

PERFORMANCE ANALYSIS: RUNNING

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This month we will look at what tools are available to assist us in understanding running performance.

While cycling analysis tools have been around for many years, it has been more difficult to monitor and capture data on running performance. Over the last 3-4 years tools that can capture information on running speed and distance have begun to appear. The battle to do this effectively has been fought between two different technologies: GPS, and inertial sensors.

Both offer the ability to capture speed data that is quite accurate in most conditions. GPS offers the benefit of also logging position, so running routes can be looked at and even overlaid with maps. Despite this, inertial sensors have been becoming ever more popular after being released 2-3 years ago. An inertial sensor is a small pod that is attached to the top of the shoe. It assesses forward movement through the use of an internal sensor that is capable of measuring movement speeds.

These foot pods have offered great potential but until recently have probably not lived up to the hype. While they have been shown to be as accurate as the GPS units once calibrated, they were only capable of assessing speed and distance, thus putting them at a disadvantage compared to GPS with its positional tracking.

In late 2006 however, Polar released their RS800 running computer which offers some additional features. The RS800sd couples the functions of a heart rate monitor with a very small foot-based inertial sensor that also captures stride length and frequency information.



This new development now means a true performance analysis tool can be used for runners during training without having the inconvenience of a large unit to carry around. We are now able to look at running speed (and distance) in conjunction with stride frequency, stride length, and altitude.



Figure 1 shows data that has been downloaded to PC post-training. This information can be used in a number of ways as the following examples show:

- Speed data allows actual performance to be assessed. While external factors such as terrain and environmental conditions will affect speed, this information allows performance benchmarks to be determined and then assessed in every training session. It also allows analysis of speed variation. Optimal performance results will occur when there is a minimal fluctuation in speed. Looking at the spread of time in different speed zones provides quick and easy feedback.

- Stride length and stride frequency determine running speed. Manipulation of these two variables can result in performance improvements. Research has shown that elite runners generally maintain relatively stable stride frequencies at varying running speeds. Interestingly, stride frequency is quite similar between runners at an elite level. Lower than optimal stride frequency may be a limitation to performance.
- Research has also indicated that once an optimal stride frequency is reached, faster running speeds will be achieved as a result of increased stride length. Being able to measure stride length will then allow this variable to be assessed, and improved through technique and fitness changes if it is deemed a limiting factor to performance.
- Altitude profiles not only allow total ascent to be looked at, but in conjunction with speed and stride frequency information, the affect of terrain on performance can be assessed. Looking at stride frequency in conjunction with altitude assists in determining your optimal stride frequency for uphill and downhill. When you are running up steeper hills, what is your optimal stride frequency? How much should you shorten your stride? For down hills, should you maintain your frequency and simply increase stride length?

The relationship between the variables captured by the foot pod allows performance, technique, physical load and even running efficiency to be assessed during each and every running session. These new technologies used to monitor and assess running performance are now simple and convenient to use in all running sessions.

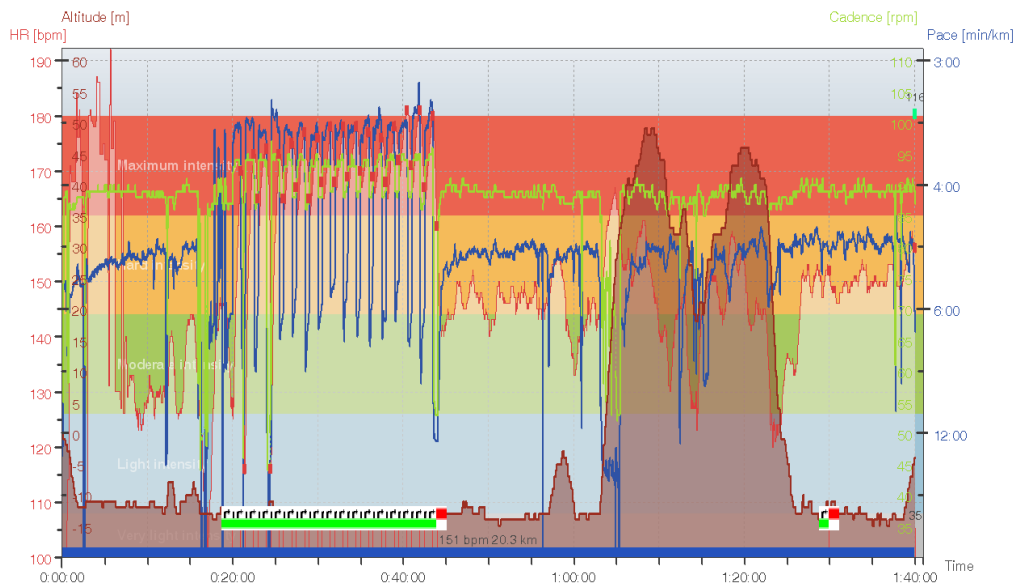


Figure 1

For more information on product specifications visit the Pursuit Performance website (<http://www.pursuit-performance.com.au/polar/html/segments/Running.html>) or to purchase the RS800sd visit www.FitShop.com.au.