As 1994 approaches, another milestone in US Naval aviation is about to be set. It will have been 20 years ago that the S-3 Viking joined the fleet and began an inevitable conquering of the domain of the super carrier. Over the years the Viking has become a remarkable versatile platform in the Battle Group and an intrinsic component of the Navy’s power projection mission.

With the demise of the CVS anti-submarine aircraft carrier in the early 1960s in favor of the more self-contained “super carriers” a need was created for a new, modern, sophisticated ASW capable airplane to replace the venerable piston driven sub-hunting S-2 Tracker. The new aircraft was to be jet powered (to rid the carrier of highly volatile AVGAS) and equipped with state-of-the-art electronics to match the continued advances being made in Soviet submarine technology.

These and other concerns prompted the Navy to initiate the VSX program which subsequently led to the production of the S-3 Viking.

The Navy’s VSX program requirements were released in 1964. An initial contract for a series of flight test research and development aircraft was awarded to Lockheed in 1969. Lockheed had teamed with LTV/Vought and UNIVAC to develop the new concept. Each company brought particular expertise to the VSX program. Lockheed brought an ASW aircraft background, having produced ASW/patrol aircraft since before WWII with continued production of the P-3 Orion. LTV/Vought brought an experience in carrier-based aircraft having produced the successful F-8 Crusader and the A-7 Corsair. UNIVAC contributed a vast expertise in data processing acoustics and had been ASW systems specialists for several years.

Lockheed produced the main fuselage and integrated all the major avionics and systems components and performed final aircraft assembly. LTV/Vought fabricated the wings, vertical stabilizers, engine nacelles and landing gear components.

UNIVAC developed a new ASW package based on the proven systems of the P-3C Orion, but with a much higher degree of automation and ruggedness to withstand the stress of carrier arrested landings and high-g catapult launches.

The S-3, from the beginning, was supposed to be more than just a replacement for the S-2 Tracker. It was developed as a quantum leap in technology with ten times the mission capabilities than its predecessor, performing new missions never before conceived for the Tracker. The S-3 encompassed twice the speed, range and ceiling of the S-2 with a maneuvering envelope more comparable to that of an attack aircraft.

The S-3A avionics suite includes the OL-82 acoustic data processor, an AN/APS-116 high resolution nose mounted search radar, the OR-89 FLIR sensor housed in a ventral retractable cupola and an aft retractable AN/ASQ-81 MAD for localization of submerged targets. The S-3A is also equipped with an AN/ALR-47 ESM system for quick omni-directional electromagnetic signals detection.

At the heart of the S-3 is the AN/AHK-10 digital central computer which integrates all onboard functions, including managing sonobuoy activities and weapons stores. It is also capable of performing hands-off flight to TACCO calculated fly-to-points for automatic release of sonobuoys. The computer maintains the aircraft’s threat library to assist in classifying unknown contacts and performs all flight/mission record keeping using digital magnetic tape for later analysis.

Other aircraft features include 60 sonobuoy tubes, an internal weapons bay plus wing pylons for additional ordnance as well as an airborne refueling probe.

Although the S-3A was principally designed as an ASW aircraft, to detect, track and sanitize the sea through which the battle group would pass, the versatile Viking was recognized as capable for additional missions. New tasking included sea surface surveillance out to 300 miles from the ship, electronic picket, scene of action commander and search and rescue. As time went on, deployments found the S-3 performing communications relay, low level navigation for other battle group aircraft, aerial mining, and threat warning surveillance. Additional modification allowed for inflight refueling tanker duties, and logistics / liaison (COD) flights. At times the S-3 was used for early ship’s EMCON (emissions condition) operations, where all the ships radars and electronic systems were shut down in a blackout condition and an S-3 would be perched at the edge of the flight deck, using its FLIR system as the eyes of the ship.

The S-3 VIKING design concept was to provide the type of system versatility of the P-3C Orion, but with a higher degree of sophistication and automation in a smaller package and a crew of only four, the pilot, COTAC, TACCO and SENSO.

The Pilot is the mission commander and manages all aircraft flying functions.

Once designated the Copilot, the COTAC acronym is more representative of the multiple tasks this position per-
VIKING’S 20TH YEAR
forms. He is copilot, tactical coordinator and non-acoustic operator for the Radar, ESM, FLIR, MAD sensors, and provides all navigation and communications duties.

The TACCO (Tactical Coordinator) is the manager who directs the tactical operations and is the pivotal point where all the mission data flows. It’s the TACCO that interprets the information in order to initiate the proper action.

The SENSO is the sole enlisted person aboard the aircraft and is the primary acoustic operator. Sensor operators know all the systems well, however, and handle a large workload which does not exclude inflight maintenance.

**Versatile Vikings**

Long before the first S-3A ever rolled off the Lockheed production line, numerous S-3 variants began to take shape on engineers’ drawing boards. Anticipating the Navy’s future requirements, Lockheed proposed various mission concepts based on the S-3A.

One of the first proposed S-3 variants was a tanker concept for inflight refueling of carrier based aircraft. Designated KS-3, the dedicated tanker concept consisted of a standard S-3 wing fuel tank and refueling probe but added a conformal weapons bay fuel tank, wing pylon mounted drop tanks and a dual internal hose and reel drogue system. The aircraft also included additional dual ground refueling receptacles. This would speed the on-deck refueling turnaround time. The tanker concept also comprised state-of-the-art navigational and communications avionics with provisions for secondary mission capabilities to conduct EW (electronic warfare) and C3 (communications relay) operations.

In order to prove the S-3 tanker concept to the Navy, Lockheed proposed developing an operational KS-3 Demonstrator aircraft. To keep costs down, an existing flight test S-3 Vikings was modified into the inflight tanker configuration. Ship No. 5 of Lockheed’s S-3A flight test program was diverted and equipped with a bolt on belly tank (simulating the proposed conformal weapons bay tank) modified wing pylons for 600 gallon drop tanks and a single hose and reel drogue system incorporated into the fuselage.

The designated KS-3A prototype was flown for almost two years and proved to be a remarkably stable and efficient refueling platform. It demonstrated the ability to move large quantities of fuel with a minimum fuel consumption which maximized available fuel for inflight transfer.

During tests the KS-3A refueled a variety of Navy aircraft. With its ability to be replenished itself in-flight using its refueling probe, the S-3 could give up more fuel than any other carrier based tanker aircraft to date. But despite its laurels, the Navy did not buy the KS-3, so none were produced. The modified KS-3A was later used for pilot training by VS-41 before being re-configured as a US-3A COD aircraft.

Although the KS-3 never went into production, there was still a great need for large quantities of fuel in the air. This prompted the Navy to adopt the ARS - Airborne Refueling System. The ARS or buddy refueling system was designed and developed by NADEP Alameda. It consists of a refueling pod (stores) housing a hose and drogue stationed on the left (port) wing with a 400 gallon drop tank on the starboard wing. This system provides the S-3A an added capability that does not interfere with its normal aircraft operations.

In the Gulf War, S-3s guided flights of strike aircraft north into Iraq refueling them enroute. Upon reaching the target area, the Vikings would climb to waiting KC-135 tankers to replenish, then refuel the strike aircraft on their return.
to the ship. In some cases the S-3s would refuel from the KC-135s several times allowing strike aircraft to press the attack longer.

Since the Gulf War, and with the proposed retirement of the existing KA-6 Tanker, the Navy will require additional tanker capability. They have initiated Project Sinclair to modify existing ARS equipped S-3Bs with removable weapons bay mounted fuel cells.

Lockheed has independently investigated several concepts of improving the S-3 refueling system to help meet future requirements.

One concept would have a removable weapons bay mounted fuel tank and not interfere with the operational mission of the aircraft. Another concept would have a permanently mounted weapons bay fuel tank. Other concepts add capability up to a dedicated tanker airframe using fleet reserve aircraft.

Another variant which emerged was the US-3A. Early in the S-3A's deployment the Navy indicated requirements to replace the C-1 Trader Carrier Onboard Delivery aircraft. The COD aircraft is vital to a Carrier Battle Group in its ability to resupply the ship with needed aircraft components like engines, spare parts, food and provisions, personnel replacements and the all important mail from home. An aircraft of this nature would also be required to act as a medical evacuation transport in the event of an emergency.

Originally, Lockheed proposed a cargo version of the S-3 that would be produced with upwards of 85% commonality with the S-3A. The aircraft would have the same cockpit, wings, stabilizers and engines. The fuselage was to be much longer and wider with a scaled down version of a C-130 rear cargo door/ramp. Plans included seating as many as 30 passengers or a straight cargo configuration with room to transport two large jet engines. The aircraft had the option of additional wing pylon mounted cargo pods or auxiliary fuel tanks. Despite its sound design, the aircraft was never built.

With the Navy still requiring a COD replacement, Lockheed developed an alternative design. A flight test Viking was modified into what would become the prototype US-3A. The aircraft was first stripped of all avionics, sensors and ASW gear including sonobuoy launching tubes, ESM Pods, and antennas. The finished product provided over 270 cubic feet interior cargo space or room for six passengers. The prototype also included wing mounted pods for an additional 2000 pounds of cargo. The cockpit remained relatively the same to that of a standard S-3 except for the installation of color weather radar and additional navigational systems. The re-configured crew consists of a pilot, copilot and load master.

The prototype aircraft proved to be a solid concept offering a long range, high speed transport plane able to haul 90 percent of the consumables needed by a carrier.

Lockheed’s original design was for the US-3A to be a production S-3 six feet longer in the fuselage. An anticipated order of 30 aircraft was hoped for but again this design was not chosen. The sole US-3A prototype was also relegated to pilot training with VS-41. But eventually, because of the need for a COD aircraft, the US-3A prototype reemerged and five additional US-3As were modified to serve the fleet through

The ES-3A.

**Timeline**

- **June 1964**: Navy announces concept for fixed wing, carrierborne ASW capable aircraft
- **December 1968**: Navy releases VSX requirements
- **4 April 1969**: Initial pre-production contract for six flight test aircraft is awarded to Lockheed with LTV and UNIVAC
- **27 August 1971**: First flight of S-3 Avionics Flying Testbed, an S-3 avionics suite installed aboard a P-3 Orion
- **8 November 1971**: S-3 prototype aircraft rolls out of Burbank plant
- **18 January 1972**: Lockheed demonstrates S-3 Avionics Systems to the Navy at the Burbank S-3 integration laboratory
- **21 January 1972**: First Flight of YS-3A
- **May 1972**: First series of Navy preliminary evaluations and assessment flight tests begin (through August 73) including initial carrier suit-ability test at Pax River (16 October 1973)
- **23 August 1972**: Flight test S-3 #3 successfully tracks submerged submarine
- **February 1973**: 35 additional Vikings are authorized for production
- **June 1973**: Flight test S-3 #5, modified as a tanker, demonstrates S-3 inflight refueling capability, refueling six different types of aircraft
- **1 October 1973**: Board of Inspection and Survey Trials (BIS) begins at Pax River (completed 21 March 1974)
- **December 1973**: Carrier suitability tests aboard USS Forrestal begins
- **20 February 1974**: First production S-3 Viking enters service with VS-41
- **12 June 1974**: Pax River based flight test S-3 conducts the first SAR mission while on a navigational test flight
- **30 September 1974**: S-3 Vikings are assigned to their first operational squadron, VS-21
VIKING'S 20TH YEAR

VRC-50 based in Guam with detachments on Diego Garcia.

The most recent S-3 variant is the ES-3A, a program with deep roots. In January 1977, Lockheed proposed a modification plan to convert a fleet S-3A Viking into a feasibility demonstrator for an Electronic Intelligence/Communications Intelligence version of the S-3. The program dubbed TASES, Tactical Airborne Signal Exploitation System, consisted of an S-3A airframe with a new sophisticated electronic surveillance package for the carrier based ELINT and COMINT mission roles. Although TASES never progressed past the planning stage, the seed was planted.

The concept reappeared again as Project SEMA, an Army program for Special Electronics Mission Aircraft. This project did not take off but ten years after the initial TASES project, Lockheed was finally awarded a prototype development contract that led to a full scale modification program for an ES-3A. The ES-3A is the Navy's over-the-horizon electronic surveillance aircraft, which provides carrier air wings with higher capability in the wake of the forced retirement of the EA-3 Whale. The mission avionics suite is based on the EP-3E ARIES II, an improved signal intelligence package for intercepting and analyzing electromagnetic emissions. The ES-3A incorporates new avionics, color displays and keyboard controls at revamped sensor stations. Internal spaces and weapons bays were converted into avionics bays for the myriad of black boxes.

As the last of 16 ES-3As rolled off the conversion line, the first ES-3As returned to undergo a series of system upgrades which were not available to the initial aircraft.

Emergence of the S-3B

As the Viking entered the 1980s, its versatility became more appreciated aboard the carrier. Advances being made in the Soviet surface and sub-surface fleets caused the Navy to consider expanding the role of the S-3 to increase its multi-mission capability. Support of both air and surface warfare assets was envisioned.

Initially designed the Weapons System Improvement Program, WSIP featured a new radar and added the Harpoon missile. WSIP included an expanded ESM suite with more sensitive emitter detection to supplement the surface warfare targeting mission. The improvement program also added a new ECM for self-defense and a new acoustic data processor. Although not a part of the WSIP program, an Airborne Refueling System (ARS) and an Auxiliary Power unit generator modification were incorporated simultaneously. Plans were also instituted to increase aircraft maintainability and reliability.

WSIP/S-3B Avionic Improvements

A new technology AN/APS-137 Inverse Synthetic Aperture Radar replaced the original APS-116 search radar. ISAR offered a long-range standoff surface target detection and classification capability. It also featured improved submarine periscope detection, even in high sea states.

ISAR generates a two dimensional radar image and automatically compares the signature to known configurations in the system's tactical library. The system is capable of simultaneous tracking of multiple contacts and accurate targeting. It is integrated in conjunction with the Harpoon missile system.

The AN/UYS-1 is a new upgraded signal processor unit with improved software to enhance underwater detection and attack. It replaces the OL-82 Acoustic Data Processor and adds a 99
channel sonobuoy receiver with a faster, more accurate Sonobuoy Reference System and a new analog tape recorder. The improvement lies in the system’s ability to differentiate signal characteristics from background noise.

The new ESM system, the ALR-76, replacing the ALR-47, is used for passive electronic warfare. In conjunction with ISAR, the ESM is utilized as a secondary contact identification and targeting system. Alone, it can detect and identify contacts without compromising the aircraft through use of its radar. The ESM also functions as a component of the aircraft’s defense system providing enemy threat warning.

Another feature of the ESM is its link to the new Electronic Counter Measures system, the ALR-39. In defense of the aircraft, the system dispenses chaff, flares or RF Jammers independently, simultaneously, manually (by the crew) or automatically (by the ESM link).

Chaff, small strips of foil, provide fire control radars or block missile command signals. Flares produce a very hot heat-signature to counter passive infrared guided missiles. RF Jammers interfere with active radar homing missiles by producing a similar noise signature which saturates the missile’s receivers.

The S-3B carries the largest chaff, flare and jammer package in the air wing. AGM-84D Harpoon Missile System is a specially updated version of the Harpoon missile modified to integrate with the Viking’s targeting system, giving the S-3B a new flexible offensive capability with a high degree of lethality.

The Harpoon itself is a high-subsonic, low-level cruise trajectory anti-ship missile with active radar guidance and countermeasure (survivability) systems onboard, that include way-point targeting, sea skimming, pop-up provisions and other programmable options.

The Viking at war

As in the past, it often takes a war to demonstrate the usefulness of a weapon system in combat. For the S-3 Viking, the Gulf War with Iraq served as an excellent forum in which to demonstrate its versatility to the maximum. No other Gulf War aircraft had more taskings or performed as many different missions as the S-3.

Operating from both Red Sea and Persian Gulf battle groups, S-3s conducted ASW missions, provided inflight refueling, and flew Maritime Patrol interdiction missions. The Vikings ESM suite was used to passively locate Iraqi radar and command, control, communication C3 sites.

Once Desert Shield gave way to Desert Storm and the air campaign began, the S-3s were tasked for the first time in their history with the strike-attack missions to destroy enemy naval bases, naval base support facilities, naval C3 headquarters and coastal Silkworm Missile sites that had a potential for threatening the battle group. The missions included targeting for the elimination of any hostile naval surface combatants. On one mission the S-3 Vikings scored their first naval combat kill.

As Desert Storm continued, the
scope of S-3 missions grew to include strikes against enemy airfields, railroad yards, ammo dumps and SAM sites. They were used to guide fast attack strike aircraft into the strike zone. These were the first overland missions for the S-3 Viking. ESM was used to locate anti-air radar installations; ISAR was used to locate mobile SCUD Missile Launchers.

Unique tasking for the S-3 included launching, TALD, (Tactical Air Launched Decoys that simulate cruise missiles) and dispensing chaff and flares during Iraqi air defence suppression raids. Other taskings included anti-mine warfare, infrared surveillance of burning Kuwaiti oil wells and maritime monitoring of the Persian Gulf Oil Slicks. The Navy battle groups would send S-3s as logistical assets to ferry the Air Tasking Order from Riyadh to the carriers. As hostilities ceased the Vikings continued conducting treaty verification flights over Iraq as part of operation “Provide Comfort”.

Since the Gulf War, the Vikings have participated in various operations like “Southern Watch” to enact no-fly zones over southern Iraq and the recent U.N. action in Somalilia. In fact, it was in Somalilia that S-3s (from VS-37) demonstrated a new capability to the overland surveillance mission, “PSYOP Leaflet Drops”, providing information to the populace in support of U.S. ground operations.

In January of this year, S-3 Vikings were giving support to Navy and Air Force strikes into Iraq in retaliation for violations of the coalition established no-fly zones. Currently S-3s of VS-32 aboard the USS America are engaged in U.N. sanctioned operations in the Adriatic providing imaging surveillance in the littoral environment.

Future missions and capabilities are now being defined through a proposed upgrade to the S-3B labeled “WSIP II”. WSIP II encompasses initiatives of the Navy’s “Health of Naval Aviation” or HONA. The HONA are a series of criteria initiated to keep out-of-production aircraft in service longer. For the S-3, HONA is broken down into three specific categories: (a) “Safety of Flight” includes such items as a new computer and a Service Life Assessment program to extend the operational service life of the aircraft pass the year 2015. (b) “Obsolescent Avionics” replaces aircraft components that can no longer be supported or repaired. The older inertial and doppler navigation systems would be replaced with new state-of-the-art CAINS II and GPS navigational aids. New VHF radios and SATCOM would update the communications suite. (c) “Mission Enhancements” encompasses provisions for new roles and missions to improve on current capabilities. Enhancements would be: ISAR+, ISAR/SAR dual mode radar, Link network (OTCIXS, TRE or TRAP and TADIXS-B), Improved Infrared optics, aircraft survivability features, laser designators and provisions for future missiles systems (SLAM, HARM, ARM and Maverick).

Special Operations S-3 Vikings

In the mid-1980s, at the apex of advanced Soviet submarine technology and heightened tensions in the cold war, the U.S. Navy established requirements for a future enhanced Carrier based multi-mission aircraft. The project, dubbed “AMSS” for Advanced Multi-Mission Sensor System, delineated specifications for a universal aircraft with a common core of avionics to facilitate quick installation of special mission sensor components. A single aircraft could be configured to conduct anti-surface warfare, over-the-horizon targeting/command, control, communications and intelligence (OTH-T/C’1), underwater warfare as well as airborne early warning and control missions while maintaining capabilities for utility logistics and airborne refueling tasks. With the drawdown, the value of the AMSS concept became questionable and was cancelled.

During the Gulf War, the S-3’s versatility gave Navy planners a new vision for future joint operations. The lesson of Desert Storm indicated that the Navy needed to make certain changes in conducting combat operations. The Navy has now established special operations divisions at each Sea Control Wing to develop enhanced Vikings. These special-ops S-3s utilize the S-3B’s multi-mission avionics suite as a systems core. The planes are integrated with off-the-shelf sensors designed for specific mission needs.

Outlaw Viking

“Outlaw Viking” is an organic battle group Over-The-Horizon Targeting/Command, Control, Communication and Intelligence capability equipped S-3. It is a prototype OTH-T/C’I system that is actually the third generation of the OASIS (Over-The-Horizon Airborne Sensor Information System) developed for the P-3C Orion. Outlaw Viking includes the OASIS III system, specially modified for the S-3 and built into the aircraft’s TACCO station with no degradation to the existing S-3B mission capabilities. The OTH-T system integrates the aircrafts radar, GPS, SATCOM and Datalink networks. A tactical plot of the operational theater is created, providing real-time standoff surveillance and targeting information that is transmitted by way of secure tactical link networks to the battle group command.

Gray Wolf

Another special operations Viking modified as an advanced imagery, surveillance and targeting platform is called “Gray Wolf”. Gray Wolf is primarily a littoral surveillance aircraft with an...
inherent air-to-air capability for anti-ship missile detection. Its principle sensor is an advanced Multi-Mode Radar System (MMRS) comprised of an enhanced ISAR with a Synthetic Aperture Radar mode.

A new stand-off camera system termed TADCS (Tactical Airborne Digital Camera System) has been added. A laser ranger (LADAR) is on-board. The communication system used by Gray Wolf is termed “MATTS” short for Mobile Airborne TRAP-TRE, an acronym explaining link networks.

The crew will have a laptop transmission system at his side to send imaging data to home base.

One item on the wish list during Desert Storm was a SCUD “detector” closer than a satellite. IRST or Infrared Search and Track system was developed from existing systems. Its use is in-the-water warning of ballistic missiles where the sensor can detect the heat plumes of a launching tactical ballistic missile (SCUD) and track the hot body in flight, providing a faster reaction time.

**Orca**

Emerging undersea warfare systems and tactics are demonstrated by an S-3 designated as Orca. Orca’s need was stimulated by the threat of new diesel and quiet nuclear submarines operating in shallow water. Two of Orca’s systems are the Intrum Extended Echo Ranger (IEER), an improved sonobuoy receiver set and the ASW laser ranger for detection of submerged contacts. A few of Gray Wolf’s systems are included in Orca, some with modifications, such as the radar which is separated into ISAR+ and a wing-mounted SAR pod giving Orca the overland mine-field detection capability.

**Calypso**

Many S-3s are currently involved in counter-narcotics missions in support of Commander Joint Task Force Four in Keywest, Florida. The S-3Bs use a combination of roll-on/roll-off avionics and hand held devices such as TADCS, camcorders and night visionware for long range detection, tracking and interdiction of suspected drug smuggling aircraft.

A concept has been developed for a dedicated counter-narcotics Viking with permanently installed systems similar to Gray Wolf but funding will have to be approved. Tagged “Calypso”, the equipment list includes ISAR+, SAR, Infrared sensors and cluster ranger.

**Viking Beartrap**

Viking Beartrap is another one of those programs that has previously been deployed on P-3 Orions. Beartrap is a unique airborne intelligence gathering and processing system and has been installed on a small number of P-3s since the 1970s with several upgrades. Viking Beartrap is currently being deployed on carriers.

**A Force Multiplier**

For the Navy the S-3 Viking has become the premier sea control platform, revolutionizing carrier operation in these times of budget cuts and downsizing force structure. The Viking is now the keystone to future carrier operations with its multi-mission capabilities and flexibility initiating new tasks that include Overland Surveillance (strike support), ASUW, OTH-T / C1, Anti-Mine Warfare, EW, littoral undersea warfare, tanking and counter-narcotics. The Vikings are also involved in new dedicated special mission operations that incorporate the latest state-of-the-art avionics and sensors. The S-3 has truly become a force multiplier. *

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<table>
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<tr>
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<tbody>
<tr>
<td>18 January 1991</td>
<td>First combat launch of TALD by S-3 (VS-38) since Gulf War air campaign began 17 January</td>
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<td>21 January 1991</td>
<td>Second combat launch of TALD by VS-38 S-3</td>
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<td>2 February 1991</td>
<td>First S-3 to drop bombs in combat - against an Iraqi coastal AAA battery (VS-24)</td>
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<td>19 February 1991</td>
<td>First Iraqi patrol boat sunk by S-3 (VS-32)</td>
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<td>27 February 1991</td>
<td>Second Iraqi patrol boat sunk by S-3 (VS-24)</td>
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<td>15 April 1991</td>
<td>First flight of ES-3A prototype and first ES-3A squadron established (VQ-5)</td>
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<td>17 September 1991</td>
<td>VX-1 DET deploys aboard USS Saratoga with ES-3A’s for operational test and evaluations</td>
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<tr>
<td>21 January 1992</td>
<td>First production ES-3A flies maiden flight</td>
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<tr>
<td>22 May 1992</td>
<td>VQ-5 receives first ES-3A</td>
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<td>19 August 1992</td>
<td>VQ-6 receives first ES-3A</td>
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<td>3 November 1992</td>
<td>VS-37 deploys S-3B on first WESTPAC detachment</td>
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<td>December 1992</td>
<td>S-3 operations begin in Somalia</td>
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<td>January 1993</td>
<td>Last S-3A deployment commences aboard USS Constellation with VS-38</td>
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<td>April 1993</td>
<td>First ES-3A deploys aboard USS Independence with VQ-5</td>
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<td>13 April 1993</td>
<td>ES-3A DET for workups aboard USS America with VQ-6 (until 18 May 1993)</td>
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<td>30 September 1993</td>
<td>Last of 16 ES-3As are delivered to the Navy</td>
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<td>October 1993</td>
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<td>3-SLAP project. This airframe logged over 2 service lifetimes worth of fatigue as the Lockheed &quot;Lifetime Stress Simulation Airframe&quot; and was the 2nd pre-production S-3 built. Later stored in a large plastic bag until it was brought out and modified as the ES-3A static mockup aircraft. The airframe was then moved to the LASC Marietta facility where it is now involved in a Navy S-3 Service Life Assessment Program (SLAP) in an initial effort to extend the service life of S-3.</td>
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**BuNo 157993 AS ES-3A**

BuNo 157993 was the US-3A prototype.

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**BuNo 157995**

BuNo 157995 was the US-3A prototype.
BuNo 160120 ready for the Bicentennial celebration.

BuNo 159736

BuNo 159742 S-3B full scale engineering flight test aircraft.

BuNo 160139

BuNo 159752 early career as sub hunter in Med over Foxtrot
### Aircraft Logbook

#### Aircraft Information
- **VS-37 Sawbucks**
- **VS-35 Bluewolves**
- **VS-33 Screwbirds**
- **VS-32 Maulers**
- **VS-31 Topcats**
- **VS-30 Diamondcutters**
- **VS-29 Dragonfires**
- **VS-28 Hukkers**
- **VS-27 Seawolves**
- **VS-24 Scouts**
- **VS-22 Checkmates**
- **VS-21 Fighting Redrails**

#### Flight Log

<table>
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<tr>
<th>LASC No</th>
<th>BuNo</th>
<th>Type</th>
<th>Location</th>
<th>Comment</th>
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<tr>
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<td>160579</td>
<td>S-3A</td>
<td>STRIKE</td>
<td>water collision, VS-38, 1987</td>
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</tbody>
</table>

- Aircraft went into the west China Sea off Kyushu coast, 21 MAR 87.
- First S-3 to launch a Tactical Air Launch Decoy (TALD) with VS-38 (11 JAN 91) - a week later it was the 1st to launch a TALD in combat during the Gulf War (18 JAN 91).
- Second S-3 to launch a TALD in combat during Gulf War with VS-38 21 JAN 91.
- Second S-3B full scale engineering development aircraft with NATC.
- Second S-3B full scale engineering development aircraft with NATC.
- Last production S-3 produced.

#### Aircraft Details
- **BuNo 159729**
- **BuNo 159778**

#### Aircraft Location
- NAS North Island, CA
- NAS Cecil Field, FL
- NAS Pax River, MD

#### Aircraft Maintenance
- **Striken Aircraft Reclamation and Disposal Center** located at Davis-Monthan AFB, Tucson, AZ.
- **Lockheed Aeronautical Systems Co. Marietta, GA.**
- **Lockheed Aeronautical Systems Co. Ontario, CA.**
- **Lockheed Western Export Co.** (the Lockheed co. conducting the ES-3A conversions at NAS Cecil Field and S-3B MOD at NAS North sel)
- **Naval Air Test Center at NAS Patuxent River, Maryland (Now NAWC-AD Pax River)**
- **Naval Air Test Center at NAS Pax River, Maryland (Now NAWC-AD Pax River)**
- **Navy Aircraft Test Directorate a division of NATC**
- **OASIS III system**
- **Personnel the ground maintenance training for east coast VS squadrons**
- **Operating systems the aircraft and its systems**
- **Fleet Readiness and Maintenance Personnel the ground maintenance training division**

#### Aircraft Logbook

- **BuNo 160607 last S-3 produced.**

#### Aircraft Status
- Formerly Air ASW Support Unit (VSSU) providing fleet replacement training for east coast VS squadrons, ON JAN 1987.