

# Adaptive RC Sailer Requirements Document

## **Background:**

The Adaptive RC Sailer Project is an attempt to provide quadriplegic RC model sailboat skippers with a means to once again enjoy their hobby and participation in sailboat racing events.

## **Problem Statement:**

Develop an open source software/hardware interface which connects adaptive devices to radio-controlled model sailboat transmitter systems.

## **Three Phase Development:**

### **Phase One - Feasibility Demonstration Prototype Interface (Digital Potentiometers with Binary Inputs)**

Construct a feasibility demonstration prototype interface which replaces the RC transmitter joystick potentiometers with microprocessor controlled digital potentiometers. Control signal inputs will be on/off toggled outputs from readily available adaptive devices such as sip & puff switches, chin-bump switches, wobble stick switches, eye-blink detectors. The interface will require a minor modification to the RC transmitter (substitution of a digital potentiometer voltages for the organic joystick potentiometer developed voltages). No other modifications would be required for either the RC receiver or the sailboat servo motors.

### **Phase Two - Demonstration Model Interface (Pulse Position Modulation With Binary Inputs)**

Develop a demonstration model interface that connects to a RC transmitter via its organic Pulse Position Modulation (PPM) Trainer Port. Initially the control signal inputs will be the same as the Phase One control signal inputs. No modifications would be required for either the RC radio system or the sailboat systems.

### **Phase Three - Adaptive RC Sailer Interface (Pulse Position Modulation With Analog Inputs)**

Expand the control signal input modalities to include:

EEG, EMG, head position/orientation, voice recognition commands, etc.

No modifications would be required for either the RC radio system or the sailboat systems.