Credit: Staff Sgt. Alexander Cook

Credit: USCG Chief Petty Officer Chad J. Hensen

Credit: Airman 1st Class Caleb Pierce

Credit: U.S. Marines

UH-60 BLACK HAWK

PRODUCTS AND SUPPORT GUIDE

MOOG

UH-60 BLACK HAWK

Credit: Capt. Peter Smedberg 10th Combat Aviation Brigade

The Sikorsky UH-60 Black Hawk helicopter has been in service since 1979 being produced in the thousands and incorporating many variants to fit tailored mission needs. This includes troop and equipment transport, electronic warfare, casualty evacuation, reconnaissance, and special operations missions. The Black Hawk is operated by all United States DoD services as well as exported internationally making the UH-60 one of the most produced and flown helicopter platforms due to its operational capabilities and customization abilities. Moog supports the Black Hawk fleet with various solutions to extend operational life and improve efficiencies.

FIELD SERVICE

Moog Field Service Representatives (FSRs) are the cornerstone of our defense sustainment services. FSRs provide superior engineering and support to the United States Government (USG) and other end-users of Moog defense products and related systems. With Moog's dedicated team of FSRs, customers receive a distinct advantage that only comes with direct hire employees backed by the full resources of a large OEM. Moog's FSR team has a combined 30+ years of Special Forces operational experience.

MOOG OFFERINGS

AVIONICS

Moog's Genesys Avionics Suite™ provides renewed operational life to the Black Hawk helicopter through a complete, comprehensive, and affordable cockpit system upgrade composed of customizable EFIS displays, UHF and VHF communication & navigation radios, IFR approved autopilot, and all associated control panels, sensors and interface devices.

RAPID WEAPONIZATION

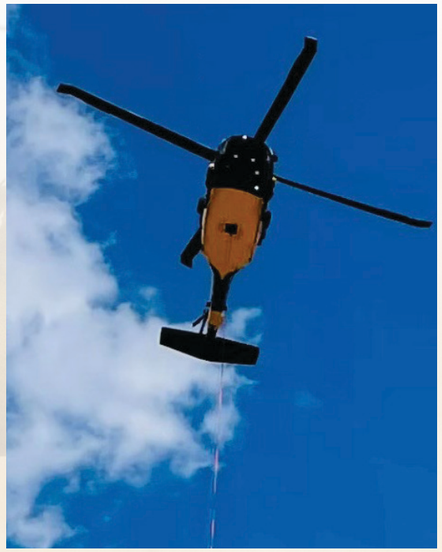
The Moog Weapon Stores Management System (SMS) has received an Air Worthiness Release (AWR) for use on the UH-60 Black Hawk. The SMS is a Modular design compliant, COTS weapons control system that seamlessly integrates with aircraft sensors and mission management systems to provide the crew with a superior fire-control solution.The flexible modular design of the SMS enables rapid integration and future upgrades to the sensors, avionics, and weapons ensuring the SMS's value for future mission requirements and weapons expansion.

POWER AND DATA TRANSMISSION

Moog provides the slip ring for both the main and tail rotor de-ice applications on the Black Hawk helicopter. Meeting the requirements for high rotational speed, exposure to extreme weather conditions, and high vibration, these high-performance slip rings have proven successful for high reliability and long-life operation. Our years of experience designing and manufacturing slip rings for helicopter requirements allows us to employ a combination of technologies for power and data transfer.

SUSTAINMENT

To best serve the challenges of operators and maintainers in the military aircraft market, Moog offers a variety of fast, flexible and reliable support solutions. These value-added services include: repair and overhaul support, reliability enhancements, technology insertion, as well as on-site field service support and training.



MOOG BLACK HAWK CAPABILITIES

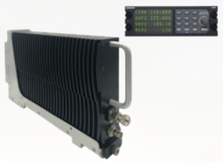
Moog offers these advanced capabilities for Black Hawk variants. We continue to invest in new innovations including a next generation vibration control system:

- Fault tolerant, redundant and synchronized electromechanical actuation
- High Harmonic Control (HHC) in-series swashplate
- Fault tolerant individual blade control
- Next generation vibration control systems in conjunction with HHC to achieve jet smooth ride

ENHANCED STORES INTERFACE UNIT (E-SIU)

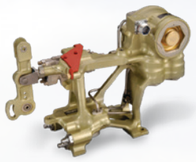
GUN ROCKET UNIT (GRU)

ENHANCED STORES MANAGEMENT COMPUTER (E-SMC)



GDR VHF & UHF NAV-COMM RADIO

YAW BOOST SERVO ASSEMBLY



PITCH TRIM ACTUATOR

APU ACCUMULATOR

VIBRATION CONTROL ACTUATION SYSTEM (VCAS)

STORES CONTROL PANEL (SCP)

MISSILE SIMULATOR ON DUAL RAIL LAUNCHER

GRC ROTOCRAFT AUTOPILOTS

CUSTOMIZABLE EFIS PRIMARY FLIGHT AND MULTI-FUNCTION SMART DISPLAYS

ROLL TRIM ASSEMBLY

SAS MODULE ASSEMBLY

GIMBAL SOLUTION

SLIP RING

AVIONICS

Moog's "Genesys Avionics Suite™" provides renewed operational life to the Black Hawk helicopter through a complete, comprehensive, and affordable cockpit upgrade. This solution offers a line of avionics designed for Black Hawk markets, featuring customizable EFIS displays with SVS and Highway-In-The-Sky symbology, embedded FMS, all classes of TAWS, dual ADAHRS, dual GPS/SBAS receivers, Genesys GDR UHF & VHF communication & navigation radios, and a Genesys GRC autopilot approved for IFR operations.

The system supports all "next generation" flight procedures, including B-RNAV, P-RNAV, RNP, LPV approaches, and PinS (Point-in-Space) helicopter approaches.

The avionics suite's flexible Modular Open Systems Approach (MOSA) enables rapid integration and future upgrades to the avionics ensuring continued meeting of future mission requirements.

Avionics Suite functions include:

- Flight Management System (FMS)
- Synthetic Vision (SVS)
- Highway-In-The-Sky (HITS)
- Terrain Awareness and Warning (TAWS)
- Engine Indication and Crew Alerting (EICAS)
- Multi-Axis autopilot and stability augmentation system
- UHF and VHF communication & navigation radios
- Live video inputs display
- Color weather radar display
- IFF and Mode-S transponder input and display

LEARN MORE ABOUT AVIONICS:

POWER AND DATA TRANSMISSION

Our high-performance slip rings have been an integral part of the Black Hawk for decades providing power and data transfer for rotor de-ice, blade fold, and instrumentation. On other helicopter platforms, these slip rings transmit power and data for flight control, high pressure hydraulics for blade fold, and positional feedback for both main and tail rotors.

Many aircraft carry electro-optical and infrared (EO/IR) sensors, target acquisition systems, and weapon stations requiring unrestrained rotation provided by the slip ring. We offer both the rotary components and assemblies for these systems and work with the OEM to provide solutions including the motor, drive electronics, slip ring, fiber optic rotary joint, fluid / pneumatic swivel, and RF rotary joint.

LEARN MORE ABOUT POWER AND DATA:

RAPID WEAPONIZATION

The Moog Weapon Stores Management System (SMS) has received an Air Worthiness Release (AWR) for use on the UH-60 Black Hawk. The SMS is a modular design, COTS weapons control system that seamlessly integrates with aircraft sensors and mission management systems to provide the crew with a superior fire-control solution.

The flexible modular design of the SMS enables rapid integration and future upgrades to the sensors, avionics, and weapons ensuring the SMS's value for future mission requirements and weapons expansion.

KEY FEATURES

- Modular design
- Lightweight – half the weight of comparable systems
- SMS software approved as non safety-critical DO-178C DAL E
- Qualified to MIL-STD-810G, MIL-STD-461G;
- Compliant to MIL-STD-704F
- MIL-STD-1760, MIL-STD-1553, ARINC 429, analog and digital I/O, Ethernet, RS232/RS422, and Serial interfaces available

LEARN MORE ABOUT RAPID WEAPONIZATION:

SUSTAINMENT

Moog is the OEM for a number of different systems on the UH-60 rotorcraft. Our flight controls include the Pitch Trim Actuator, the Roll Trim Actuator and Hydraulic Accumulator. The UH-60 also utilizes our Vibration Control Actuation System (VCAS). This system replaces traditional passive systems by measuring vibration levels at key locations in the aircraft and applying cancellation forces in an equal and opposite direction. The VCAS systems adjusts these forces as the aircraft maneuvers and as payloads change thereby increasing overall efficiency. This also results in reducing airframe fatigue, pilot fatigue and overall maintenance costs.

Additionally, the SDA (self-displacing accumulator) provides hydraulic pressure to the APU (auxiliary power unit) motor used to start the two engines.

Courtesy of: Sgt. 1st Class Warren Wright, 138th Public Affairs Detachment

Aircraft worldwide are flying far beyond their intended design life. As a result, there is high demand for new technologies and reliability improvements to offset escalating costs of maintaining these aging systems. Moog's highly skilled engineers can apply state of the art technology into aging aircraft systems, resulting in increased reliability, lower operating costs and extended useful life.

LEARN MORE ABOUT SUSTAINMENT:

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