

# Developing the 4 X 100m Relay

Loren Seagrave

Director of Track and Field and Cross Country  
IMG Academy, Bradenton, Florida

# Key Rules governing Relays [Rule 170]

1. Baton carried by hand the entire race
2. If dropped, must be recovered by athlete who dropped it
3. May leave lane to retrieve baton without lessening distance to be covered or impeding another athlete
4. Passing baton is completed when receiving runner has baton in sole possession
5. Within the takeover zone, it is only the position of the baton which is decisive

# 4 X 100m Relay Baton Changes



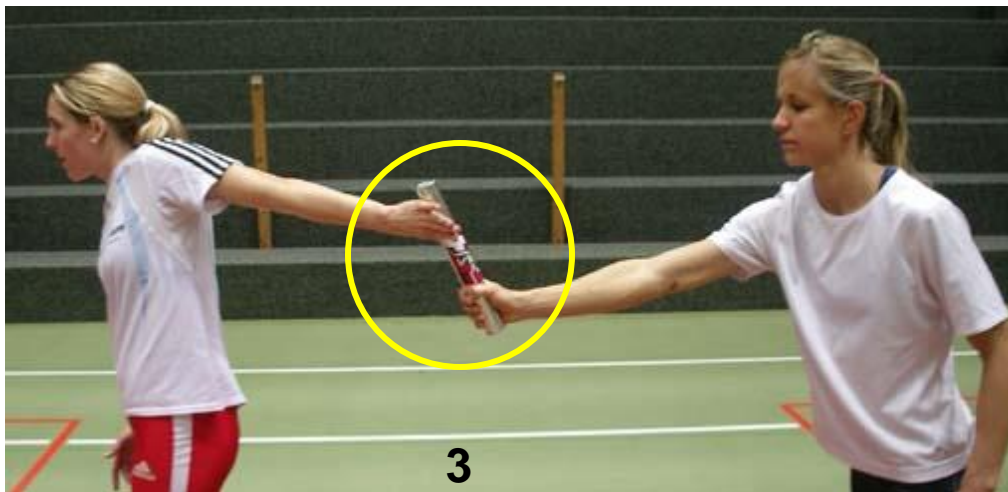
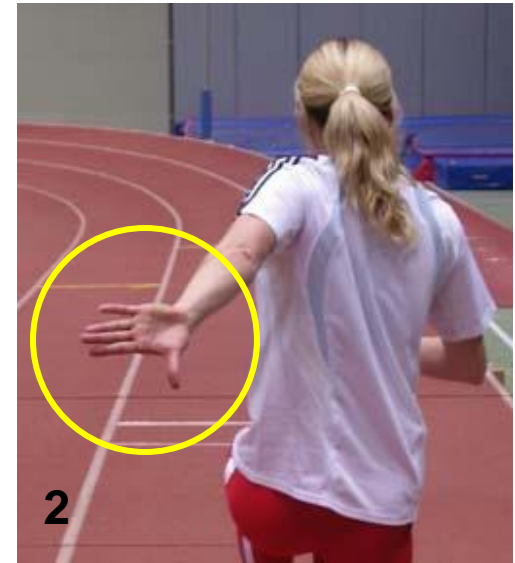
Push



Downsweep

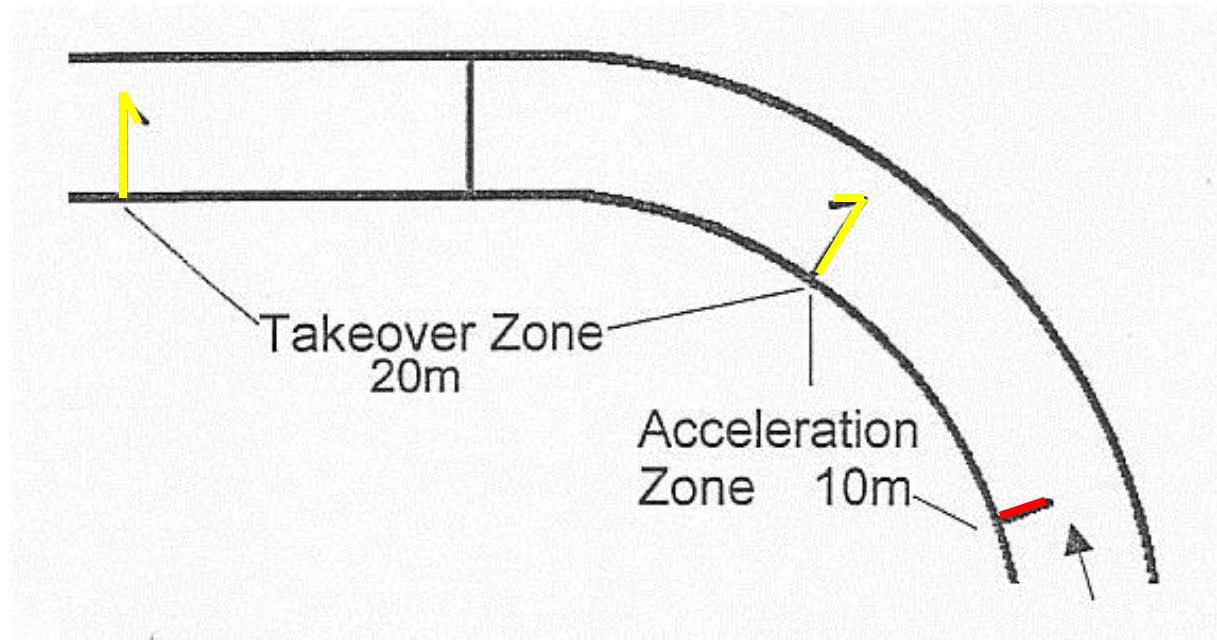


# The Push Exchange Technique





# Non-visual Exchange



- The baton must be exchanged within the 20m takeover zone
- The outgoing runner waits within the 10m acceleration zone
- A check mark is placed on the ground in front of the acceleration zone to indicate when the outgoing runner should begin to accelerate

# Skills of the Relay: Starting with Baton

- The runner who starts the relay race should use a conventional block start.
- Baton can extend beyond the line
- Gripped with the middle and ring fingers.
- Body weight should rest upon the bridge of the thumb, forefinger, and little finger.

# Non-visual Exchange

	Preparation	Acceleration	Take-over
Incoming	<ul style="list-style-type: none"><li>‣ Have the baton in the correct hand</li><li>‣ Maintain correct path in lane</li></ul>	<ul style="list-style-type: none"><li>‣ Maintain speed until past the exchange zone</li></ul>	<ul style="list-style-type: none"><li>‣ Call for the hand back at appropriate time</li><li>‣ Deliver the baton accurately and swiftly</li><li>‣ Keep cool</li></ul>
Outgoing	<ul style="list-style-type: none"><li>‣ Measure „Go“ mark precisely</li><li>‣ Take stance in proper position</li><li>‣ Anticipate the „Go“ mark consistently</li></ul>	<ul style="list-style-type: none"><li>‣ Accelerate maximally</li><li>‣ Maintain correct path in lane</li></ul>	<ul style="list-style-type: none"><li>‣ Place hand back promptly on call</li><li>‣ Hold target high and steady</li><li>‣ Take baton with authority</li></ul>

# Skills of the 4 X 100m Relay

## The Incoming Runner

- Responsible for making the pass.
- Stay in the inner or outer half of the lane, depending upon which hand holds the baton.
- Carry side should always be in the middle of the lane.
- The incoming runner positions so that the carry side shoulder is laterally aligned with the carry side shoulder of the outgoing runner.



# Skills of the 4 X 100m Relay

## The Incoming Runner

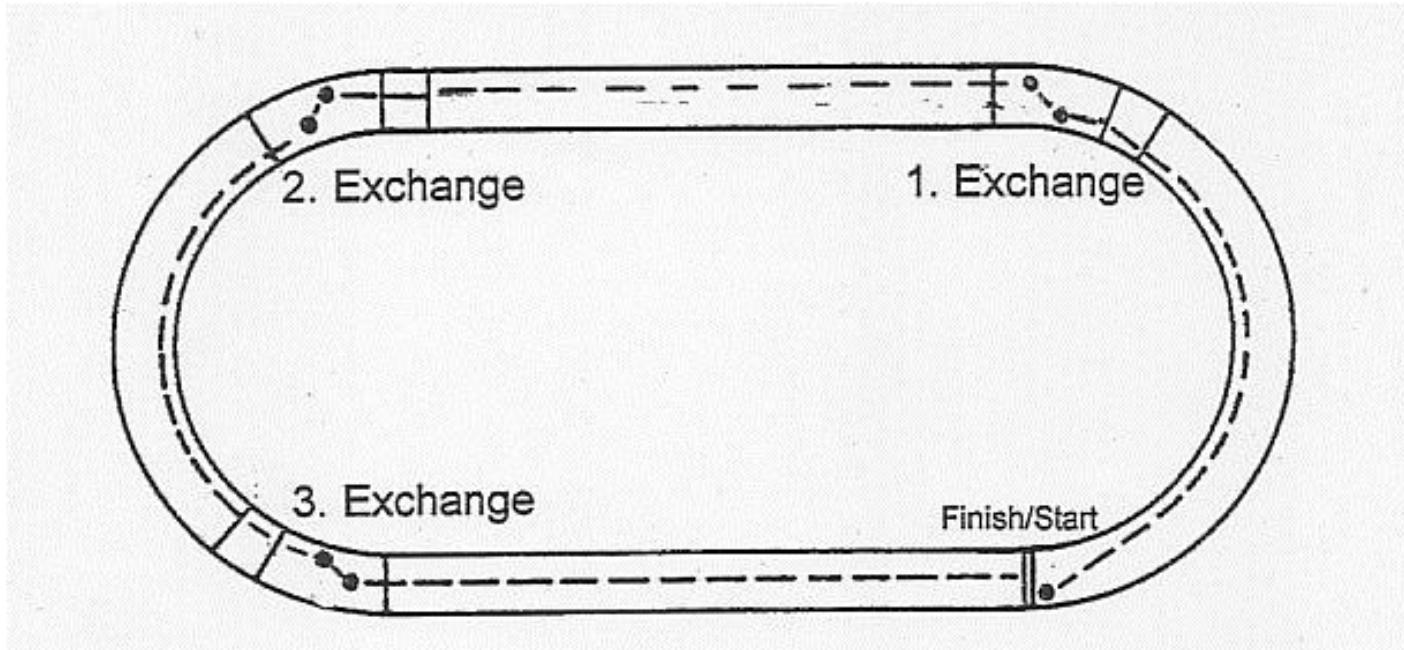
- Run strongly through the zone, without decelerating or reaching until the outgoing runner is safely carrying the baton.
- A verbal command should be used
- Baton is actively placed in the outgoing runners hand
- The end (rather than the middle) of the baton should be placed in the hand.

# Skills of the 4 X 100m Relay

## Outgoing Runner

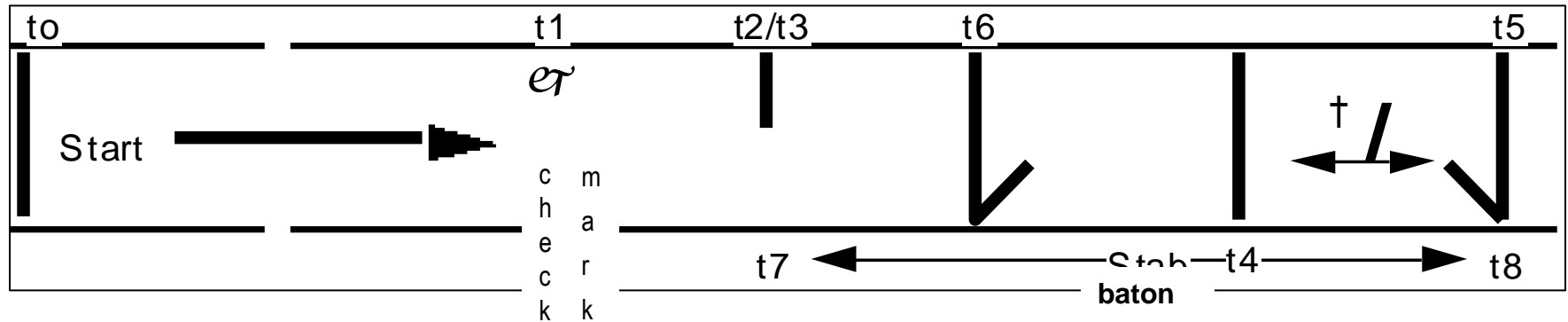
- Full speed (Always Maximum Intensity)
- The instant the incoming runner hits the go mark.
- Stay in the inner or outer half of the lane, depending upon which hand will receive the baton.
- Baton travels down the middle of the lane.
- At callback extend the arm back and presents the open hand, with a high, stable target.
- Do not feel for it.

# Non-visual Exchange



1st runner	2nd runner	3rd runner	4th runner
<ul style="list-style-type: none"><li>› Baton in right hand</li><li>› Takes inside path</li></ul>	<ul style="list-style-type: none"><li>› Baton in left hand</li><li>› Takes outside path</li></ul>	<ul style="list-style-type: none"><li>› Baton in right hand</li><li>› Takes inside path</li></ul>	<ul style="list-style-type: none"><li>› Baton in left hand</li><li>› Takes outside path</li></ul>

# Criteria and Assessment Factors



$t_{10m}$ : acceleration of the 10m of the outgoing runner

$t_{20m}$ : acceleration over the 20m of the outgoing runner

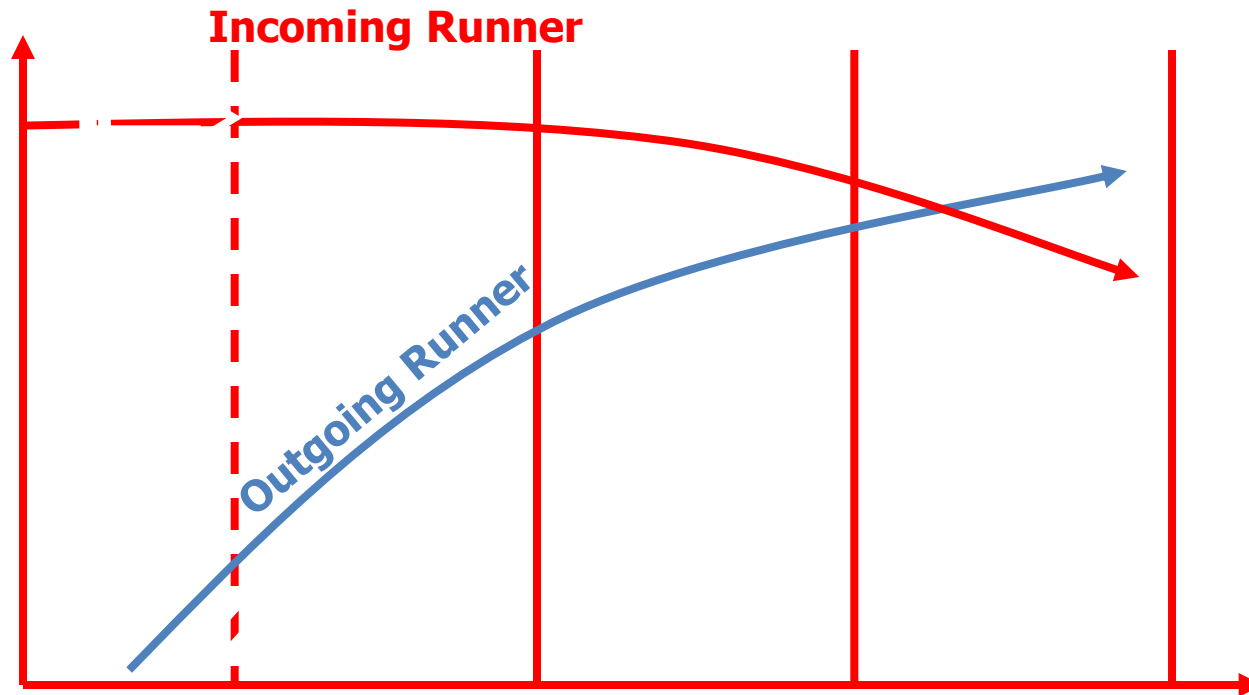
$t_{30m}$ : acceleration of the 30m of the outgoing runner

$t_{10m(IN)}$ : flying time of the incoming runner in the acceleration zone

incoming runner is active approaching the exchange or is decelerating

$t_{20-30(IN)}$ : flying time on the last 10m (20-30m) of the exchange zone of the incoming runner – gives feedback on whether the sprinter is active or passive onto and through the exchange.

# Speed of Runners in Take-over Zone



CHECK MARK

# Determining Checkmark Distances

- 1. Measure 25-27 foot-lengths on the inside lane line.  
Use trial and error to adjust accordingly (Why NOT)**
- 2. The average distance for most checkmarks in the 4  
x 100m relay is 5 – 7 metres (WHY MOT)**
- 3. The faster the incoming runner, the farther away the  
checkmark**
- 4. The slower the outgoing runner, the farther way the  
checkmark**



# Criteria and Assessment Factors

	Relay Leg			
	1st	2nd	3rd	4th
Distance Run	120m	140m	140m	120m
Baton carry distance	105m	100m	100m	95m
Start	Blocks	Rolling start		
	Great and consistant starter	Read CONSISTANTLY the Go Mark		
Mental	Confidence shared			
Hand	Right	Left	Right	Left
Run	Curve	Straight	Curve	Straight
Type of athlete	X	X	X	X

# Coaching Positions

**Positioned in infield  
or outside of track  
opposite changeover  
zone area**

- ↪ To observe acceleration / deceleration in zone
- ↪ To observe spacing at exchange
- ↪ To detect any hesitation at moment of pass
- ↪ To observe timing of incoming runner at “GO” mark and initial movement of outgoing runner

**Positioned in the lane  
20m in front of runners /  
at rear of zone**

- ↪ To observe runners position in the lane
- ↪ To observe baton exposure
- ↪ To observe body alignment as pass is made
- ↪ To observe starting action

# Exchange Efficiency Formula

Add the individual times of the relay athletes (PB's for the current season). From this total subtract the teams 4 x 100 time.

E.g.  $12.5 + 12.2 + 12.6 + 12.5 = 49.8$  (Total of four performances)  
Minus actual relay time = 47.0  
Differential = 2.8

1.0	Poor exchanges
1.5	Average exchanges
2.0	Very good exchanges
2.5	Excellent exchanges
3.0	Ideal exchanges

# Fundamental Skill Set for Coach

## Discrete Skills Required to Effectively Help Athlete to Improve Technical Efficiency

### – Observation Skills

- Positioning of the Coach
  - Side, Front and Rear
    - » Advantages of each and where to use each
- Distance from the Action
  - Close to the Movement
  - Further Away from the Movement
- Wide Focus or Narrow Focus

# 4 x 100 Relay

	Fault	Cause	Correction
Incoming runner	Incoming runner does not maintain speed into acceleration zone	Faulty conceptual technical model	Re-teach the technical model
		Athlete is over fatigued	Review training unit plan
		Poor speed maintenance capacity	Evaluate the athletes HSR mechanics and reevaluate training programme
	Incoming runner does not maintain speed through exchange zone	Faulty conceptual technical model	Re-teach the technical model
		Athlete is over fatigued	Review training unit plan
		Poor speed maintenance capacity	Evaluate the athletes HSR mechanics and reevaluate training programme
	Incoming runner does not maintain proper path	Faulty conceptual technical model	Re-teach the technical model
		Inefficient bent running technique	Re-teach bent running mechanics

	Fault	Cause	Correction
Incoming runner	Incoming runner does not recognise when to call for take over	Poor visual acuity	Refer to medical professional
		Poor perceptual skills	Practice baton passing under various/exact conditions
		Excessive sub maximal baton exchanges	Train majority of baton passes in real time environment
	Incoming runner has poor execution in baton passing skills	Faulty conceptual technical model	Re-teach the technical model
		Delivery movement is incorrect	Baton passing drills
		Poor visual acuity	Refer to medical professional
		Mispositioned in path of running	Re-teach the technical model
		Poor target placement or lack of target stability by outgoing runner	Baton passing drills with outgoing runner



Outgoing runner	Outgoing runner has difficulty measuring “go” mark	Faulty conceptual technical model	Re-teach the technical model
	Outgoing runner mispositions in the acceleration zone	Poor understanding of the rules of competition	Educate athletes in the rules of competition
		Faulty conceptual technical model	Re-teach the technical model
	Outgoing runner misjudges “go” mark	Poor visual acuity	Refer to medical professional
		Poor visual perception	Use feed back and augmented feed back to improve perceptual skills
		Lack of concentration	Devise specific strategies to insure better concentration
		Excessive sub maximal baton exchanges	Train majority of baton passes in real time environment
		Lack of practice under specific conditions	Practice baton passing under various/exact conditions

	Fault	Cause	Correction
Outgoing runner	Outgoing runner does not accelerate maximally	Faulty conceptual technical model	Re-teach the technical model
		Fear of running away from incoming runner	Psychological counseling or adjust “go” mark
	Outgoing runner does not accelerate maximally	Poor start and acceleration mechanics especially on the bent	Start and acceleration drills especially on the bent
	Outgoing runner does not maintain path of running	Faulty conceptual technical model	Re-teach the technical model
		Poor start and acceleration mechanics especially on the bend	Start and acceleration drills especially on the bent

	Fault	Cause	Correction
Outgoing runner	Outgoing runner does not respond appropriately to call for the baton pass	Call by incoming runner is not loud or distinguishable enough	Increase volume of incoming runners call or create distinguishable call or use on verbal pass
		Target is not in the right position (too low or too far outside)	<ul style="list-style-type: none"> <li>• Shoulder flexibility exercises</li> <li>• Baton passing drills</li> </ul>
		Hand is in the wrong position or target unstable	<ul style="list-style-type: none"> <li>• Re-teach the technical model</li> <li>• Baton passing drills</li> <li>• Incoming runners calls for pass too soon</li> </ul>
		Athlete turns and looks during exchange	<ul style="list-style-type: none"> <li>• Re-teach the technical model</li> <li>• Baton passing drills</li> <li>• Increase athlete's confidence</li> </ul>

	<b>Fault</b>	<b>Cause</b>	<b>Correction</b>
Outgoing runner	Outgoing runner does not respond appropriately to call for the baton pass (continued)	Athlete searches for baton	<ul style="list-style-type: none"> <li>• Re-teach the technical model</li> <li>• Baton passing drills</li> <li>• Increase athlete's confidence</li> </ul>
	Outgoing runner has poor baton skills	Inability to take and hold on to baton	<ul style="list-style-type: none"> <li>• Baton passing drills</li> <li>• Change position of athlete on relay</li> </ul>
		Inability to take or run with baton in right or left hand	<ul style="list-style-type: none"> <li>• Baton passing drills</li> <li>• Change position of athlete on relay</li> </ul>

# Baton Games and Drills

**5x throw & catch with ½ turn LH, RH**

**5x throw & catch with full turn LK RH, LH -->RH**

**Bounce baton on track & catch**

**Placement of baton in hand - (fully across palm - ulnar border to initiate grab reflex)**

**Push baton forward into hand**

**Moving passing drills - walk, jog, run....**

# Baton Games and Drills

## Hurry go catch drill

Two athletes side by side in lane, inside runner's feet aligned immediately behind those of outgoing runner. Both heel to toe.

Rear runner says “go”.

Gradually add speed through competition and starting 1m apart.  
Use hand slap pass method first