SPRINTS

Sprinting is a learned skill and is dependent on the quality of repetitive perfect practice. Critical to effective sprinting like all events is primarily focusing on developing the right foundations. Do the basics well! An appropriate posture is the first major consideration!

Speed development is concerned with optimizing the relationship between stride frequency and stride length. This necessitates developing both qualities. Speed should be developed all year round combined with emphasis on skill acquisition especially during the 'skill hungry' years.

General points about sprint technique:

1. Posture - should reflect good standing and walking posture; head up, chest out, back striaght, butt in, and stomach flat.
2. Stability - to the naked eye, the hips and trunk should not move (observe from behind and side).
3. Fluid movement patterns - explosive but fluid movements, focusing on rhythm.
4. Run over the ground - 'long leg' to strike the ground; foot lands on ground under hips; heel close to ground on impact; 'quiet' but active foot strike.
5. Arm movements will dictate leg patterns - 'swing arms back and down' and allow arms to naturally open as they swing back and then begin to close as they end the back swing phase.

Acceleration/blocks

1. Big force, short time
2. 'Push a car out of mud' concept - push back to go forward
3. Push off both blocks and throw chest out and up
4. Upon leaving the blocks aim for approx 45 degrees angle for projection
5. Gradually body becomes more upright until approx 20-25m for young sprinters they are fully upright.

Speed maintenance

1. Minimize the loss of speed
2. Focus on staying upright, maintaining frequency and not overstriding.

Bend running

1. Running the bend is likened to a series of short straights
2. Left shoulder slightly forward
3. Left arm swings slightly longer than right to match right leg longer swing phase

Teaching Sequence

Acceleration (emphasize forward lean and push back behind hips to go forward)

1. Drills (eg 'wall' drill - lean against wall/fence at 45 degrees; feet behind hips; body straight; punch knee forward and push back behind hips)
2. Various starting positions (eg beach flag starts)
3. Relay starts ('rock back, roll forward')
4. Standing starts
5. Crouch strarts
6. Block starts (initially without opposition and gradually introduce opposition)
7. Resisted starts (eg slight uphill)

Max velocity sprinting (Always focus on key technical points especially posture and fluidness)

1. Drills (eg ankling; marching; 'A' skip; straight legged shuffle =>bound)
2. Ins and outs (build up for approx 20m then 10m @ 95%+ then run out foranother 20m); gradually increase from 10m to 20m and possibly add another rep of 10-20m.
3. Varied pace runs (20m @ 90-95%+ 20m @ 85% + 20m @ 95%)

Race preparation (acceleration and transition to max velocity)

1. Sprints (95-100%) from various starting positions; building up to using blocks (gradually increase distance from 10m to approx 40-50m)
2. Event specific distances

RELAYS

Relays are the only 'team' event in track and field. Arguably one of the most exciting events to spectate, the relays provide a unique challenge for sprinters.

Key points/concepts relating to relays include:

1. Team concept - champion team versus team of champions; team goals and team commitment
2. Development of correct techniques at an early age - fun and skillful
3. Speed of baton - how fast the baton gets around the track; race eachother through the exchange zone to emphasize the speed of the baton
4. Sound tactical strategies for maximizing team's potential - running order; consider strengths and weaknesses of all personnel and the specific demands of each leg of the relay.
5. Baton exchange technique - upsweep; downsweep; push pass; Australian junior and senior teams adopted push pass technique (push baton straight after presentation of target/hand); downsweep a good precursor to learning the push pass
6. 'Lane discipline' - runners staying on the correct side of the lanes; bend runners on the inside and straight runners on the outside of the lane; prevents accidents
7. 'Free distance' - distance between two runners at baton exchange

Teaching Progressions

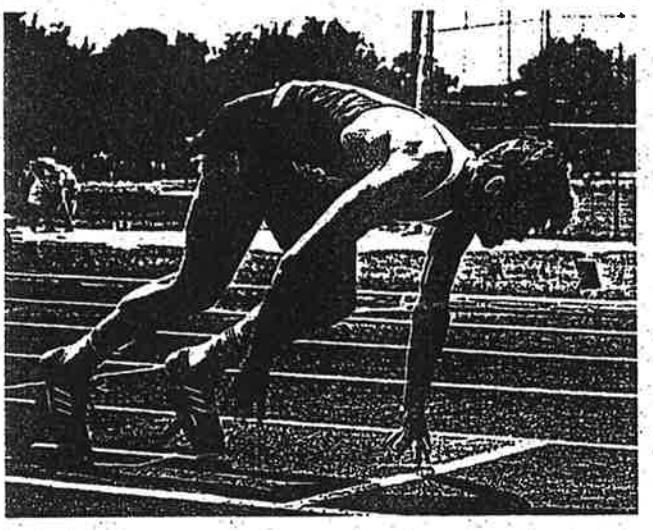
1. 'Understanding breeds compliance' - explain key points of baton exchange and responsibilities of each runner; focus on team concept
2. Drills - appropriate technique; standing => jogging => running
3. Check mark drills - timing the take-off for the outgoing runner to become more considtent
4. Racing through the exchange zone concept (without baton); includes lane discipline concept
5. Baton pass - gradually increasing from 80% to full speed
6. Time trials - no opposition; refine technique (check mark location; baton exchange; acceleration; lane discipline; etc)
7. Race against opposition - refine technique (check mark location; baton exchange; acceleration; lane discipline; etc)

FOR SCHOOLS AND BEGINNERS

Our For Schools and Beginners section in this issue returns to material from the former East German Democratic Republic, covering the most simple basic concepts of the sprint start with methodical recommendations of how to observe and guide its development.

BASICS OF THE SPRINT START

By Dr. Gerd Schroter



There are several methods and approaches to teach basic techniques in track and field events. In the following text the author outlines the nationally recommended method in the former German Democratic Republic to develop the basic crouch start action of beginners. The article is based on translated extracts from Grundlagen der Leichtathletik, Sportverlag Berlin.

BASIC PRINCIPLES

The main aim of the crouch start is to create optimally large horizontal components of accelerating forces in the shortest possible time and to maintain the frequency of the applied forces after leaving the blocks. The effectiveness in achieving this aim depends largely on the following basic criteria:

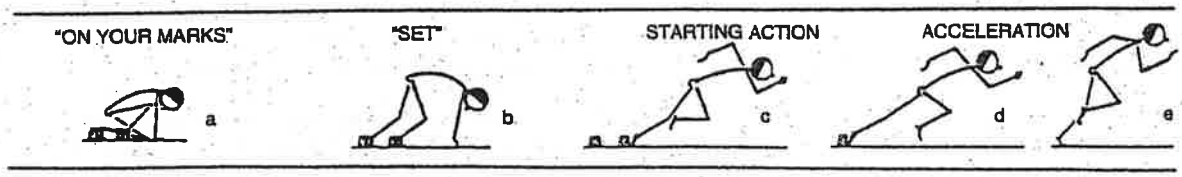


FIG. 1: THE BASIC CROUCH START

"On Your Marks" (Fig. 1, a)

- Taking an individually suitable relaxed position with an appropriate blocks placement (in the beginning a medium setting of blocks).
- The body weight is evenly distributed between hands, knees and feet.
- Straight arms are shoulder width apart and vertically above the hands.
- The head is aligned with the back with a relaxed neck.

"Set" (Fig. 1, b)

- A steady but not hasty lift of the hips.
- A slight forward movement of the body's centre of gravity (vertically above the front foot).
- The front leg bent about right angles in the knee joint.
- Hips slightly higher than shoulders.
- Both feet apply pressure to the blocks.
- Straight arms are vertically (or slightly forward) above the hands.

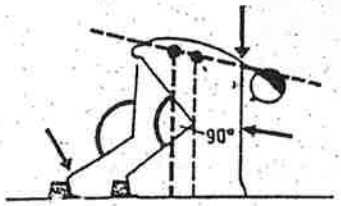


FIG. 2: THE ORTHODOX "set" POSITION

Starting Action (Fig. 1, c)

- An explosive drive from both legs.
- The rear foot leaves the blocks first.
- The front leg is fully extended.
- A very fast and flat forward swing of the rear leg.
- An active alternate side arm action.

Acceleration Run (Fig 1, d, e)

- Aiming for a high stride frequency with short flight and support phases.
- An active placement of the feet behind (later under) the body's centre of gravity.
- Landing on the ball of the feet with a rather limited lowering of the heels in amortisation phases.

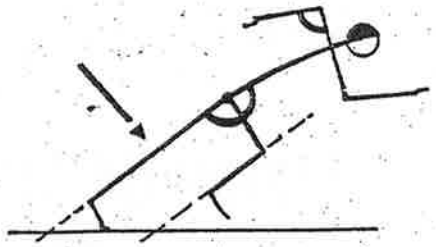


FIG. 3: BODY POSITION IN THE DRIVE FROM BLOCKS

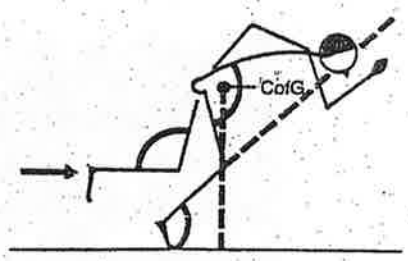


FIG. 4: CORRECT FOOT PLACEMENT IN THE FIRST STRIDE

- A gradual straightening of the body with continual lengthening of the strides.
- A straight line of forward drive within a narrow running track (no sideways placement of the feet).

TECHNICAL DEVELOPMENT

Young athletes can already during the basic training phase demonstrate a crouch start. However, while familiar with the starting procedures, there will still be qualitative shortcomings. This is often revealed in faster performances from a standing start. The main reason for this is a lack of the required strength development to produce an effective extension drive from a relatively narrow angle of the legs in the crouch start.

Every start should always be regarded as a unit that is made up from the starting action and acceleration phases. This clearly indicates that the direct starting action can not be evaluated without taking into consideration the end speed reached in the acceleration phase. Technical development must therefore always take place according to the context of starting-acceleration as a whole.

The actually defined basic starting position in basic training is determined by the best possible transfer of the available physical performance capacities which are decisive in producing an effective acceleration (this

applies in particular to legs strength). This means in the training of beginners an initial use of a variety of different standing and crouch starts before the basic crouch start position can be established (hip height, knee angles, position of centre of gravity, exact blocks placement etc).

To sum it up, each start during the development of a crouch start should always cover at least 10 to 15m, corresponding to 8 to 10 strides. The improvement of reaction and acceleration capacities requires the use of various initial starting positions, as well as different starting signals. In general, the development of the starting technique begins with the standing start and continuous over different in-between positions before the crouch position is introduced.

The practice of the actual crouch start position in isolation should take place only at the beginning and should quickly combine with accelerations. As already stressed, the search for an optimal position must be closely related to the physical performance capacities of an athlete. Emphasis , once the accelerations begin, is always placed on stride frequency at an optimal stride length.

METHODICAL RECOMMENDATIONS

Task 1: Development of the acceleration ability from the standing start.

Aim: Reaction and acceleration improvement from a relatively upright starting position.

Intensification: Increased technical performance demands, lengthening of the distance (20m).

Preliminary exercises:

- Relay games
- Changing of sides.

Basic exercises:

- Departures from a standing start position with concentration on:
  - finding the correct position,
  - part elements of the acceleration phase
  - competitive performances.

Perfection exercises:

- Falling forward starts
- Falling starts as a chain reaction
- Standing starts:
  - on a decline (stride frequency, active placement of feet).
  - with a markers controlled stride length.
  - with a long pronounced forward lean.

Observation points:

- Placement of feet with the stronger leg in front, the trunk slightly bent forward, diagonal arms position.
- Slightly bent legs with the weight shifted to the lead leg.
- A fast and flat first stride with the rear leg, corresponding arms movement.
- Continually increased stride length.

Methodical suggestions:

- Frequently changing opening positions, making use of both sides.
- In the beginning mainly sub-maximal runs, later standing starts in competitive situations.
- The use of only 'set-go' commands.

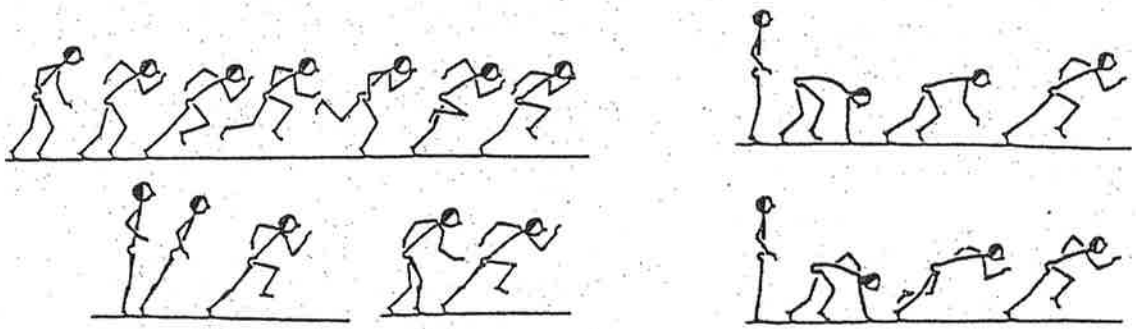


FIG. 5: STANDING START VARIATIONS

TASK 2: Development of acceleration ability from a steadily lowered starting position.

Aim: To move gradually towards the performance of the crouch start and to develop reaction capacity, as well as different elements of acceleration.

Intensification: Gradual lowering of the starting position, technical quality of the first stride, lengthening of the distance.

Preliminary exercises:

- Reaction exercises
- Starts from low initial positions.

Basic exercises:

- Starts from a lowered standing start position (in between positions)
  - with a stressed knee bend,
  - with hands touching the track before starting to accelerate,
  - as a relay changeover start,
  - as a one-hand support start.

Perfect exercises:

- Standing starts from a wide p[lacement of feet.
- Standing and falling starts against resistance.
- In between starts on a decline and marked stride length.

Observation points:

- A fast bending of the trunk from the upright position.
- The bend in the knees smaller than in the crouch start.
- A slow erection of the body, head kept in normal position.
- Forceful drive, a fast first stride.

Methodical suggestions:

- Use "on your marks, set, go" commands
- A frequent change of different types of starts.
- Stressing of the acceleration phase (above all, the first strides).
- Introduction of competitions (group starts).

TASK 3: Development of the crouch start.

Aim: Improvement of the maximal acceleration capacity from the starting blocks with a technically rational performance.

Intensification: Increased technical demands, longer distances.

Preliminary exercises:

- Repetitions of moving to the "on your marks" position.
- Starts straight from the set position.
- Starts from the in-between positions.

Basic exercises:

- Corrected repetitions of the "on your marks" and "set" positions.
- Crouch starts
  - without commands
  - with commands
  - beginning with sub-maximal intensity, later maximal intensity.

Perfection exercises:

- Starts stressing and correcting single technical elements.
- Starts with attention on the acceleration phase, looking at:
  - placement of feet in a narrow and straight path,
  - stride length (strides marked on the track).

Observation points:

- Driving with both legs from the blocks (complete extension).
- The placement of the centre of gravity in the first strides.
- Gradual lengthening of strides.
- Gradual upright movement of the body with a smooth transfer to sprinting.
- Effective "on your marks" and "set" positions.

Methodical suggestions:

- Continual explanation and correction of positions and procedures.
- Orientation on fast stride frequency.
- Frequent sub-maximal starts performed as competitions (groups).
- Concentration on selected single technical elements of the start.

Sprints

Steve Cowburn – 0419 301 412

Sprints

- Session Objectives
  - Define sprint events
  - Identify the 2 fundamentals that define sprint speed
  - Analyse and identify key actions at various stages of a sprint race
  - Identify common sprinting faults

Sprints

Introduction

- The sprints cover the following track events: 100 metres, 200 metres, 400 metres, 4x100 metre, 4x200m and the Medley relay. Although the sprints are events in themselves, the ability to sprint is an important weapon in an athlete's armoury for many track and field events and many sports.

Sprints

- What determines how fast an athlete can run?
- Stride length
- Stride cadence

Sprints

By breaking the sprinting technique into its component parts you can focus on and improve specific phases of the action. Excellent sprinting technique has some of the following characteristics...

- **Arm Action**
  Arms should swing from the shoulder. Keep them relaxed and at approximately 90 degrees of flexion. Focus on swinging arms in a straight line.
- **Body Posture**
  The entire body should lean forward slightly as the athlete runs. It should not bend from your waist, this will adversely affect the COG and correct running mechanics. Instead the slight lean forward should come from the ground up. Head and trunk should be still and entire body relaxed.
- **Ground Contact**
  Run on the balls of the feet NOT the toes. Toes are fairly weak and offer little or no stability.
- **Stride Length**
  There is a fine line between overstriding and under striding. If stride length is too great and the foot lands in front of the COG it will cause the athlete to brake. If the stride length is too short the stride frequency will be high but the athlete won't cover much ground.

Sprints

Sprint Technique

- Stages
  - On your marks
  - Set
  - Bang
  - Acceleration
  - Stride
  - Lift

Sprints

On your marks

- Feet correctly located in the blocks
- Fingers behind the line
- Fingers form a high bridge
- Hands evenly positioned slightly wider than shoulder width
- Shoulders back and vertically above or slightly forward of the hands
- Arms straight but not locked at the elbows
- Head and neck in line with the spine
- Eyes focused on the track (1 to 2 metres ahead)
- Gentle breathing
- Face and neck muscles relaxed

Sprints

Set

- Hold the breath
- Hips rise slowly to a position above the shoulders
- Head and neck in line with the spine
- Eyes focused on the track one or two metres ahead
- Shoulders vertically above or slightly forward of the hands
- Front leg knee angle approx. 90 degrees
- Rear leg knee angle approx. 120 degrees
- Feet pushed hard back into the blocks

Sprints

Bang!

- Exhale
- Drive the arms hard
- Drive the back leg forward into a high knee action
- Extend the whole body so there is a straight line through the head, spine and extended rear leg - body approx. 45 to 60 degree angle to the ground
- Eyes Focused on the track 2 to 3 metres
- Keep low, relaxed and drive
- Run out of the blocks - do not step or jump out of the blocks

Sprints

Acceleration Phase

- Eyes focused on the track to keep low to allow the build up of speed
- Forward lean of the whole body with a straight line through the head, spine and extended rear leg
- Face and neck muscles relaxed (no tension)
- Shoulders held back and relaxed, square in the lane at all times
- Arms move with a smooth forward backward action - not across the body - drive back with elbows - hands move from approx. shoulder height to hips
- Elbows maintained at 90 degrees (angle between upper and lower arm)
- Hands Relaxed - fingers loosely curled - thumb uppermost
- Legs - fully extended rear leg pushing off the track with the toes - drive the leg forward with a high knee action with the knee pointing forward and with the heel striking under the backside (not the back of the backside as the knee is low and pointing down to the ground) - extend lower leg forward of knee (rear leg drive will propel the foot forward of the knee) with toes turned up - bring foot down in a claw action with a ball of foot/toe strike on the track vertically below the knee - pull the ground under you into a full rear leg extension - (elbow drive assisting the whole action)
- On the ball of foot/toes at all times - feet pointing forward straight down the lane
- Elbow drive commences just before rear leg drive
- Fast leg action, good stride length allowing continual acceleration
- Appearance of being smooth and relaxed but driving hard with elbows and legs
- The drive is maintained for approx. 20-30 metres and then the whole body slowly comes into a high tall action

Sprints

Stride Phase

- Smooth transitions from acceleration phase to stride phase
- Eyes focused at the end of the lane - tunnel vision
- Head in line with the spine - held high and square
- Face relaxed - no tension - mouth relaxed
- Chin down, not out
- Shoulders held down (long neck), back (not hunched), relaxed and square in the lane at all times
- Smooth forward backward action of the arms- not across the body - drive back with elbows - brush vest with elbows - hands move from shoulder height to hips
- Elbows held at 90 degrees at all times (angle between upper arm and lower arm)
- Hands relaxed - fingers loosely curled - thumb uppermost
- Hips tucked under - slight forward rotation of the hip with forward leg drive to help extend the stride
- Legs - fully extended rear leg pushing off the track with the toes - drive the leg forward with a high knee action with the knee pointing forward and with the heel striking under the backside (not the back of the backside as the knee is low and pointing down to the ground) - extend lower leg forward of knee (rear leg drive will propel the foot forward of the knee) with toes turned up - bring foot down in a claw action with a ball of foot/toe strike on the track vertically below the knee - pull the ground under you into a full rear leg extension - (elbow drive assisting the whole action)
- On the ball of foot/toes with the feet pointing forward straight down the lane
- No signs of straining or tension in the face, neck and shoulders
- Appearance of being Tall , Relaxed and Smooth with maximum Drive

Sprints

Lift Phase

- As the Stride Phase but with emphasis on:
- High knee action (prancing)
- Leg action fast and light as if running on hot surface
- Fast arms - more urgency

Sprints

General Notes

As you monitor the athlete's technique look for:

- a ***Tall*** action
  - This means erect, running on the ball of foot/toes (not heels) with full extension of the back, hips and legs as opposed to 'sitting down' when running
- a ***Relaxed*** action
  - This means move easily, as opposed to tensing and 'working hard' to move. Let the movements of running flow. Keep the hands relaxed, the shoulders low and the arm swing rhythmically by the sides.
- a ***Smooth*** action
  - This means float across the top of the ground. All motion should be forward, not up and down. Leg action should be efficient and rhythmic. The legs should move easily under the body like a wheel rolling smoothly along.
- ***Drive***
  - This means push from an extended rear leg, rear elbow drive with a high forward knee drive followed by a strike and claw foot action just behind the body's centre of gravity.

Sprints

- Common faults
  - Arms
    - across body
    - Straighten at back
    - Tension
    - Short/long swing
  - Legs/feet
    - Not on ‘balls’
    - Low knee lift
    - Flat footed
  - Body
    - Shoulders/hips swing
    - High shoulders
    - Tension
    - ‘Loose’ head

SPRINTING

When sprinting: -

- Keep your head level and still; look to the front
- Hold your trunk and shoulders square to the front
- Keep your body straight
- Hold your hips under your body
- Move your arms, legs and feet in a straight path
- Swing your arms from the shoulder and keep your elbows bent at about 90 degrees
- Lift your knees up
- Lift your heel up high as you bring your knee to the front
- Land on the front part of your foot
- Use light, quick movements
- Use a smooth, flowing action