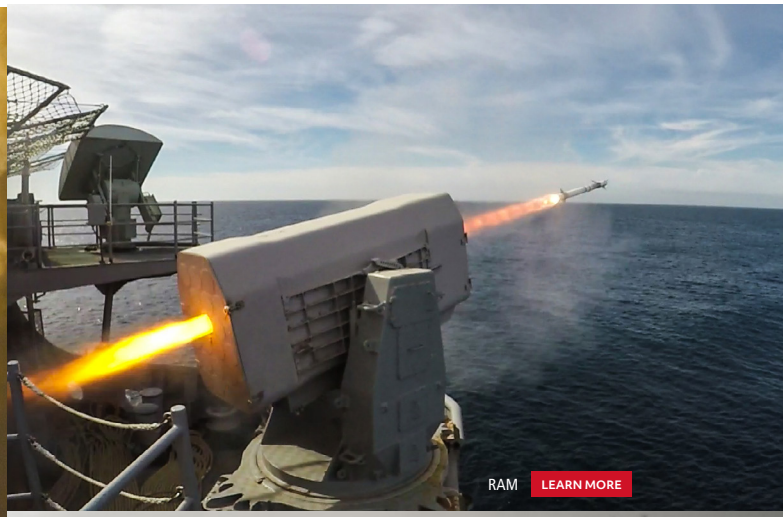
Raytheon Technologies' Suite of Guided Weapons

Raytheon Technologies (RTX) is one of the world's largest manufacturers of guided missiles and a leader in the development of integrated air and missile defence technology. Raytheon Technologies' guided weapons, optimised for both defence and strike, are operational both in Australia and with the United States and our allies worldwide.

RTX supplies most of the Australian Defence Force (ADF) guided weapon inventory. RTX's portfolio of effectors includes a suite of seven missiles either currently in service with the ADF or as part of the ADF's potential future inventory. These include the Advanced Medium-Range Air to Air Missile (AMRAAM®), AMRAAM® Extended Range (ER), Evolved Sea Sparrow Missile (ESSM), the Standard Missile (SM-2, SM-6 and SM-3) and the Rolling Airframe Missile (RAM). This suite of weapons underpins RTX's effort to support the ADF's sovereign weapons manufacturing aspirations.

This core suite of guided weapons provides the benefits derived from commonality and modularity of key components across missile generations and between missile types. This provides operational advantages as well as efficiencies across the supply chain, in engineering, technical data, training and logistic support. Utilising shared systems, parts, and expertise across the entire suite of guided weapons enables RTX to drive interoperability, build economies of scale and maximise global supply chain efficiencies. An initial focus on a suite of guided weapons from a single original equipment manufacturer (OEM) also eliminates complexity associated with the transfer of intellectual property, including production know-how, to Australia.



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① Rolling Airframe Missile (RAM™)

The RAM™ weapon system is the world's most advanced ship self-defence weapon and is designed to provide exceptional protection for ships of all sizes. It is currently deployed on more than 165 ships in 11 countries, ranging from 500-ton fast attack craft to 95,000-ton aircraft carriers.

A supersonic, lightweight, quick reaction, fire-and-forget weapon, the RAM system is designed to destroy anti-ship missiles. Requiring no additional direction upon launch, its passive radio frequency and infrared guidance design enable the system to engage multiple threats simultaneously. The missile is continually improved to stay ahead of the ever-evolving threat of anti-ship missiles, helicopters, aircraft and surface platforms.

The Block II variant, the latest evolution in the development of the RAM missile, has a larger rocket motor, advanced control section and an enhanced RF receiver capable of detecting the quietest of threat emitters. The improvements make the missile two and a half times more manoeuvrable, with one and a half times the effective intercept range. This provides the Block II variant with the capability to defeat highly demanding threats, extending the survivability of the defended ship.

② AMRAAM®

AMRAAM – Advanced Medium Range Air-to-Air Missile – is the world's most sophisticated, combat-proven air dominance weapon. With more than 30 years of design, upgrades, testing and production, this missile continues to meet defence requirements in all-weather challenges and beyond visual range. Its capabilities have been fully demonstrated in over 5,000 test shots and more than a dozen air-to-air combat victories.

The AMRAAM missile packs unprecedented performance into a lightweight, cost-effective package. It uses a combination of inertial guidance, mid-course updates, and an on-board active radar to find the intended target and complete the intercept. The AMRAAM remains the air dominance gold standard because of continual development and ongoing modernisation.

Procured by 41 countries, including Australia, the AMRAAM missile has been integrated onto the F-15A/ B/C/D/E Eagle/ Strike Eagle, F-16 Fighting Falcon, F/A-18E Super Hornet, F-35 Joint Strike Fighter, F-22 Raptor, Eurofighter Typhoon, JAS-39 Gripen, Tornado and Harrier. In the surface-launch role, it is the baseline weapon on National Advanced Surface-to-Air Missile System (NASAMS), allowing countries to use the same missile in either role with no modifications. Together, NASAMS and AMRAAM are core components of the Australian Army's LAND 19 Phase 7B program.

③ AMRAAM®-ER

The AMRAAM-Extended Range (ER) missile is a new, ground-launched solution that will intercept targets at longer distances and higher altitudes. The AMRAAM-ER missile achieves its boost in range from a larger rocket motor and optimised flight control algorithms.

Designed specifically for ground-based air defence, the AMRAAM-ER missile can be integrated with the NASAMS launcher for increased medium range air defence protection. NASAMS is owned by 11 countries, including Australia as part of the LAND 19 Phase7B program, and has been integrated into the U.S. National Capital Region's air defence system since 2005.

AMRAAM-ER is expected to go into full rate production in 2022.

④ ESSM®

The Evolved Sea Sparrow Missile (ESSM®) guided missile is an international cooperative upgrade of the RIM-7 Sea Sparrow Missile. It provides self-defence, battlespace protection and firepower against highly manoeuvrable

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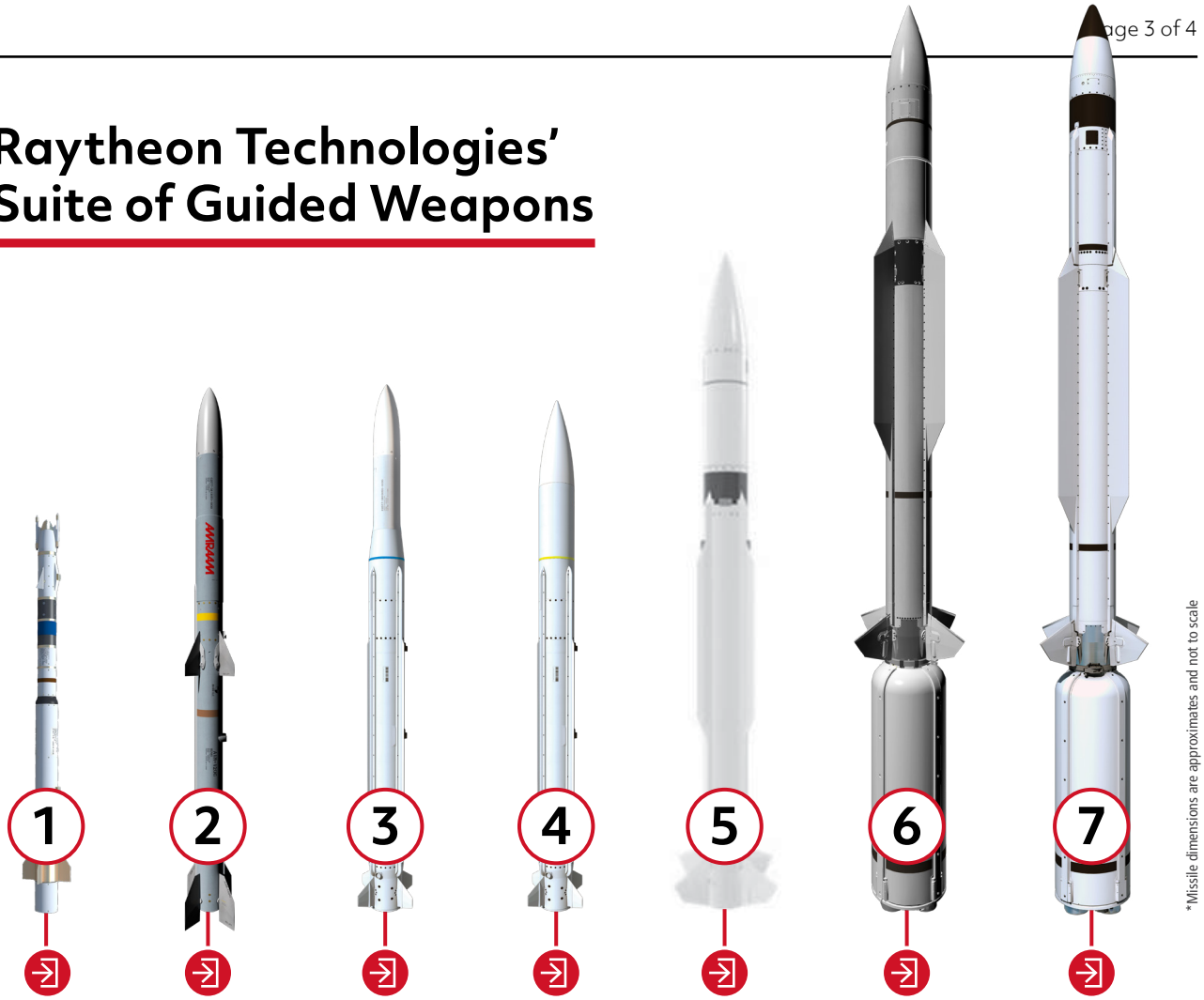

*Missile dimensions are approximates and not to scale

LEARN MORE:

anti-ship missiles in the naval environment.

Developed by the U.S. Navy and nine of the 12-member nations of the NATO SEASPARROW Consortium, the ESSM missile provides transformational anti-ship missile defence capabilities to Australia and other allies. Members of the Consortium include Australia, Belgium, Canada, Denmark, Germany, Greece, the Netherlands, Norway, Portugal, Spain, Turkey and the United States.

With more than 2,000 proven rounds in service or in production, and another 1,500 rounds anticipated based on customer requirements, it is likely the ESSM missile will be supported through 2030 and beyond. The ESSM is currently deployed by the Royal Australian Navy on the Adelaide and Anzac class frigates, as well as the Hobart class destroyers. The upgraded version of ESSM, known as Block II, is currently under development. The ESSM Block II active seeker will support terminal engagement without the launch ship's target illumination radars.

⑤ SM-2™

The SM-2™ missile is the cornerstone of a ship's layered defence – chasing threats closer to the water's surface and defending against anti-ship missiles and aircraft out to 90 nautical miles.

Standard Missile-2 (SM-2) provides increased intercept range, high and low-intercept capability, and performance against advanced and anti-ship missile threats. Its primary mission is fleet-area air defence and ship self-defence, but it has also demonstrated an extended area air defence protection capability.

To achieve the ADF's mission of providing area defence, the Royal Australian Navy's Hobart class destroyers are armed with SM-2 providing critical interoperability with other allied forces. Variants of the SM-2 include radar seeker technologies in continuous wave and interrupted continuous wave guidance modes, tail controls and solid rocket motor propulsion to engage high-speed manoeuvring threats and updated radar targeting and directional warheads. Block IIIB enhances its predecessor's capabilities by adding autonomous infrared acquisition. The U.S. Navy plans to use this variant until 2035.

RTX restarted its SM-2 production line after multiple countries pooled resources to make a "bundle" purchase. The company reconfigured and modernised its SM-2 missile factory to increase production efficiencies. It also signed new agreements with several suppliers.

In 2020, RTX and the U.S. Navy successfully flight tested the first SM-2 missile from the company's restarted production line. The SM-2 Block IIIB missile launched, flew and provided accurate telemetry data to the range, and engaged an airborne Navy target.

The SM-2 has an extensive flight test history, with more than 2,700 successful live firings. Its durability has led navies in several countries to reconfigure their fleets to support SM-2 applications.

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⑥ SM-6®

The SM-6® is three missiles in one. It is the only weapon that can perform anti-air warfare, ballistic missile defence and anti-surface warfare missions. The SM-6 combines the combat proven Standard Missile airframe and propulsion elements and was developed to augment the capabilities of the SM-2, which have provided the foundation for the Royal Australian Navy's area air defence capabilities.

The SM-6 also offers navies more flexibility in limited ship space—and it could potentially enable Australia to cost-effectively increase the offensive might of surface forces. The missile is deployable on surface ships equipped with the Mk 41 Vertical Launch System, and the Royal Australian Navy's Hobart class destroyers and Hunter class Frigates are all intended to be armed with the SM-6.

The SM-6 delivered on its initial mission to provide anti-air warfare support to the U.S. Navy by engaging manned and unmanned aircraft attacks and cruise missiles. In 2015, the weapon demonstrated it could protect ships against ballistic missiles in their final phase of flight.

⑦ SM-3®

The SM-3® interceptor is a defensive weapon the U.S. Navy uses to destroy short-to intermediate-range ballistic missiles. The interceptor uses sheer force, rather than an explosive warhead, to destroy its target. Its "kill vehicle" hits threats with the force of a 10-ton truck traveling 600 mph.

This technique, referred to as "hit-to-kill," has been likened to intercepting a bullet with another bullet. The SM-3 interceptor is a critical piece of the Phased Adaptive Approach for missile defence in Europe. The interceptor is carried by U.S. Navy ships deployed off the European coast, and is now operational at a land-based site in Romania, further enhancing Europe's protection. When the next land-based SM-3 interceptor site becomes operational in Poland, all of Europe will be defended from ballistic missile attacks.

The flexibility of the SM-3 interceptor to be based on both land and sea offers countries without ballistic missile defence-enabled navies the opportunity to take advantage of regional defence, and with the capacity to protect large areas of land. The SM-3 can cover larger areas with fewer installations, when compared to other "lower tier" missile defence solutions.

The SM-3 program has experienced more than 30 successful space intercepts, and more than 400 interceptors have been delivered to U.S. and Japanese navies.

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