

SPRINTING SPEED: THE FOUNDATION OF THE LONG JUMP

By Elio Locatelli

Elio Locatelli of Italy stresses the importance of exploiting the run-up speed potential for high level long jump performances and outlines the principles of speed training employed by Italian athletes. The article is a summary of the author's address to the XVII European Athletics Coaches Congress in Berlin, 1993, translated from Die Lehre der Leichtathletik, Germany, Vol. 32, No. 28, 1993. Re-printed with permission from Modern Athlete and Coach.

There is a definite trend in the development of long jumpers to attach particular significance to the speed of the run-up. This approach is corroborated by the fact that better results are above all achieved from an improved run-up velocity. It applies in particular to elite athletes.

Tests have shown that most long jumpers develop in the run-up speeds around 93 to 95% of their maximal potential. However, changes in the run-up speed make it necessary to change the takeoff action. The higher the run-up speed, the shorter is the time available for the takeoff impulse. This creates the need to pay attention to the development of an extremely explosive takeoff at high speeds. It also makes it necessary for the coach to test regularly the capacities of speed and reactive jumping power by using specific test procedures that take into consideration individual characteristics of an athlete.

The levels of speed and reactive jumping capacities are in Italy controlled by using the Bosco tests at the end of each preparation phase. (The Bosco tests are based on pressure platform measurements for a precise strength-speed graph of an athlete - Editor).

Individual differences in the run-up velocity values of several world-class long jumpers, as well as two Italians, are presented in table 1. The table shows the commonly used velocity measurements over the 11m to 6m and 6m to 1m sections of the run-up prior to the takeoff and the average velocities for this 10m section. Attention must be here directed to the excellent exploitation of the speed potential by Evangelisti and Lewis, who utilize 97.5% and 95.3% of their potential.

On the other hand, it is interesting to note the performances of long jumpers who have an inferior run-up speed. They have to make up their lack of speed by trying to exploit a technique that allows to stress the takeoff action (Leonid Voloshin of Russia etc). It is also interesting to recognize the range in the correlation between the run-up velocity and the distance jumped. A good example of this in

table 1 is Fringerio Fausto. Fausto had a velocity of 10.20 m/sec in his 8.13m jump but his 10.53 m/sec. run--up velocity was converted only into 7.93m, showing the importance of the ability to convert high run-up speeds.

ATHLETE	DISTANCE	TIMES (sec)		
		11m - 6m	6m - 1m	AVERAGE
Mike Powell	8.73	0.47	0.46	0.93
	8.85	0.45	0.46	0.91
Larry Myricks	8.33	0.46	0.48	0.94
	8.11	0.47	0.45	0.92
Llewellyn Starks	8.25	0.48	0.49	0.97
Frigerio Fauso	9.13	0.50	0.48	0.98
	7.93	0.49	0.46	0.95
Leonid Voloshin	9.09	0.51	0.48	0.99
	8.04	0.50	0.48	0.98
Milko Campus	8.00	0.48	0.47	0.95
	7.97	0.47	0.47	0.94
Mike Powell (Tokyo 1991)	8.95			0.92=10.869 m/sec.
Carl Lewis (Tokyo 1991)	8.91			0.89=11.235m/sec. = 95.3% max.
Giovanni Evangelisti	8.08			0.93-10.75m/sec. =97.5% max.

TABLE 1: Run-up speeds of some world-class long jumpers.

PRINCIPLES OF SPEED DEVELOPMENT

We prefer a speed development method that consists of the following six sections of training exercises:

1. Exercises to develop aerobic capacities (October-November, 6 weeks):
 - Circuit training: 3 to 4 series of 10 stations with 8 minute recoveries between series.
 - Cross-country runs over 2.5 to 4km with heart rates ranging between 160-180/min.
 - Interval runs made up from:
 - I. 3 to 4 x 1000m in 3:30 min. with 4 min. recoveries
 - II. 2 x 600m + 3 x 500m + 3 x 400m with 5 min. recoveries
 - III. 10 x 300m in about 50 sec. with 3 min. recoveries
2. Exercises to improve the anaerobic alactacid capacities (beginning of November - December 15, 6 weeks):

- In the first two weeks: 4 x 5 x 60m (88%), 1 min. recoveries between repetitions, 4 min. recoveries between series.
 - The following weeks... 3 x 4 x 60m (93%), 2 min. recoveries between repetitions, 4 min. recoveries between series.
 - 2 x 3 x 8Dm (90%), 3 to 4 min. recoveries between repetitions, 4 min. recoveries between series. This training program takes place twice a week.
3. Exercises to improve the anaerobic alactacid capacities (4 weeks).
- Sprint training:
 - I. 3 x 3 x 3Dm (95%), 2 min. recoveries between repetitions, 4 min. recoveries between series.
 - II. 3 x 2 x 40m (95%), 2 to 3 min. recoveries between repetitions, 6 min. recoveries between series.
 - Speed endurance training:
 - I. 3 x 2 x 6Dm (95 to 97%), 4 min. recoveries between repetitions, 6 min. recoveries between series.
 - II. 2 x 80m (95%), 6 min. recovery between repetitions.
4. Exercises to improve the anaerobic alactacid capacities as a base for exercise complex 5 (April to May, 6 weeks)
- Long speed endurance training:
 - I. 100m + 6 min. recovery + 150m + 8 min. recovery + 300m + 12 min. recovery + 150m + 6 min. recovery + 100m (80 to 90%).
 - II. 3 x 150m, 6 min. recoveries between repetitions + 8 min. recovery + 3 x 200m, 10 min. recoveries between repetitions + 10 min. recovery + 3 x 300m, 12 min. recoveries between repetitions (all 80 to 90%).
5. Exercises to improve anaerobic alactacid capacities (May to June, 6 weeks).
- Mixed speed endurance training.
 - I. 2 x 80m, 8 min. recoveries between repetitions + 10 min. recovery + 2 x 100m, 10 min. recovery between repetitions + 10 min. recovery + 1 x 150m + 15 min. recovery + 1 x 300m (all 98% except 95% for the 300m).

6. Exercises to develop maximal speed (July, 4 weeks)

- flying start sprints: 4 to 5 x 20 and 20m
- tempo changing sprints: 2 to 3 x 100m + 10 to 12 min. recovery + 20m fast + 20m slow + 20m fast + 20m slow + 200m fast
- super maximal flying start sprints (only for elite athletes) 4 to 5 x 60m 8 min. recoveries between repetitions. The aim is to run 0.20 sec. faster than the personal best time by using downhill and wind assisted runs.
- Run-ups with a takeoff from a 2 to 4 strides longer than the usual approach run. The run-up velocity is measured over the last two sections (11m - 6m, 6m - 1m). Emphasis is on increasing speed.

The desired adaptation processes to improve the anaerobic alactacid capacity, as explained in training exercises 4 to 5, requires approximately 10 to 12 weeks.

It is my opinion that a large volume of speed endurance training is necessary to prepare the long jumpers for long lasting competitions.

REACTIVE CAPACITIES

Our experiences with Evangelisti and other Italian long jumpers indicates a high correlation between maximal strength training and reactive capacities. It is therefore important to use Bosco test results at the end of a training phase as a guide in the planning of the next phase.

When the Bosco test results indicate a significant drop in the reactive capacities during the competition season it is advisable to eliminate forthcoming minor competitions from the planned calendar. Such test results indicate that it is time to consider regenerative procedures to restore reactive capacities. Also, experience has shown that it is unlikely to hope for satisfactory competition results in this situation.

