



SIKORSKY

CH-53K

Frequently Asked Questions

THE ONLY HEAVY
LIFT SOLUTION



SIKORSKY
A LOCKHEED MARTIN COMPANY



CH-53K FREQUENTLY ASKED QUESTIONS

How much does the aircraft weigh?

Specification Weight Empty	43,878 lb	19,000 kg
Basic Design GW (BDGW)	60,000 lb	27,200 kg
Structural Design GW (SDGW)	60,000 lb	27,200 kg
Alternate Design Gross Weight (ADGW) for Maximum Internal Load	74,000 lb	33,600 kg
Maximum Design Gross Weight (MDGW) for Maximum External Load	88,000 lb	39,900 kg

How fast does the aircraft fly?

Velocity horizontal	170 ktas	315 kph
Velocity dive	196 ktas	363 kph
Velocity @ Maximum Continuous Power & ADGW (Sea Level Standard)	158 ktas	293 kph
Velocity @ Maximum Continuous Power & ADGW (Sea Level 103°F or Sea Level 39.4°C)	164 ktas	304 kph
Velocity @ Maximum Continuous Power & ADGW (3000 ft 91.5°F or 914m 33°C)	161 ktas	298 kph
Velocity @ Maximum Continuous Power & MDGW (Sea Level Standard)	133 ktas	246 kph
Velocity @ Maximum Continuous Power & MDGW (Sea Level 103°F or Sea Level 39.4°C)	135 ktas	250 kph
Velocity @ Maximum Continuous Power & MDGW (3000 ft 91.5°F or 914m 33°C)	126 ktas	233 kph

What is the hover & service ceiling capability?

Hover Out of Ground Effect Gross Weight (Sea Level Standard)	88,000 lb	39,900 kg
Hover Out of Ground Effect Gross Weight (Sea Level 103°F or Sea Level 39.4°C)	88,000 lb	39,900 kg
Hover Out of Ground Effect Gross Weight (3000 ft 91.5°F or 914m 33°C)	85,100 lb	38,600 kg
Hover In Ground Effect Gross Weight (Sea Level Standard)	88,000 lb	39,900 kg
Hover In Ground Effect Gross Weight (Sea Level 103°F or Sea Level 39.4°C)	88,000 lb	39,900 kg
Hover In Ground Effect Gross Weight (3000 ft 91.5°F or 914m 33°C)	88,000 lb	39,900 kg
Service Ceiling @ ADGW (International Standard Atmosphere)	16,000 ft	4,880 m
Service Ceiling @ ADGW (International Standard Atmosphere + 24°C)	13,200 ft	4,020 m

What is the mission performance capability of the aircraft?

External Lift Mission Payload, @ 110 nm (204 km) Radius of Action	27,000 lb	12,200 kg
Internal Lift Mission Payload, @ 110 nm (204 km) Radius of Action	13,100 lb	5,900 kg
Maximum Internal Payload Range (Standard Day)	>400 nm	>740 km
Maximum Internal Payload Range (Marine High Hot Day)	>450 nm	>830 km

What powerplant does the CH-53K employ?

Engines - Three (3) General Electric T408-GE-400 7,500 HP (5,593 kw) Class Turboshift Engines		
Installed Takeoff Rating (Sea Level Standard)	17,700 shp ¹	13,200 kW ¹
Installed Takeoff Rating (3000 ft 91.5°F or 914m 33°C)	16,200 shp	12,100 kW
Installed Intermediate Rating (Sea Level Standard)	16,000 shp ¹	12,200 kW ¹
Installed Intermediate Rating (3000 ft 91.5°F or 914m 33°C)	12,462 shp	9,300 kW
Installed Maximum Continuous Power Rating (Sea Level Standard)	13,000 shp ¹	11,900 kW ¹
Installed Maximum Continuous Power Rating (3000 ft 91.5°F or 914m 33°C)	12,100 shp	9,000 kW

¹ transmission limited

How many rotor blades does the aircraft have? What are the dimensions? What are the operating speeds and RPMs?

Blades (Main Rotor)	7	
Blades (Tail Rotor)	4	
Geometric Chord (Main Rotor)	2.72 ft	0.829 m
Geometric Chord (Tail Rotor)	1.48 ft	0.451 m
Diameter (Main Rotor)	79 ft	24.1 m
Diameter (Tail Rotor)	20 ft	6.10 m
Normal Tip Speed (Main Rotor)	762 ft/sec	232 m/sec
Normal Tip Speed (Tail Rotor)	754 ft/sec	230 m/sec
Normal Operating Rotor Revolutions Per Minute (Main Rotor)	184 RPM	
Normal Operating Rotor Revolutions Per Minute (Tail Rotor)	720 RPM	

What is the capability of the External Cargo System?

Hook Rating - Center (Single Point)	36,000 lb	16,300 kg
Hook Rating - Fwd/Aft	25,200 lb	11,400 kg
Dual Point (30/70 & 70/30) w/o fuel management	13,500 lb	6,100 kg
Dual Point (30/70 & 70/30) w/ fuel management	27,000 lb	12,200 kg
Dual Point (40/60 & 60/40)	36,000 lb	16,300 kg.

What is the capability of the Internal Cargo System?

Floor Loading	300 lb/ft ²	1,470 kg/m ²
Standard USMC 40"x 48"	2,500 (x qty 6) lb	1,100 (x qty 6) kg
Wooden Pallets		
Full 463L Pallets	10,000 (x qty 2) lb	4,500 (x qty 2) kg.
Half 463L Pallets	5,000 (x qty 5) lb	2,300 (x qty 5) kg.
Tactical Bulk Fuel Delivery System	3 x 800 gallon tanks	3 x 3030 liter tanks

What type of armor system does the CH-53K have?

Armor Panels	Provides protection to small arms fire
Cockpit	Non-removable pilot and copilot seat & wing armor
Cabin	Non-structural panels within the floor ramp & walls
Mission Configurable	Yes

What type of Flight Control System does the CH-53K have?
What are the primary hardware elements and the basic system capabilities?

Flight Control System	Triplex redundant fly by wire system. The primary control system consists of 3 flight control computers (FCCs), 3 inertial measurement units (IMUs), and 3 air data computers (ADCs)
Pilot Controls	Active unique trim sidearm inceptor Active displacement trim collective inceptor Passive unique trim pedals

What flight director modes does the CH-53K have?

Flight director modes	Indicated Airspeed (IAS) Hold Groundspeed Hold Pitch Barometric Altitude Hold Vertical Speed Hold Altitude Pre Select Heading Select Departure/Wave-Off Flight Management System Long Range Navigation Approach to Point
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What are the primary flight control modes in the CH-53K?

Primary flight Control modes	Primary Flight Control System - Provides rate command, attitude hold in pitch/roll Automatic Flight Control System - Provides attitude command, velocity hold in pitch/roll
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What defensive Electronic Counter Measures (DECM) does the CH-53K have?

State-of-the-Art Aircraft Survivability suite

Who are the suppliers for each of the major systems and subsystems?

Airframe, Cockpit/Cabin	Spirit
Airframe, Aft Transition	GKN
Airframe, Sponson, Tail Rotor Pylon	Albany International
Airframe, Main Rotor Pylon	Aurora
Landing Gear	Heroux-Devtek
Environmental Control System	Collins Aerospace
Flight Control Servos	Collins Aerospace
Engines	General Electric Aviation
Avionics Management System	Collins Aerospace
Integrated Fuel Systems / Hydraulics	Eaton Aerospace
Engine Air Particle Protection System	Donaldson
Fuel Cell	Amfuel
Integrated Vehicle Health Management System	Collins Aerospace
Internal Cargo	DRS
Tail Drive System	Collins Aerospace
Main Rotor & Tail Rotor Servos	Collins Aerospace
Electrical Power Systems	Safran Labinal Power Systems
Main Gearbox Housing	Wellman (castings) / STADCO (machinings)
Cockpit Seats	BAE
Active Inceptor System	BAE Systems
Ramp and Door Actuation	Arkwin
Main Rotor Blade Spar Assembly	Cobham Composite Products
Data Concentrator Unit / Blade Fold Distributor	Curtiss Wright
Troop Seats	East West
Inlet Ducts	Meggitt Polymers and Composites
Main Blade Spar/Tail Rotor Blade/Main Rotor Blade Skin to Core/Tail Rotor Blade Flex Beam	Hexcel
Air Data Computer	Penny & Giles
Environmental Control System Ducts	Royal Engineered Composites
Hydraulic Blade Fold System / Main Rotor Damper / Rotor Brake Hydraulic Module / Main Gear Box & Nose Gear Box Oil Cooler	Triumph

What are the Reliability and Maintainability metrics for the CH-53K?

Mission Reliability	89%
Sortie Generation Rate	2.6
Mean Flight Hours Between Operational Mission Failures - Design Controllable (MFHBOMFDC)	31.5 hr
Mean Flight Hours Between Failures - Design Controllable (MFHBFDC)	1.7 hr
Maintenance Man-Hour per Flight Hours - Organizational (MMH/FHORG)	11.7 hr
Mean Time To Repair (MTTR)	1.5 hr
Mean Corrective Maintenance Time for Operational Mission Failures (MCMTOMF)	1.9 hr

What is the logistics footprint?

Weight Status	< 84,000 lb	< 38,100 kg
Volume Status	< 12,000 ft ³	< 340 m ³

What are the capabilities of the Diagnostics/Integrated Vehicle Health Management System (IVHMS)?

Fault Detection	95%
Fault Isolation (w/o interconnects and Government Furnished Equipment)	90%
	Centralizes the monitoring and reporting of faults detected by onboard sensors and embedded electronics Performs bearing monitoring, and rotor track and balance Generates data to support ground-based automated logistics Incorporates two Integrated Vehicle Health Management Units (IVHMU) and Sikorsky Ground Based Application (SGBA)



How big is the CH-53K aircraft (blades and tail unfolded)?

Length	99 ft	30.2 m
Width	17.5 ft	5.3 m
Height	28.3 ft	8.6 m

How big is the CH-53K cabin?

Length	30 ft	9.1 m
Width	8.6 ft	2.6 m
Height	6.5 ft	2.0 m

How many people can the CH-53K carry?

34 Crashworthy Seats Pilot, Copilot, 2 Crew Chiefs, 30 Marines

What is the material breakdown for the CH-53K aircraft?

Composite	17.7%
Aluminum	20.9%
Steel	15.5%
Titanium	15.9%
Other	30.0%

What type of armament system does the CH-53K have?

Machine Guns Three (3) 50-caliber GAU-21 machine guns in the door window, forward cabin window, and ramp

What type of crash capability does the CH-53K have?

Vertical	20g
Longitudinal	20g
Lateral	10g
Seats	Crash attenuating air crew & troop seats

What type of environmental control system is on the aircraft?

Cockpit and Avionics/Electrical Bays	Cooled
Cockpit and Cabin	Heated

What are the operational design environment limits for the CH-53K aircraft?

Temperature	-40 to +122 °F	-40 to +50 °C
Altitude	17,000 ft	5,180 m

How long does it take to fold the main rotor blades and the tail rotor pylon?

2 minutes

What ship platforms does the CH-53K have the ability to support?

Fully compatible on LHD, LHA-6 class ships

What fixed wing aircraft can the CH-53K aircraft be air transported on? How long does it take to breakdown and restore the aircraft?

C-5	2 x CH-53K
C-17	1 x CH-53K
Disassembly time	Elapsed Time 13.5 hrs, Maintenance Man Hours 70.5 hrs
Reassembly time	Elapsed Time 22.5 hrs, Maintenance Man Hours 130 hrs

What type of gearbox does the CH-53K have and what are the ratings at Normal Operating Rotor speed (184 RPM)?

Gearbox type	Split Torque	
Takeoff Rating	17,700 shp (136.2% Torque)	13,200 kw (136.2% Torque)
Intermediate Rating	16,000 shp (123.1% Torque)	11,930 kw (123.1% Torque)
Maximum Continuous Power Rating	13,000 shp (136.2% Torque)	9,700 kw (136.2% Torque)

How much fuel does the CH-53K carry? How many tanks? How long does it take to refuel the aircraft?

Internal fuel capacity	2,286 gallons (@ 6.8lb/gallon = 15,545 lb)	8,653 liters (@0.82 kg/liter = 7,095 kg)
	2 cells, per sponson	
Internal aux fuel capacity	2,400 gallons (16,320 lb)	9,085 liters (7,450 kg)
	3 x 800 gallon tanks	3 x 3,028 liter tanks
Refueling	Aerial or ground refueling is expected to take up to 18.5 minutes (depending on starting fuel level in each fuel cell and the associated environmental conditions)	

Describe the CH-53K Displays and Controls, Communication and Navigation systems.

Displays & Controls	Avionics management system (5 portrait MFDs, 2 CDUs, 2 IPCs, and 2 DTUs) Dual Data Concentrator Units
Communications	3 AN/ARC-210 RT-1851A [C] Multi Function Radios with SATCOM capability AB/APX-123 Identification Friend or Foe (IFF) AN/USQ-140(V)1[C] MIDS LVT Digital Secure Wireless ICS 4 Wired and 4 Secure Wireless stations
Navigation	Dual LN-251 Embedded GPS Inertial Navigation Systems (EGI) Advanced Digital Antenna Production (ADAP) GPS Antenna System 3 Air Data Computers Dual RT-1805/APN LPIA Radar Altimeters NAV-4500 VHF Omni-Directional range/instrument landing system/marker beacon (VOR/ILS/MB) AN/AQ-29A Forward Looking Infrared Radar (FLIR) PMA-209 TAWS - Embedded Terrain Awareness Warning System (eTAWS)

What comprises the Electrical Power System on the CH-53K?

Electrical Power System	2 Main Generators 75KVA each Auxiliary Power Unit Generator 45KVA 2 Main 350 amp AC/DC converters Backup 200 amp converter 24 AH battery
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NAVAIR Public Release 2019-493. Distribution Statement A – "Approved for public release; distribution is unlimited"

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