

NSA Photosequence 21 – the Long Jump

Jackie Joyner-Kersey

Sequence by Helmar Hommel
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The sequence shows her fifth and winning jump of 7.40m in the final of the Long Jump at the Games of the XXIVth Olympiad, Seoul, 1988.

Jackie Joyner-Kersey (USA)

Born: 3 March 1962
Height: 1.78m
Weight: 70 kg
Best marks: 200 metres – 22.30 sec. (1985)
100 metres Hurdles – 12.67 sec. (1988)
High Jump – 1.93m (1988)
Long Jump – 7.45m (1987)
Heptathlon – 7291 points (1988 – WR)

World Record holder and Olympic Champion in the Heptathlon; World Champion in the Long Jump.

Commentary by Jim Alford

The first stride shows Joyner-Kersey's normal sprint action, except for the unusual 'pointing downwards' posture of the right foot in photo 6 and the very high landing on the toes of that foot in photo 7. This is undoubtedly due to a shortening of that stride: the report on the Biomechanical Analysis of the Long Jump at Seoul concluded that on an average, in the women's event, the third-last stride was shorter than the fourth-last by about 9 cm. Note that, despite this high landing, by the time she reaches the mid-support position (photo 8) the heel of the support leg is very close to the ground, if not actually touching it, thus imparting some degree of stretch to the extensor muscles in the calf. There is also a fair amount of flexion in the knee of the support leg. So, although a large part of the forward propulsion results from the action of

Jim Alford is an IAAF Senior Consultant.



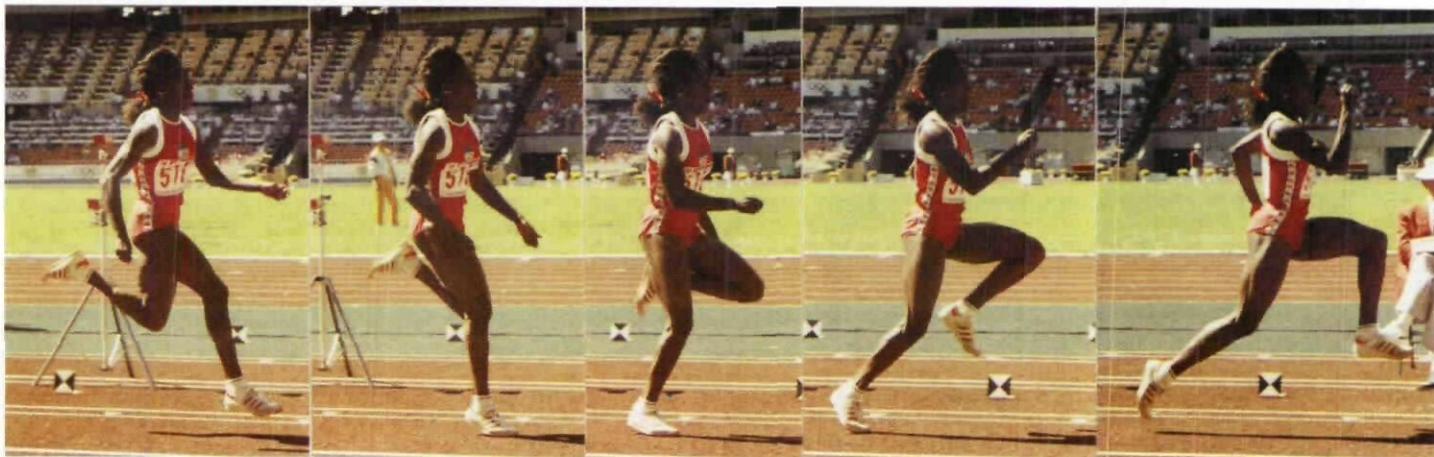
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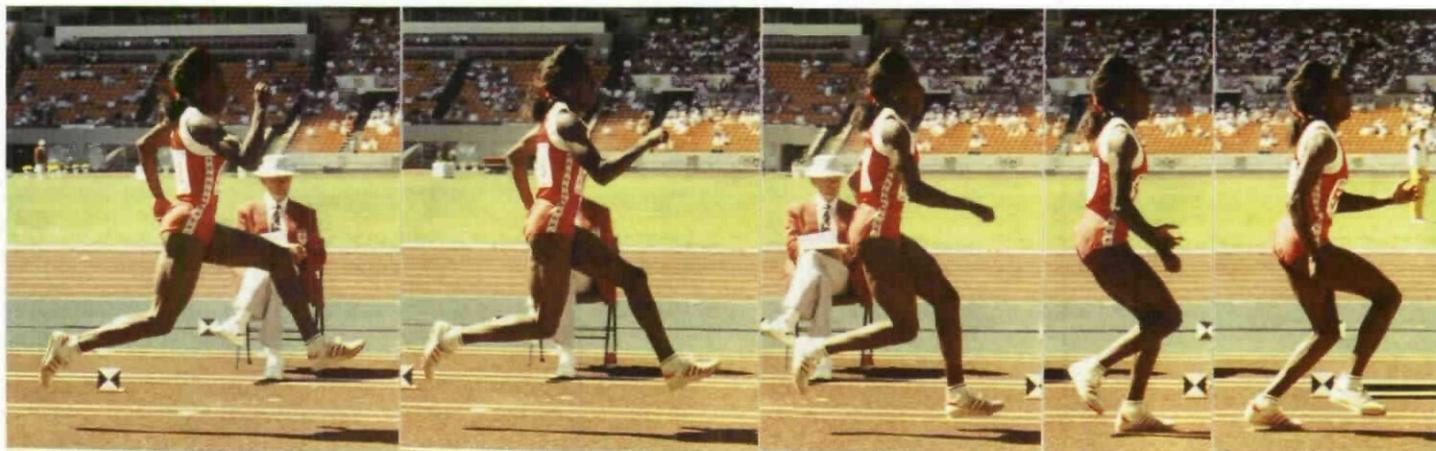
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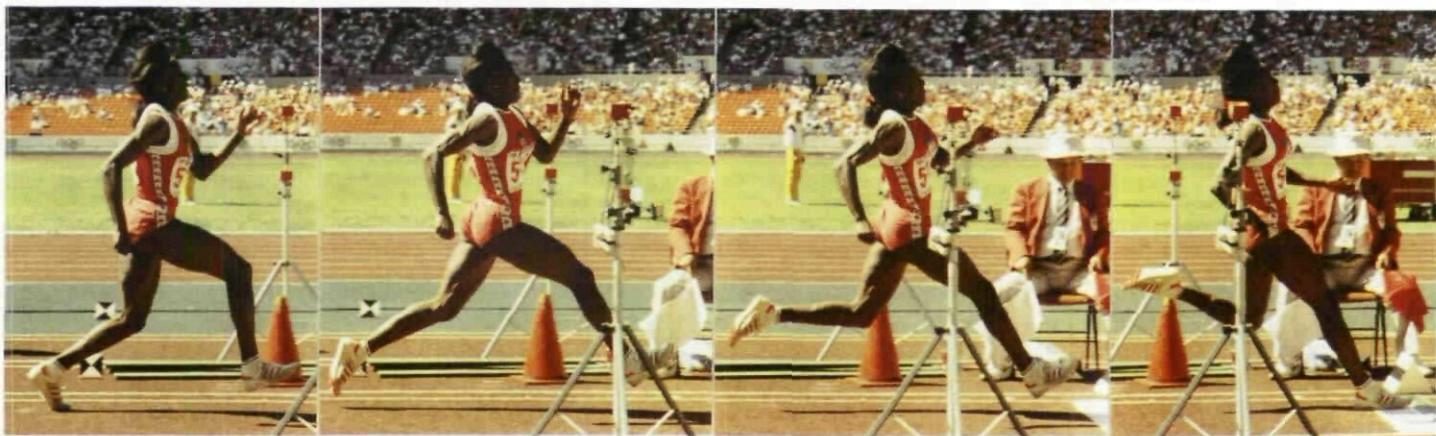
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the hip extensor (gluteals and hamstrings), it would seem that a not inconsiderable contribution is also made by the vigorous extension of the knee and ankle joint.

Note the low carriage of the arms as they reach the mid-point during the backward swing and the flexion at the elbow during the forward swing. This is characteristic of good sprinting, with each arm counter-balancing the action of the opposite leg. Photos 1-7 illustrate admirably this harmony between arms and legs, with the free leg swinging forward as a very relaxed short lever for speed of movement and, as it swings back, lengthening for more forceful action preparatory to becoming the driving leg. During this sequence the trunk shows a slight forward lean, the carriage of head and shoulders is good and the pick-up of the knee of the free leg is excellent.

The series of photos 8-13 (second-to-last stride) is most interesting, since it shows the greatest departure from a normal sprint action and a very definite preparation for lift at take-off by means of a pronounced lowering of the centre of mass. Photos 9-10 show a normal, strong sprint action but then from 11 through 12, 13 and 14 the movements are clearly modified in preparation for the jump. The free (right) leg no longer folds up as in normal sprinting; in fact it comes through very low, with the foot never rising above knee height (compare photo 14 with photo 1). The left leg remains well flexed as it sweeps down to land 'flat-footed' and then flexes even more to lower the body mass.

This modified action in preparation for the jump is continued in photos 14-19 (last stride before take-off). This is a very low stride as is plainly evident in photos 15-17, in which the vertical component of drive is much smaller than in the previous strides, thus generally producing the shortest of the last four strides. Here can be seen all the signs of a 'vertical velocity' long jumper. The head begins to tilt back as the trunk becomes more upright. The foot of the take-off leg lands well ahead of the centre of mass (photos 19 and 20) and the plant is slightly heel first. Note too the position of the head and the amount of flexion in the take-off leg shown in photos 20-21.

Photos 22 and 23 illustrate a very fine take-off technique and an example of tremendous power. The full extension of hip, knee and ankle, the posture of trunk and head, the lift from the arms and free leg are all excellent models for any jumper to emulate.

In flight (photos 22 to 46), Joyner-Kersey performs a very good 1½-stride hitch-kick, with the first stride shown in photos 22-29 and the half-stride in 29-42. Photos 43-46 show the legs held in the 'shoot' position for the landing and the arms playing a fairly static role.

During the take-off (photos 21 and 22), the trunk begins to lean forward slightly, but by the end of the take-off it has again assumed an upright posture. Photo 24 shows the beginning of the hitch-kick action: the front leg begins to straighten and the rear leg to flex.

Photos 24-29 illustrate excellently the counter-action of different moments of inertia between the left leg, as it sweeps back in a forceful, extended position, and the right leg as it is pulled through in a more effortless, well-flexed posture. The reaction from these actions is clearly shown by the backward rotation of the trunk, evident in photos 26-28. From here on, as both legs are pulled through – one after the other and both well flexed – there is an inevitable reaction and the trunk begins to rotate forward.

The arm action illustrated by photos 28-48 differs from that of many other hitch-kick jumpers such as Carl Lewis: they tend to bring the arms through one after the other to achieve a position well ahead of the head. Joyner-Kersey, however, like Mike Powell, brings the arms through together. She holds the left arm back until it is joined by the right arm (photo 30) well behind the head. She keeps both arms extended as she swings them forward and down around the shoulders. This forceful forward rotation of the arms will also help to slow up the forward rotation of the trunk but, once the arms have reached a static position (photo 41), there is nothing to hinder a forward rotation and the legs are forced to drop a little prior to the landing. Nevertheless, there is little to criticize about Joyner-Kersey's landing; the feet are well ahead of

the centre of mass and there is an orthodox movement of the body above and ahead of the mark made by the feet as the knees 'give'.

Some jumpers may 'anticipate' the hitch-kick action and thereby lose power in the take-off, often indicated by a poor pick-up of the knee of the free leg. What may appear to be a good hitch-kick is of negative effect if its premature initiation has decreased take-off power. But, provided that the hitch-kick action is not started until the jumper is well off the board, as is the case in the jump illustrated here, the take-off should not suffer.

A properly executed hitch-kick is slightly more effective than a hang and markedly more so than a 'sail' jump in facilitating a good, balanced landing position. Approach and take-off remain by far the most important components of the jump and merit the most attention, but a possible gain of perhaps 15 cm is still a worthwhile bonus.

It is perhaps unjust to label Joyner-Kersey as a 'vertical velocity' jumper. In fact she combines excellent speed and lift at take-off – a fine balance between horizontal and vertical velocity.



ALLSPORT/Tony Duffy