

# TRIPLE JUMP

The triple jump is one of the most demanding events in track and field. Utilizing speed, strength, jumping ability, and technical skill, the athlete performs three smoothly coordinated and balanced jumps while minimizing loss of horizontal velocity.

One important consideration in all activities involving explosive movement is the myotatic or stretch reflex. Placing a quick, intense stretch on a muscle immediately prior to a concentric (positive) contraction will result in a stronger, more explosive contraction of that muscle. In jumping events this is accomplished at takeoff as the load of the body's momentum forcibly lengthens the muscle. Increasing velocity will increase the load placed on the muscle producing a stronger reflex and better results, assuming the athlete has sufficient strength and coordinated skills to handle the load. This factor, as it applies to approach speed, will be examined later.

The six phases to be discussed are: (1) approach (run-up), (2) takeoff, (3) hop, (4) step, (5) jump, and (6) landing. Although each phase will be discussed separately, it is important to understand that all of these phases combine in a smooth continuous sequence. Over-emphasis of one phase is usually detrimental to subsequent phases. Perhaps the biggest deterrent to a successful effort is excessive forward rotation, which decreases the jumper's ability to appropriately apply force and reduces the distance of ensuing phases. This brings us to an interesting concept in triple jumping. Jumpers often attempt to get more out of a particular phase than they put into it. Once the center of gravity's parabolic curve (path followed while airborne) is established on each takeoff, movements to extend the distance of that phase often result in an inefficient takeoff for the next phase. To minimize rotation and loss of horizontal velocity, maintain an upright trunk position and do not overextend the foot and lower leg at touchdown.

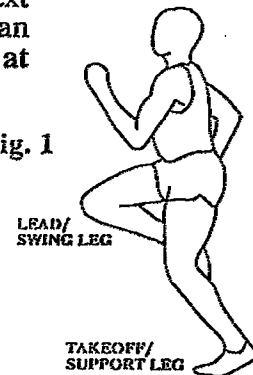
## ACTIVE LANDING

An active landing greatly assists the athlete in reducing loss of horizontal velocity following each touchdown. The following factors, when effectively timed with the landing of the hop and step phases, will reduce trauma to the jumper's body and extend the length of subsequent phases. Remember, each landing is also a takeoff for the next phase.

1. A powerful forward/upward swing of the lead leg (bent at knee) and the arms (extended) initiated **just prior** to touchdown.
2. An active foot placement in which the support leg and foot have a backward angular momentum relative to the body's center of mass. This is sometimes referred to as "pawing." Be careful, the term "pawing" may imply longer ground contact time which often produces undesirable forward rotation.
3. Transference of the momentum of body segments (arms & lead leg) to the entire body by abruptly stopping (blocking) their swinging motion. This absorbs shock at touchdown and helps preserve horizontal velocity.
4. Maintaining an upright trunk position and not grounding the takeoff (support) foot too far in front of the center of mass.
5. A shallow, quick takeoff knee eccentric/concentric contraction timed with the swing of the lead leg and arms. (NOTE: Eccentric is the lengthening or yielding muscular contraction and concentric is the shortening contraction.)

The arm opposing the swing leg has a greater range of motion and generates greater force. Each active landing makes effective use of horizontal velocity to generate the

Fig. 1



## EXAMPLE OF AN 18-STRIDE APPROACH

Fig. 2



needed vertical impulse for the next phase. An explosive extension of the trunk at takeoff helps the athlete maintain an upright position and minimize excessive forward rotation. Anticipation is important in all explosive activities and is instrumental for an active landing. In anticipating each landing/takeoff, the lead (swing) leg and arms move forward prior to touch-down. This, along with an active movement of the takeoff (support) leg, influences the direction of the parabolic curve and increases ground reaction for an explosive jump. Anticipation is important for explosive, well-balanced takeoffs; however, initiating takeoff movements too early will also lead to misdirected force and technical breakdown of the phases which follow. Following each takeoff, the limbs immediately begin to relocate in preparation for the next active landing/takeoff. Do not rush into the next phase, rather, "be patient and wait for the ground to come to you." This will extend the distance of each phase and keep the jumper in better position to maximize horizontal velocity throughout the effort.

### APPROACH

The length of the run-up will vary depending on the jumper's strength and skill, however, it is commonly between fourteen and twenty strides. The objective is to achieve maximum controllable speed with a rhythmic and smoothly accelerated run. Greater horizontal velocity at takeoff will produce a longer jump, assuming the athlete is capable of handling the speed. Since timing, control, and balance become more difficult at higher velocities, beginning jumpers may produce better efforts with a shorter and slightly slower approach. As timing and confidence improve, the length and velocity of the approach may be increased.

A coach's check mark is used to determine any stride or acceleration inconsistencies. A marker is placed adjacent to the runway where the takeoff foot makes contact six strides from the takeoff board. This mark is established in practice when working on the approach and further defined in early competitions. Once confidence in this mark is established, adjustments in the approach are made relative to foot placement at the six-stride mark, not the takeoff board (Fig. 2). Remember, this mark is for the coach and should not concern the jumper during the approach.

Near completion of the run-up, velocity and leg speed are maintained to provide an active well-balanced takeoff. Do NOT provide extra effort in the final strides to increase velocity. The jumper "lets the board come to him/her" while keeping an upright posture and relaxed, efficient running mechanics. This allows continued acceleration without sacrificing takeoff position, balance or timing. On the penultimate (second-to-last) stride, foot contact is flat while the athlete maintains velocity and body position. This placement is different from the long jump in that the jumper does not prepare or "settle" as much because there is less desire for vertical impulse at takeoff. On the final stride of the run-up, the jumper maintains normal, active running mechanics with a complete arm/leg exchange.

### Points of Emphasis

1. Select an approach length which allows smooth acceleration to maximum controllable speed. This will vary among the athletes.
2. A minimum of two check marks is recommended, one at the start and another six strides from the takeoff board (four strides for shorter approaches).

3. Remember, velocity strongly influences performance. Therefore, jumpers must be sprinters on the runway and utilize effective sprint mechanics.
4. For consistency, a standing start is recommended. If a walk or jog into the start mark is used, it must be performed identically each time.

### TAKEOFF

Observing a triple jump competition, one will witness a variety of arm motions prior to and during takeoff. Since takeoff velocity strongly influences jumping distance, deviations from normal sprint mechanics should be minimized in preparation for and during takeoff. Two of the more frequently used and functional methods are explained here.

**Single Arm Takeoff** - The jumper runs off the board with the arms again exchanging to oppose the legs. The arm swinging backward may make a complete exchange (Fig. 3) or stop at the trunk and move away from the body laterally. If a full exchange is made, the arm behind the body may be brought partially forward during the cycling of the hop to oppose recovery of the takeoff leg.

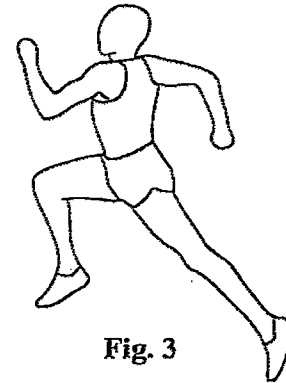


Fig. 3

**Double Arm Takeoff** - Again, the arms exchange on the takeoff stride, however, the arm swinging backward stops at the hip and thrusts forward in conjunction with the arm opposing the swing leg. This action temporarily puts both arms in front of the jumper's body during takeoff (Fig 4).

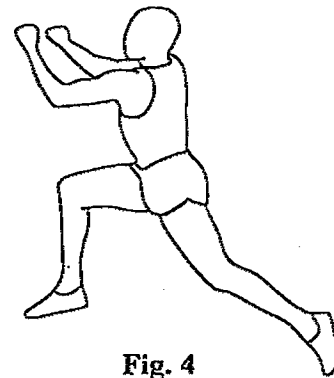


Fig. 4

In both techniques the arms and swing leg are stopped abruptly (blocked) to transfer their momentum to the body. The direction in which these limbs are moving just prior to being stopped influences the direction of the entire body. Emphasis is on the horizontal aspect of the takeoff; the hop is directed outward, not upward, making it easier to maintain velocity and balance.

### Points of Emphasis

1. **Run off the board!** The takeoff and hop phases are horizontal extensions of the approach. Checking or posting the takeoff leg produces excessive height and rotation.
2. Run "through the hips" while keeping the trunk upright (Fig. 4).
3. Keep the head (chin) up and line of sight above the horizon. Do NOT look down at the board.
4. The arms and swing leg are temporarily stopped (blocked) which transfers the momentum of these limbs to the entire body.

### HOP PHASE

The name of the event implies three "jumps", however, the first jump (hop) is more an extension of the run-up. During flight, the jumper flexes the takeoff leg at the knee and hip recovering it to a position in front of the body. At the same time, the lead leg is extended toward the ground and cycled backward in a "hitch-kicking" motion. While the legs are exchanging, the nearly extended arms are dropped, laterally separated, and

relocated behind the body (Fig. 5, 6 & 7). The movement of these limbs, and a long body axis, slows or delays forward body rotation and places the arms and what will be the swing leg in a pre-stretched position for an active thrust into the step phase (Fig. 7). **Just prior** to touchdown the support leg is extended, advancing the foot in front of the knee (Fig. 7). This movement coincides with the completion of arm withdrawal and is immediately followed by the movements described in an active landing. This provides the jumper with a quick and explosive bound into the next phase.

Fig. 7

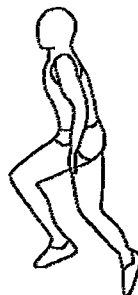
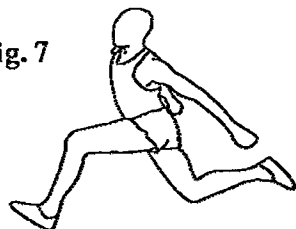


Fig. 6



Fig. 5

### Points of Emphasis

1. Maintain chest elevation, trunk extension and keep the head up to create a long body axis and slow forward rotation.
2. The flexed knee of the takeoff leg must be recovered to an approximately parallel position **before** extending and executing an active landing.
3. Following takeoff leg recovery, a substantial split (separation) between the legs is desirable (Fig. 7).
4. Return the extended arms to well behind the body before executing an active landing.

### STEP PHASE

If the hop phase is executed properly, the jumper should be in a well-balanced position with both arms and swing leg extended behind the body in preparation for takeoff in the step phase (Fig. 7). Immediately prior to touchdown, the extended arms and bent lead leg are thrust forward, again emphasizing the movements of an active landing (Fig. 8). The lead

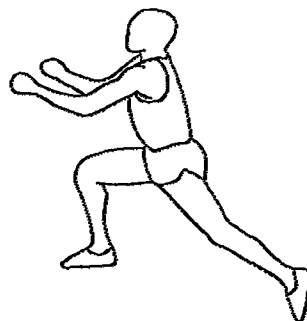


Fig. 9

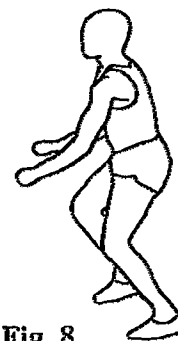


Fig. 8

knee and arms are blocked a little short of parallel to the ground, transferring the momentum of these limbs to the entire body (Fig. 9). The lead knee (bent approximately 90°) is not flexed as much as in the takeoff phase. Trunk extension, chest elevation, and head position are similar to the hop. During flight, the athlete may flex the trailing leg, drawing it up slightly to help maintain balance (Fig. 10). If this technique is used, the leg **must** be extended backward prior to landing for a forceful swing leg in the jump phase.

### Points of Emphasis

1. Be patient. Do not rush the step phase, rather let it carry while preparing for an active landing/takeoff.
2. Lead with the knee at takeoff. Leading with the foot lengthens and slows the swing leg.

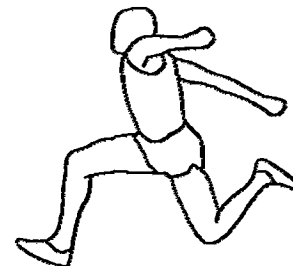


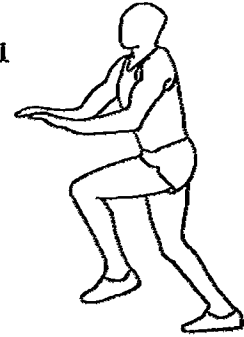
Fig. 10

- Block the swing of the lead knee and arms a little short of parallel to the ground.
- Greedy** - Do not attempt to extend the length of the step phase by reaching with the lead leg and grounding it too far in front of the center of gravity.

### JUMP PHASE

Takeoff movements for the jump are similar to those of the step except the legs assume opposite roles. Again, an active landing is emphasized, but directing the jump more upward. Often, athletes become anxious and rush the jump phase creating little vertical impulse, a flat parabolic curve and undesirable rotation. During flight, the athlete may use the hitch-kick, sail, or hang technique. The hang technique is recommended because it is easier and is usually more productive. As the athlete initiates the final jump, the arms are blocked parallel to the ground (Fig. 11) and then either continued upward above the head or dropped, cycled backward, and windmilled to a position overhead. In either case, the lead leg, which was also blocked at takeoff, may be held in this flexed position or extended downward, creating a longer body axis. Extension of the legs and trunk slow forward rotation and pre-stretch the muscles that flex the thighs.

Fig. 11



### Points of Emphasis

- Keep the chin and eyes up at takeoff. Looking down misdirects force and shortens the distance of the jump.
- Stop the swing leg and arms parallel to the ground (blocking) (Fig. 11.).
- Keeping the head and chest up and extending the legs lengthens the body axis and slows forward rotation.
- Bring the flexed knees toward the chest first, then extend the lower legs.

Fig. 12

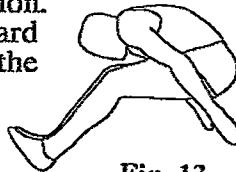
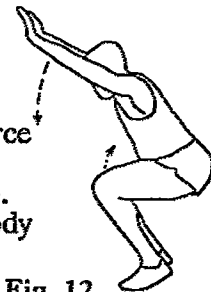


Fig. 13

### THE LANDING

Just prior to landing, drive both arms downward and, at the same time, flex at the hips to bring both knees (flexed) in front of the body (Fig. 12). The correct sequence is to first bring the bent knees to the chest, rather than immediately extending the legs. As the arms pass the knees and continue in a backward motion, the legs are extended while the hips remain flexed (Fig. 13). This sequence allows ground contact further in front of the center of gravity, increasing the distance of the jump phase and total effort. As the feet contact the sand, the knees are flexed and the arms are brought forward to maintain forward body movement. The jumper may elect to provide more pressure with one leg and "slide" to the opposite side, or come directly forward over both legs.

### Points of Emphasis

- Extend ground contact as far in front of the center of gravity as possible.
- Following contact, keep the body moving forward by flexing the knees and bringing the arms forward.

It is important to understand that the success of each phase is dependent upon the proper execution of preceding phases. Quite often we find that errors in the hop, step or jump phases are the result of poor execution during the approach and/or takeoff.