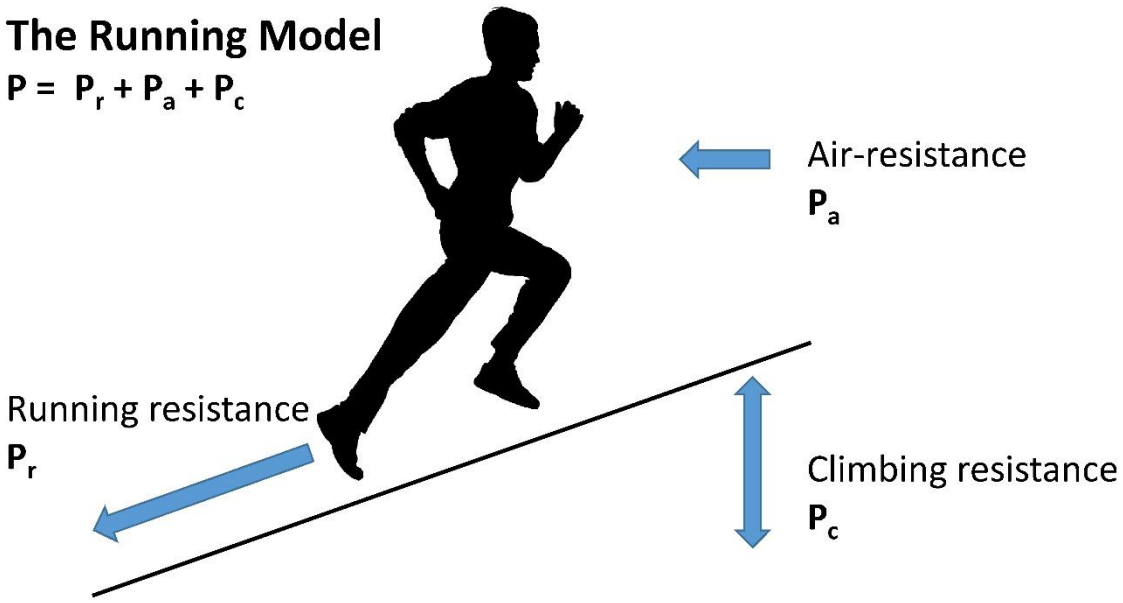
32. First tests on Power2Run

In our books **The Secret Of Running** (www.thesecretofrunning.com) and **The Secret Of Cycling** (www.thesecretofcycling.com) we have described our unified theory for the performance in running and cycling. Our running model is based on the premise that the power produced by the "human engine" (i.e. the leg muscles and the heart-lung system) must be equal to the sum of the power required to surmount the running resistance $\mathbf{P_r}$, the air-resistance $\mathbf{P_a}$ and the climbing resistance $\mathbf{P_c}$, as indicated in the figure below.



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Meanwhile, we have tested the model in many situations (running, cycling and both in the lab and in races) and found the results very convincing and consistent. Finally, we have tested the Stryd footpod on many occasions, both in the lab and in the field and we found that the Stryd power data match our model calculations perfectly.

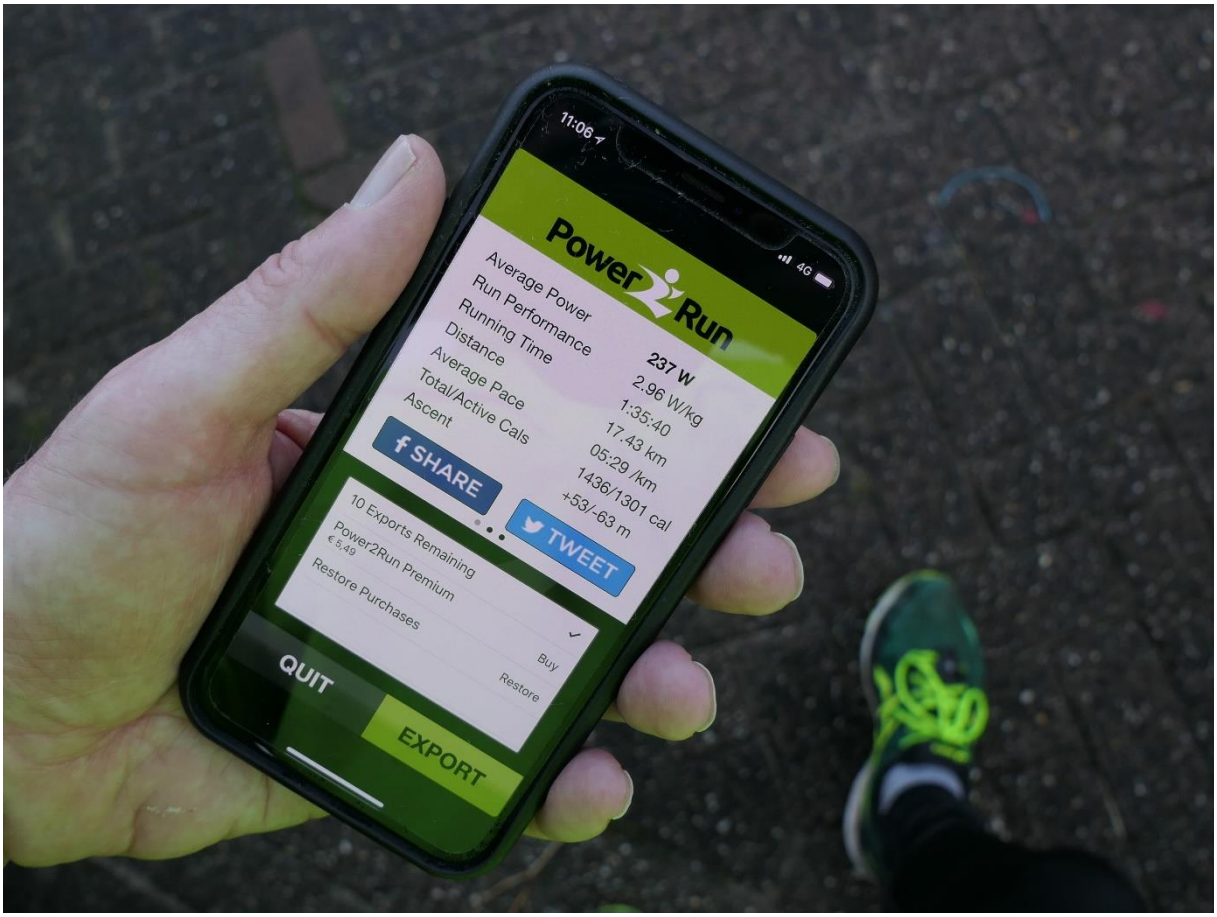
Recently, we have written 2 papers comparing the Stryd and Garmin Running Power. In this paper, we will share some experiences with the Power2Run app. Our friend Guido Vroemen asked us to test this. The Run2Power app is a running power meter developed by the California based company Inspyridon Technologies. https://www.inspyridon.com/getting-to-know-your-power2-run-app The company was named after Spyridon Louis, the Greek 1896 Olympic Marathon winner. The Power2Run app is only available on iPhone and other iOS devices, such as Apple Watch and iPad.

Main features of Power2Run app

The app calculates running power, using the barometer and accelerators of the iPhone in real-time. After a run, the app gives a summary of the average running power (in Watts), the specific power (in Watts/kg body weight), the run time (they have an auto pause option for traffic lights etc.), the total distance, the average pace, the used kilocalories and the altitude difference in meters. During the run, you can see the real-time numbers and km-splits on your iPhone screen. After a run, you can download the data and upload it to Training Peaks, Garmin Connect etc. for further analysis.

The Power2Run app can be downloaded free of charge for test runs. After 10 runs, you are expected to pay 5.49 euro for Power2Run premium.

Power2Run has a nice feature as it includes an option to select the footing of the run. As we have explained in our book, the footing has a notable impact on the power required. The app does not include an option for wind correction.

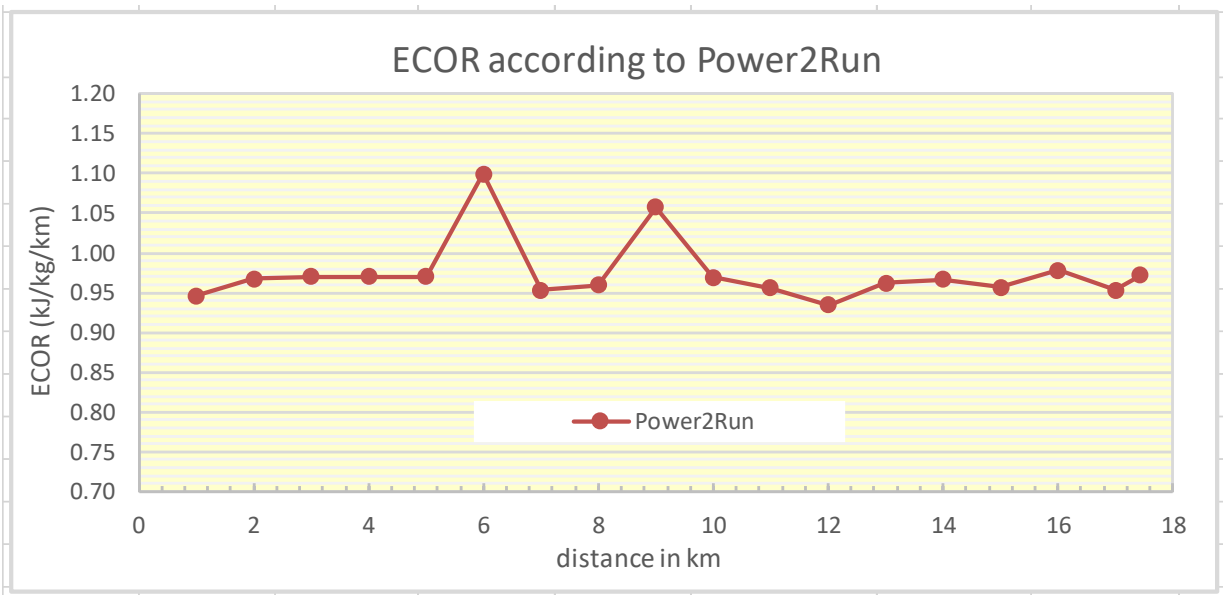


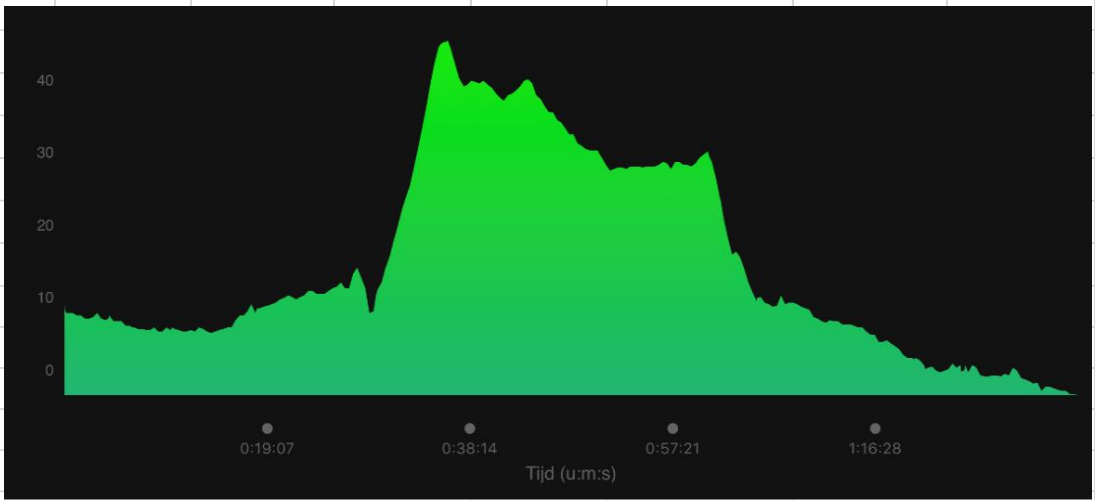
First tests and experiences with Power2Run

Author Ron has tested the Power2Run app on a number of runs on the road and also on a hilly course. He also tested different paces and compared the results of Power2Run with Garmin Running Power and Stryd and of course with theory.

In this paper, we will focus on the results of a run of 17.7 km, which included some hills. The first thing Ron noticed was that the GPS of the iPhone reported 17.43 km as distance,, which was notably different from the Garmin 935XT (GPS en Glonass) value of 17.73 km and the Stryd number of 17.70 km. Obviously, this GPS aspect has an impact on the pace and power calculations of Power2Run. The average wattage for the whole run was 237 according to Power2Run and 246 according to Stryd. Once again Garmin reports a very high number with 324 Watt.

The figure below shows the Power2Run ECOR (Energy Cost of Running) data per km. As we have explained in our book, the ECOR depend strongly on the altitude difference, so we have included a figure showing the course gradients. The total altitude difference was 51 m according to Garmin Connect and 53 m according to Running2Power.



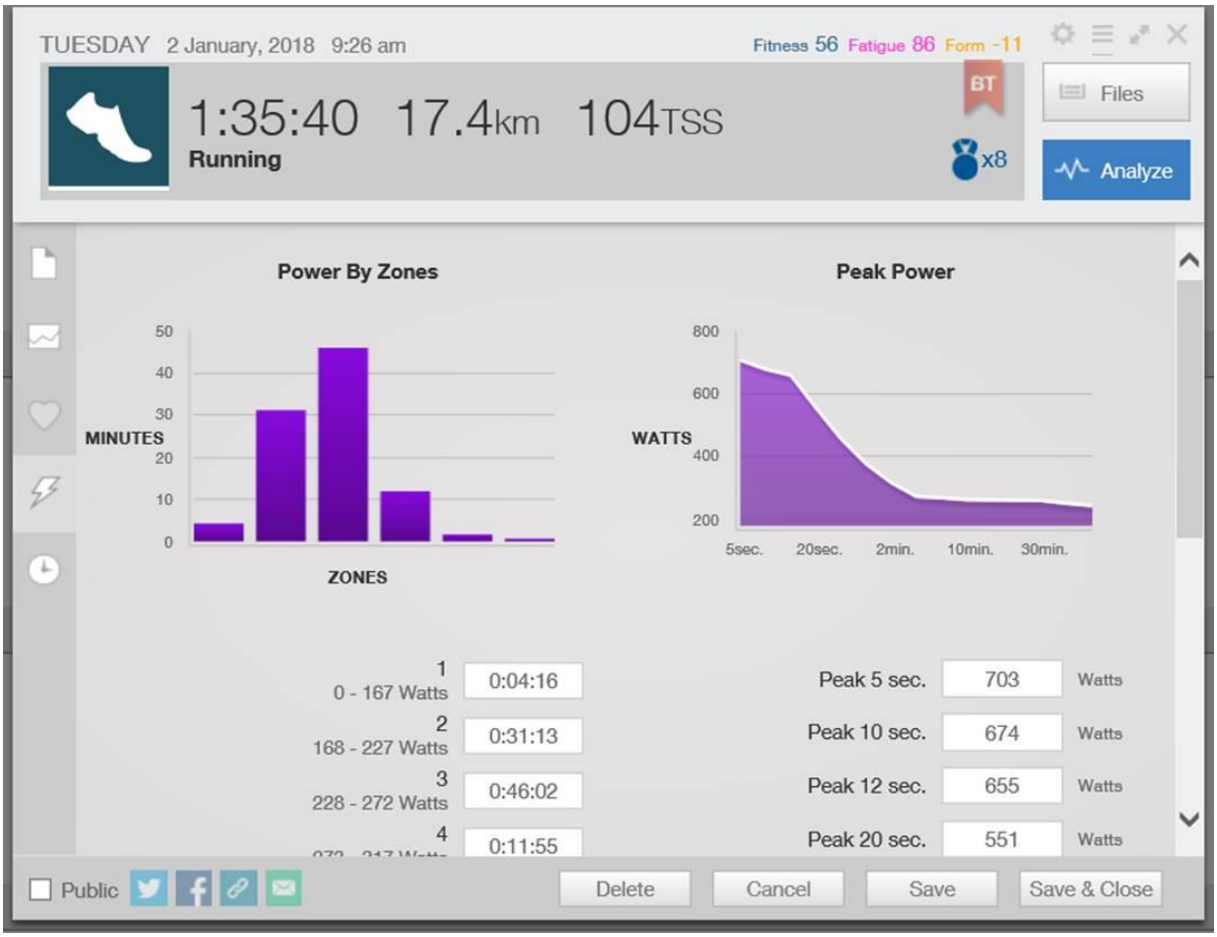


Up until the first hill Ron ran a pace of 5:40/km. At this pace his Stryd ECOR is around 1.02 kJ/kg/km After the last climb, Ron ran at 5:00/km. At this pace his Stryd ECOR is around 1.00 kJ/kg/km. As the figure shows the Power2Run numbers are slightly lower, and also lower than the theoretical standard of 0.98.

The hill at km 6 has an average gradient of 2%, the downhill section at km 12 has the same gradient. With the theory of TSOR we can calculate the Ron's ECOR should be 1.09 uphill and 0.89 downhill. The Power2Run data are 1.10 and 0.93 kJ/kg/km respectively, so quite close to theory.

TrainingPeaks

We have uploaded the vPower.tcx file with the Power2Run data into TrainingPeaks. This went smoothly. All the usual analysis could be performed. As an example we present the TP screen with the power data of the run.



Conclusions

Power2Run cleverly uses the functionality of the iPhone and other new Apple products. The calculated power data are pretty close to theory and the Stryd data. We feel that the Power2Run data are much more realistic that the IQ app Garmin Running Power.

Consequently, Power2Run can be considered a cheap and nice way for iPhone users to tap the benefits of running with power. Power users and runners who don't want to run with an iPhone will prefer the golden standard of Stryd.

To be continued!

We intend to perform many more tests on all power meters. Runners will definitely benefit from power meters, so we hope that many readers will join us in the effort. Let's share our data and conclusions on how we can use power meters to improve our running! We are curious to the reactions and experiences of the readers, we welcome you to share these at www.thesecretofrunning.com**.**

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https://www.youtube.com/channel/UCZD6RjE9d17TsXpB-TDCCrg

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