

LEARNING THE SHOT PUT TECHNIQUE

By Gudrun Lenz and Manfred Losch

There are several approaches used in teaching the shot put technique to young beginners. The following article introduces the part-whole method recommended in the former German Democratic Republic. The text is based on translated extracts from Grundlagen der Leichtathletik, a universities and high schools textbook, edited by Dr. Karl Heinz Bauersfeld and Dr. Gerd Schroter.

INTRODUCTION

A well planned development of the shot put technique should be made up from many-sided throwing exercises in which emphasis is based on the delivery action that stresses a full extension of the whole body. The development plan should naturally take into consideration adjustments required to balance the development of technique with the improvements in physical capacities. This means that the joint angles in characteristic positions are gradually changed and the path of the shot extended to correspond to the physical developments.

Because of the considerable differences of single movements and positions, the development of the shot put technique is best



LEARNING THE SHOT PUT
Photo: Revue de L'AEFA, France

approached by using the part-whole method. It is usually divided into four stages:

1. The development of the extension-delivery action.
2. The learning of the standing put.
3. The learning of the gliding movement.
4. The learning and development of the total shot put action.

EXTENSION-DELIVERY MOVEMENT

The task: coordinative preparation, development of general throwing capacity, learning of the whole body extension combined with the delivery action.

Preliminary exercises in this stage include medicine ball relays (fig. 1), medicine ball puts from different positions forward-upward, medicine ball throws forward over the head, backward over the head and from between the legs forward-upward. Emphasis in all these exercises is placed on the extension of the whole body that starts from the legs. It is particularly important to observe leg extension in all backward throws.

Basic exercises that follow the preliminary drills are made up from frontal puts with both hands and single handed from various positions and using different weight implements, upward-forward puts from a stride position and from a slight knee bend, single and double handed puts from sitting and kneeling positions, puts for higher targets etc.

All single handed throws are performed alternately with the right and left hand. Competitions can be introduced in the formats of aiming for accuracy or attempting to reach target zones. For safety it is important that only medicine balls are used for partner relays:

THE STANDING PUT

The task: establishment of a technically sound delivery movement from an optimal position with gradually changing joint angles (lower hip and knee angles).

Preliminary exercises in this stage are made up from learning to handle the shot (fig 2) and the placement of the shot on the neck. This is followed by the introduction of standing medicine ball puts from the correct standing put position. The following must be observed in the correct delivery position:

- a sideways feet astride stance with the left side towards the delivery direction and the body's centre of gravity over the right leg;

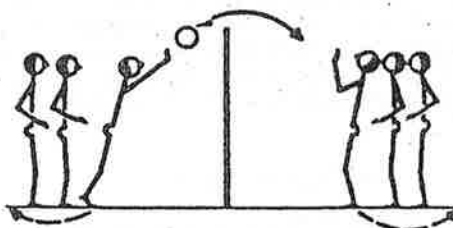
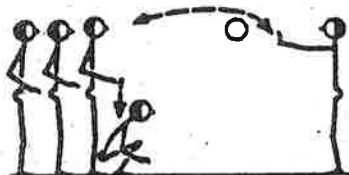
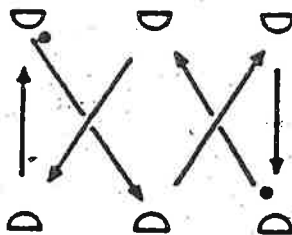


FIG. 1: MEDICINE BALL RELAYS

- the trunk rotated 90° to the right;
- a backward lean of the upper body forming a straight line of the body's left side.

Basic exercises are made up from imitation deliveries against partner resistance, including resistance against the delivery arm and against the left hip (to avoid a weight shift on to the left leg). Next come standing puts from a correct delivery position, first without and later with preliminary movements, stressing the correct delivery direction and making use of light and heavy implements to stabilize the techniques.

Emphasis in the standing puts is based on a technically correct stance with the centre of gravity over the right leg (knee angle about 12°, hip angle approximately 90°), the start of the delivery action from the right leg, a distinct movement sequence of leg-hip-shoulder-arm, and a delivery with a complete extension of the body with both feet in ground contact. The left side of the body must form a straight line at the start of the delivery.

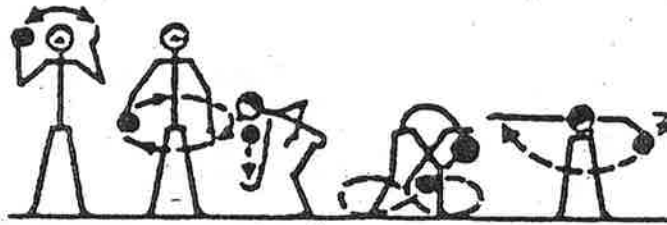


FIG. 2. LEARNING TO HANDLE THE SHOT

LEARNING OF THE GLIDER

The task: learning and development of a technically sound gliding movement into an optimal delivery position with a gradually lengthened acceleration path of the shot and increased movement speed.

Preliminary exercises are made up from games and drills with emphasis on the action of the driving and leading legs. Typical examples are backward hops with a partner holding the lead leg, backward glides that finish with a forward push of a medicine ball, backward bounding and double-legged backward hops (fig. 3 and 4).

Basic exercises that follow aim to establish a deeper starting position, first without preliminary movements and then with preliminary movements. Emphasis is on a distinct temporal separation between the start of the driving and lead leg movements. Imitation exercises include a partner assisted gliding drill in which the partner holds back the trunk (fig. 5) and imitation gliding movements with a sandbag.

The following points must be observed in all the exercises:

- An optimal starting position with the centre of gravity over the right leg, the back turned towards the throwing direction, shoulders parallel and a stable push-off position.
- An active and flat lead leg extension that should not exceed the height of the hips.
- A flat push-off from the support leg over the heel that is followed by a glide and not a hop.
- No changes in the trunk position during the glide.
- A rotation of the foot, knee and hips towards the throwing direction without any changes in the shoulder axis.
- An introduction of preliminary movement in the upright position only after the starting position has properly established.
- Start with a relatively slow gliding action before gradually increasing the speed.

LEARNING THE TOTAL ACTION

The task: joining the isolation mastered part elements into a complete shot put action with the correct speed structure. Lengthening and



FIG. 3: PARTNER ASSISTED GLIDE EXERCISES

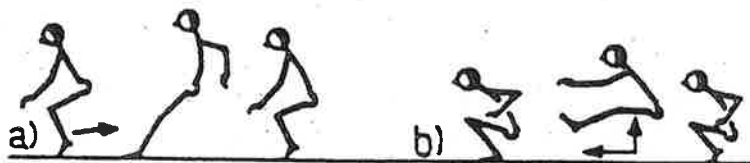


FIG. 4: BACKWARD BOUNDING EXERCISES



FIG. 5: PARTNER ASSISTED GLIDES

improving a straight line acceleration path through gradually changed joints angles in the main position.

Basic exercises are made up from the following variations:

- Throws with the competition weight implements to establish and stabilize the complete movement structure.
- Throws with lighter implements to improve the speed of the complete movement structure.
- Throws with heavier implements to develop a "feel" for the delivery and to improve speed-strength.
- Imitations of the complete movement to stabilize the spacial movement structure.

It is important that a relatively slow movement speed is first used in all basic exercises. The movement speed should be increased only gradually, always stressing acceleration and avoiding jumping type glides. The delivery movement must take place without a pause after the glide is completed with both feet in contact with the ground until the legs are fully extended.

COMMON FAULTS AND CORRECTIONS

- Body weight after preliminary movements not over the right leg at the start of the glide.
Correction: Repetitions of glides from a bent right leg position without preliminary movements.

- Insufficient lead leg action at the start of the glide.

Correction: Repetitions of partner assisted lead leg drills.

- Jumping type glide action.

Correction: Repetition glides with stressed ground contact of the support leg. Exercises against partner resistance where the partner pushes against the back to prevent upper body lift.

- Upper body rotates during the glide towards the throwing direction.

Correction: Exercises where a partner holds the hand to prevent forward rotation (fig. 4).

- Right leg fails to rotate forward during the glide.

Correction: Repetition drills stressing the correct right leg action.

- Left leg lands too late after the completion of the glide.

Correction: The use of acoustic signals to indicate correct timing. Partner assisted lead leg drills.

- Glide too short.

Correction: The use of markers to indicate correct length.

- Insufficient extension of the legs in the delivery action.

Correction: Imitation extensions with a sand-bag or a barbell on the shoulders.

- Left side of the body fails to provide a bracing action.

Correction: Partner resisted trunk rotation drills. Shot puts for height.

- Shot leaves the neck too early in the delivery action.

Correction: Putting of heavy implements. Partner resisted imitation drills.

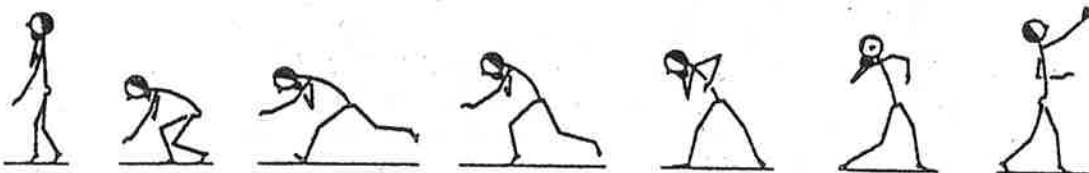
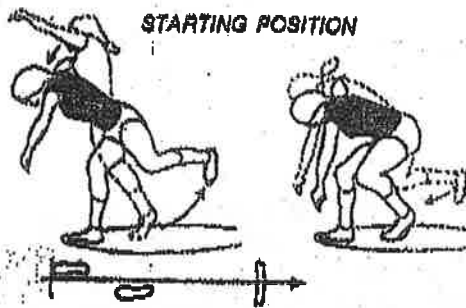


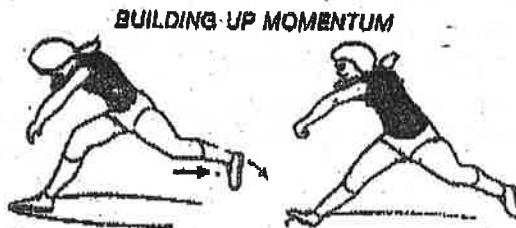
FIG. 6: THE COMPLETE SHOT PUT ACTION

EVENT ANALYSIS

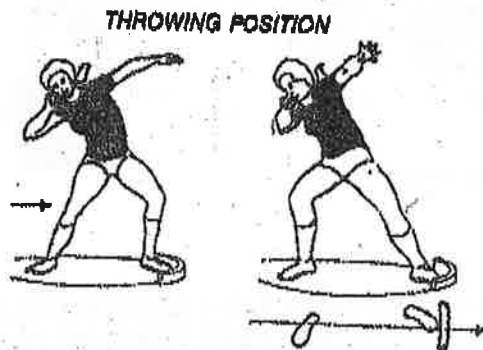
THE SHOT PUT



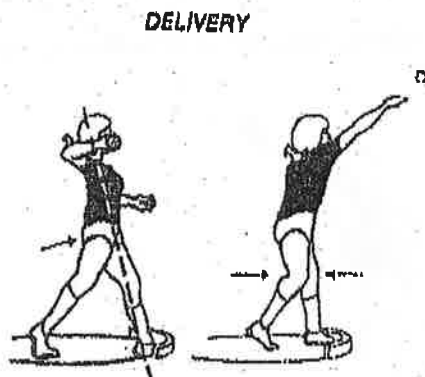
Adopt crouched position facing 180° away from putting direction.
 Right foot touching inner rim of circle; left foot approximately 50cm behind right.
 Eyes focused 3-5m away from circle. In crouched position, upper body almost parallel to ground.
 Knees flexed; weight mostly supported by right leg.
 Left arm hangs freely.



Backwards glide/shift, across circle.
 Left foot thrusts towards front of circle.
 Right leg extends fully.
 Head and shoulders continue to face rearward.
 — "closed shoulder girdle."
 Hip axis turns in throwing direction.
 Left arm extends towards rear.



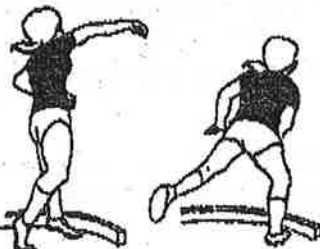
Right foot lands (on ball) close to centre of circle and points between 10 and 11 o'clock.
 Right knee flexed.
 Left foot plants against stopboard so that toes are in line with heel of right foot.
 Shoulders and head still face rear. Left shoulder higher than right.
 Chin, knee, toe alignment.
 Left side of body forms straight line.
 Left arm held high.



Inward rotation of right knee and extension of right leg in throwing direction, provides horizontal impulse.
 Flexed left leg turns outwards bringing hips to face the front.
 The trunk lifts and rotates.
 Left arm extends out and up, stretching the chest muscles.
 It is then brought in close to left side in line with the shoulders.
 Left arm blocks upper body rotation when chest faces throwing direction.
 Putting arm strikes as left leg extends.
 Body weight moves forward over extending left leg.

Right shoulder higher than left.
 Elbow of putting arm is higher than the line of the shoulders and the hand is higher than the elbow.
 Final application of force through wrist extension and finger flick.
 Left foot maintains contact with ground until release when right foot may be off ground.

RECOVERY



Reverse position of feet.
 Should occur naturally as consequence of delivery action.
 Trunk lowers over bent right leg.

DESCRIPTION

There are two main styles of shot putting in use today. The most commonly used is a modification of that developed in the 1950s by the American, Parry O'Brien. In more recent years we have seen the emergence of a rotational style which employs similar principles to discus throwing.

It is important to remember the emphasis & application of power in the Shot Put is in a linear direction. The significant muscle groups of the legs, back & thorax are major contributors to the production of a good Put.

TEACHING SEQUENCE

Holding the Shot

- (1) The shot is held at the base of the three middle fingers while the little finger and thumb provide further support on either side of the shot (Fig. 10).
 - (a) A simple way to teach the correct hold is to get the athlete to pick up, with one hand, a shot resting on the ground and then "cock" the wrist back.
 - (b) Alternatively, hold the shot in the palm of one hand and pick it up with the fingers of the putting ghan and again cock the wrist.
- (2) The shot is placed in the neck hollow where the collar bone meets the base of the neck. The elbow of the putting arm should be extended away from the body.

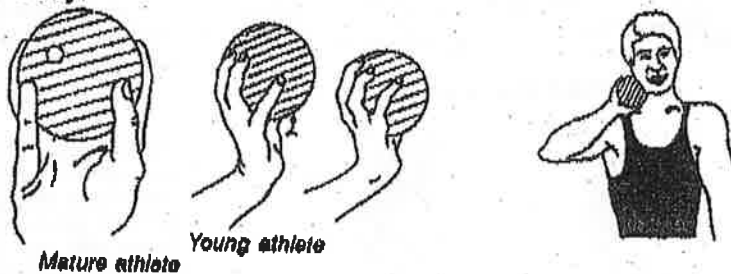


FIG. 10

Mature athlete

Young athlete

Knowing the Shot

(1) Putting Drill

Purpose: To learn the basic putting action and to stress the need for the stronger, slower muscle groups (e.g. legs) to act before the quicker, but weaker, muscles (e.g. arms).

- (a) The athletes stand facing the putting direction and hold the shot on the neck as described above.

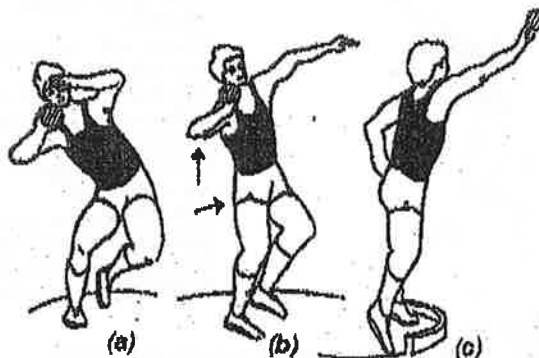


FIG. 11

- (a) Without moving the feet, turn the upper body as far away from the putting direction as is comfortably possible.
- (b) Bend the legs to produce a position as shown in fig. 11a.
- (c) Now, keeping the upper body passive, the athlete extends the legs and drives the hips around and up (fig. 11b).
- (d) The chest comes to the front as a result of the hip/shoulder rotation. Then the putting arm strikes.

Points to Stress in the Basic Putting Drill

1. Keep elbow of putting arm in line with the shoulder axis.
2. Legs act first then shoulders and arm.
3. Punch the shoulder forward and push on the shot for as long as possible.
4. The action is around, up and out.

Throwing the Implement

(1) Standing Throw

Having mastered the basic putting drill the athletic can then progress to the standing put which imitates the delivery from the throwing position.

The athlete now attempts to apply force to the shot over a greater range than was the case with the basic drill.

- (a) Place the feet above 60-90cm apart (depending on the athlete's height), with the right foot about 45° to the direction of the put and the toes of the left foot in line with the heel of the right foot (fig. 12).

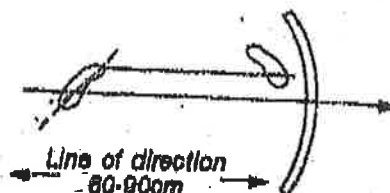


FIG. 12.

- (b) Initially, the athlete stands with shoulders and hips parallel to the putting direction, i.e. facing 90° away from the direction of put. The shot is placed on the neck as previously described and the left arm is held high above the head.
- (c) From this position and without moving the feet, the athlete turns the upper body a further 90° away from the putting direction so that the back faces the direction of throw. Note that in this position, the shoulder axis is at right angles to the throwing direction while the hip axis is almost parallel to it.
- (d) The athlete then lowers into a position similar to that shown in fig. 13(a).

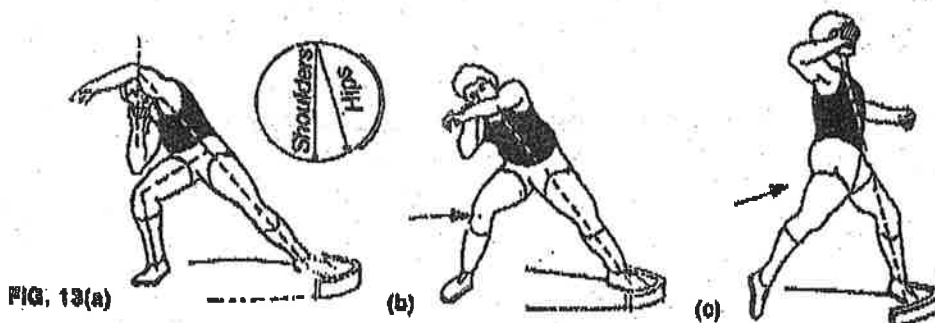


FIG. 13(a)

Check that in this position the chin, knee and right toes are in vertical alignment and that the left side of the body forms a straight line. Bodyweight is centred over the right foot and the left arm should be held higher than the head. Very little of the athlete's weight is supported by the left leg.

- (e) From this position the athlete's task is to shift his/her body weight forward, round and up over the left leg. The movement is initiated by rotating the right foot and right knee (fig. 13(b) (c)) towards the front of the circle thereby forcing the body weight onto a bent left leg (fig. 13(c)) which then extends as the hips face the putting direction... Stress the idea of forward, round and up over the left leg.
- (f) Introduce the athlete to blocking with the left side once the athlete has developed a reasonably rhythmic explosive delivery action.
- (g) A reversal of the feet can be added after an active extension of both feet.

Introducing the Shift Across the Circle

Step Across Method — (suitable for Little Athletics)

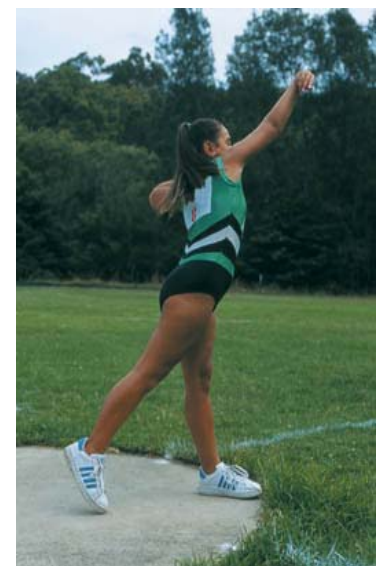
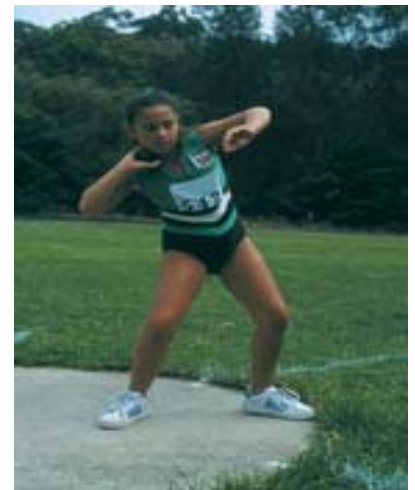
This is a suitable way to introduce athletes to the shifting movement and is particularly appropriate for Little Athletics (fig. 14).

- (1) Stand at the rear of the circle with feet shoulder-width apart and with hip and shoulder axis parallel to the putting direction.

SHOT PUT

When shot putting: -

- Hold the shot at the base of your fingers (not on the palm) with three fingers behind and the thumb and small finger to each side of the shot
- Use a balanced ready-stance. (Avoid placing your front foot hard up against the stop-board. This will make it difficult for you to turn your front foot)
- Hold the shot touching or close to the neck with your throwing elbow lifted away from your body
- Point your non-throwing arm in the direction of the throw or "wrap" your arm around your body
- Swing your feet, hips, chest and shoulders to the front as you move your weight from your back to your front foot
- Stand tall as you push the shot away from your neck in a strong "punching" action
- Watch the shot go





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

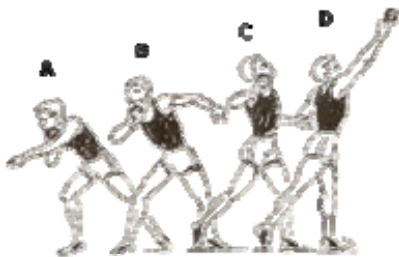


Figure 1



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 (Bartoniets, 2000) and 35 degrees for the discus.

THROWS

The throwing events in Little Athletics comprise the Shot Put, Discus and Javelin (this is limited to the U11 to U17 athletes).

As a coach you should emphasise :-

- ◆ the stronger, slower muscles (i.e. the legs, hip and trunk) act before the quicker muscles (i.e. the shoulders, arm and wrist).
- ◆ the hips lead the shoulders into the throw.
- ◆ weight is transferred from the back foot to the front foot at the point of delivery.
- ◆ throwers use speed and strength.

SHOT

In the Shot Put it is of the utmost importance to teach the athlete to push and not throw the shot. The push is a forward thrust from the shoulder with the shot held in the vicinity of the chin. the elbow behind the shot is slightly below the shoulder level.

Warm Ups

The warm up section has general information for this area. It is important. Don't forget it.

Safety

- ❖ All throwing and retrieving should be done under a coaches strict supervision.
- ❖ The shot should be dry.
- ❖ There should not be any throwing back and forth between athletes.

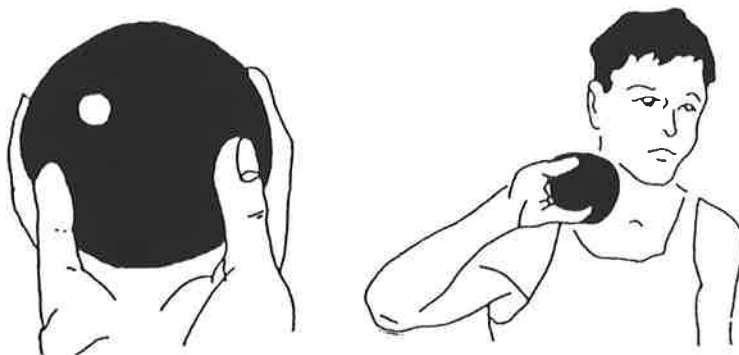
- ❖ No-one should stand in the sector when the throw is under way.
- ❖ Everyone should stand behind the thrower.
- ❖ Shots must be carried back to the circle. They should not be rolled or thrown.
- ❖ Throwing should only be allowed in a clearly marked area.

Rules

- ❖ During competition each athlete is allowed three throws (and one practice throw if time permits).
- ❖ The athlete must commence the throw from a stationary position inside the circle. The athlete is allowed to touch the inside of the iron band and the inside of the stop board.
- ❖ When the athlete takes a stance to begin the put, the shot must be either touching or within 25mm of the chin.
- ❖ The shot must be pushed from the shoulder with one hand and it must not drop below its starting position.
- ❖ The shot must not be taken behind the line of the shoulders.
- ❖ No part of the athlete's body may touch the ground outside the throwing circle, including the top of the stop board.
- ❖ The shot must land inside the inner lines of the sector.
- ❖ The athlete must not leave the circle until the shot has landed. The athlete must then leave the circle from a standing position through the rear half of the circle.

Technique

- ❖ The shot rests on the base of the longest fingers. The thumb and little finger provides support at the front. The shot should not be held in the palm of the hand. (A good hint for young athletes is “a clean palm but dirty fingers and neck”.)



FIRST BASIC ACTION :- (Shoulder Punch)

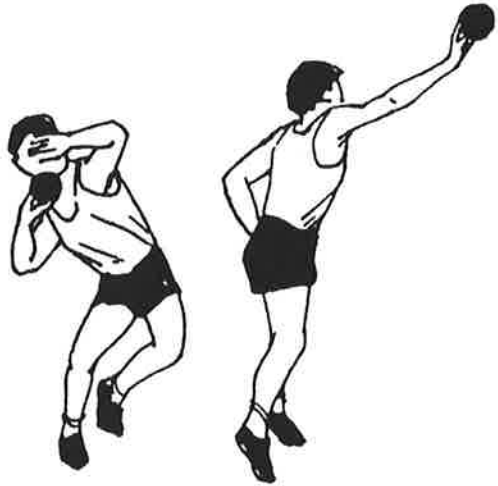
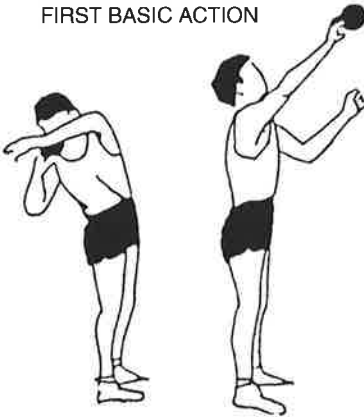
- ❖ The athlete stands feet apart (about shoulder width) facing the putting sector with the shot held correctly.
- ❖ The non-throwing elbow is held high (have wrist close to face as if checking a watch).
- ❖ Without moving the feet, the athlete turns the upper body away from the front as far as possible towards the rear of the circle and keeps the throwing elbow high.
- ❖ The non-throwing arm swings across the body.
- ❖ From that position the athlete’s shoulders punch forward with the throwing arm extended forcefully to put the shot away.

SECOND BASIC ACTION :-

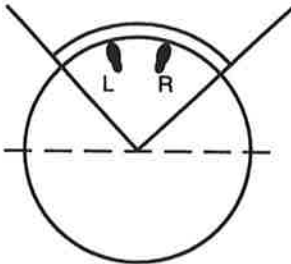
- ❖ The above action is repeated. As the body moves away from the front, the legs are bent at the knees to produce a position of more power.
- ❖ The legs are extended slightly, the hips are driven around, up and forward, leading the shoulder into the putting action.

For the beginner it is imperative that the above actions are progressively mastered before going on to a more advanced technique. This technique can be used for competition.

FIRST BASIC ACTION

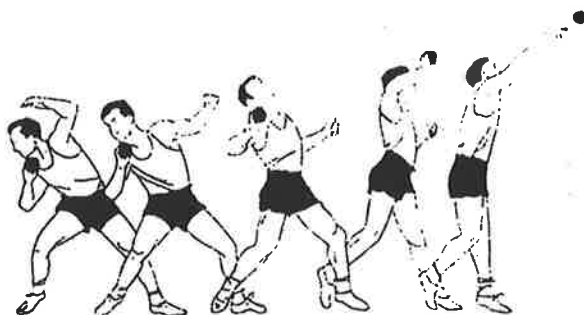
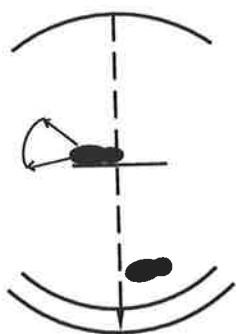


THE SECOND BASIC ACTION



STANDING THROW

- ❖ The athlete stands in a sideways position to the direction of the Put.
- ❖ The front foot should be a few cms back from the stop board. This allows for any rotation.
- ❖ The feet must be shoulder width apart with the back foot slightly pointing to the rear of the circle. The heel will be in line with the toe of the front foot.
- ❖ The athlete should turn the body towards the rear, with the back facing the throwing direction. The weight should be on the back foot, the back leg should now be bent with the chin, knee and toe in alignment.
- ❖ The rear foot is turned forward, followed by the knee and the extension of the leg. The hips are driven around and up to the throwing direction followed by the shoulder. Both elbows are high, the non-throwing elbow is driven around powerfully. (This turns the chest to the front. The body makes a bow.)
- ❖ The shot is 'punched' out.



Sequence of Standing Put

THE STEP ACROSS :-

This can be taught when athletes have mastered the Standing Throw. It will not be dealt with in this course.

Drills and Games

- ❖ Wheelbarrow races.
- ❖ Shot Putting over a High Jump bar set high.
- ❖ Two handed throwing exercises.
- ❖ Shot Put Relay:- Team members take it in turns throwing down a 60m track. Each person throws from the previous shot position.