

Multi-purpose Unmanned Vehicle Assault (MUVA) Ship

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Over the past two decades, unmanned systems have become increasingly relevant in meeting the Navy's operational demands. Despite the strides that have been made in UxV technology, no ship class has been designed explicitly to host these systems. We examined the conversion of an existing ship to meet this purpose. The San Antonio Class Amphibious Transport Dock (LPD) is a ship class currently in production designed to provide the Navy and Marine Corps with a modern, sea-based platform for transporting and deploying marines via well deck operations, flight operations, and small boat operations. We used the LPD-17 hull as our baseline for an unmanned host and added DDG-51 Flight IIA combat capabilities while eliminating the amphibious mission requirements. With the complete change in mission profile, the new vessel was redesignated as a Multi-purpose Unmanned Vehicle Assault (MUVA) ship.

We designed the MUVA platform to operate in a similar environment as current DDGs, but employing the additional UxV platforms to extend its reach. This gives it additional in-situ capability beyond a DDG, improving operational availability and influence for commanders. The MUVA ship may lack speed compared to a DDG, but is able to dwell for long periods of time while still covering a large area due to the capability and maneuverability of unmanned payloads.

Due to the uncertain nature of UxV operations, we focused extensively on our design philosophy criteria of flexibility, interoperability, and reliability. This focus led us to find ways to deploy UxVs rapidly, increase margins, incorporate redundant systems, and reduce interface requirements for payloads. Effort was made to minimize structural changes, though some were necessary to accommodate operation and stowage of some UxVs as well as to incorporate the combat requirements.

The preferred MUVA ship design included the following key modifications to meet both the combat capability and UxV host requirements:

- Addition of Mk-45 5" on forecastle
- Replaced forward/aft RAM with CIWS
- Addition of 48 VLS Cells amidships
- Extended hangar
- Removal of aft AEM/S
- Addition of SPY-1 to forward AEM/S
- Expanded CIC for greater UxV command and control
- Extensive storage and maintenance space for the full range of UxVs
- Three additional boat davits for rapid USV/UUV launch and recovery

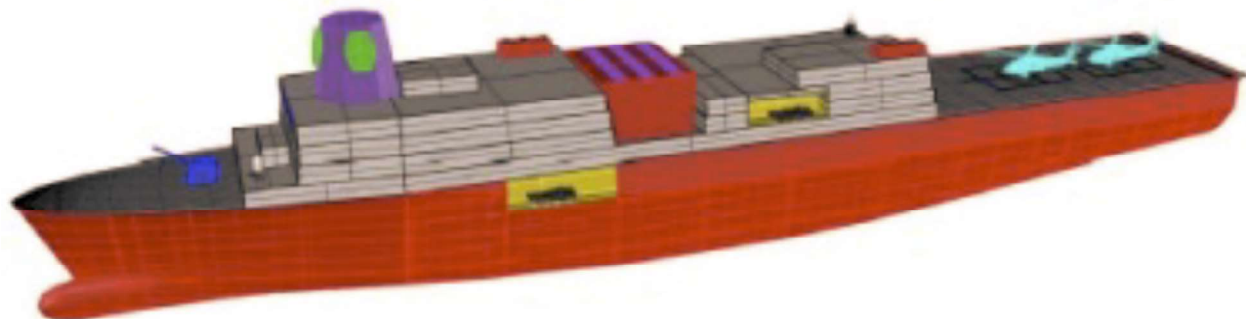


Figure 1: Preferred MUVA Design