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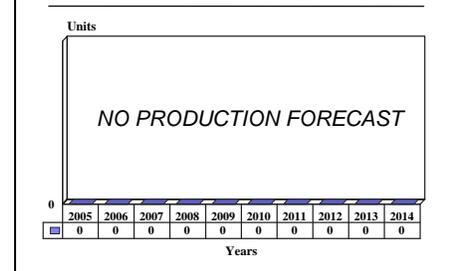
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Seahunter - Archived 12/2006

Outlook

- Production concluded
- No new domestic or foreign production orders anticipated
- U.S. Navy's procurement funding is focused on the Mk 48 heavyweight torpedo
- Foreign navies seem to favor the DM2A4 and Black Shark
- Egypt is the only known operator of the Seahunter

10 Year Unit Production Forecast
2005 - 2014



Orientation

Description. Dual-role, heavyweight torpedo.

Sponsor. Raytheon

Status. Seahunter was designated as a follow-on to the NT-37 torpedo. Reportedly, Seahunter entered production in 1995. The first production deliveries were made before the end of 1996.

Total Produced. Approximately 73 Seahunter torpedoes and several prototypes for testing were produced through the end of 2004. Sales have been restricted.

Application. The Seahunter is an anti-surface-ship/anti-submarine weapon.

Price Range. Industry sources have suggested that the Seahunter sells for approximately \$750,000 per unit. This is a much higher price than that of its older relative, the NT-37F, due to the many improvements and advanced performance features.

Contractors

Raytheon Torpedo Center, <http://www.raytheon.com>, 1050 NE Hostmark Street, Poulsbo, WA 98370 United States, Tel: +1 (360) 697-6600, Fax: +1 (360) 697-8200, Prime

Technical Data

Design Features. A heavyweight torpedo, Seahunter is designed to be compatible with all submarines equipped to fire Mk 37 and NT-37 torpedoes, with no modifications needed to either the submarine's fire control system or launch tubes.

A multimission tactical logic tested in NATO fleet operations guides Seahunter in both anti-surface ship and anti-submarine attacks.

The modular, low-maintenance design includes plug-in assemblies that also have a built-in self-test capability that should help reduce spares inventories and complicated deck-level repairs.

The two-speed engine ensures both a long operating range and a high traveling speed for the torpedo, while the cost of the high-energy propellant keeps the operating costs reasonable for exercise purposes.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Diameter	483 mm ^(a)	19 in ^(a)
Length	4,763 mm	15 ft 6 in
Weight	868 kg	1,913 lb
Weight, warhead	150 kg HE	330 lb
Weight, warhead optional	250 kg HE	551 lb
Performance		
Speed	38 kt	38 kt
Range	18,000 m	20,000 yd

^(a) Designed to swim out from 533 mm launch tubes.

Propulsion. Propulsion is supplied by a high-energy Otto fuel system using a two-speed thermal chemical rotary piston engine designed for long range and high speed. A high-energy-density chemical propellant was chosen for a power source, as such a fuel source is reported to be less expensive than equivalent battery power; this, in turn, makes exercise runs less expensive.

Control & Guidance. The torpedo is equipped with modern active/passive sonar in a solid-state, acoustic, self-noise-reduction nose assembly that reduces acoustic interference when operating at high speed or near the sea surface. The system includes adjustable detection sensitivity to compensate for high sea states. Range gating enhances its ability to avoid decoys.

Launcher Mode. Seahunter is physically compatible with all known impulse and swim-out torpedo tubes and electronically compatible with most fire control systems.

Warhead. An enlarged warhead with a sensitive, advanced anti-surface-ship warfare/anti-submarine warfare contact/proximity fuze assembly has been incorporated into the weapon to help ensure maximum target damage, optimally requiring only one hit. The torpedo can carry either a 150- or 225-kilogram high-explosive warhead.

Variants/Upgrades

This program has developed a small number of torpedo models other than the Seahunter. Seahunter, the focus of this report, is a new torpedo derived from the NT-37, and actually forms the generation beyond NT-37F. The torpedo has completely new electronics, including new guidance, new sonar, a proximity fuze, and a multispeed Otto engine for higher speed. Seahunter is 4,763 mm (15 ft, 6 in) in length, compared with 4,505 mm (14 ft, 8 in) for the NT-37F (Mod 2). The Seahunter also comes with an option for a larger warhead of 250 kilograms (high explosive).

The SeaArrow is a hybrid heavyweight torpedo, mating the Mk 48 hydroframe, warhead, and propulsion system with the digital, software-driven guidance and control

systems from the new Seahunter. Thanks to its swim-out capability, the SeaArrow can be fitted on a number of submarines, including the German Type 209.

Finally, the Seahunter(S) is a variation on the Seahunter model that underwent at-sea trials in the late 1990s. It is a shortened version of the standard-length Seahunter, being a heavyweight torpedo with all the operational capabilities of its full-length counterpart. The Seahunter(S) increases the magazine load-out of submarines by allowing them to carry two Seahunter(S) torpedoes on the reload racks originally designed for a single full-size torpedo.

Please see the separate report in this tab for further information on the Seahunter(S).

Program Review

Background. In 1992, Alliant (now Raytheon) had taken the incremental improvement of the NT-37 torpedo to the point where the next production version was effectively a new weapon. The use of new propulsion, guidance, and warhead effectively made the upgrade a completely new torpedo. This great advance (compared to that from the Mk 37 to NT-37) was recognized in 1993 when Alliant announced the new

and improved weapon as Seahunter (SEA-HUNTING TORpedo). In direct terms of lineage, the Seahunter is thus an NT-37G version of this new development, featuring a two-speed, high-energy Otto engine, programmable digital control logic, enhanced signal processing, and a warhead with a new proximity fuze by STN-Atlas Elektronik.

The prototype was tested in September 1993. Range was reported to be 2.5 times greater than that of the Mk 37. Speed was said to be about 1.5 times greater, with passive and active detection ranges doubled and warhead size increased about 1.75 times in comparison to the NT-37F.

Seahunter was ready to enter production in 1995, with first production deliveries made around 1997. The Egyptian Navy is reported to be the only customer for this torpedo with a \$30 million order for weapons to equip its rebuilt Project 633 (Romeo) class submarines.

International Teaming. In 1994, Alliant Techsystems and Sweden's Bofors Underwater Systems entered an agreement to jointly examine alternative propulsion systems for future torpedoes. In 1995, the agreement was expanded to enable the two companies to work

toward approval for a Foreign Comparative Test (FCT) program in fiscal year 1998. The aim was to use the HTP propulsion system of the Swedish Torpedo 2000 program as a precursor to the integration of the HTP in the U.S. Navy's future heavyweight torpedoes.

The HTP propulsion system is said to offer a number of advantages over Otto-fueled systems, resulting in cost reductions in the long run and making exercise firings more economical. According to Bofors, the Tp2000 with HTP would only need to be rebuilt after around 30 runs, whereas an Otto fuel-powered torpedo needs to have its propulsion system disassembled after every run.

The current state of this cooperation agreement is unknown due to the turmoil in the corporate structures at the U.S. partner's end (Raytheon is the new parent unit).

Funding

This is generally a company-funded program, with some funding coming from the countries that order the weapon.

Recent Contracts

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Alliant Technology	30	1995 – Egyptian Navy contract to procure torpedoes to arm four Chinese-built Project 633 (Romeo) class submarines being rebuilt using U.S. funding. Analysis suggests that approximately 50 torpedoes were supplied.

Timetable

<u>Year</u>	<u>Major Development</u>
1992	Development of Seahunter begins as NT-27G
1993	Seahunter prototype tested
1996-97	Seahunter ready for production; production deliveries begin
1997	Seahunter(S) developed and tested

Worldwide Distribution

Countries. Approximately 50 torpedoes supplied to the **Egyptian Navy**. No other commercial sales have been announced.

Forecast Rationale

No further orders for the Seahunter heavyweight torpedo are anticipated. Interest in this torpedo was never high, Egypt being the only known customer for the Seahunter. Raytheon is believed to be focusing its marketing energies on the Mk 48 heavyweight torpedo. In fact, reports claim this program, along with the Seahunter(S), has been abandoned by Raytheon in favor of more potentially profitable efforts.

A problem for Seahunter was that the U.S. Navy was not buying it. Raytheon developed the Seahunter for the export market and had no real intention of selling it to the U.S. Navy. Still, the perceived lack of interest from the U.S. Navy worked against the effort to secure Seahunter orders. Without support from the U.S. Navy, which continues to focus its procurement funding on the

Mk 48 heavyweight torpedo, the Seahunter was unable to achieve any real market success.

The competition in the heavyweight torpedo market remains tight. U.S. manufacturers face fierce competition from their European counterparts in a market glutted with heavyweight torpedoes. To make matters worse, much of the market that does exist is already locked up. Torpedoes are being supplied as part

of a complete submarine package, and navies are buying additional weapons to fill out their inventory of an existing type. The future heavyweight torpedo market is expected to be dominated by the Mk 48, the Spearfish, the Torpedo 2000, and the DM2A4.

Production of the Seahunter has ceased, with no further orders anticipated. This report will likely be dropped in the next year.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Missile	(Engine)	thru 04	<u>High Confidence Level</u>				<u>Good Confidence Level</u>			<u>Speculative</u>			Total 05-14	
			05	06	07	08	09	10	11	12	13	14		
RAYTHEON COMPANY SEAHUNTOR	UNSPECIFIED	73	0	0	0	0	0	0	0	0	0	0	0	0