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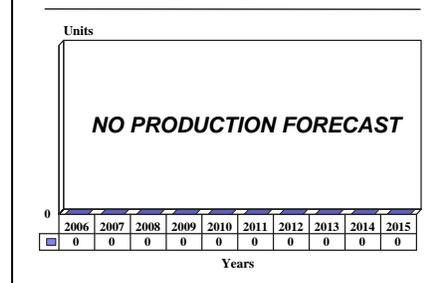
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Kaman SH-2 Seasprite - Archived 9/2007

Outlook

- Order backlog worked off in 2003, further sales prospect dim
- Software problems with Australia's SH-2Gs continue; project over budget and behind schedule
- No further sales anticipated

**10 Year Unit Production Forecast
2006 - 2015**



Orientation

Description. Twin-engine, single-main-rotor, multi-purpose naval helicopter.

Sponsor. U.S. Navy, Naval Air Systems Command, Washington, DC, USA.

Contractors. Kaman Corp, Kaman Aerospace Corp, Bloomfield, Connecticut, USA.

Status. Production completed; last of 24 SH-2G modification/remanufactured helicopters delivered to U.S. Navy in 1994. SH-2F to G conversions being performed for Australia and Poland.

Total Produced. Kaman produced 142 SH-2F and six SH-2G helicopters, and upgraded 43 SH-2Fs to the G standard through 2003.

Application. Tasks include anti-submarine and anti-surface ship warfare, search and rescue, medevac, communications relay, vertical replenishment, mine detection, small craft interdiction, law enforcement, and ship targeting.

Price Range. SH-2F, \$8.83 million (FY86 unit cost); SH-2G, \$10 million (FY87 unit cost); SH-2G upgrades estimated to be \$12 million each in 2006 dollars.

Kaman SH-2 Seasprite



SH-2G Super Seasprite

Source: Kaman Corp.

Contractors

Prime

Kaman Aerospace Corp	http://www.kamanaero.com , Old Windsor Rd, PO Box 2, Bloomfield, CT 06002-0002 United States, Tel: + 1 (860) 242-4461, Fax: + 1 (860) 243-7514, Prime
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Subcontractor

GE - Aviation	http://www.geae.com , 1000 Western Ave, Lynn, MA 01910-0001 United States, Tel: + 1 (617) 594-0100, Fax: + 1 (617) 594-4729 (T700-GE-401)
Honeywell Aerospace Engines, Systems & Services	http://www.honeywell.com/sites/aero/Propulsion_Engines.htm , 111 S 34th St, Phoenix, AZ 85034 United States, Tel: + 1 (602) 231-1000, Fax: + 1 (602) 231-5713 (GTCP 36-150BH APU)
Messier-Dowty Inc	http://www.messier-dowty.com , 574 Monarch Ave, Ajax, L1S 2G8 Ontario, Canada, Tel: + 1 (905) 683-3100, Fax: + 1 (905) 686-2914 (Main Landing Gear)
Northrop Grumman Corp	http://www.northropgrumman.com , 1840 Century Park E, Los Angeles, CA 90067-2199 United States, Tel: + 1 (310) 553-6262, Fax: + 1 (310) 201-3023 (ASN-123 Tactical Navigation System)

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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

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Technical Data

(SH-2G)

Design Features. Single-main-rotor helicopter with conventional tail boom/rotor section. Main rotor carries four blades, as does the tail rotor. Main wheeled gear is retractable with a single fixed tail wheel. Cold-drive engines.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Max length overall(a)	16.08 m	52.75 ft
Max height overall(a)	4.58 m	15.02 ft
Main rotor diameter	13.51 m	44.33 ft
Weight		
Weight empty	3,477 kg	7,665 lb
Normal TOW	6,124 kg	13,500 lb
Capacities		
Standard fuel, internal	1,044 liters	276 gal
Aux fuel, external	757 liters	200 gal
Cargo hook	1,814 kg	4,000 lb
Rescue hoist	272 kg	600 lb
Performance		
Normal cruise speed	222 kmph	120 kt
Max cruise speed	256 kmph	138 kt
Service ceiling	7,285 m	23,900 ft
Hover ceiling OGE	5,486 m	18,000 ft
Normal range, max fuel	885 km	478 nm
Propulsion		
SH-2F	(2)	GE Aircraft Engines T58-GE-8F twin-spool, axial-flow, free turbine turboshaft engines rated 1,006 kW (1,350 shp) each.
SH-2G	(2)	GE T700-GE-401 turboshaft engines rated 1,260 kW (1,690 shp) each.

Armament

One or two Mk 46 or Mk 50 torpedoes and pintle-mounted 7.62mm machine gun in both cabin doorways.

(a)With rotors turning.

Variants/Upgrades

SH-2F LAMPS Mk I. The Light Airborne Multi-Purpose System (LAMPS) helicopter was intended to extend the range capabilities of destroyer-type ships by operating from their decks against submarines and vessels carrying anti-ship missiles. Initial LAMPS capability was provided by modification of 20 early Seasprites to SH-2D configuration. In May 1973, a further developed LAMPS Mk I version, the SH-2F, was introduced, and Kaman eventually delivered 88 conversions to this standard. In a program completed in March 1982, earlier SH-2Ds were upgraded to SH-2Fs.

Compared to earlier models, the SH-2F possesses a strengthened undercarriage with a shortened wheelbase, a feature accomplished by relocating the tail wheel farther forward. Power was increased to 1,006 kW per engine.

The aircraft is fitted with Kaman's 101 rotor, which provides substantial performance while nearly eliminating rotor vibrations. This rotor system, which utilizes a titanium hub and blade retention assemblies, has a 3,000-hour life. The low vibration level greatly enhances the reliability and maintainability of other systems. The LAMPS Mk I avionics package includes

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the Texas Instruments ASQ-81 Magnetic Anomaly Detector (MAD), Canadian Marconi LN-66HP surveillance radar, Rockwell Collins ARC-159(V) UHF com radios, General Instruments ALR-66 passive radiation detection receivers, DIFAR and DICASS passive and active sonobuoys, a Teledyne ASN-123C tactical navigation system with computer and CRT display, an APN-182 Doppler radar, and an AYK-2 analog navigation computer. The current successor to the Mk I package is the Mk III suite, which is carried in the Sikorsky SH-60B Seahawk. This LAMPS entered service in 1984.

SH-2G. A Seasprite re-engined with GE T700s began flight tests in April 1985, carrying the designation YSH-2G, and in FY87 the Navy funded six new-production versions of this model. Aside from the engines, the G upgrades include a state-of-the-art UYS-503 acoustic processor, a Teledyne ASN-150

tactical system, a new cockpit instrument panel, a Hughes AAG-16 forward-looking infrared (FLIR) sensor, ALE-39 chaff/flare dispensers, an AAR-47 missile detection system, MAD, 99 channel passive/active sonobuoys, dual function work stations, and a 1553B digital databus. The Navy has also funded the conversion of 24 inventory SH-2Fs to the G configuration. The service originally planned to convert 96 Seasprites to the G standard during the 1990s: 64 for active units and 32 for reserve components. Those for active units have been equipped with the aforementioned Hughes AAQ-16 FLIR sensor, Sanders ALQ-144 jammers, Loral AAR-47 missile warning equipment, and a Collins ARC-182 secure radio. Active Navy SH-2Gs were also configured for future use of the Airborne Low Frequency Sonar. Finally, Kaman developed a new mine-detection system called Magic Lantern, which was used extensively during Desert Shield/Storm.

Program Review

Background. The original Seasprite design was of single-engine configuration, and first flew in prototype form in July 1959. Eighty-eight UH-2As were built, with the first entering squadron service in December 1962. A VFR variant, the UH-2B, joined the fleet the following August; 102 of this version were acquired. In-service use determined that the Seasprite's performance suffered under hot/high conditions, and a modification program was therefore initiated whereby all UH-2A and B models were configured with two GE T58-GE-8F engines of 932 kW each. Deliveries of this redesignated UH-2C model began in August 1967 and ended in 1972.

Various modification programs followed wherein several aircraft were fitted with armor and armament

and search-and-rescue gear. The most important modification, however, involved the addition of avionics equipment for anti-submarine warfare (ASW) and anti-ship missile defense (ASMD) duties.

International Sales

In 1995, Egypt ordered 10 F-to-G conversions from Kaman. The SH-2G conversion was also selected by the navies of Australia (11 units) and New Zealand (4) in June 1997. In August 1999, New Zealand converted one option for a fifth aircraft. In 2002, the U.S. Navy contracted with Kaman to activate four stored SH-2Gs for transfer to Poland.

Significant News

Kaman Finishes Overhaul on Second Egyptian SH-2G(E) – Kaman Aerospace Corp says it has delivered the second SH-2G(E) Super Seasprite helicopter to the Egyptian Air Force (EAF) after overhaul. Kaman has a \$5.3 million contract to provide depot-level maintenance for up to four SH-2G(E) helicopters for Egypt.

Egypt acquired its SH-2s back in 1998. The helicopters in the nine-aircraft fleet are equipped with an L-3 Ocean Systems AQS-18A dipping sonar and an associated Vista Controls digital hover coupler. The Egyptians use them in the anti-submarine-warfare role in the Mediterranean and Red seas.

The company completed work on the first EAF aircraft last November and has begun work on the third. (Kaman Aerospace, 7/06)

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Funding

The last procurement year for complete SH-2 aircraft was FY87, when six were authorized for \$76.5 million, less a \$16.3 million advanced procurement. Final modifications funding for the USN's SH-2F-to-G conversion project was allocated in FY93.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1959	First flight of H-2 prototype
Early	1960s	Production of UH/SH-2 begun
	1973	First production phase completed
	1981	SH-2 production restarted
Dec	1989	First flight of SH-2G
Mar	1990	Delivery of first SH-2G to the U.S. Navy
	1994	USN SH-2G upgrade program completed
	2003	Australian, New Zealand, Polish orders completed
Late	2004	Kaman, BAE Systems Avionics team to develop new mission suite for SH-2G

Worldwide Distribution/Inventories

(as of August 1, 2006)

Egyptian Navy	12
New Zealand Navy	5
Poland	4
Australian Navy	10

Forecast Rationale

In spite of well publicized problems with the Royal Australian Navy (RAN) SH-2Gs, Kaman continues to seek additional international customers for the Seasprite.

RAN Problems

The RAN grounded its SH-2Gs in the spring of 2006 due to major problems with the aircraft's mission-critical Integrated Tactical Avionics System (ITAS). The ITAS software package integrating the aircraft's avionics, sensors, and weapons systems has fallen significantly behind schedule and over cost, and while Australia has considered replacing the aircraft through a new acquisition program, it appears more likely that the (hopefully) less expensive option of resolving the ITA issue will be the option pursued.

Additional Sales Potential

Portugal has expressed periodic interest in acquiring a small number of additional Seasprites to complement its AgustaWestland Super Lynxes, while both Malaysia and Taiwan have also been singled out as potential buyers. However, the RAN's teething troubles may have cast a pall over the SH-2G program in recent years. Mexico and Romania have been mentioned as sales prospects in the past, but neither appears to be seriously interested at this time.

We believe the window of opportunity for further Seasprite sales has closed and we are no longer forecasting additional orders for the upgraded aircraft.

Kaman SH-2 Seasprite

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Aircraft	(Engine)	thru 05	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>			Total 06-15
			06	07	08	09	10	11	12	13	14	15		
KAMAN														
SH-2 (ALL EARLY MODELS)	T58 (VARIOUS)	88	0	0	0	0	0	0	0	0	0	0	0	0
SH-2F	T58-GE-8F	54	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (AUSTRALIA MOD)(a)	T700-GE-401	10	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (EGYPT MOD)(a)	T700-GE-401	10	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (EXPORT MOD)(a)	T700-GE-401	0	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (NEW ZEALAND MOD)(a)	T700-GE-401	5	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (US NAVY MOD)(a)	T700-GE-401	18	0	0	0	0	0	0	0	0	0	0	0	0
SH-2G (US NAVY)	T700-GE-401	6	0	0	0	0	0	0	0	0	0	0	0	0
Total Production		191	0	0	0	0	0	0	0	0	0	0	0	0

(a)MOD PROGRAM - NOT NEW PRODUCTION AIRCRAFT.