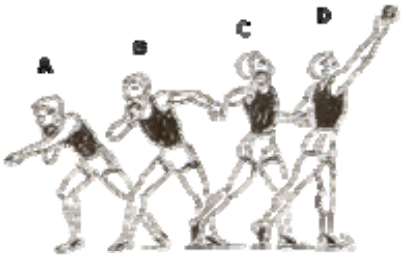

Figure 1

Figure 2

The Athlete should take up the position as in Figure 1A with the weight over the right foot and should be encouraged to think of "chin-knee-toe" being vertically in line. The feet and hips should be facing the side (at right angles to the shoulders) and the shoulder "cocked" to the rear. The width of the stance will vary according to the height of the athlete but the feet should be aligned as in figure 2. Note the position of the left hand and arm in Figure 1 A.

The Put

From this standing position (Figure 1A) the movement should be initiated by the right leg driving the right hip to the front (Figure 1B & C), transferring the bodyweight from the right leg to the left leg (Figure 1C). At the same time the left arm comes forward and up pointing along the trajectory line the shot will take (approx 45° to the horizontal). During

this action the emphasis should be on a fast right hip, keeping the elbow up behind the shot.

As the hips face the front and forward then the right shoulder is driven to the front and the left arm swings to the left side to balance the movement. When the chest is facing forward then the right arm punches the shot out, keeping the elbow high (Figure 1D). The left shoulder must not be allowed to drop during any part of this movement and the athlete should think of keeping the left side braced.

Movement into the basic put

The problem here is not simply to achieve movement across the circle to arrive in the basic putting position (Figure 1A) but how to ensure that the movement adds to the efficiency of the put. There are two accepted techniques - the shift and the rotation.

The shift - Stand at the back of the circle facing away from the throwing area with the hips and shoulders parallel. The weight is paced on the right foot with the trunk low (See picture of Denis Lewis above). The athlete then hops backwards on the right foot towards the stop board and in the process rotates the hips so that they are right angles to the shoulders. The right foot lands with the trunk low and the weight over the right foot. The left foot lands close to the stop board with the body in the initial put position (Figure 1A) and the feet position as in Figure 2.

The rotation - The approach is similar to the discus turn. Balance is important and again the rotation process must bring the athlete to the basic put starting position (Figure 1A)

Optimum Projection Angle

With ballistics the same initial speed is applied to the projectile regardless of the angle of projection. Research (Maheras 1995) has shown that the athlete cannot throw at the same speed for all angles of projection, as the angle increase so the speed decreases. This decrease in speed is a result of two factors:

- As the angle increases the athlete must expend more energy in overcoming the weight of the shot and so less effort is available to develop the release speed of the shot
- The structure of the body favours a throw in the horizontal direction - most athletes can bench press more than they can shoulder press

The focus for the shot-putter must be on projection speed and not the release angle. For elite shot-putters it appears that the optimum release angle lies between 30 and 40 degrees.

The release angle for the discus and javelin has to take into consideration aerodynamic lift and drag. The optimum angle for the Javelin is about 33 degrees (Bartonietz, 2000) and 35 degrees for the discus.