

Thesis Project Portfolio

Design of a Light Attack Aircraft

(Technical Report)

**Light Attack Aircraft: A Modern Example of Military Technological Development
Through SCOT**

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Military aircraft of today have become too sophisticated and expensive for practical application in the roles that they are most needed currently. In the Middle East, where most U.S. military engagements occur currently, societal support of direct military intervention has dropped. With modern fighter jets being impractical for the types of aircraft missions in the Middle East, a new light attack class of aircraft could be the solution to the geopolitical and technological problem in the Middle East.

The capstone project aims to design a light attack aircraft that satisfies the current operational requirements of basic air to ground missions in regions such as the Middle East. Expensive jet fighter aircraft are currently being used to execute missions that could be done just as effectively with a much less expensive light attack aircraft. Our capstone team designed an aircraft to meet the requirements laid out by the AIAA light attack aircraft undergraduate design competition. The finalized aircraft design is capable of operating out of improvised austere airstrips and carrying a significant payload of modern weapons, all while being considerably less expensive than the aircraft that currently serve these purposes.

My STS research is very closely related to my capstone project, as it analyzes the ‘why’ behind the light attack aircraft’s development. In a time where military technology gets even more and more advanced every year, why are we shifting focus from the F-35 to a light attack aircraft? This is the main question that inspired my STS research, and I argue that the answer can be traced back to social construction of technology, a framework of technological development brought to light by Pinch and Bijker in 1984. In the case of the light attack aircraft, this aircraft was not born into existence out of autonomous technological advancement, rather it was developed as a technological solution to a societal problem.

Upon completion of our aircraft design for our capstone, we had successfully designed an aircraft that satisfies all of the requirements set forward by the AIAA design competition. I could not be more satisfied with the results of my team's work for two semesters, but these results were not easily attained. Successful completion of this project required myself and my team members to face many challenges. Most difficult of all the challenges was the requirement for using a variety of complex software that my team was unfamiliar with. Additionally, I am very satisfied with the results of my STS research. After analyzing the development of the light attack aircraft, I am much more prepared to evaluate the development and ethical considerations of technology as I become a professional engineer.

I would like to thank my capstone advisor, Dr. Jesse Quinlan, for all his guidance in this project. And of course, many thanks are due to my capstone team members Will Ayscue, David Gibbs, Catherine Hanafin, Lauren Hancock, Brendan Schneider, and Hope Wheeler for all of their hard work and contributions to our capstone project.