Adapting AAVs to Changing Threats

Submersible Amphibious Assault Vehicles (SAAVs)

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AAV7

Amphibious Assault Vehicle (AAV) Brief History

- 1972 - AAV7 hull first used
- 1980s - Upgraded and renamed to AAV7
- Long-planned replacement by the EFV
- 2011 - EFV program cancelled
- 2012 - Advanced Combat Vehicle (ACV)

AAV7s

Approaching

The Beach

Changing Threats in the Water

- Surface-to-surface missiles move horizon
  - Extend trip from ship to shore
  - May target AAVs in the water
- Required design responses
  - Extended Range
  - Stealth
  - The Element of Surprise

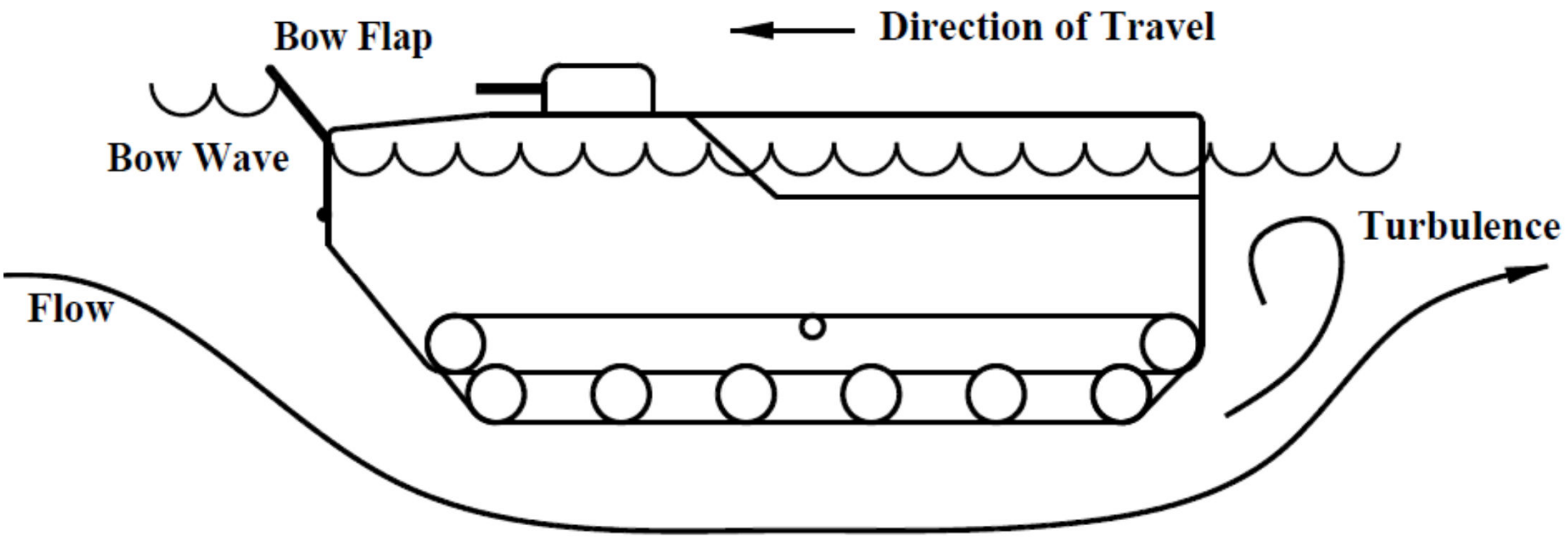
Changing Threats on Land

- Land threats gain sophistication
  - Rocket-propelled Grenades (RPGs)
  - Improvised Explosive Devices (IUDs)
  - To be determined
- Require more versatile armor
  - Modular bolt-on packages
  - Heavier AAVs

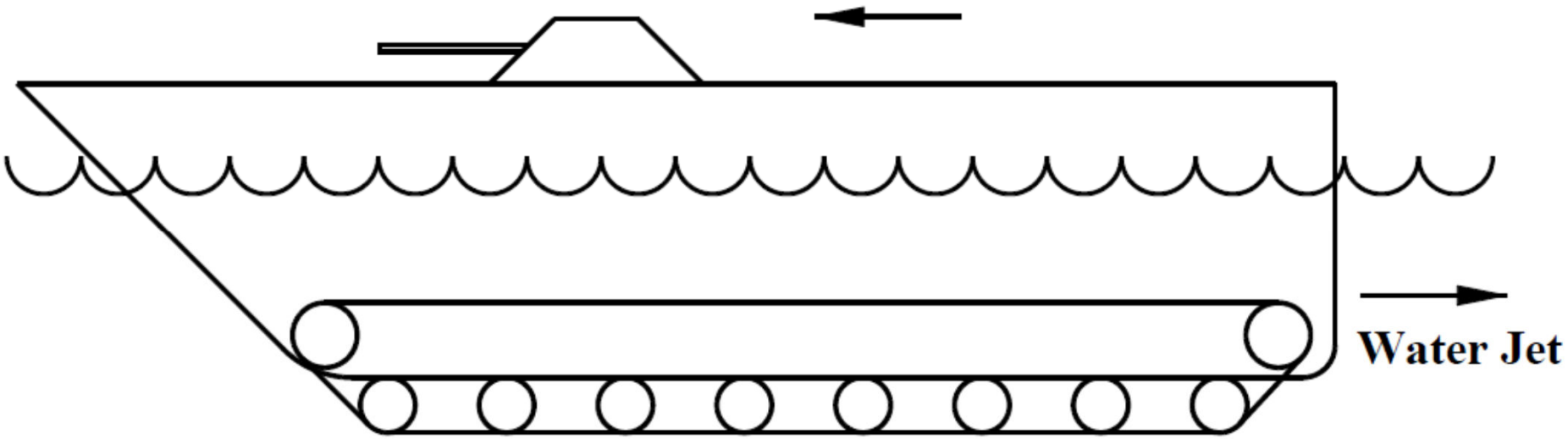
Expeditionary Fighting Vehicle (EFV)

EFV Planing on the Surface

AAV7 Marine Operation



EFV Low-speed Marine Ops

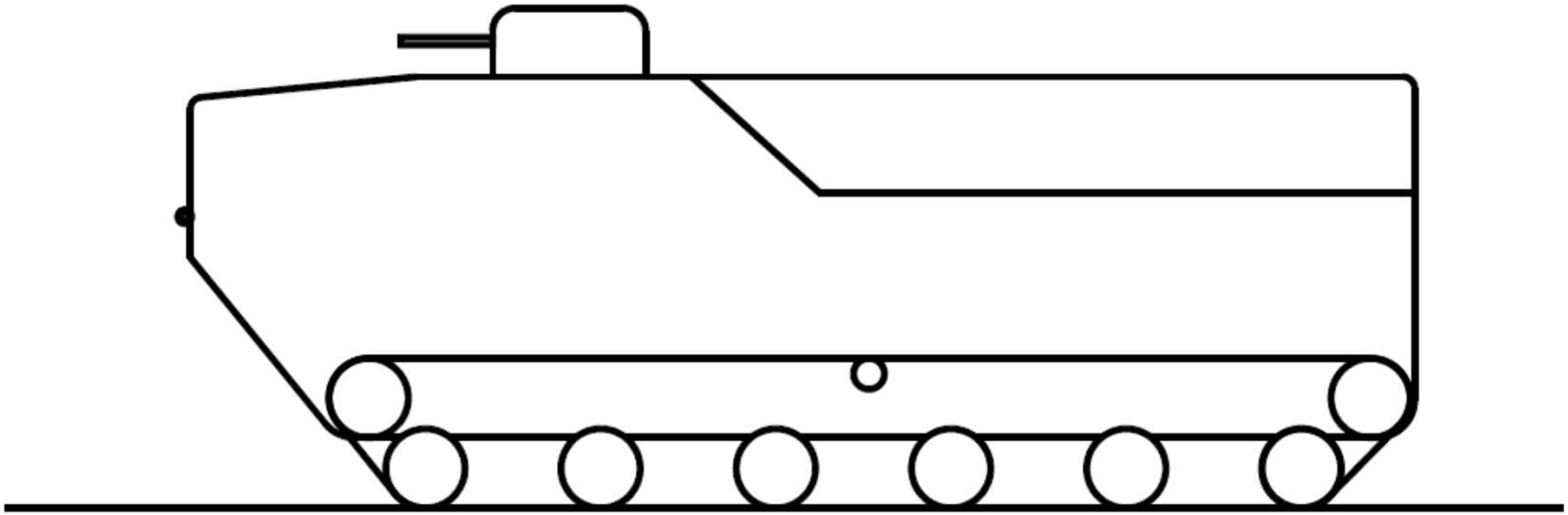


Amphibious Assault Vehicle (AAV) Limitations in the Water

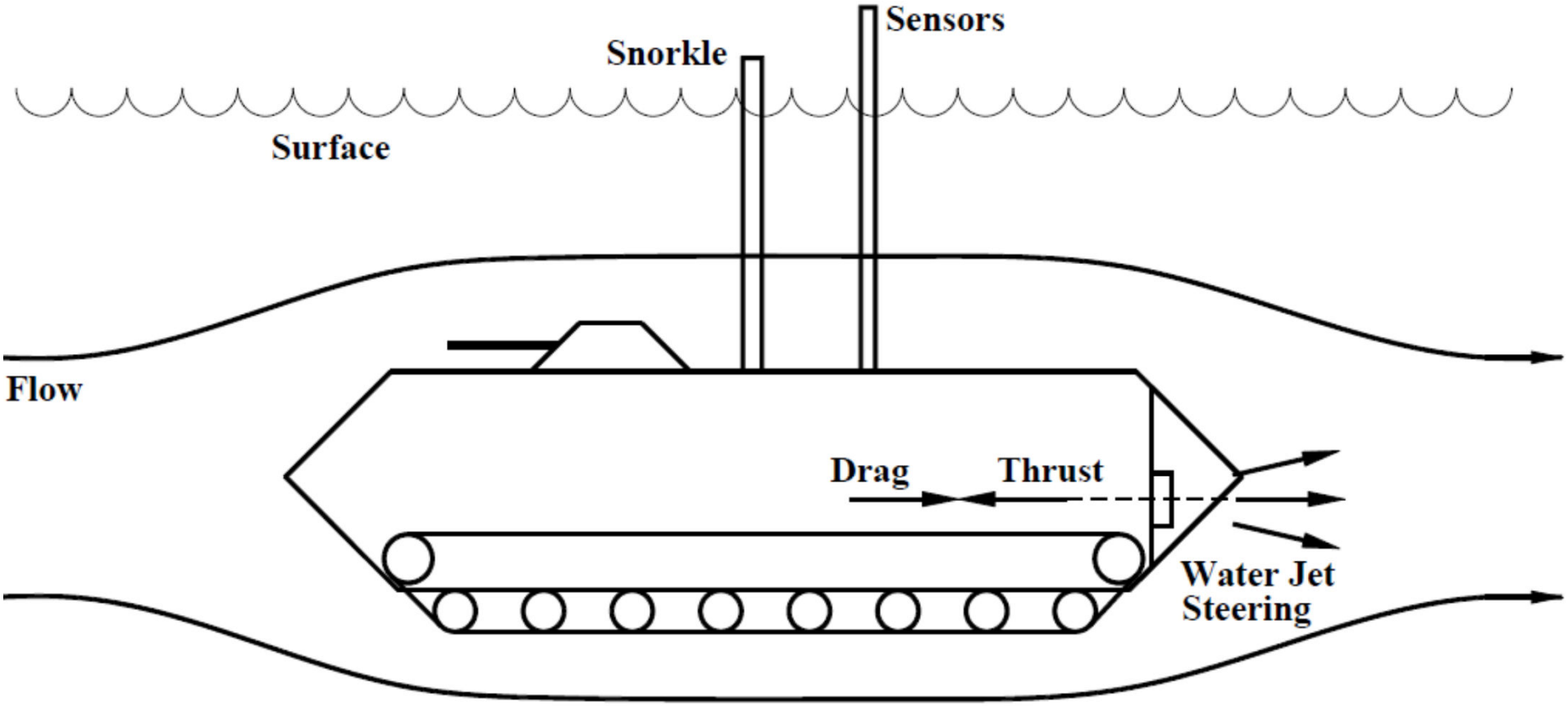
- High drag limits speed and range
- High visibility limits stealth and surprise
- Exposure to missile and canon fire
- An uncomfortable ride in moderate seas
- Danger of being rolled in the surf on the beach

AAV Limitations on Land

- Barge hull design limits deflection angles
- Need for buoyancy limits weight and armor



Submersible AAV (SAAV)



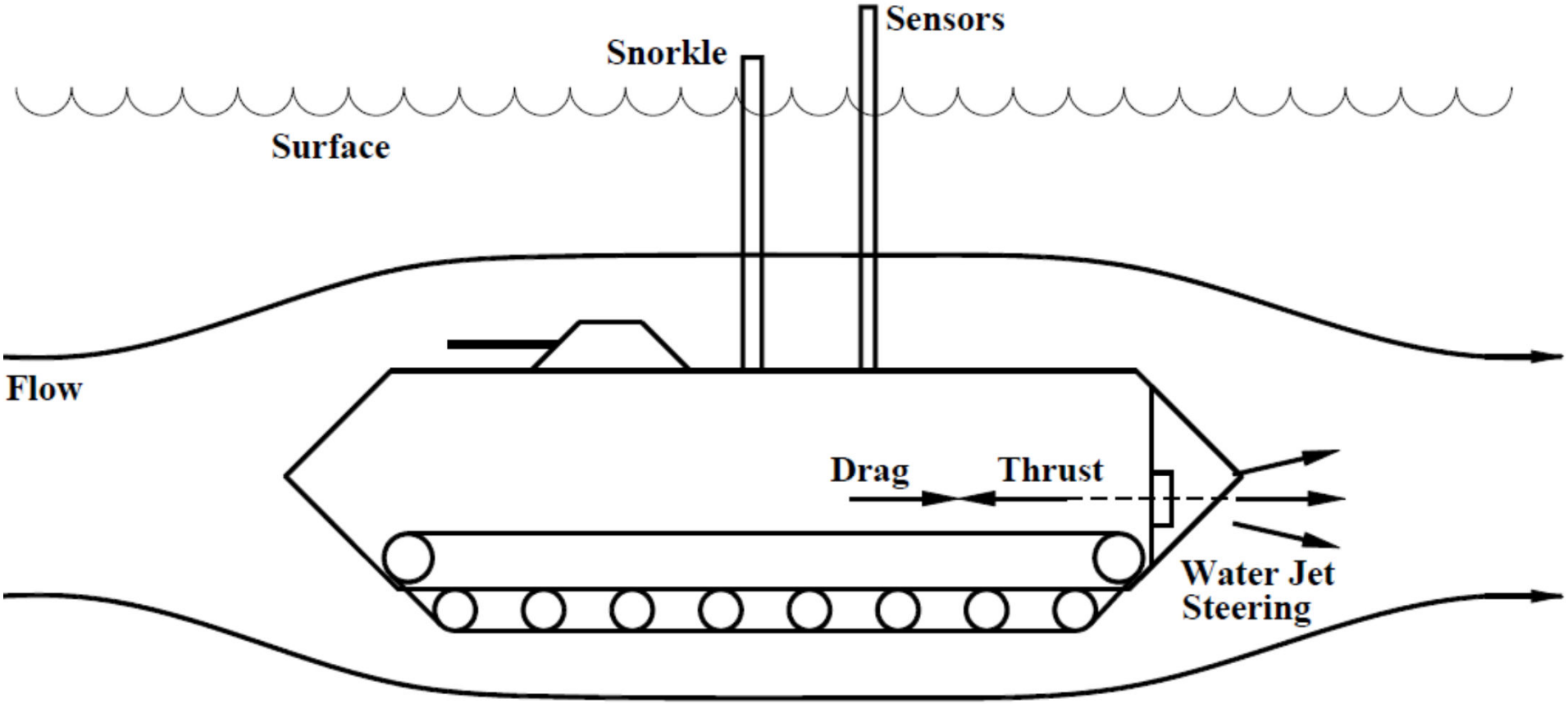
SAAV Propulsion Efficiency

- All AAVs use marine jet propulsion
- Space for pump/jet diameter is limited, which limits propulsion efficiency
- Increased submergence allows increased propulsion efficiency
- SAAV jets have increased submergence

SAAV Design Features

- ✓Hull shape ideal for both marine and land ops
  - Balanced hydrodynamic shape
  - Effective ballistic deflection angles
- ✓Jets vertically directed for vertical steering
- ✓Jets also be used for horizontal steering
- ✓Uses modern periscope and snorkel

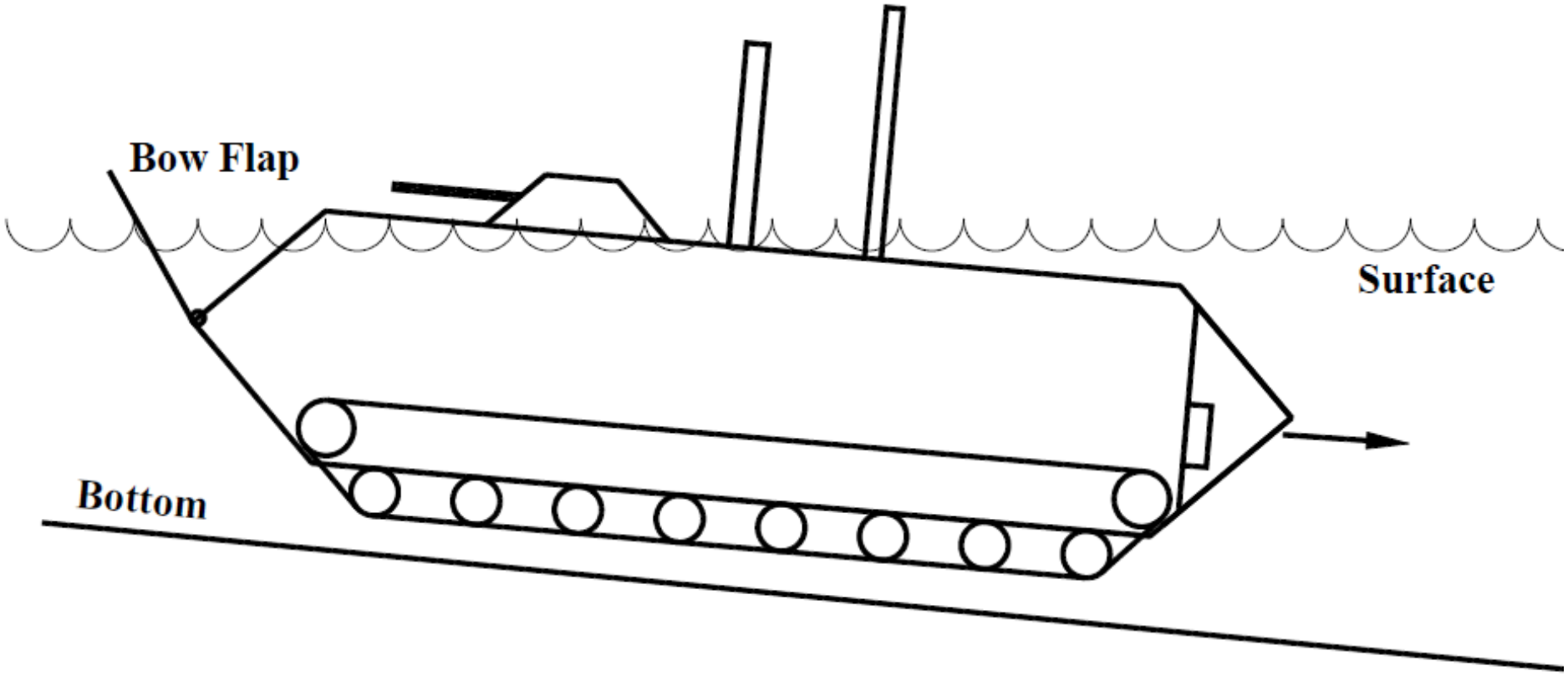
Submersible AAV (SAAV)



SAAV Design Benefits in Water

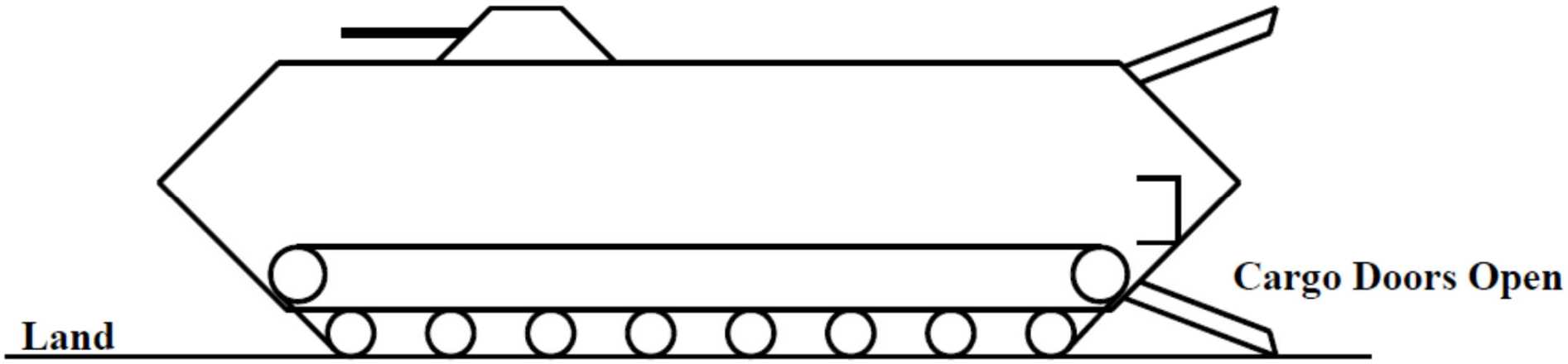
- Reduced drag = higher speed, longer range, reduced fuel use
- More submergence = better propulsion
- Stealth & the element of surprise
- Operation in higher sea states
- Less debilitating ride
- Reduced exposure to wave action on beach

Surface Ops/Landing



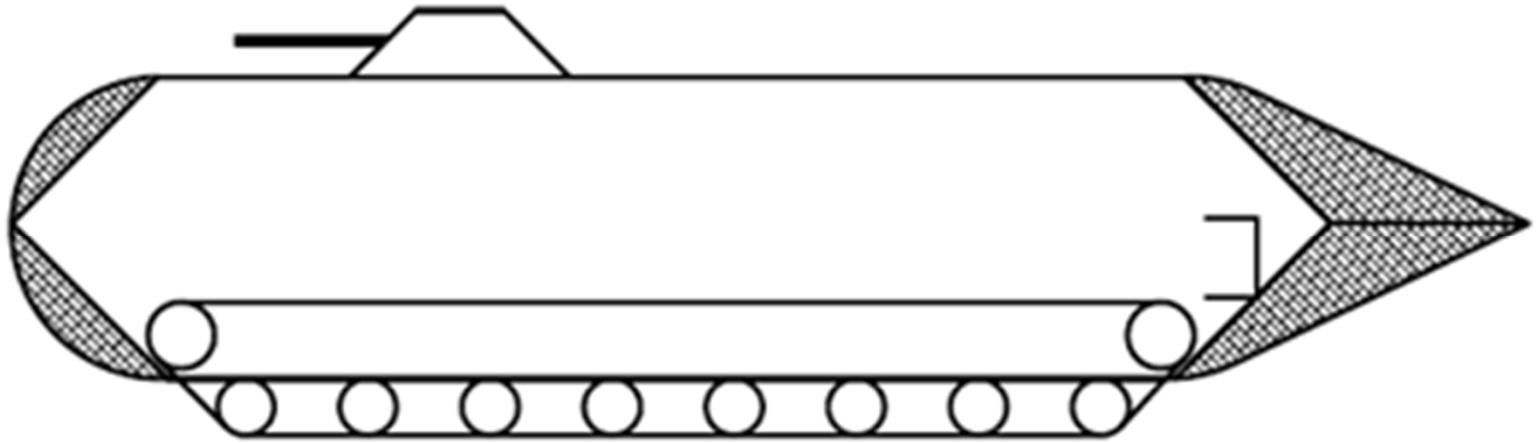
SAAV Design Benefits on Land

- Improved ballistic deflection angles
- More armor carrying capacity
- No compromises due to sub capability



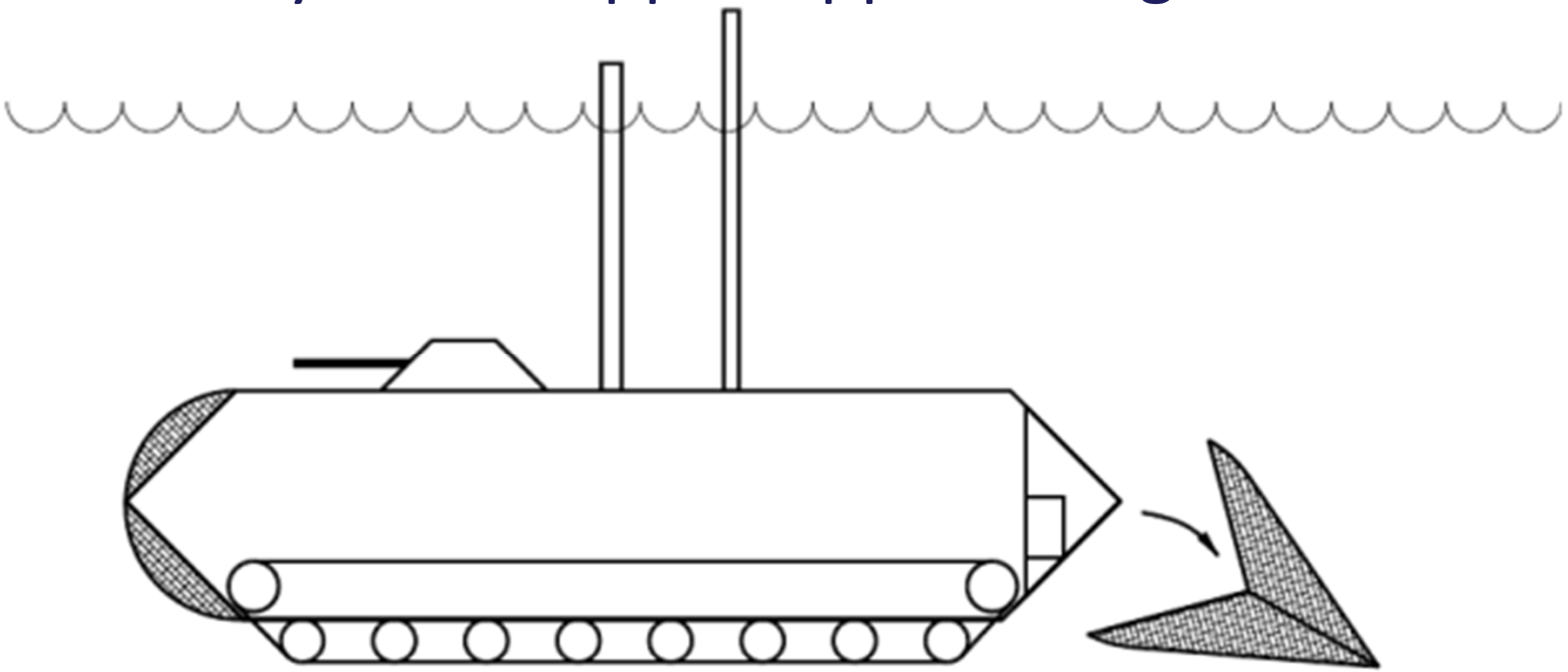
Making Use of Bolt-on Armor

- Armor modules to address expected threats
- May incorporate drag reduction contours
- To increase speed/range

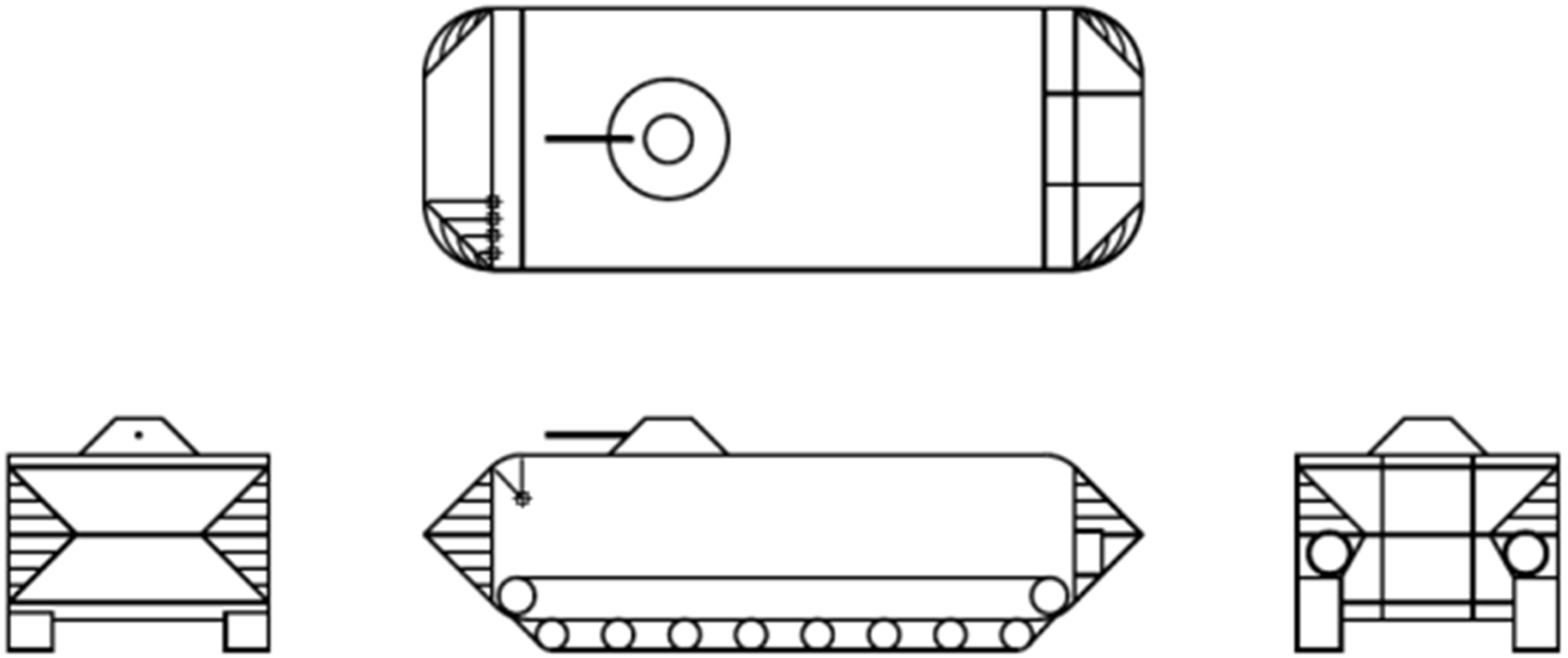


Auxiliary Fuel Tank Extends Range

- Composite tail may include fuel bladder along with drag reduction contours
- Auxiliary tank dropped approaching beach



Radii Reduce Drag and Keep Deflection Angles



SAAV Minimizes Time and Money

- Maximum use of existing technologies
  - Submersibles, submarines, & USVs
  - Periscopes, snorkels, ballasting
  - Composite components and bolt-on armor
  - Low pressure sealing
- Facilitates modular design of subsystems, like armor, ballasting, and payload.

SAAV Benefit Summary

- Tactical advantages getting to the beach
  - Stealth, surprise, range, sea states, ride, etc.
- Better deflection angles on land
- Modular mission packages to meet threats
- Economic and timely development
  - Uses well understood design concepts
  - Uses existing component designs

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