

## **Validation test of VX Sports GPS device for measuring movement demands of team sports**

Coutts & Duffield (2010) have previously shown that GPS devices have an acceptable level of accuracy for total distance (<5%) and reliability for peak speed. They tested three different models in the GPSports product range on a circuit (Fig 1. below) previously shown to simulate the movement demands of team sports (Bishop et al. 2001). Two moderately trained athletes each completed 8 bouts (6 X 128.5m laps) of the circuit while wearing a pair of each different GPS device. All GPS devices recorded distance and speed data at 1Hz during each lap. 20m sprint time was measured at the start of each lap by timing lights. All devices were within 5m of the actual lap distance and had a good level of reliability (coefficient of variation (CV) <5%). The GPS peak speed was correlated with 20m sprint time for all devices (r= -0.40 to -0.53, P<0.001).

We recreated the same study using the VX Log 100 from the VX Sports range of GPS devices. The VX Log 100 device recorded distance and speed data at 4Hz during each lap.

### **Results:**

<b>Device</b>	<b>Recorded Lap Distance (Mean ± SD)</b>	<b>Recorded Bout Distance (Mean ± SD)</b>	<b>% Difference from actual lap distance (Mean ± SD)</b>	<b>% Difference from actual bout distance (Mean ± SD)</b>	<b>Lap CV</b>	<b>Bout CV</b>
<b>A</b>	128.31 ± 2.19m	769.88 ± 6.92m	0.24 ± 1.71%	-0.14 ± 0.89%	1.71%	0.90%
<b>B</b>	127.58 ± 3.27m	765.5 ± 11.39m	-0.33 ± 2.44%	-0.71 ± 1.47%	2.45%	1.49%

### **Correlation of GPS Peak Speed with 20m Sprint time**

Device A= (r= -0.369, P<0.015) \*

Device B= (r= -0.630, P<0.18)

\* Significant @ P<0.05

### **Conclusion:**

Both VX Sport (VX Log 100) GPS devices showed high levels of accuracy for total lap(0.24 ± 1.71%,-0.33 ± 2.44% )and bout distance (-0.14 ± 0.89%,-0.71 ± 1.47%) respectively. Both

devices showed good to moderate negative correlations between recorded peak speed and the 20m sprint time recorded by dual-beam timing lights; however only Device A showed a significant correlation ( $r=-0.369$ ,  $P<0.015$ ). This pilot study shows that the VX Log 100 GPS unit is a valid, reliable device capable of accurately monitoring the demands of a team sport environment. It must be highlighted however that each individual device may have its own inherent variance. To overcome this issue especially in a multi-use situation, i.e. multiple games in a tournament, users should issue devices to athletes to control for this variance.

## References

Bishop D, Spencer M, Duffield R, Lawrence S. (2001) The validity of a repeated sprint ability test. *J Sci Med Sport* 4(1):19-29

Coutts A, Duffield R. (2010) Validity and reliability of GPS devices for measuring movement demands of team sports. *J Sci Med Sport* 13(2010) 133-135

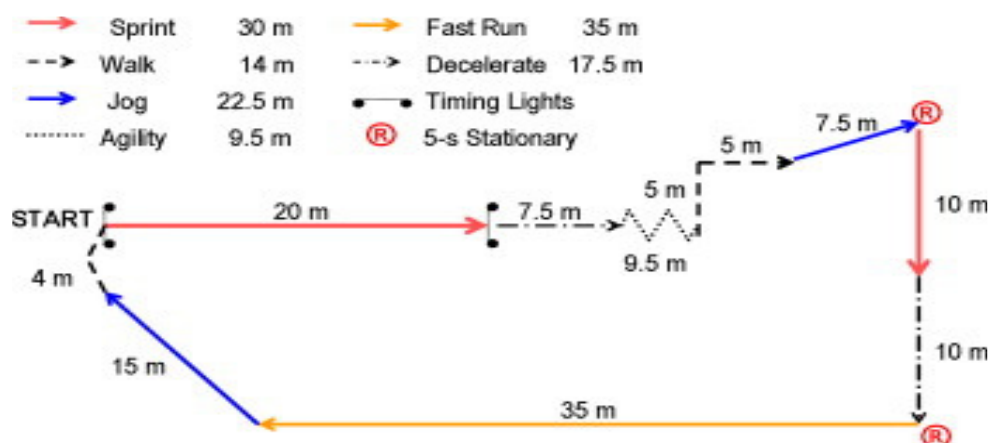


Figure 1 Circuit designed to simulate movement demands of a team sport (Coutts & Duffield 2010)

*This brief validation test was completed as part of a dissertation titled "Quantifying the physical demands of match play in Cerebral Palsy Football". This dissertation was undertaken by Derek Malone as part of the requirements for a Masters in Strength & Conditioning from the University Of Edinburgh. Expected completion date is September 2010.*