ATHLETICS OMNIBUS - LONG JUMP

From the Athletics Omnibus of Richard Stander, South Africa

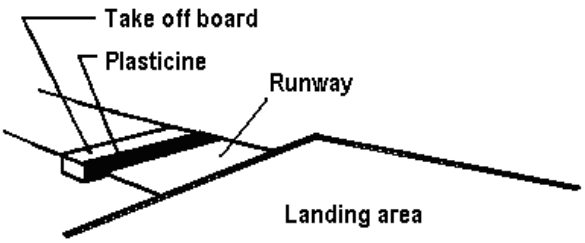
LONG JUMP

The objective of long jumping is to try and jump as far as possible by stepping on a take off board and landing in a sand put. To avoid injury, the landing area is filled silicone sand that remain lose and give way easily during landing. The athlete is allowed a limited run-up before the jump.

1. THE COMPETITION AREA

THE RUNWAY: This should be at least 1.22m wide and 40m long.

THE TAKE-OFF BOARD: 1.22m in length, 20cms in width and 10cm in depth. On the side nearer the landing area there should be placed a board of plasticine for recording the athlete's foot print when he has foot-faulted. The board should be painted white and be at the same level as the ground and should be positioned at least one metre in from the edge of the landing area.



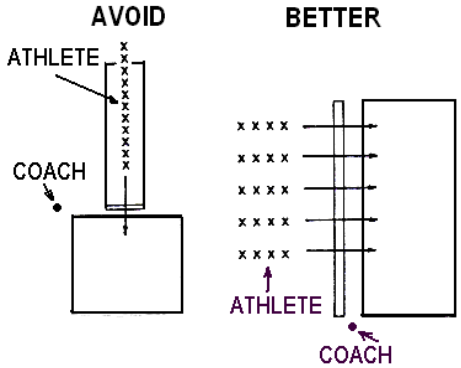
THE LANDING AREA: This should be at least 2.75m wide and the distance from the take-off line to the end of the landing area should be at least 10m. The surface of the sand in the landing area should be level with the top of the take-off board.

2. TEACHING THE LONG JUMP TECHNIQUE

The teaching of the long jump technique must be kept simple. To begin with, athletes should be taught to think of speed and lift at take-off, from the beginning.

Although flight technique and landing is important, distance is primarily a product of speed into the board and a good take-off from it.

The novice athlete should not be introduced to the take-off board until the later stages of teaching.
In modern long jumping the position of the head is crucial. It must remain upright during all stages of the jump.
Choose a suitable jumping area. A long jump pit itself, which should be jumped into sideways.
Mark out a short approach run and place a marker where the run starts.
Athletes should not go further than this mark.
At this stage, if athletes do a lot of jumps from a long run, fatigue will set in quickly. This will lead to the development of bad technique and injuries.

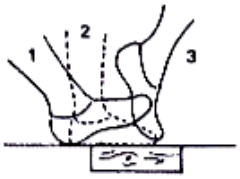


From this short approach (7 strides is sufficient), run, take off, and then land in whatever style comes naturally. As athletes jump, the following fundamental points should be introduced:

1. Run fast
2. A natural head position
3. Look ahead at all times
4. A flat back
5. A good extension of the take-off leg
6. A good position of the 'free' thigh
7. Vigorous use of the arms.
8. A good extended position of the take-off foot

The athlete will feel that the take-off is a flat-footed one.

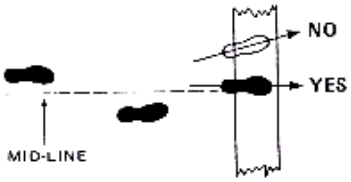
1. The heel will land slightly first.
2. There is then a rolling action onto the ball of the foot as the take-off proceeds.
3. Then the take-off foot pushes off strongly upwards, using the toes.



Once these postural positions are achieved, look at the action of the take-off leg.

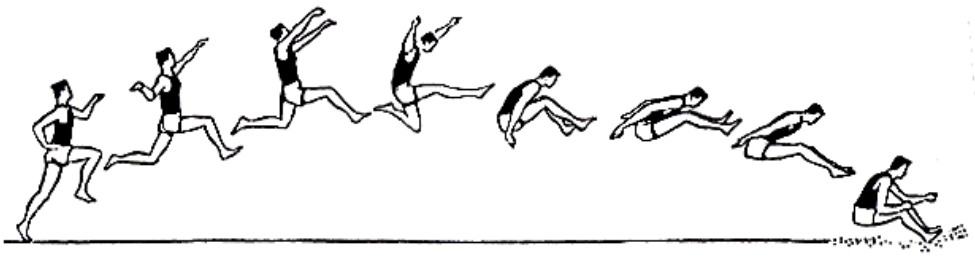
This should be a “fast foot” action, which is first pawing and then driving as the athlete extends the take-off leg. Do not allow the athlete to “stab” the ground with the take-off leg.

Care should be taken in the way in which the foot is placed on the board.



1. The foot should be placed on the mid line of the body at the take-off.
2. The foot must point forward in the direction of the jump.
3. Once the take-off has taken place the action in the air should be natural and most athletes will do the “sail” style.

On landing, the aim is to reach out with the heels as far as possible to produce a good “leg shoot”.



2.1. **THE LONG JUMPER SHOULD AVOID**

- Shortening or lengthening the last stride before take-off.
- Taking off from the heel and with insufficient speed.
- Inclining the trunk too far forward or back.
- Imbalance in the flight phase.
- A premature leg shoot.
- Insufficient lift of the legs in the landing.
- One foot dropping below the other on landing.

2.2. **THE LONG JUMPER SHOULD AIM TO**

- Maintain speed right up to the take-off.
- Achieve a rapid and a dynamic drive up from the board.
- Modify the running position slightly, aiming at a more upright position.
- Use a good compensatory action of the arms.
- Achieve a good range of movement.
- Become stronger and so apply more force in the final action.
- Practise landing drills.
- Master the correct action of the arms and extension and flexion of the legs.

3. IMPROVING THE LONG JUMP TECHNIQUE.

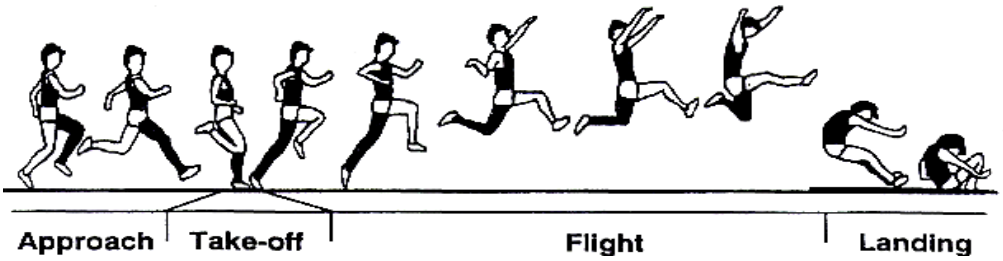
3.1. THE SAIL TECHNIQUE (Also called the stride or bundle technique).

The sail technique should be encouraged among younger athletes because it:

- encourages a good take-off
- encourages an upright trunk
- encourages the striding position of free leg
- encourages the bent pull through of take-off leg
- encourages both legs to be held up together for a good landing position
- it is a good basic technical precursor to the hang or the hitch kick technique.

The long jump technique is divided up into 4 phases:

1. approach,
2. take-off,
3. flight and
4. landing.



The most critical phases are on the ground; the approach, which contains acceleration to an optimum controllable speed, and the take-off, which consists of the final stride to leaving the ground. These two phases largely determine the performance of the last two phases; what happens in the air, flight, and the landing.

2.1. THE APPROACH

Depending on the level of performance, approach varies between:

1. primary school jumpers: 11-15 strides
2. high school jumpers: 15-19 strides
3. senior athletes: 19-23 strides (35-45 m)

- The approach run for woman is generally 3-4 m shorter than the men's due to a lack of muscular strength are.

In order to attain maximum horizontal velocity, it is wise to develop a rhythm on the approach run which contains a speed pattern designed to achieve maximum horizontal velocity at the right time and place in the approach run, as shown below.

The run-up is smoothly and progressively accelerated and, during the last few strides, there is a slight lowering of the hips in preparation for the take-off as seen below. The long jumper prepares for take-off by sinking the hips and then raising the hips into the take-off phase.

The hips should not sink artificially. In fact, the athlete should concentrate on high hips through this phase.

The sinking usually results in the next to last stride being longer than normal and the final stride being up to 25 cm shorter than a normal running stride.

The hips sink and stride adjustment all happens in response to the athlete's postural adjustments in preparation for the take-off.

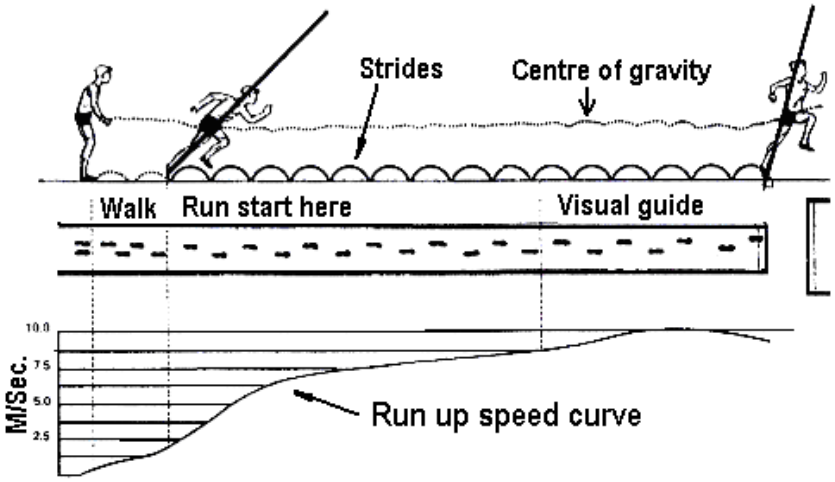
Accurate measurement of the approach and good judgement during the last few strides is essential

2.2. HOW TO MEASURE THE APPROACH

If an athlete uses 19 strides in the approach run, the take-off foot strikes the ground 10 times before take-off.

The athlete stands on the take-off board and start running away from the landing area while counting the steps each time the take-off foot touches the ground.

On the count of 10, for a 19-stride approach, he will take off.



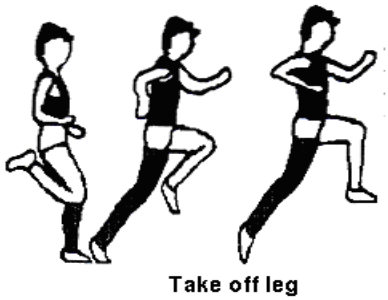
The coach will pinpoint the tenth touchdown and measure the distance from the take-off board.

This is done 6 times and the farthest marker is used to measure the distance to the take-off board during competition. This distance will be used as the initial run-up distance.

- The run-up distance will lengthen if the wind is blowing from behind, and shortened when blowing from the front. The various track surfaces will also cause the run-up to vary.

2.3. THE TAKE-OFF

When the take-off foot is placed on the board, it is well ahead of the centre of gravity, which allows time for maximum vertical velocity to be imparted to the centre of gravity. This vertical impulse is further assisted by the quick upward acceleration of the "free" limbs, the arms and the non take-off leg, against the braced take-off leg. The final impulse is imparted by the vigorous straightening of the take-off leg itself.



NOTE:

1. Maximum extension through hip, knee, ankle, and toe.
2. Free thigh at least parallel to the ground.
3. Co-ordinate with the opposite arm.
4. Chest and back straight, eyes looking ahead.
5. Head not thrown back.
6. Maintain speed throughout take-off.
7. Foot must point forward on touchdown.
8. Once these postural positions are achieved, look at the action of the take-off leg. This should be a "fast foot" action, which is first pawing and then driving as the athlete extends the take-off leg. Do not allow the athlete to "stab" the ground with the take-off leg.

2.4. HOW TO DETERMINE THE STRONGEST TAKE-OFF LEG.

Ask the athlete to kick a ball. If he kicks the ball with the left foot, while the right foot supports the body on the ground, the right foot usually will be the take-off leg.

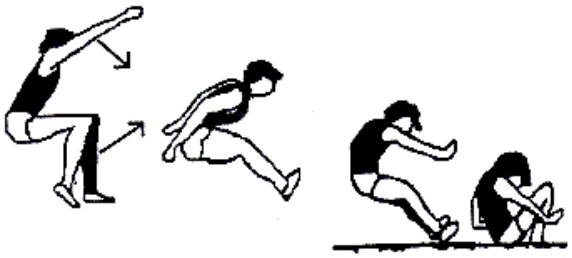
2.5. THE FLIGHT

- On take-off, raise the free leg to a horizontal position.
- After take-off, the free leg must trail behind for most of the flight.
- After take-off both arms must be brought above shoulder height.

- Keep the trunk in an upright position during flight. This will allow more space for the legs to be lifted during the landing phase.
- Maintain hips/back/head alignment.
- The take-off leg must be bending when brought forward in the latter part of the flight, in preparation for the landing. The bend leg will reduce forward trunk rotation.
- Keep the thigh of the free leg in a horizontal position. Extend the swinging leg forward and upwards to land. This will reduce backward rotation when the trailing leg is brought forward.

2.6. THE LANDING

- During preparation for the landing, the jumper is trying to get the heels as far away from the scratch line as possible.
- This technique demands that the athlete reach a position where he would normally fall back into the sand in a normal landing.
- The body remains upright, with the head looking forward.
- The arms are forced down and backward to assist the legs in the upward motion.
- With weaker athletes and female athletes the upper body will tend to lean forward during this phase.
- They should bring the upper body upright again before landing by pushing the arms horizontally forward, not upwards, to avoid the legs from dropping again, and to reduce forward rotation.



- The arms must remain in this forward position until the landing is completed to avoid backward rotation.

2.7. OTHER TECHNIQUES

Up to now, the sail technique was discussed. It is the simplest form of jump and commonly used, untaught by beginners. The stride technique is only a modified type of sail jump used by the East Europeans. In this style, the take-off position is maintained longer than in the sail technique.

Because of the similarity, both styles are called the sail jump. More sophisticated long jump techniques are been used by some athletes to try and counteract the forward and backward rotation, but the success of these techniques is questionable.

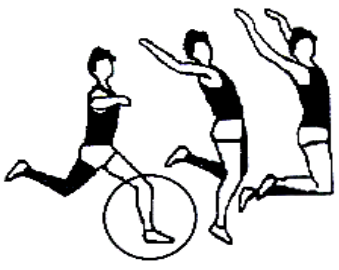
The most recent batch of record holders and winners in important championships have used very simple styles of long jumping and have been very agile in the landing phases of the long jump.

The most commonly used long jump variations are:

2.7.1. THE HANG

The main differences are:

1. No separate leg action.
2. The thigh of the free leg is quickly raised to the horizontal position and then lowered during flight.
3. The take-off leg trail behind during most of the flight.
4. The arms are lifted at the same time upwards.
5. The whole body is extended and slightly arched.



2.7.2. THE HITCH-KICK

The main differences are:

1. Separate leg action.
2. The free leg is straightened and drawn down and to the rear after take-off.
3. At the same time, the take-off leg is drawn forward and upwards.
4. The athlete appears to be running in mid air.

2.8. LONG JUMP EXERCISES FOR THE SAIL TECHNIQUE

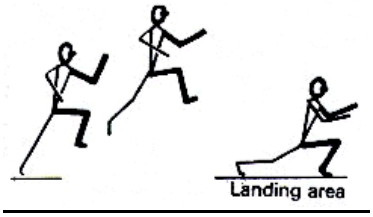
The technique exercises for the sail jump is easy to learn for the young athlete. The following drills can be done to develop long jump skills:

BOUNDING/TAKE-OFF

To reinforce the complete take-off movement jump 3 times on the take-off leg, land on the opposite leg, take one step and take off.

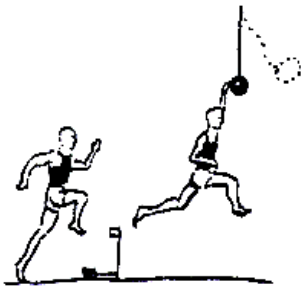
SAIL

To acquire a good range of movement at take-off and maximum extension of the jumping leg, take a 5-9 strides approach take-off with a good combined leg action and hold the position to the landing.



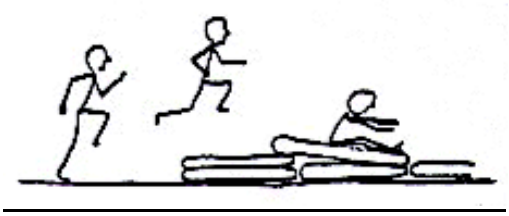
HURDLE/BALL

To maintain the head/trunk/hip alignment during flight and to punch the arm on the take-off side upwards, take a 5-9 strides approach take-off over a low hurdle while hitting the ball above.



FLOATING

To maintain balance in flight and to acquire a good leg shoot prior to landing take a 5-9 strides approach take-off, holds the free leg in its take-off position - then draws up the take-off leg, extending both legs forward prior to landing on a mattress.



EXTEND

To acquire a good leg shoot prior to landing take a 5-9 strides approach take-off, hit a ball in flight and extend both legs to clear a sand 'wall' in the sand pit.

4. TRAINING

During the period of training, the conditioning philosophy will be as follows:

- Use an over distance approach.
- First quantity, then quality.
- Build a foundation of endurance and then develop speed gradually. This will prevent injury.
- For the first month of training you will do no speed work and you will not time anything.
- You will develop speed by doing a great deal of short, fast work and by improving your sprinting form.
- The test distance for endurance will be 300m, and test distance for speed will be 30-50 m. A jumper will only be successful when both tests are done well.
- As the season progresses, you will do less work but faster work.
- Workouts will generally be a hard day followed by an easy day, with a lightening up of work two days before competition or time trail.
- Your schedule is flexible. You may change the daily routine because of weather, body condition, or emotional outlook.
- You should completely recover from one workout to the next. If you are not completely recovered, do less work, or rest.
- You should never train when you are ill nor have an injury.
- If your training schedule is limited, you may telescope this schedule into two-week periods instead of month periods.
- Your workouts must be fun or rewarding, preferably both.

5. TRAINING SESSIONS

5.1. All training sessions should always start of with warm-up session and stretching exercises.
5.2. After all training sessions a cool down and stretching session should follow.
5.3. Refer to the chapter on mobility for event specific warm –up and stretching exercises.

6. TYPES OF TRAINING

6.1. MUSCLE ENDURANCE TRAINING

INTERVAL RUNS E.G.:
- 12 x 150 m @ 75% - rest 1 minute between reps.
- 8 x 200 m @ 75% - rest 1 minute between reps.
- 6 x 300 m @ 75 % - rest 2 minutes between reps.

BREAK DOWN INTERVAL RUNS E.G.:
- (400 m, 300 m, 200 m, 150 m, 100 m) @ 75% - jog back

BUILD UP INTERVAL RUNS E.G.:
- (150 m, 200 m, 300 m, 400 m) @ 75% - jog back.

PYRAMID INTERVAL RUNS E.G.:
- (150 m, 200 m, 300 m, 200 m, 150 m) @ 75% - jog back

6.2. SPEED ENDURANCE TRAINING

NORMAL TEMPO RUNS E.G.:
- 6 x 110 m @ 90% - rest 1 minute between reps.
- 4 x 150 m @ 90% - rest 2 minutes between reps.
- 3 x 300 m @ 90% - rest 3 minutes between reps.

BREAK DOWN TEMPO RUNS E.G.:
- (300 m, 200 m, 150 m, 100 m, 50 m) @ 90% - walk back.

BUILD UP TEMPO RUNS E.G.:
- (50 m, 100 m, 200 m, 300 m) @ 90% - walk back.

PYRAMID TEMPO RUNS E.G.:
- (50 m, 100 m, 150 m, 100 m, 50 m) @ 90% - walk back

COMBINATION TEMPO RUNS e.g. for a 60 sec. 400 m sprinter:
- 300 m in 45 sec., rest 30 sec. and sprint 100 m.

HOLLOW SPRINTS E.G.:

- 40 m sprint, 30 m cruise, 30 m sprint, and walk back.

STEP DOWN 200'S
- Each successive 200 m is one second faster. Walk or jog between. When you can do 25-24-23, you can run a 47 sec. 400 m.

10 X 110M SPRINT @ 90% EFFORT.
- Concentrate on correct form the last 30 m.

SPEED ENDURANCE TIME TRAILS
- 300 m sprint - take time
- 100 m sprint - take only time of last 30m

6.3. **SPEED TRAINING**

50 M DOWN HILL SPRINTING X 5
- The slope must not be more than 6º.

FLYING 30'S
- The athlete takes a flying start, and the time is taken between two beacons when the athlete is full speed.
- 30 m acceleration - 30 m sprint x 5

SPEED TIME TRAILS
- 50 m sprint - take time
- bend sprint over 70 m - take time
- 30 m sprint from start.

RUNNING DOWN HILL - slope 6º - 5 x 50 m

ELASTIC BAND - exercise 5 x 10 m

MOTOR CYCLE PULL - 5 x 30 m with 30 m acceleration

TECHNIQUE DRILLS AT CONTROLLABLE SPEED

- 5x 50 m high knee action - walk back
- 5x 50 m reach exercise - walk back
- 5x 50 m run high on toes - walk back
- 5x 50 m arm reach exercise - walk back
- 5x 50 m bounding - walk back
- 5x 50 m bounce - walk back
- 5x 50 m forward lean exercise - walk back
- 5x 30 sec. run tall exercise - rest 30 sec. - walk back
- 5x 50 m relaxation exercise - walk back
- 5x 50 m flick up heels exercise - walk back

6.4. **CO-ORDINATION DRILLS**

PIPE DRILLS
- Place 20 pieces of hose pipe 500 mm apart and run over the pipes as fast as you can, without toughing.

5X 50 M HEIDI HOPS
- Run with a double step in each stride.

5X 50 M STRAIGHT LEG DRILLS
- Lift straight leg hip high, and down, followed by the other leg. Keep upper body upright.

5X 50 M LONG/SHORT LEG DRILLS
- Lift bend leg hip high, and down. Tough the ground. Then lift the same leg up straight, hip high. Repeat with the other leg. Keep upper body upright.

5X 50 M FRONT/SIDE DRILLS

- Lift straight leg hip high, and down toughing the ground and immediately kick sideways. Repeat with the other leg. Keep upper body upright.

7. TRAINING PROGRAMMES

Muscle endurance, speed endurance, rhythm drills and pure speed training forms a vital part of the jumper's training program and is covered in detail in the manual for sprinting.

The exercises above, together with the jump technique exercises and strength training are combined in a long term training program that would look more or less as follows:

LONG JUMP LONG TERM PLAN SEPTEMBER TO APRIL	**PHASE**					
	CONDITIONING		PREPARATION		COMPETITION	
TRAINING METHODS	1	2	1	2	1	2
MUSCLE ENDURANCE (STAMINA)	30%	25%	20%	15%	10%	5%
SPEED ENDURANCE	5%	10%	15%	20%	15%	15%
STRENGTH	5%	10%	15%	20%	20%	20%
SPEED	5%	10%	15%	20%	20%	25%
TECHNIQUE + RHYTHM	50%	40%	30%	20%	20%	15%
ACTIVE REST	5%	5%	5%	5%	15%	20%

8. A TRAINING PROGRAMME FOR THE JUMPER

- If your training schedule is limited, you may telescope this one month cycles into two week cycles.
- Phase 1 of each sub-section of the program is used as a conditioning period for the new exercises.
- During phase 2 the intensity of the training is gradually increased.
- Two examples of a 14-day training program in all the jump disciplines are given. One in the pre-season and one in the peak season.

CONDITIONING PHASE		**MONTH: SEPTEMBER**													
CONDITIONING	**EXERCISE**	M	T	W	T	F	S	S	M	T	W	T	F	S	S
M. ENDURANCE	5x 100 m / 75%/ rest 1 min	#		#					#		#				
	4x 150 m / 75%/ rest 1½ min		#		#					#		#			
	3x 200 m / 75%/ rest 3 min														
S. ENDURANCE	3x 100m step-down / 1 min. rest														
	100m/150m/200m/90% / rest 1 min.														
	5x 100m hollow sprints / 1 min. rest														
SPEED 100%	5x 50m / recover														
	5x flying 30's / recover														
	5x 30m sprint from start / recover														
STRENGTH	5x Hurdle bounding	#		#					#		#				
	5x box take-off	#		#					#		#				
	20x ankle reinforcing		#		#					#		#			
	20x wall bar		#		#					#		#			
TECHNIQUE	5x bounding / take-off		#		#					#		#			
	5x sail		#		#					#		#			
	5x hurdle/ball		#		#					#		#			
RHYTHM	5x 50m straight leg drills	#		#					#		#				
	5x 50m long / short leg drills	#		#					#		#				
	5x 50m front / side drills	#		#					#		#				
REST						#	#	#					#	#	#

COMPETITION PHASE		**MONTH: FEBRUARY**													
CONDITIONING	**EXERCISE**	M	T	W	T	F	S	S	M	T	W	T	F	S	S
M. ENDURANCE	5x 100 m / 75%/ rest 1 min														
	4x 150 m / 75%/ rest 1½ min		#		#					#		#			
	3x 200 m / 75%/ rest 3 min														
S. ENDURANCE	3x 100m step-down / 1 min. rest	#		#					#		#				
	100m/150m/200m/90%/rest 1 min.														

	5x 100m hollow sprints / 1 min. rest														
SPEED 100%	5x 50m / recover	#							#						
	5x flying 30's / recover			#							#				
	5x 30m sprint from start / recover														
STRENGTH	5x box bounding	#		#					#		#				
	15x ankle reinforcing	#		#					#		#				
	15x wall bar		#							#					
	15x hamstring exercise		#							#					
TECHNIQUE	3x full run up				#							#			
	5x sail		#							#					
	5x floating		#							#					
	5x extend		#		#					#		#			
RHYTHM	5x 50m straight leg drills	#		#					#		#				
	5x 50m long / short leg drills	#		#					#		#				
	5x 50m front / side drills	#		#					#		#				
REST					#	#		#				#	#		#
COMPETITION							#							#	

9. RULES FOR LONG JUMP

9.1. GENERAL

- Where there is more than 8 competitors, each competitor may have three trails, and the 8 competitors with the best jumps may have three additional trials. Where there are 8 competitors or fewer, each competitor is allowed 6 trials.
- All jumps are measured perpendicular, from the nearest break in the landing area by part of the body or limbs, to the take-off line or its extension.
- Competitors are allowed 1½ minutes in which to complete their jump.
- Ties are decided by taking the second best jump, and if a tie remains, the third best, and so on.

9.2. SPECIFIC

- The runway should be 1,22 to 1,25m in width and at least 40 m in length.
- The take-off board is made of wood or other suitable rigged material and measures 1,21 m to 1,22 m long, 198 mm wide and 100 mm deep. It must be painted white. In a recess on the side of the board nearer the landing area, a board, covered with plasticine or other material, should be placed for recording the athlete's footprint when he has foot-faulted. If no such board is available, damp sand may be shaped with a 30º slope from the take-off board to check for foot-faults.
- The take-off board must be placed between 1 and 3 m from the nearer end of the landing area. The distance between the take-off board and the far end of the landing area must be at least 10 m.
- The landing area must be between 2,75 m and 3 m wide and should be placed so that the middle of the runway, if extended, would coincide with the middle of the landing area.
- The landing area should be filled with soft damp sand, the top surface of which must be level with the take-off board.

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