Computer Controlled Aiming & Tagging System

Updated Product Specification and Project Plan

EML 4551C – Senior Design – Spring 2012

Team # 2

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Project Sponsor
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Project Advisor(s)

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Introduction

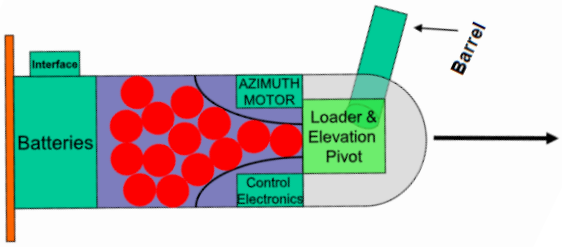
The goal of this project is to design a nondestructive method to test and evaluate the accuracy of Eglin's fuze sensors for their Controlled Aiming and Tagging System (CCATS). This design will allow the user to input data for multiple targets of interest and tag them for real time post processing data with high precision and accuracy in a static testing environment.

Product Specification

The tagging system will use a nondestructive method to tag the targets of interest and measure the dispersion, accuracy, and latency of the tagging system to ensure peak performance during live simulation. Paintballs will be used as visual aid to measure and evaluate the repeatability and of each test run. User inputs will be integrated in the system to allow the user to cycle through targets at predetermined locations. The barrel of the tagging system should ideally move from each target within one second or less to minimize latency and allow a smooth motion of the barrel with minimum jerk between each target. After talking with our customer we generated a list of customer needs and translated them into engineering specifications in the QFD.

Customer Needs

- Less than 50lbs
- All components locally housed
- Smooth azimuth/elevation movement
- Be able to shoot and re-aim in any direction less than 1 second
- System is very accurate
- The system can produce repeatable results as far as accuracy firing on different targets
- Computer interface
- Power supply by generator
- Tag marker
- Safe to operate



Updated Constraints

Constraints that have been revised or changed are the power supply and the azimuth and elevation angles of the barrel. For bench testing the new power supply to be used will be a variable AC to DC power supply for the motors and a standard wall plug supply for the controller. Due to the closed loop servo motors that will be used the azimuth angle that will be able to be achieved is 251 degs. The elevation angle that will be able to be achieved will be approximately 137 degs from the vertical.

Quality Function Deployment

		Engineering Specifications						
		Case must be lighter than 50 lbs.	Power system last longer than 6 hours	Slew rate resolution less than 1 degree/sec	User input coordinates (deg)	Paintball Gun accurate up to 1 deg	Firing system fires within 2 sec of aiming	Slew Rate Resolution less than 1 degree
Customer Needs	Lighter Than 50 lbs.	x	x			x		
	Locally Housed Components	x						
	Smooth Azimuth/Elevation Movement			x				x
	Easy to Use Power System		x					
	Computer Interfacing				x		x	
	Accurate			x		x		x
	Repeatable			x		x		
	Must be able to shoot and Re-aim			x				
	Non Destructive Marking Device					x		
	Must be safe to opperate						x	

An x denotes that there is a relation between the customer need and the translation into an engineering specification. It can be seen that the Slew rate resolution and selecting a Paintball Gun will be a significant factor in meeting customer needs.

Budget

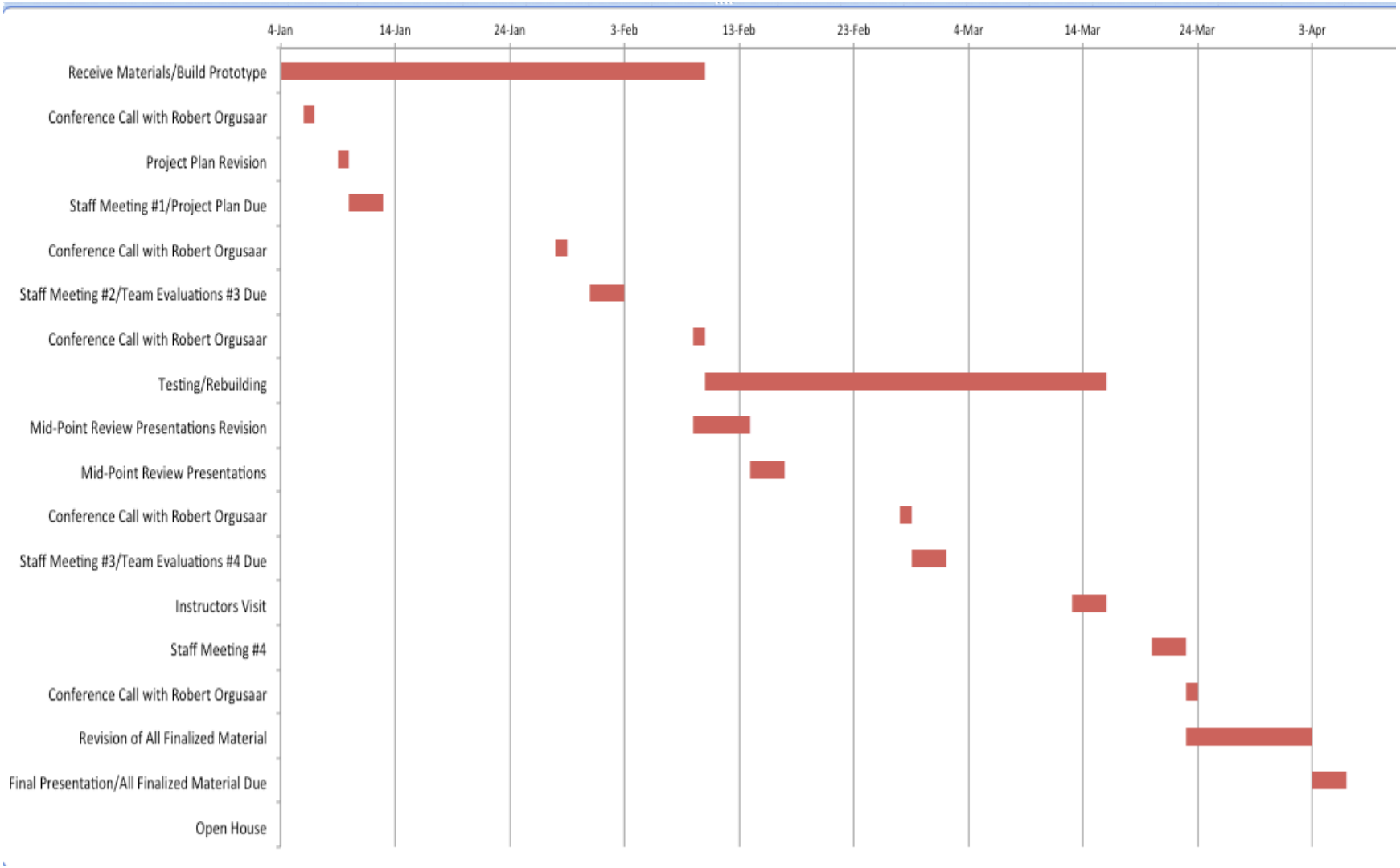
Our budget as of now is set at $2000 from Eglin AFB. Additional funds may be available from Eglin and is currently being researched. Since a final concept has not been decided on exact materials are unknown at this time. However, these funds will go towards purchasing materials, software needed for programming and any machine work needed.

Project Plan

Computer Controlled Aiming and Tagging System

Tasks	Start Date	Duration (Days)	End Date
Receive Materials/Build Prototype	4-Jan	37	10-Feb
Conference Call with Robert Orgusaar	6-Jan	1	6-Jan
Project Plan Revision	9-Jan	1	9-Jan
Staff Meeting #1/Project Plan Due	10-Jan	3	12-Jan
Conference Call with Robert Orgusaar	28-Jan	1	28-Jan
Staff Meeting #2/Team Evaluations #3 Due	31-Jan	3	2-Feb
Conference Call with Robert Orgusaar	9-Feb	1	9-Feb
Testing/Rebuilding	10-Feb	35	16-Mar
Mid-Point Review Presentations Revision	9-Feb	5	13-Feb
Mid-Point Review Presentations	14-Feb	3	16-Feb
Conference Call with Robert Orgusaar	27-Feb	1	27-Feb
Staff Meeting #3/Team Evaluations #4 Due	28-Feb	3	1-Mar
Instructors Visit	13-Mar	3	15-Mar
Staff Meeting #4	20-Mar	3	22-Mar
Conference Call with Robert Orgusaar	23-Mar	1	23-Mar
Revision of All Finalized Material	23-Mar	11	2-Apr
Final Presentation/All Finalized Material Due	3-Apr	3	5-Apr
Open House	12-Apr	1	12-Apr

Gantt Chart


4-Jan
14-Jan
24-Jan
3-Feb
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23-Feb
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