

Northrop Grumman Internship 2009

Brian DeKock, Mechanical Engineering Concentration

About Northrop Grumman

Northrop Grumman Corporation is a leading global security company whose 120,000 employees provide innovative systems, products, and solutions in aerospace, electronics, information systems, shipbuilding and technical services to government and commercial customers worldwide.



E-2D Advanced Hawkeye

The Electronic Systems Sector

Northrop Grumman is a leader in:

- airborne radar
- navigation systems

- electronic countermeasures
- precision weapons

Key products include:

- F-16, F-22 and F-35
- active electronically scanned array sensor systems
- airborne early warning and control radar systems

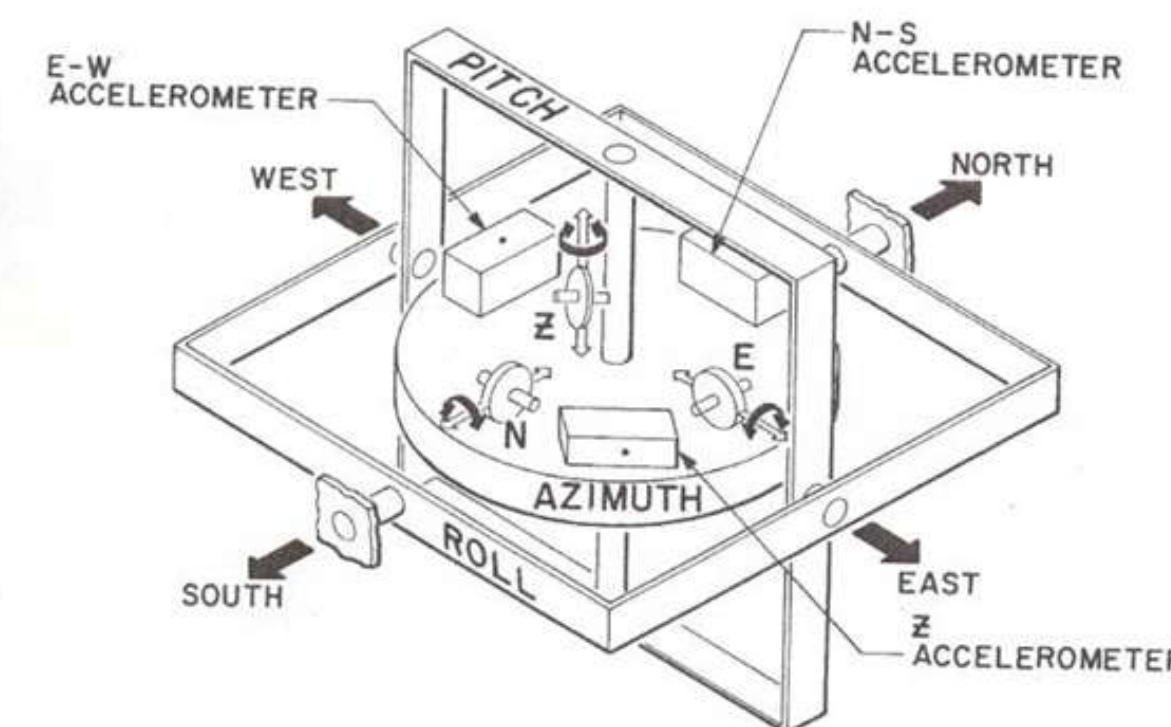
- digital electronic warfare systems
- aircraft missile defense systems
- air defense systems
- integrated bridge systems
- situational awareness
- fiber-optic gyro-based navigation systems



B-2 Spirit

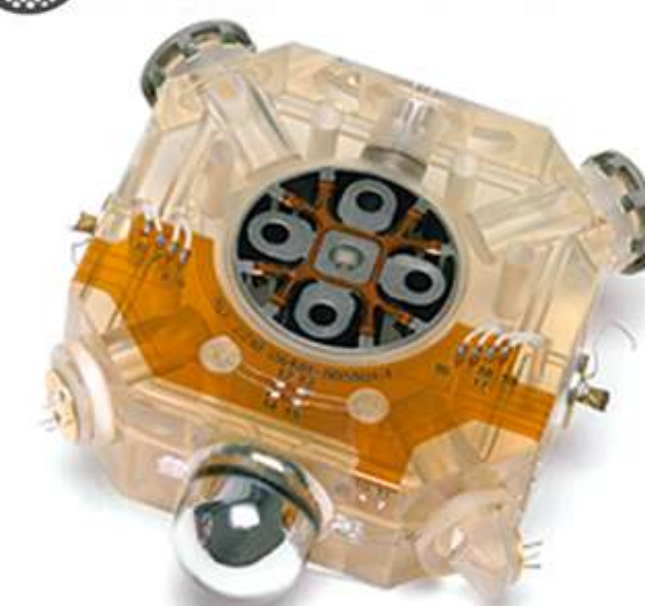
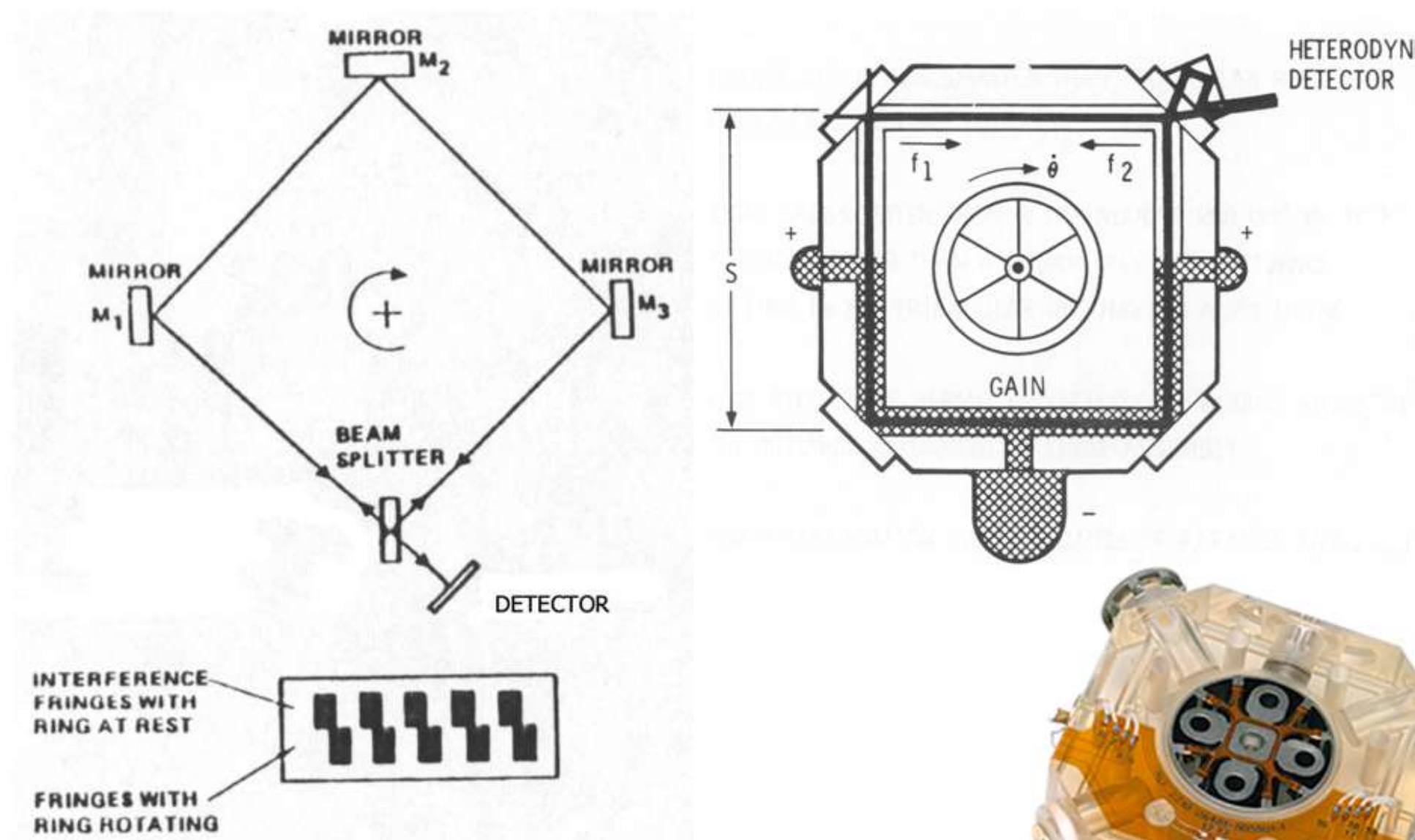
Inertial Systems Functional Basics

- Gimbaled System
 - Precision mechanical/electrical design
 - Low computational demand
- Strapdown System
 - High Dynamic Environments
 - High computational demands



A fiber optic gyroscope (FOG) is a gyroscope that uses the interference of light to detect mechanical rotation. The sensor is a coil of as much as 5 km of optical fiber. Two light beams travel along the fiber in opposite directions. The beam traveling against the rotation experiences a slightly longer path than the other beam. The resulting phase shift affects how the beams interfere with each other when they are combined. The intensity of the combined beam then depends on the rotation rate of the device.

Ring Laser Gyro Technology



LX Offers New Training Program

Northrop Grumman “went live” a year and a half ago with Learning Exchange (LX), a training program that employees use to obtain certification in technical areas. The intent was to make their overall training experience more productive, while cultivating the company’s talent. Employees will find that LX has regular updates to keep them current with the latest training modules. LX was implemented to replace the outdated previous program called PeopleSoft. The training team expects learners to benefit from a new friendlier version once the LX system is upgraded in the upcoming year.

Family of Northrop Gyroscopes

Gyro Type	Accuracy	Random Drift (deg/hr 1-Sig)	Cost	Production Rate
G-2000 DTG	Medium	1 - 0.3	Low	High
G-2000 DTG 2X	Medium - High	0.3 - 0.05	Low	Low
FIBER OPTIC GYRO	Medium - High	1 - 0.004	Medium - High	High
LASER GYRO	Medium - High	0.01 - 0.001	Medium - High	High
HRG (Hemispherical Resonator)	High	0.01 - 0.0001	High	Low
MEMS GYRO (SiGi)	Low - Medium	100 - 5	Low?	?

Conclusions

Over the course of the summer I learned valuable lessons and gained many different skills. Not only did I become a better engineer from a technical perspective, but I also learned many important things about the business that goes on alongside engineering. My summer at Northrop Grumman was a good experience that I will not soon forget.

