USER GUIDE

GPS Base Station Setup

1. Open u-center on a personal computer.
2. Connect one u-blox antenna to the base station via the female SMA port on the simpleRTK2b module.
3. Connect the dipole antenna to the base station via the female SMA port on the XBee module.
4. Connect a micro-USB connector to the accompanying port on the simpleRTK2b module labelled “POWER + GPS.”
5. Insert the USB connector of the micro-USB cable into an available USB port on the personal computer with the u-center software.
6. In u-center, under the “Connect serial port” option, select the corresponding COM port for the GPS device.
7. Wait for “Fix Mode” to display “TIME.” (~10 minutes)

Onboard Powerup

1. Connect each battery power plug to the female connectors on the power bus.
2. Connect each battery balance cable to the battery monitoring circuit. The red wires for each cable must be connected to pins [b13] and [h18], respectively.
3. Connect the other u-blox antenna to the rover station on the boat via the female SMA port on the simpleRTK2b module, facing the bottom of the boat.
4. Connect the other dipole antenna to the rover station via the female SMA port on the XBee module, facing the top of the boat.
5. Connect the USB-C cable to the accompanying port on the Raspberry Pi.
6. Power on the boat using the power switch.
7. Put the lid in place over the antenna on the Raspberry Pi GPS module, and attach a smaller dipole antenna to the Arduino module via the female SMA connector.
8. Fasten the lid by securing the clamps over the handles on each end of the lid, tucking any cables underneath the rim of the lid.

NOTE: The Raspberry Pi must be allowed to fully complete the bootup process (~2 minutes) before powering off the system.

Battery Monitor Setup

1. Open Arduino on a personal computer.
2. Connect the other small, dipole antenna to the base Arduino module via the female SMA connector.
3. Connect a USB-B connector to the accompanying port on the base Arduino.

4. Insert the USB-A connector of the USB cable into an available port on the personal computer with the Arduino software.
5. Under the Tools menu, select “Serial Monitor.”
6. Ensure the baud rate selected is identical to the baud rate of the transmitting Arduino (by default, 115200).

Switch to Autonomous Mode

1. Place the boat in water deep enough to allow the hull to settle into the water, bearing the full weight of the boat.
2. Ensure that Switch A on the controller is set to position 0 (Manual).
3. Power on the RC controller by pressing the power button in the center of the controller.
4. Hold the left throttle down until the controller is fully powered on.
5. A short tone of five beeps emitted by the ESCs on the boat indicate a connection between the controller and the motors.
6. Set Switch A on the controller to position 1 for Autonomous mode.

The boat is now operational. While the boat will always be operational in Manual mode, the boat will only begin running in Autonomous mode once the Raspberry Pi has finished the startup sequence and begins to implement the current program.

NOTE: Mode of operation is determined by Switch A:
position 0 = Manual; position 1 = Autonomous