Lockheed Martin

Additive Manufacturing

Introduction to Engineering Design
EDGSN 100 Section 002

Rebridgerators / Design Team 4
Derrick Andreassi, personal.psu.edu/daa5344, daa5344@psu.edu
Gabe Ferreri, personal.psu.edu/gzf5062, gzf5062@psu.edu
Jimmy Nowoswait, personal.psu.edu/jpn5202, jpn5202@psu.edu
Stephen Gordon, personal.psu.edu/sfg5219, sfg5219@psu.edu

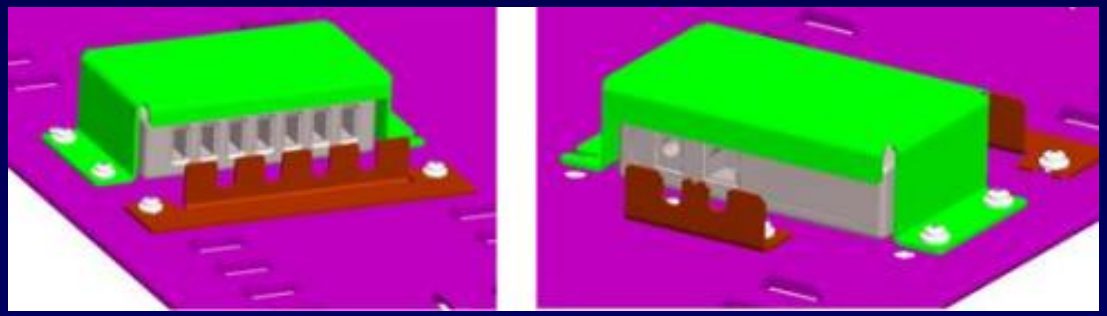
Presented to: Prof. Berezniak
Date: 04/29/2016

Purpose

The purpose of this presentation is to present a redesigned USB Hub Mounting Bracket as a debug and auxiliary mounting device for a custom avionics mission system requiring fewer parts

Background

Mounting brackets are typically used to hold USB Hubs in place on a given surface while preventing attached cables from being disconnected



Sponsor

Lockheed Martin is headquartered in Bethesda, Maryland and is a global security and aerospace company. The company employs nearly 126,000 people around the globe. Specifically, Lockheed Martin is involved in research, development, design, manufacturing, integration, and technology systems sustainment

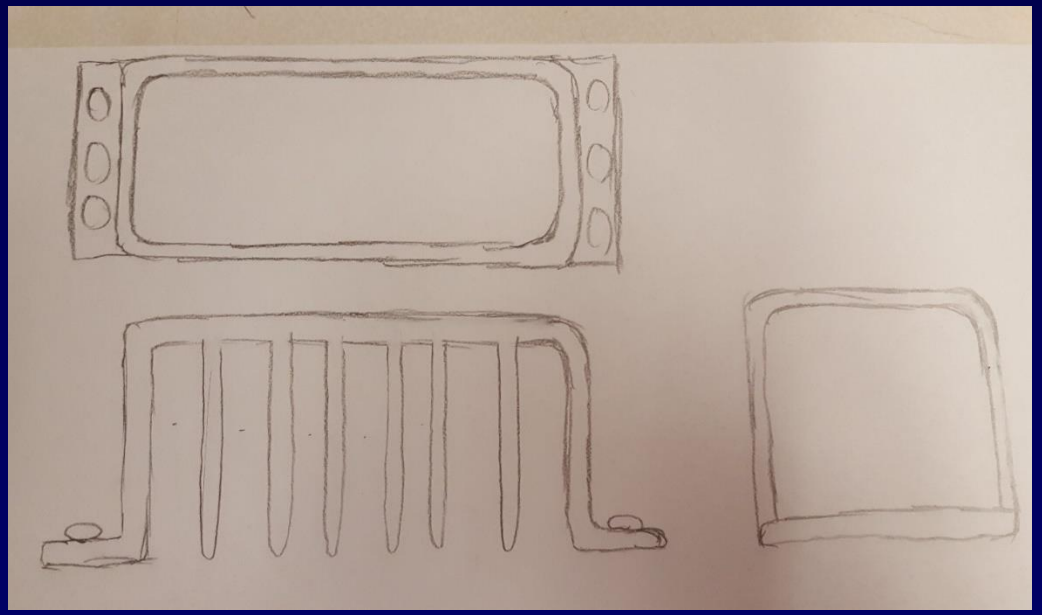
LOCKHEED MARTIN

Project Description

The Design Team came to the conclusion that the new bracket could easily be made in SolidWorks. The redesigned Mounting Bracket is meant to reduce the number of assembly parts and provide a vertical installation configuration

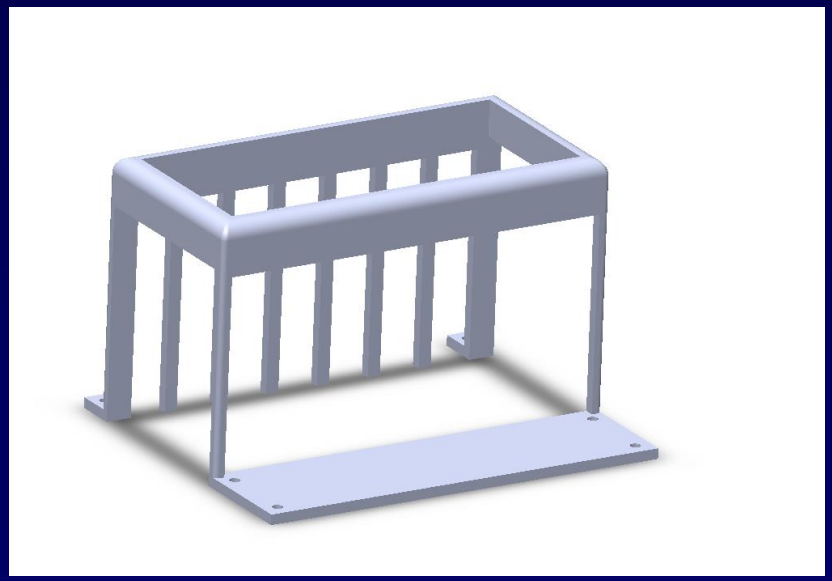
Procedures (1 of 2)

The design team first began by sketching possible alternatives based on previous designs. In an effort to improve the economic efficiency the new bracket design, materials were removed where they were deemed unnecessary for the bracket



Procedures (2 of 2)

Once a final concept for the new alternative bracket was visualized, the design team used SolidWorks to create a 3-D model of the bracket. , the SolidWorks model of the mounting bracket that was created ended up having a unique, cage-like design



Results and Discussion

New Model

Total Unique Part Count: 1

Total Part Count: 1

- Base Hub Enclosure: 1
- Power Retention Bar: 1
- USB Retention Bar: 1
- Screws: 6
- Washer: 0
- Lock Washer: 0

Original Model

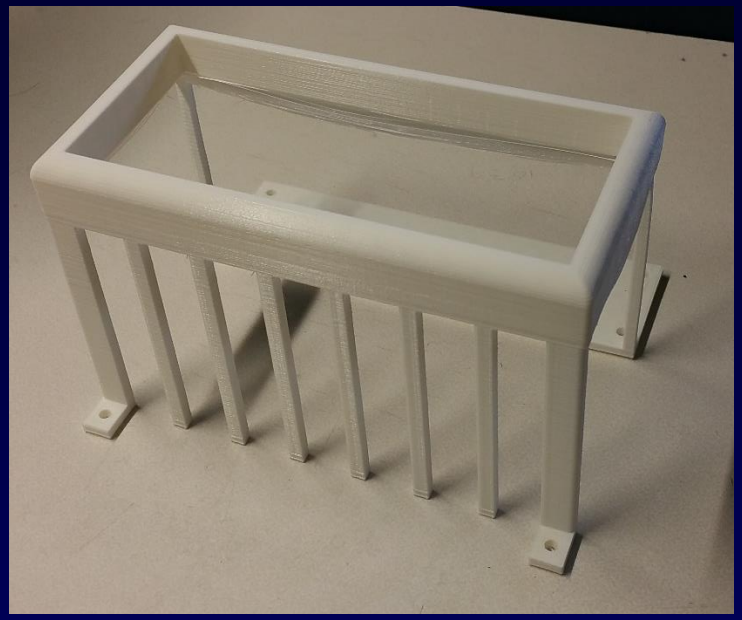
Total Unique Part Count: 6

Total Part Count: 27

- Base Hub Enclosure: 1
- Power Retention Bar: 1
- USB Retention Bar: 1
- Screws: 8
- Washer: 8
- Lock Washer: 6

Conclusions and Recommendations

The re-designed bracket is unibody rather than the original six unique parts. Retention bars for both the power and USB are part of the unibody and are essentially prongs that are close enough together to ensure the wire does not slip through. Rather than eight screws, washers, and lock washers, there are now only six screws and zero washers and lock washers



Closing

The new 7-port USB hub has minimized total part count by about 20 parts. Made with the correct material, this design is the best prototype. Working on this project was very enjoyable and we welcome any other tasks and future projects.