Project Jump Start Submission Sheet

Keep answers as short as possible while still meeting specifications. Submit as a PDF.

Team Number:

Team Member Names:

## Include Code Modifications to Implement New Printer Functionality

Effort:

* ☐ Includes modified code from the PrintRollPitchHeading() function from SensorIMU.cpp.
* ☐ Includes modified printer if statement from the main loop of E80\_Lab\_07\_dive.ino. (Approximately lines 107-121.)
* ☐ Includes an estimate of your main loop sampling frequency derived by looking up LOOP\_PERIOD in TimingOffsets.h.

Complete:

* ☐ Loop period estimate is correct.

## Graphs of Position Inferred from IMU

Effort:

* ☐ Includes plot of x,y coordinates of board stack overlaid on ideal 0.5 m path. X-axis should be x coordinate in meters. Y-axis should be y coordinate in meters. Plot includes appropriate axis labels and units.
* ☐ Includes plot of y coordinate of board stack vs. time (you can figure it out from sample number and the loop period from earlier sections) with uncertainty bounds derived from theory of integrating noisy accelerometer data.

Complete:

* ☐ x, y coordinates do not resemble 0.5 m path because of accumulated noise.
* ☐ y coordinate vs. time remains within theoretical bounds.

## Dive Activity Only: Pressure Calibration Curve

Effort:

* ☐ Includes modified code from the PrintRollPitchHeading() function from SensorIMU.cpp.
* ☐ Includes modified printer if statement from the main loop of E80\_Lab\_07\_dive.ino. (Approximately lines 107-121.)
* ☐ Includes updated depthCal\_slope and depthCal\_intercept values.

Complete:

* There are no complete requirements for this section.

## Dive Activity Only: Control Effort and Trajectory from Deployment

Effort:

* ☐ Includes modified code from the dive() function from DepthControl.cpp.
* ☐ Includes plot of depth and depth\_des, overlaid on the same y-axis vs. time on the x-axis. Includes appropriate labels, units and legends.
* ☐ Includes plot of uV vs. time with appropriate labels and units. You have the option of including this as an x-aligned subplot below the depth/depth\_des plot, which highlights how effort is related to the robot’s depth.

Complete:

* ☐ depth tracks depth\_des, uV decays as depth approaches depth\_des, and system exhibits the second-order settling characteristic of P-control on depth in a robot.

## Surface Activity Only: Calibrated and Uncalibrated Magnetometer Performance

Effort:

* ☐ Includes figure generated by Mag\_Calibration.m.
* ☐ Includes figure of superimposed calibrated and uncalibrated magnetometer amgentic induction measurements (in mG) on xy plane.
* ☐ Includes figure of superimposed calibrated and uncalibrated heading (in radians) vs. time measurements.

Complete:

* There are no complete requirements for this section.

## Surface Activity Only: GPS Points from Walking a Path

4.2 Plot the logged x,y positions from the path you walked with your GPS

Effort:

* ☐ Includes modified code from the updateState() function from XYStateEstimator.cpp. This function should calculate state.x, state.y and state.yaw (by converting from heading).
* ☐ Includes a plot of measured x and y positions during the walk around Parsons. The x-axis should be the x coordinate, and the y axis should be the y coordinate. Overlay this plot on an image of campus to effectively show the path.

Complete:

* There are no complete requirements for this section.

## Surface Activity Only: Control Effort and Trajectory from Deployment

EC2.1 Plot the logged paths of x, y points, (bonus points if plotted on top of an image of campus) for the experiment where the student is guided by printed U\_R and U\_L values EC2.2 Plot the angle error and control effort u as a function of time for the experiments where the student is guided by printed U\_R and U\_L values. EC2.3 Plot the logged paths of x, y points, (bonus points if plotted on top of an image of campus) for the experiment where the student is guided by motor rotation rates EC2.3 Plot the angle error and control effort u as a function of time for the experiments where the student is guided by motor rotation rates.

Effort:

* ☐ Includes plot of logged paths of x,y points overlaid on ideal trajector and an image of campus. X-axis is x measurement in meters. Y axis is y measurement in meters.
* ☐ Includes plot of angle error vs. time
* ☐ Includes plot of control effort vs. time

Complete:

* There are no complete requirements for this section.