FREEDOM Variant
Littoral Combat Ship
Full Speed Ahead
The LCS Mission
The Littoral Combat Ship (LCS) is designed to defeat growing littoral threats and provide assured access and dominance in coastal and open waters. A fast, maneuverable surface combatant, the LCS provides warfighting capabilities and operational flexibility for focused missions including mine-clearing, anti-submarine and anti-surface warfare.

Platform Capabilities
The Lockheed Martin FREEDOM variant – a survivable, semi-planning steel monohull – provides outstanding maneuverability with proven sea-keeping characteristics to support launch and recovery operations, mission execution and optimum crew comfort. High levels of automation, the integrated total ship systems and an experienced industry team are just some of the strong characteristics that Team Freedom brings to this critical program.

Key Advantages
- Minimally manned crew
- Speeds exceed 40 knots
- More than 40 percent reconfigurable space
- Greater than 1,000 nautical mile (nm) range at top speed; 4,000 nm range at cruise speed
- Multi-mission modular capable
- High degree of maneuverability and handling
- Highly automated and total ship wide system integration

Core Defense Systems
Capabilities on the LCS in all configurations include self-defense, navigation and C4I. Self-defense features include:
- Rolling-Airframe Missile Launching System
- 57 mm Main Gun
- Mine, Torpedo Detection
- Decoy System

A New Breed of Warship
LCS replaces ships in the current Navy fleet, including FFG-7 Oliver Hazard Perry Class frigates, MCM Avenger Class mine countermeasures vessels and Osprey Class coastal mine hunters.

Innovative stern ramp provides efficient launch and recovery of hard-bottomed vehicles while ship is underway.

Sailors aboard USS Freedom (LCS 1) signal an MH-60R assigned to Helicopter Maritime Strike Squadron (HSM) 77 to land during a joint maritime exercise.
**Mission Packages**

**Anti-Submarine Warfare Mission Package (ASW MP):** Provides the capability to detect, classify, localize, and prosecute enemy submarines.
- MH-60 Romeo Helicopter with Forward Looking Infrared Radar (FLIR), Laser Rangefinder/Designator (LRD), Inverse Synthetic Aperture (ISAR), Airborne Low Frequency Sonar (ALFS), sonobuoys, and MK54 Lightweight Hybrid Torpedoes.
- Vertical Takeoff Unmanned Aerial Vehicle (VTUAV)
- ASW Escort Module with towed Variable Depth Sonar (VDS) active source, a Multi-Function Towed Array (MFTA) acoustic receiver, and Continuous Active Sonar (CAS) processing and system control.
- Torpedo Defense Module with an MFTA with Acoustic Intercept (ACI) for alertment and a Light Weight Tow (LWT) for countermeasures.

**Mine Countermeasures Mission Package (MCM MP):** Provides the capability to conduct mine hunting (detection, classification, identification and neutralization) and mine sweeping operations for mine threats.
- MH-60 Sierra Helicopter
- VTUAV
- Remote Multi-Mission Vehicles (RMMVs)
- AN/AQS-20A Mine Hunting Sonars
- Airborne Laser Mine Detection System (ALMDS)
- Airborne Mine Neutralization System (AMNS)
- Organic Airborne and Surface Influence Sweep (OASIS)
- Unmanned Surface Vehicle (USV)
- Unmanned Surface Sweep System (US3)
- Coastal Battlefield Reconnaissance and Analysis (CBOA)
- Surface Mine Countermeasures Unmanned Undersea Vehicle (SMCM UUV)

**Surface Warfare Mission Package (SUW MP):** Provides the capability to conduct enhanced range coordinated detection, tracking, classification, identification and neutralization of groups of attacking, multiple, small boat threats and to conduct maritime security missions.
- MH-60 Romeo Helicopter with eight Hellfire missiles, a .50 caliber machine gun, and a 7.62 mm machine gun
- VTUAV
- Two 30 mm Gun Module that uses the MK 46 MOD (X) Gun Weapon System with MK 44 MOD 2 30 mm Automatic Cannon
- Surface-to-Surface Missile Module (SSMM), which will use the Griffin Block IB missile for Increment I and a yet to be determined missile for Increment II, which will provide extended range neutralization capabilities.
- Maritime Security Module which uses two 11 in Rigid Hull Inflatable Boats (RHIBs); Visit, Board, Search, and Seizure (VBSS) gear; two berthing modules with gear storage; and one head and shower module.

**Mission Package Scenario:**
A nation is being attacked in a conflict over contested land, and it picks up intelligence indicating a submarine threat is imminent. An LCS receives orders to interdict, and the ship is reconfigured for an anti-submarine warfare and deployed in a matter of days. Once in position, the LCS employs the ASW MP vehicles and sensors – including an MH-60 Romeo, which carries an active dipping sonar, sonobuoys and lightweight torpedoes – for neutralizing the threat.

**Interoperability**

LCS’s open architecture enables rapid and cost-effective technology insertion and spiral development capability. LCSs are networked to share tactical information with other naval aircraft, ships, submarines, joint and coalition units and LCS groups, providing the right people with the right information quickly and efficiently. Leveraging the U.S. Navy’s investment in open architecture and common C3 systems, we are delivering proven warfighting capability in the littorals and interoperability across a full-spectrum of surface Navy and U.S. Coast Guard ships.

**COMBATSS-21:** Open architecture integrated combat management system derived from the Common Source Library that produces the Advance Capability Build (ACB) 12 used across the U.S. Navy’s latest Aegis surface combatants. COMBATSS-21 and the ship’s Total Ship Computing Environment provide the hardware and software interfaces for quick integration of new capabilities such as weapons, sensors and communication links. COMBATSS-21 provides the backbone of the self-defense suite, integrating the radar, electro optical / infrared cameras, gun fire control system, countermeasures and short range anti-air missiles.

**Intelligent System Manager (ISM-X™):** Leveraging 30 years of experience developing control systems for the U.S. Navy and international military customers, ISM-X™ provides a fully integrated plant management system for propulsion, electric plant, auxiliaries and engineering casualty/damage control systems. It employs open software architecture, distributed processing and an integrated development environment to reduce the labor and material costs of implementation, while improving overall system performance, reliability and flexibility.
Proven Team Performance
The Lockheed Martin-led LCS Team includes shipbuilder Marinette Marine Corporation and naval architect Gibbs & Cox, as well as key domestic and international industry leaders and suppliers selected through a competitive, open business model.

- **Lockheed Martin**: performs work on nearly 100 surface combatants globally
- **Marinette Marine Corporation**: designed and built more than 1,500 vessels; internationally recognized for efficient, modular, sub-assembly and assembly-line manufacturing techniques
- **Gibbs & Cox**: ship designs include more than 60 percent of U.S. Navy Surface Fleet and active duty ships in 15 navies worldwide

Achieving Greater Affordability and Efficiency
LCS demonstrates Lockheed Martin’s focus on affordability in a demanding economic climate. With each LCS built, cost continues to decrease.

- **Efficiencies**: incorporating lessons learned from construction and feedback from the sailors who have operated USS Freedom for two years and over 55,000 nm
- **Performance**: delivering on time, on budget. Deployed USS Freedom two years early; with following ships all on budget and schedule
- **Innovations**: applying technology that reduces production costs, increases our efficiencies and streamlines workload solutions for the crews

Economic Impact
Jobs / Economic Stimulation
In 2014, the program’s peak year which assumes production of two ships per year, an economic impact study found that the Lockheed Martin LCS contracts will generate nearly 13,000 jobs across the nation.

Supplier Base
The program does business with more than 700 suppliers in 43 states and several countries. In addition to our partners Marinette Marine and Gibbs & Cox, we also work with key subcontractors including Rolls Royce, Fairbanks Morse, BAE, EADS and DRS, among others, to provide economic benefit totaling millions for employees, suppliers and taxes. For information on doing business with Lockheed Martin, please visit: www.lockheedmartin.com/suppliers/doingbusiness
**Ship Design Features**

### Universal 3-Axis Overhead Crane System
Provides positive control movement of mission modules and offboard vehicles for safe and efficient launch, recovery and handling.

### Flight Deck
- Size is more than 1.5 times that of current surface combatants.
- Accommodate mission module weapons.
- Up to Sea State 4

### Watercraft Launch and Recovery
- Up to Sea State 4

### Aircraft Hangar
- Size is 2 times that of current surface combatants with space for two H-60 helos or one H-60 helo and three VTUAVs.

### Hull
- Advanced semi-planing steel monohull
- Length Overall: 118.6 meters (389 feet)
- Beam Overall: 17.5 meters (57 feet)
- Draft: 4.1 meters (13.5 feet)
- Full Load Displacement: Approximately 3,200 metric tons
- Top Speed: Greater than 40 knots

### Core Crew
Less than 50; Accommodations for 75 sailors provide higher sailor quality of life than current fleet

### Core Self-Defense Suite
Includes 3D air search radar, Rolling Airframe Missile, medium caliber gun, EO/IR gunfire control system and decoy launching system

### Side Door
Close proximity to waterline provides easy access for small boats to reload, replenish and refuel.

### Stern Ramp
With near waterline access allows safe launch and recovery of watercraft while ship is underway.

### Large Reconfigurable Volume
Provides mission flexibility.

### Fully Integrated Communications Suite
Introduces the submarine common radio room into the surface fleet for commonality.

### Mission Systems
- include COMBATSS-21, which integrates proven open architecture components from Aegis and SSDS with ruggedized COTS total ship computing environment
- Large Reconfigurable Volume provides mission flexibility
- Fully Integrated Communications Suite
- Weapon Module Stations

### Ship Design Specifications

<table>
<thead>
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<th>Hull</th>
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<td>Aircraft Launch and Recovery</td>
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<td>Propulsion</td>
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