



# Sikorsky Archives News

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## *The First Sikorsky Large Cabin Single Main Rotor Helicopter Configurations Evolved During The 1950s*

S-58 (H-34)



S-55 (H-19)



S-56 (H-37)



S-58

**T**he Sikorsky helicopter configuration of the 1940s created the worldwide helicopter industry, but was eventually overtaken by more productive configurations being developed by competitive companies in the mid 1950s. The early Sikorsky configurations located the engine under the main rotor center line, and produced a limitation on aircraft passengers and cargo loading due to center of gravity limitations. Sikorsky could not compete with the designs being produced by the Piaseki HUP and Bell HSL tandem rotor series of helicopters at the time. The Sikorsky Aircraft team

confronted the configuration limitations by developing large cabin helicopters by relocating the engines to the nose of the aircraft on the S-55 and S-58, and placing the engines on stub wing extensions on the S-56 aircraft. Innovations in rotor systems, flight controls and hydraulics produced helicopters that were highly competitive with the competition at the time. The paper written by Ray Leoni, "Sikorsky Utility Helicopters, a Hard Beginning" details the primary improvements that were responsible for keeping the Sikorsky helicopter a major world class aircraft, and it can be accessed on our website under essays. 📄

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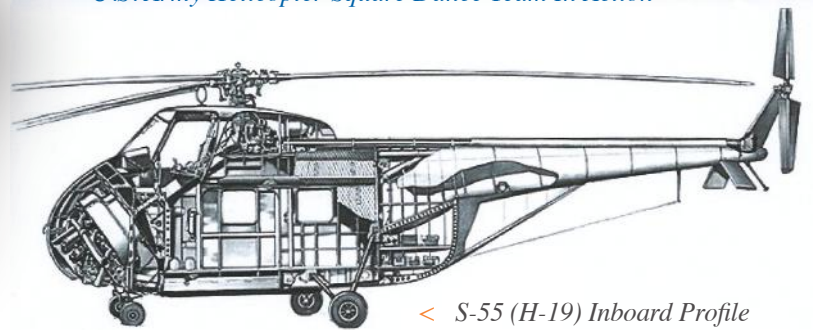
## The S-55 (H-19) Was The First Sikorsky Large Cabin Helicopter



*U.S. Army Helicopter Square Dance Team In Action*



*U.S. Army Square Dance Team Patch*



*S-55 (H-19) Inboard Profile*

The S-55 helicopter was designed and built with company funds and without government sponsorship.

It was the first Sikorsky helicopter with the engine located in the nose. The general arrangement became the Sikorsky recognizable configuration through the 1950s. In Sept 1956, the Army's famed precision flying Helicopter Square Dance Team demonstrated the aerodynamic agility of the aircraft by performing the country style dance steps in the sky with the H-19, as shown in the photos at the National Aircraft Show in Oklahoma City. The Army Team's arm patch is shown above and was worn with pride by team members.



*U.S. Army Team and Sqare Dance Partner With Face Makeup*

*U.S. Airforce H-19*



The most significant design enhancements coupled with relocating the engine in the nose included use of offset hinges in the main rotor head to increase control moments resulting in a larger center of gravity range for cargo and passengers. The design change produced a cabin that practically had unrestricted placement of passengers and cargo. This configuration coupled with other system enhancements led to Sikorsky capturing a major share of the worldwide utility market. By the end of production in 1964, 1,281 were manufactured by Sikorsky, and 477 by foreign licencees.



## The S-58 Family Of Helicopters Evolved In 1952 For The U.S. Navy's HSS-1 Seabat Requirement

The S-58 was created with company funds and was a larger cabin growth version of the S-55 utilizing a higher powered engine located in the nose of the aircraft. The number of main and tail rotor blades were increased. Growth versions of the power transmission drive systems, and improvements in flight controls, hydraulic, electrical, avionics and navigation systems were implemented. Key operational features to address the U. S. Navy anti-submarine mission requirements were incorporated as follows:

- > Doppler Navigation and Dipping Sonar
- > Automatic Stabilization System
- > Helicopter Auto Pilot
- > Weapons Carrier for Torpedoes, Mines and Depth Charges



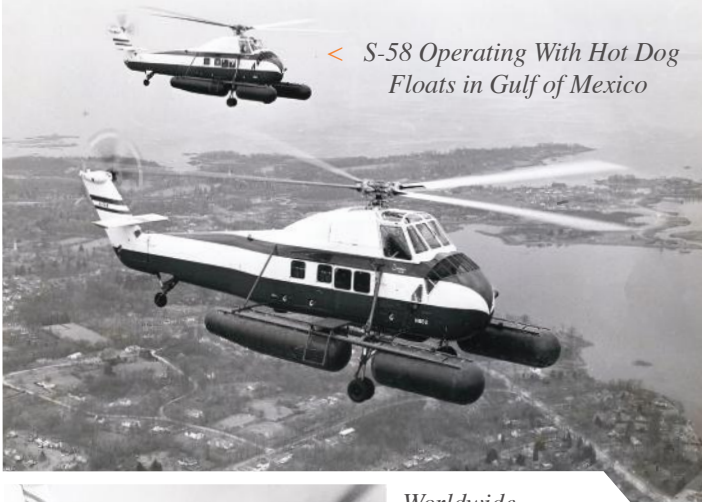
U.S. Navy HSS-1



U.S. Marines H-34

Commercial versions of the S-58 were being utilized to meet industry requirements. After receiving FAA certification in 1956, the S-58 entered commercial passenger service with pioneer operators including Chicago Helicopter Airways, New York Airways, Los Angeles Airways, World Wide Helicopters and Sabena in Brussels.

The construction and aerial logging industries recognized the capabilities of the S-58 and introduced the aircraft into their operations. The offshore oil industry was utilizing helicopters to meet their transportation requirements, and the S-58 quickly became their large cabin aerial transportation vehicle. By the end of production in 1969, 1870 were manufactured by Sikorsky in addition to 440 by foreign licensees. 🇺🇸



< S-58 Operating With Hot Dog Floats in Gulf of Mexico



Worldwide S-58



Sabena S-58



## The S-55 And S-58 Aircraft were Pioneers In Helicopter Offshore Oil Support In The 1950s

The offshore oil industry started in the early 1930s in the Gulf of Mexico. Transportation of crew and supplies were accomplished by boats and ships. As oil rigs were moved further offshore, helicopters became the preferred rapid transit system. Prior to the availability of the Sikorsky S-55 oil companies transported their workers back and forth via a fleet of crew boats. Some of the boat trips consumed from five to six hours of time. In addition, many of the workers arrived at the oil rigs at various stages of sea sickness due to rough boat rides in choppy waters.

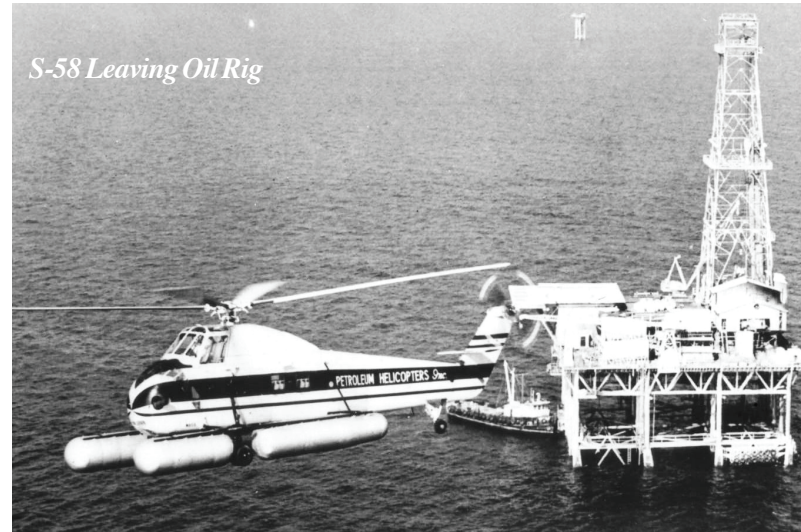
The crews were required to stay aboard the rigs for periods of ten days, with the following four days off. The rigs were required to feed and house the crew. The personnel turn over rate was high due to the disruption of families left on shore. As a result, the oil companies began flying personnel for their larger rigs which were further offshore on a daily round trip schedule. Flight lengths varied from 7 to 42 miles with flight times from 6 to 42 minutes. This allowed the oil workers to have a normal work day with normal days off resulting in happier families.



*S-55 on Barge supporting oil rig*



*S-58 Leaving Oil Rig*



*Maintenance being performed at the PHI facilities in Grande Isle, LA for the scheduled airline service to oil rigs. The mechanic working on the engine is Dan Libertino prior to his Sikorsky employment.*

During the 1950s, the S-55 and the S-58 helicopters were more technically advanced in the industry relative to their competition. In addition, history has shown that even after production of the models had terminated, they were being rebuilt and upgraded with turboshaft engines by manufacturers and end users. This is a testament to the design philosophy at Sikorsky, which can best be described by end users who have stated in public that, **“Sikorsky makes helicopters strong like a bull”**. 🐮



**The U.S. Marine Corps established a requirement for a large assault transport helicopter in 1950. Sikorsky Aircraft won the design competition with the S-56 .**

**T**he U.S. Marines version was the HR2S-1 and the U.S. Army version was the H-37. Powered by two 2,100 horsepower piston engines, it first flew in December 1953. The S-56 had nose clam shell doors that could be rapidly swung open to provide for egress of troops as shown in the photo on right.

The Marine Corps HR2S-1 had the first fully automatic folding main and tail rotor systems providing an overall reduced envelope enabling the aircraft to be stowed below the flight deck. Based at sea, the U.S. Marine Corps had worldwide capability. A total of 156 S-56 aircraft were built for the U. S. Marines and Army.

The aircraft was used in Vietnam to carry damaged aircraft out of hostile territory to be repaired and put back into service, as well as for rapid deployment of troops to remote areas as required. The distinctive variations in aircraft markings is shown in the photos reflective of the desires of the end user. ☺



*U.S. Army H-37*



*U.S. Army H-37*



*U.S. Marine HR2S-1*



*U.S. Marine HR2S-1*



*HR2S-1 Air Lifting HSS-1*





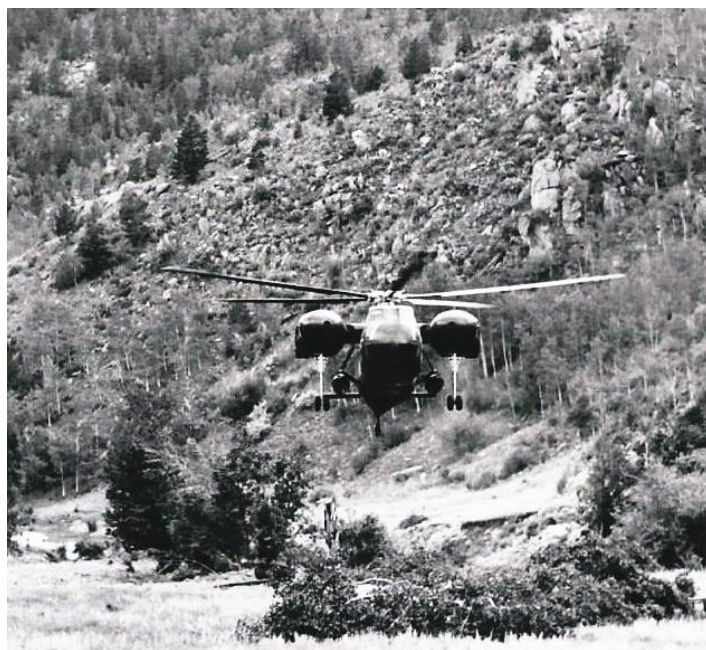
HR2S-1W

**T**wo S-56 helicopters were modified as HR2S-1W airborne early warning aircraft incorporating a powerful large radar in a chin dome shown above. The program was discontinued due to increased drag and reduced performance.

In August of 1957, the world's largest known helicopter, the H-37 shown in photo on right performed two rescue missions by Army pilots operating out of Fort Rucker, Al. The first successful mission involved rescuing a Boy Scout who was injured near a stream located above 10,000 foot altitude. Three days later a second mission was launched by an H-37 to rescue a seriously injured man from the southwest slope of Pikes Peak. The doctor who accompanied the H-37 stated that without the timely helicopter evacuation there would have been no chance for the man's survival. ☺



H-37 Delivering A Maintenance Building



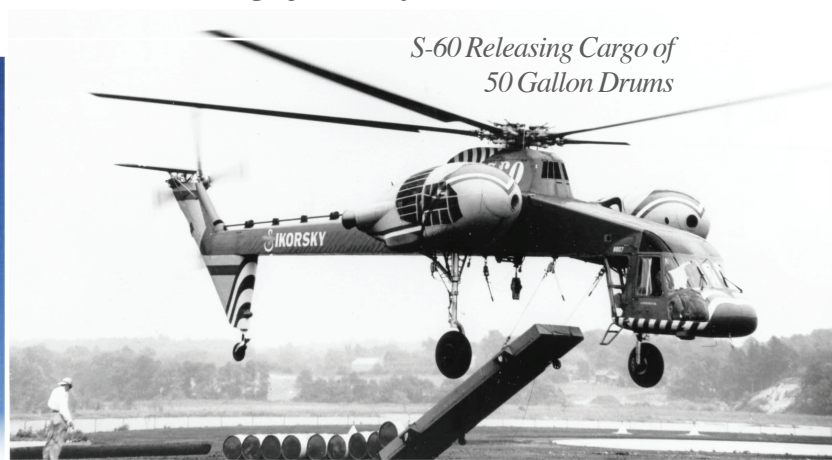
## *Igor Sikorsky's Last Vision - The Flying SkyCrane*

**I**n 1955 Sikorsky envisioned a helicopter without a cabin that was capable of picking up and delivering a cargo of any geometric shape slung under the fuselage. Mr. Sikorsky and Lew Knapp, then Chief of Preliminary Design created the S-60 SkyCrane helicopter.

Without Igor Sikorsky's passion and genius it is clear there would never have been a SkyCrane helicopter. Experience gained with the S-60 laid the foundation for the S-64 design just five years later. ☺

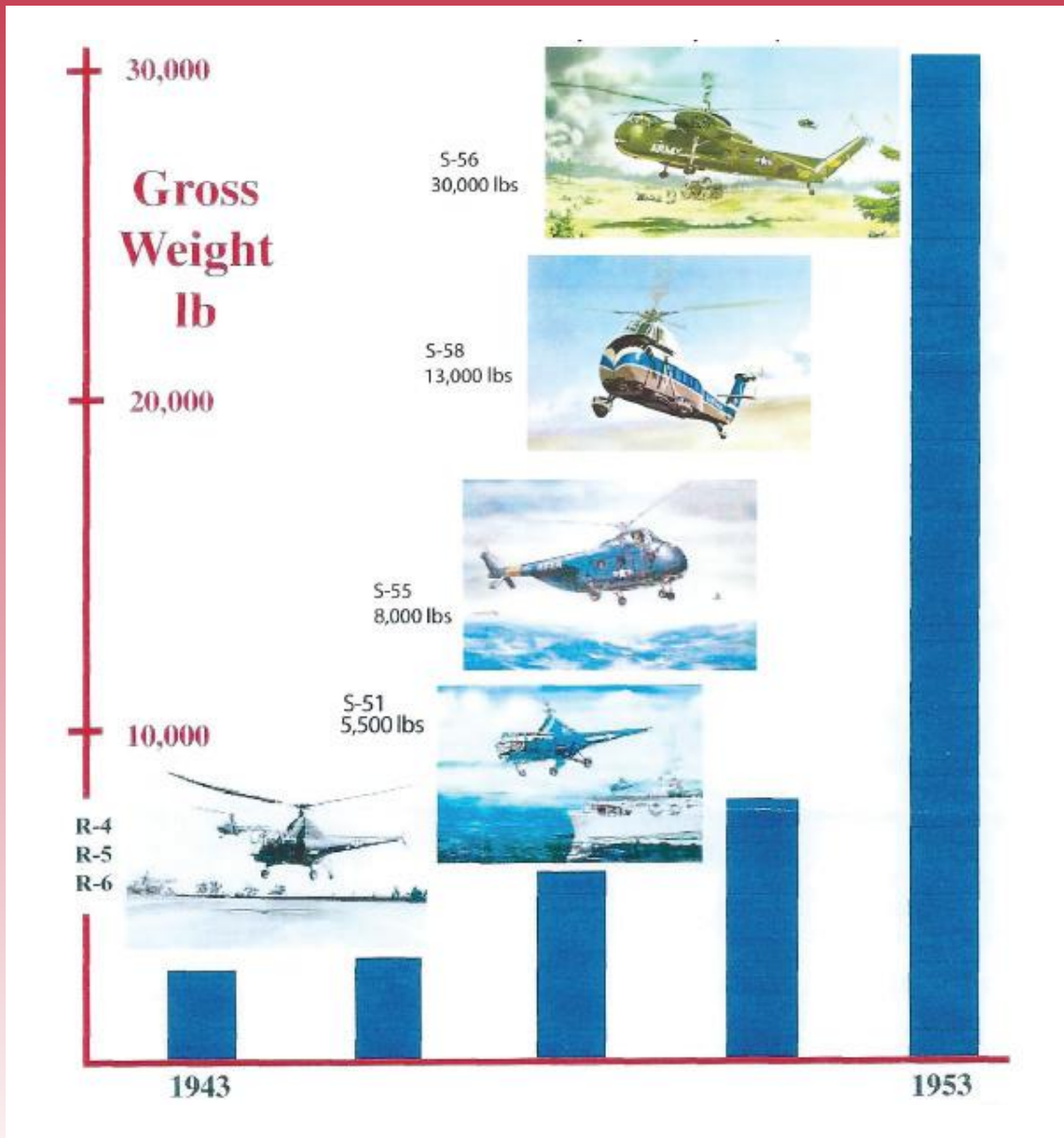


S-60



S-60 Releasing Cargo of 50 Gallon Drums

**During 1943 to 1953 Sikorsky Aircraft Successfully Increased The Gross Weight Capability For New Helicopter Models From 2,540 Pounds For The R-4 (S-47) To 30,000 Pounds For The H-37 (S-56), And Successfully Demonstrated The S-60 First Successful Flying Crane In History. This Period Was One Of The Most Prolific Decades In The History of Sikorsky Helicopters.**



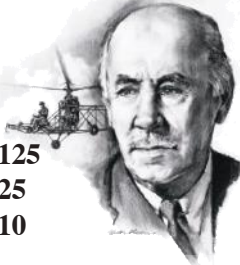


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## First Trans Atlantic Helicopter Crossing

**I**n July of 1952 two U.S. Airforce H-19 helicopters made the first trans Atlantic Crossing by way of Labrador, Greenland, Iceland and Scotland to Wiesbaden, Germany.

*Newsletter designed and edited by Lee Jacobson and Sikorsky Archive members with graphic assistance by Edgar Guzman*

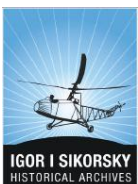


“A flying machine rising directly from the ground by the action of a lifting propeller was most appealing to my imagination. The helicopter approaches closer than any other vehicle to fulfillment of mankind’s ancient dream of the flying horse and the magic carpet.”

*— Igor Sikorsky*

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