
P16551:

— Observer Calibrator —

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Stand

ZOMEi Z669 SLR Camera Tripod with Ball Head and Carrying Case

- Price: \$94.99
- Material: Magnesium Aluminum Alloy
- Head Type: Ball Head
- Panoramic Angle: Horizontal 360°
- Net Weight: 3.7 lbs/ 1.68 kg
- Load Capacity: 15 lbs/ 7 kg
- Folded Length: 14 inches/ 37 cm
- Max Height: 60 inches/ 152 cm



Risk Assessment

	Risk Item	Effect	Cause	Likelihood	Importance	Action to Minimize Risk	Owner
	Technical Concerns						
1	Project exceeds budget	Major redesigning after fabrication	Major redesigning after fabrication, breaking OC, etc.	1	4	Discuss major purchases, keep OC in a safe place, take care during designing and fabrication	Team
2	OC is not finished by the conclusion of MSDII	Customer is dissatisfied, team needs to do more work after May	Bad time management and task scheduling	1	4	Ensure team is on-schedule with meeting deadlines	Zhen
3	OC is dropped during transport	Electrical components, Optical components or housing unit broken	Housing unit not designed well	3	2	Ensure the housing is strong enough to protect the device's internal components	Ben
4	Lights are not bright enough for experiments	Device effectively fails to accomplish intended use	Integrating Spheres don't reflect enough light	2	5	Ensure the lights selected for inclusion in the device are safe to be used	Ben
5	Lights are not bright enough for experiments	Device effectively fails to accomplish intended use	Not enough current through LEDs	2	5	Ensure Arduino can power LED drive circuitry	Kevin
6	Observer Interface is unintuitive or difficult to work with	Research is hindered by lengthy observer training sessions	Bad choice of combination of buttons/dials/etc.	3	4	Test user acceptance with multiple observers	Alex
7	Researcher Interface is unintuitive or is not customizable enough	Customer is dissatisfied, has to redesign interface and re-code MATLAB	MATLAB interface was not designed well	3	3	Collaborate with team members to ensure MATLAB interface seems intuitive	Tony

Problem Tracking

Project Name:		Observer Calibrator			Date:		9/22/2016
Project Number:		P16551			Revision:		1
	Identifying & Selecting Problem PSP 1	Analyzing Problem PSP 2	Generating Potential Solutions PSP 3	Selecting & Planning Solution PSP 4	Implementing Solution PSP 5	Evaluating Solution PSP 6	
Rating	R1	R2	R3	Y4	Y5	G6	
CRITICAL	Encoder set up might not work as well as previously thought.	The encoder is working, as we can see the quadrature waves on the oscilloscope, however the changed duty cycle on our PWM output is not being reflected by that.	We need to identify the source of the problem. Possibly the code is not working properly, or the encoder is changing states too rapidly for the arduino and Matlab to process. Possible solution could be to go back to Potentiometers.	Pugh diagram, find parts, cost analysis	Get approval from team, customer. Implement selected solution,	Run same tests that were performed for this review	
	No native matlab library for Adafruit servo shield	Servo shield purchased only has a library developed for Arduino's IDE, but not one for Matlab	Either need to generate our own Matlab library, figure out how to convert the Adafruit IDE library into one which is compatible with Matlab, or look into other possible PWM driver shields.	Pugh diagram, find parts, cost analysis	Get approval from team, customer. Implement selected solution,	Run same tests that were performed for this review	

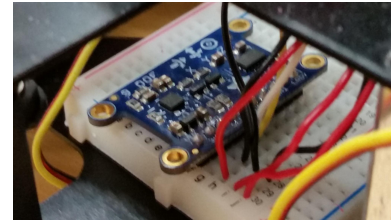
Possible Software Solution

Use Arduino IDE to program Arduino
Functionality

Communicate with MATLAB via serial
connection over USB

Should Enable better processing on Arduino
side, while being able to receive and display
data on Matlab side

Relevant Experience with Similar Design:
Principles of Robotics Final Project



Alex's and Tony's 3 week plan

Week 6: Mainly will be consistent of meeting with subject matter experts. We need to identify the source of the problem with the communication between the encoder and arduino/Matlab as well as discuss whether there are simpler solutions for the servo shield (to address the fact that there is no native Matlab library). Ideally we will have identified the source of the problems and selected a solution to implement by Thursday's meeting.

Week 7: Implementing and testing the solutions selected from Week 6

Week 8: If everything is working properly, full integration with integrating spheres will be tested, and luminance tests can be ran.