Revision of Lockheed Martin Human Type Target for Manufacturability

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15 November 2016



Introduction and Background

- Lockheed Martin is designing a Human Type Target System for training Law Enforcement and Military personnel as a part of their Urban Operations Training System
- Lockheed Martin is currently purchasing a competitor's product for use
- This product does not meet their standards for realism or durability
- Lockheed Martin has a basic prototype

Need Statement

"Lockheed Martin's current human type target system is incomplete and requires further design for manufacturability and durability."

Goal Statement

"The goal of this project is to revise Lockheed Martin's current prototype and take it to a production-ready-state."

Components to be Redesigned for Manufacturability

Not Shown: Target Interface

Module

- Interface Plates
- 2x4 Adapter
- Stand



Constraints

- Perform at least 1000 drops before failure
- Ricochet averse
- Moveable by 1 person
- Max 2 ft x 2 ft base plate
- Capable of withstanding impacts from 7.62 mm, 5.56 mm, and airsoft BB rounds
- Operable in a variety of environmental conditions

Constraints Continued

Target prices (maximum) – batches of 100

- Interface plate \$50.00 each
- 2x4 adapter \$25.00
- Stand \$70.00



Current Prototype





- Issues with binding on clamps
- Difficult to reset



Current Prototype (Cont.)





- Design one Interface Plate to be used in both plate locations
- Design Interface Plates with minimal assembly required

Current Prototype (Cont.)



- Base must be designed for mobility and must house the control box (green box)
- Must not occupy an area greater than 2'x2'

Current Prototype (Cont.)



Raymond Lessig



Design a single 2x4 adapter to be used for attaching different components

2x4 Adapter Design



- Designed so that this one 2x4 adapter can be used in several locations
- Design must be altered for injection molding

Interface Plate Design (Front)





Interface Plate Design (Rear)





Design for Injection Molding

Figure 29 - Example of Rib Design



Design for Injection Molding (Cont.)









Full Assembly



Task Name	Oct						Nov						Dec				
	Sep 25	Oct 2	Oct 9	Oct 16	Oct 23	Oc	:t 30	Nov 6	Nov 13	Nov 20	Nov	27	Dec 4	Dec 11	Dec 18	Dec 25	Jan 1
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Obtain Prototype				Obtain	Prototype												
Test Current Prototype				Test Cu	urrent Proto	type											
Identify Issues				Identify	Issues												
Background Research								Backgr	ound Rese	earch							
Similar Products	Simila	r Products															
Design for Mobility	Design for	Mobility															
Materials				Mat	terials												
Injection Molding								Injection	n Molding								
Brainstorming										Bra	instormi	ng					
Ideation for Stand					ld	eation	n for Star	ıd									
Ideation for Interface Plate					ldea	ation f	for Interf	ace Plate									
Analysis of Alternative Designs										Analy	ysis of A	lterna	ative Design	S			
Design Selection										Des	sign Sele	ection					
Prototype Solutions											P	rototy	pe Solutions)			
Create Detailed Design for Interface Plate										Cre	ate Deta	ailed D	esign for In	terface Plat	e		
Create Detailed Design for Stand										Cre	ate Deta	ailed D	esign for St	and			
Prototype Designs											P	rototy	pe Designs				
Test Solutions										/					Test Solutio	ns	
Analyze Interface Plate Performance														Analyz	e Interface	Plate Perfor	mance
Analyze Stand Performance														Analyz	e Stand Per	formance	
Determine Next Steps															Determine N	ext Steps	

Next Steps

- Finalize designs for injection molding
- Purchase parts
 - Arduino board
 - Clamps
- Continue weekly calls with sponsor

Summary

- Introduction and Background
- Need and Goal Statement
- Constraints
- Lockheed Martin Prototype
- Injection Molding Components
 - 2x4 Adapter
 - Interface Plate
- Stand Design
- Timeline