

ADA Units in Vietnam

Order of Battle

AIR DEFENSE ARTILLERY UNITS

SERVED IN VIETNAM 1965-1972

1ST BATTALION 44TH ARTILLERY (AW)(SP)

TWIN 40MM "DUSTER" WITH ATTACHED:

G-BATTERY 65TH ARTILLERY QUAD 50 CALIBER (MG)

G-BATTERY 29TH ARTILLERY (SEARCHLIGHTS)

5TH BATTALION 2ND ARTILLERY (AW)(SP)

TWIN 40MM "DUSTER" WITH ATTACHED:

D-BATTERY 71ST ARTILLERY QUAD 50 CALIBER (MG)

I-BATTERY 29TH ARTILLERY (SEARCHLIGHTS)

VULCAN 20MM COMBAT TEAM

4TH BATTALION 60TH ARTILLERY (AW)(SP)

TWIN 40MM "DUSTER" WITH ATTACHED:

E-BATTERY 41ST ARTILLERY QUAD 50 CALIBER (MG)

B-BATTERY 29TH ARTILLERY (SEARCHLIGHTS)

G-BATTERY 55TH ARTILLERY QUAD 50 CALIBER (MG)

H-BATTERY 29TH ARTILLERY (SEARCHLIGHTS)

6TH BATTALION 56TH ARTILLERY (HAWK)

6TH BATTALION 71ST ARTILLERY (HAWK)

"The **1st Battalion, 44th Artillery**, with attached **Battery G, 65th Artillery (M-55)**, and **Battery G, 29th Artillery (Searchlight)**, supported the 3rd Marine Division in northern I Corps area. Based at Dong Ha and Da Nang, 1/44 operated from Phu Bai in the south to Con Thien in the north and Khe Sanh in the west.

"The **5th Battalion, 2nd Artillery**, with attached **Battery D, 71st Artillery (M-55)**, and **Battery I, 29th Artillery; (Searchlight)**, was assigned to II Field Force Artillery at Long Binh [north of Saigon].

"The **4th Battalion, 60th Artillery**, with attached **Battery E, 41st Artillery (M-55)**, and **Battery B, 29th Artillery (Searchlight)**, belonged to the 41st Artillery Group of I Field Force Artillery and operated out of Qui Nhon, An Khe and Tuy Hoa. A separate Quad unit,

Battery G of the 55th Artillery, was assigned to the Americal Division at Chu Lai. Finally, **Battery H of the 29th Artillery (Searchlight)**, supported operations of the 9th Infantry Division.

The **6th Battalion, 56th Artillery (Hawk)** and **6th Battalion, 71st Artillery (Hawk)** were initially assigned to the 97th Artillery Group. The 6/56th provided air defense of the Tan Son Nhut, Bien Hoa, Long Binh and Qui Nhon areas. In 1968 the 6th Battalion, 56th Artillery (HAWK) became the first and only HAWK battalion to be assigned to an infantry division in a combat zone (Americal Division). The 6/71st was first stationed at Qui Nhon and relocated to Cam Ranh Bay in 1966.

Air Defense Artillery units were physically present in the Republic of Vietnam during the following periods:

ADA Unit	Arrived RVN	Left RVN
6/71 HAWKS	30-Sep-65	22-Sep-68
6/56 HAWKS	30-Sep-65	2-Aug-69
B/7/29 SLT	23-Oct-65	23-Jun-72
G/65 Quads	30-Oct-66	26-Dec-71
1/44 ADA	7-Nov-66	30-Dec-71
5/2 ADA	22-Nov-66	22-Jun-71
D/71 Quads	29-Nov-66	25-Jun-71
D/71 Quads	15-Sep-71	20-Mar-72
4/60 ADA	11-Mar-67	21-Dec-71
E/41 Quads	1-Mar-67	26-Dec-71
G/29 SLT	24-Mar-67	1-Oct-71
H/29 SLT	24-Mar-67	31-Mar-72
I/29 SLT	24-Mar-67	30-Apr-71
G/55 Quads	25-Feb-68	31-Jul-71
VULCAN	8-Oct-68	11-May-69
ADA Presence	30-Sep-65	23-Jun-72

- Vietnam Order of Battle, Stanton 1987

"Each of the Air Defense battalions had over a thousand men, but the units never fought as batteries, much less as battalions. Demands for fire support far outstripped availability of weapons, and individual fire units were quickly scattered throughout the battalions' areas of responsibility. Each Duster battery had two firing platoons, both of which could be employed independently, as could the six firing sections of each machine-gun battery. As a result, the war fought by the Air Defense gunners in Vietnam was overwhelmingly a sergeant's war, as detached platoons and firing sections found themselves under the operations control of other types of units. Normal missions for the automatic weapons included convoy security, perimeter defense, and fire support for maneuver operations."

"Automatic-weapons units began to stand down early in 1971 and had left Vietnam completely by mid-1972. By that time, the Quad and three Duster battalions sent to Vietnam had fired well over four million 40mm rounds and 10 million .50-caliber rounds in support of American, Vietnamese and Allied forces."

- Charles E. Kirkpatrick, in "Arsenal", *Vietnam* magazine, Spring '89

ADA Equipment in Vietnam

The Duster



M-42A1 self-propelled 40mm anti-aircraft gun system

Crew	6 [usually 4-5 in actual combat conditions]
Armament	Twin 40mm cannon, one 7.62 mm machine-gun
Ammunition	Main anti-aircraft: 480 rounds
	Types: Armor-Piercing Tracer and High Explosive Tracer
Armor	All-welded steel - thickness: 9mm-25mm (0.35-0.99in)
Dimensions	Length (including guns): 20ft 10in (6.356m)
	Length (hull): 19ft 1in (5.819m)
	Width: 10ft 7in (3.225m)
	Height: 9ft 4in (2.847m)
Weight	Combat: 49,500lbs (22.452kg)

Ground pressure	9.24lb/in ² (0.65kg/cm ²)
Engine	Continental (or Lycoming) six-cylinder air-cooled gasoline engine developing 500bhp at 2,800rpm
Fuel Capacity	140 US gallons (530 liters)
Performance	Road speed: 45 mph (72km/h)
	Range: 100 miles (161km)
	Vertical obstacle: 2ft 4in (0.711m)
	Trench: 6ft 4in (1.828m)
	Gradient: 60 %
Source: <i>The Illustrated Encyclopedia of the World's Tanks and Fighting Vehicles</i>	

Vehicle Specs



Production of the M41 Walker Bulldog tank was undertaken by the Cadillac Car Division of the General Motors Corporation at the Cleveland Tank Plant and first production models were completed in 1951. The M41 was the first member of a whole family of vehicles sharing many common components. The family included the M42 self-propelled anti-aircraft gun or Duster as it is also known, which was in production from early 1952 to December 1959. Production of the M42 amounted to 3700 units.

The driver and radio operator are seated at the front of the vehicle with the other four crew members in the turret, which is in the center of the hull. The engine and transmission are in the rear. The M42 has torsion-bar suspension consisting of five dual rubber-tired road wheels with the idler at the front and the drive sprocket at the rear, and three track-return rollers. The first, second and fifth road wheel stations have a hydraulic shock absorber. The steel tracks have replaceable rubber pads.

- Source: *The Illustrated Encyclopedia of the World's Tanks and Fighting Vehicles*

Armament

The main armament consists of twin 40 mm cannon mounted in an open-topped turret. These have hydraulic elevation from -3 degrees to +85 degrees, and traverse through a full 360 degrees. Manual controls are also provided, and with these the guns can be depressed a further 2 degrees. Each barrel has a cyclic rate of fire of 120 rounds per minute. Maximum anti-aircraft range is 5,000 meters and maximum ground-to-ground range is 9,475 meters.

- Source: *The Illustrated Encyclopedia of the World's Tanks and Fighting Vehicles*

"Light air-defense guns, of calibres from 20 to 40 millimetres, were developed in the 1930s for protection against dive bombers and low-level attack. The most famous of these was a 40-millimetre gun sold by the Swedish firm of Bofors. Virtually an enlarged machine gun, this fired small exploding shells at a rate of about 120 rounds per minute--fast enough to provide a dense screen of fragments through which the aircraft would have to fly. Fire control was largely visual, though some guns were equipped with predictors and power control."

- *Encyclopaedia Britannica*

"The Duster's Bofors 40mm guns had been well tried by both sides in World War II. Loaded with four round clips, the guns could fire at a rate up to 240 rounds per minute to a theoretical extreme range of 9,200 meters. All 40mm ammunition was tracer, however, and the system was designed primarily for direct fire on pinpoint targets at ranges of approximately 2,000 meters, where the gunner could see the strike of the rounds. The two-round HEIT projectile used in Vietnam was point-detonating and designed to self-destruct at 3,500 meters.

- Charles E. Kirkpatrick, in "Arsenal", *Vietnam magazine*

Most of the 40mm ammunition was stored in the ammunition containers along the tops of the track guard either side of the turret. Three sighting devices are incorporated into the fire-control system:

1. Computing sight M38 - designed to control fire of the cannon against both air and ground targets.
2. Reflex sight M24C - designed to superimpose a graticule pattern in the gunner's line of sight.
3. Speed ring sight - used during manual operation if a power failure or local control system malfunction occurs.

- Source: *The Illustrated Encyclopedia of the World's Tanks and Fighting Vehicles*

M-55 Quad 50



Near LZ Betty, 1968

Known as the 'Whispering Death' - each M-55 Quad 50 consisted of four Browning M2 .50-caliber machine guns mounted in a power turret. The M55 received a new, more powerful generator in the 1960s and served through the Vietnam War, usually mounted in the back of an M35 2.5 ton or M54 5-ton gun trucks. The Quad 50 is operated by two loaders and one gunner. A full complement crew also included a squad leader who directed fire and a driver when the turret was mounted in a truck. The mount is capable of traversing a full 360 degrees around, with an angle elevation between -10 and +90 degrees. Traverse and elevation are electrically driven, powered by two rechargeable 6-volt batteries. All four guns could be fired at once, but standard practice was to alternate between firing the upper and lower pair of guns, allowing one pair to cool while the other was in use. This allowed for longer periods of action as overheating of the gun barrels was lessened. Intended With an effective rate of fire of 1,000 to 1,500 rounds per minute, the Quad in action "could literally suck the life out of a hillside at ranges up to half a mile". Quad 50s were employed in fire base and fixed landing zone security as well as convoy escort operations.

"Generally speaking...Quads could not go cross-country in support of maneuver units. But in operations away from established road nets where heavy machine-gun support was needed, it was possible to slingload the Quad with the CH-47 helicopter."

- Charles E. Kirkpatrick, in "Arsenal", *Vietnam magazine*

Searchlights



1LT James Perry I Battery, 29th Artillery (Searchlights) & Sergeant Moore, who was in charge of two jeep-mounted infrared searchlights. Duster compound near Long Binh, Vietnam, Nov 1968

Both Dusters and Quads "served well in perimeter defenses, where gunners could establish clear fields of fire and alternate firing positions. It was there that the AN/TVS-3 (30-inch) and the newer AN/MSS-3 (23-inch) searchlights were most useful, too. Focused to its brightest setting, The larger AN/TVS-3 carbon arc lamp could put out 400 million candlepower — far brighter than direct sunlight at noon — onto a target nearly 10,000 yards away. The smaller 23-inch xenon searchlights were similar to traditional arc lamps, these types shoot electricity between electrodes in a chamber full of ionized xenon gas and could put out 120 million candlepower.

In addition to being simpler and more efficient, the new AN/MSS-3 lights were small enough to fit on a standard M-151 jeep — and were able to put out beams in the visible or infrared spectrum. With special binoculars or telescopes, troops could see enemies without giving away their positions. Having found the enemy, gunners switched to visible light mode for target illumination and engagement. Quads and Dusters were quickly on target because the men routinely laid searchlight azimuth indicators parallel with the automatic weapons.

The other major use of searchlights was to bounce light from clouds to improve vision for friendly patrols and nearby positions using starlight scopes."

- Charles E. Kirkpatrick, in "Arsenal", *Vietnam magazine*

Hawks



Rocket launcher Chu Lai, Vietnam, Eddie Donato



A Hawk PAR radar

"Hawk means 'Homing All-the-Way Killer' and is a surprisingly long-lived US system which began development in 1952 and is still in use worldwide today. It was designed to be a low-level system for deployment with field armies. Although cumbersome and needing large numbers of men and vehicles, it was accepted because nothing else was remotely as good, and with a few modifications it has remained perfectly serviceable. The missile has a two-stage solid fuel motor, giving both an initial high acceleration rate and sustained thrust. The original launcher was a three-missile cluster on a trailer but fixed and mobile launchers with up to nine missiles are now in use. The Hawk is a radar homer which picks up signals from a radar which are reflected by the target, and steers itself to the interception."

- Source: Ian Hogg, *Twentieth Century Artillery*, p. 230

The radar used in Vietnam consisted of four systems depending upon requirements, the PAR: Pulse Acquisition Radar—a search radar with a 20 rpm rotation, for high/medium altitude target detection, the CWAR: Continuous Wave Acquisition Radar—a search doppler radar with a 20 rpm rotation, for low altitude target detection, the HPIR: High Power Illuminator doppler Radar—target tracking, illumination and missile guidance and the ROR: Range Only Radar—K-band pulse radar which provides range information when the other systems are jammed or unavailable.

Hawk personnel in HHB took part in the battle for Widows Village where a battalion of NVA were holed up during Tet 68. The unit received the Vietnamese Cross of Gallantry w/Palm for that action and others in the protection of these areas. HHB 6/56 was also prominent in civil action to prepare the villages against the VC.

Vulcans



HAVE GUN WILL TRAVEL

C Battery, 5th Battalion, 2nd Artillery, Dong Tam, 1969

An Air Defense Vulcan test unit was deployed to Vietnam in late 1968. The unit, called the "Vulcan combat test team", consisted of a platoon of four XM-163 vehicles each mounting the Vulcan M16A1 six barreled gatling gun on a converted M113A1 chassis, plus one spare. (These were proper mods and not "in country" lash-ups of turrets and mini guns). The unit was attached to the 5/2nd Artillery operating out of Long Binh. Vehicles 1 & 2 had range only radar, whilst the remainder had dummy radars, presumably as they'd probably be used in a ground role (not Anti Aircraft). They were used mainly in the convoy escort role. Like all armored personnel carriers, however, the front of the Vulcan proved vulnerable to enemy RPGs.

The unit trained at Ft. Bliss, Texas, and all men were volunteers. Initially sent to Vietnam for ninety days, the team of 28 men (supplemented by soldiers from the 5/2nd Artillery) extended for an additional forty-five days. All men earned Army Commendation medals or Bronze Stars and two were killed in action. One of the KIA's was the commanding officer. (One NCO went on to serve later with the 1/44th Artillery and earned a Silver Star.)

- researched by Martin Tingey and Gary Puro (See *Vietnam Tracks* by Simon Dunstan.)

The 1/44th Artillery battalion is now part of the AWE at Ft Hood, Texas, headquarters of the 4th Infantry Division. The 1/44th is now equipped with Bradley infantry fighting vehicles with Stinger missile pods mounted on them.

Deployment of Dusters, Quad 50s and Searchlights



HAVE MERCY LIKE HELL I WILL
A Battery, 5th Battalion, 2nd Artillery, Lai Khe, 1969

"Once recovered from the National Guard, the old anti-aircraft weapons went to Vietnam by the battalion. Starting in the fall of 1966, the U.S. Army deployed three battalions of Dusters to the Republic of Vietnam, each battalion consisting of a headquarters battery and four Duster batteries, and each augmented by one attached Quad-50 battery and an artillery searchlight battery."

"M-55s and M-42s were old pieces of equipment that needed a lot of maintenance and required hard-to-get spare parts. The gasoline-powered Dusters were particularly susceptible to fires in the engine compartment. Thus, despite its cross country capability, it was not wise to use the Duster in extended search and destroy operations in heavy jungle terrain because of excessive wear on engines, transmissions and suspensions.

"On the plus side, the Duster was essentially a fairly simple piece of machinery on which the crews could perform maintenance. Better yet, the Duster's high ground clearance and excellent suspension-system design gave it an ability to withstand land mine explosions with minimal crew casualties.

"Although the Duster's 40mm shell had a terrific blast and fragmentation effect, it also had a highly sensitive point-detonating fuse that limited effectiveness in heavy vegetation. Under those conditions, the better weapon was the Quad, because the heavy .50-caliber projectile could easily punch through cover that would detonate the Duster's 40mm shell too early for it to be effective. At long ranges, however the 40mm shell was far more useful, particularly against field

formations. The Duster also was able to deliver indirect fires by using data from field artillery fire-directions centers."

"Soldiers of the 1/44th Artillery and their Marine counterparts in I Corps set the pattern of Quad and Duster operations. Because of an early scarcity of armored-combat vehicles, M-42s were first used as armor. Often thankful men quickly learned the value of high volumes of 40mm and .50-caliber fire, both in the field and perimeter defenses. Quads beefed up the defenses of remote fire bases, while Dusters accompanied both supply and tactical convoys along contested highways to break up ambushes. Dusters of Battery C, 1/44th Artillery, led the task force of Operations Pegasus that broke the siege of Khe Sanh in April 1968. Dusters and Quads provided critical final-protective fires throughout Vietnam during the Tet offensive and later took part in Operation Lam Son 719. Whenever fire support was needed, M-42s and M-55s could be found."

- Charles E. Kirkpatrick, in "Arsenal", *Vietnam magazine*