



## Unitech Composites Enables Weaponization of the Venerable UH-60 Black Hawk

By Mr. Dan Kinney

*A Sikorsky S-70 Black Hawk, here armed with air-to-surface rockets and a Hellfire air-to-surface missile, is transformed from a civil utility machine to a battlefield warrior with Unitech Composite's LASS*

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**T**he Black Hawk helicopter is one of the most recognized fixtures in Army aviation. In fact, Sikorsky, a Lockheed Martin company, recently celebrated the Black Hawk's 40th anniversary since it was first delivered to the U.S. Army back on October 31, 1978. Now, more than 4,000 Black Hawk aircraft of all types are in service today, and the U.S. Army is the largest operator with over 2,100 aircraft. Ci-

vilian versions and some military versions are produced under various S-70 model designations. One thing is clear, for an aircraft to be around for 40 years, it must remain relevant for and the men and women who serve with and are supported by this aircraft every day.

Over the last four decades, Black Hawks have steadfastly flown in and out of countless combat zones. The U.S. military has primarily relied on this

workhorse to transport troops and provide needed supplies to the war fighter. However, an increasingly important role of some UH-60s is to support assault missions to deliver and extract soldiers in combat zones, save lives in casualty evacuation missions, and now even strike targets in Iraq, Afghanistan and other conflict areas. Unitech Composites is proud to support these expanded missions by enabling a weapons capability that is available for Black Hawk operators around the world. Unitech's lightweight composite weapons pylons help transform the Black Hawk into a true multi-role aircraft.

## Evolution of Today's Weaponized Black Hawk

The variety of Black Hawk configurations and missions they support is extensive. One that is starting to take hold now involves "weaponizing" a UH-60 with an assortment of sensors and armaments. Fortunately, the needed airframe was already established, and in production at Sikorsky.

Part way through the production of the UH-60A "alpha" models, Sikorsky added hardpoints to the fuselage, so customers could add stub "wings" to carry extra fuel tanks. The initial stub wing system was referred to as the External Stores Support System (ESSS), which entered service in 1986. Each ESSS has two pylons on each wing so a set of wings can carry up to four fuel ferry tanks, each capable of holding 230 gallons. Eventually the Army replaced the original tanks with 200-gallon Crashworthy External Fuel System (CEFS) tanks.

Once the hardpoints and wings were added to the helicopter to carry fuel tanks, it didn't take long before users decided they wanted to carry weapons instead of fuel on the wings. The result was a UH-60 Black Hawk variant with integrated weapons which gave it additional mission capability to use it as a gunship in support of the ground forces tactical commander. Instead of carrying nine combat-equipped troops in an air assault configuration, the new variant was equipped with an array of weaponry so that it could perform armed escort and close air support missions along with a crew of four (pilot, copilot and two crew chiefs/door gunners).

Initially the armed Black Hawks utilized the ESSS wings, but they were heavy and obstructed the field of fire for the door guns. Next, the ESSS wings were shortened to create the External Fuel System (EFS) wings which had a single weapons store per side. Eventually the initial customer migrated away from primarily metallic wings to composite wings. Today those Black Hawk helicopters are equipped with either Lightweight Armament Support Structure (LASS) wings which have one weapons store per side, or the larger Multi-station Lightweight Armament Support Structure (MLASS) wings, which have two weapons stores per side. Unitech Composites is the design authority for these lightweight wings, which followed their Composite

Universal Weapons Pylon (CUWP) for the OH-58D Kiowa Warrior.

### Options for Weaponized Black Hawk

The composite LASS and MLASS wings are robust and can carry 700 lbs. per weapons station. The list of weapons that have been flown on LASS and/or MLASS wings include:

- M134 Minigun – 7.62mm x 51mm NATO ammunition – six-barrel machine gun – mounted in the gunner's window in a fixed forward-facing fitment
- M230 Cannon – 30mm chain gun – 1,100 rounds @ 625 rounds per minute – the same gun used on the AH-64 Apache attack helicopter
- M261/M260/LWL-12 Rocket Launchers – 19/7/12-round 2.75-inch (70mm) Folding-Fin Aerial Rockets (FFAR) – Typically unguided (Hydra 70) or guided (APKWS)
- M299 Missile Launcher – Each capable of holding four AGM-114 Hellfire missiles
- GAU 19/A – .50 Cal 3-barreled Gatling gun – Can be podded or unpodded
- AIM-92 ATAS (air-to-air Stinger)

A set of fully configured LASS wings weighs 294 lbs. without weapons, compared to EFS wings which are 452 lbs. A set of fully configured MLASS wings weigh 540 lbs., compared to ESSS wings which weigh 730 lbs. The weight savings enabled by LASS and MLASS composite wings is significant and enables operator's greater flexibility. Mission planners now have the option of carrying more JP-8 fuel or more firepower.

In addition to the variety of weaponry that can be incorporated into an armed Black Hawk, operators can also integrate more sophisticated electronics such as laser rangefinder/designator targeting systems or a monocular head-up display (MONOHUD) which provides weapon aiming cues for the pilots. For customers who want to carry extra fuel, Robertson Fuel Systems offers several Internal Auxiliary Fuel Tank System (IAFTS) options. Most common are either a single tank that holds close to 200 gallons or dual tanks that hold roughly 170 gallons each. An added benefit of internal auxiliary tanks verses installed on wings is the aircraft has reduced drag and better weight and center of gravity (CG) characteristics.

### Increased Availability of Weaponized Black Hawks

Currently, the U.S., Columbia and

UAE are the only ones who own UH-60s equipped with wings, or weapons pylons. However, Unitech Composites recently announced that it received an initial contract for LASS wings for the Afghan UH-60 Black Hawk program, managed by the Utility Helicopter Project Office (UHPO).

The Foreign Military Sales (FMS) office within the UHPO now has an option for customers who want to arm their Black Hawks. Older UH-60L and even UH-60A models with hardpoints can also be converted to armed aircraft in relatively quick order. Several integrators already have weapon Stores Management Systems (SMS) kits available.

For a country with a small defense budget, an armed Black Hawk is a very cost-effective solution if one wanted close air support capability without having to sustain a dedicated platform. The Black Hawk is already well known for its versatility, and now with a weaponized configuration, it truly is one of the best examples of a multi-role aircraft.

### Summary

The Black Hawk helicopter is celebrating its 40th anniversary, and in 2019 Unitech Composites will celebrate the same milestone. Unitech is honored to be a part of the Army aviation community, where for years we have supplied structural and nonstructural composite components and assemblies to leading Original Equipment Manufacturers (OEMs), such as Boeing, Lockheed Martin, and MD Helicopters. However, it is our composite weapons pylons that we are most excited about today.

Unitech's LASS and MLASS products enable the UH-60 to become a true multi-role aircraft that can operate as a traditional medium-lift utility helicopter or it can be configured to support air assault and attack missions. A weaponized Black Hawk is an ideal platform for customers who must rely on fewer aircraft and smaller budgets. Unitech's lightweight weapons pylons have supported warfighters in the air and on the ground for more than a decade, and we look forward to bringing similar capabilities to even more customers around the world.

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*Mr. Dan Kinney is the senior director for business development and programs at Unitech Composites, based in Hayden, Idaho. Unitech Composites is a Unitech Aerospace company.*