

# A Protocol for Establishing Critical Power in Running

A working draft from Stryd

## 1. Update

We recently published a critical power testing protocol for running in September 2015 (<https://goo.gl/eJ0xR0>). Since then, we have been working with coaches and athletes to refine the testing protocol. The following major changes have been made:

1. The original 3-9 minute test is replaced by the following 3-6 lap test. More specifically, the 3-min maximum effort run is replaced by a 3-lap, 1,200-meter maximum effort run, and the 9-min maximum effort run is replaced by a 6-lap, 2,400-meter maximum effort run. The primary reason behind this change is that, the original 3-9 minute test requires accurate distance measurement during the test. It is a known challenge for GPS watches/phones to provide accurate distance measurements while on a track. The new 3-6 lap test relies on the generally-accurate running track distance and the measurement of time, thereby avoiding dependence on GPS accuracy and allowing runners to pace themselves based on a visible destination instead of a duration.
2. We introduce a 2-lap, 800-meter easy-pace run during the initial warm-up phase. This helps athletes perform a better warm up, and establishes a power-pace relationship at low-speed zones.
3. The refined critical power testing protocol has been integrated into the Stryd mobile app (iOS and Android). It enables runners to perform the critical power test and establish their performance baselines.

At this moment, we are working with coaches and athletes to test the refined protocol. We will provide more testing results when become available.

## 2. Stryd Mobile App

The 3-6 lap critical power testing protocol has been integrated into the Stryd mobile app (both iOS and Android). Please carry your smart phone and use the Stryd mobile app to guide the test on a track. After the test, the Stryd Mobile App will compute your critical power automatically, and the results will also be shown on the Stryd PowerCenter. Please download the Stryd iOS mobile app from Apple's TestFlight. Please download the Stryd Android app from the Google Play Store.

**Stryd mobile app tutorial video: <https://youtu.be/ZE3VEcs7KXw>**

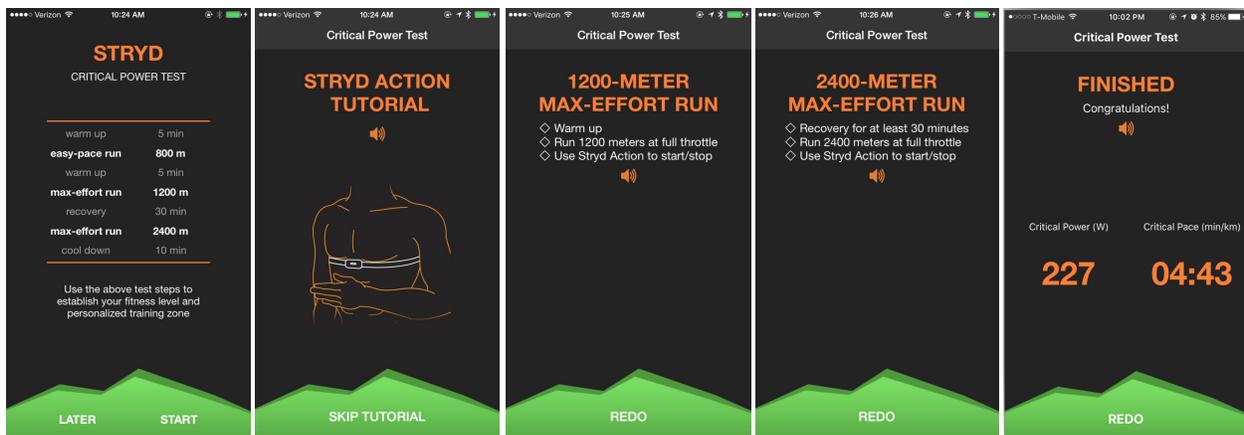


Figure 1. Stryd mobile app with built-in support for the critical power testing protocol.

### 3. Protocol

Table 1 shows the Critical Power Protocol, which was designed with two goals in mind:

1. It should accurately and consistently determine the critical running power baseline.
2. It should be easy to follow and interfere minimally with an athlete's ongoing training schedule.

Activity	Time or Duration	Description
Warmup	5 minutes	Walking or light jogging to increase muscle and core temperatures. Next, do five 100-meter strides at approximately 80% maximum effort to enhance the blood circulation and ready your muscles for intense use.
Easy-pace run	800 meters	2 laps on a 400-meter track, please use the innermost lane. Run at an easy pace, such that you can comfortably maintain conversation.
Warmup	5 minutes	
Maximum-effort run	1,200 meters	3 laps on a 400-meter track, please use the innermost lane. Run at a consistent pace throughout the test, but so that you are nearly exhausted at the end of the test. Therefore, do not start from an all-out sprint, because that would result in an inconsistent pace during the run.
Recovery	30 minutes	Throughout the 30-minute recovery period, the runner should walk or jog slowly. Right before the end of the 30-minute recovery period, do a few light 100 meter strides to prime the body for the second maximum distance effort.
Maximum-effort run	2,400 meters	3 laps on a 400-meter track, please use the innermost lane. Run at a consistent pace throughout the test, but so that you are nearly exhausted at the end of the test. As was the case for the three-lap run, it is important to maintain a consistent pace during this run instead of dramatically changing pace (and effort) during the run.
Cool down	10 minutes	The athlete should follow his or her normal post-workout cool-down routine. It is fine to spend more than 10 minutes cooling down, if the athlete prefers.

Even though the Stryd mobile app currently only supports the refined 3-6 lap based critical power test, you are welcome to use whatever method you think most appropriate to determine your power zones. Our goal with the critical power test is to provide an easy to use and effective approach for athletes who aren't already committed to another approach.

### 4. Note

You still still be able to access the original 3-9 minute critical power protocol description via the following URL: <https://goo.gl/eJ0xR0>