

# High Energy Laser (HEL)

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For Professor Perkins

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John Smith  
President  
Department of Defense  
3456 Chestatee Road  
Washington D.C. 32211

Dear Mr. Smith:

We are pleased to submit the following proposal to provide you with a new technological advance in laser defense. As you know, we have been a leader in technological advances over the past 20 years and have done numerous contracts with the Department of Defense in the past and will continue to do so in the future. Everyone here at Northrop Grumman is very excited about this new find and is working hard to perfect it. I know that as you read further, you will be excited too.

Sincerely,

Travis Elmore  
President

## Introduction

Northrop Grumman has taken laser technology to another level. Lasers are used in everyday life from doctors to soldiers. We have created a land based laser called HEL (High Energy Laser) that can shoot down any missile, mortar round, and other projectile that is fired from the ground aimed at military personnel, military equipment, and innocent civilians. This will greatly reduce casualties on the battlefield and help protect citizens in our own country.

## Benefits

### ❖ Saves Lives

Many people have been killed in war by missiles and mortar rounds. This will greatly reduce if not eliminate casualties caused by these types of weapons. The system is designed to defend deployed forces, large military installations, civilian populations, and industrial areas.

### ❖ Cost Efficient

Every weapon that is used by the military has to be reloaded. This means you have to keep paying for ammunition every time someone fires their weapon and expend rounds. The HEL does not have to be reloaded because it is a laser that is generated over and over again anytime you have to use it. Reloading is allowing the laser to cool down (Kopp, 2008).

### ❖ Easy Maintenance

Every piece of equipment will be under warranty and military personnel will be trained on how to operate and maintain the HEL substation by our staff.

## Description of Technology

Once operational, HEL will consist of four main components: a command center, a fire control radar, a pointer-tracker, and the high energy laser itself. The command center, known as Command, Control, Communications, and Intelligence will manage all aspects of the system, including detecting, tracking, and destroying incoming targets within HEL's range (Technology Demonstration Program, 2004). C3I will be operated by a two-man crew: a commander and a gunner.

Positioned near the hostile zone, the fire control radar will continuously scan the horizon for threats. Once an incoming rocket has been detected, the radar will calculate the target's trajectory and enable the pointer-tracker to lock on to the target. HEL will be mounted on a large gimbaled assembly that will allow the pointer-tracker to swivel when tracking the rockets.

Once the target is within range, the pointer-tracker will focus HEL's high-energy deuterium-fluoride (DF) laser beam on the incoming rocket. The DF laser beam is created by mixing fluorine atoms with helium and deuterium to generate DF in an excited state. A resonator extracts the DF and transforms it into a beam of coherent, monochromatic light (ABL YAL 1A Airborne Laser, 2008).

The beam itself is only a few inches in diameter, but is powerful enough to heat steel at 200 yards or more. The pointer-tracker will keep the laser beam focused on the incoming rocket until the intense heat causes the warhead to explode. Debris from the blast will fall short of the rocket's intended target, thus effectively neutralizing the threat. Once deployed, HEL will be capable of firing 60 shots before reloading. The system will operate at a per-kill cost of approximately \$3,000, making it one of the most inexpensive anti-missile systems in existence.

## Costs

The overall cost of the research will be over 130 million dollars. We are asking for 100 million dollars to be able to finish and produce this valuable product. The chart below will illustrate how each year the money will be distributed.

Year	Jan	Mar	Jun	Sep
2008				10 million
2009	10 million	10 million	10 million	10 million
2010	10million	10 million	10 million	20 million

## Comparisons with other products

There are no other comparisons like this on the market. There are however, mobile and air lasers that are being developed but it just isn't as accurate or as powerful as the stationary HEL.

## Implementation

The system will be used to defend deployed forces, large military installations, civilian populations, and industrial areas.

## Conclusion

In programs such as HEL, the speed of lasers permits rapid interception of both short range rockets with a short flight time, but also the ability to destroy larger, even intercontinental missiles during their brief ascent, or boost phase. Lasers based on land would permit much more comfortable reaction times, be cost effective, easy to maintain, and save numerous lives.

## Recommendation

Northrop Grumman will provide the Department of Defense with its final product immediately following its successful prototype of the HEL. The testing will be completed by February 2010 and begin sending product out by June 2010.

Department of Defense agrees to pay 100 million dollar research grant for the period of September 15, 2008 to February 1, 2010. Northrop Grumman agrees to send any new changes about the HEL technology at its earliest convenience.

I, \_\_\_\_\_, of Department of Defense, agree to the terms above from Travis Elmore of Northrop Grumman, will fund (100 million dollars) the HEL technology for the period of September 15, 2008 to February 1, 2010. The testing of the prototype will be provided immediately.

## References

ABL YAL 1A Airborne Laser (2008, January). , USA. Retrieved July 29, 2008  
from, SPG Media Web site:  
<http://www.airforce-technology.com/projects/abl/>

Kopp, Dr. Carlo (2008, July 27). *High Energy Laser Directed Energy Weapons*.  
Retrieved July 29, 2008 from, Air Power Australia Web site:  
<http://www.ausairpower.net/APA-DEW-HEL-Analysis.html>

(M-THEL) Technology Demonstration Program (2004, January). Retrieved July 29, 2008  
from, Defense Update Web site:  
<http://www.defense-update.com/directory/THEL.htm>