

## **AC-119K Stinger** <http://www.globalsecurity.org/military/systems/aircraft/ac-119k.htm>

The US Air Force developed the AC-119K Stinger in order to meet urgent requirements for a gunship to supplement the AC-130A that could perform all of the missions of the earlier gunship models. The AC-119K was intended to allay fears from elements of the US Air Force that the initially proposed AC-119G, only intended to replace the AC-47D, would be too limited in its capabilities. The C-119G's twin piston engined performance was so marginal at combat gross weight, that the Air Force had intended from the beginning to upgrade selected aircraft to a newly designated C-119K configuration. The K bolstered the piston engines with 2 wing-mounted J-85 jet engines. The difference was no small thing. While the rate of climb with one engine out was 500 feet per minute for the C-119K, the C-119G's performance under the same conditions was listed "unsatisfactory at combat gross weight."

The resulting AC-119Ks were to be devoted to the truck hunting mission especially on the Ho Chi Minh Trail, where AC-130s had been very successful, but were in limited supply. With 20mm weapons in addition to the 7.62mm guns found on the AC-119G, they could very effectively destroy most truck types encountered. With more than 4,200 rounds of ammunition & advanced avionics, the AC-119K offered a suitable compliment to the AC-130A/E aircraft. The Stinger, which also had a secondary mission of supporting troops in contact, carried 2 20mm "Vulcan" cannons & 4 7.62mm "Miniguns," as opposed to the 4 miniguns carried by the AC-119G. Like the AC-119G, the AC-119K used the standard night observation device (NOD), but the AC-119K could also search out targets with infrared equipment. This was a noticeable improvement over the seldom used NOD on AC-119Gs because the FLIR did not require starlight or moonlight. In addition to the AC-119Ks had the same flare equipment & door-mounted, 20-watt "white light" illuminator as the AC-119G. The illuminator's 1.5-million candle power variable beam could light up a football stadium with superb clarity on the darkest nights. Of course, it also told the bad guys below exactly where to point their weapons, a drawback that discouraged the gunship crews from using the illuminator whenever possible. A AN/APQ-133 beacon-tracking radar helped the AC-119K pinpoint friendly troops who had the necessary transponder. This feature helped the Stinger interpose a curtain of fire to protect besieged outposts, for example, but served no purpose on interdiction missions & was removed from the aircraft in December 1970. In their fire control systems, both the AC-119G & -119K used the same kind of analog computer as had been tested in Project Gunship II, the development of the AC-130A. Basically, the computer lacked flexibility, since it could be programmed for only a limited range of airspeeds, bank angles, & altitudes. If a shift from one sensor to another, or enemy fire, dictated a marked change in altitude, the crew might have to reprogram the computer to continue the mission. The inability of the automatic pilot to hold the gunship in a steeply banked turn further complicated the task of fire control with both the Shadow & Stinger.

The first AC-119K began arriving in Vietnam in October 1969, & by January 1970, the second C-119 gunship squadron, the 18th Special Operations Squadron, was combat ready. By February 1970, there were 18 AC-119 gunships in Southeast of both types. Two aircraft were lost in the spring of 1970 at Da Nang Air Base to equipment malfunction. The AC-119Ks eventually settled into 2 operating locations. AC-119Ks were equally distributed between Da Nang Air Base in the Republic of Vietnam (South Vietnam) & Nakhon Phanom Royal Thai Air Force Base in Thailand by April 1971. The flight at Da Nang was primarily concerned with armed reconnaissance in the Steel Tiger area of operations in Laos, with a secondary mission of providing close air support for troops in contact in Military Region 1. The flight at Nakhon Phanom was primarily oriented toward close air support for troops in contact in the Barrel Roll area of operations in Laos, with a secondary mission of armed reconnaissance in the Plaine des Jarres. The aircraft were extremely effective in both of these missions.

The diverse operating locations & the organizational support caused some difficulty for the AC-119K personnel. The flight at Nakhon Phanom for example, was placed under the 56th Special Operations Wing for support. The flight was assigned to the 18th Special Operations Squadron at Phan Rang, however, & flew combat missions directed by Seventh Air Force. This complex situation required excessive coordination to reconcile the areas of support, command & control, & administration. Despite this problem, the aircrews were able to effectively employ the AC-119K & perform their mission as required.

The AC-119K was extremely effective as a truck killer, but care had to be taken to avoid areas of heavy anti-aircraft artillery concentration. As with other gunships, the AC-119K's relatively slow speed & predictable attack pattern made it vulnerable to anti-aircraft artillery. Although the AC-119K had performed adequately during a combat evaluation lasting from November 1969 through February 1970, codenamed Combat King, the 16 aircraft soon revealed weaknesses, as well as certain strengths, in missions against the trail. In addition to the overall anti-

aircraft threat, experience in combat demonstrated that the 20mm shell was too light to destroy trucks, & the rapid-fire M61 cannon often jammed. Although the 2 auxiliary jet engines improved performance, they increased the operating ceiling to only about 5,500 above ground level, beyond reach of machine guns, but well within range of the 23mm, 37mm, & 57mm anti-aircraft guns prevalent along the Ho Chi Minh Trail. Still, the auxiliary jets did enable the flight engineer to reduce the power setting & richness of the fuel mixture for the piston engines, adjustments that curtailed the exhaust plumes & made optical tracking difficult for the gunners below. If the gun crews did knock out an engine or inflict other severe damage, the auxiliary powerplants gave the Stinger a chance to survive, provided the crew reacted promptly & skillfully.

In an attempt to improve the lethality of the AC-119K, a hunter-killer concept was developed, pairing the aircraft with the Army's Grumman OV-1 Mohawk (or more commonly "Spud"), which would act as a target seeker. Once a target was identified, the gunship would be called in for the attack. Two versions of the OV-1 were used, the OV-1B carrying a Side Looking Airborne Radar (SLAR) & the OV-1C with an infrared (IR) detector. The Army OV-1s flew out of Udorn Royal Thai Air Base & conducted nightly reconnaissance patrols of the Barrel Roll area of operations in Laos, including the Plain of Jars. The IR-equipped OV-1Cs could detect heat from the engines of trucks & even camp fires. The SLAR equipped OV-1Bs were used to detect moving objects. In many cases, the targets identified by the OV-1s were gone by the time the recorded reconnaissance data was gathered, interpreted & analyzed. The idea was to relay the near real time target data appearing on the OV-1 monitors to AC-119K gunships operating in the area. The first test period of the OV-1 Seeker & AC-119K Destroyer (or Hunter Killer) teams was between 27 April & 23 May 1970. Intelligence data indicated most enemy troop movements were conducted in the late evening, so the evaluation missions were flown between 8 & 11 PM at night. When the OV-1s detected a target, the information was passed to an Airborne Battlefield Command & Control Center (ABCCC), a modified C-130, which in the area of operations used the call-sign "Alleycat." If a gunship was available (support of troops in contact took precedence over all other missions), & target validation could be obtained, the ABCCC relayed the information to the gunship. The AC-119K then flew to the target area & attempted to identify the target using its FLIR or NOD.

The test was relatively successful when all the equipment worked properly, but this was rare. The SLAR system on the OV-1B was prone to failure & there was only one aircraft assigned to the Army detachment at Udorn. The AC-119K systems were also prone to failure. There were only 3 Stinger assigned at Udorn & each was scheduled for a mission every night. The season was changing from "dry season" to "wet season" & some missions were canceled due to bad weather. Furthermore, the IR detection capability of the OV-1C was reduced with increased moisture. Wet weather virtually eliminated the IR detection capability of the AC-119K. The most serious problem with the team, however, were the rules of engagement because of several friendly fire incidents. As a result, nearly all targets identified by the OV-1 were reported to the ABCCC, which in turn relayed the information to the US embassy in Laos for validation. Once validated, the target information was relayed back to the ABCCC, which would then call for the gunship. The gunship would then be cleared to attack to coordinates of the original sighting, but if the target had moved, the entire validation process had to begin again.

Enemy anti-aircraft fire in Laos also became deadlier as the enemy deployed an increasing number of weapons that could reach the Stinger's normal operating altitude. The AC-119Ks used a 5,500 feet above ground level working altitude in areas without enemy anti-aircraft artillery & a 7,000 feet above ground level altitude in areas with such weapons. However, the AC-119K was unable to climb out of range of the anti-aircraft guns & also lacked the maneuverability to avoid the strings of tracers rising from the ground. The added thrust of the jet engines could not fully compensate for the additional weight of guns, fire control system, & sensors left the aircraft likely to stall if the pilot banked too steeply or pulled up too sharply. This vulnerability led pilots to try to avoid any environment where weapons larger than 57mm were present, although even the 57mm weapon could be effective, without radar control, at altitudes of 9-11,000 feet. Despite the necessity of avoiding areas of heavy anti-aircraft artillery concentration in Laos, the AC-119K was able to produce significant results in its armed reconnaissance role. During the last 6 months of 1970, the Stingers destroyed 275 vehicles & damaged another 275. On 16 December 1970, an AC-119K set the year's record for total trucks destroyed or damaged by all types of gunships. This record for one mission was 29 trucks destroyed & 6 damaged. During this same period they also destroyed 279 sampans & damaged 64. These figures were subject to qualification, however, for the time period covered only a portion of the dry season in Laos. Enemy truck traffic was generally low during the wet season & high during the dry season.

The Stinger gunships were also often withdrawn from truck hunting activity to provide close air support for troops in contact. Support of troops in contact during 1970 accounted for 329 confirmed enemy killed by air. Normal working altitude for troops in contact targets was 3,500 feet above ground level. This enabled the AC-119Ks to shoot accurately with both the 20mm cannon & 7.62mm miniguns & be relatively safe from small arms fire. Heavy automatic weapons, such as the 12.7mm & 14.5mm types, were not often encountered in a troops in contact situation & heavy anti-aircraft artillery was rarely present. In addition to performing these missions in Vietnam & Laos, the AC-119Ks also supplemented similar missions assigned primarily to AC-119Gs in Cambodia.

By February 1971, the AC-119K gunships no longer attacked traffic in the vicinity of Mu Gia, Ban Karai, & Ban Raving Passes; Tchepone; & Ban Laboy Ford, due to the anti-aircraft threat, though the planes continued to serve elsewhere in Laos. To help increase the effectiveness of the AC-119K, a mix of 20mm Armor-Piercing Incendiary & High-Explosive Incendiary rounds was introduced on an experimental basis to see if this would enhance the aircraft's truck killing capability. Headquarters, Pacific Air Forces concluded that the initial returns were inconclusive, but Stinger crew members felt otherwise. On 28 February 1971, a Stinger destroyed 8 PT-76 tanks using the mix while operating in support of Operation Lam Son 719 in Laos. The ground commander on the scene confirmed that all 8 tanks were completely destroyed. In addition, AC-119K aircraft destroyed or damaged 1,845 vehicles during the first 3 months of 1971. A revision of official opinion was clearly in order & one was soon forthcoming. It was acknowledged that "there is now very definite evidence that the ammo mix results in appreciably increased effectiveness." Consequently, the mix became standard for all AC-119K ordnance loads.

A second test period for the OV-1/AC-119K teaming was also conducted between 19 September & 19 November 1971, 16 months after the initial test. The second test was formed in an ad hoc manner at the start of the fall dry season. A large column of enemy trucks was detected on the morning of 19 September & the Army urgently requested gunship support. The OV-1s were still based at Udorn, but the AC-119Ks had moved to Nakhon Phanom. Although the tactics were essentially the same during the second test period, the results were not. The OV-1 advisories amounted to a very small number of successful attacks. The AC-130 Spectre gunships were in use by this time & were very effective at finding their own targets & destroying them without the cumbersome relay & validation scheme used for OV-1 identified contacts. With the failure of the second Hunter Killer test, the concept was dropped. Fears about the capabilities of the AC-119s held by the Seventh Air Force's commanding officer General William Momyer, such as maintenance problems, dogged the Fairchild gunships throughout their service in Southeast Asia. The AC-119G models in particular proved to be a mechanic's nightmare, though the AC-119Ks had troubles enough. Beginning in Dec 1971, 20mm fire from the Stingers unaccountably kept missing targets. The problem appeared to lie in the computerized fire control system, which somehow misinterpreted the sensor data it was translating into instructions for the pilot. Accuracy had not improved by the end of Mar 1972, when North Vietnam invaded the South, & emphasis shifted from interdiction of the Ho Chi Minh Trail to the support of South Vietnamese troops.

ENHANCE PLUS directed by the Air Force Chief of Staff on 1 October 1972, transferred 16 AC-119Ks assigned to Pacific Air Forces & the 6 assigned to the 1st Special Operations Wing to South Vietnamese Air Force. This decision wiped out the entire 1st Special Operations Wing AC-119K force. Therefore, on 20 October 1972, with no available aircraft, the AC-119K class at Hurlburt was advised that their training had been cancelled. Since they required auxiliary fuel tanks in order to fly across the Pacific Ocean, the Hurlburt aircraft deployed on 22 October 1972 to Robins Air Force Base, Georgia, for that modification. However, when ENHANCE PLUS was cancelled, 3 of the 6 1st Special Operations Wing aircraft redeployed home. Hardly had they returned when the program was revived & all 6 aircraft departed for Southeast Asia on 29 October 1972.

Title to the aircraft did not automatically provide the needed aircraft capability. Besides lacking electronics technicians to repair & fine tune certain of the AC-119K's sensors, the South Vietnamese Air Force faced a shortage of crews able to fly the aircraft. In December 1972, 6 AC-119K crewmembers from the 415th Special Operations Training Squadron deployed to Southeast Asia to train the South Vietnamese. This training team consisted of one pilot, 2 navigators, one flight engineer, one gunner, & one illuminator operator. It completed its mission & returned home on 5 March 1973. The 415th Special Operations Training Squadron earned the Air Force Outstanding Unit Award for the period between 15 September 1970 & 25 July 1971, when it had been located at Lockbourne & had flown the gunships. The Air Force phased out its last AC-119 in 1973. By the time the South Vietnamese began flying the AC-119K, its time had passed as a weapon of interdiction. Not even the AC-130 could roam at will over an expanded & better defended Ho Chi Minh Trail.