



# Sikorsky S-64 Skycrane – Lifting the Impossible

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# Need for the Sikorsky S-64 Skycrane

## What did the S-64 need to satisfy?

- Heavy cargo transport
- Quick-safe-efficient turn-around time
- Lifting capabilities in rigid spaces



Fig 2.1 - Sikorsky S-60

## PREVIOUS MODEL : SIKORSKY S-60 (FIG 2.1)

### ◇ COMPARISON BETWEEN S-64 vs. S-60

#### ◇ MAXIMUM TAKE OFF WEIGHT

◇ S-64: 38,000 POUNDS

◇ S-60: 31,200 POUNDS

#### ◇ EMPTY WEIGHT

◇ S-64: 17,240 POUNDS

◇ S-60: 19,613 POUNDS

#### ◇ NUMBER OF BLADES

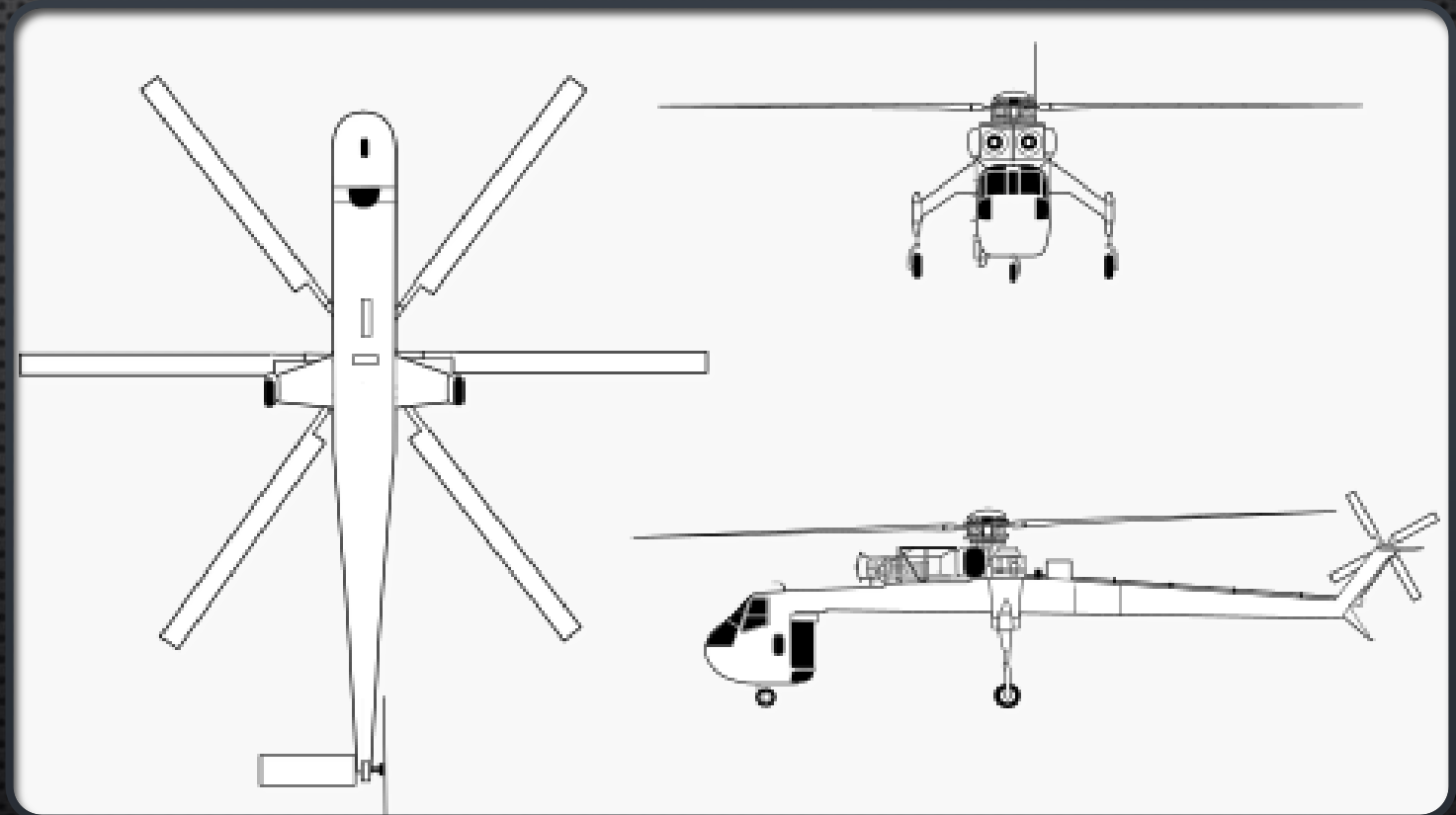
◇ S-64: 6 BLADES

◇ S-60: 5 BLADES



# Sikorsky S-64 Skycrane Configuration

- NO CABIN - "STICK FUSELAGE"
- 2 PRATT & WHITNEY JFTD – 12 TURBINE ENGINES
- 72 – FT DIAMETER ROTOR (6 BLADES)
- TAIL SKID
- TRICYCLE LANDING GEAR
- FLY-BY-WIRE CONTROLS
- REAR FACING COCKPIT





# "Low-speed" Aerodynamics/propulsion design attributes

## ♦ Aerodynamic attributes

- ♦ Large rotor blades – Produces more lift + allows heavier payloads.
- ♦ Tail Rotor – Counteracts the torque produced by main rotor blades for stability.
- ♦ Transmission tilted 3 degrees

## Propulsion attributes

- ♦ Two Pratt and Whitney engines to produce necessary lift
- ♦ Variable Pitch rotors to control stability during different level loads







# Design and Manufacturing



- ◆ **Company:** Sikorsky Aircraft Corporation
- ◆ **Initial Development to first prototype flight:**  
April 1961 (Program "Go-Ahead") -> May 1962  
(First flight)
- ◆ **Number Produced:** 99
- ◆ **Unit Cost:** ~ \$30 million
- ◆ **Operational life cycle:** 1962 - Present

# Impact of the S-64 Skycrane



## ♦ **Military Application:**

- ♦ During the 1950's & 1960's the S-64 was used to frequently transport troops, fuel, ammunition, & equipment to bases

## ♦ **Alpine National Park Fire ( Jan 5th – 14th 1998):**

- ♦ 94 loads ~ 810,000 Liters used for fire suppression

## • **Impact on Future Designs**

- Successful external load operations influenced future use of S-64
- Knowledge gained from S-64 helped the development of the Sikorsky S-92 & CH-53K

## ♦ **References:**

- ♦ <https://sikorskyarchives.com/home/sikorsky-product-history/helicopter-innovation-era/sikorsky-s-64/>



*Carrying a damaged F4 Phantom*