ASA COACHING MANUAL
FOR THROWS

Revised by Pierre Blignaut in cooperation with and Hugo Badenhorst.

GUIDELINES FOR COACHING

GENERAL

1. **INTRODUCTION**
In order to be able to understand and apply the basic principals of the different throws, it is necessary to be aware of some general aspects such as the influence of nature and the abilities of athletes on throwing.

2. LAWS OF GRAVITY
In order to coach the throws it is necessary to basically understand the three laws of motion (gravity) which is as follows:

a. Every material body continues in its state of rest, or uniform motion in a straight line, except when forces are applied to change that state.

b. The rate of change of momentum is proportional to the applied force and takes place in the direction in which force is applied.

c. For every action there is an equal and opposite reaction.

The following definitions will help to understand the practical application in the different events.

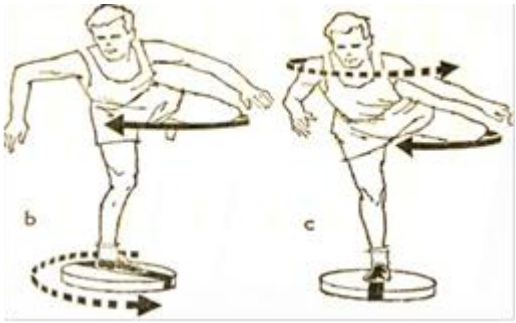
Gravity: Is the force which causes all bodies to move vertically downwards.

Velocity: The time it takes to cover a certain distance in a certain direction. In athletics also called
speed (no direction) - measured in meter/second

Acceleration: The rate at what velocity increases e.g. the time it takes to get to top speed.

Linear motion: The whole body moves in the same forward direction which per definition should be straight forward.

Angular motion: Whereas linear motion is forward, angular motion is rotational by nature and is more common in athletics as pure linear motion.



3. TALENT IDENTIFICATION

Throwers are generally long stocky persons with long arms and broadish hips and shoulders (mesomorph). However, there are a number of aspects that should be considered when identifying throwers, such as the following:

Height	Co - ordination
Body type (mesomorph)	Rhythm
Speed	Strength
Explosiveness	

A number of easy tests can be done to assist with talent identification:

1. Overhead throw forward (weight for age group)
2. Overhead throw forward (weight for age group)
3. One weight - lighter
4 One weight – heavier
5 Start sprint 10 metres
6 Flying sprint 10 metres
6. Standing Throws x 3 with 5 minutes rest (average)
7. ½ Squat*
8. Deadlift*

9. Bench.*

* Only 18 years and older

event	1	2	3	4	5	6	7	8	9	10
SP - M										

These tests will give an indication of who should be your best jumpers

4. BIOMECHANICS OF THE THROWS

1) Speed and angle of delivery will–
   i. influences height / distance of a throw;
   ii. angular speed provides momentum for the throw;
   iii. short foot contact – long foot contacts have a breaking effect;
   iv. athlete must develop muscular tension through whole body;

2) Transfer
   i prevent loss of speed in delivery
   ii obtain maximal upwards thrust through upper leg,hips and shoulders

3) Angle of thrust
   a. angle through hips
   b. determines flight path
   c. cannot be altered after delivery
   d. fixed parabola

5. ENERGY SOURCES

- AEROBIC
  - External source i e the oxygen that is breathed in.

- ANAEROBIC
  - Exhausts external sources.
  - Obtains energy internally

- ALACTIC (0 – 6 SECONDS) – primary source for all the jumps
  - First movement of high intensity
  - Activity up to 6 seconds (about 50 m)

- Draws reserves from muscles
- Recovers after 2 – 3 minutes
- Recovery capacity can be developed

- LACTIC (7 – 38 SECONDS)
  - Prevents removal of toxins due to shortage of o2
  - Toxins build up
  - Main cause of muscle fatigue
  - Decreases speed
  - Recovers after 60 minutes
  - Recovery capacity developed – training (7 - 38 sec)
  - Higher intensity = higher lactic acid
  - Light movement afterwards enhances recovery
  -

PERIODISATION

1.TERMINOLOGY

- Short term (3 – 12 months)
  - Micro 1 week
  - Messo 3 – 9 weeks
  - Macro season
- Medium term (1 – 2 years)Long term (3 – 5 years)

2. **CYCLES**

- **PREPARATION 1 (WINTER)**

  - GENERAL CONDITIONING
    - Volume very high
    - Intensity very low
    - Rest short
    - Non specific
    -

  - SPECIFIC PREPARATION
    - Specific conditioning

- Exercises more specific to event
- Volume still high
- Intensity low
- Rest short
- Technique training introduced – always do first

- **PREPARATION 2 (Pre – season) (Summer)**
  - Training for competition
  - Volume decreases
  - Intensity increases
  - Rest still short
  - Technique emphasised
  - Evaluation of
    - Strength
    - Endurance
    - Speed / Rhythm
    - Technique

- **COMPETITION**

PHASE 1	PHASE 2
Technique – high quality	Concentrate on competitions
Volume very low	Volume very low
Intensity very high	Intensity very high
Rest long	Rest very long
Stabilize performance	Psychological preparation

- **TRANSITION**
  - Active rest --- recovery
  - Planning for next phase

SHOT PUT

The two most commonly used shot put techniques today are.

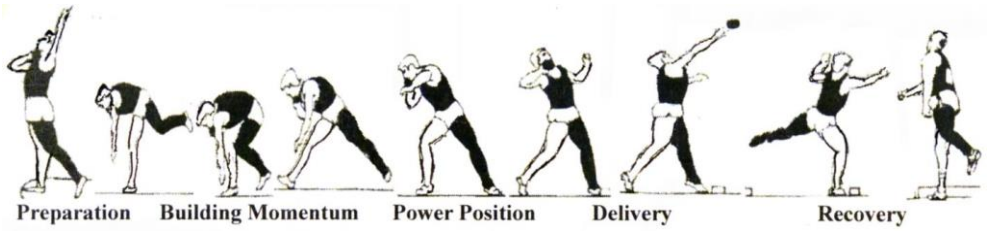
The linear technique, commonly referred to at the 0'Brian technique, and
1. The rotational technique, similar to the discus throw technique.

The rotational technique is very technical, and if not executed well, the performance of the athlete will lack consistency. For this reason, it is advised for the novice to develop the linear technique and progress to the rotational technique at a later stage, if needed.

THE LINEAR TECHNIQUE

The right handed technique will be explained in all examples used in this book.
The shout put technique comprises of the following phases.

- Preparation
- Glide
- Throw
- Recovery



PREPARATION

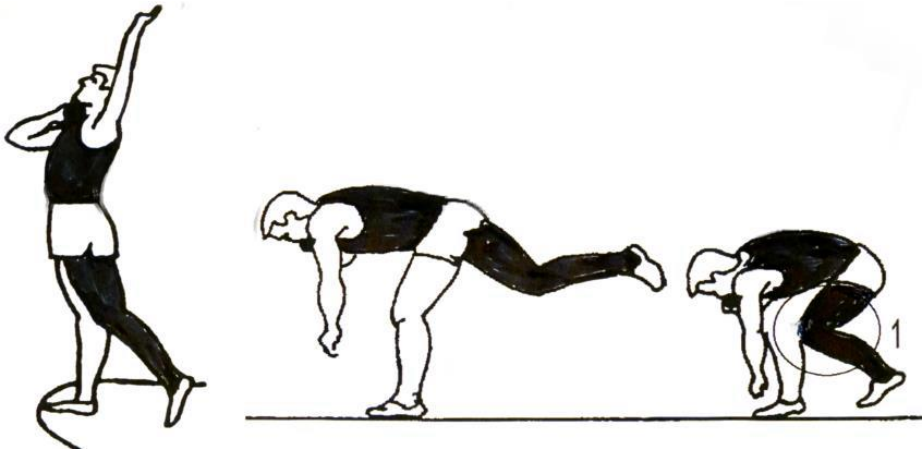
Place the shot in the hand so that it remains clear of the palm.

This is done by the resting of the shot on the base of the fingers and the fingers itself.

The middle three fingers should not be stretched apart.

The little finger and the thumb support the shot on the sides.

The wrist bends back as far as possible



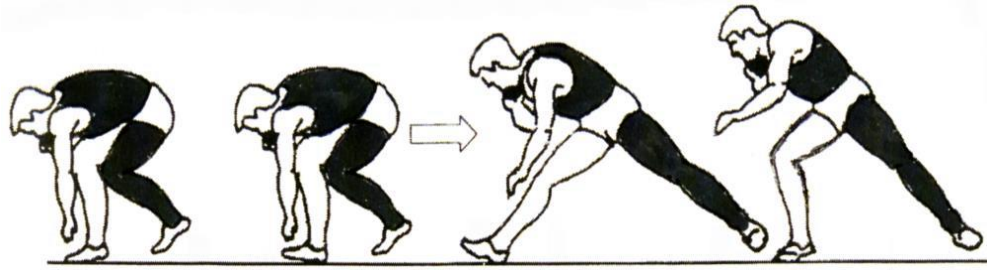
Once the shot lies comfortable on the base of the fingers,

- Place the shot into the hollow base of the neck (in front of the ear)
- The palm facing forwards
- thumb pointing down
- and the elbow in a high position.
- Take up a modified 'T' position, facing away from the direction of the throw, eyes focused on a point 6 m behind the circle.
- The weight of the body is on the right leg.
- The shot must be directly above the right foot.
- The left leg must stay low and slightly bent to ensure good rhythm and movement during the start of the glide.

THE GLIDE

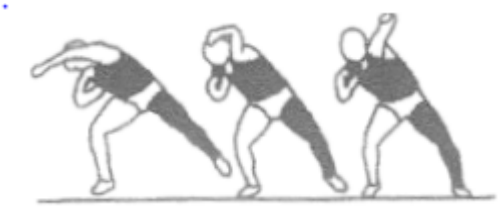
- Lower the trunk and bend the supporting leg with the shot remaining above the right foot
- As the trunk is lowered, the heel of the supporting leg is raised.

- The athlete rolls back, and drive from the sole and heal of the supporting leg (1) when the hips are lower than the shoulders. Driving from the toe will lift the upper body prematurely. The heel must break contact at the back of the circle.
- The free leg is brought down and kicked backwards immediately and vigorously in the direction of the base of the Stop-block.
- The glide must be done by the legs only. No assistance must come from the upper body or the free arm.
- The free arm is dragging behind.
- Point the thumb of the free arm down to keep it relaxed.
- The shoulders remain facing away from the direction of the throw in a closed position. This is done by resting the Shot on the base of the fingers -: and the fingers itself.

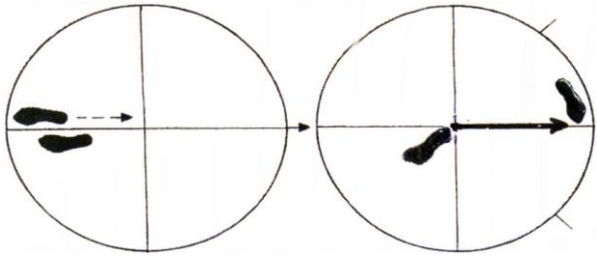


MID GLIDE

- The right foot performs a low hop, clearing the ground to avoid the slowing down effect of a dragging foot.
- After the right foot left the ground, the foot, knee and hip rotate anti-clockwise.
- The right foot is quickly pulled back under the body, directly beneath the Shot, and land. in the Centre of the circle.
- The right foot land first after the hop, and shortly afterwards the left foot.
- Both fee land on their soles.
- The body weight is still on the right leg and in a chin-knee-toe position.



The left foot land near the stop board and slightly to the left of the line of throw. If it land on the centre line, the hips will have problems coming through, and if it land to far from the centre line, the athlete will be of balance.



- The trunk starts to lean back, but the shoulders remain facing to the rear. This is done by forcing the free shoulder to stay low. The free arm remains long, relaxed (thumb pointing downwards), and to the rear

THE POWER POSITION

More than 80% of the acceleration is produced during this phase

Both feet are now on the ground about 1m apart, with the weight still on the right leg, in a chin-knee-toe position

The right foot is in the 10 o'clock position if the direction of throw is in the 6 o'clock position.

The left leg point in the direction of the throw (6 o'clock) with the left foot on the ground, slightly of centre

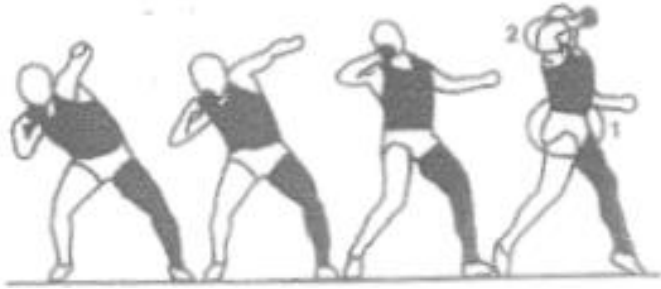
The hips are in an open position.

The trunk is still slightly arched with the shoulders still square to the rear but slightly open.

The eyes are looking back

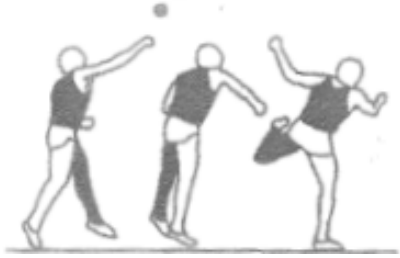
THE THROW

- The body weight is still on the right leg.
- The right hip is turned to the front, ahead of the shoulders, by extending the right leg (1), while the last side of the body is kept rigid.
- Extend the left knee only when the hips are square to the front, to gain maximum delivery height. Put the Shot at the same time, very fate and very fast.
- Put the Shot with the elbow raised, directly behind the shot, in line with the throw (2).
- The throw is accompanied by the rapid extension of the right leg. The left arm is dragging behind to delay the rotation of the shoulders, and then remain firm (blocked) during the final thrust of the right side of the body. It must not be allowed to sweep too far backwards.



- The shot must leave the hand only when the hand gave the last impulse to the shot and the left leg and foot is fully extended.
- The eyes follow the delivery
- The legs/hips extension must lead the shoulder / shot extension throughout the entire movement
- The delivery angle is approximately 40°

- **RECOVERY**
- After putting the Shot, jump round placing the right leg forward.
- The trunk is dropped downwards to lower the centre of gravity. This is done by bending the right leg on landing.
- The left foot must stay close to the ground on its way back



EXERCISES TO IMPROVE THE LINEAR TECHNIQUE

LEGS/ARMS CO-ORDINATION

- To co-ordinate the legs and arms in the throwing movement, stand with the feet in line, the trunk leaning back slightly and with the Shot held in both hands in front of the chest.
- Step forward on the left foot and throw the shot with a simultaneous extension of arms and legs.

THE THROW

To learn the final movement, take up a position with the feet astride, with the body resting on a bent rear lag. The rear foot must be tin the 'throwing line and the forward foot slightly to the left of it. The trunk is turned to the rear and lowered slightly, with the left arm wrapped loosely across the chest Rotate the right leg to the front, turn and straighten the trunk, extending both legs, and put the Shot.

GLIDE AND THROW

To learn the glide and link it up with the final action, stand with the left foot forward and facing the front, with the trunk upright and turned slightly to the side,

Hop forward to land first on the right leg and then immediately on the left. Put the Shot immediately the left foot has landed

GLIDE WITHOUT FLIGHT

To learn the glide without using the flight phase, stand facing the rear with the left leg stretched back towards the direction of throwing. Pull the left fag in towards the right leg and immediately return it to its previous position, keeping the body turned towards the rear. The put can now be made from this position,

GLIDE TO POWER POSITION

To learn the technique of the glide, repeat only the glide several times, by pulling up the left leg and throw it out, while driving from the right leg. Land on the right leg again in the power position. Check for correct feet alignment, position of the Shot, low trunk, relaxed left arm, etc.

SHORT GLIDE AND THROW

To combine the various phases of the put, do a complete throw, well controlled, with a very short and low glide.

The final action with the trunk must be executed with a good perpendicular position.

STRENGTH TRAINING WITHOUT WEIGHTS

WRIST ACTION

Hold the shot correctly. Flick the shot from the fingers of one hand to the fingers of the other hand.

The Shot must not touch the palm of the hand

FREE LEG ACTION

Stand in a good chin-knee-toe position with the free leg positioned against a medicine ball

Roll back until the hips is lower than the shoulders, and pushes the ball with the free lag while executing the glide with the Supporting leg.

HIP/SHOULDER PUSH

Sit in a hurdle stride position with a medicine ball held with both hands

Bring the hips in a square position to the delivery line, open the shoulders and push the medicine ball away at an angle of approximately 40°.

LEG/HIP/SHOULDER PUSH

Sit on the knees, holding a medicine ball between the hands, next to the body but with the hips square to delivery.

Sit upright, open the shoulders and push the medicine ball away, blocking with the free arm.

BACKWARDS THROW

To develop the back muscles, hold a shot between both hands, bend down with the shot between the legs, bring the body upright and throw the Shot back, as far as possible

STOMACH EXERCISE

To strengthen the trunk and arms, lie on the back, with the feet astride and with a medicine ball held on the chest. Lift the chest and push the ball in the upright position.

STEP-UPS

To strengthen the legs, alternate step-ups on to a small bench not more than 30 cm high with maximum extension of the ankle and leg.

Try to lift the body as high as possible.

STRENGTH TRAINING WITH WEIGHTS

BACK SQUAT

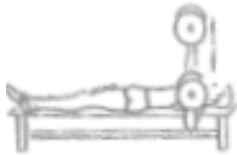
To strengthen the lower part of the body, which is used in all phases of the movement, carry out squats with weights on the shoulders, keeping the trunk as upright as possible.

POWER SNATCH

To strengthen the legs and back, bend the knees to take a wide grasp of a bar loaded with discs and lift the bar above the head, with both legs and arms taking part in the movement. Keep the trunk as upright as possible at all times.

BENCH PRESS

To strengthen the arms and upper body, lie on the back on the bench, hold a dumb-bell on the chest and lift the dumb-bell vertically upwards until the arms are completely extended.



SIDE BENDS

To strengthen the lateral muscles, stand with the feet astride, with a weighted bar resting on the shoulders and held with a wide grasp Bend the trunk sideways and back

DUMP-BELL PRESS

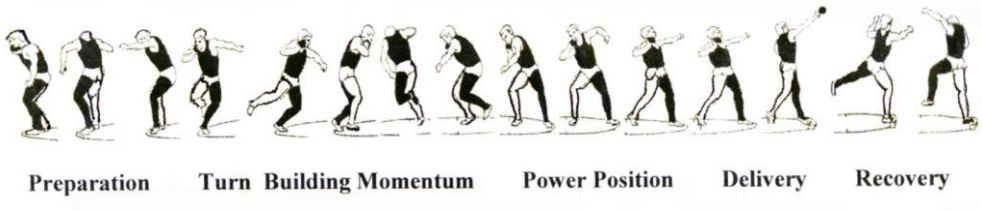
To strengthen the throwing arm and shoulder hold a dumb-bell at shoulder height, stretch upwards vigorously with both arm and shoulder.

WARMING UP AND STRETCHING EXERCISES FOR SHOT PUT

Warming up and stretching is important before any exercises or competition. Refer to the chapter on conditioning for more information. A few examples of stretching:

ROTATIONAL TECHNIQUE

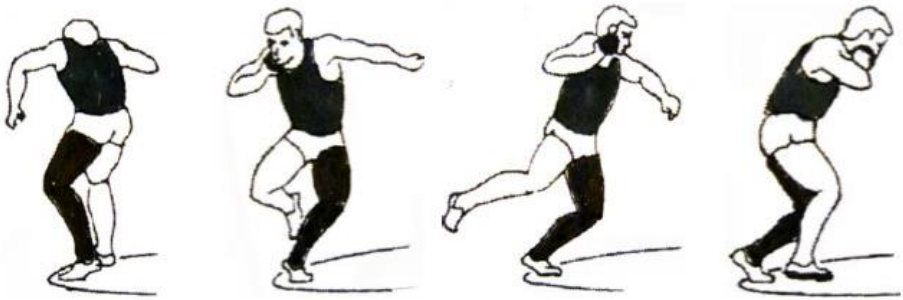
The Rotation as Shot Put Technique is divided into five phases: Preparation, Turn - building momentum, Power Position, Delivery and Recovery. In the preparation phase the thrower moves to the optimum position to begin the turn and pre-tension is built up. In the turn phase the shot is accelerated and momentum is build up as the thrower moves to the power position. In the delivery phase additional velocity is produced and transferred to the shot before it is released. In the recovery phase the thrower braces and avoids stepping out of the circle



Preparation

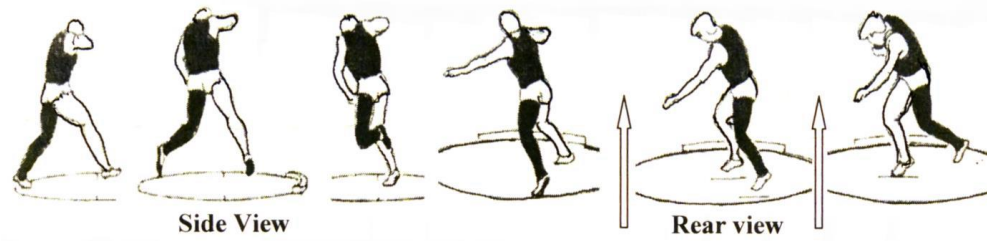
The same basic preparation as for the linear technique applies in order to get an optimum position and grip and build up pre tension, in preparation to begin the turn. Allow enough time for athlete to become familiar with the grip. Body and limb stability during preparation is very important. Shot is placed further back on the neck then in the Linear Technique. Upper body is bent slightly forward, the back to the stop board. Legs are spread a little more than shoulder-width. Weight is on the balls of the feet. Upper body twists against the direction of the turn. Turn starts when right shoulder points in the direction of the throw. Turn starts to the left.

Turn Building Momentum



The turn helps to accelerate the thrower and the shot. Body weight is transferred on to the ball of the left foot, knees are bent.

Left foot, left knee and straight left arm turn to the left simultaneously. Right leg swings wide.
Initial movement is slow and controlled in the direction of the throw.
Twist and run into the turn rather than jump.
Develop drills to maintain balance through the turn. Keep the shoulders level

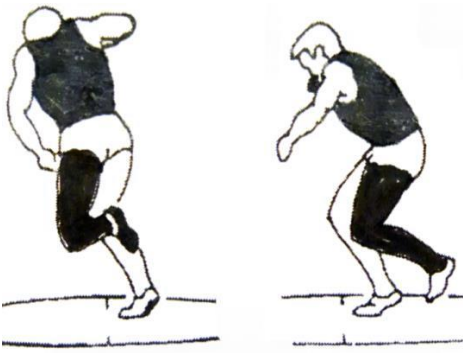


The left knee and toe must have turned completely to the front before drive off of left foot.

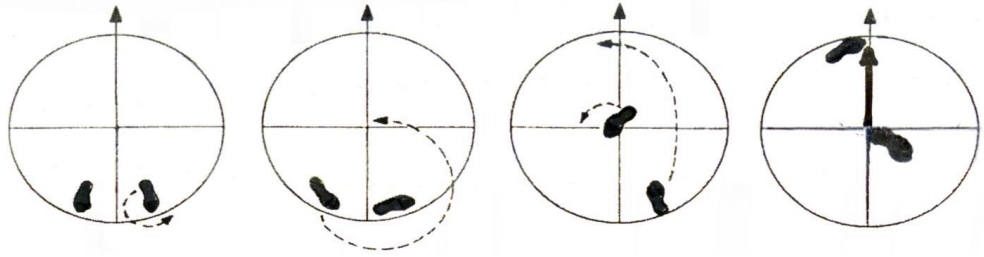
The driving leg is not completely extended. Flat jump, led by a high right knee (leads forwards not upwards). Landing is on the ball of the right foot at the centre of the circle. The trunk is bent for landing, the left arm folds across the chest with the thump up.

Observe the limb positions and the balance in the turn. Ensure that acceleration is maintained through this phase. Ensure a turn, rather than a jump.

Landing is on the ball of the right foot. Body weight is over the right foot.
Left knee moves close to the right knee and forward.
Body is kept closed (left arm is in front of the trunk with thump up, head faces the rear of the circle).
The delivery phase begins when both feet land on the ground.

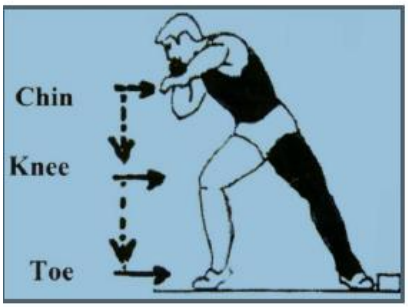


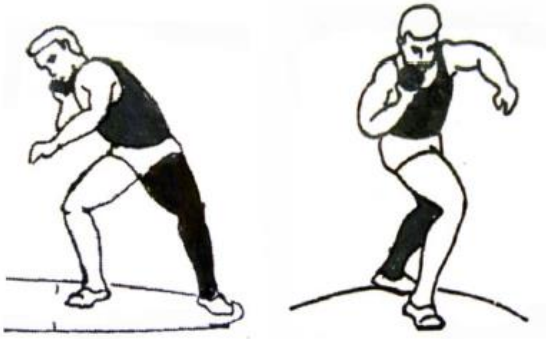
Foot placement



Power Position

Feet are more than shoulder-width apart, turn is to the left on the ball of the left foot. (1) Right leg swings over the outside to the centre of the circle. (2) Right foot lands on the ball of the foot in the centre of the circle, the left foot lands quickly after the right foot. (3) Power position has a narrower base than in the linear technique ('Heel-Toe' position). (4)





RULES

THE SHOT

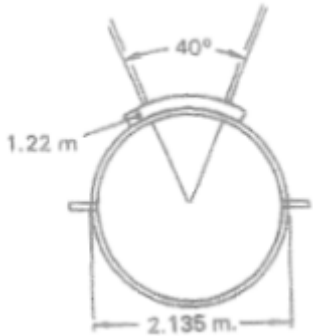
The Shot must be of solid iron, brass or any metal not softer than brass, or a shell of such metal filled with lead or other material. The men's Shot weighs 7.26 kg and the woman's Shot 4 kg.

It must be spherical in shape and the surface must be smooth,

The senior men's Shot has a maximum diameter of 130 mm and a minimum diameter of 110 mm and the woman's Shot a maximum of 95 mm and a minimum diameter of 95 mm.

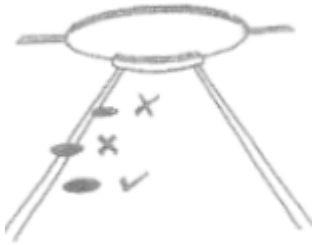
THE THROWING CIRCLE

The circle ring must be made of iron, steel or other suitable material and its inside diameter is 2,135 m. The top of the circle must be flush with the ground outside. The interior of the circle may be constructed of concrete, asphalt or some other firm but not slippery material. The surface must be level and must be 20 mm lower than the outer edge of the rim of the circle. The circle is divided into two halves, which are indicated by lines drawn from the top of the metal extending for at least 0,75 m on either side of the circle. The rear edge of these two lines, if continued across the circle, would meet at the centre of the circle.



THE SECTOR

The Shot must fall so that the nearest mark made by the fall of the Shot is within the inner edges of lines 5 cm wide marking a sector of 40°, set out on the ground, so that the radial lines cross at the centre of the circle.



GENERAL RULES

The competitor must start from a stationary and balanced position inside the circle. He must not leave the circle until the implement has touched the ground, and then his first contact with the ground outside the circle must be behind the line drawn outside. The competitor may touch the inside edge of the stop-board, but not the top. The Shot must be put from the shoulder with one hand only. In the preliminary stance, it must be held close to the chin, and the hand must never drop below that position throughout the throw. The put is measured from the nearest mark made by the fall of the Shot to the inside of the circumference of the circle, along a line from the mark made by the Shot to the centre of the circle.

Where there are more than eight competitors, each shall be allowed three trials, and the eight competitors with best performances shall be allowed three additional trials. If there are eight competitors or fewer, each shall be allowed six trials.

DISCUS THROW

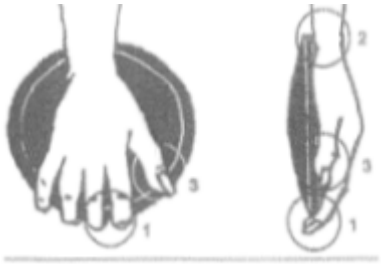
There is only one basic discus throw technique with individual variations within the technique, but the aim is always to deliver the discus with optimum speed and balance. The right-handed technique will be explained in all examples used in this book, The discus technique comprises of three phases: Swings turn and throw.

- A right-hand thrower performs 1½ turns to the left.
- The left leg is in front when the discus is thrown.

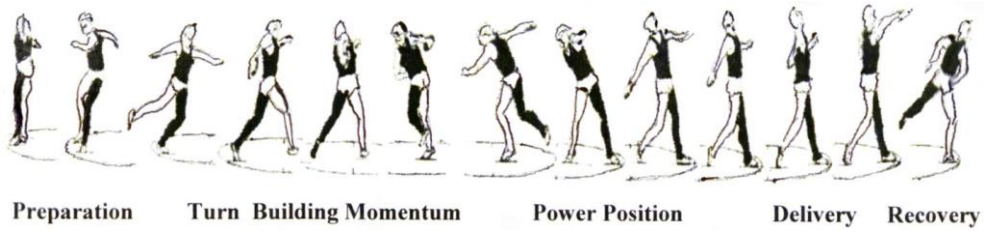
THE GRIP

The grip determines the position of the discus in flight. Held incorrectly, will lead to a poor flight, no matter how efficient the technique.

1. Hold the discus only with the end finger joints (1) so that the finger pads are turned over the rim.
2. The fingers should be comfortably and evenly spaced, as relaxed as possible.
3. The discus rests against the base of the throwing hand (2).
4. The hand will flex slightly inwards at the wrist, but the athlete must not pinch the discus with the wrist (2).
5. The thumb rests on the discus (3) to give stability on release. It must not be lifted.
6. The discus leaves the hand at the pointing finger turning clockwise.



PHASES OF A THROW



PREPARATION PHASE

THE SWING

The athlete takes up positional the back of the ring with the toes almost touching it.

Swing the discus as far behind to the right as possible, rotating the trunk at the same time (1). Do not force the hand to far back otherwise the centre of gravity will be outside the body stance, causing it to be off balance.

The legs are in a straddle position, shoulder-width apart and the back is in the direction of the throw. Both knees are bending slightly (2). The right foot is flat on the ground, pointing in the opposite direction of the throw, and the left foot is on its toe. The weight is balanced over the right heel.

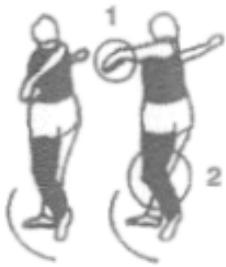
The head is kept upright throughout the entire movement, Focus on the horizon to keep it upright.

PRELIMINARY SWINGS

Preliminary swings can be taken to help the body relax and to feel the rhythm

The body-weight is being transferred rhythmically from the right foot to the left and back

The last knee must not bend too much towards the right knee. The right arm travel from back to front and back Do not force the hand too far back to avoid a loss of balance.



MOMENTUM BUILDING PHASE

THE TURN

Push of forwards with the left leg, in a running action, in the direction of the throw when the left foot and face is pointing towards the direction of the throw (1)

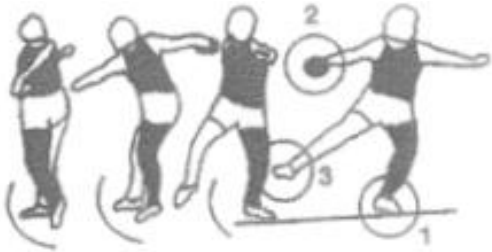
Keep the throwing arm as high as possible above hip height and behind the body (2) The free arm is in a relaxed position in front of the chest in line with the right arm behind the chess.

The right leg is swung forward in a rotational motion, almost stretched, and close to the ground. The right knee is in front of the foot and the leg is leading the body. When the shoulders is facing the delivery area, the leverage of the right leg is shortened to enable it to be brought forward faster.

The right foot is placed in the centre of the circle and the body weight is now supported by the right leg (3). The left leg takes the shortest possible route around the right leg to the front to develop the rotational speed of the delivery arm.

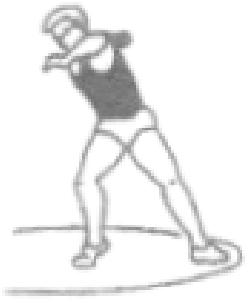
Place left leg quickly and actively just in front of the edge of the circle (4) to land in the power position. The left foot must land vary soon after the right foot. A late left foot will always result in a loss of range.

The left arm is bent to facilitate the faster rotation.



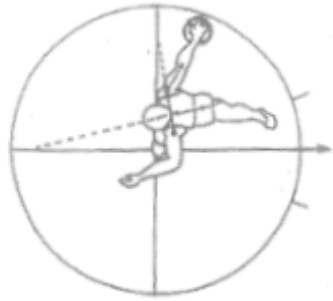
DELIVERY PHASE

THE POWER POSITION



- The weight is supported on the right leg in the throwing position,
- The right foot is in the centre of the circle and the left foot slightly of centre, to allow for room for the hips to drive through. (The right toe is in line with the left heel)
- The body is in the chin-knee-toe position leaning away from the direction of throw.
- The right heel must never touch the ground until the throw is completed.
- The hips are still leading the shoulders and the trunk is in a torque position.
- The throwing arm is dragging behind the body.
- The left arm is slightly bend.

- The eyes are looking away from the direction of throw



THE THROW

- Only when both feet are on the ground, the throwing action can begin.
- From the power position the thrower should rotate on the ball of both feet.
- Turn the right foot in the direction of the throw. The foot will cause the knee to turn the hip to turn, the shoulder to turn and eventually the throwing arm to come through fast and relaxed.
- When the right hip turn towards the front (1), the right leg must be extended simultaneously.
- With the front foot now firmly grounded, extend the front leg (2) to gain maximum height and bring the discus through at shoulder height. Keep the front foot on the ground as long as possible As long as the front foot is or the ground, the right side will continue driving forward. Therefore it is important to time the extension of the front lag correctly.
- The shoulders must be kept level throughout the throw, especially during the final action. This can be achieved by maintaining the chin-knee-toe position. Keep the trunk upright.
- The left arm is dragging behind to delay the rotation of the shoulders, and then remain firm (blocked) during the final thrust of the right side of the body. It must not be allowed to sweep too far backwards.
- Finally the left leg is swung backwards and the feet interchange in order to maintain balance within the circle. Bend the right leg to lower the centre of gravity. The shorter the body, the easier it will regain balance.
- Given the correct sequence of movements, the reverse will automatically take care of itself and on no account should a reverse be conscientiously practiced.

DELIVERY ANGLE

Once the discuss technique is mastered, the delivery angle needs attention. The discuss is highly affected by the wind's speed and direction. A head wind gives the longest throws.

The best release angles are

Angle	Wind direction
± 27°	Head wind
± 43°	Tail wind
36 - 40°	No wind

RECOVERY PHASE

EXERCISES TO IMPROVE THE TECHNIQUE

ROLL ACTION

To learn how to hold the discus, and how the discus should leave the hand, stand with the left foot forward, logo slightly bent and the trunk leaning forwards a little

Swing the throwing arm back to front and roll the discus along the ground in a straight line. Keep the throwing straight

DISCUS SPIN

To learn how to spin the discus when it leaves the hand, take the same position as for the previous exercise but now let the discus spin in the air for a while before it lands on its edge on the ground and then rolls forward

FINAL THROW

To practice the final phase of the throw, mark a throwing line on the ground, and stand with the feet astride, with the sole of the right foot on the line and the left foot slightly to the left of the line. Support the discus with the left hand in front of the chest, with the right hand On top of the discus. Swing the discus back with a straight arm, pivoting on the feet. Then rotate forward quickly and throw with extension of the legs but keeping the right foot on the ground.

CENTRE CIRCLE THROW

To simulate the arrival at the circle and movements into the throw, use the same actions as in the previous exercise, but now the left leg is lifted from the ground as the trunk rotates to the rear, and then placed down to the ground again as the trunk is turned to the front for the throw.

FLIGHT EXERCISE

To combine the flight across the circle with the final phase (initial rotation excluded), stand with the left foot forward and then run over his foot in the direction of the throw and land on the right foot, at the same time producing a rotation in order to land in the

throwing position

INITIAL PIVOTING MOVEMENT

To learn the initial pivoting movement, face the rear, swing the discus to the rear and then rotate both feet towards the left, carrying the knees in the same direction



ARM BEHIND BACK

To develop fast leg movement across the circle, hold the throwing arm tightly against the back and the left arm relaxed across the chest Take up position in the back of the circle and execute the movement from the initial turn to the power position maintaining the chin-knee-toe position.

STRENGTH TRAINING WITHOUT WEIGHTS

DELIVERY THROW

To strengthen the final delivery action, stand in the POWER POSITION AND hold the shot in the right hand. The weight of the shot will depend on the strength of the athlete. Execute the final throw as as possible maintaining the chin-knee-toe position.

SIT AND THROW

To strengthen the delivery action of the upper body, sit down, hold a medicine ball between the hands behind the back, and throw the ball forward as far as possible.

KNEES THROW

To strengthen the delivery action from the hips, stand on the knees and hold a medicine ball between the hands. Move the ball to the back and throw the ball forward as far as

possible with the hand.

BENCH THROW

To strengthen the abdominal muscles used in the discus throw, sit on a bench, lean back. Move, the ball to the back with both hands and throw the ball forward as far as possible with one hand.

STRENGTH EXERCISES WITH THE USE OF WEIGHTS

BACK SQUAT

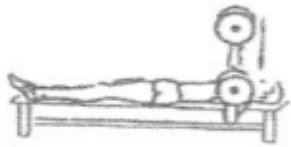
To strengthen the lower part of the body, which is used in all phases of the movement, carry out squats with weights on the shoulders, keeping the trunk as upright as possible

POWER SNATCH

To strengthen the legs and back, bend the knees to take a wide grasp of a bar loaded with discs and lift the bar above the head, with both lags and firms taking part in the movement. Keep the trunk as upright as possible at all times.

BENCH PRESS

To strengthen the arms and upper body, lie on the back on the bench, hold a dumbbell on the chest and lift the dumb-bell vertically upwards until the arms are completely extended.



SIDE BENDS

To strengthen the lateral muscles, stand with the feel astride, with a weighted bar resting on the shoulders and held with a wide grasp. Bend the trunk sideways and back.

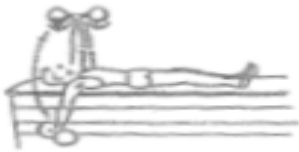
DUMBBELL FLY'S

To strengthen the upper front of the trunk and the arms, lie on the back, on a bench, with the arms sideways and grasping dumbbells in the hands, raise the arms up to the vertical position and back.

DOUBLE ARM ROWING

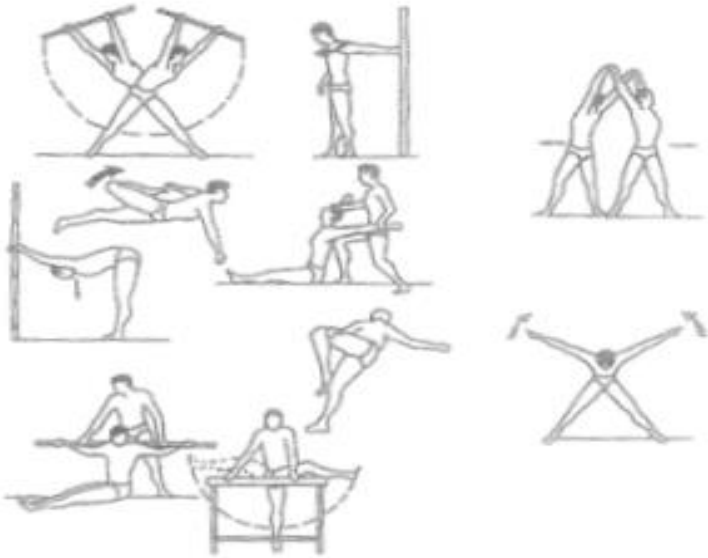
To strengthen the waist, sit astride on a bench with a weighted bar resting on the ground to the right. Reach down to the bar, lift it to the chest and put it down on the left-hand side.





WARMING UP AND STRETCHING EXERCISES FOR DISCUS THROW

Warming up and stretching is important before any exercises or competition. Refer to the chapter on conditioning for more information. A few examples of stretching exercises for shot put are shown below.



RULES

IMPLEMENT

The body of the discuss is made of wood, or other suitable material, with a metal rim, the edge of the discus is circular. Each side of the discus must be identical and made without indentations, projections or sharp edges.

The sides must taper in a straight line from the beginning of the curve of the rim to a circle of a radius of 25 mm from the centre of the discus.

The senior men's discus weighs 2 kg and has a diameter of 219 to 221 mm, the woman’s weighs 1 kg and has a diameter of 180 mm to 182 mm.

GENERAL RULES

The rules permit touching the face or inner part of the iron ring surrounding the circle, but prohibit stepping on or touching with any part of the body the top edge, or the ground outside, once the throw has begun.

The thrower may not leave the circle before the implement has fallen to the ground, and then his first contact with the metal rim, or the ground outside, must be behind the extension lines at each side of the circle The time limit of competition of a throw is 1½ minutes

If there are eight or less competitors, each one should have six attempts. If there are more than eight competitors, each has three attempts and the best eight another three attempts

THROWING SECTOR

The throwing sector is limited by the inner edges of lines which form an angle of 40° at the centre of the circle

JAVELIN THROW

There is only one basic javelin throw technique with individual variations within the technique, but the aim is always to deliver the javelin with optimum speed and balance.

The right-handed technique will be explained in all examples used in this book.

THE GRIP

The javelin must lie in the sold of the hand so that it is in line with the direction of throw. The javelin must lie along the length of the palm and not across. The javelin must be held at the back of the cord, with at least one finger placed behind the edge of the binding. Three different types of grips are commonly used.

THE AMERICAN GRIP

The thumb and the first two joints of the index finger are behind the cord.

THE FINNISH GRIP

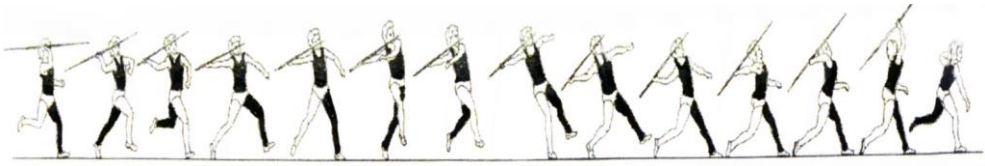
The thumb and the first two joints of the index finger are behind the cord, while the index finger supports the shaft. The extended finger assists the rotation of the javelin during delivery.

THE “V”- GRIP

The javelin is held between the index and middle fingers behind the cord. The position of the fingers assists the throwing arm in slaying al shoulder height during the approach.

JAVELIN TECHNIQUE

The javelin technique sequence comprises of 4 phases. An approach, a 5-step rhythm, throw and recovery.



Approach ------- 5-stride rhythm ------ Delivery---------- Recovery

APPROACH

APPROACH AND 5 STEP RHYTHM

The approach run is divided into two phases, a preliminary phase and a final phase commonly revered to as the "rhythm of five".

The average length of approach, including the 5 step rhythm is

Juniors 9- 13 strides
Seniors 13 - 19 strides

THE APPROACH (PRELIMINARY)

During this phase the javelin is carried at head height, with the arm bent, the elbow pointing forward.
The palm of the hand must face upwards This will help the wrist, elbow and shoulder to relax, and therefore lead to an easy running action.
The shoulders are parallel to the run-up and the hips are kept high, with the bodyweight carried on the ball of the foot.
The javelin is lined up approximately parallel to the ground.
The approach speed increases constantly to the maximum controllable speed. The length of the preliminary approach run is:

- Juniors. 4 – 8 strides long, finishing on the right foot contact with the ground.
- Seniors. 8 – 14 strides long, finishing on the right foot contact with the ground.

5 STEP RHYTHM (TRANSITION)

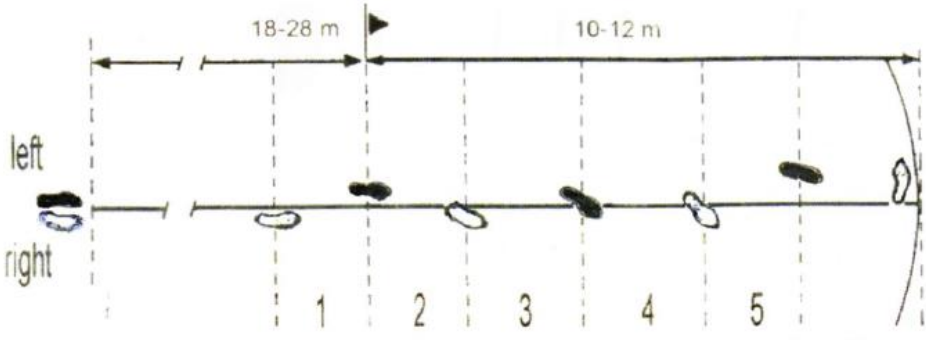
- A clear marker must be placed next to the run-up area to indicate the start of the 5 step rhythm
- The approach speed continues to increase constantly to the maximum controllable Speed, without lengthening the stride.

TEACHING STEPS

5 STRIDE RHYTHM

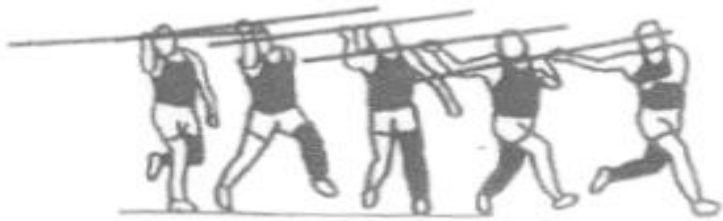
- To learn the 5-stride rhythm, stand, facing the throwing direction with the right foot forward.
- Turn the shoulders 90° to the right and reach back with the throwing arm and javelin, folding the left arm loosely across the chest, and looking straight ahead.
- Keeping the throwing arms straight and well up so that the tip of the javelin lies levels, with the brow, takes 5 steps.
- Step one, on to the left foot.
- Step two on the right foot,
- Step 3 on to the left foot,
- Preparing to make a low jump for step 4 on to the right foot,
- and then step 5, quickly on to the left foot, pushing the right hip forward and landing with the left foot pointing straight ahead. Brace the left side of the body and make a throw The rhythm is one, two, three...four-five,
- followed by one more step on to the right foot to pull up without fouling the throwing arc.
- First walk, then at a jog, then at a run and finally after a preliminary run-up

FOOT PLACEMENT



WITHDRAWAL (STEPS 1 + 2)

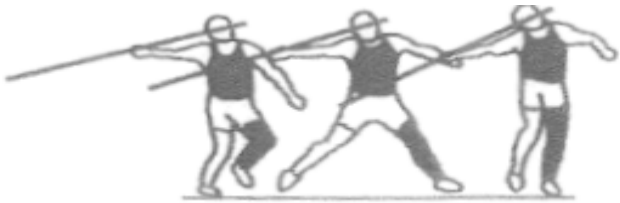
On landing on the right foot, move the throwing arm straight forward and then back to the rear, over the right shoulder, until the arm is fully stretched at shoulder height, with the palm of the throwing hand facing upwards. Do not rush the withdrawal to avoid running sideways to long. Try to accelerate ahead of the javelin, rather than pushing the javelin back. This way, it will be easier to maintain the approach speed.



The shoulders turn to be in line with delivery area, while the hips remain square with the delivery area, with the feet pointing forward, to maintain the approach speed, and to produce torsion in the upper body prior to the throw. The right leg must drive forwards and upwards to assist the hips to maintain their position, and to assist the left leg in maintaining approach speed. The javelin must remain pointing in the direction of the throw.

IMPULSE (STEP 3)

Step 3 serves as preparation for the subsequent drive step.
Hold the javelin close to head with the point in line of the eyebrows. It must remain in this position until the final delivery action. The eyes look straight ahead.



DELIVERY (STEP 4 – DRIVE)

A longer, flatter drive step of the right leg takes place after pushing off with he left leg The trunk starts to lean back because of the long stride and this facilitates a long, final delivery pull of the throwing arm.

The right foot is kept low while the right leg drive forward, across the left fool (the shortest possible path)

The left leg, after completion of the drive, is brought forward, and is In front of the right leg before the right foot touches the ground (1)

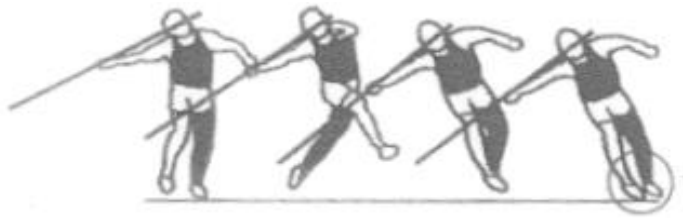
The right foot touches the ground ahead of the hips and shoulders, on the outside edge, heel first. The right leg is bend to absorb the shock.

The right foot is placed on the line of throw to ensure that the eventual drive is directed through the hips and trunk.

Ag the right foot lands, at the end of the 'cross-step', the heel is quickly lifted and rotates clockwise until the foot finishes up on the little toe, thus bringing about an clockwise rotation of the right knee and hip The angle of the foot in relation to the line of throw should not be more than 45°, to ensure an active drive through the hips.

The shoulders are still in line with the direction of the throw. The last arm is folded across the chest to keep the chest muscles relaxed.

The right arm is stretched, with the wrist closed and the palm up, to prevent the tip of the javelin to lift. The tip of the javelin must still be in line with the eyebrows.



DELIVERY (STEP 5)

The left leg is brought forward to bring the body in the power position.
The right leg drive forward and upwards while waiting for the left foot to come down. Do not force the left foot down, otherwise the centre of gravity will move to behind the right leg, losing the forward driving action.

The braced left leg lands flatfooted, pointing forward (1), to avoid the knee from collapsing and absorb the momentum of the approach run. The braced left leg is kept straight and acts like a wooden leg. The touchdown of the left leg takes place very soon after the right foot.

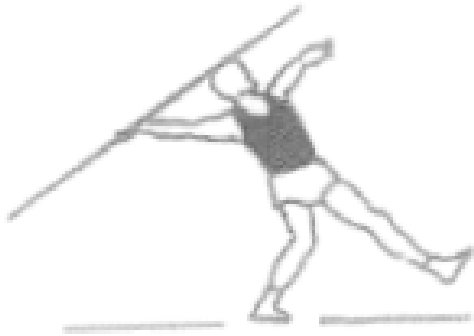
With both legs on the ground, the driving through the hips is accelerated, causing the upper trunk to form a backward arc to create torque prior to delivery.

Keep the throwing arm still extended at shoulder height (2)

The free arm remains relaxed ahead of the body.

THE POWER POSITION

- The body is arched in the "power" position,
- The head faces the direction of throw,
- The shoulders and javelin are roughly parallel.
- The throwing hand is held high, palm facing upwards and the wrist closed.
- The left leg is well forward, held like a “wooden leg",
- The left lag is totally extended.
- The right leg is slightly bent with the foot on the ground ahead of the hips and shoulders.



THE THROW

With both feat on the ground, the right leg drives the right hip forward over an extended left leg in front (1). Almost 80% of the launching speed are generated during this phase. The front leg must be extended to ensure a high point of release.

Turn the right hip quickly forward and up to bring it square with the delivery area. The chest and shoulders must follow in rapid succession.

The right elbow will follow by rotating outwards and up, alongside the head (2), while the right shoulder is pulled through and the arm is "whipped over the shoulder" with a vigorous forward and upward extension. The “whipping” action should be a result of the hip /chest / shoulder movement, and not an action on its own. The delivery arm must start its final action when the hand is above the shoulder.

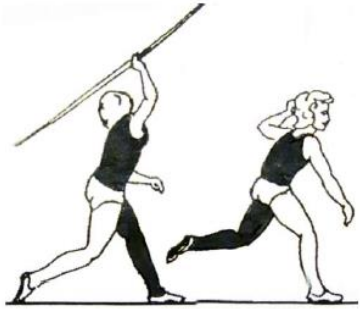
Keep the left arm relaxed, next to the body and then remain firm (blocked) during the final thrust of the right side of the body. It must not be allowed to sweep too far backwards.

The eyes look forward towards the point of the javelin to avoid the shoulders from turning. The launching takes place above the left foot. The outward rotation of the elbow along with

the release of the fingers on the javelin causes the javelin to rotate clockwise to create stability during flight.

RECOVERY

Ride over the left leg after delivery, while keeping the left foot on the ground. Bring the tight leg quickly forward, immediately after the release of the javelin to prevent fouling of the throw. Place the foot on the ground with the leg slightly bend to absorb the forward momentum.



DELIVERY ANGLE

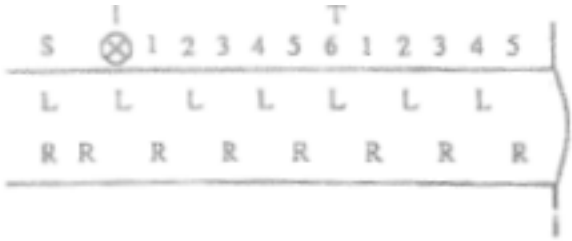
The optimum delivery angle is 30 and 36°. The faster the javelin is thrown, the lower the trajectory will be.
Strong headwinds require a lower delivery angle and strong tailwinds requite an increased delivery angle.
Javelins are manufactured according to distance rating. A thrower who throws 50 m requires a javelin, which flies optimally at 50 m, etc. The higher the distance rating of the javelin, the lower the angle of release.

MEASURING THE RUN-UP

The check marks for the javelin thrower are as important as those used in the jumping events. The elite thrower knows almost to the centimeter how close he will be to the scratch line. This technique should be practiced on every throwing day.

To establish a check mark, which is placed at the position where the rhythm must change, the thrower begins 2 steps before the first check mark. The first check mark is hit with the left foot, then the thrower continues for 6 steps to hit the T with the left foot. The T point is the tart of the five-count final approach, which includes the cross-step.

As the technique of the thrower develops, the run-up will be lengthened by adding two strides at a time. In a longer run-up, the total length of the last 5-stride rhythm will also be longer.



L = LEFT FOOT, R = RIGHT FOOT, S = START OF APPROACH, ⊗ = CHECK MARK, T = START OF FIVE-COUNT APPROACH.

The athlete should run the full run-up while an observer mark the position of the check marks. This is done six times, and the farthest markers from the scratch line is measured and written down. These distances are measured next to the run-up prior to the competition and tested. Small adjustments can be done according to the specific situations. Keep in mind that the run-up will differ slightly on different approach surfaces, or weather conditions.

.Running into a headwind will require a shorter run-up and running in a tailwind will require a longer run-up In bad weather, the run-up must be shortened for better control in the 5-step rhythm

EXERCISES TO |IMPROVE THE TECHNIQUE

1. **FINAL ARM ACTIO**

   No learn the final arm stand with the left foot forward, holding the javelin above the shoulder with the elbow forward and the tip of the javelin pointing slightly downwards. Throw the javelin into the ground 3-4 m ahead, with a stabbing action, with a pull from the shoulder straight through the shaft of the javelin, and an extension of the elbow and hand.

2. Repeat the action above, lean further back with the javelin not pointing to the ground and throw the javelin to

land 10-15 m ahead.

POWER POSITION THROW

- To execute the throw from the power position, stand with the feet 50 - 90 cm apart, with the feet pointing forward, and the weight on the rear leg,
- Lift the left foot off the ground, keeping the weight on the bent right leg and drive the right leg hard, pivoting clockwise, on the ball of the fool.

- Ground the lengthened left foot flatfooted, to block the left hip and allow the right hip to rotate to the front, forming a bowed back, with the shoulder, arm and hand to follow.
- Keep the elbow close to the javelin throughout the action.

RHYTHM WITH RECOVERY

- Start with the right foot forward, with the javelin fully withdrawn
- The left fool stride forward, followed by a longer, higher stride with the right foot.
- The emphasis of the big stride will leave the body weight back over the rear in the Power position.
- The three strides should be on the flat feet, not he toes.

RIGHT FOOT / LEG / SHOULDER ACTION

To simulate the important right foot, leg and shoulder action, grip a support, such as an upright of a throwing cage, loosely with the right hand and then step forward about a meter from the hand. Now place the left foot well ahead in a throwing position, with the body weight over a well-bent back leg. Turn . the right foot and knee inwards and push the right hip forward, so that the right shoulder pulls against the extended right arm.

BACK ARC THROW

To strengthen the upper trunk and shoulder muscles for the pull through phase, lie on the back with a medicine ball under the lower back. Arc well back, holding a medicine ball between both hands, and throw the ball forward as far as possible. Straighten the back first and follow through with the arms.

HIP THROW EXERCISE

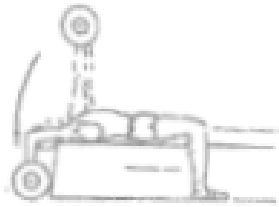
To develop the feeling of the hip throw, stand with the feet about 1 m apart. Go down, bending the right knee and turn the knee outward, while the left leg is kept straight.

urn the right knee inwards. The right hip should drive forward and up. The hip movement must be a result of the knee movement and not a movement on its own.

STRENGTH EXERCISES WITH THE USE OF WEIGHTS

TRICEPS EXTENSION

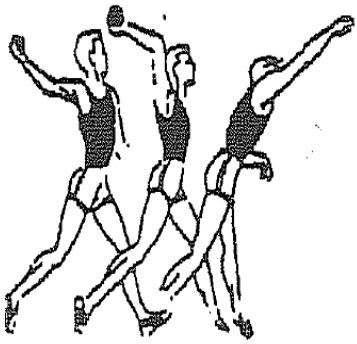
To strengthen the muscles of the arm concerned in the final movement, lie on a bench with the feet resting on the ground at each side of the bench. Reach back with the arms well bent to grasp a weighted bar with narrow grip and raise the bar to a position above the chest with the arms extended. Keep the elbows well forward.



STRENGTH TRAINING WITHOUT WEIGHTS

HEAVY BALL THROW

Standing with the feet well apart and with the body weight well supported on the rear leg. The rear leg should be wall bent and the front leg slightly bent. Turn the shoulders to the side and lean well back with the arm well extended and the palm of the hand facing upwards, while holding a small heavy ball. Rotate the right knee and hip to the front and throw the ball with a high elbow, a strong pull from the shoulder and a final extension of the throwing arm high above the shoulder. Follow through with the right arm over the front foot to make a recovery step.

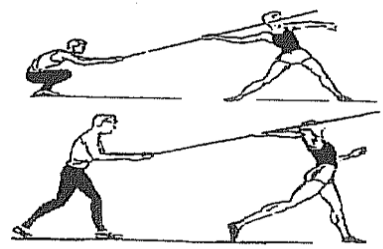


DIRECTING FLIGHT

To direct the flight and to 'feel the javelin in order to guide it, stand in the same position as above, holding a javelin in the hand.

Another athlete holds on to the end of the javelin while driving through.

The hips must stay in front of the shoulders and the javelin must pass over the right shoulder.

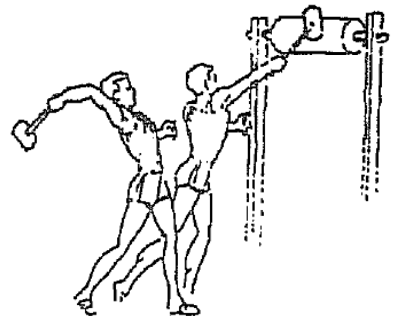


HAMMER EXERCISE

To strengthen the final delivery action. Stand in the final stride position, while holding a 4-kg hammer, palm facing upwards.

Drive through with the right hip and shoulder with the right arm following and drive through to hit a log.

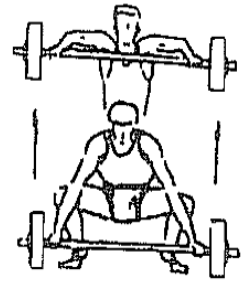
The hammer must hit the log when the right hand is directly above the left foot.



HIGH CLEAN LIF

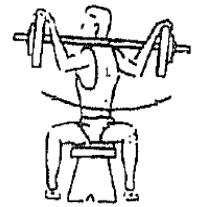
To strengthen the legs, trunk, shoulders and arms, bend the legs to take a wide grasp of a weighted bar.

Now extend the legs strongly and pull with the shoulders and finally the arms until the bar is at chin height.



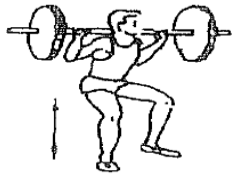
TRUNK TURNING WITH BAR ACROSS SHOULDERSo mobilise the hips and trunk, sit on a bench with the feet resting on the ground at each side of the bench.

Place a weighted bar on the shoulders and hold the bar with a wide grip. Rotate the trunk in both directions.



BACK SQUAT

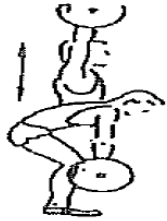
To strengthen the lower part of the body, which is used in all phases of the movement, carry out squats with weights on the shoulders, keeping the trunk as upright as possible.



POWER SNATCH

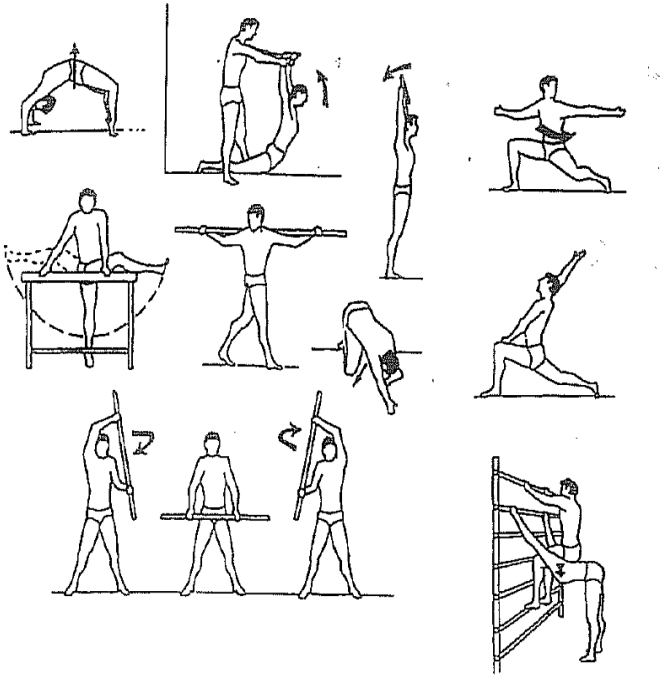
To strengthen the legs and back, bend the knees to take a wide grasp of a bar loaded with discs and list the bar above the head, with both legs and arms taking part in the movement.

Keep the trunk as upright as possible at all times.



WARMING UP AND STRETCHING EXERCISES FOR JAVELIN THROW

Warming up and stretching is important before any exercises or competition. Refer to the chapter on conditioning for more information. A few examples of stretching exercises for shot put are shown below.



RULES

IMPLEMENT

The javelin consists of three parts a head, a shaft and a cord grip The shaft must be constructed of metal and has, fixed to it, a metal head terminating in a sharp point.

The rules regarding specifications for both men's and woman's javelins are very complex, in order to guarantee a regular flight and legal landing. Great care must be taken by the Technical Manager to ensure that all javelins to be used in a competition comply strictly with these rules. The weight of the men's javelin is 800 gm and that for woman is 600 gm. The lengths are respectively 2.60 to 2,70 m and 2,20 to 2,30 m.

At meetings such as the Olympic Games, World or Regional Championships etc., only javelins provided by the Organising Committee may be used.

At other, smaller competitions, competitors may use their own javelins, provided that they are checked and marked as approved by the Organising Committee before the competition and made available to all competitors.

THE RUNWAY

The length of the runway should not be more than 36,50 m but not less than 30 m and should be marked by two parallel lines, 50 mm in width and 4 m apart.

THE THROWING ARC

This should consist of a strip made of paint, wood or metal 70 mm in width, painted white and flush with the ground, and should be an arc of a circle drawn with a radius of 8 m. Lines,0,75 m in length, are drawn from the extremities of the arc at right angles to the parallel lines marking the runway.

THROWING SECTOR

This is bounded by the inner edges of two lines, which are drawn from the centre of the arc through the points at which the arc joins the lines marking the edge of the runway.

GENERAL RULES

The javelin must be held at the grip and the throw must be made over the shoulder or upper part of the throwing arm.

For a throw to be valid the tip of the metal head must strike the ground before any other part of the javelin and it must fall completely within the inner edges of the landing sector.

The competitor must make his approach and throw within the lines demarcating the runway It is a foul throw if, after starting his throw, he touches the lines or the ground outside with any part of his body. He must not leave the runway until the javelin has landed and then his first contact with the parallel lines or the ground outside the runway must be completely behind the lines, at the ends of the arc at the right angles to the parallel lines. Once he has started his throw, the competitor must not turn completely around so that his back is towards the throwing arc.

The number of throws allowed is the same as for the shot and discus

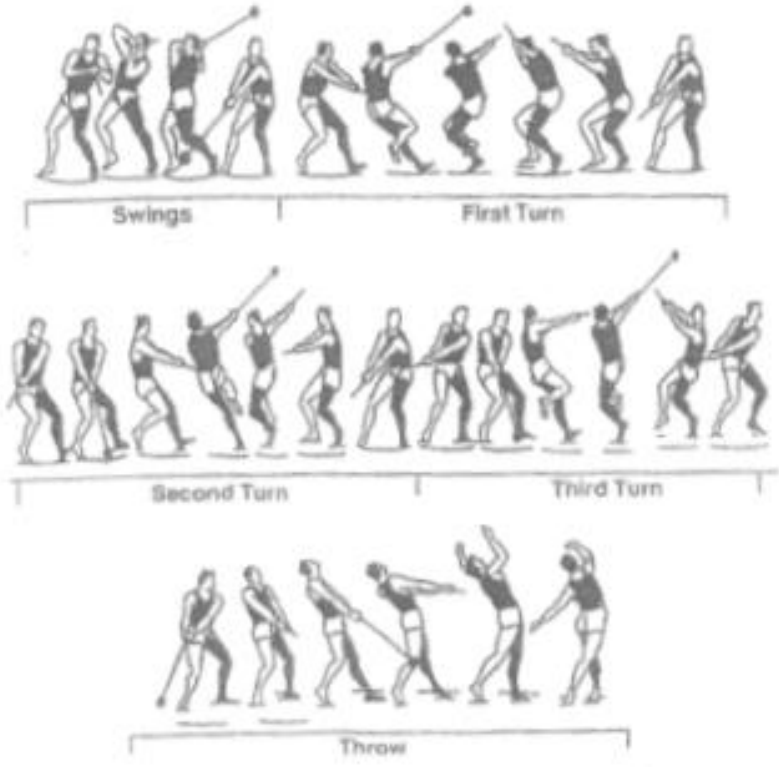
HAMMER THROW

There is only one basic hammer throw technique with individual variations within the technique but the aim is always to deliver the hammer with optimum speed and balance. The right-handed technique will be explained in all examples used in this book.

HAMMER THROW TECHNIQUE

The hammer throwing technique is divided up into three phases: swings, turns and the throw

3 or 4 turns are normally used to accelerate the hammer.

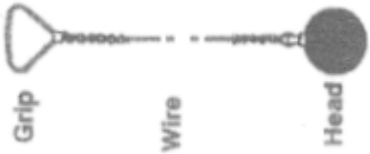


The three most difficult skills for the hammer thrower to learn are:

1. To keep the arms lengthened for the greatest arm radius and therefore faster hammer speed.
2. To stay low to allow for leg explosion at delivery.
3. To execute tight, quick turns to develop maximum speed prior to delivery

ABOUT THE HAMMER

The hammer consists of three parts, a metal head and spindle, a wire and a grip (handle)



THE HAMMER HEAD AND SPINDLE

The head is usually made of steel shells filled with lead. The lead can be added or taken out according to the different weights needed in the various competitions.

The spindle, which attaches the wire to the hammerhead, is screwed into the casing and lock in position with an Allen screw. A ball-race is mounted inside the casing of the hammerhead. to allow the spindle to turn.

THE WIRE

The wire is a single, unbroken and straight spring steel wire at least 3 mm in diameter. The steel wire is very brittle and any kink in the wire will cause it to break. It is therefore safest to replace it immediately when a kink appears. Hammers, when stored. should hang from a hook, to keep the wire straight

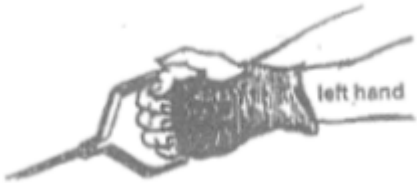
THE GRIP (HANDLE)

The handles vary in shape, size, and weight, and are usually chosen by throwers according to how the handle fit in their hand,

GRIP ON THE HANDLE

Right hand throwers turn to the left and hold the handle with the left hand, which is then covered by the right hand.

Gloves should be worn to protect the hand from skin damage, blisters and calluses. For further protection, the fingers can be taped individually with PVC insulation tape. Tape that is not smooth should be avoided to prevent chasing inside the glove.



STARTING POSITION

Stand in the back of the circle, facing away, from the direction of throw, with the feel spaced approximately shoulder width apart.

The hammerhead is placed on he ground, to the rear and right hand side of the thrower,

The wire is kept straight, with the arms stretched as long as possible, and slightly away from the body

The legs are slightly bent, appearing to be sitting.

The head is kept upright

PRELIMINARY SWINGS

Before starting the first turn of the sequence, 2 - 3 wide, flat preliminary swings must he executed to:

1. give the hammer momentum,
2. feel the rhythm of the throw,
3. establish the correct plane for the hammer,
4. establish correct balance of the body.

As the hammerhead comes to the front. during the start of the first preliminary swing, the body weight shifts to the left heel and the hammer is t swept in a wide path in front. The arms are kept straight. The eyes look at the horizon. The chin and knee forms a vertical line through the left toe.

As the hammer crosses the front, the arms start to bend and the hands are brought up to be in line with the head. The arms form a “window" in front of the face (1). with the elbows open, and the athlete must look through the "window" to the horizon. The hands (not the hammerhead) pass behind the head, at the same height as the forehead.

The shoulders, which were turned to the right, now turn to the left. The hips are displaced laterally in the opposite direction of the shoulders.

This causes the right leg to bent and creates a pulling action on the hammer through the arms.

The legs remain slightly bent throughout the swing to maintain balance and a low centre of gravity.

The hands are now brought forward while the arms are stretched to allow the widest possible range for the hammer to travel.

The hammerhead falls to its lowest point just to the right of the right foot. If the low point is to early e.g. directly to the right of the body, the hammerhead will rise to steeply in front throwing the athlete of balance.

The second swing must be slightly higher and faster until the fastest controllable speed is achieved. A third swing, slightly higher than the first and second swings can also be executed, providing the speed remain at the fastest, controllable pace. In the final preliminary swing, the hammer, at its highest point, should not rise above the head, and should be just below the knee at the lowest point, to create a flat plane prior to entry into the first turn

FIRST TURN

The entry into the first turn must be executed correctly, to ensure a good technique in the remainder of the turns. Preparation already starts when the hammer is at its highest point during the last preliminary swing.

The hips are pushed in the opposite direction to counteract the pull off the hammer. The right leg bent, and creates a pull action on the hammer.

Foot movement start when the hammer reaches the low point in the final preliminary swing. Most of the body weight must be on the left heel.

Pivot 180° anti-clockwise on the heel off the left foot (1) and 90° on the toes of the right foot, in unison with the torso and the hammer, The hammer and the two shoulders form an isosceles triangle at all times.

Push off with the right foot. The body weight is transferred from the heel to the ball of the left foot. Continue to turn for a further 180° on the ball of the left foot.

The right foot only leaves the ground once the hammer has reached its highest point. This is done to maintain double foot contact as long as possible.

Rotate the right foot quickly and smoothly around the left foot and place it on the ground next to and parallel to the left foot, in the same position as when the movement had started.

This causes the hips and shoulders to overtake the hammer, thus creating torsion in the upper body. The Torsion in the upper body, along with the continues rotation of the body, causes the hammer to accelerate.

The body weight must be back on the heel of the foot before the right foot touches the ground. The trunk must lean slightly forward, but must remain straight, with the shoulders closed to ensure maximum travel range of the hammer. The eyes are focused on the hammer.

The arms also remain stretched until delivery to achieve maximum speed of the hammer. The thrower now has travelled one-foot length in the direction of the delivery area.

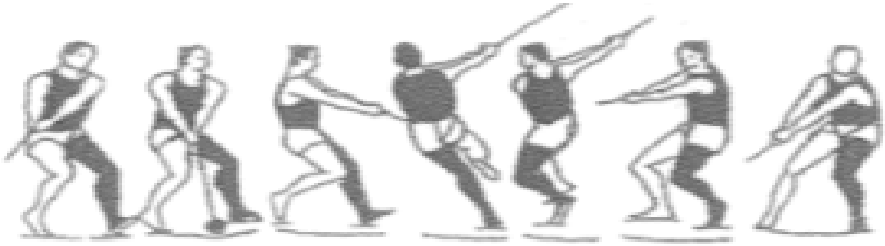
SECOND TURN

A second left foot heel-ball turn is executed with the right hip and right leg overtaking the hammer in the second half of the turn.

Push the left knee anti-clockwise to guide the rotation of the left foot, directly after the right foot touches the ground to ensure continues movement of the hammer.

Place the right foot on the ground quickly and smoothly, using the shorter route around the left foot. Because of the shorter route, more torsion is created in the upper body to accelerate the hammer speed.

After completion of the second turn the thrower now has travelled two foot lengths in the direction of the delivery area.



THIRD TURN

A third left foot heel-ball turn is executed with the right hip and right leg overtaking the hammer in the second half of the turn. The right leg uses the shortest possible route around the left foot to create more torsion in the upper body, to accelerate the hammer even faster.

Push the last knee anti-clockwise to aid the rotation of the left foot, directly after the right foot touches the ground to ensure continuous movement of the hammer.

With each turn, the lead of the lower body over the hammer must be increased.

After completion of the third turn the thrower now has travelled three-foot lengths in the direction of the delivery area.

THROW

The delivery starts when the fight foot touches the ground at the end of the final turn. The weight of the body is on the left leg

Throw by extending the ankle, knee and hip joints of both legs, while turning the right hip forward. The trunk and the head form a backward arc. The eyes remain focused on the hammer. At the same time the left side of the body is braced and the left hip is kept stationary.

The arms move upwards, and to the left in a whiplash movement The pull action of the arms on the hammer must continue even after the release took place to ensure no loss of velocity prior to release. Release takes place when the hands reach shoulder height. The delivery angle is approximately 42 - 44 g.

RECOVERY

After delivery, lower the centre of gravity by bending the legs and reverse the foot positions with a little jump and keep the eyes on the hammer in flight.

EXERCISES TO IMPROVE THE TECHNIQUE

STICK SWING

To get the feel of the hammer and learn the swing, stand with the feet astride, legs slightly bent and the arms straight, with a broom or stick held with both hands. Start a pull from the shoulders to swing the broom from the right-rear to the front and then continue the swing so that it rises to the left (elbows open and the hands in line with the forehead) and then descends to the right again, the left arm lowering in front of the chest, with rotation of the trunk, and the hips swing in the opposite direction,

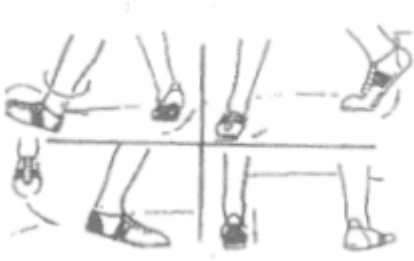
SHORT HANDLE HAMMER THROW -

To learn the delivery phase, swing as in the previous exercise using a short, light hammer or sandbag, and then throw, pivoting in the direction of the throw and then extending the legs and trunk. Try to achieve a good arched position and keep the arms straight. The left foot must turn on the heel and the right foot on the toes.

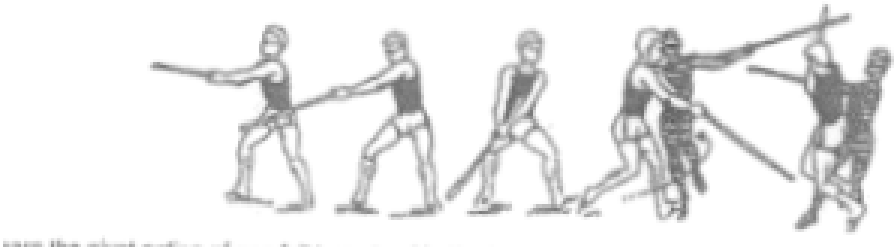
It is very important that the weight used during this phase is lighter than the competition weight to ensure the development of the correct technique. Only when the technique is technically correct, the athlete can progress to a regulation hammer.

180° PIVOTING ACTION

To learn the pivoting action of the turns, stand in the hammer throw position with the body weight that rests over the left heel. Turn the left knee anticlockwise while pivoting on the left heel and the toes of the right foot. The right foot is taken of the ground as the right knee comes close to the left leg, and on completion of the heel part of the turn. The left foot role onto the ball of the foot while the right foot rotate closely around the left leg and placed next to the left foot, shoulder width apart.



360° PIVOT AND STICK SWING



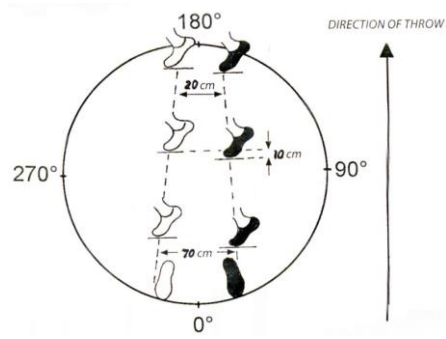
To learn the pivot action of one full turn stand in the hammer throw position, holding a broom or stick with both hands. Turn the knee anti-clockwise while the left foot rotates 180° on the ball of the foot and the right foot 90° on the toes of the foot. The right foot leave the ground when the stick is at its highest point, and rotate 360° closely and anti-clockwise around the left leg, and placed next to the left foot on the ground. The hands and the shoulders must form an isosceles triangle throughout the entire turn. Only when the technique is technically correct, the athlete can progress to the regulation hammer throw.

3 TURNS AND THROW

To co-ordinate the total movement execute 3 full turns as explained in the previous exercise,

The movement must flow from one turn to the next without any interruption. Each time a turn is completed, the athlete travelled one foot length in the direction of the throw.

Only when the technique is technically correct, the athlete can progress to a regulation hammer.



STRENGTH EXERCISES TO IMPROVE THE TECHNIQUE

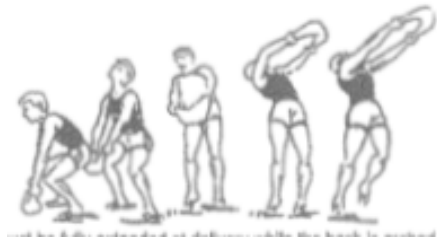
DELIVERY ARM THROW

To develop the final pulling action of the left arm prior to the delivery, place the one end of a bar on the ground and the other weighted and in the left hand. Go down by bending the right leg, and pull the bar through vigorously while stretching the ankle, hip and shoulder joints. A bystander can support the bar after completion of the action to stop the weight from pulling the athlete of balance.

PULL THROUGH AND DELIVERY

To develop the final pull through action and delivery, hold a sandbag or medicine ball in both hands and go down with the chin, knee and left toes in a vertical line.

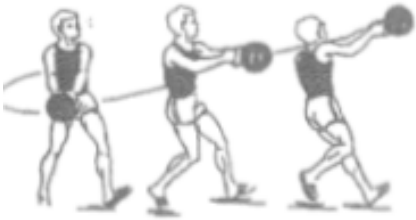
The body weight must be on the left heel. Execute the final throwing - 3 action and deliver the sandbag at shoulder height.



The ankle, hip and shoulder joints must be fully extended at delivery while the back is arched and the eyes focused on the sandbag

WEIGHTED 180° TURN

To develop the push with the right foot and the turn on the heel of the left foot holds a heavy ball between the hands and stand in the chin-knee-toe position. Turn the left knee anti-clockwise while the left foot turns 180° on the heel of the foot. The left foot rolls over onto the ball of the foot as the right foot is rotating around the left foot and placed next to the left foot, Progress to a 360° turn when the athlete can control the weight.



BACKWARD THROW

To strengthen the back muscles, stand with the feet apart and hold a weighted ball of a medicine ball between the legs.

Bend the trunk and extend it vigorously, arching the legs and arms upwards, throwing the ball over the head.

POWER SNATCH

To strengthen the legs and back, bend the knees to take a wide grasp of a bar loaded with discs and lift the bar above the head, with both legs and arms taking part in the movement. Keep the trunk as upright as possible at all times.

WARMING UP AND STRETCHING EXERCISES FOR HAMMER THROW

Warming up and stretching is important before any exercises or competition. Refer to the chapter on conditioning for more information. A few examples of stretching exercises for shot put are shown below.

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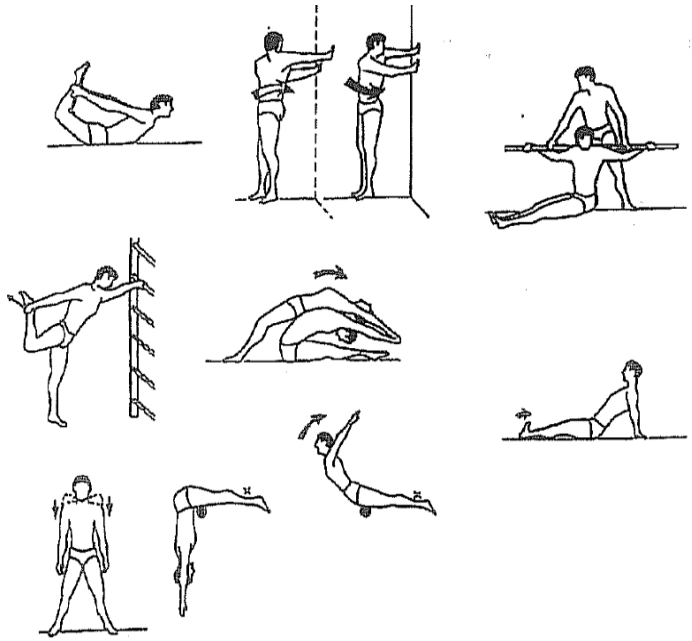

RULES

THE IMPLEMENT

This may be made of iron or other suitable material not softer than brass. It may be filled with lead or other solid metal. It should be completely spherical with a minimum diameter of 110mm.

THE WIRE

This joins the ball to the grip, should be a single, unbroken and straight length of spring steel at 3mm in diameter,

THROWING CIRCLE

This shall be the same as for putting the shot.

PROTECTIVE CAGE

This should be U-shaped in plan, consisting of a minimum of 7 panels of netting, each 2,74 m wide. The width of the mouth should be 6 m, positioned 4.2 m in front of the throwing circle The minimum height of the netting panels should be 5 m. Provision should be made to prevent the hammer from sliding along the ground underneath the netting

GENERAL RULES

These are the same as for shot put and discus throw, but the gloves are permitted for the protection of the hands. The gloves must be smooth on the back and the front, and the fingertips must be exposed. The singers must not be taped together, but individual fingers may be taped only to cover an open wound. To protect the spine from injury, a competitor may wear a belt of leather or suitable material. To obtain a better grip, the hammer thrower may use a suitable substance on his hands or gloves, but no substance may be spread on his shoes, nor in the circle.

CONDITIONING

Training schedules in South Africa normally start in September, after the winter sports are completed.

The various championships from zone to national level take place in March to April. During this period the conditioning philosophy will be as follows

1. First quantity, them quality.
2. Build a foundation of endurance and then develop speed gradually. This will prevent injury.
3. For the first month of training you will do no speed work.
4. You will develop speed by doing a great deal of short, fast work and sprints over distances shorter than 50 m.
5. As the season progresses, you will do less work but faster work.
6. Workouts will generally be a hard day followed by an easy day, with a lightening up of work two days before competition.
7. Your schedule is flexible. You may change the daily routine because of weather, body condition, or emotional outlook.
8. You should completely recover from one workout to the next. If you are not completely recovered, do less work, or rest.
9. You should never train when you are ill or have an injury.
10. If your training schedule is limited, you may telescope this schedule into two-week periods instead of month periods.
11. Your workouts must be fun or rewarding, preferably both.

WORKOUTS

All workouts should always start of with:

1. A general warm up session,
2. Followed by a stretching session,
3. Followed by a specific warm up session.

WARNING UP

It is important that the athlete should warm up before stretching of training. Warming up should functional. It has the following advantages for the athlete:

1. It helps to prevent muscle stiffness.
2. It helps to relax the muscles and allows the muscles to contract faster during a competition. (better muscle co-ordination.)
3. It improves blood circulation to enable oxygen to reach the muscles faster.
4. The body temperature rises which improves metabolism in the muscle.

5. The body (heart) can adjust easily to the competition when there is a sudden increase in pace or a fast delivery.

A light jog twice around the track can be regarded as a general warm up session.

50m acceleration runs can be used as specific warm-up exercises.

A preliminary throw can only be done after a proper warm-up session.

Before the competition the following throwing warm-up session is suggested:

1. Important technique simulations, followed by
2. two or three easy throws, followed by,
3. One or two harder throws (still not maximum)

STRETCHING EXERCISES

1. Light stretching exercises must be done prior to a training session or competition, while more intensive stretching can be done after the training session. These can be regarded as 'warm down" exercises.
2. Static (gradual) stretching exercises are better than ballistic (jerking) stretching exercises, because muscles are stretched evenly and without a jerking action and thus prevents injuries to muscles during a competition.
3. The thicker muscles must be stretched more than the thinner muscles.
4. Stretching must be functional.

STRETCHING EXERCISES HAVE THE FOLLOWING ADVANTAGES:

1. If stretching is done regularly, suppleness of the muscles is regained and maintained.
2. Supple muscles leads to faster muscle-reaction.
3. Improves the mobility of the limbs.

Recommended stretching exercises for male and female athletes can be seen at the relevant events

TYPES OF WORKOUTS

GENERAL CONDITIONING

The need for endurance training for the thrower, such as jogging sessions, is virtually nil. However, a change of environment is sometimes needed, and circuit training in a gymnasium, a game of soccer or volleyball can come in handy.

TECHNIQUE

Technique exercises must be done on a regular basis. A high school athlete for example should throw at least 75 - 100 technique specific throws per weak during the preparation phase and at least 40 full throws. At least 75 - 100 full throws should be executed per week during the high intensity phase.

MOBILITY

Strength training tends to reduce mobility especially in the ankle, hip and shoulder joints as well as the spine. This will drastically reduce the capacity to perform, and increase the injury risk. Intensive stretching exercises must be done with every technique session and must be event specific.

STRENGTH ENDURANCE

Strength endurance and muscle endurance are not taxed during competition but is necessary to develop to be able to cope with high quality output during long periods of training. It is also valuable when mental endurance is needed during concentration at an intense level over a long period of time.

Using medicine ball exercises, or weight training at low intensity e.g. 75%, 10 - 20 repetitions and 3 - 5 sets can develop it.

MAXIMUM STRENGTH

Maximum strength is not valuable during the execution of the throw because of the slow muscle contraction, which develop because of maximum strength exercises. However, it provides the foundation upon which all other strength development is based e.g. specific strength, elastic strength and static strength.

Maximum strength can be developed with 80 - 100% weight lifting with 1 - 5 repetitions and 5 - 8 sets,

STATIC STRENGTH

Static strength is used during the blocking of the left side of the body, while the right side of the body delivers the implement. It is developed mainly during weight lifting sessions at 100% intensity with 1 - 3 repetitions and 1 - 3 sets.

SPECIFIC STRENGTH

Specific strength is developed when throwing with implements slightly heavier than competition implements, or with medicine balls,

ELASTIC STRENGTH

Elastic strength is developed during exercises such as jumping, bounding and hopping and plays an important roll in the delivery speed of the implement.

SPEED

General speed can be developed by means of:

- 30 - 50 m sprints,
- elastic strength exercises
- and explosive use of weight lifting.

SPECIFIC SPEED

For specific speed the athlete can use under weight implements e.g. a shot with a whole drilled through. The lighter implement (not more than 15% lighter)will give the athlete the experience of throwing distances to which he aspires. To light implements will cause elbow injuries and destroy his timing for the event.

The exercises above are combined in a long term training programme that would look more or less as follows.

THROWS LONG TERM PLAN	**PHASE**		
SEPTEMBER TO APRIL	**CONDITIONING**	**PREPARATION**	**COMPETITION**

TRAINING METHODS	1	2	1	2	1	2
General conditioning	30%	25%	20%	15%	10%	5%
Technique + Mobility	20%	20%	25%	25%	25%	30%
Strength endurance + Max strength	30%	25%	20%	15%	10%	5%
Specific elastic and static strength	10%	15%	15%	25%	25%	20%
Speed + competition	5%	5%	10%	10%	15%	20%

A TRAINING PROGRAMME FOR THE THROWER

- If your training schedule is limited, you may telescope this one month cycles into two week cycles.
- Phase 1 0f each sub-section of the programme is used as a conditioning period for the new exercises.
- During phase 2 the intensity of the training is gradually increased.
- Two examples of a 14 day training programme in all the throwing disciplines are given. One in the pre-season and one in the peak season.

CONDITIONING PHASE	MONTH: SEPTEMBER													
CONDITIONING	**M**	**T**	**W**	**T**	**F**	**S**	**S**	**M**	**T**	**W**	**T**	**F**	**S**	**S**
General conditioning e.g. circuit training, volley ball		✓		✓					✓		✓			
Technical throws concentrating on specifics	✓		✓					✓		✓				
Full throw														
Mobility – event specific	✓		✓					✓		✓				
Endurance strength		✓		✓					✓		✓			
Maximum strength	✓		✓					✓		✓				
Static strength														
Specific strength														
Elastic strength														
Speed														
Competition														
Rest					✓	✓	✓					✓	✓	✓

PREPARATION PHASE	MONTH: SEPTEMBER													
CONDITIONING	**M**	**T**	**W**	**T**	**F**	**S**	**S**	**M**	**T**	**W**	**T**	**F**	**S**	**S**
General conditioning e.g. circuit				✓							✓			

training, volley ball														
Technical throws concentrating on specifics				✓					✓		✓			
Full throw	✓		✓					✓		✓				
Mobility – event specific	✓	✓	✓	✓				✓	✓	✓	✓			
Endurance strength		✓		✓					✓		✓			
Maximum strength	✓		✓					✓		✓				
Static strength														
Specific strength			✓							✓				
Elastic strength														
Speed	✓							✓						
Competition						✓							✓	
Rest					✓	✓	✓					✓	✓	✓

OMPETITION PHASE	**MONTH: SEPTEMBER**													
CONDITIONING	**M**	**T**	**W**	**T**	**F**	**S**	**S**	**M**	**T**	**W**	**T**	**F**	**S**	**S**
General conditioning e.g. circuit training, volley ball														
Technical throws concentrating on specifics		✓		✓					✓		✓			
Full throw	✓		✓		✓			✓		✓		✓		
Mobility – event specific	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		
Endurance strength														
Maximum strength														
Static strength	✓		✓					✓		✓				
Specific strength		✓		✓					✓		✓			
Elastic strength	✓		✓					✓		✓				
Speed	✓		✓					✓		✓				
Competition						✓							✓	
Rest				✓	✓	✓	✓				✓	✓	✓	✓

LAWS OF COACHING

a) **LAW OF INDIVIDUALITY**
Each athlete has an own personality and physical attributes that needs to be evaluated and taken in account. Every individual reacts in a unique manner to exercises and loads and intensity.

b) **LAW OF INVOLVEMENT**
It is important for the success of a training program that the athletes buys inti it and participates full in the execution thereof.

c) **LAW OF PROGRESSIVE OVERLOAD**
Volume and intensity as well as loads should regularly be adapted in order for development to take place. If the volume, intensity and rest periods always remain the same no development will take place and performance will stay the same or weaken.

d) **LAW OF VARIETY**
An exercise should from time to time be replaced by different exercises with the same effect in order to maintain the interest of the athlete. Otherwise it becomes boring.

e) **LAW OF ADAPTATION/REST**
The rest or recovery after an **overload** allows the body time to adapt to new levels and the adaptation that takes place allows the athlete to perform better.

f) **LAW OF REVERSIBILITY**
The training with a high load followed by recovery has a direct bearing on the increase or decrease of the performance level of the athlete.

g) **LAW OF SPECIFICITY**
The exercise and loads should be specific to the attributes of the athlete and the event for
which he / she trains.

SUMMARY

Rest is the most important cornerstone of three very basic rules:

1. Moderation must always be kept in mind during training to avoid serious injuries. The human body can take far more stress than we generally give it. However, it needs to adapt to heavier stresses gradually, by making use of hard training does not make up for the loss, and will lead to injury and illness due to a lack of rest.
3. To rest is vary Important. More training load creates extra physical stress, which call for more recovery time. The body

sufficient rest periods.

2. Consistent training on a reasonable level should be done every day. If a few days of training are missed, the body loses its form. A day or two of extra makes its adaptation to stress when the body is at rest, rather than during stress. This is a part of the principle of overloading. Peak performance can only be achieved after a moderate, constant increase in training load, followed by sufficient rest.

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