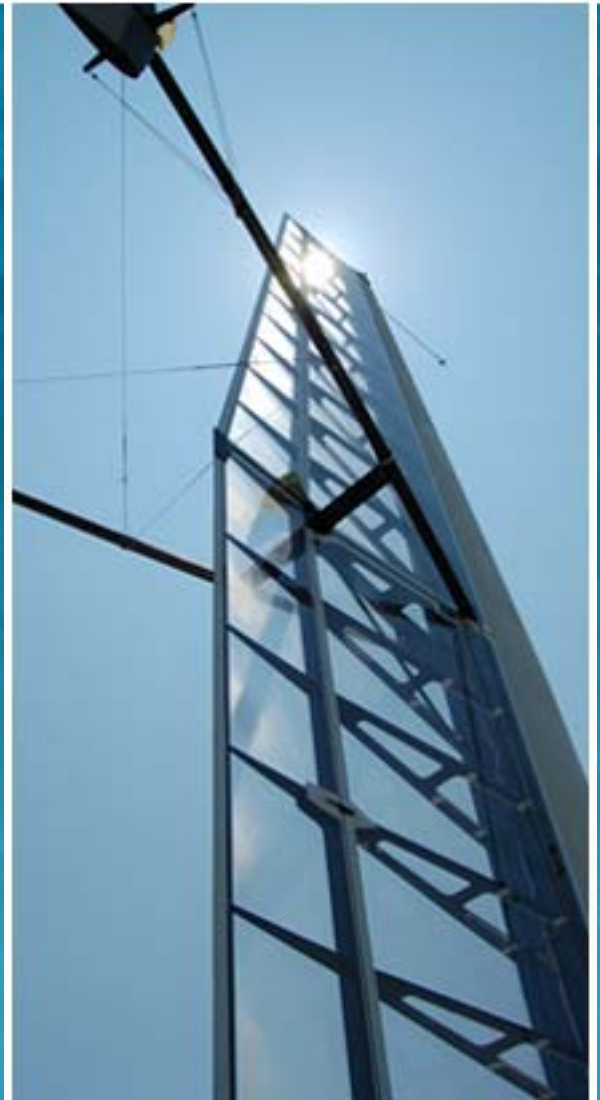
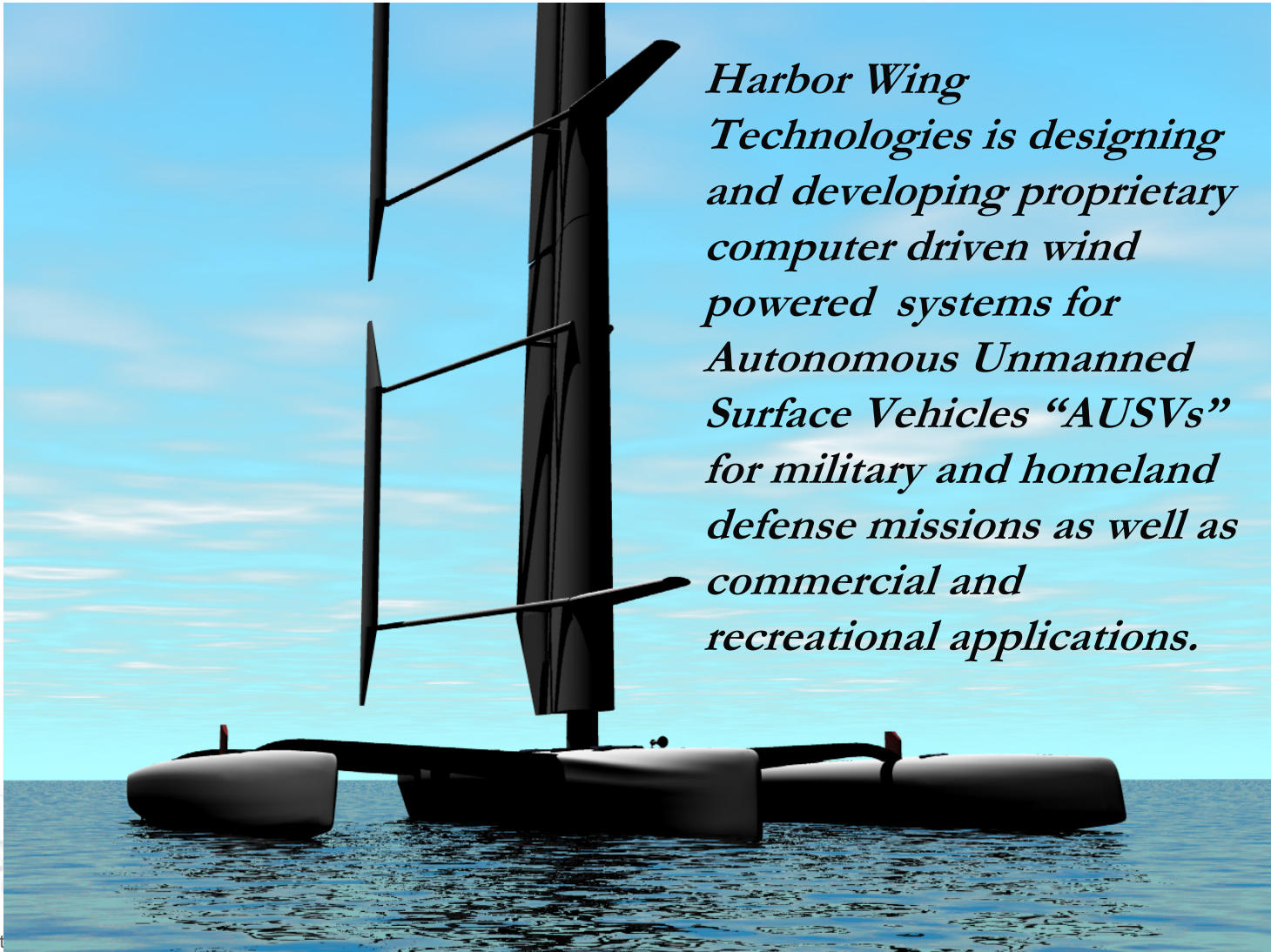


# *Harbor Wing Technologies Overview*

"This document is proprietary to Harbor Wing Technologies, 101 Yesler Way, Suite 610 Seattle, WA and cannot be released to others without written consent of Harbor Wing."



# Harbor Wing's Mission



*Harbor Wing Technologies is designing and developing proprietary computer driven wind powered systems for Autonomous Unmanned Surface Vehicles "AUSVs" for military and homeland defense missions as well as commercial and recreational applications.*

HARBO

HWT Propriet

# Product Solutions

- Autonomous Unmanned Surface Vessels
  - Long term/long range surveillance for Military and Industry
- Commercial/Industrial WingSails™
  - Research vessels and supplemental power for fuel savings on commercial vessels.
- Recreational WingSails™ and Controls
  - Revolutionary Wind Driven systems for private vessels

# UAV Deployment History – A Parallel

Unmanned Aerial Vehicles have become a mainstay of ISR inventories in militaries around the world.

From 1999 to 2009, U.S. military UAV procurement grew from \$500 million to \$3.4 billion—a seven-fold increase that represented an average combined annual growth rate of 21 percent during this period of staggering growth.

“What is not in doubt, is that, much as in the world of unmanned aircraft, USV’s have a bright future and are likely to make a major contribution to both civil and military maritime operations. It is easy to predict that the world is on the verge of a boom in USVs that is likely to mirror that of UAVs.”

Unmanned Vehicles Magazine, April 2009

# Performance Highlights

- WingSail propulsion controlled at desired speed
- Efficient at all points of sail.
- Assigned GPS go-to points achieved without difficulty
- Steady straight headings maintained despite strong winds/heavy seas (40 knot maximum apparent wind)
- Precise course holding on extended transits
- Pivot like turn maneuvers without perceptible drift





# Harbor Wing - One of a Kind AUSV

- A unique Autonomous Unmanned Surface Vehicle
- Patented WingSail propulsion system
- Environmentally friendly design and operations
- Light weight, high performance, multi hull design
- Advanced software and electro-mechanical controls
- Less cost than manned platforms on similar missions

Unlike other USV designs, the HWT AUSV is suited for long-range long-endurance open ocean ISR missions to cover large patrol areas or for long periods on station.



# Government and Commercial Applications

## Government

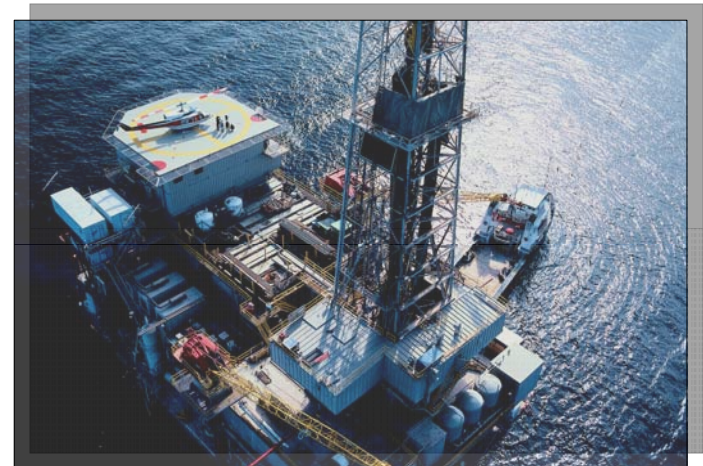
- Port Security
- Coastal Patrol
- Communications Networking
- Border Protection – Drugs & Immigration
- Sensitive Area and Exclusive Economic Zone Enforcement
- Range Clearance & Monitoring

## Scientific

- Ocean/Environmental Data Collection – SeaKeepers International [www.seakeepers.org](http://www.seakeepers.org)
- Marine Mammal Monitoring – sono-bouy
- Sensor Deployment and Monitoring

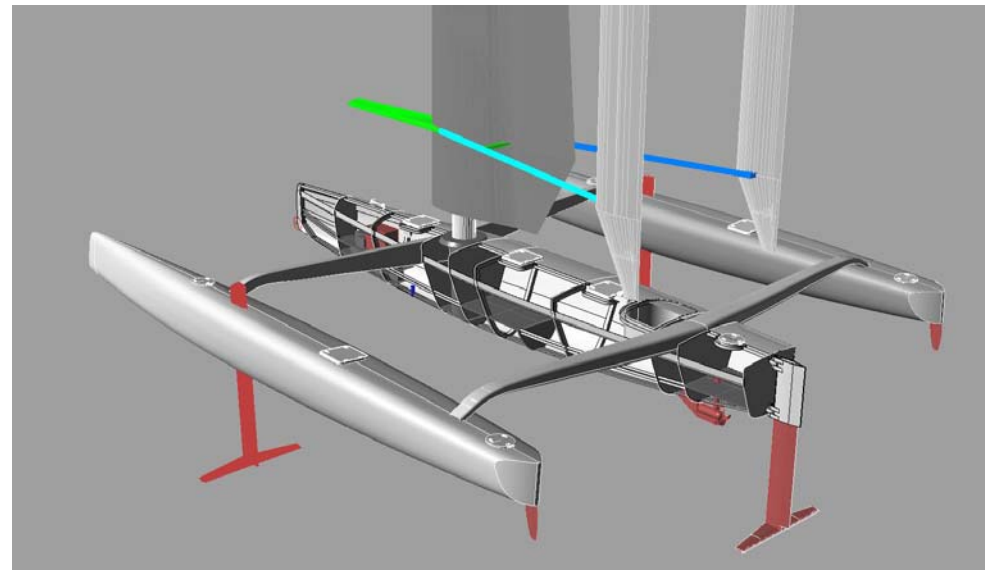
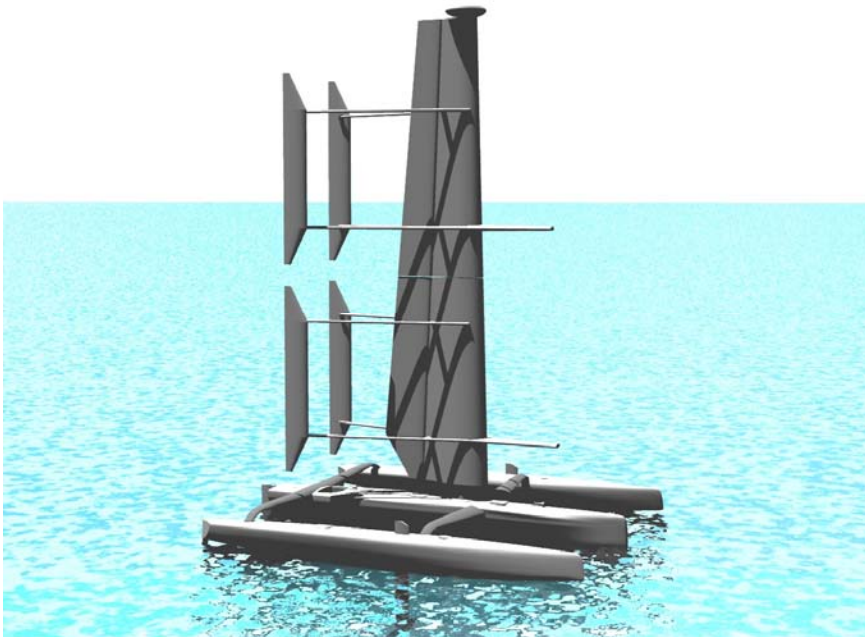
## Commercial Applications

- Commercial Exploration and Mapping
- High Value Asset Security
- Commercial Vessel WingSail



# X-3 Production Vessel Design Renderings

HWT X-3 on the water

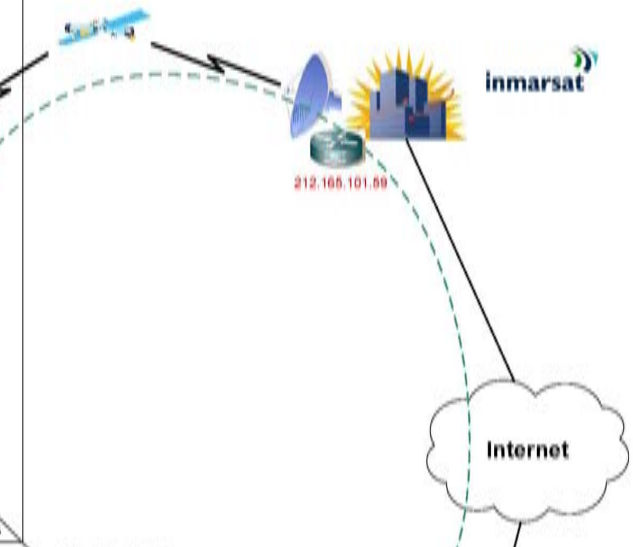
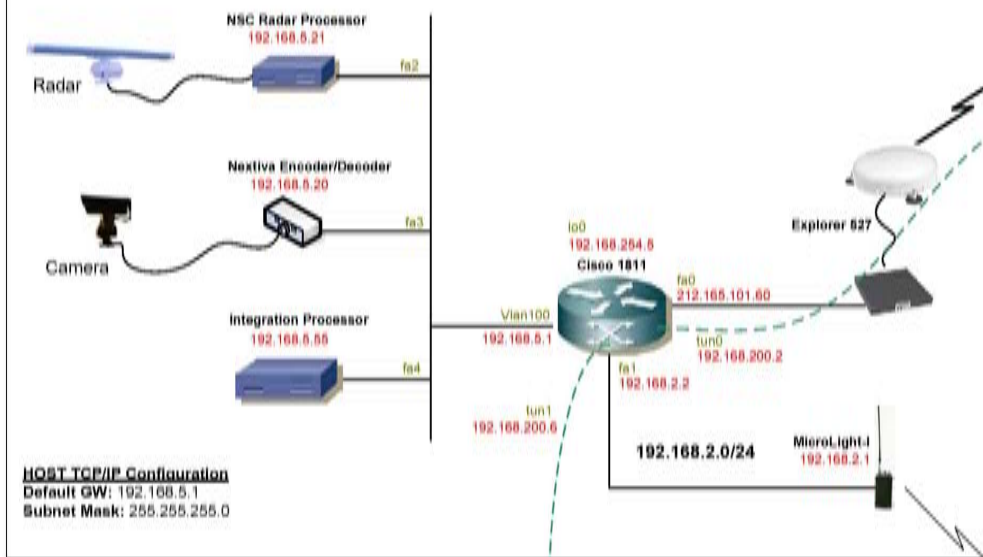


HWT X-3 Cutaway

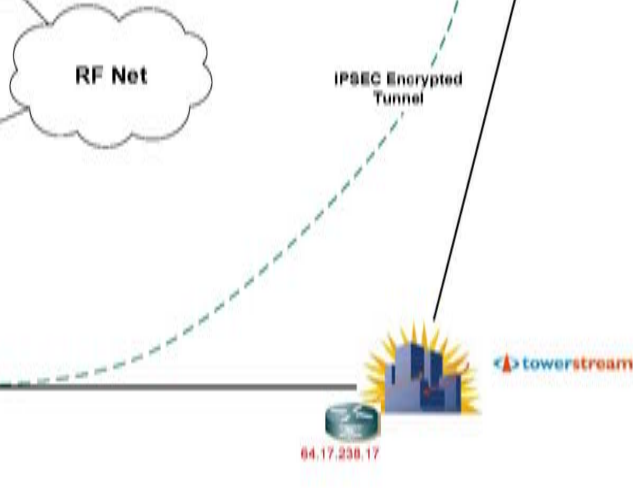
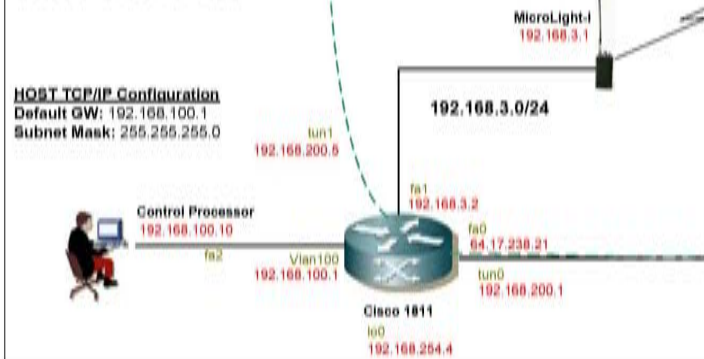






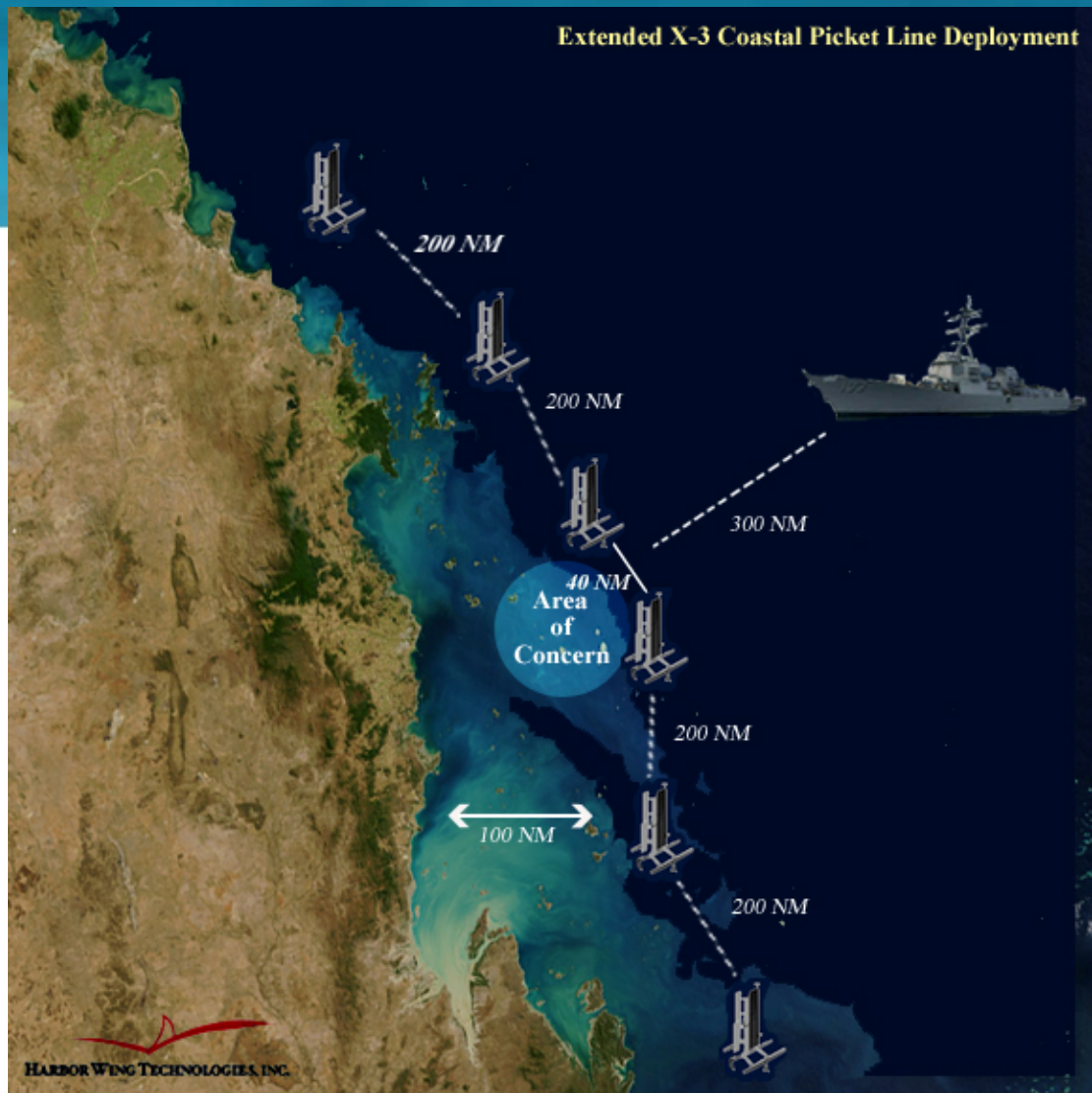
### Harbor Wing (AUSV)



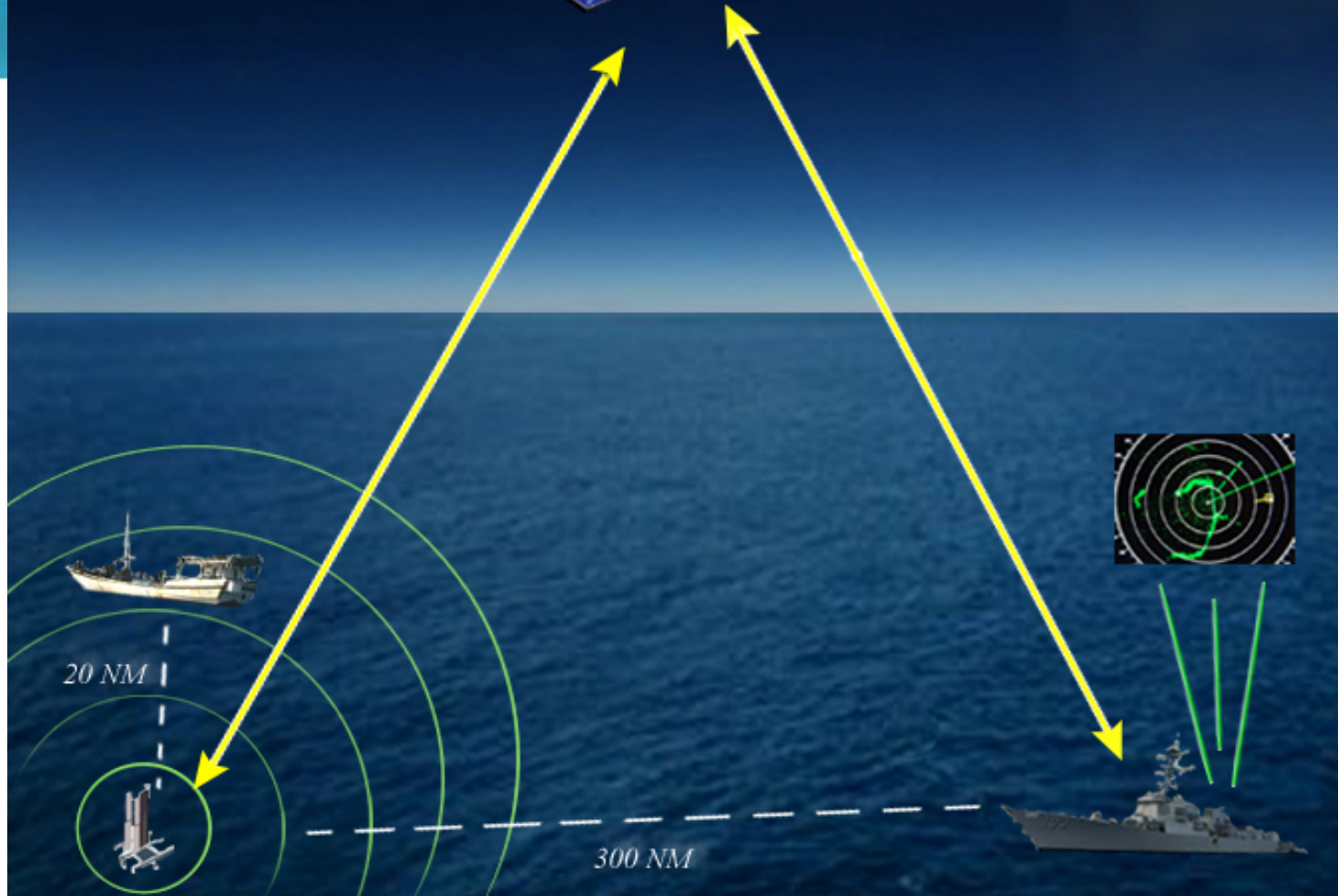
### Shore Station Lab



<b>Title:</b> Harbor Wing Technologies Demo	<b>Sites:</b> R101	<b>Filename:</b> Harbor Wing Portsmouth Demo.vsd	<b>Release Date:</b> 02/25/08	 
<b>Project:</b> 080137: Harbor Wing(Athena) Internet Connection	<b>Version:</b> 1.0	<b>Page:</b> 1 of 3	<b>Author:</b> ENS/ESS = Vetter / Weizman/ Gianopoulos	

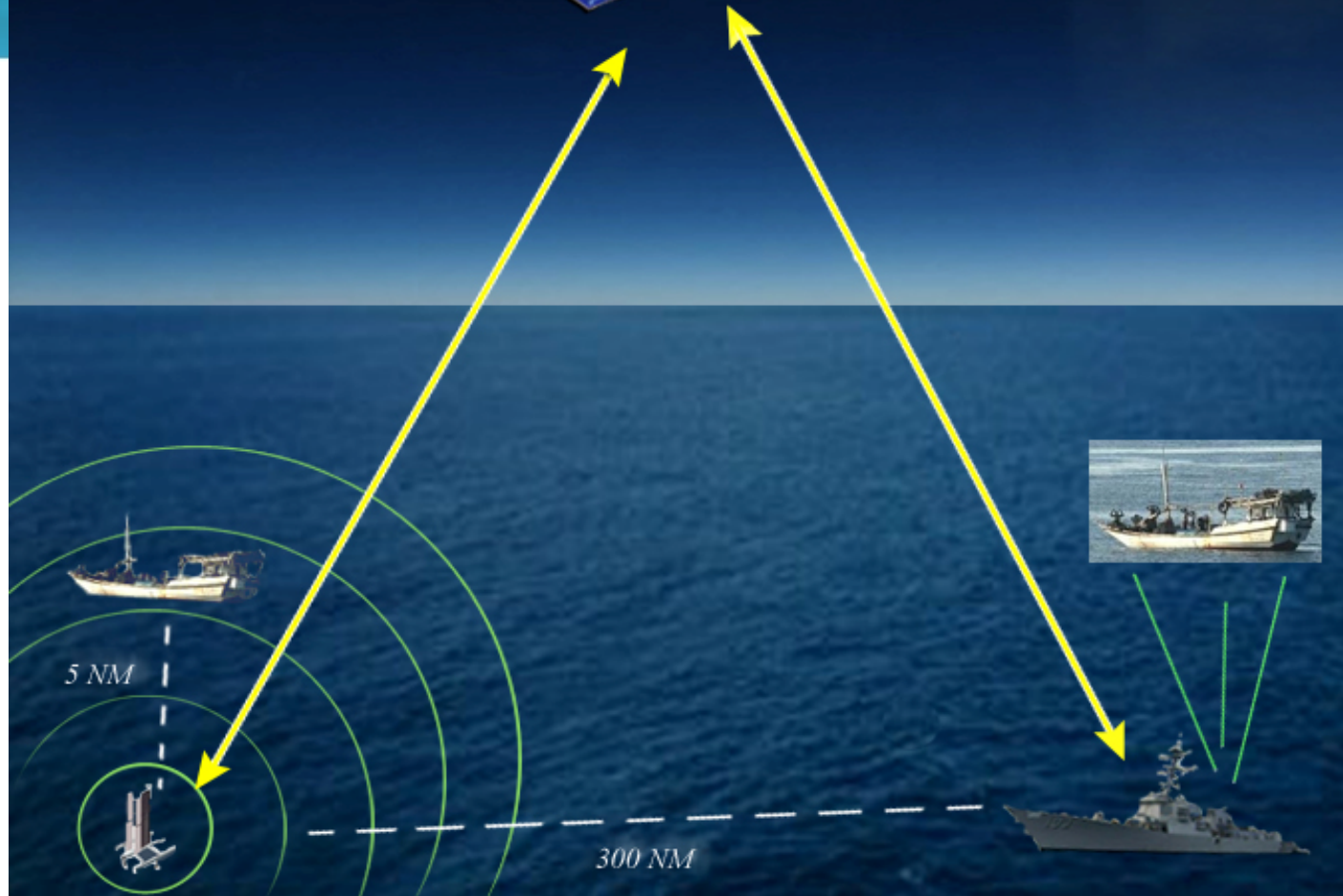


*AUSV's provide non-stationary, low signature, long baseline, and long endurance surveillance. The enemy is unlikely to predict and thus avoid being detected.*



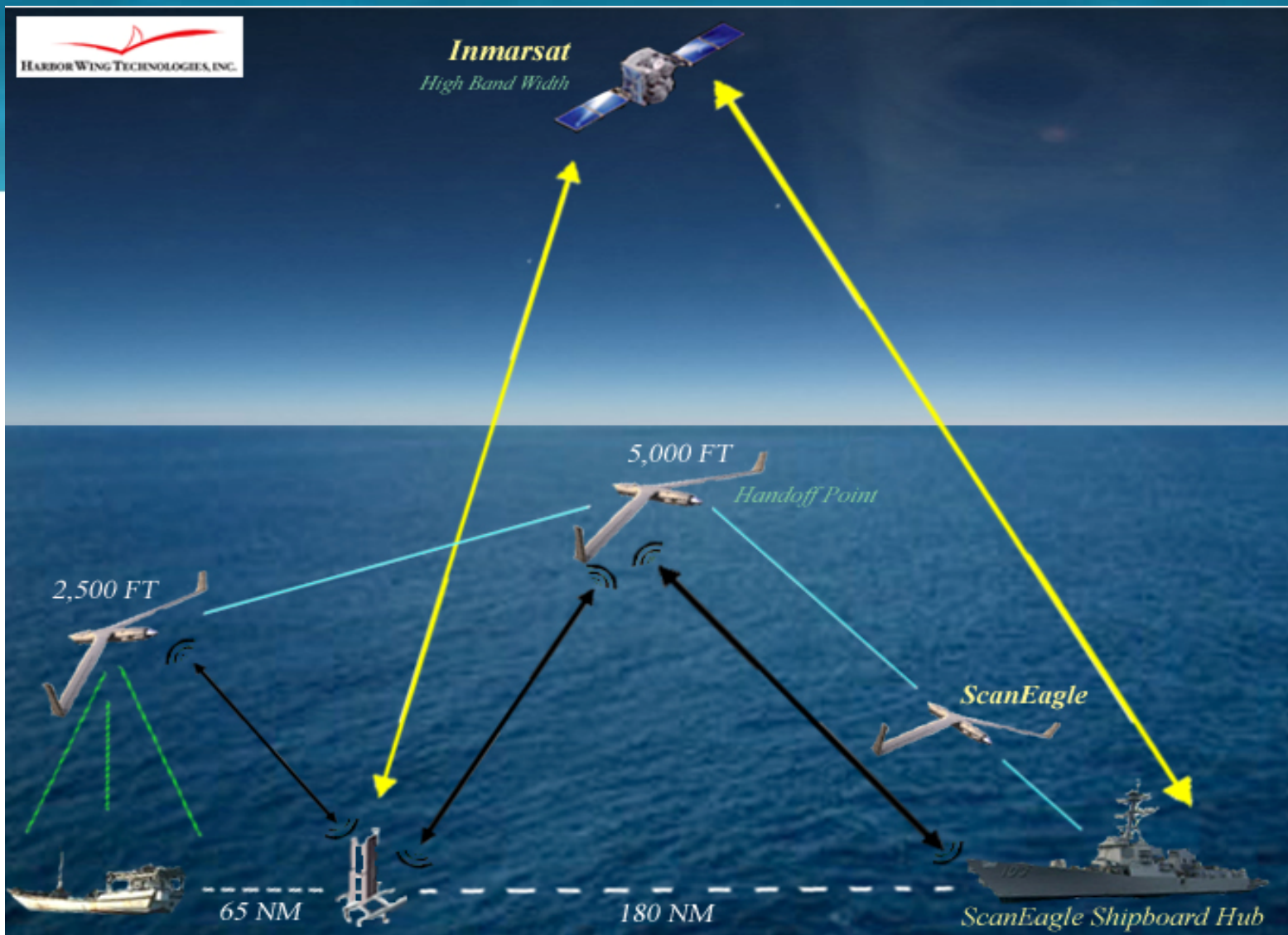
*The command ship dynamically directs the search pattern of the AUSV. The AUSV determines the location, speed and often covertly the ID of the target vessel at distance with wing top mounted surface radar.*



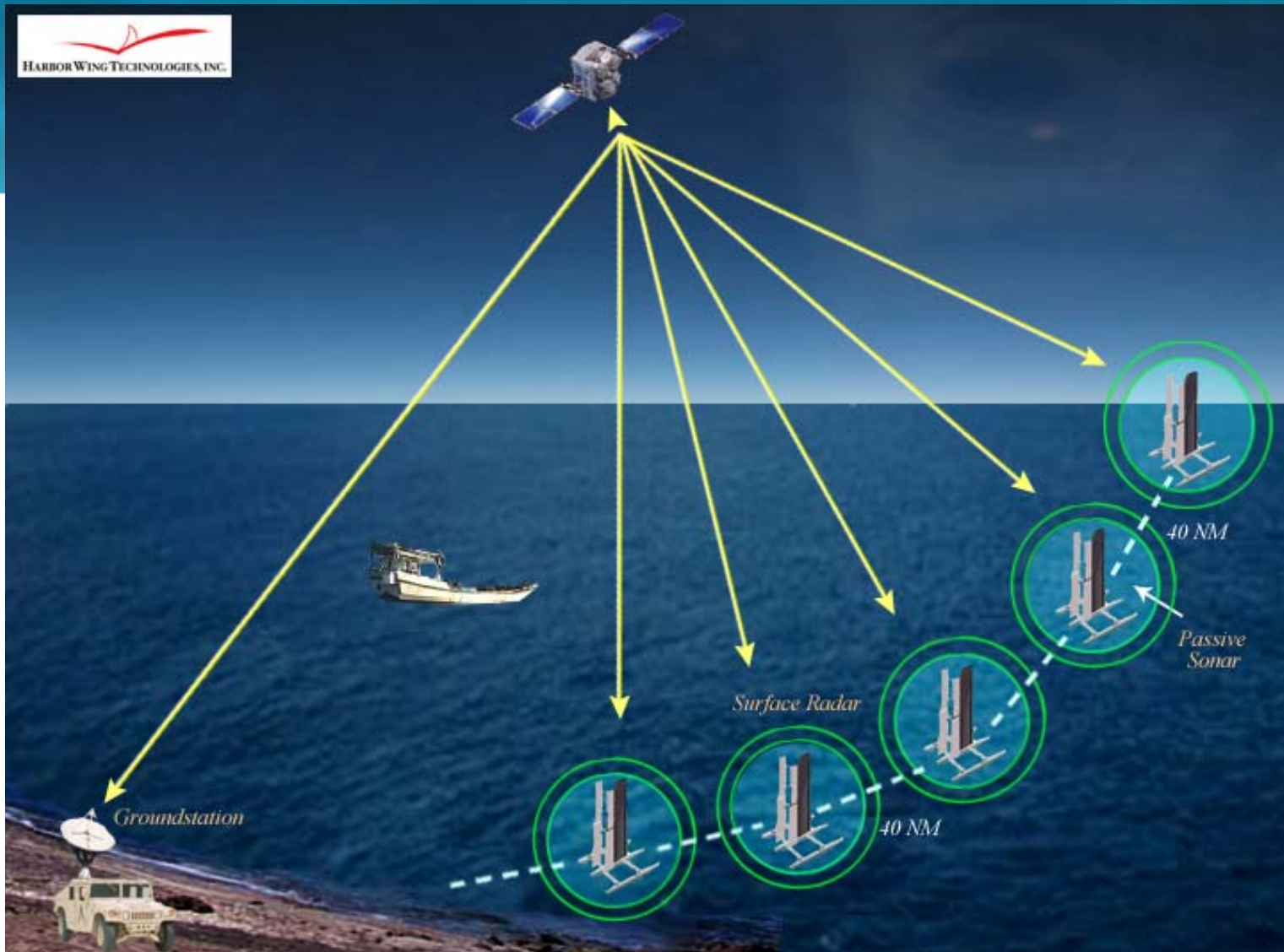


*The AUSV can be directed to close on the target to supply EO/IR video images*





The command ship launches and directs the UAV to the X-3 handoff spoke site. The video from the UAV often taken covertly is relayed via the AUSV to the Command ship via high BW satellite communication. This increases the ScanEagle's range 350% .



*AUSV 250 NM+ Picket/Patrol  
Towed Passive Sonar 10nm range, 10kw surface radar 15 nm range,  
EO/IR camera 3-5 nm range*

# HWT Commercial/Recreational

An important component of the HWT plan is to penetrate commercial and recreational markets. The WingSail and computer control system can be fit to existing multi-hull designs to provide efficient auxiliary power for commercial vessels. For recreational vessels, the WingSail is not meant to replace traditional sailing but offer an efficient alternative to rigorous sail handling and burning gallons of diesel.



Morelli & Melvin designed 170 Ft. Catamaran with HWT WingSails



# HWT Commercial Opportunities

The WingSail system applied to commercial vessels provides supplemental wind propulsion to reduce fuel consumption and extend endurance at sea.

- ★ Active discussions with Navatek Limited, a Hawaii-based naval architect/shipyard that specializes in advanced hull designs, about installing our commercial WingSail on a demonstrator vessel to be funded by the U. S. government.
- ★ We are engaged in discussions with a Japanese trading company about installing WingSails on Japanese fishing vessels.
- ★ Talks with a major U.S. defense contractor about inclusion in contract offset programs that could include the use of AUSV's as a part of private coastal security operations in the Middle East.
- ★ HWT is being proposed by Adventure Cat, a Bay Area company, as the WingSail provider for a new Wind Driven passenger Ferry
- ★ Discussions with Insitu ( Boeing) for testing interoperability with UAV's and exploring service revenue enhancements



# Recreational Yachting



*High performance, visually striking luxury.  
Unlike anything you have experienced  
before! Control, safety and  
performance...In a class all it's own.*



*Single Handed Control - Superb Styling - Outstanding performance*

Harbor Wing AUSV and WingSail designs featured in:

- SeaHorse Magazine
- Boats International Magazine
- Sail Magazine
- Sailing Anarchy – [www.sailinganarchy.com](http://www.sailinganarchy.com)

HWT Proprietary

# Recreational Opportunities

HWT is actively promoting the use of our WingSail system on various recreational vessels.

- ★ We have been in discussion with several catamaran manufacturers who have all recognized the value of our product and indicated a willingness to work with us when we are ready.
- ★ We are making a proposal to BMW/Oracle racing for development funding in exchange for promotion and advertising rights during HWT AUSV demonstrations and recreational marketing.
- ★ We have proposed the building of the first Morelli & Melvin designed custom catamaran outfitted with our WingSail system.



# HARBOR WING TECHNOLOGIES, INC.

## Harbor Wing Offices:

Harbor Wing Technologies, Inc.  
101 Yesler Way, Suite 610  
Seattle, WA 98104  
[kenc@harborwingtech.com](mailto:kenc@harborwingtech.com)  
[rhyeatman@harborwingtech.com](mailto:rhyeatman@harborwingtech.com)

Harbor Wing Technologies, Inc.  
C/O NAVSUBTRACENPAC  
Bldg 39/26A, Rm 201  
1130 Bole Street  
Pearl Harbor, HI 96860  
[mtott@harborwingtech.com](mailto:mtott@harborwingtech.com)

[www.harborwingtech.com](http://www.harborwingtech.com)

