HOWTO IMPROVE RUN-UP SPEED AND PRECISION

By Vladimir Popov

The run-up plays an extremely important role in the performance of horizontal jumps. In the following text Russian coach, Vladimir Popov, looks in detail into the length, velocity and precision of the run-ups and makes recommendations for the development of an optimal approach run. The article is a slightly abbreviated translation from Legkaya Atletika, Russia, No. 4, April, 1995. Re-printed with permission from Modern Athlete and Coach.

The run-up is a decisive component in the determinations of the results in horizontal jumping events. It is characterized by the perception of acceleration, an elastic contact with the track, a bold approach to the takeoff.

How should a fast and precise run-up be constructed and developed? The following text attempts to give some advice on how it can be achieved.

LENGTH OF THE RUN-UP

Athletes often employ unjustifiably long or short run-ups. In the first case, the maximal speed is reached well before the takeoff with velocity losses in the last strides. In the second case, athletes simply fail to reach their potential speed prior to the takeoff. It should be kept in mind here that a run-up velocity improvement by 0.1 m/sec. prior to the take-off adds up to 2% to the distance.

The length of the run-up depends on an athlete's physique, level of preparation and, above all, on his/her acceleration capacity. This capacity can be evaluated with reasonable objectivity in the comparison of individual 40m and 100m performances. The following can be used as a rough guide:

Times of 5.7 and 13.0 sec. correspond to a run-up length of 12 strides, 5.4 and 12.5 sec. to 14 strides, 5.2 and 12.0 sec. to 16 strides, 5.0 and 11 .3 sec. to 1 8 strides, 4.8 and 10.9 sec. to 20 strides and 4.6 and 10.4 sec. to 22 strides. Female jumpers should on an average add two strides to the corresponding times.

From this follows that athletes who clock 5.2 to 5.1 sec. in the 40m sprint and 11.6 to 11.3 in the 100m (women 5.4 to 5.3 sec. and 12.4 to 12.0 sec) are advised to employ run-ups of 17 to 18 strides, about 32 to 36m in length. Shorter and fast striding athletes will have slightly shorter approach runs. The run-up can be increased by a stride or two as the performance level of an athlete improves

and reaches 22 to 24 strides among elite jumpers, corresponding to a distance of 43 to 46m.

The length of the run-up changes during a season according to the athlete's form, track conditions and wind direction. Generally a head wind requires to shorten the run-ups by 30 to 50cm, while a tail wind adds 20 to 40cm to its length. It is important that the run-up in competitions and in training jumps from a full run-up is always exactly measured with a tape.

A typical example of how the run-up changes during a long jumper's career is outlined in table 1.

	RESULTS			RUN-UP	
PHASE	30m (sec)	100m (sec)	LONG JUMP (m)	STRIDES (No)	LENGTH (m)
1. 1947-1948	4.8-4.4	14.0-12.3	4.50-5.55	12-14	18-23
2. 1950-1951	4.3-4.2	12.0-11.7	5.62-6.46	16	25-27
3. 1951-1954	4.2-4.1	11.5-11.1	6.94-7.16	18	32-34
4. 1954-1959	4.0-3.8	11.0-10.8	7.29-7.69	20	37-41

TABLE 1: An actual example of the development of a long jump run-up. Phase 1 = 15 to 17 yrs. (youth competition); phase 2 = 18 to 19 yrs. (junior competition); phase 3 = 20-22 yrs. (senior competition); phase 4 = elite senior competition.

SPEED OF THE RUN-UP

Although the run-up plays a leading role in the performance of horizontal jumps, many shortcomings in this phase can be observed even in important competitions. Obviously athletes and coaches should pay more attention to the development of run-up speed, rhythm and precision in training.

The development of the run-up rhythm usually takes place in repetition runs with a gradually increased tempo and stride length. It is important to perform these runs with a correctly distributed effort and active last strides that resemble the actual preparation for the takeoff. Other common drills to develop an optimal run-up include the following:

- Repetition run-ups in the correct rhythm with 2 to 4 strides added to the normal run-up.
- Wind assisted run-ups in the correct rhythm.
- Run-ups on a declined track (1° to 2°) with the last 4 to 6 strides executed on a flat surface.
- Sprints from a crouch start using 18 to 24 strides.

- Runs over low hurdles in a 3- or 5-stride rhythm.

The most effective speed strength exercises in the development of run-up speed include the following examples:

- Standing imitation arm action with a gradually increased tempo up to the maximal.
- Standing, wall supported, imitation sprint leg action with a gradually increased tempo up to the maximal.
- A variety of jumping exercises, including bounding with emphasis on ankle extension, fast jumps on one leg, fast repetition jumps into a wide split position, etc.
- Walking and running with a load on the shoulders, followed by a swift unloaded action to exploit the sudden relief.

Important in the performance of full length run-ups is a constant evaluation and intelligent correction of any deviations from the desired optimal execution. This can be assisted by placing check marks for the sixth stride from the start of the run-up and six strides before the takeoff. As a fast run-up is decisive in reaching optimal distances, it is particularly important to observe an active approach to the board, indicating that the athlete aims to reach maximal velocity at the takeoff.

PRECISION ON THE RUN-UP

The development of a precise, stable and reliable run-up can be assisted by:

- Using a simple, unchanged position for the start of the run-up.
- Using a check mark and controlling regularly the length of the last 6 strides.
- Paying attention to external factors to make the necessary changes according to the direction and strength of the wind and the condition of the track surface.
- Attempting to concentrate thoroughly not only in competitions but also in full length run-ups in training.
- Using mental imagery to rehearse the distribution of effort and the rhythm of the run-up before the start of a competition and before each jump.

Experience, movement memory, self-confidence and attention to external conditions help to adjust the length of the run-up during the pre-competition trials. Nevertheless, it is essential to check the exact takeoff point and hitting the

check mark after each jump to make the necessary adjustments. It is also advisable to improve confidence by shortening the run-up about 10 to 15cm for the first competition attempt.

The same applies to the appearance of first signs of fatigue in prolonged competitions. All these adjustments are naturally individual and depend on an athlete's experiences, which can be assisted by keeping a diary of competition and training jumps as shown in table 2.

	START OF THE RUN-UP (M)	DEVIATION (CM)	ACTUAL LENGTH (M)	DISTANCE (M)	LENGTH OF LAST 6 STRIDES (M)
Trial run-ups					
First	39.80	+5	39.85	–	13.75
Second	39.90	–	39.90	–	13.80
Competition Jumps					
First	40.00	-5	39.95	7.34	13.80
Second	40.00	+5	40.05	7.60	13.90
Third	40.10	-10	40.00	7.26	13.85
Final Jumps					
First	40.00	+2	40.02	7.65	14.00
Second	40.10	-5	40.05	7.50	13.85
Third	40.10	-12	39.98	7.69	13.95

TABLE 2: Sample diary recordings of the changes in the run-up during a competition.

An analysis of the diary recordings, as shown in table 2, is helpful in the establishment of a fast, stable and reliable run-up. Further improvement is possible by finding an individual optimal relationship between the length and frequency of the last six run-up strides. As can be seen in table 3, it is possible to reach a run-up velocity of 10m/sec. with a stride length of 2.00 or 2.50m. However, this requires in the first case a stride frequency of 5 stride/sec., in the second case only 4 stride/sec.

We have in table 3 included unrealistic border values and believe that a possible optimal relationship is in a 2.30 to 2.35m stride length and 4.4 to 4.3 stride/sec. stride frequency range. In this case the time for the last six strides would be between 1.36 to 1 .40 sec. Obviously, any deviations from the individual optimal leads to velocity losses in the last six or even the last two strides.

TIME OF LAST SIX STRIDES (SEC)		1.50	1.40	1.36	1.33	1.30	1.20
STRIDE FREQUENCY (ST/SEC)		4.0	4.3	4.4	4.5	4.6	5.0
AVERAGE STRIDE LENGTH (M)	LAST SIX STRIDES (M)	AVERAGE RUN-UP VELOCITY (M/SEC)					
1.85	11.10	7.4	7.95	8.14	8.32	8.51	9.25
1.90	11.40	7.6	8.17	8.36	8.55	8.74	9.50
1.95	11.70	7.8	8.38	8.58	8.77	8.97	9.75
2.00	12.00	8.0	8.60	8.80	9.00	9.20	10.00
2.10	12.60	8.4	9.03	9.24	9.45	9.66	10.50
2.20	13.20	8.8	9.46	9.68	9.90	10.12	11.00
2.30	13.80	9.2	9.89	10.12	10.35	10.58	11.50
2.40	14.40	9.7	10.32	10.56	10.80	11.04	12.00
2.50	15.00	10.00	10.75	11.00	11.25	11.50	12.50

TABLE 3: The relationship between run-up velocity and the stride length and stride frequency over the last six strides.