

# THE JAVELIN RUN-UP

**By Hans Torim**

*A detailed description of the author's views on the javelin run-up from the initial stages to the impulse stride and the pre-delivery position. The article is a slightly condensed translation from Javelin Throwing Technique, Learning and Teaching, published by Vilde Pedagogical Institute, Tallinn, Estonian SSR. Re-printed here with permission from Modern Athlete and Coach.*

## THE INITIAL STAGE

At the start of the run-up the javelin is carried above the shoulder with the arm bent in the elbow and the hand holding the javelin about the height of the head. Slight differences in this position depend on the individual preferences for the withdrawal action.

The run-up is started from a check mark with the left foot forward, or a few preliminary walking or slow running strides before the left foot hits the check mark. The run-up begins with a smooth acceleration and aims to reach in 8 to 10 running strides a movement speed that corresponds to the thrower's capacities and technical level. The final speed must allow the thrower to move into an efficient pre-delivery position to be ready for the beginning of the actual delivery.

It is considered that a suitable run-up speed is about  $\frac{2}{3}$  of the maximal sprinting speed. Leading male throwers reach speeds of 7 to 8m/sec., female throwers 6 to 7m/sec. Running is performed on the balls of the feet, avoiding bouncing or stamping on the spot. Shortening or lengthening of the strides in order to reach the final check mark is inefficient because the thrower must be psychologically and physically prepared for an optimal and relaxed withdrawal of the javelin, the impulse stride and the delivery. This is fostered by the performance of the last strides of the initial stage with the help of inertia and without losses in forward speed.

## THE FINAL STAGE

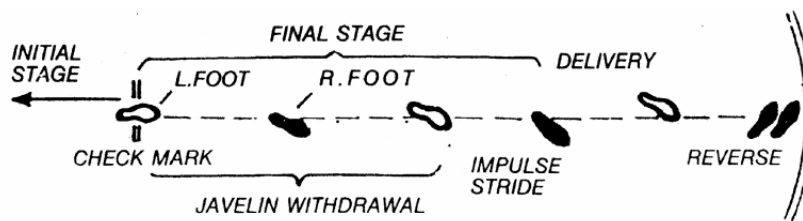
The final stage of the run-up begins when the left foot hits the second check mark. The most common, simple and effective is the three-stride variation - two strides for the withdrawal of the javelin and one impulse stride (fig.3). All these strides are running strides, whereas the fourth stride should be included in the delivery phase. The delivery stride, in contrast to the task of forward movement of the other strides, is involved in breaking the forward movement of the legs and hips. It is also not a running stride because the flight phase is missing.

The departure from the inclusion of the throwing stride to the run-up allows for a better understanding in the analysis of the different movement phases of the javelin throw. Although the final stage of the run-up and the delivery are closely connected, the above described terminology, replacing what is normally referred to as a four-stride run-up, appears to be justified.

### *Withdrawal Strides*

The javelin withdrawal strides begin with the rotation of the shoulder girdle to the right. It occurs smoothly without interrupting the forward travel of the body. While a slightly lifted left shoulder turns towards the run-up direction, an active withdrawal of the throwing arm is still delayed. The athlete looks into the direction of the throw and there is no rotation in the hip girdle. It is kept across the running direction, assisted by the forward drive of the right thigh.

There is a slight trunk rotation and, as the right leg lands after the flight phase, also some hip rotation. The right foot lands on its outside edge but remains pointing towards the running direction. The thrower continues the run with the legs and hips driving vigorously forward.



THE MAIN PHASES OF THE JAVELIN RUN-UP

The withdrawal of the javelin is concluded in the second stride. It occurs smoothly and with a somewhat delayed action. The hand moves directly back to about ear level and the javelin is kept close to the head. In this, relatively ample and ground covering, running stride the active legs and the hip girdle appear to run away from the throwing arm and shoulder, pulling the elbow joint straight.

A noticeable backward lean opposite to the throwing direction is created. From this stage on the thrower appears to drag the javelin with a straight but relaxed arm and throwing shoulder muscles. This “dragging” behind action and an optimal backward lean must continue until the delivery begins. The last will only succeed when the thrower can maintain relatively more active forward movement speed of the legs and hips than that of the arm and the throwing shoulder.

The “dragging” action can be disrupted when the forward movement of the legs and the hip girdle slows down, when the thrower delays the placement of the left leg in the throwing position, or when the arm is prematurely bent in the elbow. In this case the javelin and the arm “catch up” with the thrower, the backward lean is reduced, tension in the arm slackens and the delivery movement is shortened.

A noticeable hip rotation takes place during the second withdrawal stride when the left leg makes an extensive forward movement some throwers even reach here a position where the hip and shoulder axis are virtually parallel. This brings the thrower into a position where the trunk, the throwing arm and the javelin are close to what is required in the following pre-delivery position.

Some throwers do not complete the withdrawal of the javelin at the end of the second stride (evidently for psychological reasons). They are not yet ready for the impulse stride and the following delivery and perform two supplementary strides, continuing to run with the hips and shoulders rotated to the right. In this position it is rather difficult to maintain forward speed and a correct position of the trunk, shoulders and the throwing arm. For this reason a six-stride variation can not be recommended, particularly to beginners.

### *Impulse Stride*

The impulse stride begins with an active placement of the left foot, transferred immediately into a sharp forward drive. The athlete pushes back against the track, moving the hip girdle actively forward. The right leg executes at the same time a fast movement directly forward that assists to shift the thrower's body weight quicker over the take-off leg.

The take-off into the impulse stride therefore takes place through an active gathering of the widely split legs (thighs) in the flight phase of the previous stride, followed immediately by a forward directed drive. The thrower now performs during a low, close to the track, flight phase an opposite direction scissors movement, pushing the right foot actively down to bring at the same time the left leg fast forward. The left leg passes the right already during the flight and is considerably ahead of it at the moment the landing in the impulse stride has taking place.



THE IMPULSE STRIDE

Because the left leg has already passed the right and the last is after the impulse stride placed with an active downward-backward motion on the track, the right leg lands relatively close to the body's centre of gravity. This allows the thrower to reach the delivery phase faster and with less movement speed losses. It is the reason why it is unnecessary to attempt to place the right leg as far as possible ahead of the body during the impulse stride. A long, and therefore high and breaking impulse stride in order to get the legs further ahead of the body is consequently avoided.

The right leg lands straight in the direction of the run-up with an optimal knee bend and pre-tensed muscle. This allows avoiding an over-deep bend in the knee joint when the body weight passes over it. The foot is more or less turned to the right of the throwing direction (45 to 90°), depending on the degree of the hip rotation during the impulse stride.

The thrower strives during the impulse stride to maintain a relaxed position without muscular tension in the throwing arm, trunk and shoulder girdle. The head and the eyes are turned in the direction of the throw. Attention is directed to leg action and concentration to an un-delayed beginning of the delivery phase.

There is an increased backward lean of the body when the right leg lands at the end of the impulse stride, due to the relatively more active forward movement of the legs and hips.

The actual moment of the landing of the right foot at the end of the impulse stride can be regarded as the kinematic dividing line between the run-up and the delivery phases. The position of the thrower at this moment can therefore be regarded as the pre-delivery position.

### *The Pre-delivery Position*

An efficient pre-delivery position following the impulse stride has the following characteristics:

- An optimal backward lean of the body (30 to 35°) with the left shoulder pointing in the throwing direction.
- The eyes looking slightly upward in the throwing direction (30 to 35° upward-forward).
- The throwing arm, shoulder and elbow are extended back, opposite to the throwing direction, with the hand about ear level.
- The left arm, bent in the elbow, is placed about shoulder height.
- The front end of the javelin is held close to the head, approximately level with the eyes.
- The three axis (javelin, shoulder, hip) are virtually parallel to the direction of the throw. (The hip girdle could be turned somewhat less to the right).
- The foot of the right leg, pre-tensed and with an optimal knee bend, is turned 45 to 90° to the right of the throwing direction.
- A virtually straight left leg is already ahead of the right in the direction of the throw.

- There is no tension in the trunk, shoulder and the throwing arm muscles.
- The thrower is maximally prepared for the following delivery.

It should be noted that some variations can occur in the parameters of the pre-delivery position, depending on such specific individual features of a thrower as the run-up speed, physical performance capacities, natural throwing action and the control and understanding of technique. However, these variations should not exceed certain optimal limits, nor be contrary to the biomechanical principles of the technique. As the same applied to the following delivery phase, it is essential that the pre-delivery position is favorable for an effective delivery. The lightning fast delivery does not allow sufficient time for corrections.

The javelin run-up can be summed up as follows:

RUN-UP PHASES	
<b>INITIAL STAGE</b>	<b>FINAL STAGE</b>
About 6 to 12 running strides	Javelin withdrawal Two strides + impulse stride
Begin: Basic position	Begin: First withdrawal stride
End: Start of the withdrawal (Reaching the check mark)	End: Landing of the right foot after the impulse stride (Pre-delivery position)
Main task: Development of maximal speed for the athlete-javelin system. Preparedness for the following actions.	Main task: Maintenance of the speed of the athlete-javelin system. Reaching of an optimal pre-delivery position.