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Using the Pace Clock

By Scott Rabalais

(Or, How To Survive A Workout If You Hate Math)

A group of Masters swimmers are busy with a set of 10 x 100-yard swims on a 1:45 interval. During the set, the coach randomly picks out swimmers and asks them their time on the previous 100. He will likely hear a few of these responses:

- 1) Was I supposed to get my time?
- 2) Uh...1:22...no...1:29
- 3) I'm not sure...
- 4) Let's see, I left on the 50 and came in on the 17.
- 5) The same as him (or her).

Actually, while some Masters are adept at calculating times, far too many are due for a refresher course in pace clock mathematics. Simple subtraction indicates that a typical 50-year-old Masters swimmer has not experienced fourth-grade math for...well...40 years!

Why is reading the pace clock so important for swimmers? First, practice times are an exact measurement of our performance. You may try to swim faster, but the actual results of your efforts are unknown until you read the clock. It is possible, even common, that swimmers who try harder actually lose efficiency and swim slower.

Another benefit derived from noting times is the ability to set clearly-defined goals. For example, a swimmer may wish to complete 5 x 100 on 2:00, with descending times through the set. If the swimmer completes the first 100 in 1:40, then he automatically has a goal for the second 100 -- 1:39 or better.

Setting sights on the clock also allows a swimmer to maintain accurate intervals. If a swimmer wishes to complete a set of 10 x 50 on an interval of 1:00, he must read the clock and leave on the "0" (or "60") at the start of each repeat. Without eyeing the clock, the swimmer will have no idea when to leave. Or, swimmers may end up following each other, leading to a "blind-leading-the-blind" scenario. When used properly, intervals can serve as "deadlines" -- they tell us, "It's time to go!"

The Basics

In any pool, be aware of the location of the pace clocks. If clocks are positioned at both ends of a pool, are they synchronized? If you are unable to see the clocks due to poor vision, use a digital wristwatch or a smaller pace clock that can be placed at the end of your lane. In each case, make sure your timing apparatus is synchronized with the group's pace clocks. As a last resort, recruit a lane mate or coach who is "pace-clock dependable" to assist you with send off times.

Part of the difficulty of determining swim times on a pace clock is that a clock uses a 60-second unit rather than an even 10 or 100 units. So, if a swimmer is sent off on the 30-second mark and returns on the next 17-second mark, determining the swim time can be confusing. 17 minus 30? 30 minus 17? Of course, in this case, most would recognize that the finishing on the 17 is 13 seconds short of a minute of swimming, thus the time being 47 seconds. Using addition, one may add 30 seconds (time from send-off to the next minute) to 17 to equal, once again, 47 seconds.

Like it or not, basic math skills, primarily addition and subtraction, are required for using the pace clock. Unfortunately, most of us have become accustomed to using calculators and computers to handle even the simplest of mathematical tasks. Also unfortunate is the fact that most calculators and computers are not waterproof.

Learning pace clock skills may be likened to moving through various levels of difficulty, much as we did in our formative years of education. As we complete the basics of one level, we move to the next for yet another challenge.

Level I - Elementary School

Depending on the type of set or swim prescribed, using the pace clock can be quite simple or extremely difficult. The first level requires the simplest of math skills and usually can be mastered by the beginner in his or her first workout.

Straight Sets

Example: 10 x 50 yards on 1:00

Explanation:

10 - number of repetitions (repeats)

50 yards - distance of each repetition

1:00 - interval for each repetition (swim + rest)

The most basic type of interval training is the straight set. During a straight set, the distance per repetition and the interval per repetition remain constant.

In this example, the swimmer completes a 50-yard swim 10 times, leaving on an interval of 1:00. This means that if a 50-yard swim is completed in :45, a 15-second rest period will follow.

In pace clock lingo, each 50-yard swim will begin "on the top" in this set. This slogan is derived from the second hand pointing upwards to the "0" or "60" on the clock.

Fixed Rest Sets

Example: 4 x 200 yards with :30 rest

In a fixed rest set, the amount of rest following each repetition will be the same, regardless of swimming speed. In the above example, the swimmer completes four repetitions of 200 yards, resting :30 after each. This interval structure may be less demanding as it avoids the "deadline" of a straight-set rest interval.

Timed Swims

Example: T-20

While most swimmers chart progress through a workout by measuring distance, an alternative way is to measure with time. Choose a specific time period and swim continuously for that duration. A "T-20" would mean swimming continuously for 20 minutes.

Another example is 4 x 5:00 swims with 1:00 rest. In other words, swim for 5:00, four times, resting 1:00 after each. A coach or a visible pace clock can assist in determining when the 5:00 period has ended.

TEST #1: In a fixed rest set of 5 x 100/:15 rest, the swimmer complete the first 100 when the clock reads "53." When does the swimmer leave for the next 100? (Answer below.)

Level II - High School

Once the basics of elementary school are mastered, the swimmer moves to slightly more complex pace clock skills involving memory work, and, occasionally, some tricky addition and subtraction.

Advanced straight sets

Example: 12 x 50 on :55

Like the straight set in Level I, the swimmer leaves each 50 on a fixed interval. But unlike the previous example of an interval of 1:00, the swimmer leaves on a different send-off time each repeat. For this set, the swimmer leaves "on the top" for the first 50, on the 55 for the next, then the 50 and so on. The swimmer can simply subtract five seconds from the previous send off time to determine the current send-off time. Particularly tricky on this type of set is determining the swim time, since the swimmer is leaving on a different number with each repeat.

Variable rest sets

Example: 4 x 150, rest :30, :20 and :10

In a set of 4 x 150, there are three rest periods within the set. In a variable rest set, the amount of rest between repeats varies. In the above example, the rest decreases through the set. Attempting to swim the same time on each 150 while the rest decreases can be a challenging set. An alternate way to devise a variable rest set would be to increase the amount of rest through the set.

Broken Swims

Example: Broken 200 as 50-25-50-25-50, resting :15 per break

Broken swims are often race distances divided into smaller increments with rest periods after each segment. In the above example, a 200 is divided into a series of 50s and 25s. With four rest breaks at :15 apiece, the total rest within the swim is 1:00. To obtain the actual 200 time, subtract 1:00 from the total swim + rest time.

TEST #2: In a set of 8 x 50 on :50, what is the clock's second-hand position when leaving for the sixth repetition?

Level III - College

Level III sets are more demanding than those practiced in "high school," and most require keeping track of swim and varying interval times simultaneously. Keep a few aspirin on deck in case of headaches.

Descending Interval

Example: 6 x 100, starting on 2:00 and descending the interval :05 per repeat

In this example, the first 100 is swum on a 2:00 interval, the second is on 1:55, the third on 1:50, and so on. Swimming at an even pace through the set will result in decreasing rest by :05 per 100. Here is the breakdown of send-off times:

Rep # = repetition number

Send-Off = repetition starting time, cumulative time of set

SHP = second-hand position

Int = interval, swim + rest duration of repetition

Rep	S-O	SHP	Int
1	0:00	0	2:00
2	2:00	0	:55
3	3:55	55	1:50
4	5:45	45	1:45
5	7:30	30	1:40
6	9:10	10	1:35

Ascending Intervals

Example: 8 x 25, starting on :30 interval, ascending by :05

An ascending interval set is the opposite of a descending interval set. The first 25 is on :30, the second on :35, then :40, etc.

Pyramid intervals

Pyramid intervals are sets that combine descending and ascending intervals. For example, a pyramid set might consist of 7 x 150 on intervals of 2:20, 2:30, 2:40, 2:50, 2:40, 2:30 and 2:20.

TEST #3: Swimmer Bob is attempting a set of 6 x 75 on a descending interval. The interval for the first 75 is 1:30 and descends by :05 each 75. On the fourth 75, he swims the 75 yards in 1:00. How much rest will he have before leaving on the next 75?

Level IV - Graduate School

If unsure of how to manage Level IV intervals, just ask the Rhodes scholar in the lane next to you.

Descending interval/Descending times

Example: 50s starting on 1:00, descending interval by :01 per 50 until failure.

Also, descend times by :01 per 50.

This challenging set involves reducing the interval until the swimmer is unable to complete a 50 within the allotted interval time. The first 50 would be on a 1:00 interval, followed by a 50 on :59, then :58, :57, etc. It is helpful to determine the send-off times in advance and to post them at the end of your lane. Even more challenging is figuring your time on each 50 within this type of set, attempting to descend times evenly through the set.

Ladders

Example: 300, 275, 250, 225, 200...25 on :35 per 25 yards

Some ladders can be easily followed (300 on 6:00, 200 on 4:00, 100 on 2:00). But others are not so easy. In the above example, the stated interval is "35 seconds per 25 yards." This means that for 300 yards, the interval would be 12 lengths x 35 sec = 420 seconds, or 7:00. Then, the interval for the 275 would be 11 x 35, or 385 seconds, or 6:25. Rather than multiplying for each repeat, simply subtract 35 seconds from the previous interval. But don't forget your previous send-off time. Truly boggle the mind by attempting to maintain a pace of 25 seconds per 25 throughout the set. Go figure!

TEST #4: Fast Mary's goal is to complete a ladder, starting at 400 yards and decreasing by 50 yards each swim until she completes a 50-yard swim (400, 350, 300...50). Her interval is :45 per 50. How long will it take her to complete the set, assuming she swims the final in exactly 45 seconds?

Like any other skill, using the pace clock takes practice in order to master. Don't give up and don't rely on others to do the work for you. In the long run, you'll be a smarter and more motivated swimmer if you understand the pace clock. Even if you do hate math.

Test Answers

#1) On the 8

#2) 10

#3) 15 seconds

#4) 27 minutes