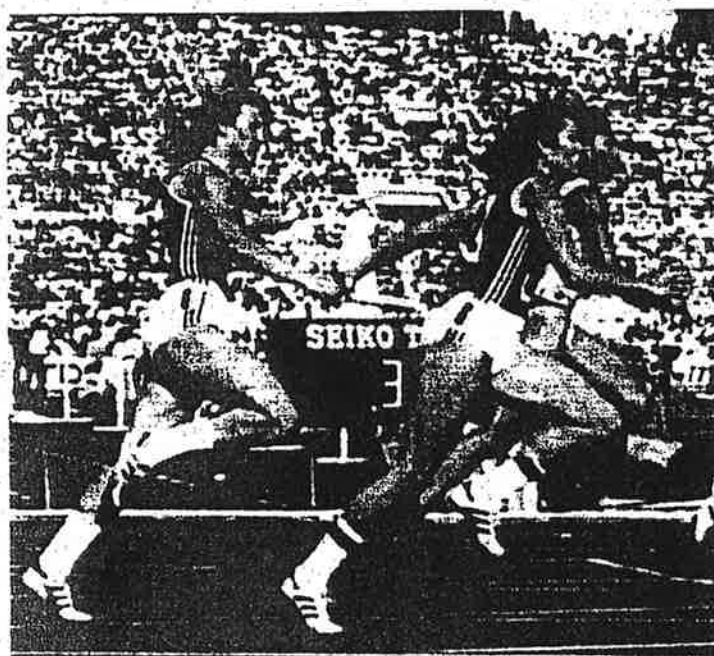


TECHNIQUE AS A PERFORMANCE FACTOR IN THE 4 x 100M RELAY

By Winifried Vonstein

An analysis of the various changeover and baton passing techniques in the sprint relay, recommending the alternate changeover with the push passing method as the most efficient. The article is a slightly abbreviated translation from Die Lehre der Leichtathletik, Vol. 27, No. 31, 1988, published by Deutscher Sportverlag Kurt Stroof GMBH, West Germany.



INTRODUCTION

The aim in the 4 x 100m relay is to carry the baton under competition conditions as fast as possible around the track. This depends, not only on the fastest possible sprinting capacity of the team members, but also on the perfection of the changeover procedures. (Bauersfeld/Schroter 1986). Deciding technical elements allow here teams of lower running capacity to compete successfully and make up for their shortcoming in the running ability through a correspondingly high technical level.

In spite of the significance of this, the technical literature contains comparatively few

publications on relay racing. Most present basic exercises for the learning of the technique and the procedures of the baton change. The whole complex is still not sufficiently researched, its meaning still not appreciated.

The following text will shortly present and discuss the deciding elements in the technical factors of the relay.

Rules of the Race

The rules require that the baton is handed over from one runner to the next only within the 20m changeover zone. The changeover is

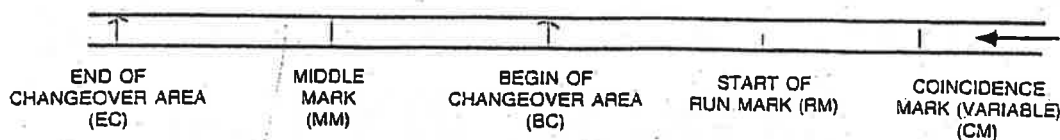


FIG. 1: A SCHEME OF THE CHANGEOVER ZONE

completed when the baton is in the sole possession of the outgoing runner. The outgoing runners are allowed to start up to 10m outside the changeover area and can use additional markers (usually tape on synthetic tracks), denoted by Oberste (1979) as the x"coincidence mark". This chosen mark designates "the point where the reaction movements should be started" (see fig. 1).

The outgoing runner observes the incoming partner, as well as the marker, and should when the baton carrier crosses the coincident point begin his acceleration. The coincidence mark is established by trial so that the baton carrying runner still reaches the fast starting outgoing runner to complete the changeover.

The term "coincidence mark" by Oberste (1979) is employed in the sense of clarity. The use of terms like the "starting mark" (Bauersfeld/Schroter 1986) can easily be confused with "starting line" (Bauersfeld/Schroter 1986) or the "starting point" (Jonath 1973) that signify the spot where the outgoing runner starts. The term "reaction mark" is also occasionally used (Loetz/Knebel 1982) (the common term in English is "check mark" — editor).

CHANGEOVER TECHNIQUE

The performance capacity of a relay team depends strongly on the level of the changeover procedures. The technique of the changeover comprises, according to Bauersfeld/Schroter (1987) the following points:

- The type of the changeover
- The accuracy of the start and the acceleration of the outgoing runner
- The technique of the baton passing
- The utilization of the changeover area.

Changeover Categories

We distinguish between three changeover categories:

- Outside changeover
- Inside changeover
- Alternate changeover.

The baton in the outside changeover is taken with the right (outside) hand, in the inside changeover with the left (inside) hand. The baton in both of these changeover categories is changed into the other hand after it has been received.

The alternative changeover, also known as the Frankfurt changeover (Jonath 1973), is made up from a combination of inside and outside changeovers. The first and the third are inside changeovers, the second is an outside changeover. The advantages of this type of changeover is that it requires not change of the baton from one hand into the other and reduces the risk of dropping the baton. The other advantage is in the shorter running path, as the curve runners can permanently run close to the inside lane line.

Oberset (1979) regarded as disadvantages of the alternate changeover the difficulties of an eventual correction of the grip on the baton, the larger curve of the incoming runner in the second changeover and the passing of the baton with the mostly less skilful left hand in the second changeover.

According to my own experience, these disadvantages carry no significant weight. Taking and handing of the baton with the left hand is a question of regular training, the disadvantage of the larger running curve can be taken into consideration in the fixing of the check mark.

The alternate changeover is preferred because of the shorter running path and the avoidance of the baton change from one hand into the other. All highly qualified relay teams employ the alternate changeover because of these obvious advantages.

Accuracy of the Start and Acceleration

Two essential demands are set for the outgoing runner:

- He must achieve a maximal acceleration performance
- The reaction to start must take place exactly at the coincidence point between the marker and the incoming runner.

This means that the outgoing runner must be in a position that allows, on one hand, to

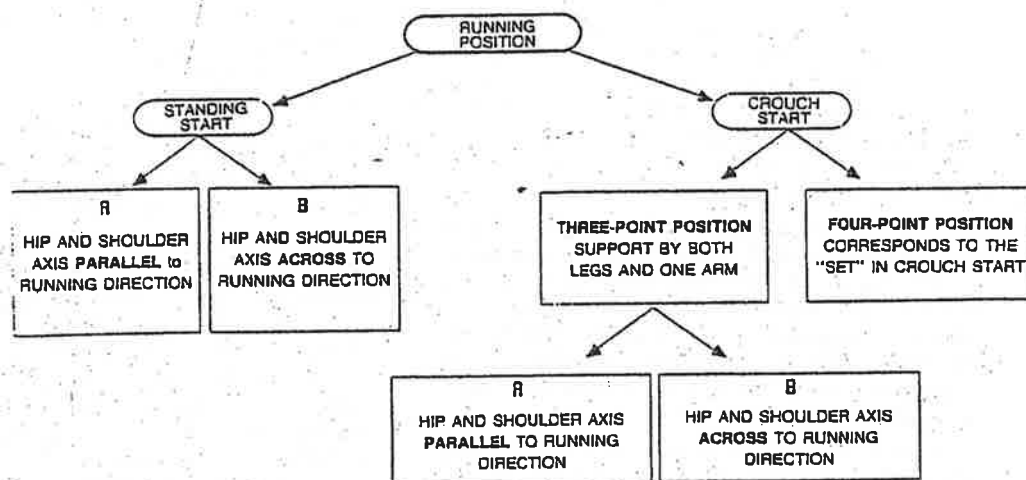


FIG. 2: STARTING VARIATIONS OF THE OUTGOING RUNNERS
(According to Oberste 1979)

observe the incoming runner and the check mark and, on the other hand, makes it possible to start with a maximal acceleration. The starting behaviour in relay racing are presented, according to Oberste (1976), in fig. 2.

The criteria of the acceleration capacity and the observation ability must be considered in the evaluation of the different starting procedures. It can be presumed that the three and four point positions have advantages, as far as balance and acceleration are concerned.

The most favourable observation conditions, according to Oberste (1979), result in the upright head position in the standing start (A variation in fig. 2). The necessary swing of the long axis of the body to start the acceleration can be developed in training so that there are no disadvantages.

The standing start position, because of the better observation, should definitely have priority for the less experienced runners. "The start from a crouch position is relatively difficult because the approach of the incoming runner can only be inaccurately judged". (Bauersfeld/Schroter 1986). The employment of a crouch start requires frequent training because of the difficulties of the head position for observation (Oberste 1979).

The accuracy and stability of the coincidence reaction is extremely important to reach high level relay performances and is frequently responsible for defective performances. For this reason I agree with Oberste that better

observation conditions with an upright head position in the standing start must be given preference. Experienced athletes can naturally after sufficient training switch to the crouch start and achieve with it possibilities for better acceleration.

"The outgoing runner must make every effort to reach the highest possible acceleration rate at the moment the incoming runner reaches the check mark (coincidence mark)" (Bauersfeld/Schroter 1986). This acceleration takes place like in normal sprinting. The arm of the outgoing runner is moved back to take the baton only after a short command called out by the incoming runner. The outgoing runner must even in this phase attempt not to slacken the tempo, while the incoming runner must maintain the speed.

It appears important here to point out that the runners who run in the straight don't necessarily have to keep to the outside of the lane. This can often impede the runners on the neighbouring outside lane. Aiming to the middle of the lane leaves sufficient space for the changeover partners, saves a little of the running path and does not impede other runners.

PASSING TECHNIQUE

Two passing techniques are generally distinguished in the literature — the upward pass and the downward pass. Oberste (1979) divides baton passing further, according to movement of the baton carrying arm, into swing and push techniques. As this is a more

realistic terminology, it will be used here further.

The baton in the swing technique is struck into the hand of the receiver in an arch. In the upward pass the baton is guided from below into the "area around the thumb" (Nett 1979), whereas in the downward technique the baton is guided from above into the palm of the extended arm of the receiving runner.

The baton in the push technique is pushed forward in a straight line into the horizontally placed hand of the extended arm of the receiver (Variation A, fig. 3). The variation B, although regarded by Oberste (1979) as potentially effective (vertical position of the receiver's hand), has in this author's opinion no practical meaning.

Oberste, who carefully evaluated the different passing techniques, came to the conclusion that the upward swing technique has disadvantages because the difficulty in guiding the relatively large mass (extended

increase the baton speed within the change-over zone. Improved guiding conditions make it possible to shorten the coupling phase in the push technique. The pushing movement, that involves in a sequence the shoulder, elbow and hand joints, allows for a better and more precise guidance of the baton. The movements of the incoming and outgoing runners are synchronized and it is not necessary to await the steady position of the receiver's hand.

Further advantages are shown in the studies by Schmidtke, who claims that underarm dominated target movements are more precise than overarm dominated movements, particularly when the target is at a level that corresponds to about 60 to 70% of the body height. In addition, Schmidtke points out that the striking rate in horizontally placed targets is higher than in vertically placed targets. Both occur in the push technique with an upward held baton. The push technique also makes it possible to gain distance through the widely extended arms of both changeover partners.

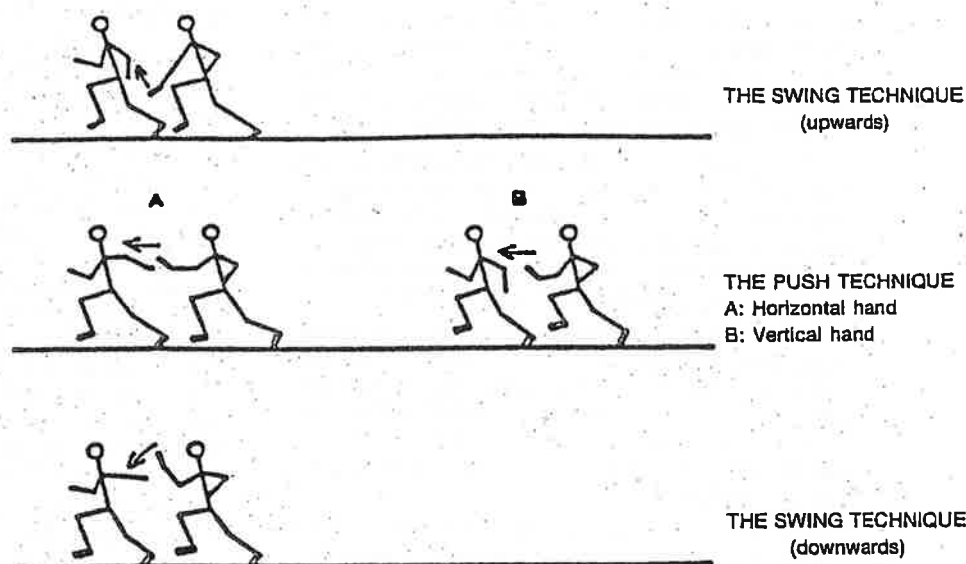


FIG. 3: DIFFERENT CHANGEOVER TECHNIQUES (Oberste 1979)

arm). It is subject to considerable fluctuations. Further, the target area (receiver's hand) is relatively far away from the controlling organ (the eye) of the incoming runner. The negative influences of the extended arm/hand position of the receiver are quoted as a disadvantage in the downward swing technique.

The precision of the pass can shorten the "coupling phase" (Oberste 1979) and thereby

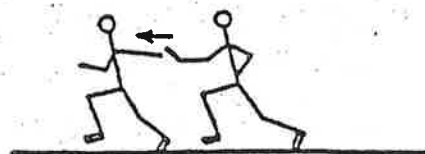


FIG. 4: THE PUSH TECHNIQUE

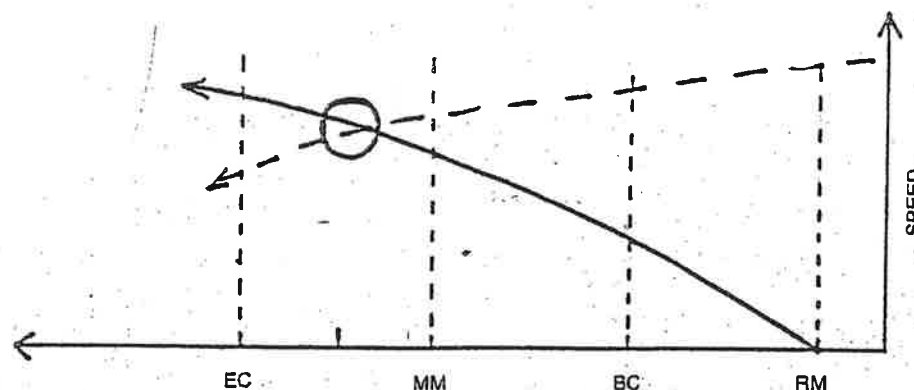


FIG. 5: A SPEED GRAPH IN THE USE OF THE CHANGEOVER ZONE

The decision in the evaluated changeover techniques falls in favour of the push technique. However, the arm position presented graphically by Oberste (fig. 3, variation A) can be regarded as poor in practice because running with an extended arm in the acceleration phase is extremely difficult for the outgoing runner. A relatively short extended arm phase is demanded in the push technique to avoid any hesitation in the acceleration.

The push technique, favoured by this author, is presented in Fig. 4. The baton is pushed forward in a straight line and pressed into the palm of the extended arm of the receiving runner. (A push-press movement).

Utilization of the Changeover Area

The rules require that the baton must always be passed within the 20m changeover zone. The outgoing runner is allowed to start from a line 10m outside the changeover area. It is therefore sensible, in order to achieve the highest possible baton speed, that the baton passing takes place well within the second half of the changeover zone. This allows the outgoing runner to reach the highest possible running speed. The baton speed depends on the running speed of the incoming runner up to the point of passing and is definitely higher than the speed of the accelerating receiver.

However, because of the possible risk factors in the passing of the baton directly at the end of the changeover area, it is attempted to execute the start of the pass just after the middle line. The pass would in this case normally take place within two or three strides at around the third quarter of the changeover zone (approximately 15m). This is a calculated necessary safety factor. (fig. 5)

SUMMARY

The performance technique of the relay covers the following points:

- The type of the changeover
- The acceleration run
- The technique of the baton passing
- The utilization of the changeover area

The alternate changeover technique is favoured because it allows a shorter running path and eliminates the change of the baton from one hand into the other while running.

As a precise start of the outgoing runner is of decisive significance, the standing start, because its observation advantage, is preferable. Only experienced relay runners can switch to the crouch start for possible faster acceleration.

The push technique with an upright held baton is preferable from the known passing methods. It has the most favourable assumptions as far as an accurate control is concerned, the position of the hand of the receiver and a possible gain of distance.

A safety factor is calculated for the utilization of the changeover area, attempting to execute the actual pass of the baton at around the third quarter of the changeover area. Attempts to move closer to the end of the zone can take place only when both partners are extremely confident.

The presented factors clearly indicate that the sprint relay must be regarded as an event with its own technical elements that require objective development and training. This has to be taken into consideration in the planning of training for sprinters.

The list of literature is available from the publishers.



RELAY TRAINING FOR THE LITTLE ATHLETE

A coaching guide | Stephen Cowburn

Introduction

This guide has been written principally for use by Little Athlete Relay Coach's. The information and advice it offers has been gathered over several years of relay coaching with boys and girls in the U9 to U15 age groups and is based on the practical experience.

Warming up

Before any training session commences it is very important that the athletes are sufficiently 'warmed up'.

Normal sprint warm up are OK but it is a good idea to also include a few exercises that include handling/changing of the relay baton.

Exercises

- Joggle relay
- Joggle relay with exercise
 - Sit ups
 - Push ups
 - Mogles
 - Star jumps
 - Cartwheel
- Continuous lap (good for developing change timing skill required for 4x200 and medley)
- Indian file
- Seated 'row'

Basic Principles

While we need to understand the details of good relay running the basics can be summed up in a few points:

- The athlete with the baton should be running as fast as they can at all times
- The baton change should occur with both athletes as close to max speed as possible
- Free space should be maximized on each change
- The relay team should be selected based on the strengths of the athlete relative to the portion of the race they will contest.

Model Relay Technique

Using the 4x100m relay race as an example we next discuss the model technique.

Hand Change Sequence

When considering the most efficient sequence of baton pass/receive we need to consider where in the lane each athlete should run their leg and where they will be at the time of baton change (see lane discipline).

The first athlete will start on the bend and, so as to not run any further than necessary, will run close to the inside of the track. The second athlete is therefore required to wait at the change box on the outside of the lane. For the baton to change athletes easily the first athlete must carry the baton in the Right hand and the second athlete must take the baton in the Left hand.

The second athlete to third athlete change is the reverse of this, and so on.

Right, Left, Right, Left (RLRL) is therefore the preferred sequence for baton pass/receive.

A couple of points spill out of this:

- Firstly with a RLRL sequence the baton is always in the centre of the lane.
- The first and third athletes, running the bend, will generally lean into the corner slightly. With a RLRL the baton is in clear space on their outside and away from the adjacent lane athlete.

Pass Method

There are three basic baton passing methods – Push, Up and Down.

A Push pass is where the outgoing athlete (outgoing) athlete's hand is held facing palm forward (vertical) and the baton is pushed into the hand in a forward motion by the incoming athlete. Generally requires the outgoing athlete to have their arm out to the side thereby losing free space'. Most commonly used by senior athlete apparently because of upper body muscle mass prohibiting them stretching their arm backwards.

An Upwards pass is where the outgoing athlete's hand is held facing palm down and the baton is placed in the hand in an upward motion by the incoming athlete. Not seen very much nowadays but common in the schools system of years past. Requires a slightly unnatural motion of the incoming athlete to place the baton on the upward swing of the arm.

A Downwards pass is where the outgoing athlete's hand is held facing palm up and the baton is placed in the hand in a downward motion by the incoming athlete. This is the most common method used in junior relays. Incoming athlete and outgoing athlete athletes can assume the correct arm position easily and the downward motion is complementary to the normal running action of the incoming athlete.



Responsibility

It is very important that each athlete knows what they are responsible for.

Incoming

- To maintain maximum speed approaching the change zone and until, even shortly after, the change has been completed.
- To loudly and clearly call for the outgoing athletes 'HAND' when close enough to make the change.
- To place the baton in the outgoing athlete's hand in a positive downward motion.
- To maintain position in their side of the lane.

Outgoing

- To commence running, accelerating as fast as possible, when the incoming athlete reaches the check mark
- To run normally (not with receiving hand back) until called.
- To maintain an open steady outstretched hand with which to receive the baton when called
- To maintain position in their side of the lane
- To make sure that the baton exchange occurs in the Change Box
 - not to receive the baton before the start of the change box and
 - not to exit the change box before baton change has occurred.

In the unfortunate event the baton is dropped it is the athlete who dropped the baton's responsibility to pick it up. This can occur at any time no matter where the baton come to rest however athletes from other teams must not be impeded while retrieving the baton.

If the baton is dropped during the act of passing the baton (pass is incomplete) it is the incoming athlete's responsibility to retrieve it and pass to the outgoing athlete.

Lane Discipline

For a short time, during the actual exchange of the baton, two athletes are in close proximity to each other in the same lane. Lane discipline refers to requirement on the relay athlete to keep to their half of the lane thus minimizing the potential to run into the other athlete. Using the RLRL approach:



- 1st athlete runs the bend tight to the inside of the lane. The baton is in the right hand (middle of the lane).
- The 2nd athlete is waiting at the first change box on the outside of the lane. This athlete will receive with the left hand (middle of the lane).
- During the change each athlete keeps to their half of the track until the change is complete and the outgoing athlete is clear of the change box.

Sighted or Blind

The change of the baton can be either sighted or blind.

A sighted change refers to the practice of the outgoing athlete looking back for the incoming athlete/baton until the change has been completed.

A blind change refers to the change taking place while the outgoing athlete is looking forward away from the baton and incoming athlete at the time of the change.

Which is best?



Some points to consider:

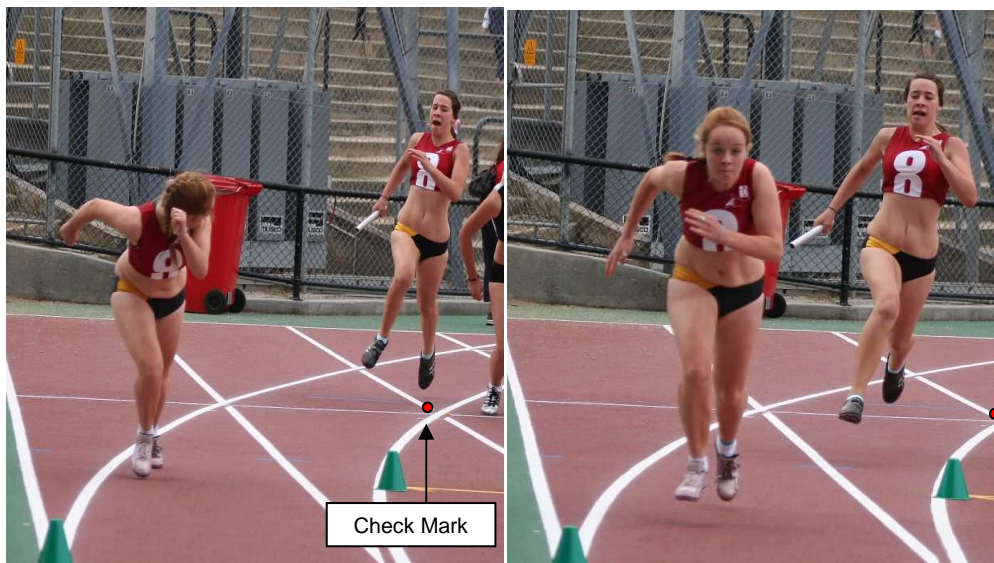
- An athlete looking backwards cannot possibly run at maximum speed
- An athlete looking backwards, especially on a bend, is likely to run out of lane.
- With both athletes in sight of the baton there is an increased tendency for each to try to reach for the others hand/baton – responsibility is unclear

Blind changes need some practice to build confidence but are clearly the better option.

Check Mark

When does the outgoing athlete know when to start running?

You can get away with either the incoming athlete telling (shouting to) the outgoing athlete to start running or the outgoing athlete making their own mind up. In both cases however a judgment call is required often at a time of high anxiety or when the athlete is under pressure.



In some races where 'unlaned' changes occur this cannot be avoided (4x200 3-4th change & Medley 3-4th change) however where possible a check mark should be used.

A check mark can be anything from a piece of tape to an old washer. It is simply a mark on the track that tells the outgoing athlete when to start running (i.e. when the incoming athlete reaches the Mark)

It is placed on the opposite side of the track (not on the line) to the outgoing athlete approximately 6 walking paces outside the beginning of the change box (or acceleration zone if use is permitted)

Of all the practice that takes place at a relay session most time is spent trying to fine tune the check mark position so that the incoming and outgoing athlete are at maximum speed when the change takes place (in the change box).

Free Space

Do you ever wonder why a relay team can cover a set distance faster than an individual athlete? Sure 4 athletes will become less fatigued than an individual athlete over the same distance but equally some time may be lost during the baton changing. One reason is because of the 'Free Distance' – distance that does not have to be run but that is gained in the act of passing the baton.



With incoming and outgoing athlete arms at full stretch this free space may equate to around 1.5 metre each change. With three changes per race this is 4.5 metres the baton does not have to run.

Communication

When does the outgoing athlete know when to put out their receiving hand? The outgoing athlete will commence running normally (once the incoming athlete reaches the check mark). When the incoming athlete is close enough to make the change a loud call of 'HAND' (or similar short sharp pre arranged call) is made whereupon the outgoing athlete extends the receiving arm.

Despite the best planning and preparation things can still go wrong. Athletes need to communicate with each other whenever this happens to best overcome the situation. Most common problems occur at the time of change so at all training sessions practice good communication between changing athletes and develop a simple 'message' language both understand.

Typical problems to prepare for are:

- Incoming athlete will not reach outgoing athlete before end of change box – a command of 'SLOW' or similar is issued by incoming athlete.
- Outgoing athlete is on wrong side of track (usually coupled with wrong receiving hand out) – a command of 'SIDE' or similar is issued by incoming athlete
- Outgoing athlete is jogging and not accelerating from start - a command of 'GO' or similar is issued by incoming athlete

A 4x100 change

- First athlete commences in lane with baton in Right hand. Runs close to inside of lane
- Second athlete is waiting just inside change box (or acceleration zone if use permitted) on outside of track. Outgoing athlete's body is facing away from the incoming athlete but is looking towards incoming athlete and at the Check Mark which is positioned on the inside of the track some 6 paces away
- When the incoming athlete reaches the Check Mark the outgoing athlete turns and faces forward and commences running as fast as possible.
- When the incoming athlete is within passing range of the outgoing athlete the incoming athlete issues the request (shouts loudly) 'HAND!' Note – this should occur inside the Change Box
- The outgoing athlete upon hearing the 'HAND!' command from the incoming athlete fully extends the receiving arm, open handed with palm facing up.
- The incoming athlete, now within passing distance and faced with the outgoing athletes extended arm, firmly plants the baton into the outgoing athletes hand in a downward motion
- Once the baton has been passed the incoming athlete should slow down very gradually, avoiding a sudden slowing down. Like taking your foot off the accelerator without applying the brakes.
- The outgoing athlete speeds off to the next change

The window of time, when passing and outgoing athlete athletes are traveling at the same speed and are close enough to affect transference of the baton, is very small.

Emphasis on practice, especially in the final stages of preparation before a competition, should be on fine tuning the placement of Check Marks so as to:

- Differences in athlete running speed
- Adjust for slow starters, fast finishers
- Give the athletes confidence in their markers
- Ensure baton change occurs with both athlete as close to max speed as possible

Points to note

- The outgoing athlete's arm should not be extended too high or too low – optimally at an angle of approximately 10-30° from horizontal. The arm should be straight behind the athlete and as still as possible (not waving around).
- The outgoing athlete should accelerate as fast as possible from the beginning and not 'wait' for the incoming athlete. If you have worked out the timing correctly the pass will happen at maximum speed.
- Stress to the outgoing athlete the need for hard acceleration, not a slow jog, off the mark. Also stress to the incoming athlete the need to maintain full speed and not to slow down when approaching the change zone.
- Stress the importance to the outgoing athlete of providing the incoming athlete with a big, still target with which to make the transition. Watch for the outgoing athlete extending the receiving arm prematurely – the outgoing athlete must run normally, using both arms, until the command 'HAND' is issued.

Common Faults

- Outgoing athlete putting wrong hand out
- Outgoing athlete's arm low and not outstretched
- Outgoing athlete jogs away rather than at maximum acceleration
- Incoming athlete slows approaching change box
- Outgoing athlete leaves before incoming athlete has reached Check Mark
- Change occurs before/after change box

Team Strategy

How do you decide who should run what leg? In a 4x100 all legs are 100m so does it matter?

In reality, even in a 4x100m relay race, each leg is quite different and has unique characteristics. To be at your best you need to match the leg characteristics with your relay team.

For example, in a 4x100m, the 2nd and 3rd legs are longer than the 1st and 4th mainly because athletes in these legs have a receive and a pass to make. 1st and 4th athletes only have either a pass or receive to make. Also the first athlete is the only athlete to start from a stationary position. All other athletes start from a rolling start.

Relay Races by 'Leg' Characteristics

4x100m

- 1st leg – starts on bend. Shortest leg. Passes baton only (and while sighted). Suits athlete with good start technique, fast reactions, and good bend runner. Only athlete to commence from a stationary start.
- 2nd leg – long leg, straight. Receives and passes baton. The 2nd & 3rd legs of the 4x100 are the longest legs. Typically, excluding other factors, you would put your fastest athletes on these two legs. As leg 2 is contested on the straight consider the 'strength' of the athlete especially if required to run into a head wind. Tall/slight athletes are more affected by wind.
- 3rd leg – long leg, bend. Receives and passes baton. This leg is contested completely on the bend. Bends are generally contested better by shorter athletes. Of your two fastest athletes, all things being equal, the shorter athlete may be better on this leg.
- 4th leg – short leg, straight. Receives baton only. Not uncommon for the slowest athlete in the squad to run this leg because it is a short leg and the athlete has a rolling start. Also athlete only has to receive baton. Suits a determined finisher that can hold form under pressure.

4x 200m

- 1st leg – starts on bend. Passes baton only (and while sighted). Suits athlete with good start technique, fast reactions.
- 2nd leg – Receives and passes baton. Has to receive and pass baton – suit good baton changer
- 3rd leg – Runs the bend in lane then breaks lane at beginning of straight. Receives and passes baton. Pass must occur between blue lines. Technically the hardest leg of the 4 x 200. Athlete has to receive the baton in lane, break lane at beginning of straight, 'find' the outgoing athlete and pass baton between blue lines. Cannot use a Check Mark. (Note - Unlaned changes can be congested and interference is possible which could lead to disqualification). Suits confident athlete.
- 4th leg – Receives baton between blue lines. Receives baton only. 4th leg athlete has to enter track between blue lines and establish (and hold) a receiving position. Cannot use a Check Mark. Stress to 4th athlete not to move out of position – responsibility is with 3rd athlete to find and go to 4th athlete. Suit a strong confident athlete.

Medley

- 1st leg – 100m. Good starter/bend runner. Quick reactions. Passes baton only. Suits athlete with good start technique, fast reactions.
- 2nd leg – 100m. Straight. Receives and passes baton. Has to receive and pass baton – suit good baton changer
- 3rd leg – 200m. Breaks lane at beginning of straight. Receives and passes baton. Pass must occur between blue lines. Technically the hardest leg of the Medley. Athlete has to receive the baton in lane, break lane at beginning of straight, 'find' the outgoing athlete and pass baton between blue lines. Cannot use a check mark. (Note – Unlaned changes can be congested and interference is possible which could lead to disqualification) Suits confident athlete.
- 4th leg – 400m. Key to success in Medley. Receives baton only. 4th leg athlete has to enter track between blue lines and establish (and hold) a receiving position. Cannot use a Check Mark. Stress to 4th athlete not to move out of position – responsibility is with 3rd athlete to find and go to 4th athlete. The 4th (400m) leg constitutes half the race so clearly success in this event requires a strong 400m athlete.

A Final Word On Relay Technique.

The major point to get across to your squad is that it is the speed in which the baton travels the allotted distance that determines the success of the team.

'Who so ever is in possession of the baton should at all times be traveling as fast as possible'.

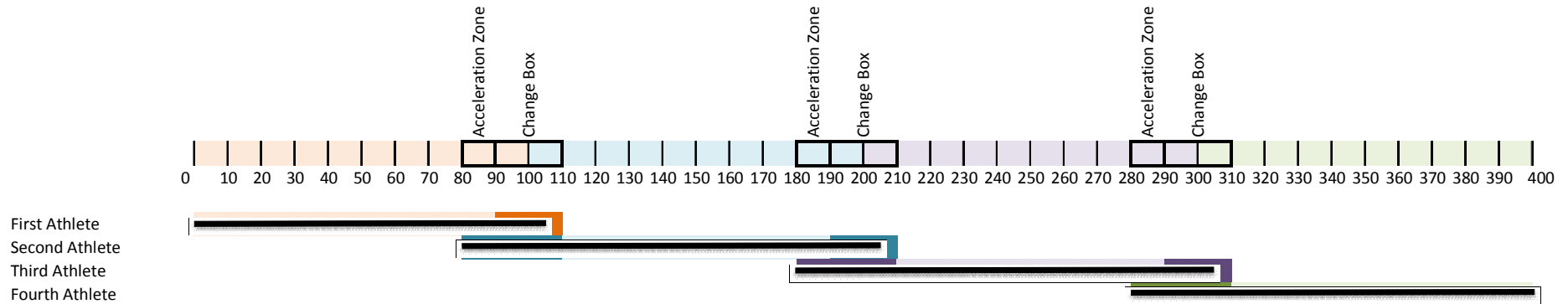
First Edition - July 2009

Revised - October 2010

© Stephen Cowburn

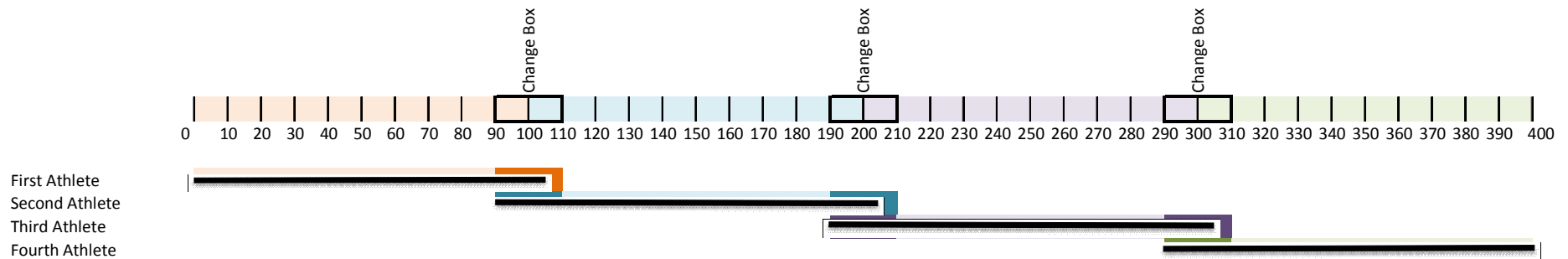
RELAY TRAINING FOR THE LITTLE ATHLETE

Acceleration Zone (U11 - U15)



	Min	Max	Typ.	Comments
First Athlete	90	110	105	Only athlete to start from standing start - needs good start technique and reaction time. Only a pass to make. Shortest Leg. Bend Run.
Second Athlete	80	130	125	Rolling start. Pass and Receive to make. 1 of 2 Longest Legs. Straight Run. Probably hardest leg.
Third Athlete	80	130	125	Rolling start. Pass and Receive to make. 1 of 2 Longest Legs. Bend Run.
Fourth Athlete	90	120	120	Rolling start. Only a Receive to make. 2nd Shortest Leg. Straight Run.

No Acceleration Zone (U9-U10)



	Min	Max	Typ.	Comments
First Athlete	90	110	105	Only athlete to start from standing start - needs good start technique and reaction time. Only a pass to make. Shortest Leg. Bend Run.
Second Athlete	80	120	115	Rolling start. Pass and Receive to make. 1 of 2 Longest Legs. Straight Run. Probably hardest leg.
Third Athlete	80	120	115	Rolling start. Pass and Receive to make. 1 of 2 Longest Legs. Bend Run.
Fourth Athlete	90	110	110	Rolling start. Only a Receive to make. 2nd Shortest Leg. Straight Run.

SHUTTLE RELAY

When running a shuttle relay: -

- Use a normal running action. Hold the baton at the bottom end
- When passing the baton, hold the baton up vertically and stretch your arm out when you are getting close to the next runner
- When taking the baton, stretch your arms out in front of your chest and hold your hands together in a "butterfly" position

NOTE: The person passing the baton should run to the side of the person taking the baton to avoid interference/collisions

