Harpoon

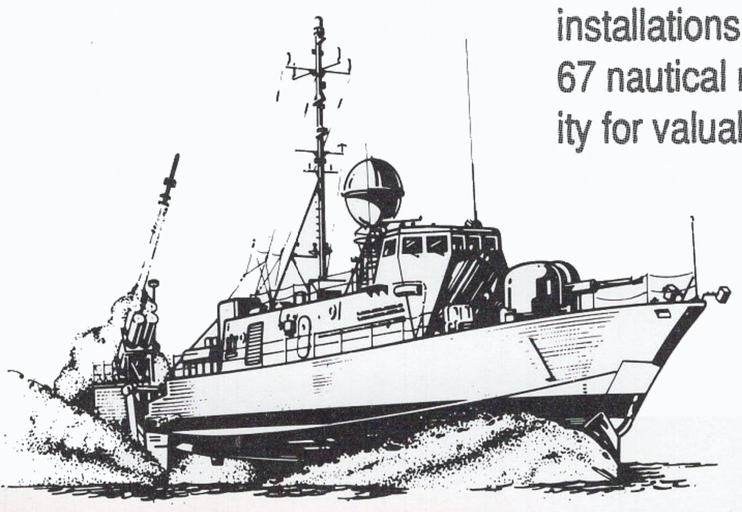
MCDONNELL DOUGLAS

MCDONNELL DOUGLAS

Harpoon

An effective all-weather, sea skimming, anti-ship missile with over-the-horizon range in excess of 67 nautical miles.

THE PREMIER ANTI-SHIP MISSILE

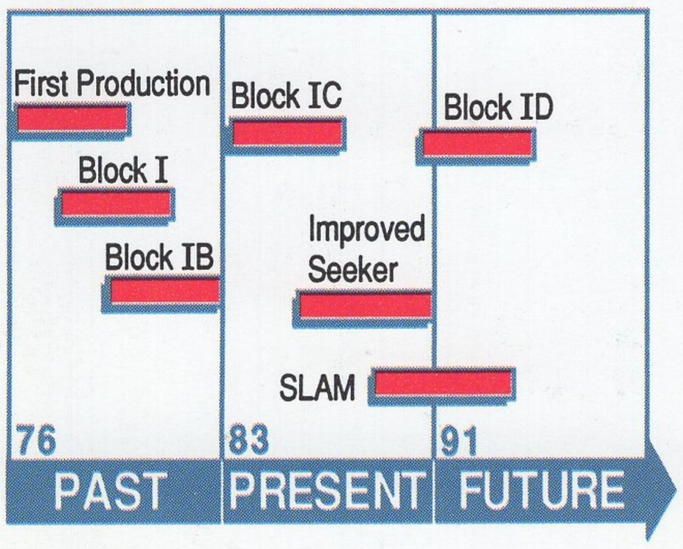


Harpoon is designed for deployment on surface ships, aircraft, submarines, and ground-based installations. Launched from standoff ranges in excess of 67 nautical miles, Harpoon provides enhanced survivability for valuable launch platforms. Harpoon is providing new dimensions in firepower and accuracy for the U.S. Navy, U.S. Air Force, U.S. Coast Guard, and many allies.

The Harpoon Weapon System consists of the missile, launcher and a Command Launch System (CLS). The CLS can be a stand-alone system such as the Harpoon Shipboard, Harpoon Aircraft, and the Encapsulated Harpoon Command and Launch Subsystems, or its function can be integrated into an aircraft, ship, or submarine fire control system.

This multi-platform flexibility and ease of installation have resulted in the selection of the Harpoon Weapon System by cost-conscious military services throughout the world. The missile system provides total interoperability across numerous platforms; therefore, it is very attractive when support costs are considered.

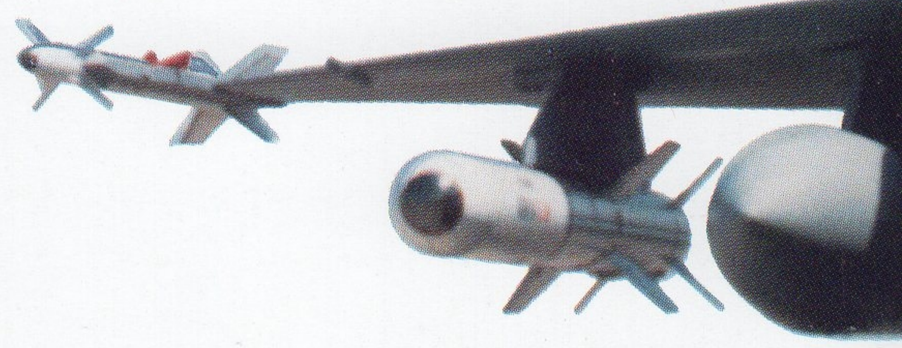
As prime contractor for the Naval Air Systems Command (NAVAIR), McDonnell Douglas Missile Systems Company (MDMSC) has been responsible for development and production of Harpoon since mid-1971. A continuous planned product improvement program has resulted in a series of missile and CLS performance improvements to meet new threats.

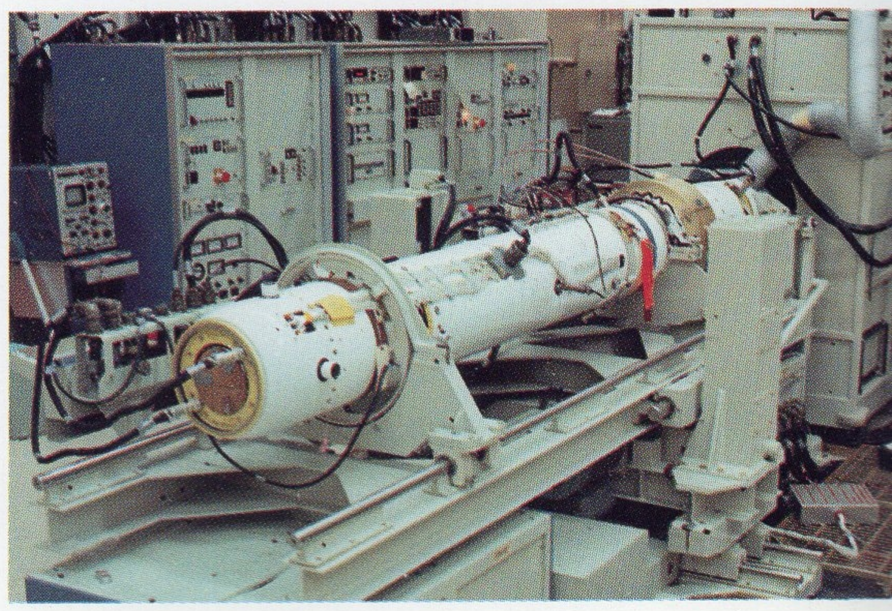


AGM-84E SLAM, the imaging infrared (IIR) variant of Harpoon, was developed to provide standoff range against land and selective ship targets with pinpoint accuracy. SLAM uses many Harpoon components and the same logistics support system to maximize commonality and interoperability. The latest Harpoon active radar variant, A/RGM-84F, designated Block ID, is two feet (0.9m) longer and 200 lbs (90 kg) heavier than A/RGM-84D Harpoon Block IC. Block ID doubles the range of Block IC and provides a reattack capability to counter the evolutionary threat.

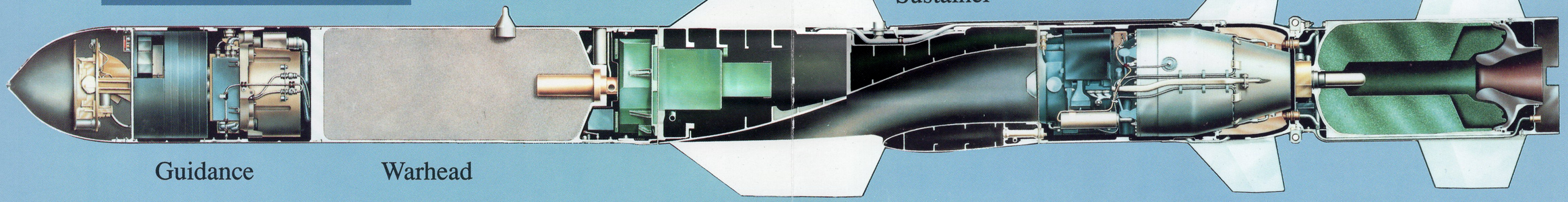
Harpoon has demonstrated exceptional reliability in flight test and has had a 100% success rate in combat launches.

The Harpoon Weapon System is deployed worldwide with full logistic support available from 15 weapon stations. Harpoon maintenance and logistics are based on the "round of ammunition" concept. Built-in-Test (BIT) is available to operating units to assess status of the missile, and command and launch subsystems. Weapon station support equipment includes the Missile Subsystem Test Set (MSTS) for automated test and fault isolation. Depot support is provided at MDMSC in St. Charles, Missouri.



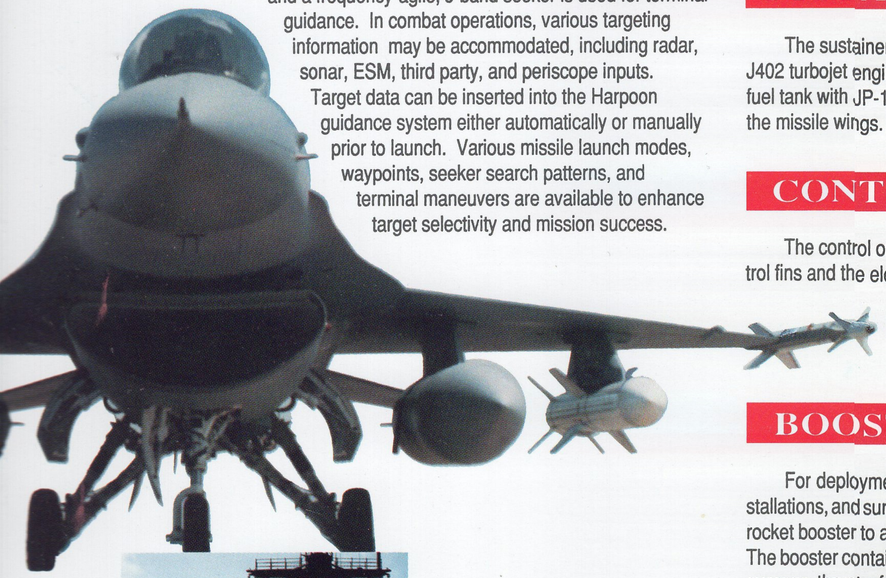


MISSILE FEATURES



GUIDANCE SECTION

The guidance system provides all-weather capability and superior performance in electronic warfare environments. A three-axis, strap-down attitude reference assembly plus a general purpose digital computer and a radar altimeter are used for midcourse guidance, and a frequency-agile, J-band seeker is used for terminal guidance. In combat operations, various targeting information may be accommodated, including radar, sonar, ESM, third party, and periscope inputs. Target data can be inserted into the Harpoon guidance system either automatically or manually prior to launch. Various missile launch modes, waypoints, seeker search patterns, and terminal maneuvers are available to enhance target selectivity and mission success.



WARHEAD

The warhead is a 500 pound, blast/fragmentation, high explosive unitary warhead. Delayed fuzing is employed to permit warhead penetration of the ship's hull.

SUSTAINER SECTION

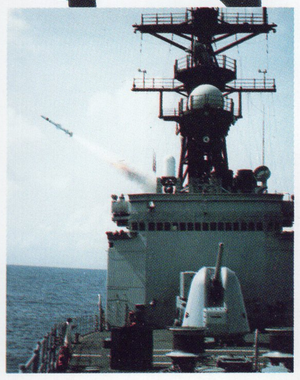
The sustainer section consists of a Teledyne CAE J402 turbojet engine, cast aluminum flush inlet, a sealed fuel tank with JP-10 fuel, two silver-zinc batteries, and the missile wings.

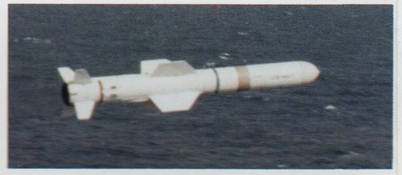
CONTROL SECTION

The control or boattail section supports the four control fins and the electromechanical actuators for each.

BOOSTER

For deployment from submarines, ground-based installations, and surface platforms, Harpoon employs a solid rocket booster to accelerate the missile to cruise velocity. The booster contains a solid propellant which produces an average thrust of 12,000 pounds for approximately 2.9 seconds. A booster-assisted missile is launched at a medium elevation angle and follows a ballistic trajectory. After the booster is expended, it separates from the missile.





FLIGHT PROFILE

When Harpoon is launched from ships, ground-based installations and submarines, the turbojet engine starts automatically after booster separation. For air-launched Harpoon, the booster is not used; the turbojet engine fires on command or automatically depending on speed and altitude of the launch aircraft. Using the MGU and data from the radar altimeter the missile flies at the optimum height for the prevailing sea state. The radar seeker is initialized at mid-course cruise altitude as it approaches the target. After acquisition, Harpoon descends to the sea skimming altitude. Just prior to impact the missile executes a shallow pop-up or low level run-in to the target.

MISSILE DIMENSIONS & WEIGHT

	Block IC	Block ID
Diameter	13.5 in (34.3 cm)	13.5 in (34.3 cm)
Wing Span	36.0 in (91.4 cm)	36.0 in (91.4 cm)
Length		
Air launch	151.5 in (389.8 cm)	175 in (444.5 cm)
Sub/ Ground Launch	182.5 in (463.5 cm)	NA
Ship launch	182.5 in (463.5 cm)	206 in (523.2 cm)
Weight		
Air Launch	1172 lbs (531.6 kg)	1390 lbs (631.8 kg)
Sub/ Ground Launch	1530 lbs (693.9 kg)	NA
Ship launch	1530 lbs (693.9 kg)	1757 lbs (798.6 kg)

HARPOON PLATFORMS

USA

Aircraft
P-3 ASW Patrol
S-3 ASW Patrol
A-6 Attack
F/A-18 Attack
B-52 Bomber
F-16 Fighter

Ships
PHM Patrol Hydrofoils
FFG-7 & FF-1052 Guided Missile Frigates
DD & DDG Class Destroyers
CG & CGN Class Guided Missile Cruisers
BB Battleships
WHEC Coast Guard Cutters

Submarines
Classes 594, 637, 688
Nuclear Attack

Allies

Aircraft
P-3A/B/C, F-111C, Nimrod, F-27, F/A-18, F-16, CN-235, F-50

Ship Classes
Frigates, Fast Patrol Boats, Corvettes, Destroyers

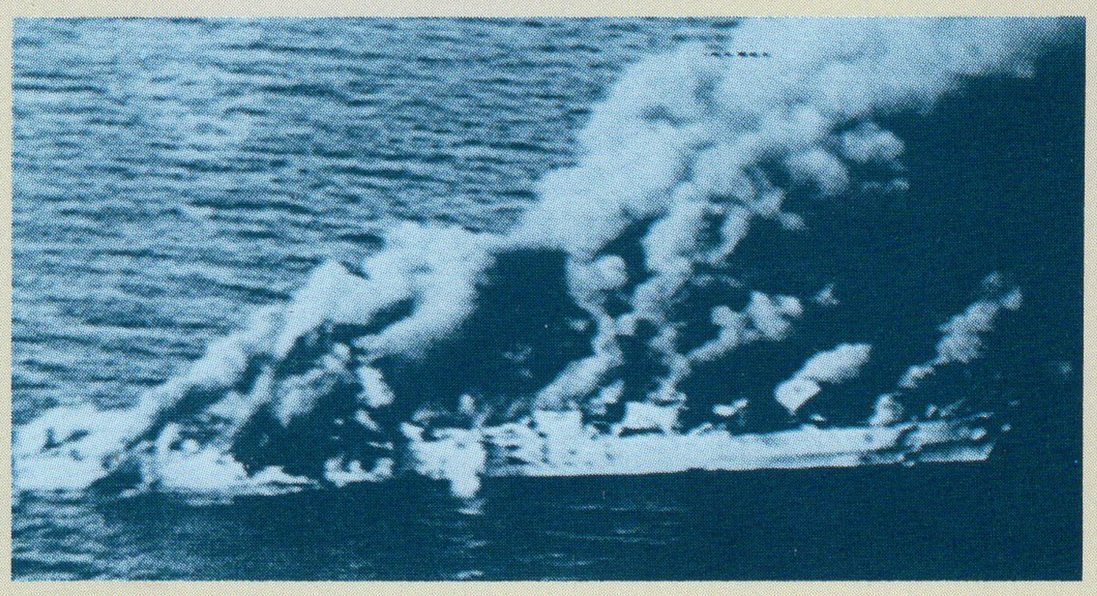
Submarine Classes
Virtually All Attack Submarines

Coastal Defense

PLATFORM INTEGRATION

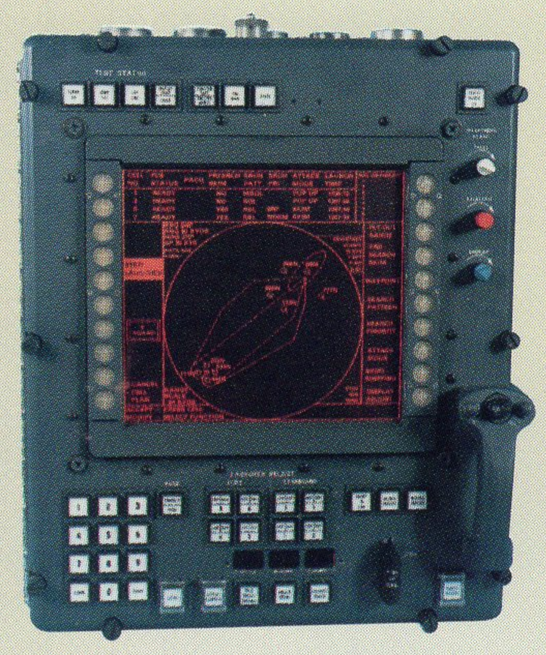
Air Launch

A launch kit adapts the Harpoon missile airframe for integration on various types of aircraft. Missile initialization and launch can be accomplished via a Harpoon Aircraft Command-Launch Control Set (HACLCS) for maritime patrol aircraft such as the P-3 and F-27. High performance combat aircraft, such as the F/A-18 and A-6, use CLS functions integrated into the aircraft avionics. Other specialized air launch systems include the Harpoon Interface Adapter Kit (HIAK) for F-16 and an upgraded HACLCS for CN-235 and other new candidate platforms.



Ship Launch

Virtually all ship installations use a Harpoon Shipboard Command and Launch Control System (HSCLCS) or MK-13 Tartar Launcher and Canister. Various canister configurations (thick wall, Grade B, and light weight) are available to meet specific weight, space, and protection requirements. The latest HSCLCS AN/SWG-1A(V) provides graphic displays and automatic engagement planning to optimize Harpoon performance. The computer-based Harpoon Operator/Team Training System (HOTTS) provides shore-based HSCLCS training.

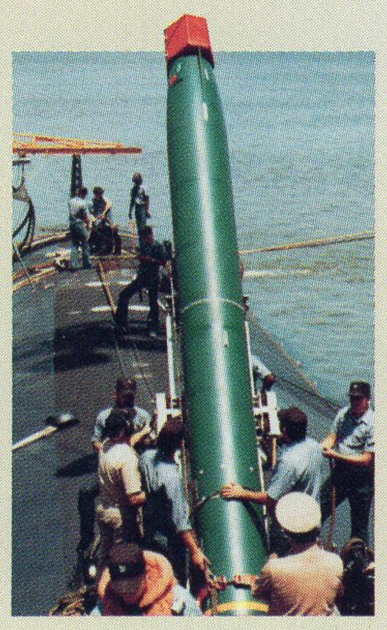


Ground Launch

The Harpoon Coastal Defense System (HCDS) uses Grade B canisters and the HSCLCS AN/SWG-1A(V) for planning engagements and launching the missile. The customer has the option of selecting communications, targeting sources, vehicles, and ancillary services to minimize system support costs.

Submarine Launch

For submarine launch, Harpoon is installed in a buoyant capsule which is fired from the submarine's torpedo tubes and glides to the surface. Upon broaching the surface, capsule sections separate and the missile's booster ignites, launching the missile into the same trajectory used in surface launches. The Encapsulated Harpoon Command and Launch System, federated systems (submarine fire control system interfaced to the Harpoon Data Processor) or integrated fire control systems, such as the USN MK 117, are used to initialize and launch Harpoon.



McDonnell Douglas Missile Systems Company
A company of leaders.

Attn: Director of Marketing, m/c 5982042
P.O. Box 516
St. Louis, MO 63166

phone: (314) 925-5022 fax: (314) 925-5775

E01/91A05KH3