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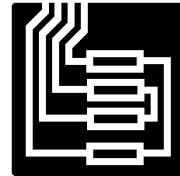
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Lockheed S-3 Series - Archived 1/2006

Outlook

- Navy began retiring S-3Bs in 2004, all to be phased out by 2009
- Lockheed Martin seeking to place retired aircraft with overseas operators

Note: Icons indicate area(s) of current and potential retrofit/modernization activity



Orientation

Description. Carrier-based, twin-engine anti-submarine warfare aircraft. Accommodates a crew of four.

Developer/Primary Manufacturer. Lockheed Corp, Lockheed Aeronautical Systems Co, Burbank, California, USA.

Current Status. Series production ended in 1978. Inventory aircraft to be retired between 2004 and 2009.

Total Produced. A total of 187 S-3A Vikings produced; 112 S-3Bs currently in U.S. Navy inventory.

Application. Carrier-based anti-submarine warfare.

Price Range. The cost of the mission avionics for the ES-3A conversion is approximately \$12 million per aircraft, and the modification kit cost is approximately \$4 million per aircraft. The S-3A to S-3B upgrade costs approximately \$5 million per aircraft.

Technical Data

(S-3A)

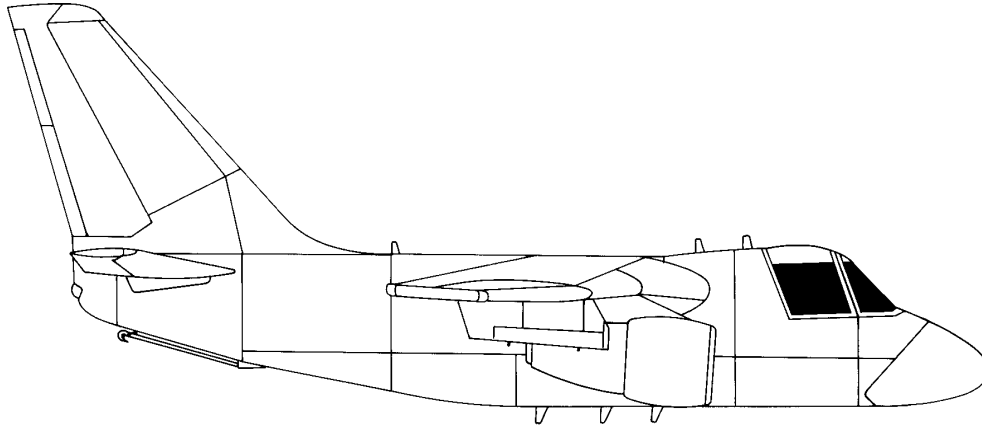
| | <u>Metric</u> | <u>U.S.</u> |
|-------------------------|---------------|-------------|
| Dimensions | | |
| Length overall | 16.26 m | 53.33 ft |
| Height overall | 6.93 m | 22.73 ft |
| Wingspan | 20.93 m | 68.65 ft |
| Wing area, gross | 55.56 sq m | 598.0 sq ft |
| Weight | | |
| Empty | 12,088 kg | 26,650 lb |
| Max design gross weight | 23,832 kg | 52,539 lb |
| Normal ASW T-O weight | 19,278 kg | 42,500 lb |
| Performance | | |
| Max level speed | 834 km/hr | 450 kt |
| Service ceiling | 10,671+ m | 35,000+ ft |
| Ferry range | 5,558+ km | 3,000+ nm |

Propulsion

Two General Electric TF34-GE-2 high-bypass-ratio turbofans

| | <u>Metric</u> | <u>U.S.</u> |
|---------------|---------------|-------------|
| Thrust (each) | 41.26 kN | 9,275 lbst |

Armament. Split weapons bays can accommodate torpedoes, bombs, depth bombs, or mines. Two underwing pylons can carry flare launchers, mines, cluster bombs, auxiliary fuel tanks, rocket pods, or bombs.



LOCKHEED S-3A

Source: Forecast International

Program Review

Background. Development of the Lockheed S-3A Viking stemmed from a late 1960s U.S. Navy requirement for a replacement for the aging Grumman S-2 ASW (anti-submarine warfare) aircraft. Lockheed's four-man, twin-turbofan design was selected over a General Dynamics entry in a 1969 evaluation. Of the total of 187 aircraft produced by Lockheed-California between 1972 and 1978, approximately 160 aircraft currently remain in the Navy's inventory.

Development of the S-3 was undertaken by Lockheed, in partnership with LTV Corp's Vought Systems

Division and Sperry Rand's Univac Federal Systems Division. Vought designed and built the wing, engine pods, tail unit, and landing gear. Univac designed and built the digital computer.

For its ASW role, the Viking carries a variety of sonobuoys. A magnetic-anomaly detection boom can be extended from the rear fuselage. Other equipment includes a Texas Instruments APS-116 high-resolution radar, a forward-looking infrared (FLIR) scanner in a retractable turret, and passive electronic countermeasures (ECM) in wingtip pods.

Variants

S-3A. Initial production version. First flight of initial prototype took place in January 1972. Initial deliveries to U.S. Navy in February 1974.

US-3A. Carrier onboard delivery (COD) version. Converted from S-3A airframes.

KS-3A. Tanker version. Only KS-3A produced was eventually converted to US-3A configuration (in 1983).

ES-3A. Electronic reconnaissance variant, replaced the U.S. Navy's EA-3B Skywarriors. Retired in 2000.

S-3B. S-3As modified under Weapon System Improvement Program (WSIP).

Funding

Recent and planned S-3 modification funding is as follows:

| | U.S. FUNDING | | | | | | | |
|----------|---------------------|------------|-------------|------------|-------------------|------------|-------------------|------------|
| | <u>FY02</u> | | <u>FY03</u> | | <u>FY04 (Req)</u> | | <u>FY05 (Req)</u> | |
| | <u>QTY</u> | <u>AMT</u> | <u>QTY</u> | <u>AMT</u> | <u>QTY</u> | <u>AMT</u> | <u>QTY</u> | <u>AMT</u> |
| S-3 Mods | - | 42.3 | - | 29.6 | - | 8.3 | - | 1.9 |

All \$ are in millions.

NOTE: Navy budget documents project funding requests of an additional \$2.1 million in FY06-08.

Milestones

| <u>Month</u> | <u>Year</u> | <u>Major Development</u> |
|--------------|-------------|---|
| | 1969 | Lockheed S-3A selected over General Dynamics design for S-2 replacement |
| Jan | 1972 | Initial prototype flown for first time |
| Feb | 1974 | Initial deliveries to U.S. Navy |
| | 1978 | Last production aircraft delivered |
| Mar | 1988 | Lockheed awarded contract for ES-3A prototype development |
| | 1992 | Initial redeliveries of ES-3A variants |
| | 1993-94 | S-3B, ES-3 conversions completed |

Worldwide Distribution

(As of October 1, 2004)

| <u>Region</u> | <u>Country</u> | <u>Total</u> | <u>Variant</u> | <u>Avg. Age (Yrs)</u> |
|----------------------|----------------|--------------|----------------|-----------------------|
| <u>North America</u> | United States | 112 | S-3B | 26; converted 1987-94 |

Opportunities

The U.S. Navy began retiring its S-3s in 2004, and all aircraft will be phased out by 2009. The service notes that with only "minor enhancements" the aircraft could soldier on until about 2020, thus raising the possibility of selling the aircraft on the international market.

In mid-2004 Bulgaria was reported to be interested in acquiring an unspecified number of the Vikings for use as strike platforms in the Black Sea. Earlier, Venezuela had expressed interest, but continuing political unrest in that country has ruled out a purchase.

We will monitor ongoing developments regarding the prospects for a "new" career for the S-3B, but we are not projecting further upgrades at this time.

AIRFRAME

Critical Structures Upgrade. The U.S. Navy initiated this upgrade of several S-3B airframe components to ensure their operational capabilities into the year 2015. The service subsequently decided to phase the aircraft out of service during the 2004 to 2009 timeframe.

This project replaces the windshield temperature controller and modifies the wingfold lug, horizontal stabilizer hinge fitting, flight control elements, fuel flow/bleed air select vent valves, counterweights, flap track ribs, wingfold actuator lug, and Kapton wiring. Kit installations were begun in FY00, and the final three aircraft were completed in early FY05.

ELECTRONICS

UHF/VHF Upgrade. The ARC-156 UHF radio aboard the S-3B is being replaced with the improved ARC-187, which will also meet JCS (Joint Chiefs of Staff) requirements for UHF SATCOM users. The Viking currently lacks a VHF set, but will be fitted with the ARC-182. The Navy is refitting 92 S-3Bs.

Through FY03, this project was funded at \$111.8 million; the final \$1.9 million was approved in FY05 funding. The final 12 aircraft are being refitted in FY05.

FI's Opportunity Outlook

| | | | | | | | | | | | | | | | |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Program | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

ELECTRONICS

UHF/VHF Upgrade

In Progress +=> 92 S-3B

| | | | | | | | | | | | | | | | |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Program | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
