

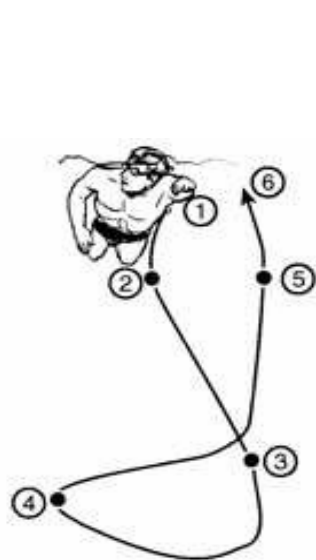
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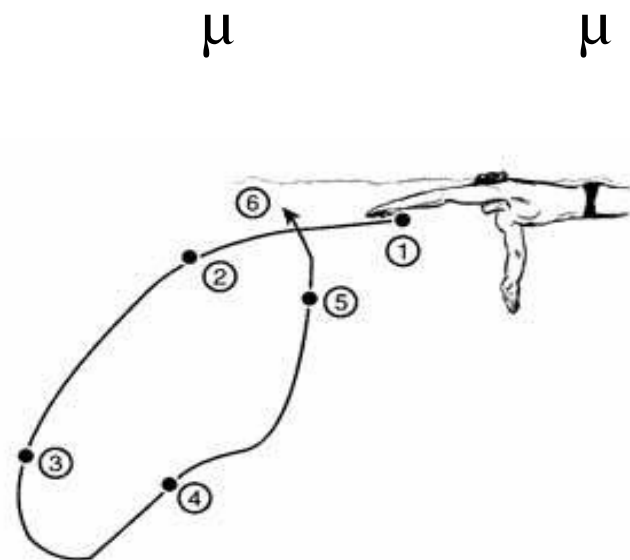
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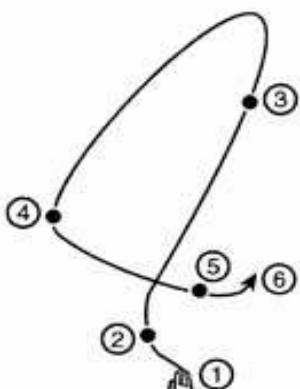
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Front view



Side view



Underneath view

- 1-2 Entry and stretch
- 2-3 Downsweep to catch
- 3 Catch
- 3-4 Insweep
- 4-5 Upsweep
- 5-6 Release and Exit

- 1-2. (μ)
- 2-3. -
- 3. μ
- 3-4. - μ
- 4-5. -
- 5-6.

μ

μ

μ

μ



Figure 4.13 A stroke pattern for the front crawl drawn relative to the swimmer's moving body.

Figure 4.1 Typical stroke patterns for the front crawl stroke from front, side, and underneath views. These patterns were drawn from data provided by Tom Jager, world-record holder for the 50 m freestyle.

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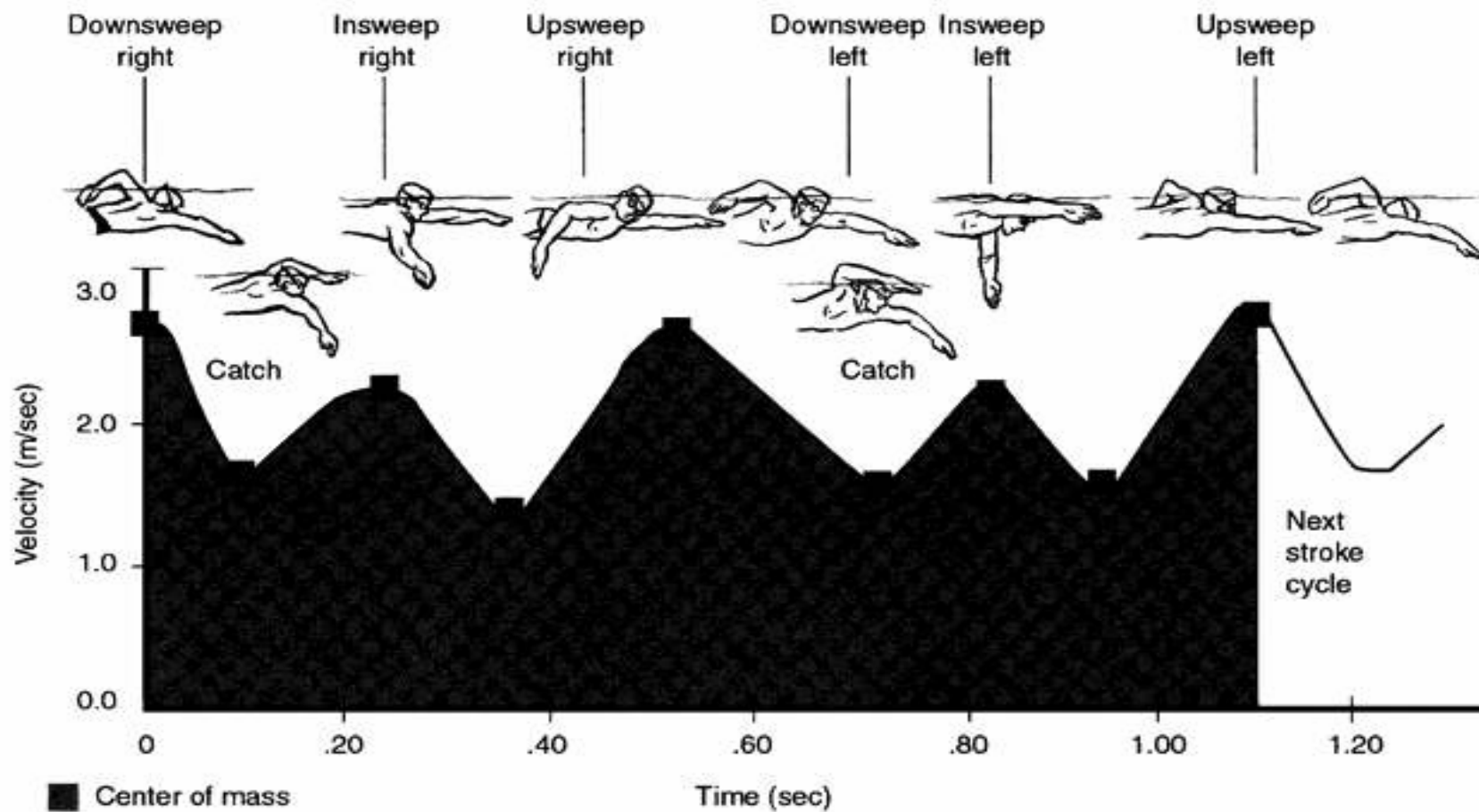


Figure 4.2 A forward velocity tracing for the front crawl stroke. The subject is Francisco Sanchez, world short course and NCAA champion in the 50 and 100 m freestyles.

μ μ

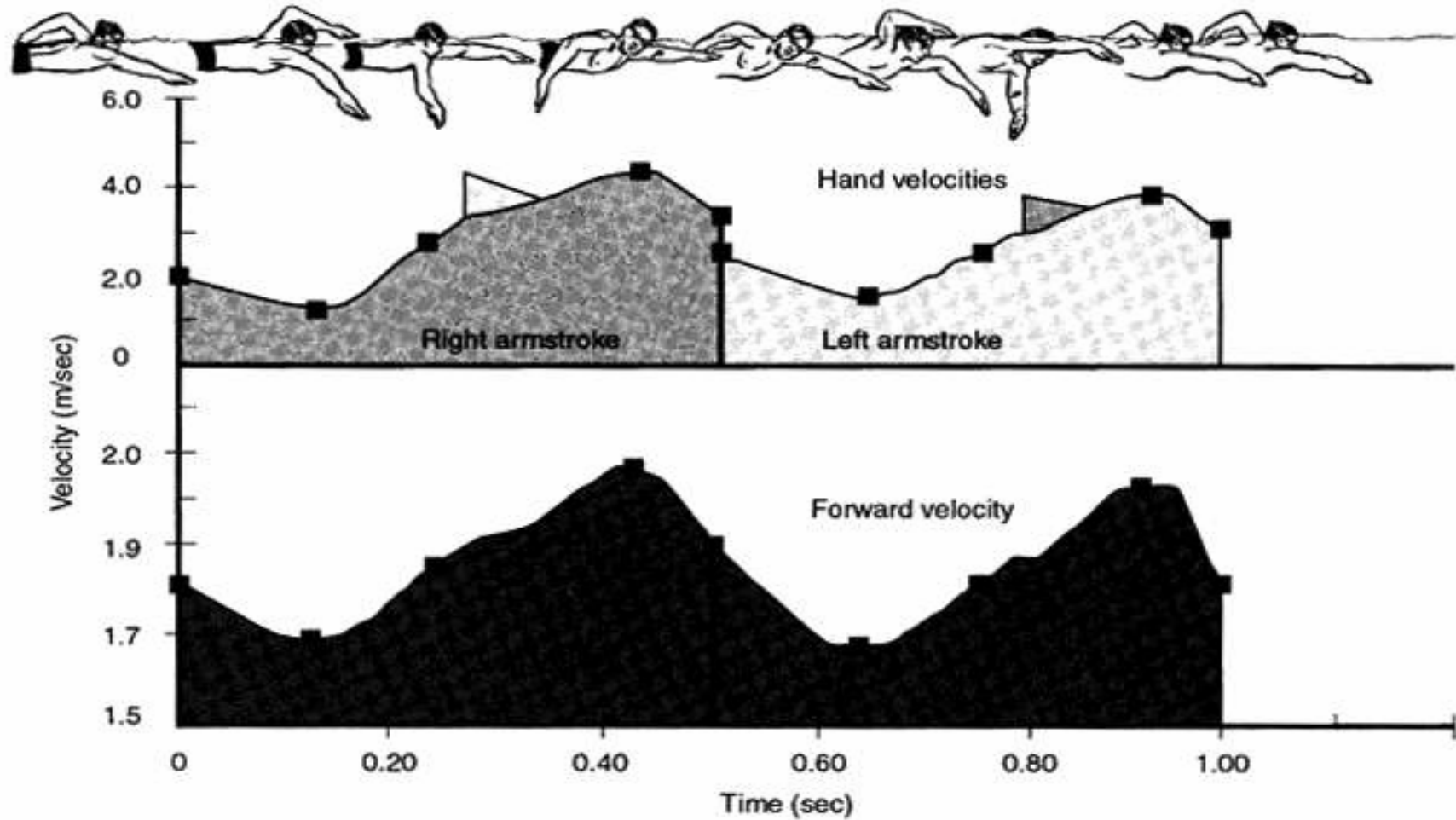


Figure 4.4 A one-peak forward velocity pattern for the front crawl stroke.

μ μ

(μ)

μ

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μ

μ

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μ

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μ μ

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μ

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5.1

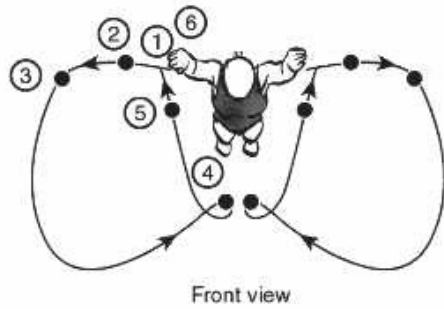
5.3

μ

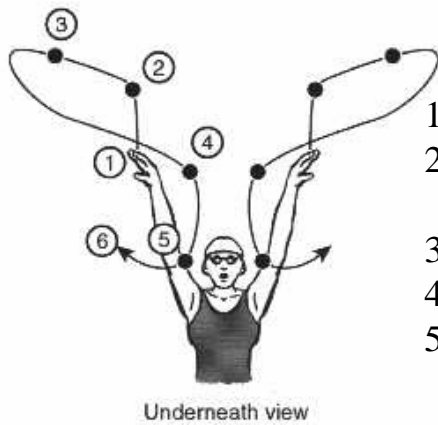
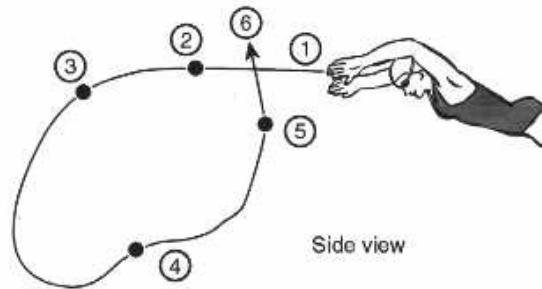
μ

μ

μ



- 1-2 Entry and stretch
- 2-3 OutswEEP
- 3 Catch
- 3-4 InswEEP
- 4-5 Upsweep
- 5-6 Release and exit



- 1-2. μ
- 2-3.
- 3. μ
- 3-4. (μ)
- 4-5. ()
- 5-6.

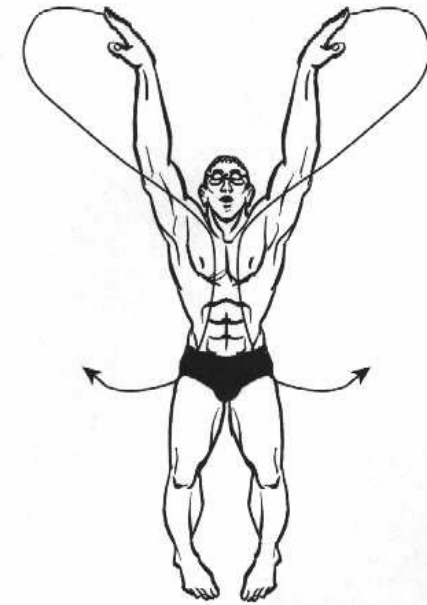


Figure 5.3 An underneath view of a stroke pattern for the butterfly drawn relative to the swimmer's moving body.

Figure 5.1 Front, side, and underneath views of Mary T Meagher's stroke patterns for the butterfly.

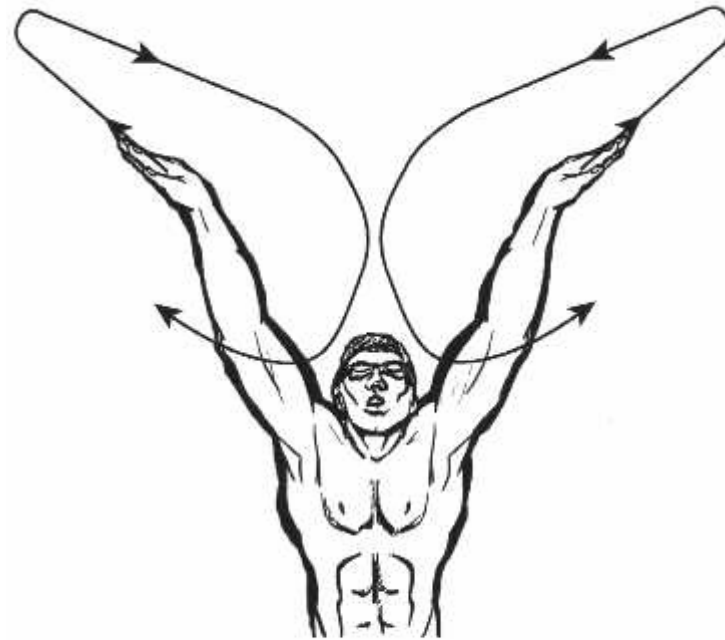


Figure 5.2 An underneath stroke pattern of butterfly where the hands are brought together under the body.

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μ

(μ)

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μ

(μ)

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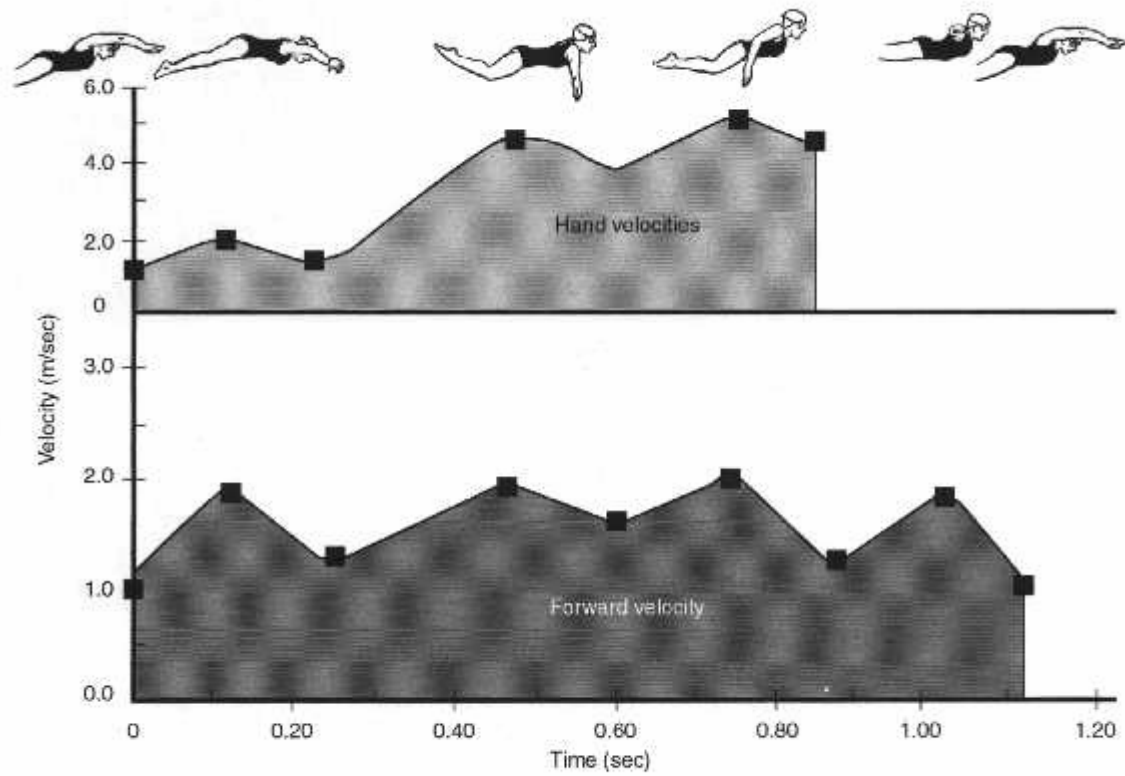


Figure 5.4 Hand and body velocity graphs for Mary T. Meagher during one butterfly stroke cycle.

μ μ

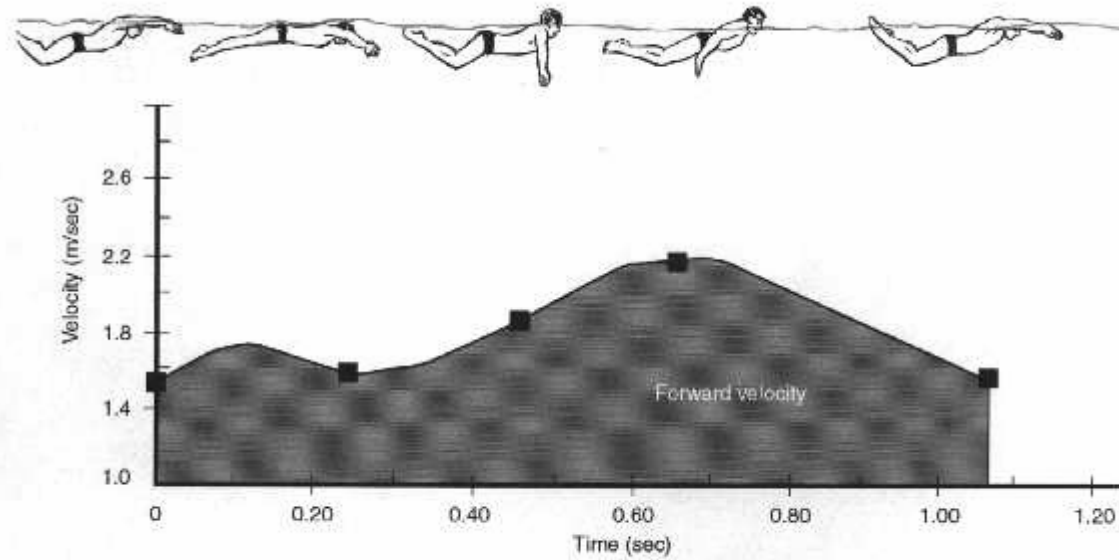
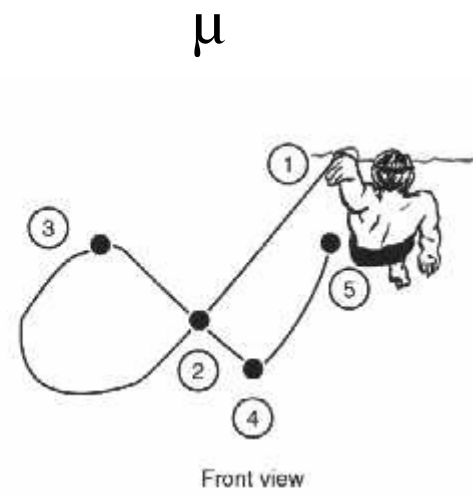
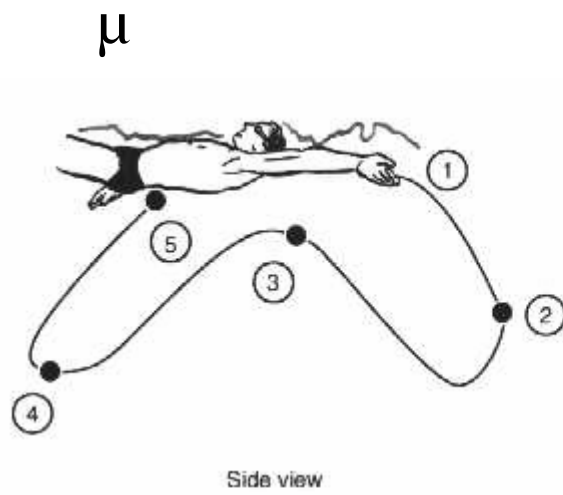


Figure 5.7 A velocity graph showing a one-peak acceleration pattern.



1-2 First downsweep
 2-3 Catch and first upsweep
 3-4 Second downsweep
 4-5 Release and exit

1-2: -
 2: μ
 2-3: (μ) -
 3-4: () -
 4-5:

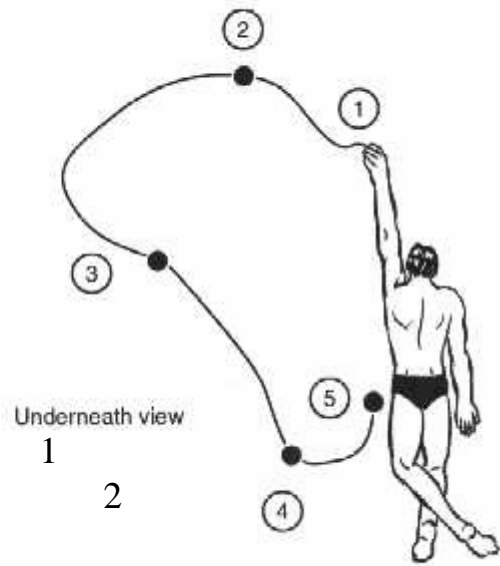


Figure 6.1 Side, front, and underneath views of the stroke patterns for a two-peak backstroke.

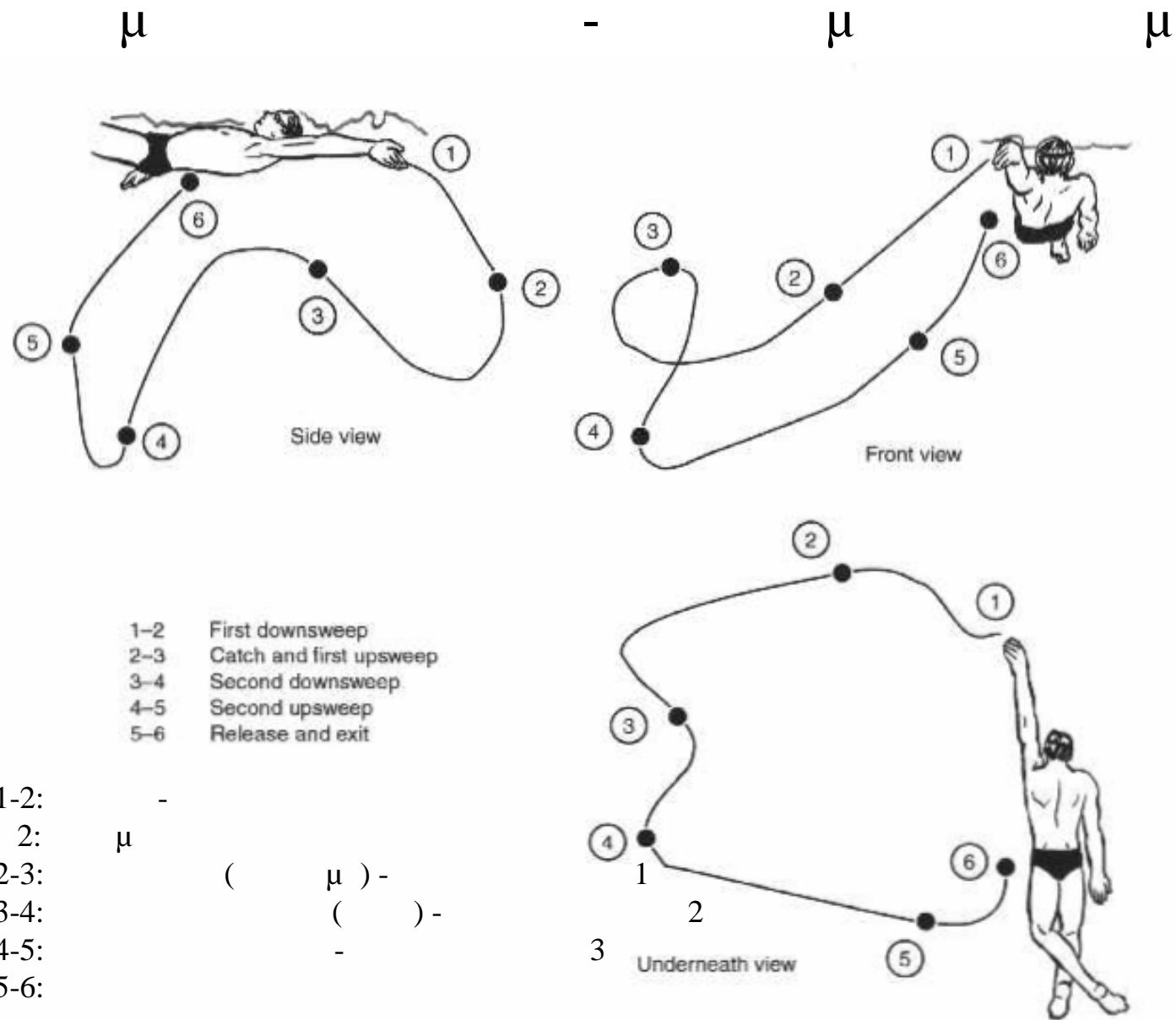


Figure 6.2 Side, front, and underneath stroke patterns for a three-peak backstroke.

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2-3:

(μ)

μ

μ

()

3-4:

()

μ

μ

(μ)

-

μ

μ

4-5:

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μ

μ

-

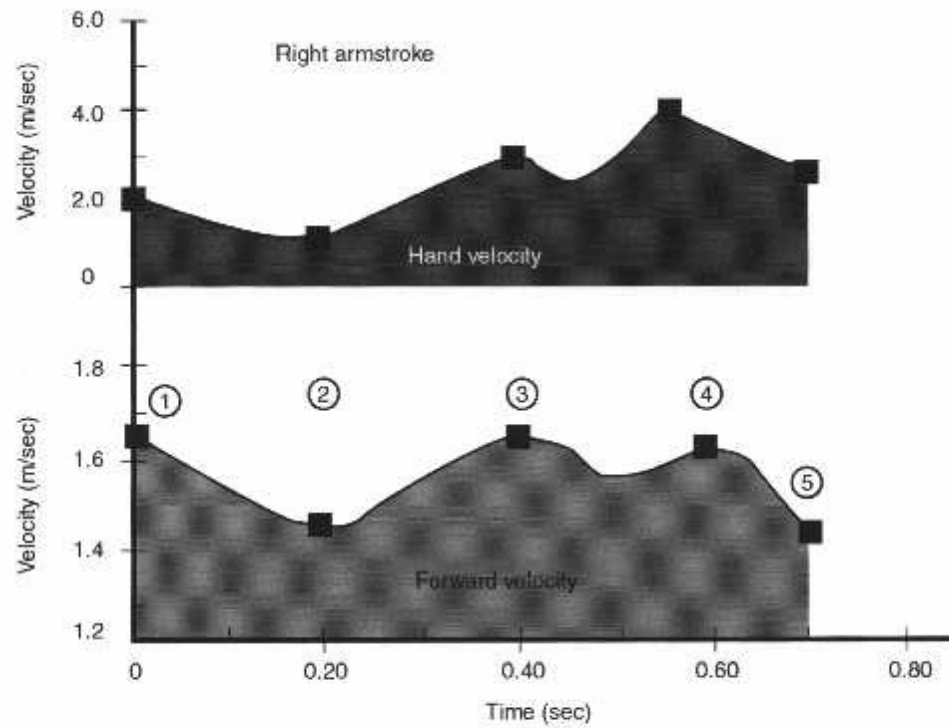
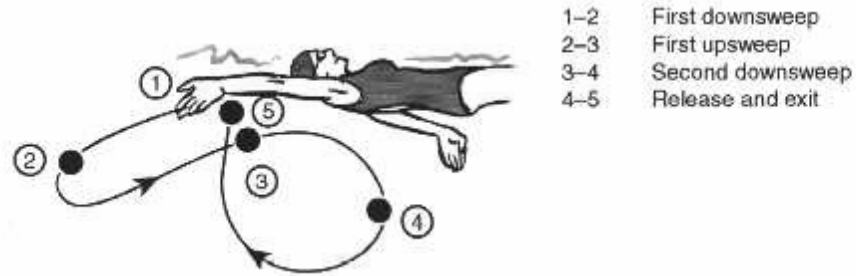
 μ 

Figure 6.3 Forward velocity and hand velocity graphs for Theresa Andrews, a member of the 1984 U.S. Olympic swimming team. She uses a two-peak propulsive style.

Adapted from Luedtke 1986.

μ - μ (μ)

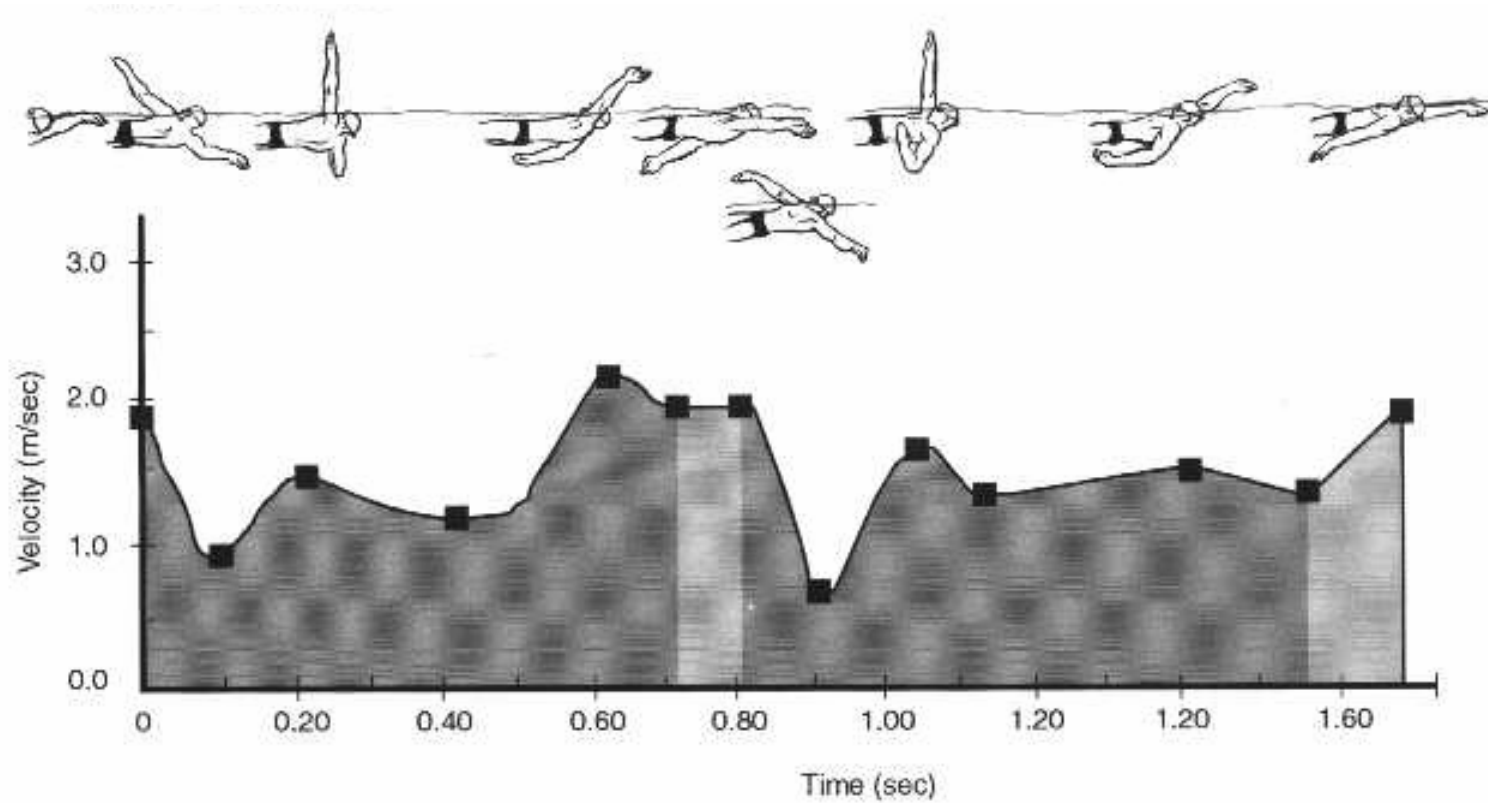


Figure 6.4 A forward velocity graph for backstroke swimmer Martin Lopez-Zubero, former world record holder in the 200 m backstroke.

Adapted from Cappaert, 1993.

(μ)

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μ

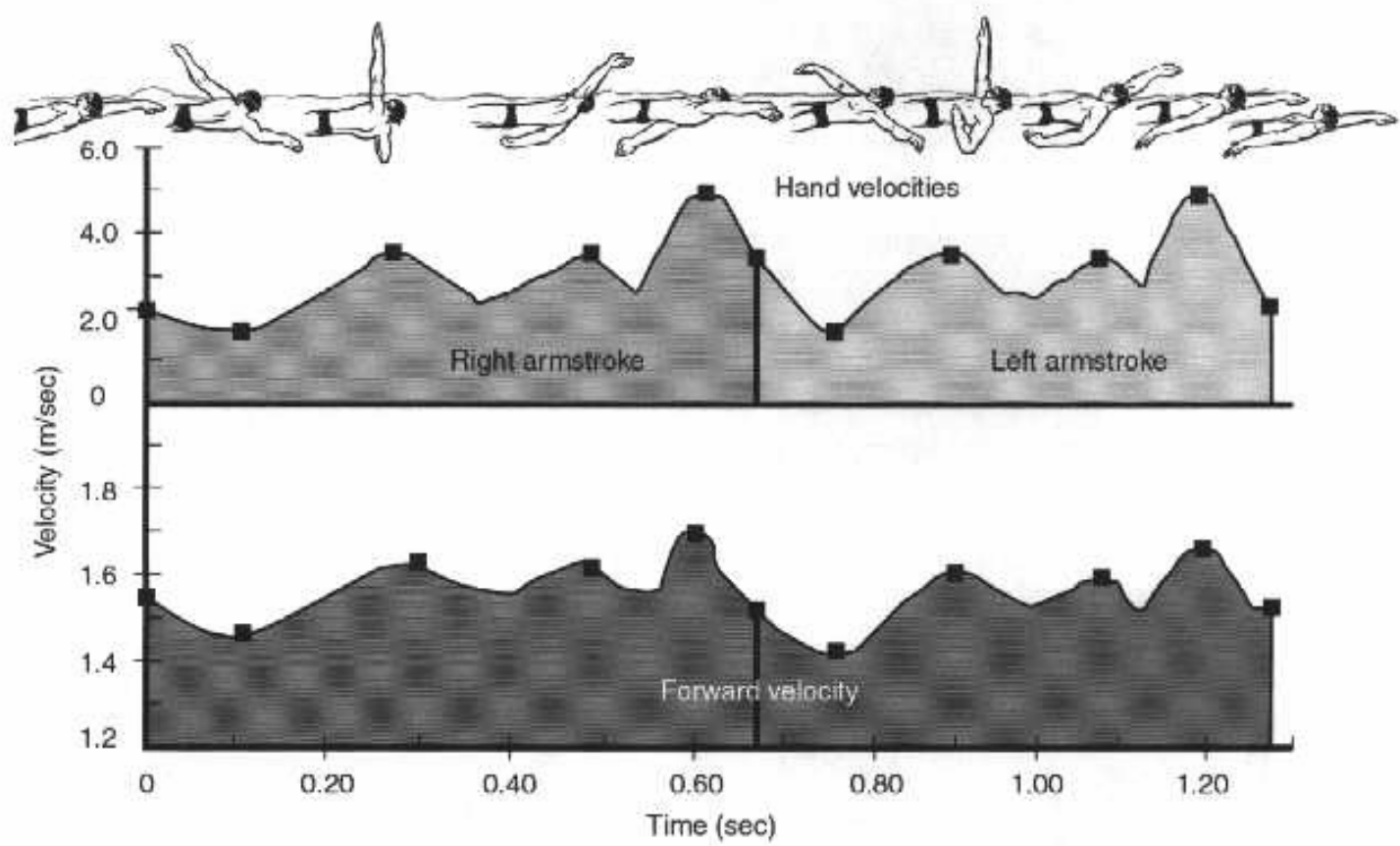


Figure 6.5 Ideal forward velocity and hand velocity patterns for the backstroke.

μ μ - μ

- 1-2 First downsweep
- 2-3 First upsweep
- 3-4 Second downsweep
- 4-5 Release and exit

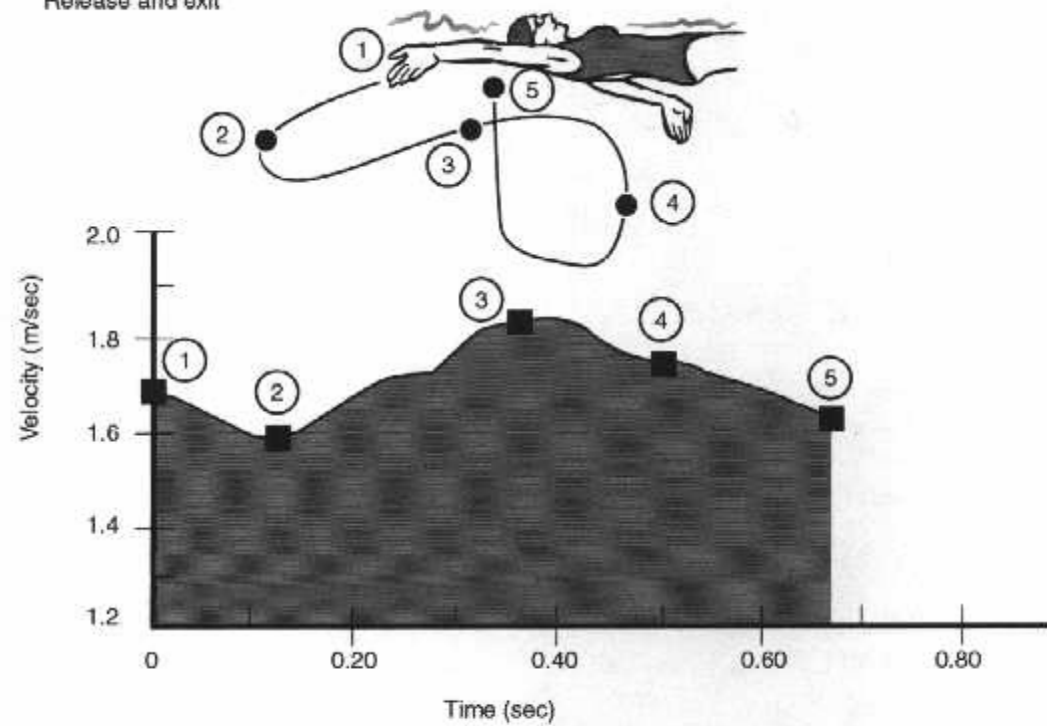


Figure 6.6 A one-peak velocity pattern for Tori Trees, member of the 1984 U.S. Olympic swimming team.

Adapted from Luedtke 1986.

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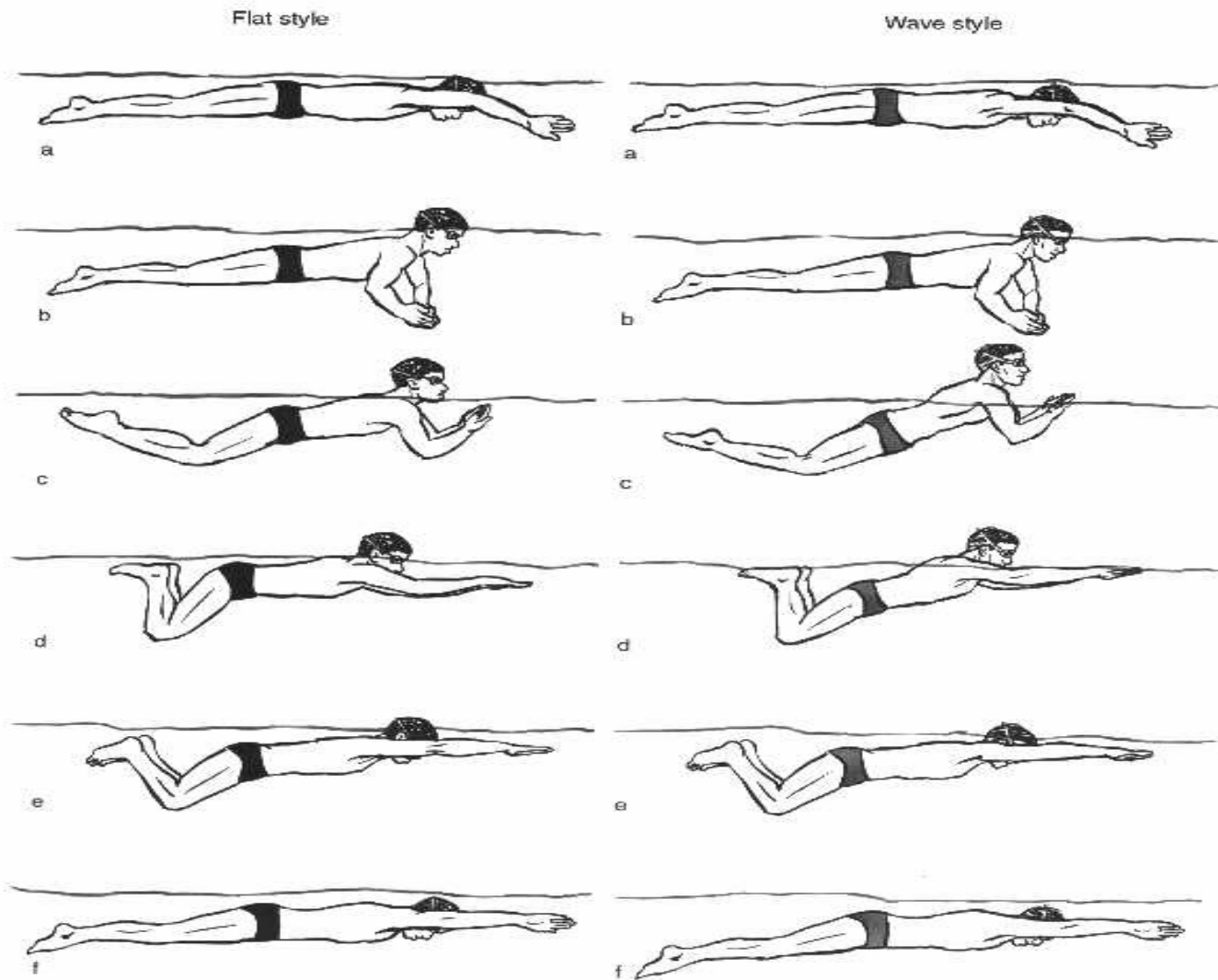


Figure 7.1 A comparison of the flat and wave styles of breaststroke.

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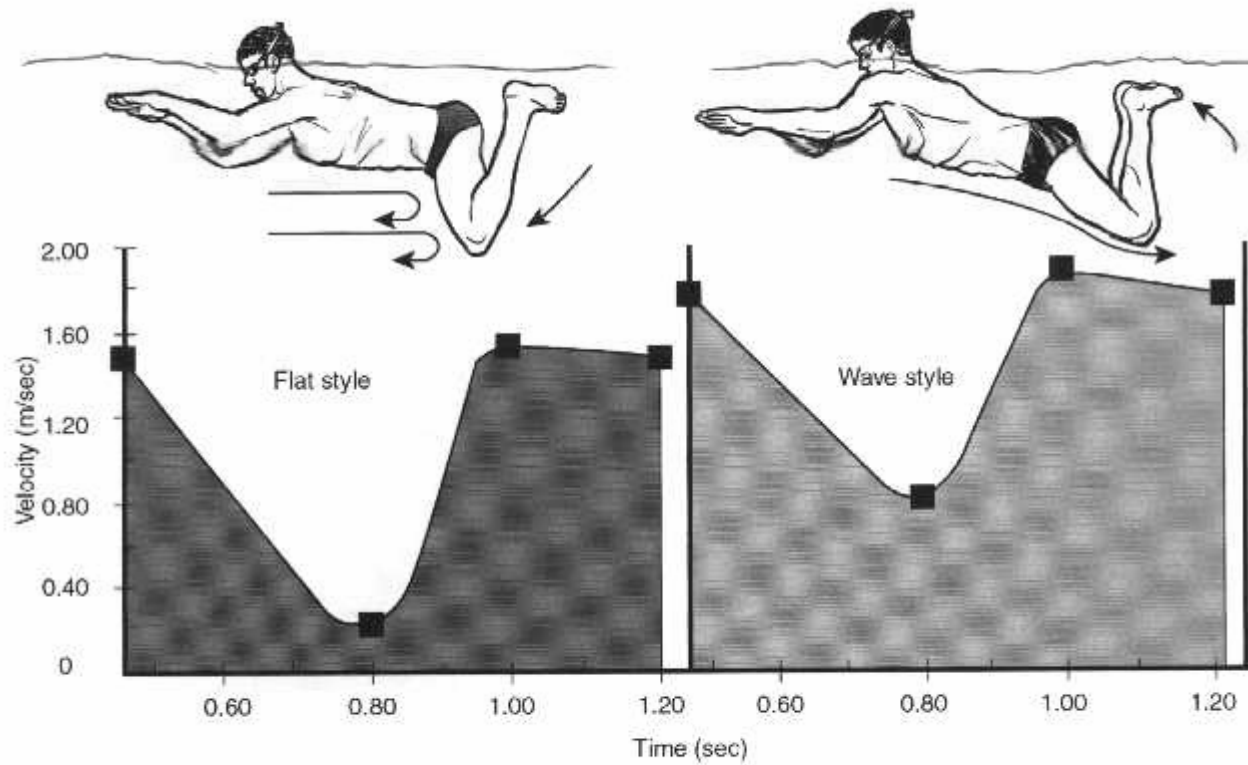
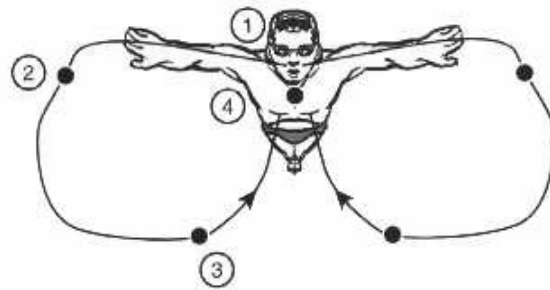


Figure 7.2 A comparison of resistive drag produced by leg recoveries in the flat and wave styles of breaststroke.

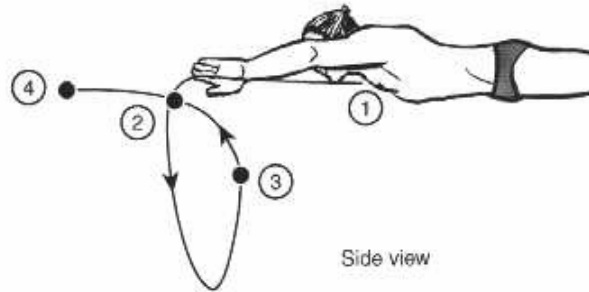
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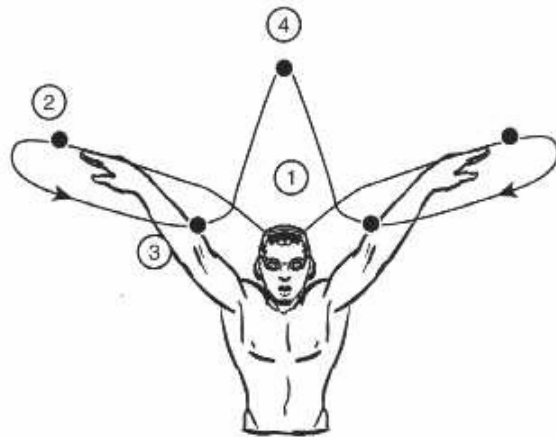


- 1-2 OutswEEP
- 2-3 InswEEP
- 3-4 Release and recovery

Front view



Side view



- 1-2.
 - 2.
 - 2-3.
 - 3-4.
- μ

Underneath view

Figure 7.3 Front, side, and underneath stroke patterns for the breaststroke.

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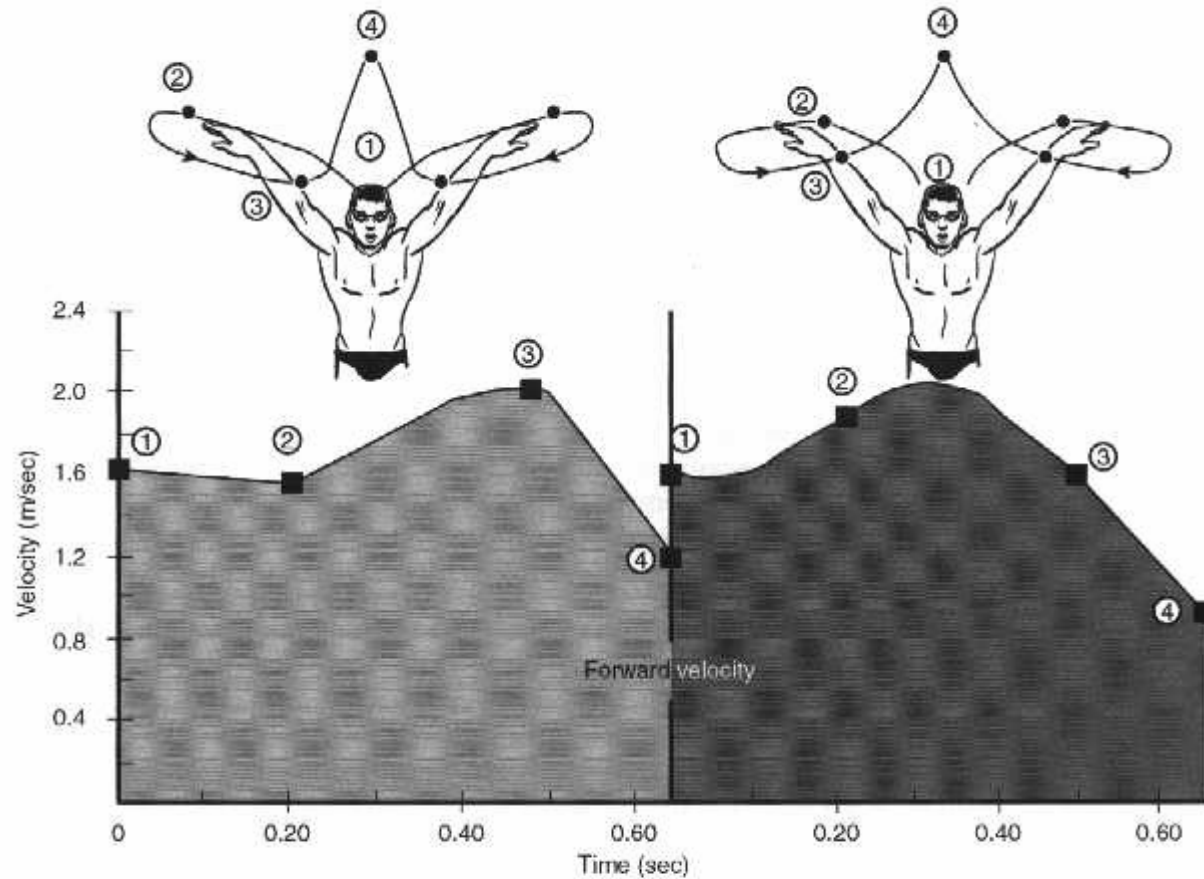


Figure 7.4 Propulsion during two types of breaststroke armstrokes. The graph on the left shows the pattern of sweeping the hands out during the outstroke and back during the instroke. The graph on the right depicts another common pattern of sweeping the hands out and back during the outstroke and in and forward during the instroke.

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(2) . μ μ

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(μ 2) μ μ

(μ μ)

μ μ .

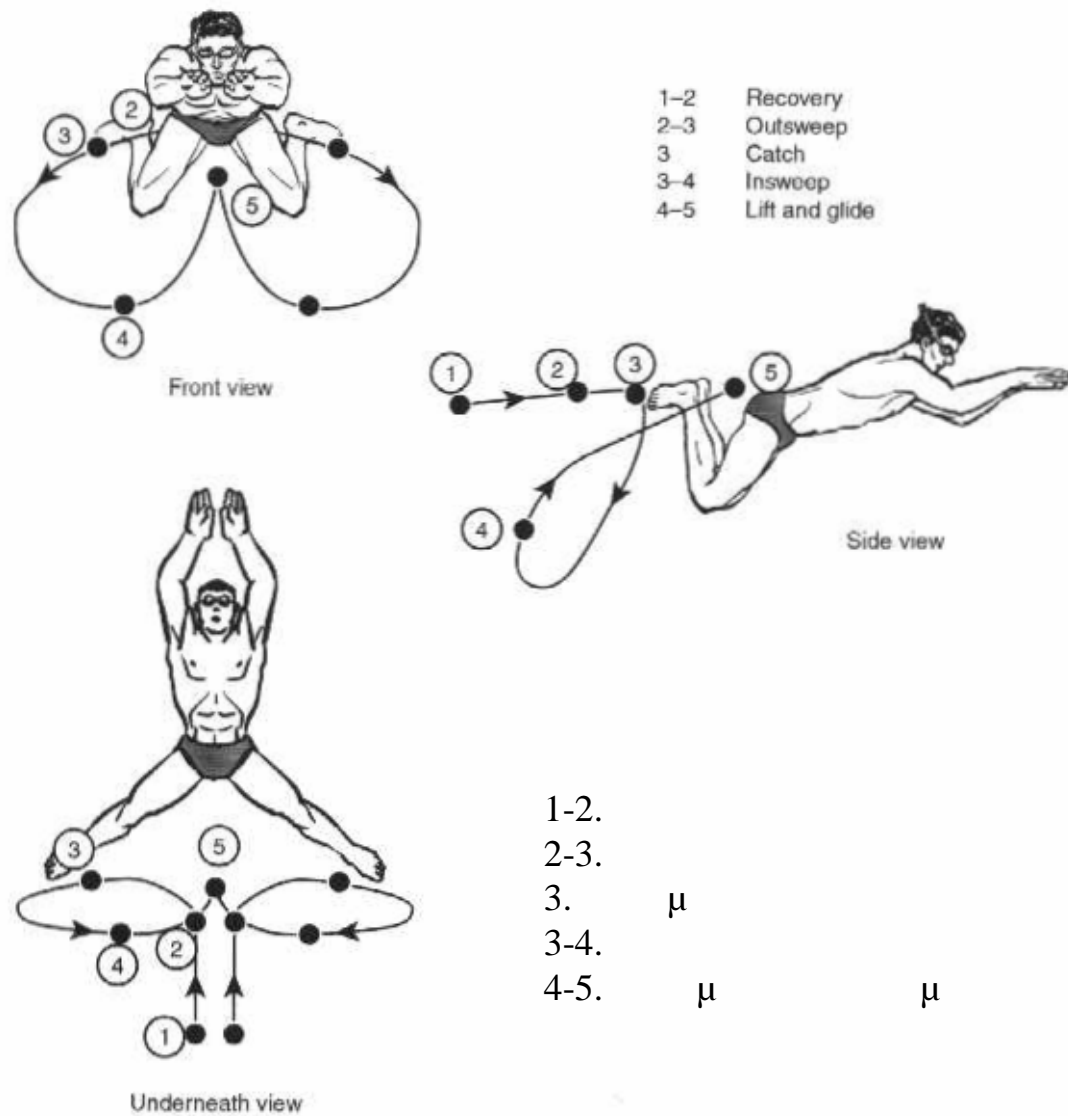


Figure 7.5 Typical side, front, and underneath view patterns of motion for the breaststroke kick. These patterns were drawn relative to the water.

— — μ

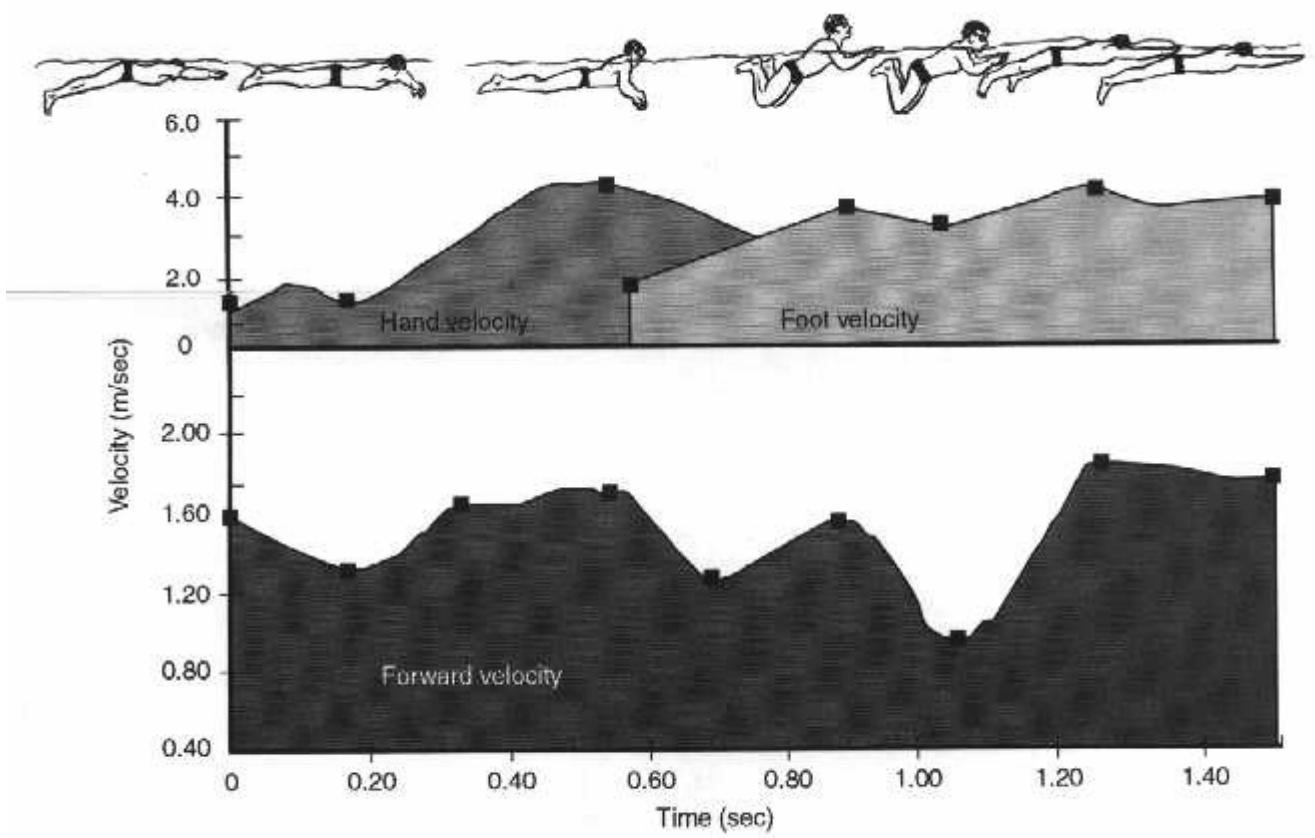


Figure 7.7 Typical forward, hand, and foot velocity patterns for breaststroker Glenn D. Mills.

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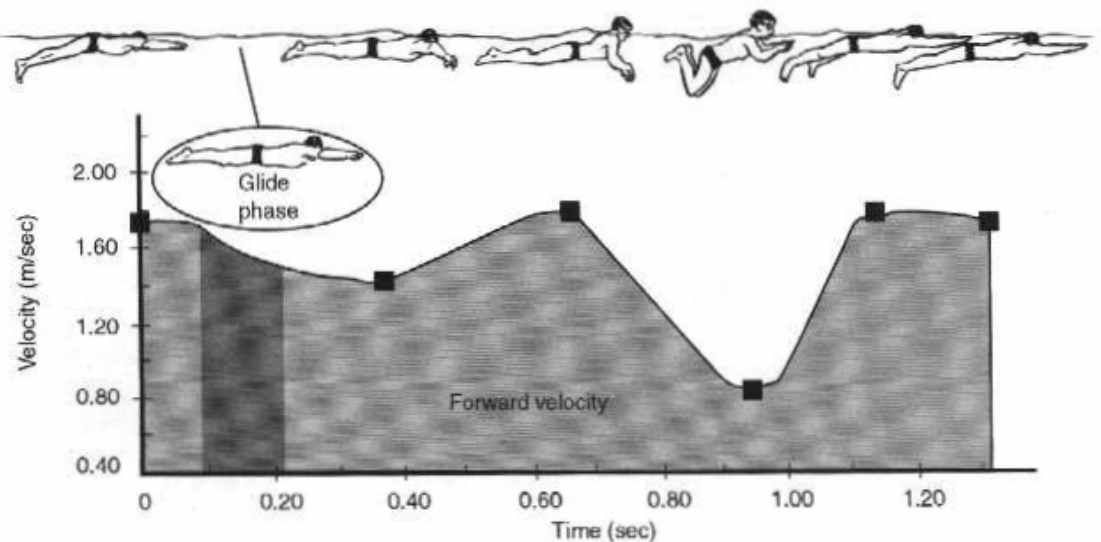


Figure 7.17 A forward velocity chart for a swimmer who is using glide timing.

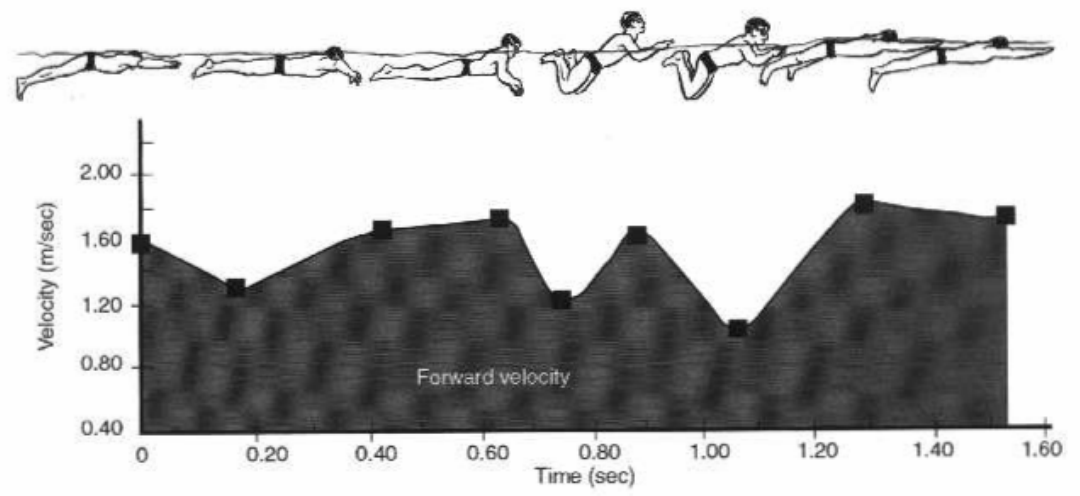


Figure 7.18 An example of overlap timing.

μ -
μ μ
(μ μ), μ μ
μ μ μ μ μ μ
μ μ μ μ μ μ
μ μ μ μ μ μ
μ μ μ μ μ μ