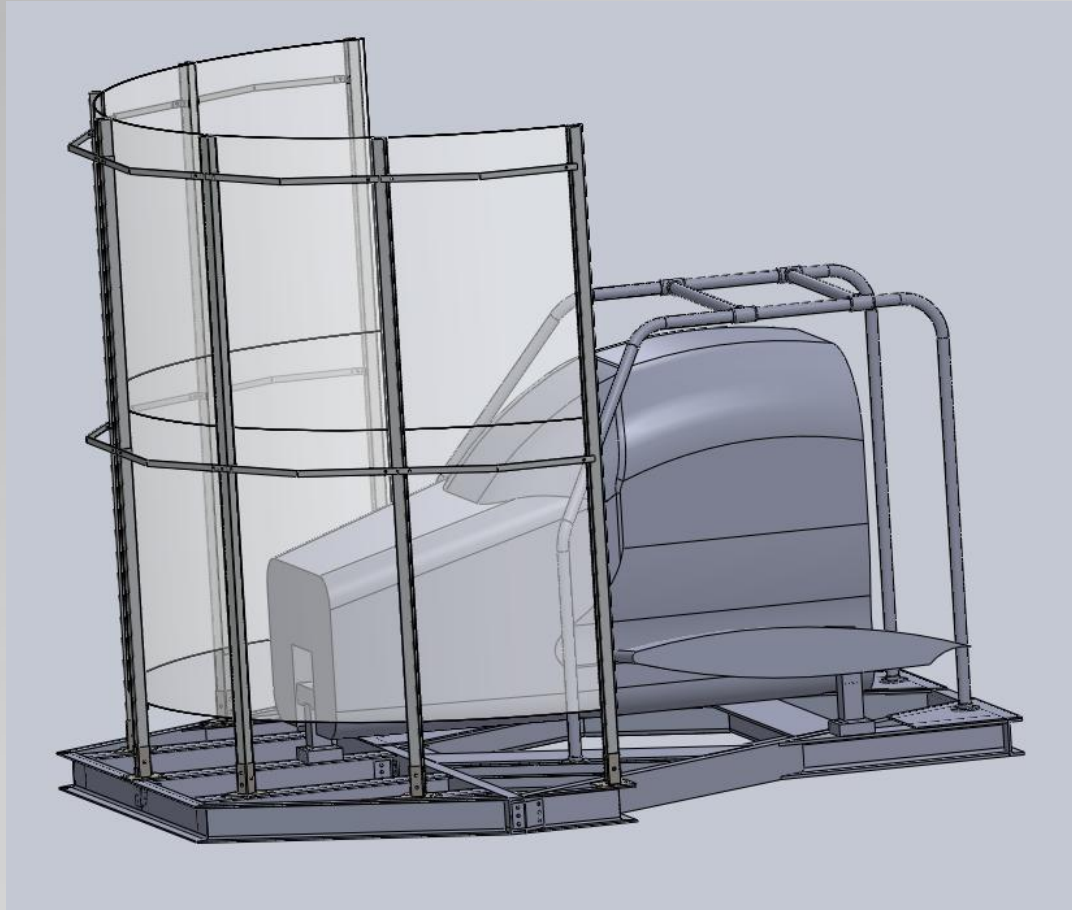


P12243: MOOG Flight Simulator Visual Display Mount

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Cody Hatch (ME)
Zachary Bolotin (Team Lead ME)
Robert Swartz (ME)



Project Overview

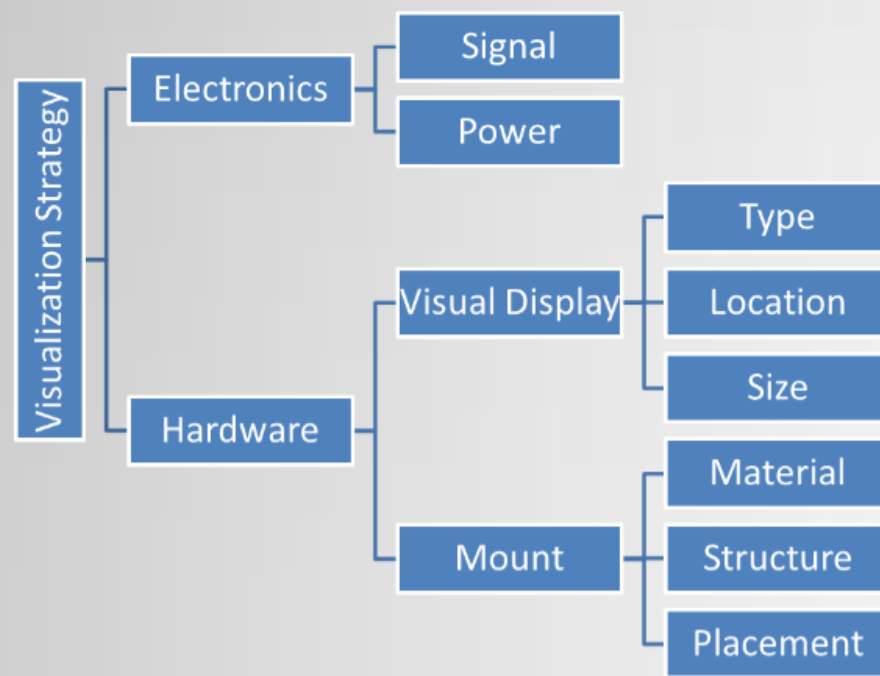
The objective of this project is to design, build and test a visual display system for a nonlinear closed loop aircraft simulator. The design requires that a visual display be mounted in front of a cockpit from an actual aircraft which will then be mounted to a six degree of freedom actuation table.

Customer Needs

- Immersive Visual Environment
- Robust Mounting Strategy
- Interface with Flight Simulation Software



System Design



1. Single TV in front of cockpit
2. Multiple TVs
3. Single projector, flat screen
4. Multiple projectors, curved screen
5. Rear projection, off motion table

	Cost	Weight	Acceleration Tolerance	Vibration Tolerance	Feasibility	Screen Size	Replacement Value	Risk
Weight	2	1	2	1	2	2	1	1
Design #1	3	2	1	2	2	1	1	1
Design #2	2	1	1	2	2	2	2	2
Design #3	3	3	2	1	3	2	3	3
Design #4	1	3	2	1	2	3	3	3
Design #5	2	4	3	3	4	4	3	4

Our Chosen Solution

Projection System

Calculations for projector distance



$$\text{Throw Ratio} \equiv R = D/W$$

$D \equiv$ Distance from vertex of screen to lens

$W \equiv$ Width of projected image on flat surface

- (2) InFocus IN1503 Portable Projector
- (1) Matrox DualHead2GO
- PixelWix SGL2 Warping Software



Screen

To achieve maximum immersion, we constructed a curved screen made of aluminum verticals and crossbars with steel flanges holding them in place. The screen itself was a polycarbonate sheet.

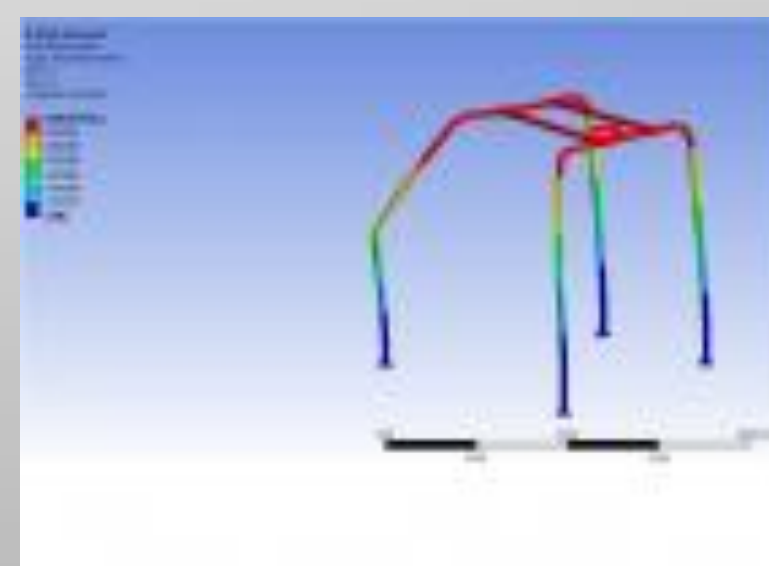
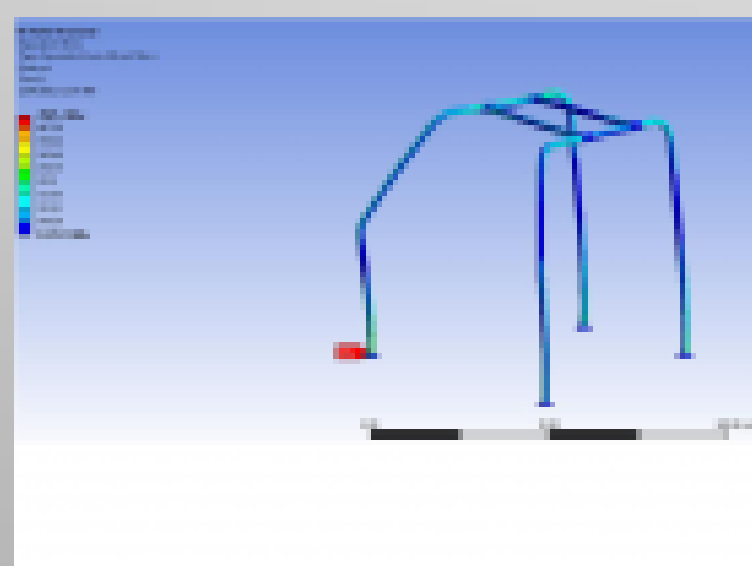


Support Frame

- 1 1/2" steel pipe
- Bent to fit over and around cockpit
- 1/8" steel plate holds projectors



Analysis



Acknowledgements

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