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Sikorsky's Mid-Sized Moneymaker — the S-58

Sikorsky flew four XHSS-1s, prototypes of the long-serving S-58, starting in 1954 at the Bridgeport, Connecticut plant. (unless noted, all images property of the Igor I. Sikorsky Historical Archives)

By the time the last new S-58 rolled from the Bridgeport, Connecticut line in January 1969, Sikorsky Aircraft had built 1,821 of the mid-sized helicopters for military and commercial customers. License production in Yeovil, England and Marignane, France added another 483 aircraft to the global fleet. Sergei Sikorsky recently reflected, "The S-58 you might call the bread-and-butter machine for Sikorsky in the 1950s and '60s. The production of the '58 ran for something like 25 years, and it was, I would say, one of the most successful piston-engine helicopters that Sikorsky ever built."

The 14,000 lb S-58 fought wars and saved lives with all the US armed services and with 30 foreign air arms from Argentina to Thailand. With about twice the payload of the hard-working S-55, it grew helicopter airline routes and hauled construction and oil industry loads in harsh environments.

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In the course of international business campaigns, Sergei Sikorsky himself logged about 65 flight hours in the S-58 at the factory and abroad. He noted, “The S-55 was a great machine, but it could not be accused of being overpowered. The S-58 had enough reserve power to where it could do things the S-55 never could.”

The S-55 with a 600 hp Pratt & Whitney radial piston engine turning a three-bladed main rotor gave the US Navy its first shipboard antisubmarine warfare (ASW) helicopter, albeit one used in hunter-killer teams – one helicopter to carry a dipping sonar and the other to drop a torpedo. The S-58 with 1,500 hp Wright R-1820 engine had the power to carry sonar and weapons up to a Lulu nuclear depth charge. The commercial S-55 with room for up to eight passengers and two pilots began scheduled helicopter airlines in the US and Europe. The S-58 with 12 passengers and greater range extended route networks. Retired Sikorsky senior vice president for engineering and advanced programs Ray Leoni later wrote, “It wasn’t built to replace the S-55 but to extend the company’s reach into the utility market by offering a larger aircraft.”

Like the three-bladed S-55, the four-bladed S-58 stacked passenger cabin, fuel cells, and cargo hook below the main rotor to make the helicopter insensitive to changes in center-of-gravity. It retained the offset flapping hinge main rotor hub of the S-55 to broaden the useful center of gravity and improve control response. Also like the S-55, the S-58 had its engine inclined in the nose, accessible behind clamshell doors with its driveshaft running up behind the elevated cockpit to the main transmission. The commercial S-58 brochure claimed, “Only three hours are needed to effect a change of either engine or rotor head and main transmission.”

The distinctive S-58 fuselage was refined by wind tunnel testing for better stability, higher speeds, and more efficient cruise. In his Sikorsky Aircraft workbook, aerodynamicist Prof Sikorsky wrote of the S-58, “Natural development from the S-55 led to th[is] excellent helicopter which was not only larger

With manually folded rotors, HSS-1s, seen here with HS-7 in 1958, gave the Navy a capable ASW helicopter. (US Navy)

and approximately twice as powerful but had greatly improved aerodynamic form.”

Sergei Sikorsky observed, “If you took a look at the earlier machines, the S-51 and the S-55, you had a cabin and a thin ice cream cone tailcone structure with a tail rotor.” Pilots of early S-55s could slap the high tailboom with main rotor blades in a hard landing, “That configuration was pretty darn vulnerable in day-to-day use. You could hit the tail rotor on the ground pretty easily if you flared too high, too hard. On the S-58, you had a tailwheel and a fairly fat back fuselage with a tail rotor and the tailwheel protecting the tail rotor. I remember also that very same tail-dragger configuration was also used in the UTTAS

The Marines briefly employed the HUS-1 in Vietnam with rocket pods as an early gunship. (John Hax)

[Utility Tactical Transport Aircraft System] which would become the Black Hawk."

Filling Orders

The US Navy deployed the S-55 (HO4S-1) aboard aircraft carriers in 1953 though it already planned a more capable ASW helicopter. The service and Sikorsky Aircraft considered a modified S-55 with the more powerful R-1820 engine, but the Navy chose to develop the tandem-rotor HSL-1. Sikorsky undertook independent development of its new, four-bladed, single-main-rotor helicopter with a spacious, streamlined fuselage.

When the Navy abandoned the troubled HSL-1, Sikorsky received a contract in June 1952 for four XHSS-1 prototypes. Test pilot Jimmy Viner flew the first on March 8,1954. In April, *Sikorsky News* showed the helicopter in tiedown tests and reported, "Specifications are classified." On June 21, 1954, Bob Decker demonstrated the XHSS-1 before 150 military leaders, industry representatives and reporters. The new subhunter deployed sonar from a 50 ft hover over Long Island Sound, and *Sikorsky News* claimed, "Characteristics of the XHSS-1 will enable it to scout subs faster, closer to the water, and more thoroughly than present Navy anti-sub equipment." The company paper added, "Mr. Sikorsky told newsmen Sikorsky Aircraft would produce a civil version of the XHSS-1, calling it the S-58."

By 1954, Sikorsky's Bridgeport helicopter factory had grown to three times its original size and employed more than 4,500 people. S-58 production work started at Bridgeport before the XHSS-1 first flight and continued while the bigger S-56 and smaller S-55 filled the new Stratford factory dedicated in October 1955. HSS-1 (later SH-34G) deliveries began to Navy Squadron HS-3 that year. The US Navy ultimately received 385 Sikorsky *Seabats*.

On July 12, 1956, an HSS-1 set three Fédération Aéronautique Internationale (FAI) world records for speed over closed courses, including 141.9 mph (228.39 km/h) over a 100 km course. The HSS-1 became the first rotary-wing aircraft qualified by the Navy for standard instrument flight rules used by fixed-wing aircraft. In 1957, Sikorsky and the

A US Army H-34A is pre-flighted at Bremerhaven, Germany in 1956 prior to a deployment exercise. (US Army)

Navy tested two HSS-1Fs powered by side-by-side General Electric T58 turboshafts in a modified nose.

In 1956, Westland Aircraft in the United Kingdom bought rights to produce and develop the HSS-1 and S-58 derivatives. The company flew a Sikorsky-built HSS-1 powered by an 1,100 shp Gazelle turboshaft and began production deliveries of the Wessex HAS Mk. 1 with a 1,540 shp Gazelle to the Royal Navy in 1959. The license-built helicopter spawned single- and twin-turboshaft versions for the Royal Navy and Air Force, the Royal Australian Navy, and other customers. Wessex served British forces around the world, notably in the 1982 Falklands campaign. RAF Wessex provided search-and-rescue coverage around the UK and equipped the Queen's Flight to transport the Royal Family. The civilian Mk. 60 was adopted by Bristow in the North Sea and other oil operators.

The 1,000th Sikorsky S-58, a US Navy subhunter, was delivered in November 1958. That year, a Navy HSS-1 demonstrated helicopter vertical replenishment (VERTREP), hauling cargo from supply ships to combatants underway, a role performed today by the Sikorsky MH-60S Seahawk. Navy Squadron HS-5 at Quonset Point Naval Air Station in Rhode Island received HSS-1Ns in 1960 with autostabilization

equipment, better flight instruments, automatic engine controls, and a hover-coupler. The *Nightdippers* pioneered ASW hover at night.

HSS-1Ns (SH-34Js) served the Navy until replaced by Sikorsky's turbine-engine HSS-2 (SH-3A) starting in 1961. Navy squadron VX-6 used LH-34Ds to support researchers in Antarctica in 1963. A few new HUS-1Gs and ex-Navy H-34s would fly with US Coast Guard and Air Force rescue units pending delivery of Sikorsky's turbine engine S-62 and S-61R.

With the 31,000 lb S-56 (HR2S-1/CH-37) heavy lift helicopter in just two fleet squadrons, the US Marine Corps decided to meet its broader need for vertical lift with the S-58 (HUS-1/UH-34D). Deliveries of some 600 *Seahorses* started in February 1957, and the 'temporary" piston-engine solution gave the Marine Corps its first armed and armored assault helicopter, one instrumented for night/adverse weather flying. *Operation Shufly* first sent UH-34Ds to South Vietnam with Marine Medium Lift Squadron HMM-362 in 1962.

John Hax flew UH-34Ds in Vietnam with HMM-163 in 1965. His memoir confided, "In the evolution of the helicopter, the H-34 came along at a strange time. By then there had been technological advances in gearing-down gas turbine engines for helicopter gearboxes, and the piston engine was therefore determined to have no future in helicopters except for very small ones. The H-34 was a dinosaur as it left the drawing board, the last piston-engine powered military helicopter ever."

Japanese HSS-1s joined the helicopter relief effort after Typhoon Vera mauled Honshu Island in 1959.

Hax continued, "So why did we all love the UH-34D? It had one saving characteristic: reliability. If you didn't get shot down, and didn't crash or the engine didn't quit, it (almost) always got you there and back. Even former jet fighter pilots in the squadron who absolutely hated helicopters – Shuddering Shithouses, they called them – had to grudgingly admit the UH-34 was the most reliable aircraft they'd flown. Enough to make one want to work for the company that made them." John Hax ultimately worked at Sikorsky Aircraft for 37 years and influenced design of the tail-dragging UTTAS.

The US Army took delivery of its first S-58s (H-34 *Choctaws*) in March 1955 and began to fill formations with the "light" cargo helicopters, first at Fort Sill, Oklahoma and then Fort Rucker, Alabama. The Army ultimately received 437 *Choctaws* through 1965 and returned early CH-34s to Sikorsky for automatic stabilization equipment.

Together, the Army Executive Flight Detachment and Marine Corps Presidential Flight Detachment used VCH-34s and HUS-1Zs to transport the President of the United States. In September, 1959, President Eisenhower took Soviet Premier Nikita Khrushchev on a half-hour tour of Washington DC aboard *Marine One*. Sergei Sikorsky recounted, "They were flying in a VIP S-58 with very plushy seats. The soundproofing was such that the two Presidents could talk over a table. Khruschev leans directly into Eisenhower's face and says, 'You know, this helicopter was built by a Russian.' Eisenhower said, 'Yes, I know it was designed and built by a Russian.' Khruschev said, 'Yes, a very smart Russian – all Russians are smart, but this was a super-smart Russian.' Eisenhower very calmly says to him, 'Yeah, smart enough to get out of Russia in time." Horrified Presidential staff feared World War III. "Khruschev slammed his fist on the table, started laughing, and said, 'That's Number One for you, Mr. President!'"

Open For Business

Khruschev's 1959 visit was followed by a surprise

Sikorsky and the Navy tested the HSS-1F with T58 turboshaft power in 1957.

Soviet request to buy three S-58s. With the helicopter then front-line equipment in US forces, Sikorsky Aircraft Division President Lee S. Johnson expressed Cold War concerns. He wrote United Aircraft Export Corp. President Joe Barr, “It is very possible that this sale will become a political issue in the forthcoming [US Presidential] election. It is even possible for it to become subject for Congressional investigation. . . I therefore feel strongly that the record should be made clear and our files reflect the fact that we did not solicit this sale. I suggest that, rather than proceed on an oral go-ahead from the State Department, we ask for a letter requesting us to proceed with the negotiation.” The Soviets ultimately received two S-58s. Years later, Sergei

Turbine-engine Westland Wessex served the UK Royal Navy in the Falklands in 1982.

The company-owned S-58 demonstrator began civil certification testing in 1956.

Sikorsky found one in the Monino Air Force Museum near Moscow.

In 1955, the Royal Canadian Air Force became the first S-58 customer outside the US military. Canadian H-34s helped construct remote Pinetree radar stations in 1958. French H-34s airlifted troops and provided aerial fire support in Algeria in 1959. That same year, the Japan Coast Guard sent two HSS-1s to the Antarctic on the icebreaker *Soya* to ferry people and supplies 100 miles from the ship to a research outpost ashore. Japanese and American HSS-1s were part of the helicopter response to the deadly Typhoon Vera in September 1959.

Belgian Air Force 40 Squadron received its first HSS-1 in 1961 and began search-and-rescue operations over the North Sea. Commercial S-58Cs were

The Belgian Air Force acquired HSS-1s for Search and Rescue in 1961 and retired the last in 1986.

acquired from SABENA Belgian World Airways, and S-58s would remain in Belgian military service until 1986. German Army Aviation received its first H-34Gs in 1957. More of the utility and rescue helicopters were acquired by the German Navy and Air Force, and the type was not officially retired until 1975. Israel used H-34s delivered through Germany to rescue pilots and airlift paratroops in the 1967 mid-east war.

The first commercial S-58B was completed in February 1956 and began Civil Aeronautics Administration certification testing. The S-58C *Skybus* with extra cabin windows and a rear passenger door was delivered to Chicago Helicopter Airways in May 1957, and *Sikorsky News* reported, "The 12-passenger aircraft will add to the scheduled passenger service now being offered by three S-55 helicopters." Float-equipped S-58Cs began passenger service with New York Airways in August 1957 and enabled the busy S-55 operator to increase the number of passenger seats available per day five-fold. By 1959, Chicago Helicopter Airways had six S-58s, the largest airline passenger fleet in the United States. In 1962, Igor Sikorsky became the carrier's honorary one-millionth passenger.

An S-58 was a backdrop for historic Sikorsky trio -- test pilot Jimmy Viner, designer Igor Sikorsky, and pioneer Army pilot BG Frank Gregory in 1963.

SABENA offered fixed-wing/helicopter service from New York to Paris in 1957. Ad copy promised passengers could fly to Brussels on a DC-7C airliner and, "Waiting for you there is a giant Sikorsky S-58 helicopter to fly direct to downtown Paris. On the way, you see the rolling countryside and quaint villages of Belgium and France, then a bird's-eye view of the Arch of Triumph, Notre Dame, and all of Paris." SABENA acquired eight S-58Cs and by 1960 had international routes from Brussels to Rotterdam, Antwerp, Lille, Eindhoven, Maastricht, Liege, Paris, Dortmund, Duisburg, Cologne and Bonn.

SABENA operated S-58s on passenger routes through Belgium, Holland, France, Germany and Luxembourg.

Commercial S-58s supported construction in remote regions. In 1957, the first commercial oil rig in Papua, New Guinea was built 220 miles from the nearest port with equipment delivered entirely by World Wide Helicopters S-58s. A Sikorsky-owned S-58 flown by company test pilot Lloyd Blanchard demonstrated its power line construction potential for the Puerto Rico Water Resources Authority. Blanchard told *Sikorsky News* the helicopter could set one transmission pole every 12 minutes. Conventional ground teams would need three to five days per pole. The same S-58 flown by Petroleum Helicopters 18 months later saved 216 people in a single day when Hurricane Donna ravaged Puerto Rico. Sikorsky sold its S-58 demonstrator in the spring of 1965 to Columbia

Canadian operator Okanagan Helicopters converted several S-58Bs to turbine S-58Ts.

Helicopters for powerline construction in California's mountains.

Sikorsky Aircraft closed and re-started S-58 production in Bridgeport and Stratford three times to match market demand. The last S-58 on the Stratford assembly line in 1964 wore a sign that said 'Good-bye, old friend'. It was the 1,791st S-58 built, and the story was far from done. Another 30 piston-engine helicopters were produced over the next five years, and in January 1970 Sikorsky President Wesley Kuhrt announced the turbine-engine S-58T conversion program at the Helicopter Association of America tradeshow in Las Vegas, Nevada.

The S-58T Twin Pac conversion put two Pratt & Whitney Canada PT6 turboshafts with a Stratford-built combining gearbox in a reconfigured nose to hike installed power from 1,500 hp to 1,800 shp and increase payload 3,000 lb at high density altitudes. The TwinPac also promised higher reliability and reduced maintenance costs versus traditional piston power. Sikorsky bought back a piston-engine S-58 from Carson Helicopters in 1970 for the conversion demonstrator.

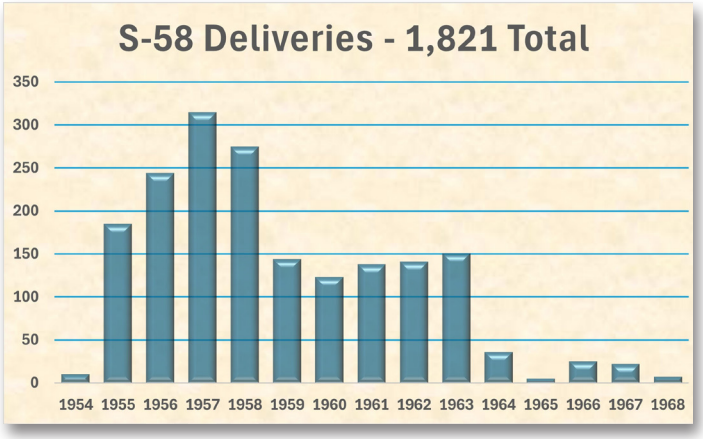
The S-58T was FAA-certified in April 1971.

Sikorsky ultimately converted 49 S-58Ts for oil and construction customers and sold field conversion kits

The S-58T Screaming Mimi continues flying today with 5 State Helicopters. (5 State Helicopters)

to S-58 operators. The company sold the FAA Type Certificate and manufacturing and support rights for the S-58 series to California Helicopter International in 1981. As Centerpointe Aerospace, the company continues to service and modernize the S-58T.

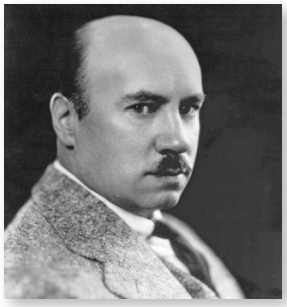
One S-58T converted from a Vietnam veteran UH-34D was painted pink with a big cartoon mouth to play *Screaming Mimi* in the network TV show *Riptide* from 1984 to 1986. With a striking professional paint job, the same hard-working Sikorsky helicopter earns its keep today with 5 State Helicopters based in Royse City, Texas.



Under Table: S-58 production at Bridgeport and Stratford stretched from 1954 to 1968. The last S-58 assembled by Sikorsky was delivered in April 1969.

Two Roads Brewery – February 1, 2025 The Archives members celebrated the concurrent 100th birthday of Sergei Sikorsky and the Two Roads Brewery release of this year's brew of the Russian Stout, Igor's Dream. The event was highlighted with a virtual link-up with Sergei. He participated in the speeches, was given a 'walk around' of the displays, and concluded with all present singing Happy Birthday. (l to r: Bob Kennedy, Gary Boyd, Fred Falcha, Ed Sullivan, Dan Libertino, John Bulakowski, Jim Husvar, Andreanne Johnson, Paul Swanson and Jack Williams)

Prepared by Frank Colucci and John Bulakowski with graphic art and layout by Jodi Buckley.



"Within a week after my arrival in Paris, I visited Captain Ferber, who was one of the outstanding pioneers of early aviation. . . 'Do not waste your time on a helicopter,' he advised me again and again, kindly but firmly. "The airplane will be far more valuable."

Igor Sikorsky, *The Story of the Winged S*

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