



Kline Technical Consulting LLC

U.S. Air Force Saves More Than \$1M in Development of Airborne Laser with Kline Technical Consulting

Challenge: The U.S. Air Force required a program manager for the U.S. airborne laser (ABL) program. The program manager would oversee an engineering support team to design, model, develop, and test a payload package that would stabilize the airborne laser platform in an aircraft.

Solution: The U.S. Air Force selected Kline Technical Consulting (KTC) to manage the payload package project because of the company's background and patent position in advanced ceramic composite materials, engineering expertise, and deep knowledge of military applications.

Application Area: Electronic Warfare

"Managing this program involved tremendous amounts of data, flowing from designers to users and requiring multiple rounds of iteration. KTC's expertise with military systems and requirements made them perfect for this job. They could easily communicate with our users and the design team, making the whole process a smooth one."

– Corporate Vice President, HYTEC, Inc.

Critical Factors for the U.S. Air Force ABL

- **Precision:** Because the payload was an airborne laser, remaining precisely on target was imperative even as the airframe was moving in all three axes.
- **Cost:** The payload package needed a robust design so that it could be deployed on more platforms, more quickly.
- **Flexibility:** The U.S. Air Force and Team ABL required that the laser package could be easily moved from one aircraft to another.

Background:

The U.S. Air Force ABL, designated YAL-1A, is a high-energy laser weapon system for the destruction of tactical theatre ballistic missiles, carried on a modified Boeing 747-400F freighter aircraft.

The ABL was developed by the Air Force Research Laboratory and Team ABL, which consisted of Boeing, TRW (now Northrop Grumman Space Technologies), and Lockheed Martin.

Application:

Previously, the U.S. Air Force and Team ABL focused their work on using large, complex laser gyros, but the expense, maintenance, and difficulties in mounting the payload package within the gyros left the team searching for a new solution.

The best design team in the world to create a payload package that would work with the large laser gyros was HYTEC, a Los Alamos-based company that had previously designed packaging systems for LIGO, ATLAS/LHC, and other laser applications. The U.S. Air Force and Team ABL hired the Los Alamos-based design team alongside KTC, who would manage the program and interface with the design team. With KTC's deep knowledge of the military organization's requirements and processes, the company served as an ideal project manager between the designers, the U.S. Air Force, and Team ABL.

KTC's program management involved overseeing tremendous amounts of data, flowing from designers to users and allowing for multiple rounds of iteration. KTC applied past knowledge and experience with military operations to successfully communicate requirements between the two organizations. In addition, KTC managed the hardware fabrication and assembly, which required identification of outstanding machining, fabrication, and advanced carbon fiber polymer matrix composites. KTC's engineering expertise, as well as the Los Alamos firm's patents and proven past performance, was critical to the success of the program.

Because the payload package was for an airborne laser, precision was a critical requirement of the final solution. The laser needed to maintain precise sighting and remain fixed on a target while the aircraft was moving. KTC understood the complexity of this requirement and fulfilled the military requirements with the design team.

Deliverables:

The resulting payload package could be mounted in any large aircraft or other aerial platform. The cost-effective, robust design was flexible in a way that allowed the laser package to be deployed on more platforms, more quickly. KTC helped create a laser package that not only worked for this aircraft, but could be easily moved from one aircraft to another.

Results:

The payload package is successfully used in present follow-on programs with the ABL. Through the expertise of the design team under the leadership and experience of KTC, Team ABL saved hundreds of thousands of dollars per ABL system manufactured, and millions of dollars in the product lifecycle costs since the design used lower cost materials, much simpler and faster construction, and required much lower maintenance expense.

KTC Provides Active Countermeasures

As a leading expert in cyber and electronic warfare, KTC has decades of experience in the areas of developing and testing electronic warfare systems for government military and intelligence groups, as well as government-contracted, large commercial businesses.

"We have a deep knowledge of military organizations, requirements, and processes. With our extensive expertise with electronic warfare systems and solutions, the KTC team was a perfect fit between the design team and the U.S. Air Force to develop a payload package for the ABL that would be precise, cost-effective, and flexible." –Dr. Robert Kline