

THE VALUE OF PERFORMANCE.
NORTHROP GRUMMAN

UMBC SWE

Amanda Panneton

April 29, 2015

amanda.panneton@ngc.com

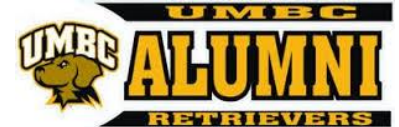
- Amanda Panneton: amanada.panneton@ngc.com
- Going on 7 years of working at Northrop Grumman as a computer engineer in the digital technology department
- A member of SWE since 2012
- Married to a fellow Northrop Grumman engineer
- Obsessed with my pit bull terrier, Reesie
- Love to travel, work out, try new restaurants and decorate my new home

My Time At UMBC

- Graduated from Perry Hall High School in 2004



- Graduated from UMBC with a Bachelor of Science in Computer Engineering in 2008.



- Summer internships after my Sophomore and Junior years at Northrop Grumman

- CWIT Scholar, C3 and the first CWIT Scholar to graduate with a degree in Computer Engineering



- Vice President of the Engineering Council of Majors

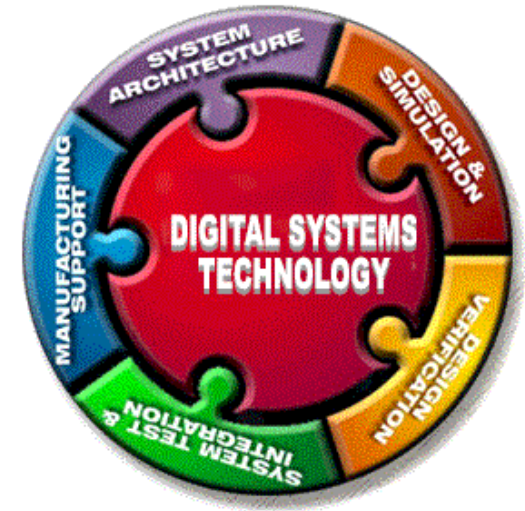
- Numerous positions in my sorority, Phi Sigma Sigma



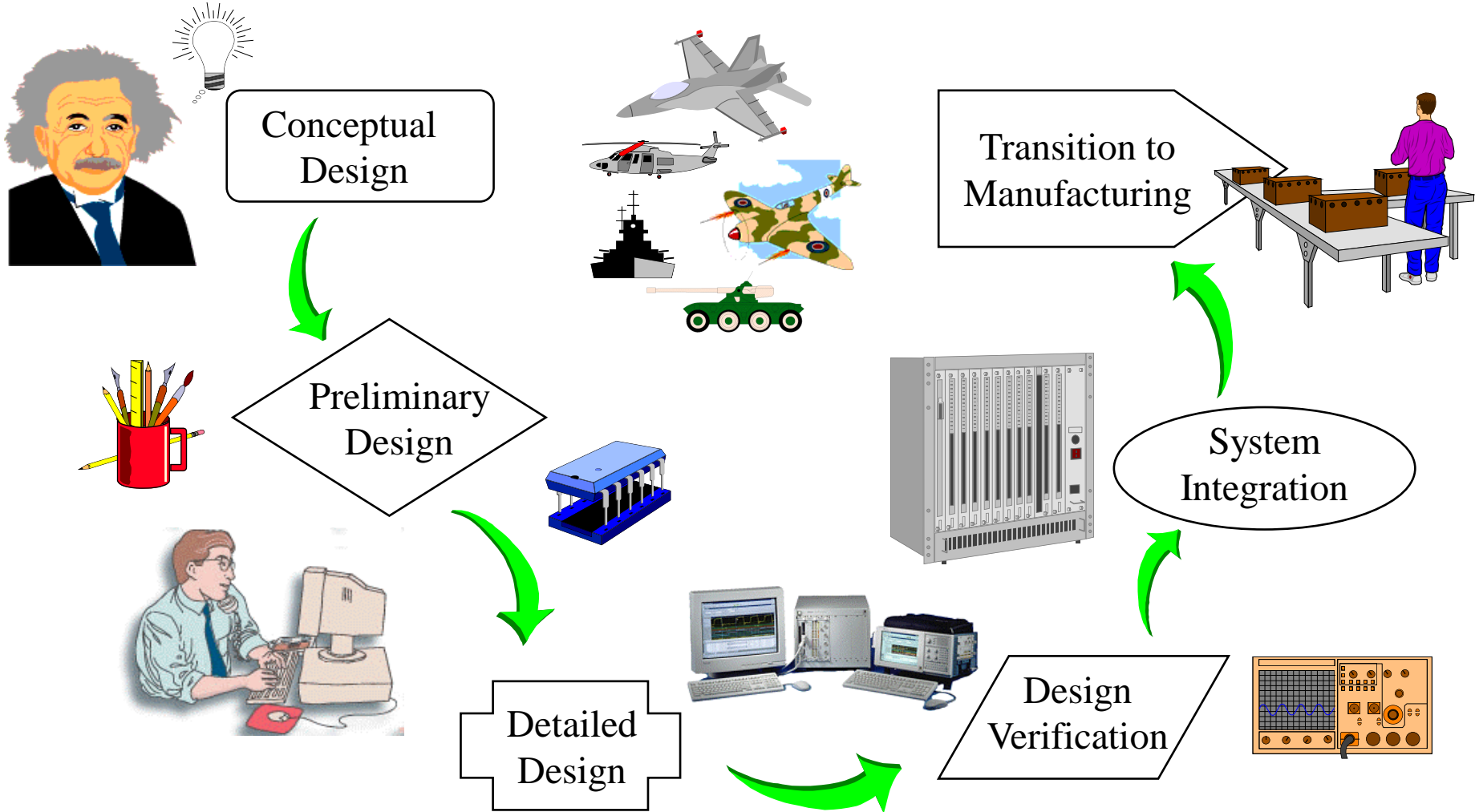
- We are an American global aerospace and defense technology company and currently the fifth-largest defense contractor in the world
- CEO: Wesley G Bush
- Headquarters: Falls Church, VA
- Fortune 500 company – rank 122 in 2014
- Business Sectors:
 - Aerospace Systems – Redondo Beach, CA
 - Electronic Systems – Linthicum, MD
 - Information Systems – McLean, VA
 - Technical Series – Herndon, VA

- A leading developer, manufacturer, integrator and supporter of a variety of advanced electronic and maritime systems for U.S. and international customers for national security and non-defense applications.
- Systems include high performance sensors and intelligence processing and navigation systems operating in all environments from undersea to outer space. Applications include airborne surveillance, space sensing, biochemical detection, intelligence fusing and analysis, aircraft fire control, precision weapon engagement, electronic countermeasures, inertial navigation, air and missile defense, air traffic control, ship bridge control, communications, and mail processing.
- President: Gloria Flach – SWE member!
- Plants & Offices in MD: Annapolis, Baltimore, Elkridge, Linthicum and Sykesville
 - Approximately 10,000 employees
- Hardware Engineering: RF Aperture Technology, Signal Conversion Technology, Mechanical Technology, Test Design Engineering, Power Conversion Technology, RF Devices & Packaging Technology
- 5 • Processing Technologies: Digital Technology & Software Engineering

- Product Areas & Expertise:
 - Application Specific Integrated Circuits (ASIC)
 - Anti Tamper and Information Assurance Solutions
 - High Speed Digital Circuit Card Assemblies
 - Programmable Logic Devices (CPLD & FPGAs)
 - **Antenna & Beam Steering Control**
 - Digital Signal Processors
 - EO/IR Image Processors
 - Digital Receivers
 - Radar Signal Processor
 - Real-Time Sensor Control Products
 - Verification



Digital Technology Design Flow



Digital Technology Design Tools

- StateCAD (VHDL State Machine Synthesis)



StateCAD™

- Synplicity (Design Synthesis)



- Mentor Graphics Xpedition (Schematic Entry, Layout, Simulation)



- Altera MAX+Plus II FPGA Development Software



- Actel FPGA Designer Series Development System



- Xilinx Vivado & ISE FPGA Design Suite



- Modelsim/QuartaSim (FPGA/ASIC Design Simulation & Verification)

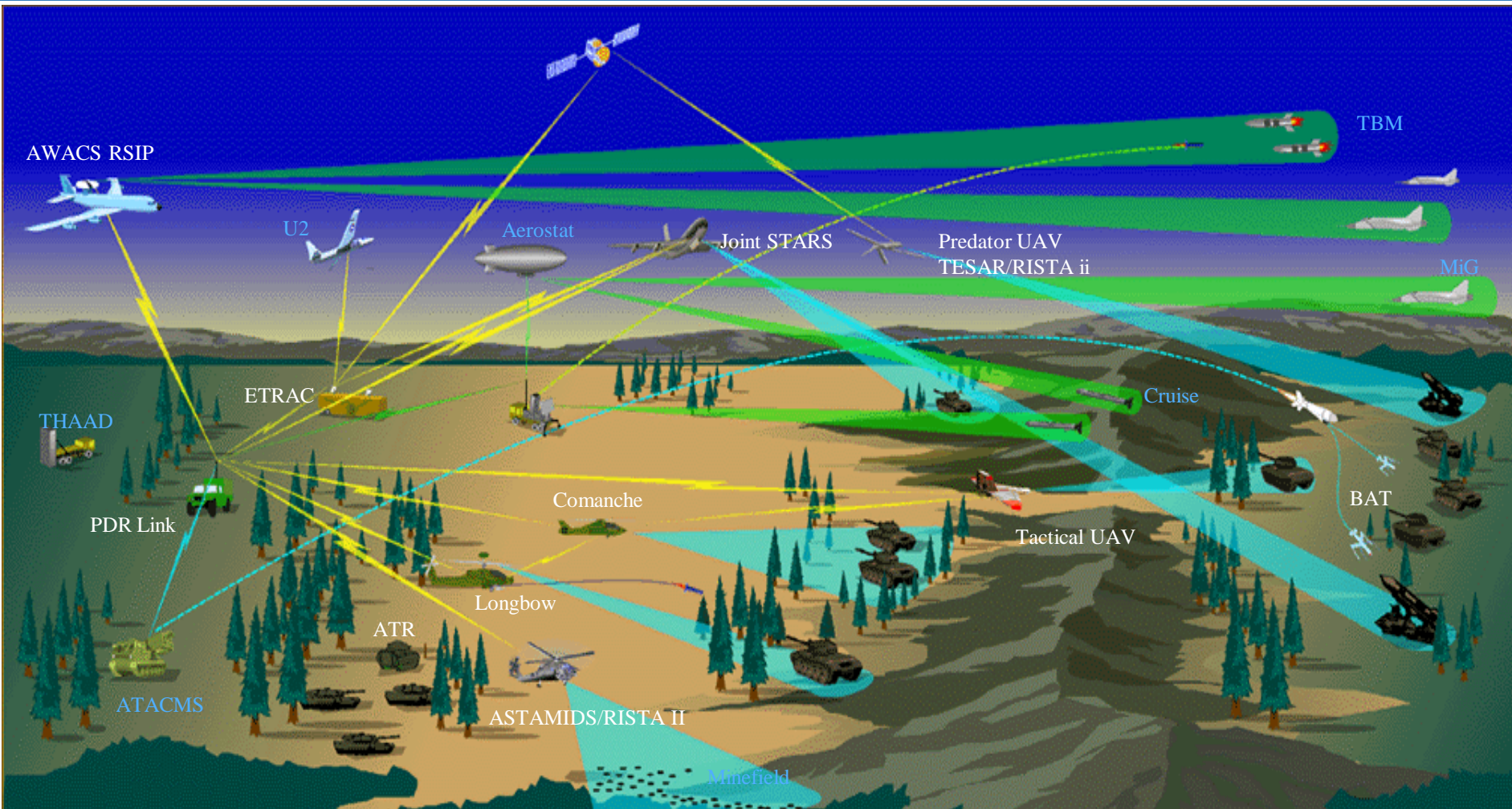


- PSPICE Analog Circuit Simulator

- LineSim Signal Modeling and Analysis Tool

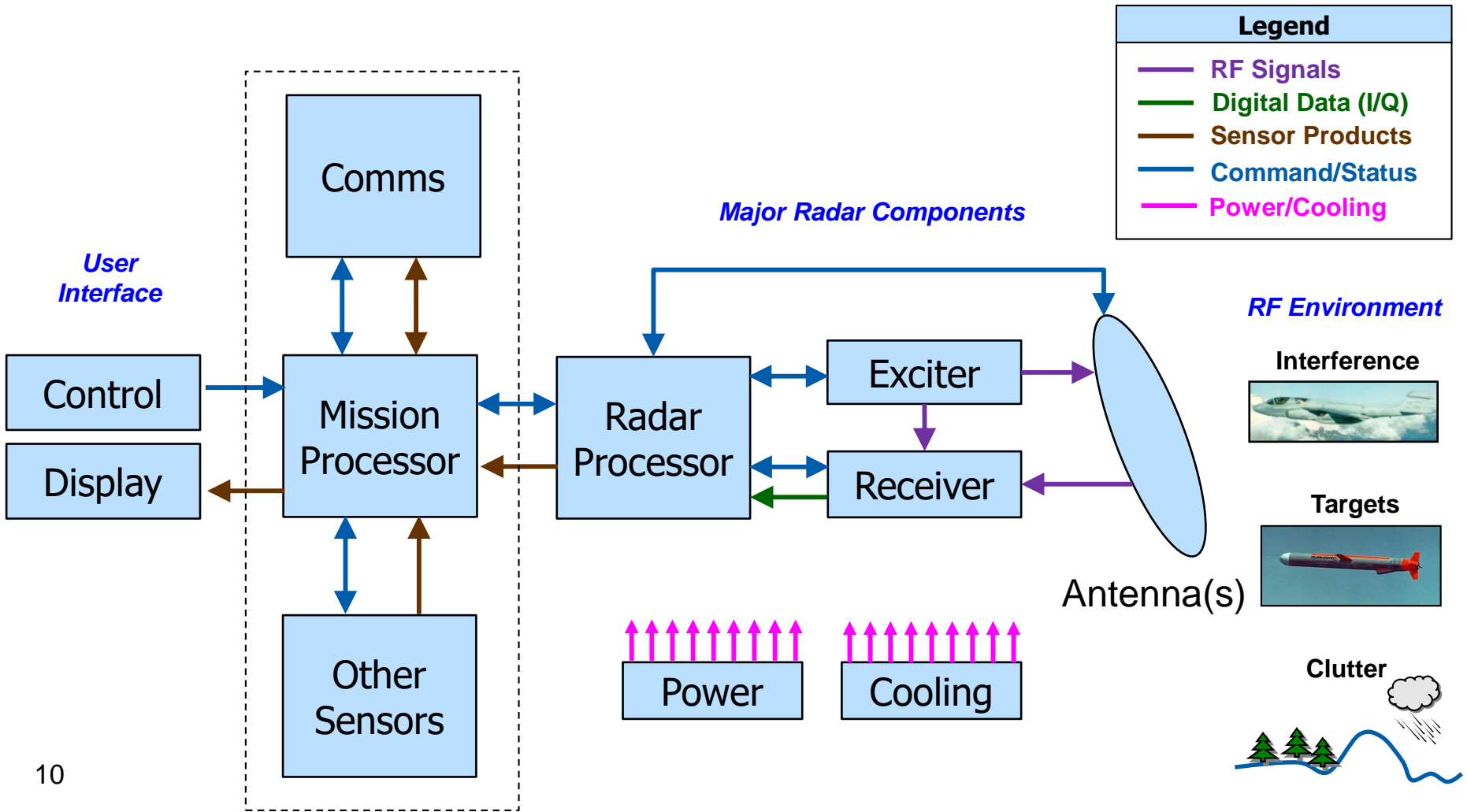


Digital Technology Battlefield Presence

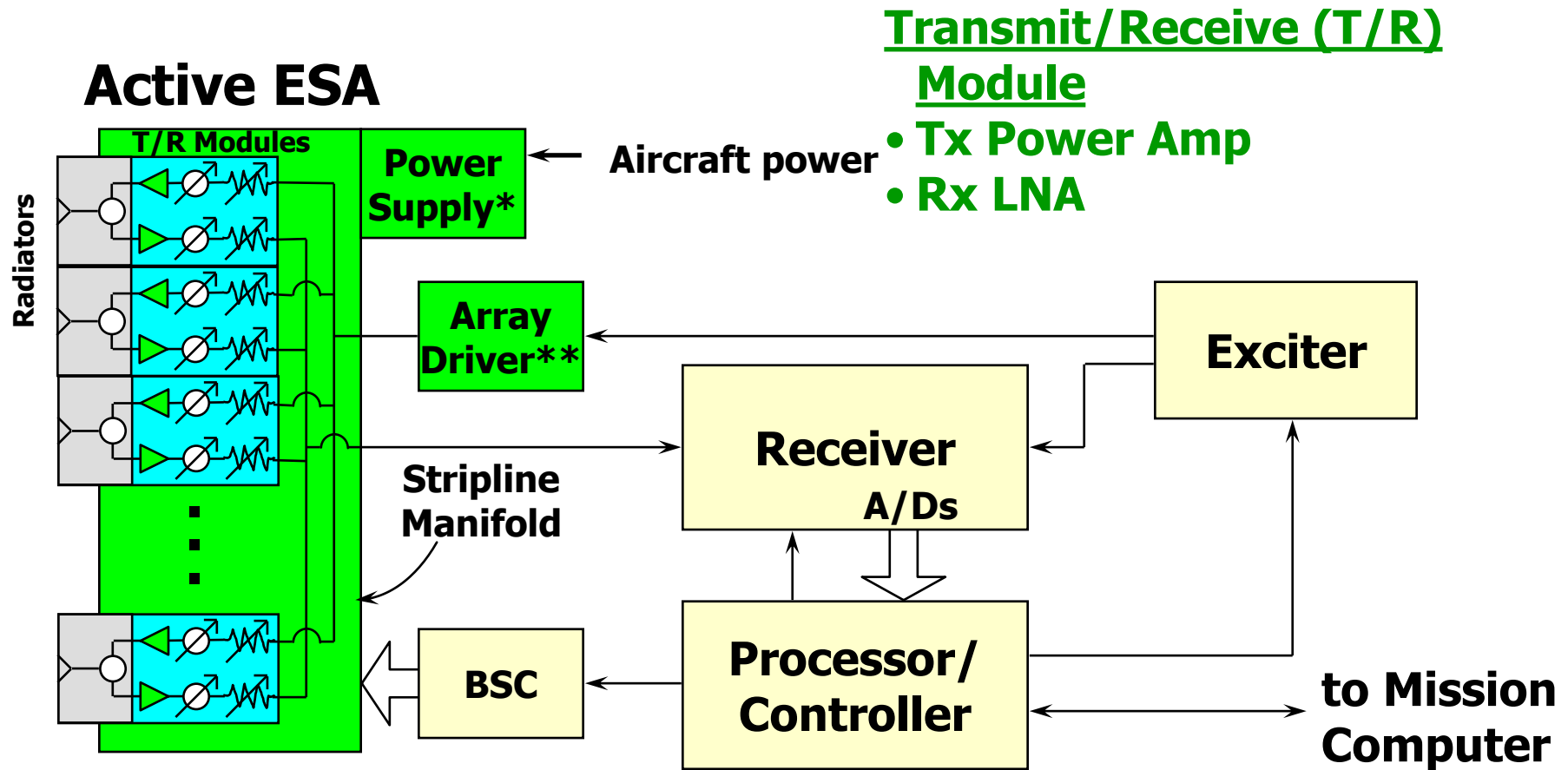


RADAR = RAdio Detection and Ranging

- A Radar transmits a radio wave (electromagnetic wave) which is reflected back toward the radar by a target. The radar receives the radio wave thereby detecting the presence of a target.



What Is An Active Electronically Scanned Array (AESA)?

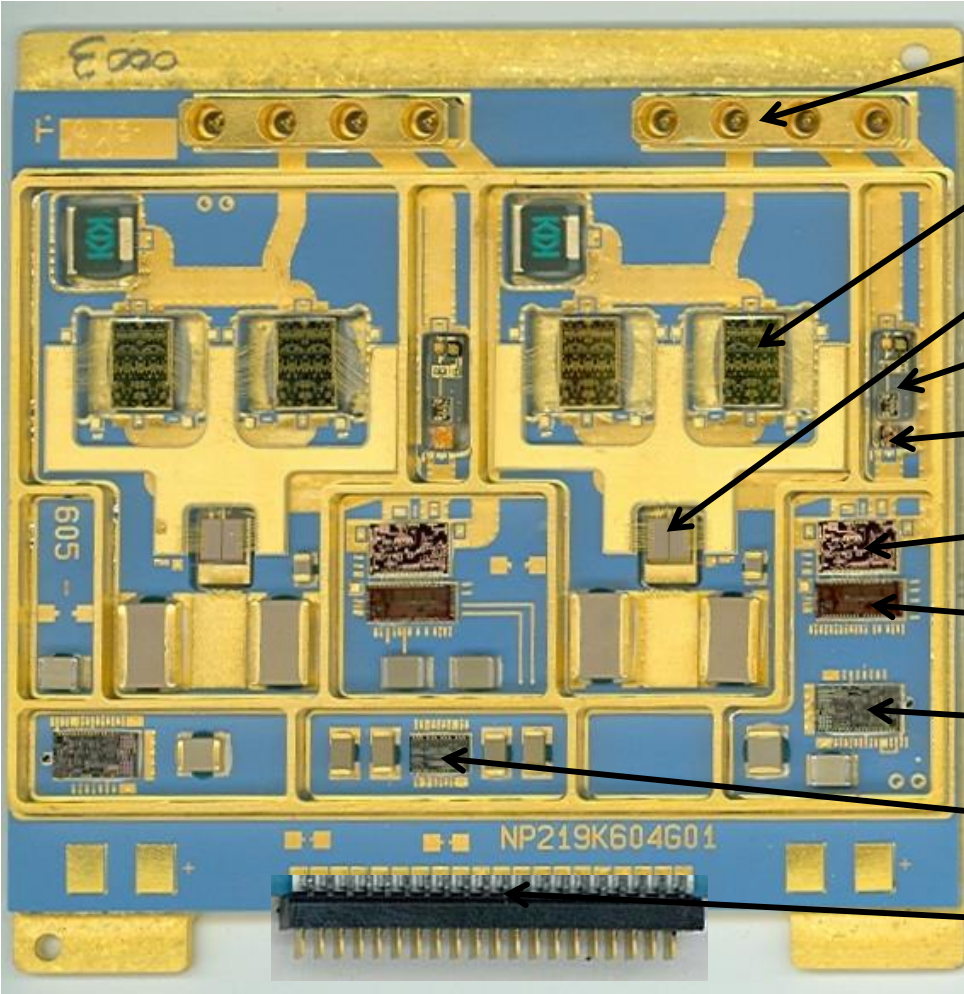


* Low voltage power supply for the T/R modules

** 50 watt solid state array driver needed for amplification

AESA

Traditional T/R Module



RF Connectors

High Power Amplifier (HPA)

Switching FET

Receiver Protector / Limiter (RP)

Low Noise Amplifier (LNA)

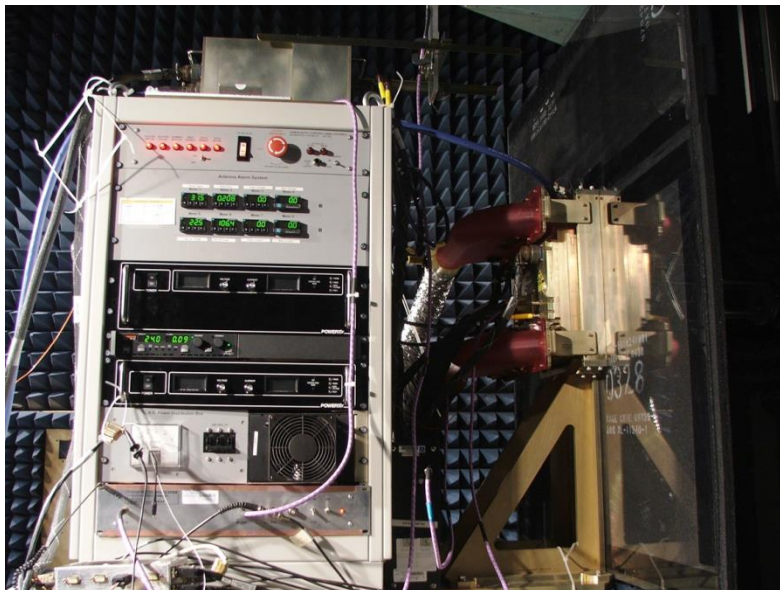
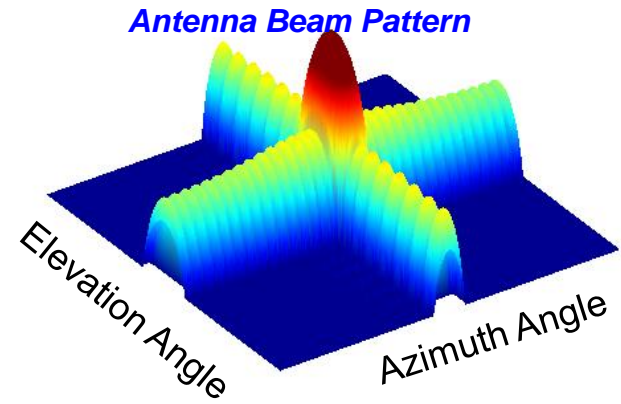
Multifunction MMIC (MFC)

Module Controller ASIC

Drain Regulator ASIC

Gate Regulator ASIC

DC Connector



Northrop Grumman Electronic Systems Products - AESA

- Pioneer in AESA (Advanced Electronically Scanned Array) Radars



AN/APG-83 Scalable Agile Beam Radar

SABR optimizes radar system performance within existing power and cooling allocations of legacy F-16s worldwide and will make these F-16 fleets relevant for decades to come.



AN/TPS-80 G/ATOR

The AN/TPS-80 G/ATOR provides multi-faceted detection and tracking capabilities to enable engagement of a wide range of hostile threats, and offers robust air traffic control capabilities.



AN/APG-81 for the F-35

The radar is designed to enable F-35 pilots to effectively engage air and ground targets at long range, while also providing outstanding situational awareness for enhanced survivability.



AN/APG-77 for the F-22

Rapid beam agility, low radar cross section and target detection capability enable the air dominance fighter to achieve "first look, first kill" capability.



AN/APG-80

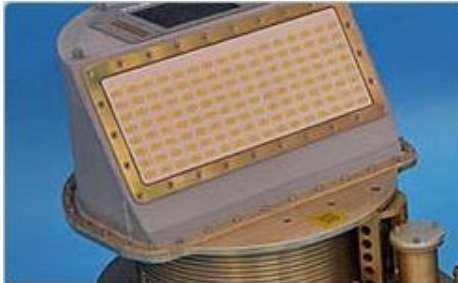
The APG-80 is designed to search continuously for and track multiple targets within the forward hemisphere of the aircraft.



AN/ASQ-236 Radar Pod

The ASQ-236 is a tactical Ku-band AESA radar pod.

Northrop Grumman Electronic Systems Products - AESA



AN/ZPY-1 STARLite

Weighing just 65 pounds, STARLite is a compact SAR/GMTI/DMTI radar system ideal for equipping a variety of manned and unmanned platforms for mission-critical tactical reconnaissance.



AN/ZPY-2 MR-RTIP

The Multi-Platform Radar Technology Improvement Program uses AESA technology and COTS hardware to deliver long range, very high-resolution SAR, GMTI and air target tracking.



AN/ZPY-3 Multi-Function Active Sensor

The AN/ZPY-3 MFAS is a 360-degree field-of-regard active electronically scanned array radar designed for maritime surveillance.



HAMMR

The Highly Adaptable Multi-Mission Radar features a compact, lightweight ground configuration that employs AESA antenna technology from airborne fighter aircraft.



MESA

The MESA radar provides air-to-air coverage, air-to-surface coverage, integrated identification friend or foe, special track beams and focused sector operation.



VADER

The Vehicle and Dismount Exploitation Radar will allow accurate GMTI data and SAR imagery to be readily available to ground commanders in real time.

- <http://www.northropgrumman.com/MediaResources/Pages/Advertising.aspx>
- C⁴ISR concept of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance

Summer Internships at Northrop Grumman

- Looking for rising juniors or seniors at accredited engineering colleges and universities
- Typically an 8-12 week commitment
- Work with professional engineers on real programs
- Many intern programs such as orientation, kick off events, networking opportunities with leadership and other interns, social activities and learning sessions.
- Co-op opportunities available as well
- “Soak up knowledge and ask questions from anyone who is willing to share – don’t be afraid to approach them with questions”

<http://www.northropgrumman.com/Careers/StudentsAndNewGrads/Pages/Internships.aspx>

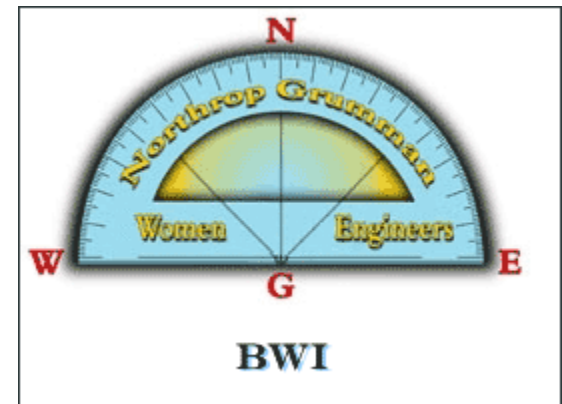
- Rotational Assignment Program
- Several Assignments in Variety of Departments
 - Learn how the company works
 - Learn the company's products
 - Network with engineers of various backgrounds
 - Gain a mentor
 - Ultimately become a better engineering because you understand the “big picture”
 - Find the best fit for you and your interests!
- Other Programs:
 - Future Technical Leaders Program (FTLP)
 - Systems Engineering Radar Class
- Continuing Education Options – NGC paid in full for my Masters of Science in Electrical Engineering from John's Hopkins University!

- 9/80 Program – 9 hours Mon-Thur, 8 hours Fri every other Fri and the other Fri off. 80 Hours every 2 weeks.
- Flexible work arrangements – Part-time Employment, Flex Office/Telework, Flextime
- Wellness – Benefits, Onsite fitness center and HealthWaves (WW, Virgin HealthMiles, Onsite Medical, etc.)
- Financial and Retirement Support
- Employee Discounts

Employee Resource Groups

- AATG – African American Task Group
- Adelante – Hispanic Employee Resource Group
- APPN – Asian Pacific Professional Network
- Connect1NG – enterprise-wide program fostering assimilation of new employees
- GEN2GEN – seeks to bridge gap between junior and experience professionals
- NG-WE – Northrop Grumman Women Engineers (SWE affinity group)
- PrIDA – Pride in Diversity Alliance
- SPROUT – Source for Parenting Resources, Opportunities, Understanding and Teamwork
- VERITAS – Veterans, Employees and Reservists Inspired to Act and Serve
- VOICE – Victory Over Impairment Challenges in the Enterprise
- WINS – Women’s Initiative for Networking and Success

- Mission Statement: The Northrop Grumman Women Engineers ERG stimulates employees to achieve their full potential in careers as engineers and leaders, expands the image of the engineering profession as a positive force in the quality of life, and demonstrates the value of diversity.
- Education Outreach - Engineers Week
- STEM Outreach Activities
- Women's History Month celebrations
- Mid-Atlantic SWE Region E Conference



THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

