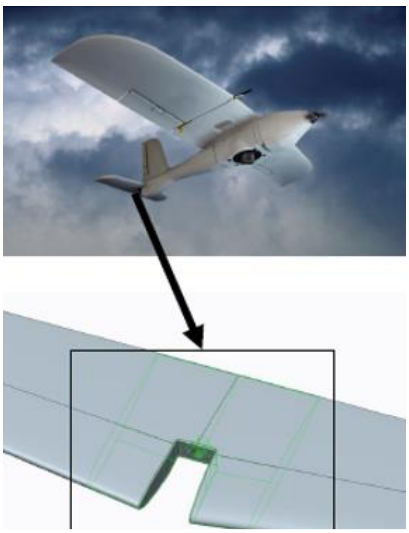
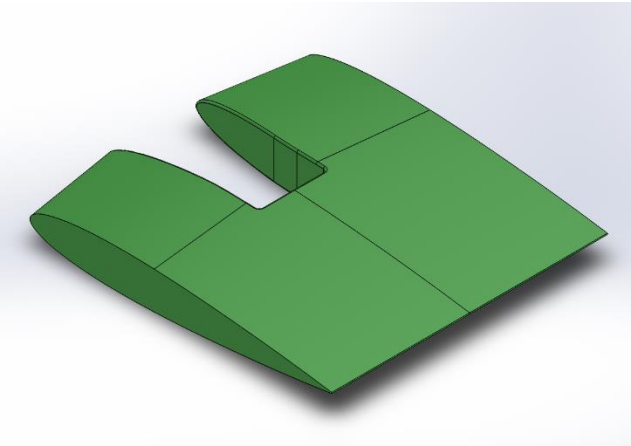
Design Project 2: Desert Hawk 3 redesign

Lockheed Martin tasked my team with redesigning the tail wing of their Desert Hawk 3, a small UAV. The design focus was on absorbing high shock loads experienced during landing while also making the part lightweight and additively manufactured. We took our inspiration from airless tires which use a combination of rigid and rubberlike materials to absorb shock loads and carry payloads.



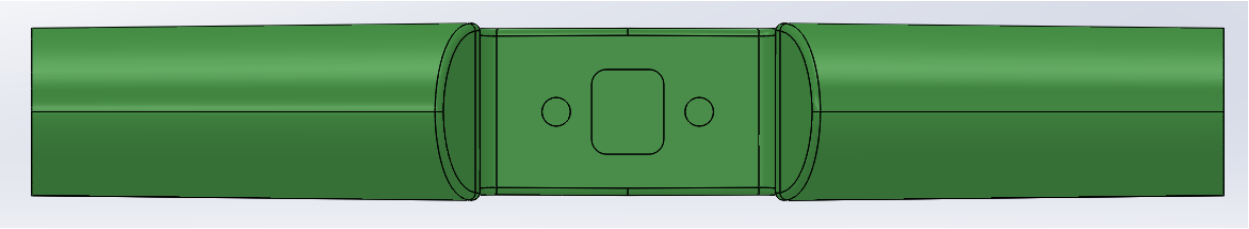
Above is the picture of the Desert Hawk 3 and the section of the tail wing we were tasked to create



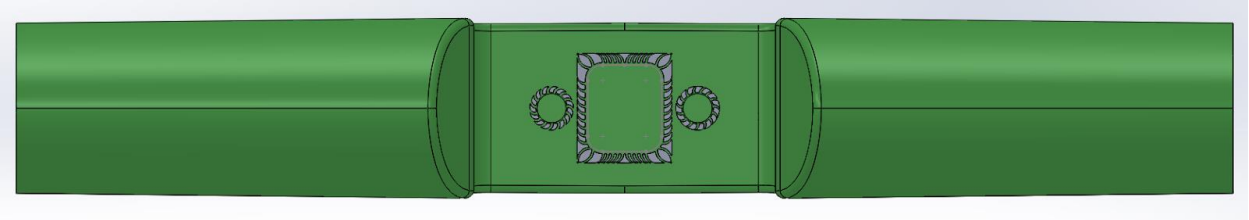
To the left is an isometric view of a Solidworks model of that part

To the right is a Bridgestone Airless tire from which we were inspired

Below is the front view of the Solidworks model. It shows the three load-bearing connector holes that attach the wing to body of the craft

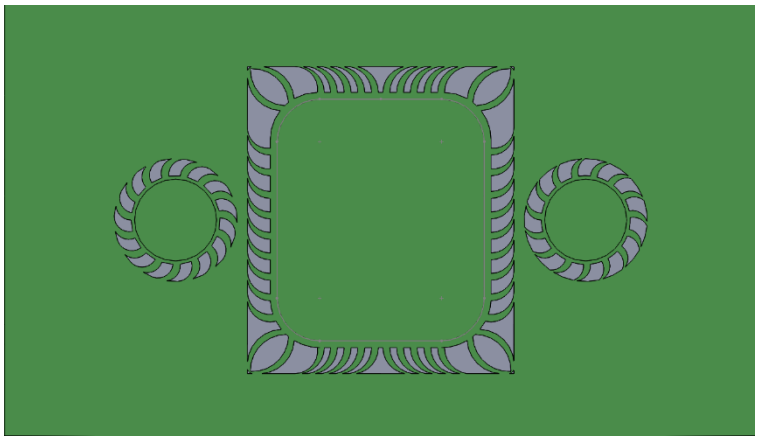


Before

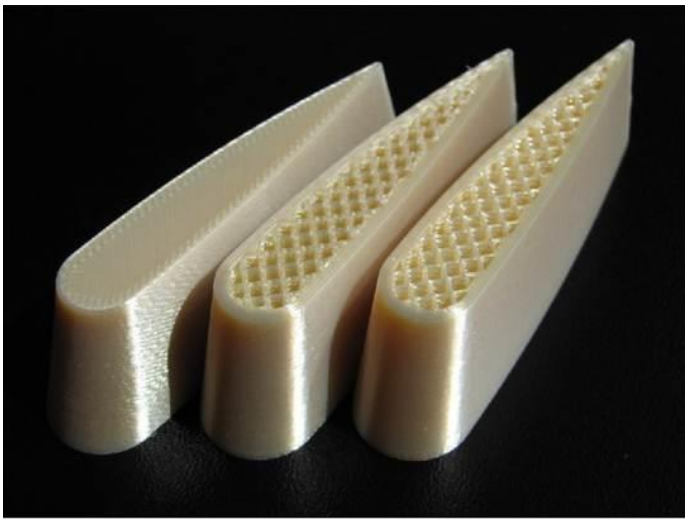


After

To the right is close up of the connector holes with the complex, spring-like spokes.



Below is the honeycomb structure that would lighten the craft while maintaining its structural integrity



Finally, below is the Stratasys Objet 360 Connex, which uses the process of material jetting to additively manufacture parts. We suggested using this process because it can print both rubber-like and rigid materials which would be ideal for shock absorption.

Thank You!

LOCKHEED MARTIN

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