

# Computrainer testing

## 1. Information displayed in the Computrainer Performance Report

### Watts

Power is defined as exerted force multiplied by distance traveled divided by the time to produce it. It is measured in watts.

### SpinScan Definition

The **SpinScan number** is defined as: Average Torque divided by Maximum Torque multiplied by 100. In essence, the SpinScan numbers represent efficiency of the muscle groups in the legs to produce power evenly through the stroke. The more efficiently you use the muscles in your legs to “pedal in circles”, the higher the SpinScan values will become and the flatter (bargraph) or rounder (polar) the SpinScan Torque Profile will become. If your legs could produce power like an electric motor, the graphs would be perfectly flat (or round) and the SpinScan values would be 100, as in 100% efficient.

### Bargraph SpinScan

The Bargraph Torque Graph is a multicolored bar graph and represents one full 360 degree pedal stroke divided into 15 degree segments, 24 in all. The first bar is the left leg at Top Dead Center (TDC) and TDC for the right leg starts 180 degrees later, or 12 bars later, in the center of the graph. The height of the bars is proportional to torque, showing road thrust in foot pounds. Paying attention to the weaker (lower) areas of the Torque Graph you can determine which muscle group(s) can best improve this weak area. Specifically training these muscle group(s) to “fill in” the weak area will thereby produce an overall “flat” SpinScan over time. A flatter Torque Profile along with higher SpinScan Numbers should equate to less fatigue for any single muscle group and improved overall endurance.

**SpinScan Numbers:** combined (average) and also separate for left and right leg.

**Power Split** displays power output differences between left and right leg in %.

**Left and Right ATA** (Average Torque Angle): displays the average point in degrees that represent efficient crank arm length usage. The **Polar SpinScan** shows a Torque Graph in a circular, or polar, pattern (what we call the peanut). The Polar version also adds ATA (Average Torque Angle), which is a visual representation of where the average torque is being applied. It represents how you use the “lever-arm” of your bike cranks. The longest, and most efficient “lever-arm” of a bicycle crank is while it is at 90-degrees from TDC (Top Dead Centre). If the muscles are firing too early or too late, ATA will indicate this. Values too high, too low, or uneven may awaken the need to have an expert coach or exercise physiologist examine what you’re doing.

### What is an Optimum SpinScan?

As a general rule, higher numbers are better than lower numbers. It has been our observation that roadies produce numbers in the 70’s to mid 80’s range, while mountain bikers may see much lower values because they spend more time standing on the pedals. Clearly, staying in the seat as long as you can while increasing the grade and eventually you will produce higher SpinScan numbers.

## 2. A word about heart rate

### **Heart rate zones (can also refer to comparative watts zones as outlined in test results):**

Using heart rate zones will improve the quality of your training, especially during the winter and should result in great improvements in your cycling speed and power during the summer. For those of you who are using these zones for the first time you will find the biggest training change is on your long rides. Long rides should be done in zone 2. However, if you are only biking once a week, then you probably should do a portion of your ride needs to be in zone 2, a portion on technique such as single leg spins and fast legs spinning in very high cadence, and a portion needs to be tempo or strength building activities.

If you are riding a couple of times a week then you will get the greatest benefit from doing your long ride in zone 2.

As an athlete's fitness level increases so does their heart rate at their anaerobic threshold. In very general terms your anaerobic threshold is the point where your body can't resist the effects of exercise and it starts to fatigue. Although this particular test is not an "anaerobic threshold test", your heart rate at the end of the test should be fairly close to you anaerobic threshold if you worked hard ☺ !! The effect of training is that, after consistent, good quality cycling training, the amount of power you will be able to produce at the same heart rate will be higher which translates into faster cycling. For example if you average watts was 160W with a heart rate of 150 BPM, then after training your new watt output would be 200W at the same heart rate of 150BPM for the same time frame. The result will show that you biked further in terms of kilometres.

### **Cycling versus running Heart Rate**

As a general guideline running heart rates are 15 beats higher than cycling heart rates.

## 3. Cycling Zones (can use heart rate or watts as indicated on results sheet)

*Zone 1* is recovery workouts – this zone is used by athletes who don't take a day off during the week. They use a zone 1 workout on their day off. It is **meant** to be very easy.

*Zone 2* is for your endurance workouts – this is important as it strengthens your slow twitch muscle fibers and it improves your body's ability to use fat for energy and save the glycogen (carbs) for later in a workout or race. It is especially important to build your endurance in the first two years of training. Endurance training builds your cardiovascular system (heart, lungs & blood). The length of an athlete's endurance workout needs to be increased carefully to allow adaptation to occur. The general guideline is don't increase by more than 10% of total time or distance per week. Building triathlon specific endurance takes months and years not weeks or days. The majority of training is in this zone, including long rides.

*Zone 3* is your tempo zone – this is important to build muscular endurance and mental focus. This is critical in triathletes to train the body to resist fatigue during prolonged efforts. (eg racing) this type of training helps to keep your pace high towards the end of an event. Training done in this zone trains muscle specific fibers required rather than the cardiovascular system like zone 2 workouts. Tempo workouts are typically 20 - 40 minutes of continuous effort. Can also break them up as sets of long intervals, e.g. 3 x 8 minutes tempo/1 minute easy (most productive workout for endurance)

*Zone 4* is your sub-threshold – this is the zone where you will race. Training this zone is done through "controlled" time trialing. Work-outs in this zone would be 3-5 intervals with equal

work/recovery. Duration of each interval is 3 - 6 minutes. (introduce these at the beginning of race season after a couple of months of riding mostly in Zone 2)

*Zone 5* is your anaerobic or power zone – this type of training is done through all out intervals. This type of training has a high potential for injury. Typical work-outs in this zone would be 1 - 2 minute efforts with full recovery in between (usually 2 to 4 minutes) (use these early in the season to improve technique or late in the season when peaking)

#### **4. PWR**

*Power to Weight ratio*: measured in watts per kg. You should try to increase your PWR by either getting stronger (increasing power you can cycle at) or by getting lighter (decreasing weight). Recreational athletes have more success increasing the PWR by increasing the power they can produce then by decreasing weight. Most athletes are at an ideal body weight and decreasing weight results in loss of lean muscle mass and ultimately power. Under optimal conditions a rider with the highest PWR will cycle faster. This is especially important when comparing cycling abilities. The athlete with a higher PWR will be able to climb faster. Cycling specific strength exercises such as squats, lunges, step ups or leg press will improve your hamstring and calf strength and improve your cycling power.

#### **5. Technique comments**

Here are some general comments

1. Bend your elbows when you are riding. Having straight arms causes a lot of shoulder and upper back tension. It also shifts your weight un-naturally aft on the bike.
2. Keep your shoulders & head still. This is extremely important as it develops your core and means you are using your legs to cycle not your entire body making you more efficient and lowering the number of muscles involved in riding and lowering your heart rate. To work on this:
  - a. Get rid of your store bought wheel life and use a phone book. The store bought blocks keep your front wheel still allowing your shoulders to rock. If you use a phone book you will need to keep your shoulders still to stay on the phone book,
  - b. Do some standing and keep your hips steady but putting something like a piece of paper on your head and try to hold it there,
  - c. Let go of you handlebars with one hand while you are standing, this will force your core to stabilize your body.
3. One Legged Drills are essential to developing hip flexor strength and pedal efficiency. Start with 30 sec per leg and when you can do it without “clunking” increase to 45 – 60 sec. Do them in both a very easy gear to develop technique and a hard gear to develop strength. Your pedal efficiency will also improve if you do them with your hands on your brake hoods, drops or in your aerobars.
4. When you are doing an interval set that requires you to move between standing and sitting it is important to keep your pedals moving as you change. When going from sitting to standing use your body weight to throw yourself up into the standing position and really push on the pedal. You have 6 free pedal strokes when you stand that you can use your body weight to generate power. If you have a pause in your pedal stroke between sitting and standing you lose this power.

Happy cycling!!