

## **Instrumentation of a Kayak and Kayak Paddle to Measure the Force Characteristics Developed Whilst Paddling: Technical Note**

**Richard Smith<sup>1</sup>, Jacob Michael<sup>1</sup>**

<sup>1</sup>*The School of Exercise and Sport Science, University of Sydney*

**Aim:** The purpose of this technical note was to present the design to measure the force developed by the kayaker (footrest, seat and paddle forces) when paddling. **Methods:** Force measuring devices (load cells) were attached to the footrest and seat within the kayak and strain gauges were attached to the shaft of the paddle to gather information of force development. During calibration and testing, the data points were transmitted to a Windows based computer using an eight channel telemetry system for analysis. **Results:** Dynamic calibration results showed a comparable force pattern comparing the force-time curves of the individual load cells and strain gauges with the S-Beam load cell. **Conclusions:** After numerous calibration measures and testing in the field, the design created was considered successful in measuring accurate force data of the previously unknown areas of force application. Contemporary systems of force measurement only measure paddle force, whereas the presented system measures paddle, footrest and seat forces yielding a greater representation of measured efficiency.