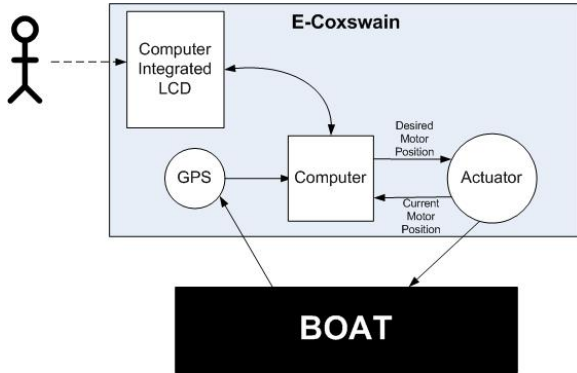


**The Opportunity**

Researchers at the Santa Clara University Department of Computer Engineering have developed an electronic replacement for a human coxswain during a rowing crew race. The e-coxswain is designed to fit into nearly any coxed racing shell, and take up all of the basic responsibilities of a human coxswain during a race, including steering a straight course, monitoring the stroke rate, and reminding rowers of the predefined race plan.



The e-coxswain is a completely automated system, removing the human element of a coxswain. In addition to the features of the currently used Cox-Box™ system (a product of Nielsen-Kellerman), the e-coxswain has the ability to

- steer a straight course on its own with a motor driven rudder,
- provide detailed race reports that can be used to analyze a crew's performance,
- accurately measure distances using a global positioning system and use that information to accurately calculate a boat's time to travel a given distance.

**Technology**

The design replaces the human coxswain in a crew boat with an automated electrical and mechanical system. The system relies on a predefined map of the course, collected using a global positioning satellite (GPS) receiver. This same GPS receiver is then used in the boat—or shell—to track the shell's progress and deviation from the map. These GPS results are then input into a computerized control system that outputs a signal to a small motor that moves the rudder, thereby controlling the shell and keeping it on track. In addition, the eCoxswain signals to the rowers when to row while monitoring the stroke rate.

**Performance**

The system:

- Can be used in any coxed shell.
- Is durable: Wires, connections, and other components are protected from environmental exposure.
- Records data for later review
- Detects other boats and/or obstacles
- Has simple maintenance that can be performed by average coach, rower, or coxswain.
- Lasts about ten years, similar life of 'Cox-Box'.
- Costs around \$1000 retail.

**Intellectual Property**

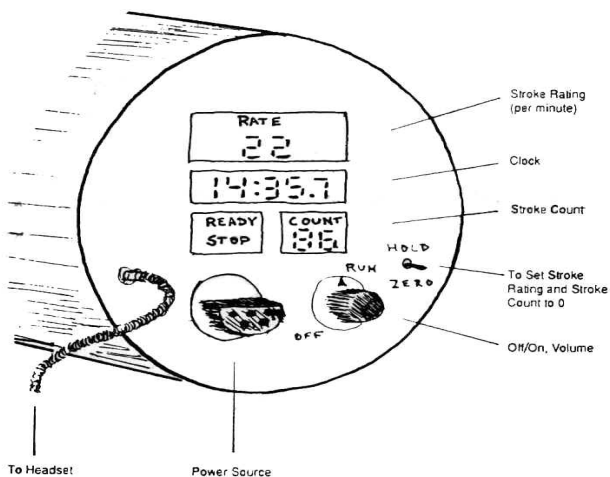
The innovative system is protected by US Patent Applications.

**For More Information**

We are seeking qualified licensees to bring this innovative new navigation technology into commercial use.

For more information, contact:

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*Drawing by Weir Strange*