

A Basic Javelin Technique



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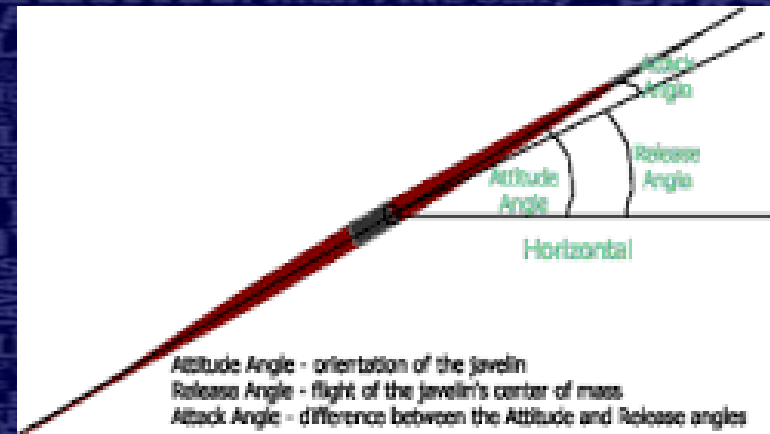
Big Picture

Long javelin throws

- Big ($F=ma$) force
- Long range
- Short time

Major determinants

- Speed of Release
- Angle of Release
- Height of Release



More than just a throw

“Rather than a throw, the javelin is an over-arm, whip-and-flail motion that uses the entire body”

(Brown, Webb, and Sing)

“Fling, sling, whip are much more descriptive and imply a more relaxed, sequentially efficient delivery in which the arm becomes involved only after the major muscles of the legs, hips, and trunk have been utilized” (Sloan)

Basic Throwing Principles

1. Involve the whole body
2. Achieve a summation of forces
3. Apply force in the direction of the throw
4. Achieve a long range of motion
5. Weight transfer

(Dunn and McGill)

Overview

- Acceleration into plant (stride)



*Delivery whipping action =
transfer of linear momentum +
rotation around body's vertical axis*

- Technique, Speed, Strength, Flexibility
- Continuum that builds on successive steps

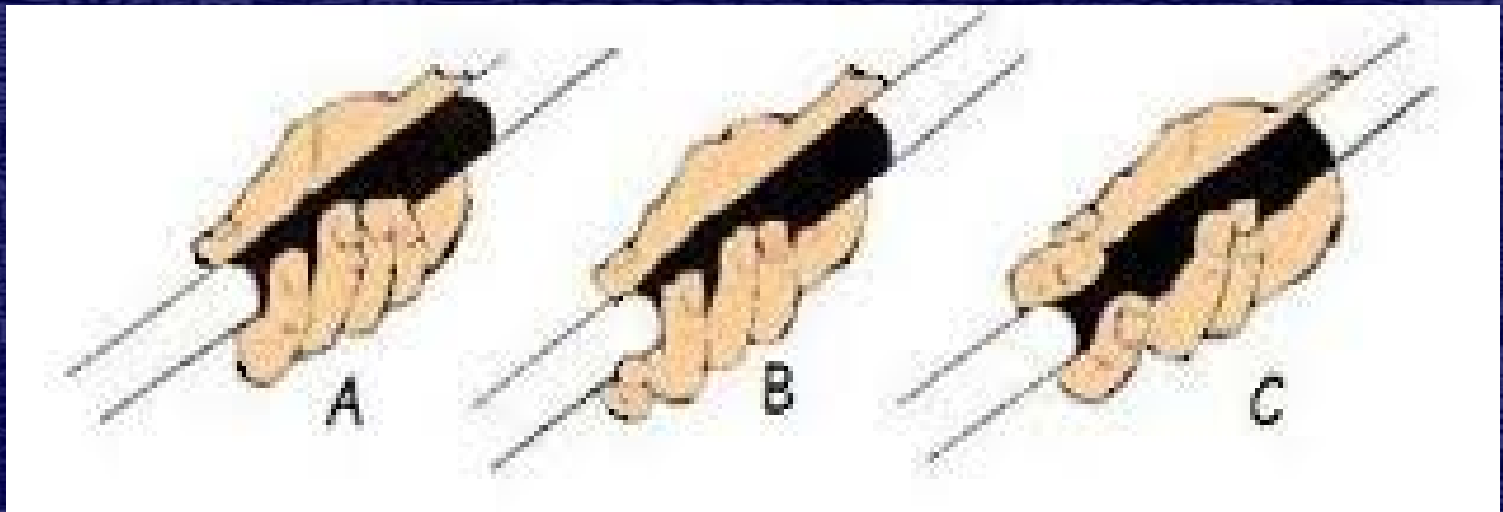
Sequence

- Grip
- Carry
- Initial Approach
- Transition – 7 steps
- Withdrawal
- Cross Step
- Penultimate Stride
- Final Stride
- Delivery/Release
- Recovery

Right-Hand Orientation
Stride – 2 feet

Grip

- Where force is applied
- Firm, but relaxed, no tension in forearm
- Long groove of palm
- American (A), Finnish (B), Fork (C)



Carry

- Palm up
- Upper arm parallel to ground
- Elbow flexed to 90°
- Elbow pointed forward
- Javelin just above/right of head/behind ear
- Javelin aligned in direction of throw
- Tip tilted slightly down/then parallel to ground
- Thrower relaxed/comfortable with javelin
- Javelin is held still



Rhythmic Approach



- Consistent acceleration pattern
- “Normal” running mechanics
- Optimal horizontal speed at final foot strike
- Initial goal get up to speed/start rhythm
- 11 to 17 strides \propto physical/technical

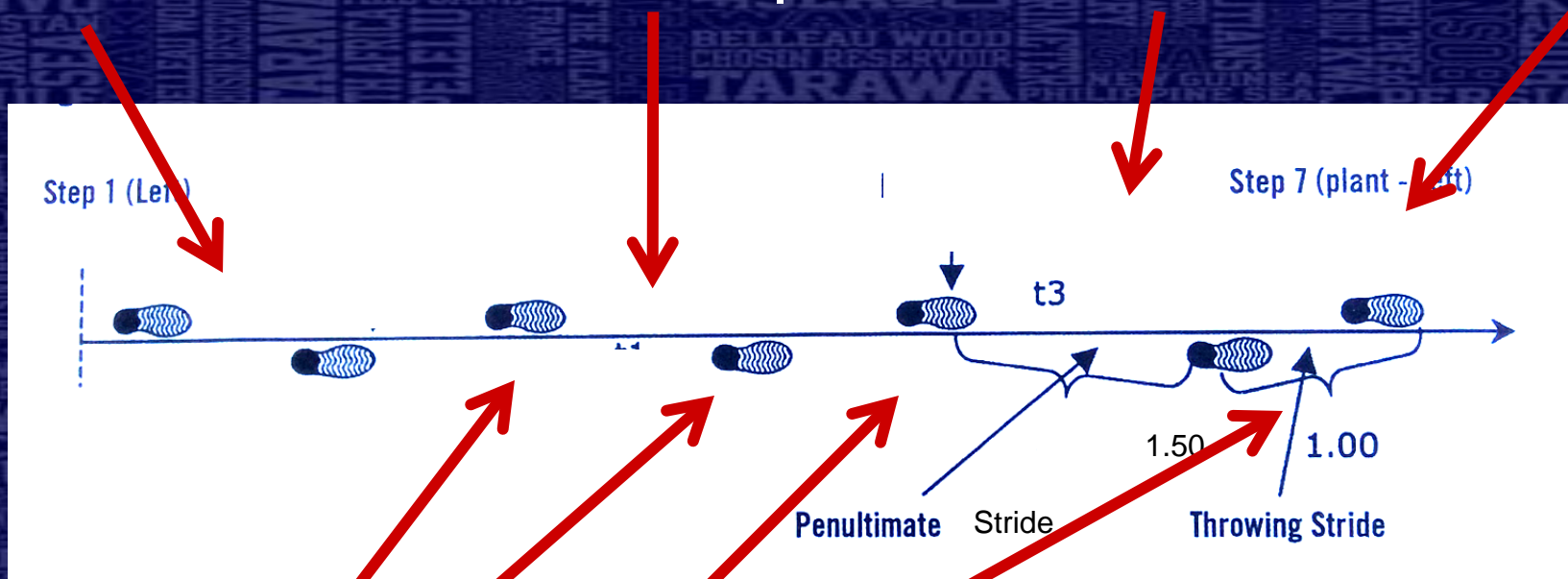
Initial Approach

- Palm up
- Upper arm parallel
- Elbow flexed to 90°
- Elbow pointed forward
- Javelin near head/behind ear
- Javelin aligned
- Tip down/then parallel
- Javelin held still
- “Normal” running mechanics



Transition (last 7 steps)

Withdrawal → Cross Step → Penultimate → Final



Rhythmic

1-2-Three--45

L-R-Left--RL

Maheras, Terauds

Withdrawal (left to right to left #1)

- Left arm extends forward
- Right arm extends directly backward
- Javelin is maintained parallel to shoulders
- Head remains forward
- Hand is shoulder height/wrist is straight
- Tip near the temple
- Trunk rotates clockwise
- Feet also turn
- **Keep rhythm**

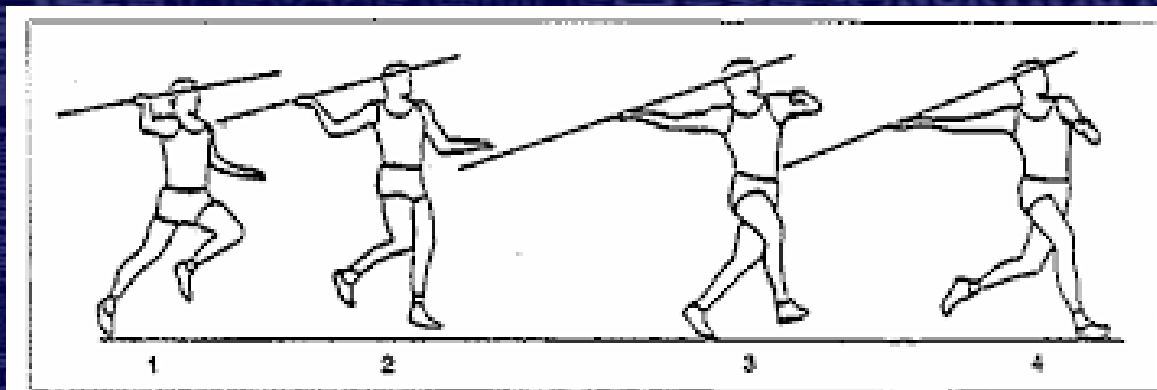


Figure 2: Swedish javelin withdrawal during two strides

Cross Steps

(Steps 1 and 2)



- Trunk and shoulders rotated to 90°
- Hips at approximately $\approx 45^\circ$
- Feet have turned to the right
- Running slightly sideways
- Drive right knee forward
- Hold the javelin in place
- Keep the rhythm

Full Approach (Withdrawal/Cross Step)

- Left arm forward
- Right arm directly backward
- Javelin parallel to shoulders
- Head forward
- Hand shoulder height
- Wrist straight
- Tip near the temple
- Trunk rotates
- Feet turned
- Trunk/shoulders at 90°
- Hips at $\approx 45^\circ$
- Feet turned
- Drive knee forward
- Javelin held in place



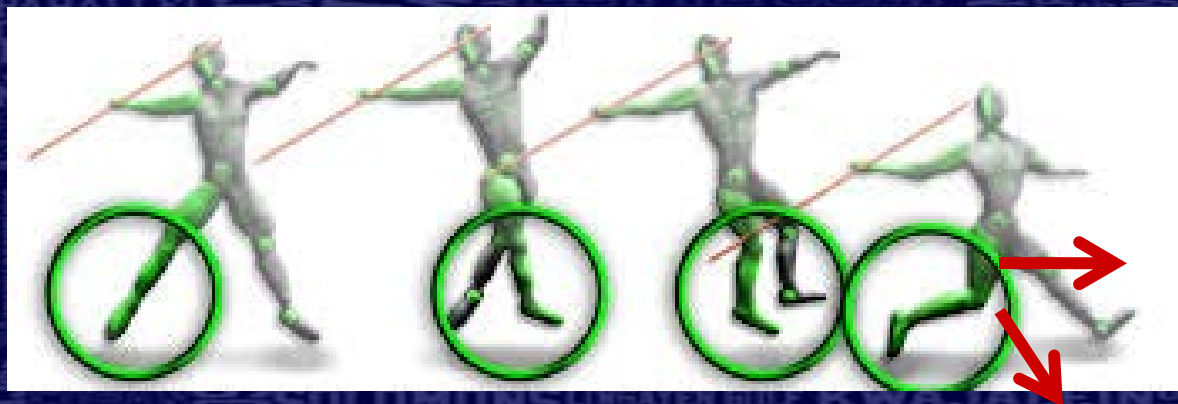
Penultimate Stride Left (Step 3)

- Slightly shortened step
- Active pull toward the body
- Left foot contact on ball of foot
- Exaggerated cross step



Penultimate Right (Step 4)

- Right knee/lower leg quickly thrust forward
- Soft right foot landing on ball of foot
- Right knee bends/continues to move forward
- Upper body remains upright and relaxed
- Throwing hand at/above shoulder level



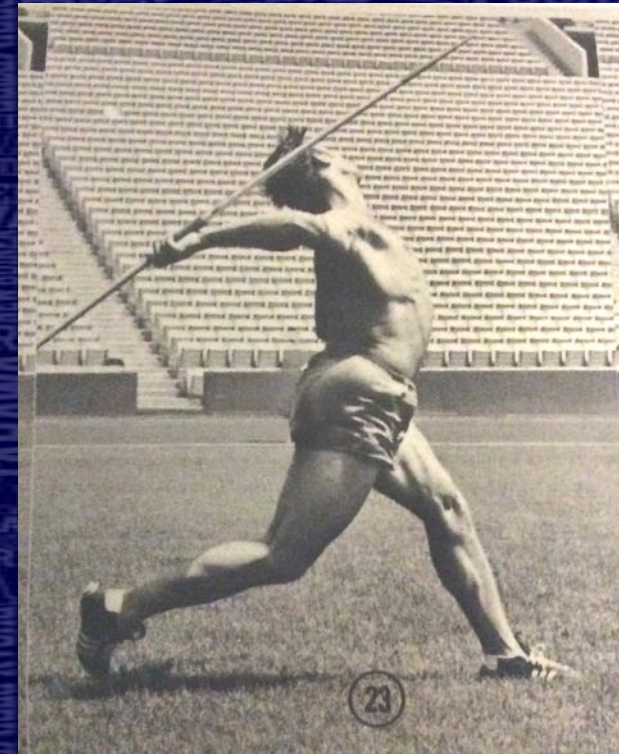
Final Stride (Step 4 → Step 5)

- Soft right foot creates very little resistance
- Body weight moves quickly beyond right foot
- Hips begin counterclockwise rotation
- Right foot starts to roll over
- Left arm about to flexed/forcefully drawn back
- Shoulder plane rotation will follow quickly
- Throwing arm still relaxed



Final Stride (continued)

- Left foot (plant) serves as a brake
- Left (post) leg remains rigid
- Left side remains firm
- Throwing arm/shoulder has been “stretched”
- Arm/shoulder muscles contract
- Arm strikes fast/elbow high/close to mid line



Full Approach (Penultimate/Final)

- Active pull toward the body
- Knee/lower leg thrust forward
- Soft right foot landing on ball
- Hips begin rotation
- Right knee drops
- Weight moves past right foot
- Right foot rolls over
- Left foot is brake
- Left leg remains rigid
- Left side remains firm
- Left arm drawn in
- Arm/shoulder “stretched”
- Arm/shoulder muscles contract
- Arm strikes fast/elbow high/close to mid line



Delivery



- Momentum transferred + rotation completed
- Capitalizing on pre-stretched muscles
- Throwing arm activates only at the very end

Release

- Release angle influenced by the position the thrower develops in the approach ($35^{\circ} \pm 5$)
- Release occurs near the front, as high as possible
- Throwing hand rotates thumb down



Recovery

- Left foot remains grounded
- Right leg brought forward to stop momentum
- Stop and balance before watching



Full Approach

- Carry
- Rhythmic Approach
- Withdrawal
- Cross Step
- Penultimate
- Final
- Delivery
- Release
- Recovery

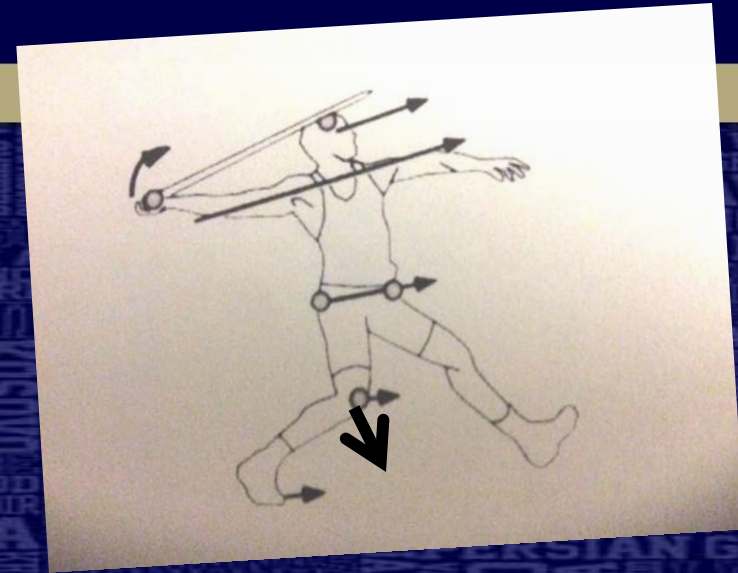


Full Approach

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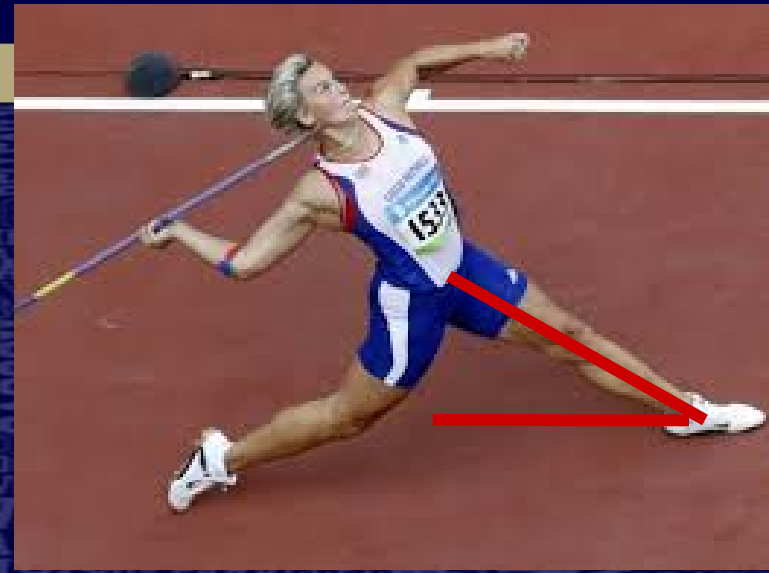


Technical Points



- Upper body erect, slight lean due to rotation
- Legs and hips must initiate delivery
- Right leg lands bent/allow it to collapse forward
- Roll through with right leg/right foot turns over
- Quick transfer from right to left
- As the right hip completes rotation, the upper body will follow

Technical Points



- Left leg planted horizontally, not vertically
- Cannot collapse at the waist/buckle at knee
- Hold the left side firm, drive up over the plant
- Use long, accelerated pathway for arm strike
- Elbow leads/hand overtakes/whipping action
- Pull through the point, tail through the tip

Better Throwers (Valleala)

- Greater approach speed
- Quicker final stride (.16 s)
- Longer pull distance
- Shorter pull time
- Greater flexion in knee joint of right leg during preparatory and delivery phases
- Produce higher ground reaction forces

Training Implication

Each thrower has a unique combination of maximum release velocity and optimum release angle

Combination is dependent on:

- Size
- Strength
- Technique

→ Help them identify unique “optimum” release angle first, then spend time developing their ability to apply maximum release speed

Training Implication

Release speed is the #1 determinant of distance and the result of force applied to javelin

- 20-30% ground reaction forces in the approach
- 70-80% muscular acceleration in the delivery (pulling distance, support leg action, hip/shoulder rotation)

(Valleala)

- ➔ Optimize, don't maximize approach speed
- ➔ Train technique coordination/sequencing, Increase specific strength/improve rate of force production, Improve overall and javelin-specific flexibility

Javelin Finesse (Terauds)

- Having a run of just the **right velocity**.
- Having a well established **rhythm** for the run, transition, and throw.
- **Leading** the throw with the legs, hips, trunk, shoulder, arm, and forearm, in that order.
- **Aligning** the javelin with the direction of the throw.
- Being able to **apply force** directly along the long axis of the javelin.
- Keeping **pull down at release to a minimum**.
- Releasing javelin at "thrower's **optimum angle** of release."
- Keeping **angle of attack** at release to a minimum.

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Happy Holidays!
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