Sending Control Signals to the boat while in Autonomous Modes

Strategies for using the RC Transmitter to send simple commands to the robotic boat

1. Switching Sail control between Automatic and Manual

- When the boat is being sailed with Autonomous sail the Sail control is not being used.
- During regular sailing the sail is least often full-out. We can use this lever position to indicate Autonomous sailing.
- Define lever position of > 1850 or so to mean use Autonomous Sail. Anything less than that is Manual Sail
- The benefit of this strategy is that you can always take control back from the Arduino and bring the boat home without having to go chase down someone with a skiff to go rescue your boat.
- Program this using a boolean variable such as Auto = TRUE or FALSE. When the sail channel of the Receiver is read in as >1850, set Auto = TRUE, else auto = FALSE

2. Using the Rudder Lever to initiate a **direction** maneuver when sailing Full-Autonomous

- In Full-autonomous mode both the Rudder and Sail are controlled by the computer. In this case both the Sail and the Rudder levers are free to send simple signals to the boat.
- Program the Sail Lever to be Manual or Autonomous as described in Strategy 1.
- Start with a heading for the boat to sail. This can be relative to the wind (such as Wind Vane at 90°) or referenced to the absolute compass (such as point the boat at 60°).
- Use "Rudder Left" (< 1200) as signal L that can tell the boat to change heading by some amount in the positive direction, such as add 45° to the desired direction. This will initiate a maneuver such as heading up, tacking, bearing off, off or jibing. To prevent the code from adding multiple of the change amount, you need to make sure that the Rudder Lever goes back to the center (1400 – 1600) before adding in another change.
- Similarly, "Rudder Right" (> 1800) can be used as a signal R that can tell the boat to initiate a right-turning maneuver.

3. Using the Sail Lever to set the heading when sailing Full-Autonomous

- This strategy can be used in Full-autonomous mode, when both the Rudder and Sail are controlled by the computer and both the Sail and the Rudder levers are free to send simple signals to the boat.
- Use the Sail Lever to set a heading for the boat to sail. Center could be 0° (in irons). If you rotate the Transmitter so the antenna is facing left and the Sail Lever is on top, then you can set define the range of Sail lever inputs to be full left = -180° and full right = 180°
- The Rudder Lever now has a left and right swipe signal available. One of these can be used to put the boat back in full manual mode to help it sail home. The other might be used to put it in Manual rudder/Autonomous sail to help you sail it home.

4. Using the Rudder Lever to initiate a **Distance** maneuver when sailing Full-Autonomous

- This strategy can be used in Full-autonomous mode, when both the Rudder and Sail are controlled by the computer and both the Sail and the Rudder levers are free to send simple signals to the boat.
- Program the Sail Lever to be Manual or Autonomous as described in Strategy 1.
- Start with a heading for the boat to sail. This can be relative to the wind (such as Wind Vane at 90°) or referenced to the absolute compass (such as point the boat at 60°).
- Use "Rudder Left" (< 1200) as signal L that can tell the boat to sail a certain distance in the X direction. Once it gets there it can either come back or sit in irons, begin to sail a box, etc. To prevent the code from adding multiple of the change amount, you need to make sure that the Rudder Lever goes back to the center (1400 – 1600) before adding in another change.
- Similarly, "Rudder Right" (> 1800) can be used as a signal R that can tell the boat to sail a certain distance in the Y direction.