2003-09-03

AEM/S Stepping Stone to Stealth

Solitario, William

AEM/S ... Stepping Stone To Stealth

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September 04, 2003

NORTHROP GRUMMAN
Ship Systems

Outline

- Background
- Concept Description
- Manufacturing Approach
- Transition to Fleet
- Summary

AEM/S on USS Radford

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BACKGROUND

- Half scale DDG Mast
- Composite Structures

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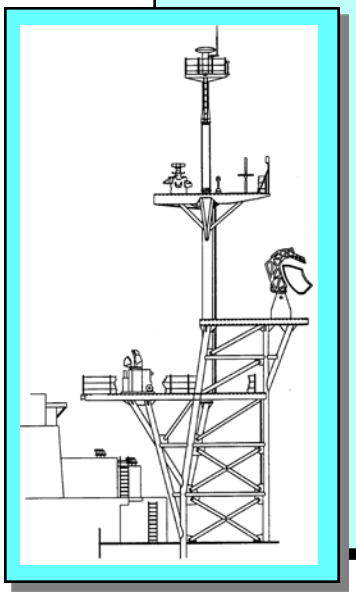
ATD PAYOFFS

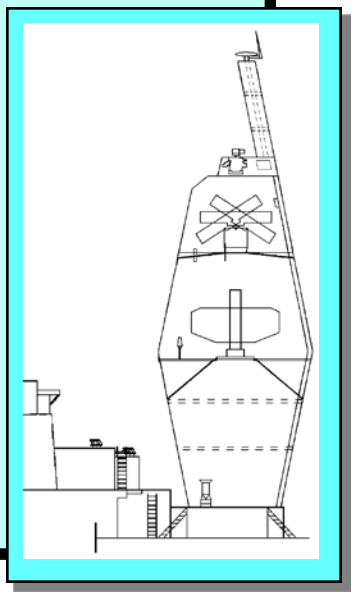
SOLVES PROBLEMS

- **Sensor Performance**
  - Blockage
  - False Targets
  - Sensor Downtime
- **Affordable Signature Control**
- **Topside Weight Limitations**
- **Life Cycle Costs**
  - Sensors
  - PCMS



ENABLES NEW TECHNOLOGY

- **Embedded Sensors**
- **Planar Arrays**
- **Low Observable Ship Signatures**



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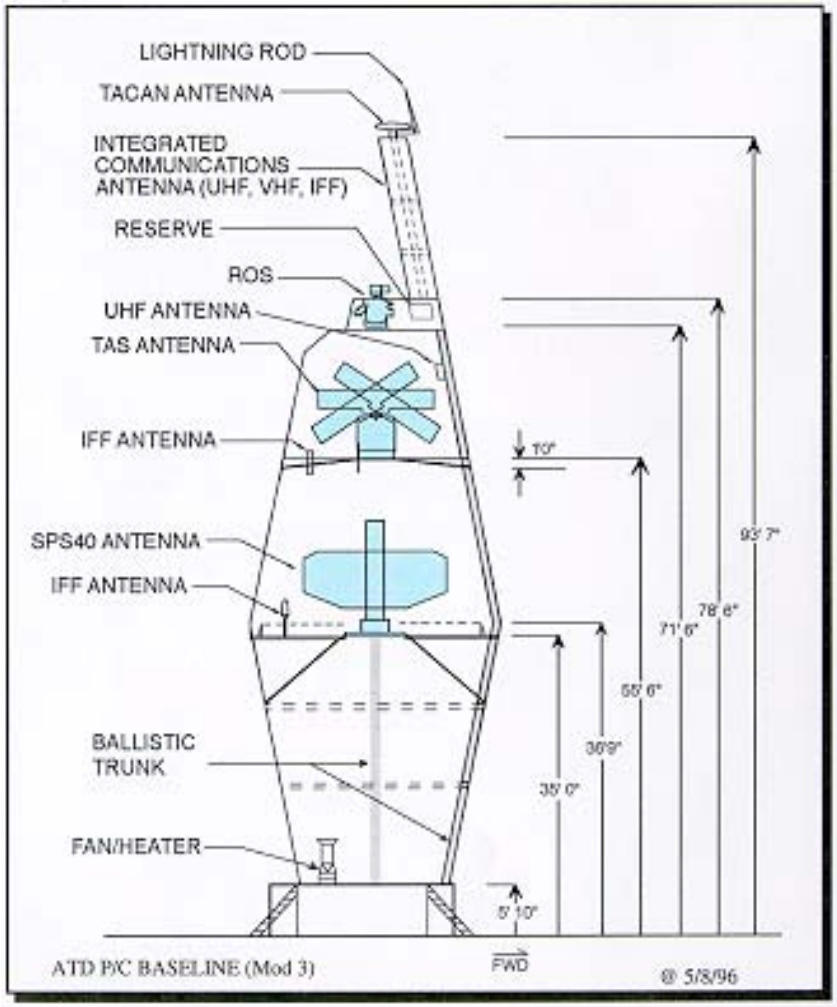
ADVANCED ENCLOSED MAST/SENSOR AEM/S



- **LARGE COMPOSITE STRUCTURE**
  - 71 1/2' High; 31' Dia; 30 Ltons
- **SHAPED TO REDUCE RCS**
  - Hexagonal
  - 10° Slope
- **UPPER HALF**
  - Frequency Selective Structure
  - Integrated Communications
- **LOWER HALF**
  - Reflective; RAS Option
  - Metallic Shielding
- **BALLISTIC WAVEGUIDE TRUNK**
- **INTEGRATED EMI/EMP**

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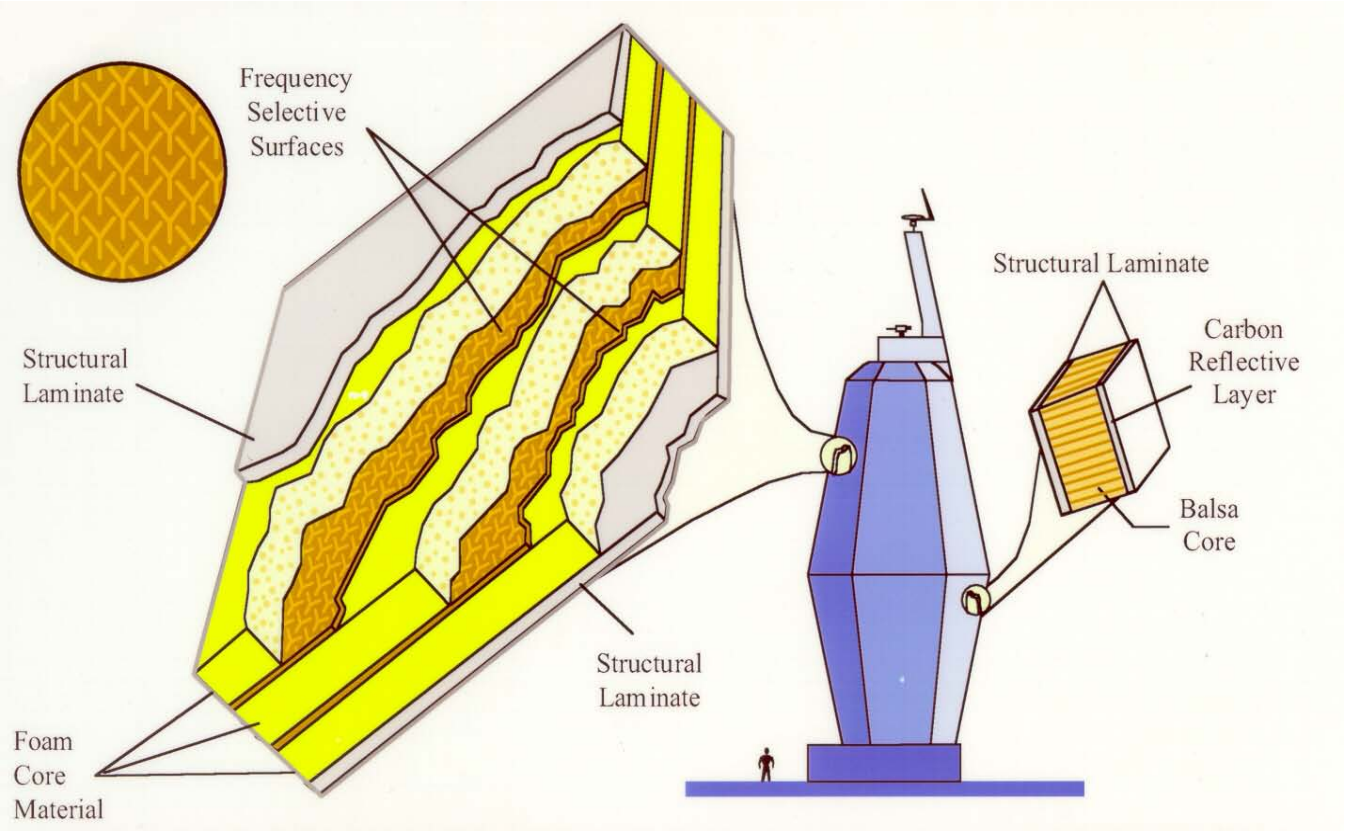
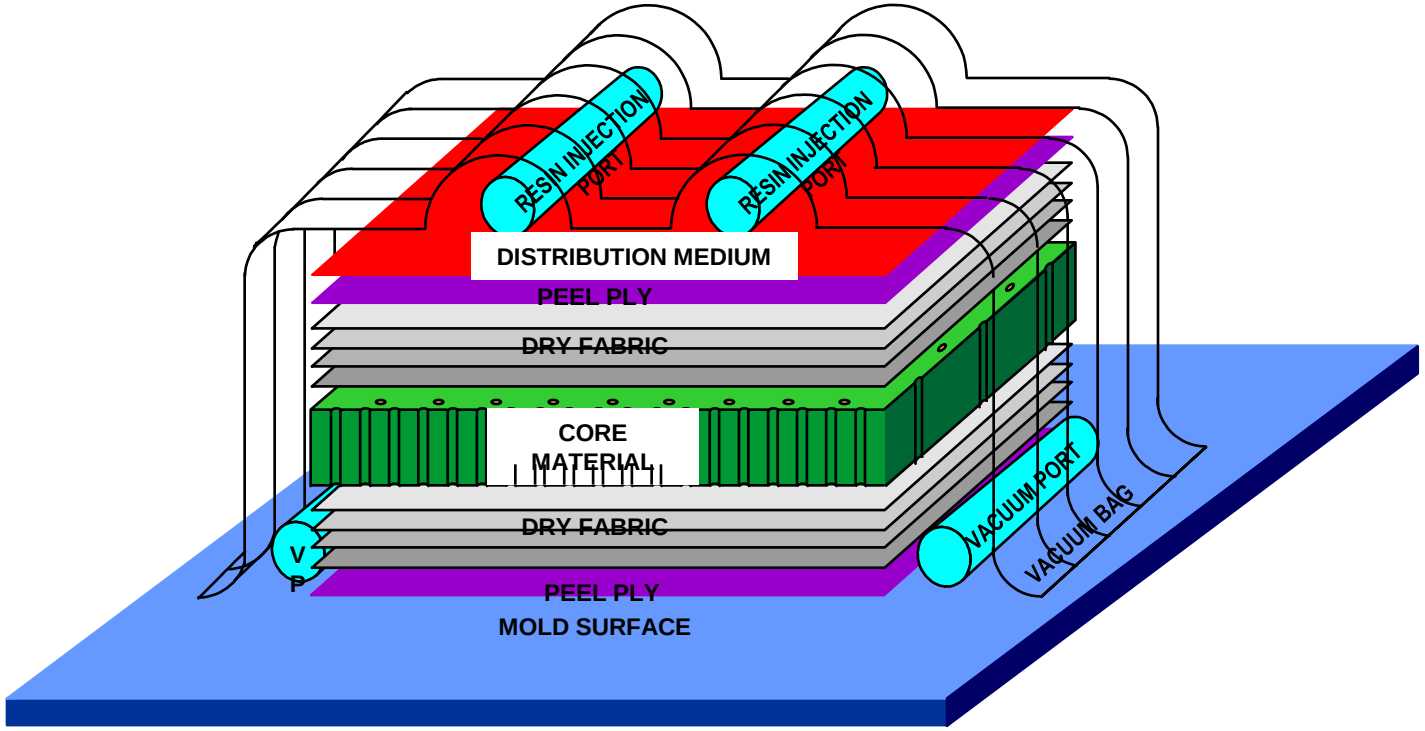
TAILORED MATERIAL SYSTEMS



Manufacturing Process

Seemann Composite Resin Infusion Molding Process (SCRIMP):

- Near Autoclave Laminate Quality At Shipyard Prices
- Extremely Low Void Content Laminate
- High Fiber to Resin Volume Ratio = High Strength to Weight



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SCRIMP = Cost Effective Advanced Composite Structures

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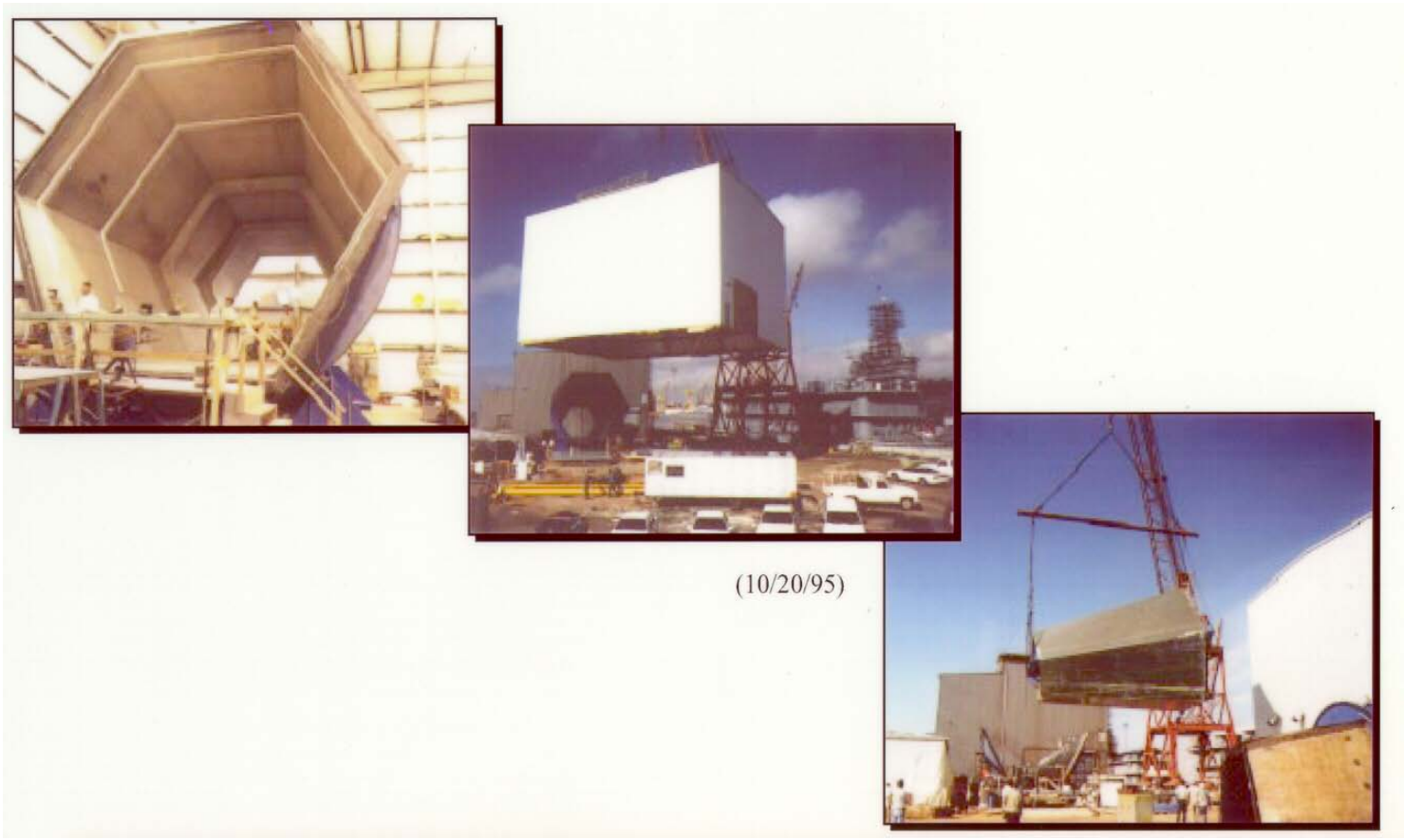
FABRICATING THE STRUCTURAL MAST



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The AEM/S Experience – Fiber Reinforcement & Core Lay-up For A Deck

Cloth Lay-up On Mold

Core Laid On Cloth

Core Laid On Cloth

Cloth Lay-up On Core

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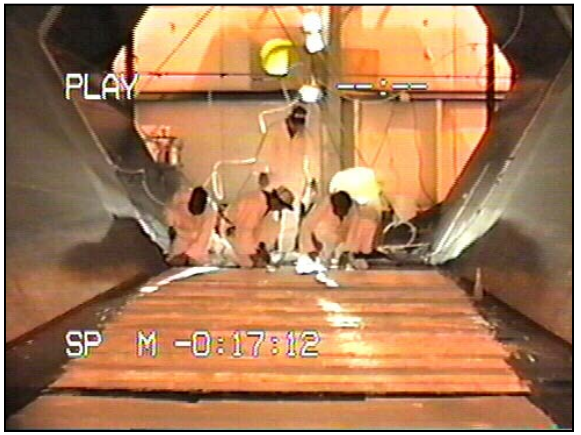
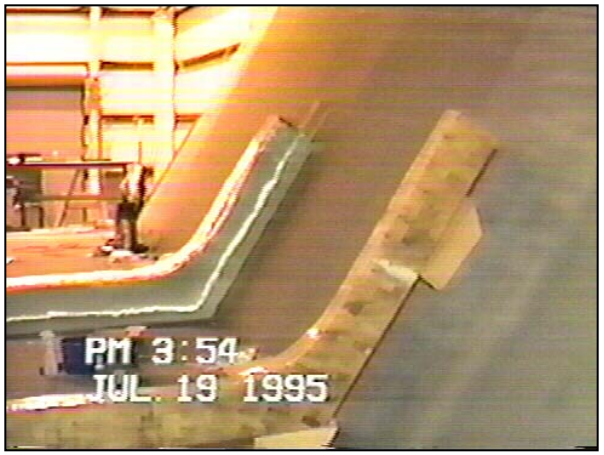
The AEM/S Experience – Fiber Reinforcement & Core Lay-up For The Mast

Cloth Lay-up In Full-Round Mold

Panel Laminated & Mold Rotated

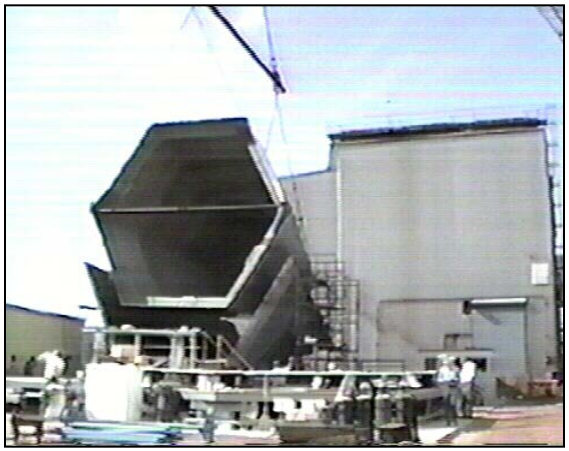


Lay-up For Sixth Side Panel



Ring Girder Installation

Ring Girders Laminated In-Place



Lower-Half Removed From Mold

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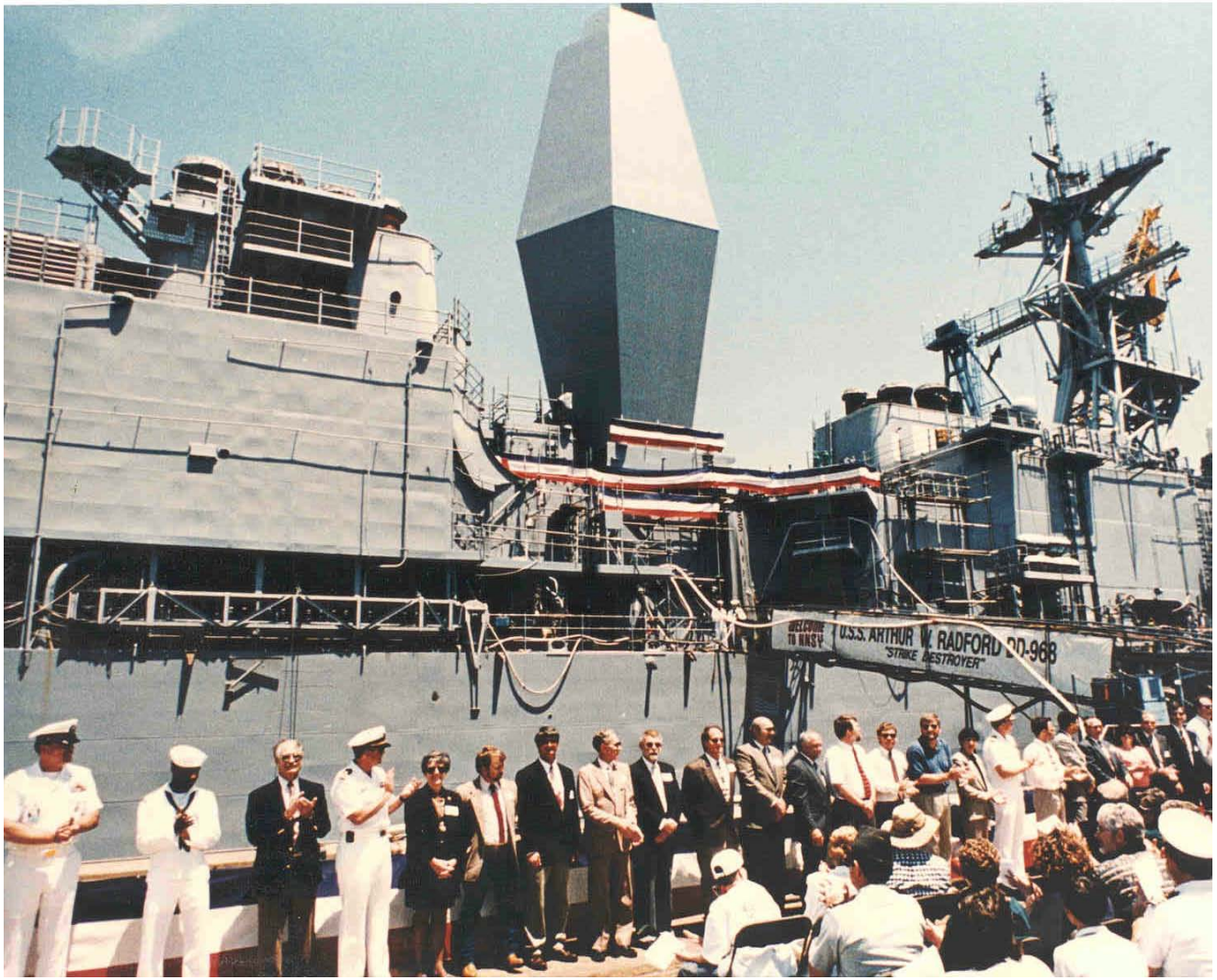
The USS Radford AEM/S Mast Stepping Ceremony



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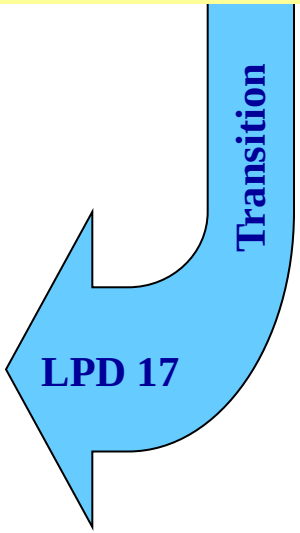
AEM/S Fleet Transition to LPD 17

- Successful ONR Funded Advanced Technology Demonstration (ATD) project
- Rapid Transition from R&D to New Construction
- Example of what can be Accomplished when the Navy and Private Industry Work Together

Advanced Composite Mast on USS Radford



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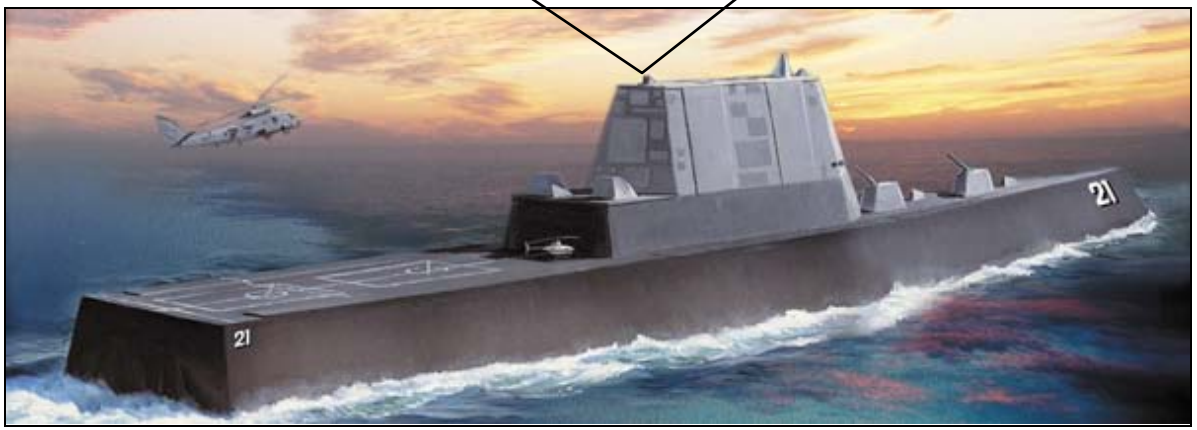
Integrated Topside Goal



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