OBJECTIVE

World Robotic Sailing Championship

Autonomous Sailboat with limited capability
AUTONOMOUS

Desired Heading: 105.11°
Heading: 98.28°
40.113987° N 88.290237° W
Speed: 0.16 Knots
Relative Wind: 270°
Heeling: 1.25°
Rudder: -7°
Sail: 45°

Base
40.114178° N 88.290027° W
Distance to Base: 27.73 m
Onboard MCU to record sensor output and control servo settings for RC and autonomous modes

Ground Control System to monitor sensor feedback

49° 07' 3.334" N
88° 12' 33.337" W
1.83 G

RC transmitter for dual-mode capability
BLOCK DIAGRAM
TELEMETRY
GROUND CONTROL SYSTEM: LABVIEW

- Insert pic of screenshot of example of it running
- Can talk about log file and how we use gpx file for map
GROUND CONTROL SYSTEM: LABVIEW
GROUND CONTROL SYSTEM: LABVIEW

- Labview interface screenshot of example of it running.
- Can talk about log file and how we use gpx file for map.
GROUND CONTROL SYSTEM: LOG
GROUND CONTROL SYSTEM: GPX FILE

```xml
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</trkseg>
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</gpx>
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EXPERIMENTAL RESULTS

https://gpx.studio/
RUDDER CONTROL
SAIL CONTROL
SAIL CONTROL

Heeling > 15 or Heeling < -15

Heeling < 15 and Heeling > -15

S1

S2

Heeling > 15 or Heeling < -15

Heeling < 15 and Heeling > -15
E-COMPASS
ECOMPASS - LSM303

- Hard Iron Calibration
  - Offset = (AccelMin + AccelMax) / 2

- Heeling Angle ~ Roll
  - Roll = atan2(AccelY, AccelZ)
ENCODER
ENCODER
WIND VANE
PROJECT SUCCESS

ON-BOARD PROCESSING SYSTEM

- Rudder Control
- Sail Control

GROUND CONTROL SYSTEM

- Telemetry sends data back to base
CONCLUSIONS AND REDESIGN

- Differential Control
- PID Tuning (Ziegler-Nichols Method)
- Return to Base