Effectively Coaching the 4x100 Relay

Athletics Scotland Conference
Emirates Arena, Glasgow 2016

The 4x100 Pop Quiz

1. How many meters of acceleration could an outgoing runner possibly have before receiving the baton?

2. Which relay “leg” is the longest?

3. (T/F) A time advantage can be gained through “free space” between runners during the baton exchange.

4. What segment(s) of the relay can be timed to determine if your team is running efficiently?

The 4x100 Pop Quiz continued…

5. Where should the baton exchange occur?

6. On which relay leg would you generally place your fastest runner?

7. (T/F) The placement of the outgoing runner largely depends upon the speed of the incoming runner.

8. (T/F) A good sprinter has not reached full speed at 25 meters.

The 4x100 Pop Quiz continued…

9. Which country held the WR in the Women's 4x100 Relay at **41.37** for 27 years?

10. Which country surprised the world with their **37.79** WR in the Men's 4x100 in 1990?

11. What type of pass did these teams use?

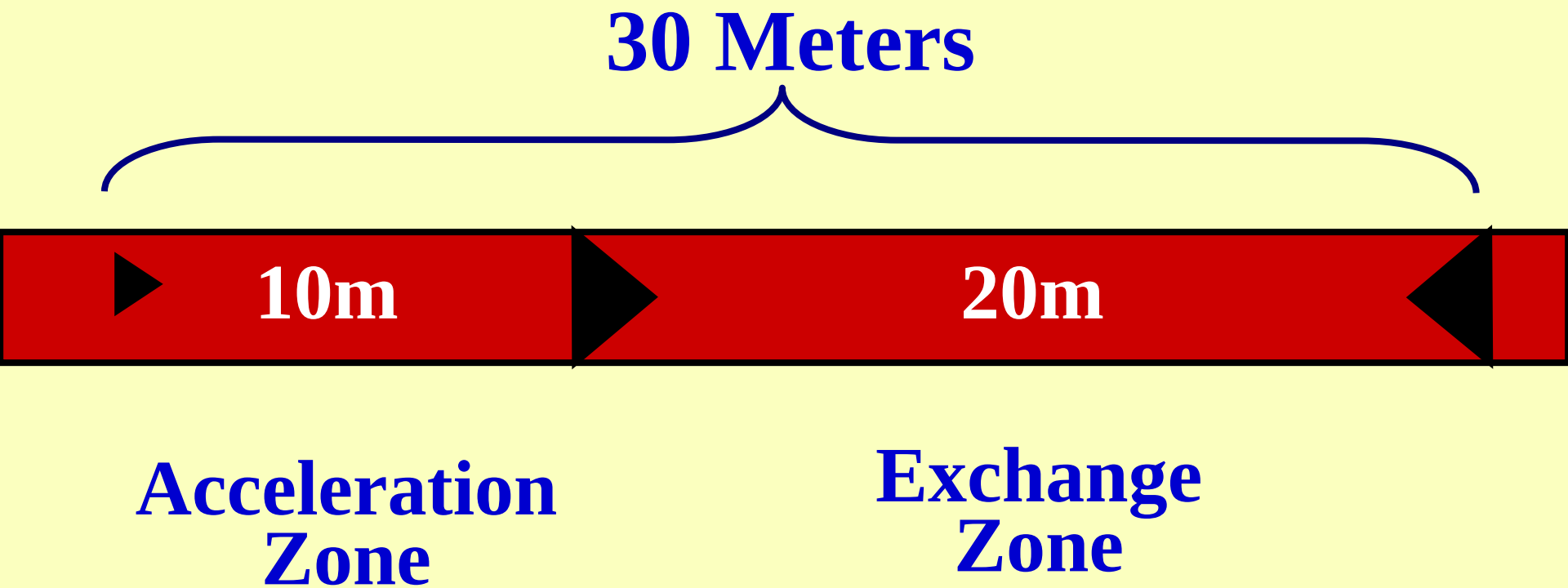
12. What grade (A-F) would you give this pass?


© AFP/GETTY IMAGES

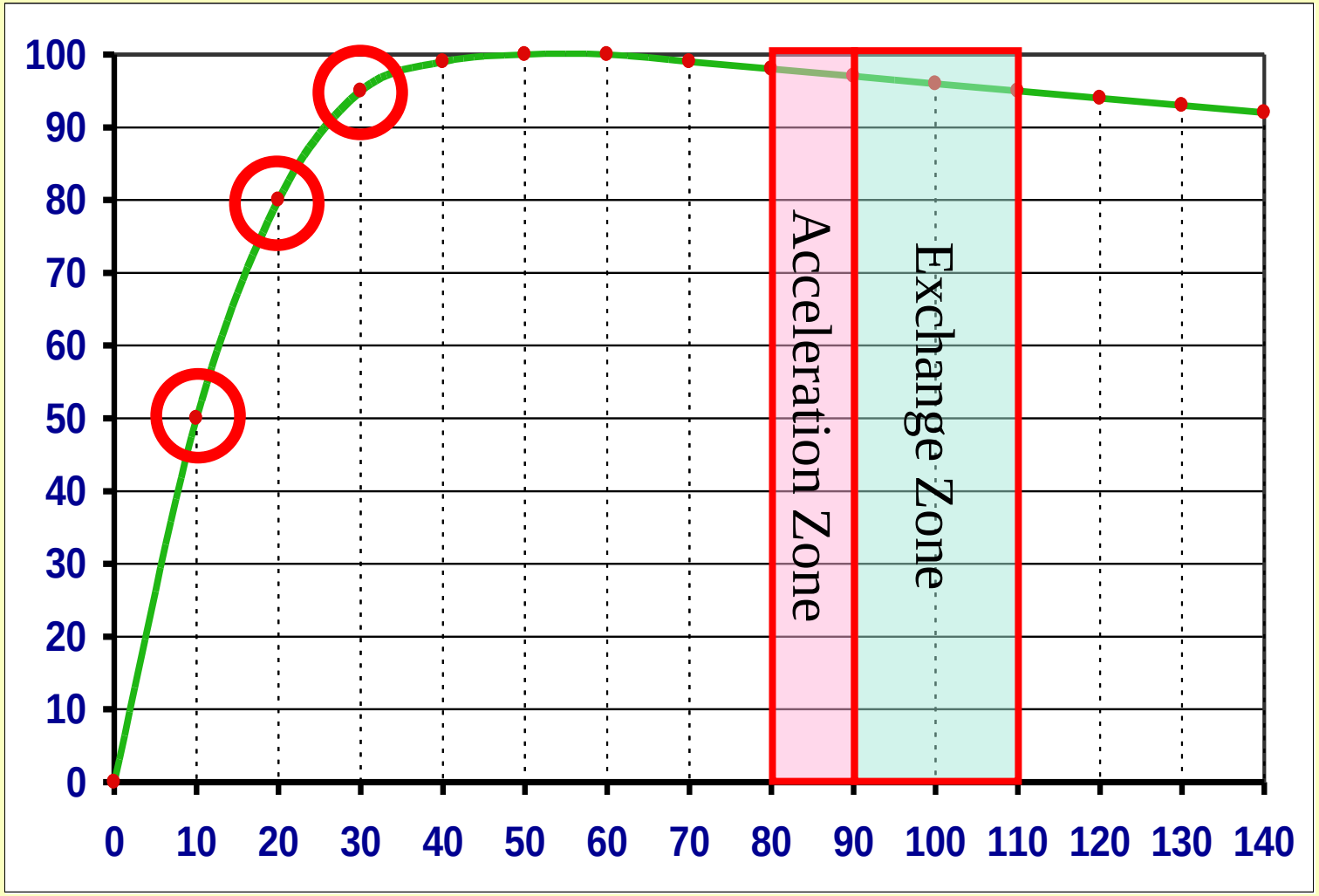
A Review of Relay Basics

- Basic Premise: **Get the baton safely around the track as fast as possible.**
- Because they run turns, the 1st & 3rd legs run in the left (inside) half of the lane, and they receive / hold the baton in the right hand
- The 2nd & 4th legs run in the right (outside) half of the lane and receive / hold the baton in the left hand

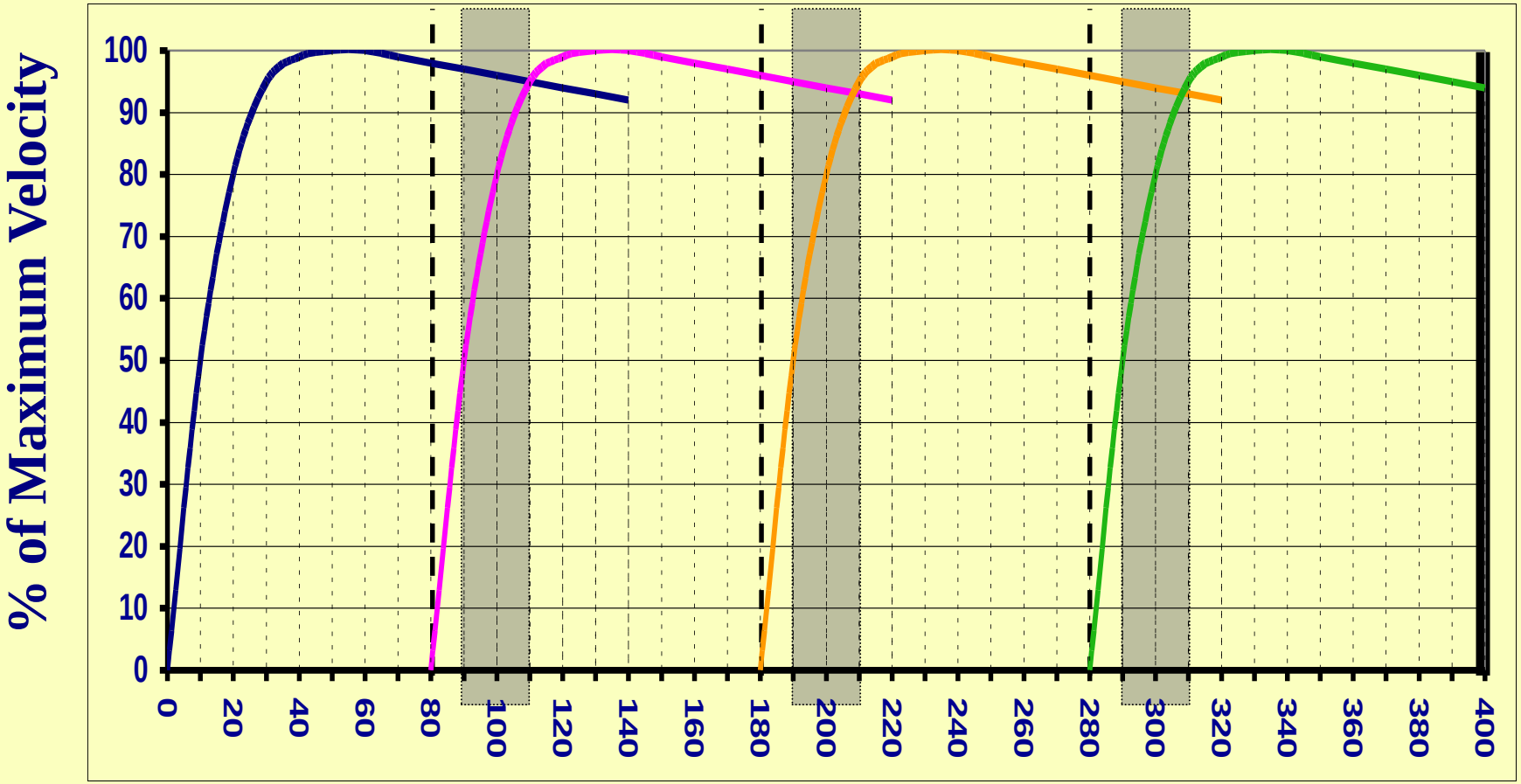
Relay Zone Measurements



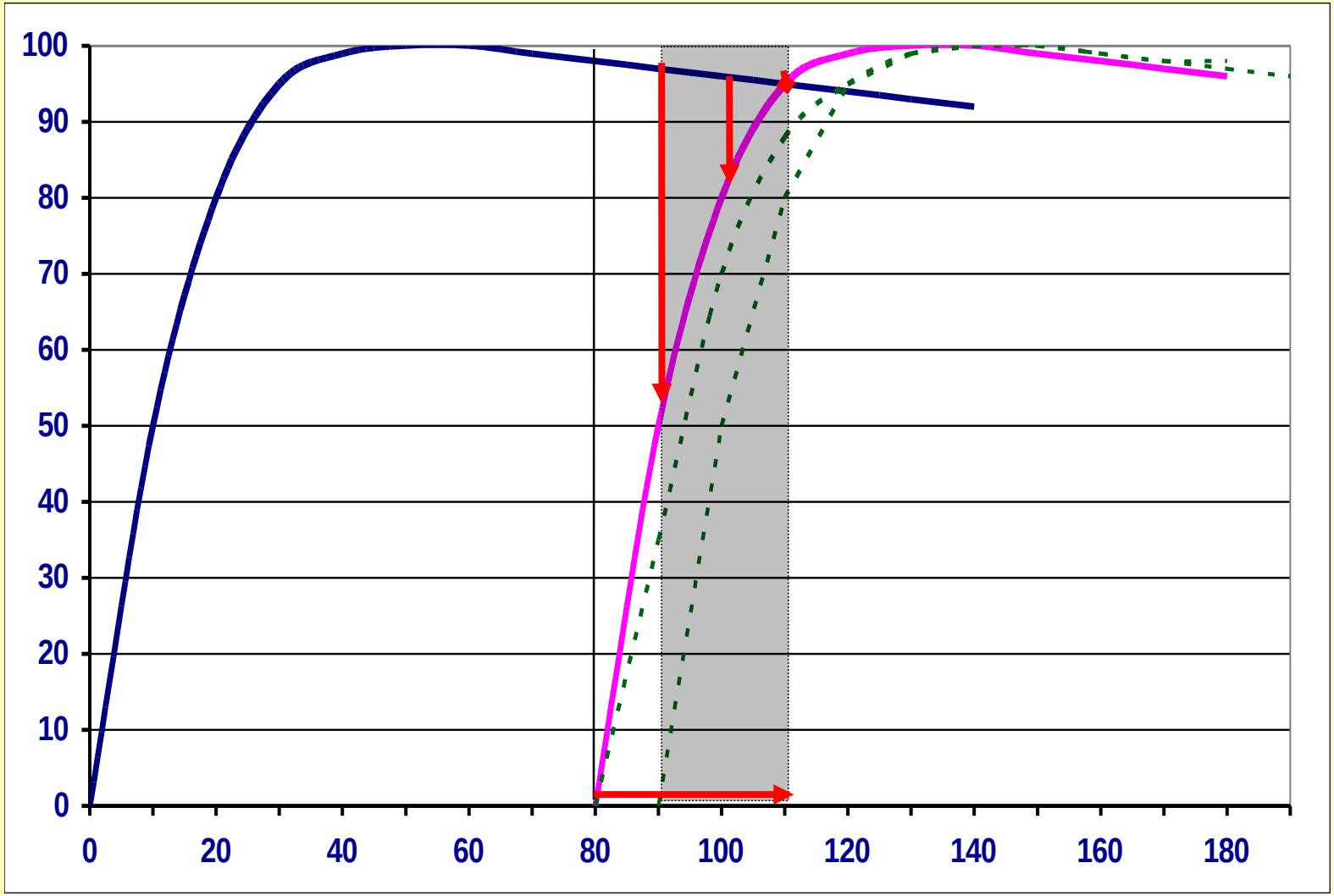
Typical Acceleration Curve



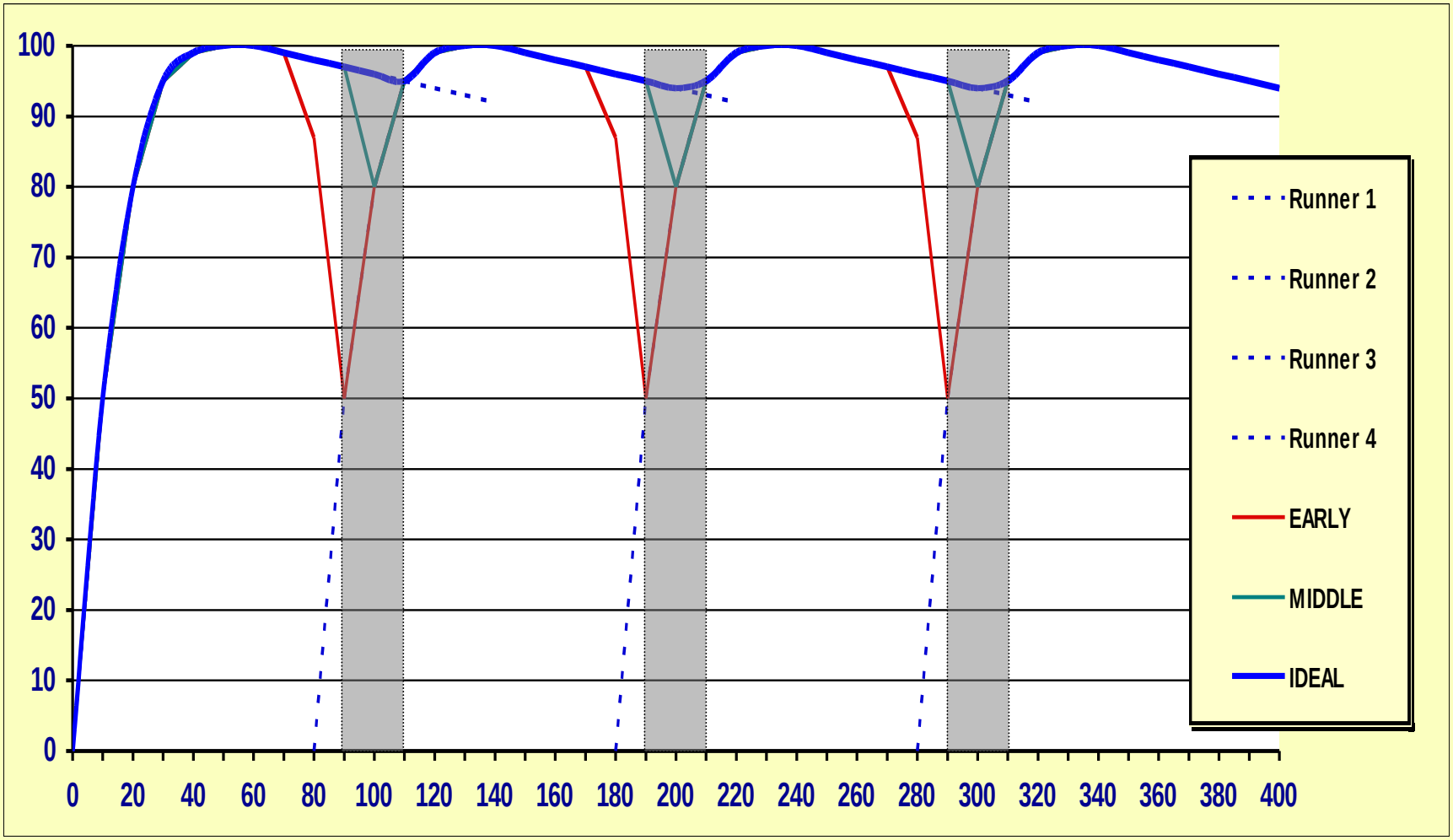
4x100 - Entire Race



Baton Speed in Exchange Zone



Ideal Baton Speed

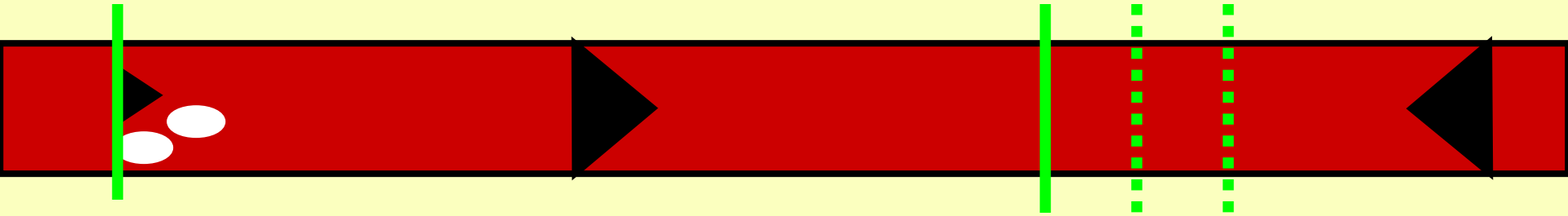


The Effect of a Later Pass

2 Cardinal Rules of the Relay

1. Outgoing runner always sets up at the ***very beginning*** of the Acceleration Zone.

2. The baton exchange should occur ***as late as safely possible*** in the zone.



Acceleration Zone

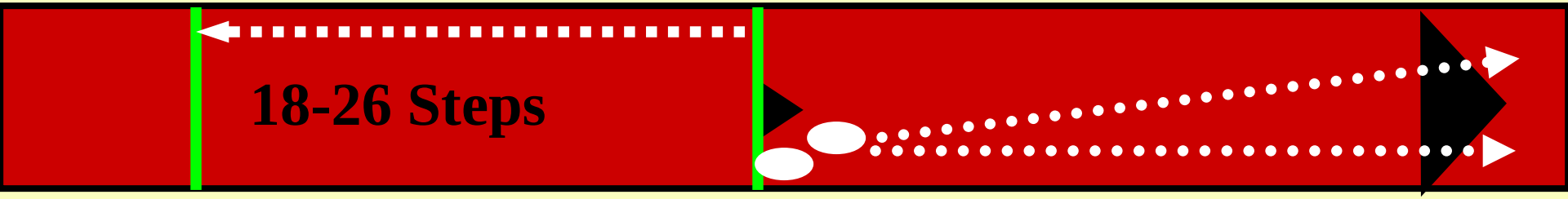
Exchange Zone

Determining When to “Go”

•Measure 18-26 heel-toe steps back from the start of the Acceleration Zone & mark spot.

•This point varies so that runners mesh at the proper point in the Exchange Zone. This is the **ONLY** variable in relay placement

•Outgoing runner leaves as incoming runner hits the “Go” mark.



“Go” Mark

Acceleration Zone

The Outgoing Runner

- May stand or crouch with feet pointing down the track, left foot forward--right foot back

The Outgoing Runner …continued

- Always lines up on the outside of lane*
- Starts with confidence when incoming runner hits “Go” mark
- Accelerates smoothly and powerfully
- Extends soft, steady hand on verbal or visual cue
- Grasps baton **after** it is placed in his/her hand
- Never looks back!

The Incoming Runner

- Must push through the zone & catch outgoing runner, never slowing (max. speed endurance)
- Gives verbal cue at appropriate time*
- Extends baton at appropriate time
- Maintains speed in zone after pass
- Stays in lane until all other teams have completed their passes

The Psychology of Running in the Zone

- The three exchange zones are the most critical areas of the relay.

- The goal in these areas is to have minimal decrease the linear horizontal velocity of the baton.

- The incoming runner must enter the zone with the idea of catching (and even running past) the outgoing runner. S/he must realize that any slowing will result in an inferior exchange. Maximum speed endurance becomes critical. Don't relax mentally. **"Attack & push through the zone!"**

- The outgoing runner must accelerate smoothly and powerfully, without hesitation. Any interruption in the acceleration process will result in a decrease of baton velocity as the runners mesh.

Types of Relay Exchanges

- **Overhand Downsweep Pass**
  - most popular pass until after 2000
  - formerly used by all U.S. national teams
  - Advantage: supposed "Free Distance"
- **Push Pass**
  - variation of overhand, used by the USA, Jamaica, GBR
  - Advantages: less alteration of sprint mechanics
    supposed baton acceleration
- **Underhand Upsweep Pass**
  - used by Japan (and formerly France & GDR)
  - Advantages: sprint mechanics maintained
    safe and easy

Disadvantages of the Overhand Downsweep Pass

- Proper sprint mechanics are significantly altered
- A good pass requires exact timing
- More chance the baton will be dropped
- More chance the initial pass attempt will be missed
- The concept of "Free Distance" is flawed

The Myth of Free Distance

- Gains made through lean and full arm extension are more than offset by slowing due to altered sprint mechanics

The Myth of Free Distance …continued

- Since the **overhand pass cannot occur without free space**, it is necessarily manufactured by the incoming runner by decreasing velocity in the most critical juncture of the race.

Advantages of the Upsweep Underhand Pass

- Proper sprint mechanics are maintained, ensuring smooth acceleration and minimal deceleration of the baton in the zone.

Advantages of the Upsweep Underhand Pass

- Missed initial attempt doesn't break sprint rhythm
- Doesn't require exact timing or precise spacing
- Palm down hand is a better target
- **Disadvantage:** "**The Shrinking Baton**"
  -must be rotated up in hand

How Far Does Each Runner Run?

	Exchange Point	Accel.	Running w/Baton	Total Meters
1st Leg	Mid-Zone 3/4 - Zone	0 0	100 105	100 105
2nd Leg	Mid-Zone 3/4 - Zone	20 25	100 100	120 125
3rd Leg	Mid-Zone 3/4 - Zone	20 25	100 100	120 125
4th Leg	Mid-Zone 3/4 - Zone	20 25	100 95	120 120

Personnel and Placement Considerations

- **1st Leg**: good starter, good turn runner, trouble receiving pass, shorter, fastest (?)
- **2nd Leg**: good baton handler, taller, lefty, well-developed speed endurance, faster than 3rd leg (?)
- **3rd Leg**: good baton handler, good turn runner, shorter, well-developed speed endurance, slower than 2nd leg (?)
- **4th Leg**: not necessarily fastest, aggressive, resilient, handles pressure well, possibly slowest (?)

Teaching & Practicing the Relay

- **Progression for teaching the pass mechanics**
  1. Stationary with receiving hand back
  2. Stationary with arm swings & verbal cue
  3. Jogging with (and w/o) verbal cue
  4. Staggered sprinting with (and w/o) verbal cue
- **Practicing the exchange**

  Must simulate racing speed to be accurate

  -use spikes

  -have adequate run-in

  Practice 1st and 3rd exchange together on same turn, and then practice 2nd exchange (maybe on another day)
- **Coaching points**

  Warm-up with batons

  View from a distance

  Vary lanes and conditions

  Time the baton through the X-zone to determine efficiency

Wrap-Up

Review Pop Quiz Answe
Would you change
now?

Re
don’t be afraid to try
s
g new!