

# U.S. Army Flamethrower Vehicles

## (Part Three of a Three-Part Series)

*By Captain John Ringquist*

### Army Flamethrower Vehicle Research and Development (1945–1953)

Following World War II, Army research involving flamethrower tanks initially focused on two variants of the M26 medium tank. The T-35 was a joint Chemical Warfare Service/Ordnance Board project involving the modification of an M26 tank so that a coaxial flame gun and a 90-millimeter cannon were housed in the same turret.<sup>1</sup> In July 1948, the Army concluded that there was no longer a requirement for a main armament flamethrower and the T-35 experiment was cancelled. Next, the Army pursued further development of a kit that was designed to transform the M26 into a flamethrower tank without the need for a complete vehicle conversion, thus minimizing the time required for the transformation. The approved unit (designed by Chemical and Radiological Laboratories [CARL], Edgewood Arsenal, Maryland, and built by the M.W. Kellogg Company) consisted of a nonintegral flame gun and trailer. An E-29 flame gun could be mounted on the glacis plate of the M26 which, in turn, could tow a motorized, 500-gallon E-24 fuel trailer.<sup>2</sup> The E-24 trailer could be remotely operated from within the tank and was equipped with a quick-disconnect linkage. The unit, which was delivered to the U.S. Army Chemical School on 10 January 1953, tested well, as it demonstrated a 190-yard range.<sup>3</sup> However, despite its performance, it was not further developed. Other research and development had indicated that low-cost operational flamethrower tanks could be created with minimal effort and no need for a trailer.

In 1953, CARL and the Ground Munitions Branch, Munitions Division, Edgewood Arsenal, developed a flamethrower vehicle that used an improvised 3/8-inch armor plate miniturret and a Canadian “Iroquois” flame gun. The tank was modified in three days “to show how quickly an obsolete tank could be converted to a flame tank. The experiment used the same tank that had been used for the T-35 tests and employed the same model of flamethrower used on the T-65 AUV [action utility vehicle]/APC [armored personnel carrier].”<sup>4</sup> While this experiment proved that obsolete vehicles could be restored to utility using attachable flamethrowers, other vehicles were under consideration for use as flamethrower platforms.

The vehicle selected for further development was an M39 AUV modified by Detroit Arsenal, Warren, Michigan, under the direction of CARL.<sup>5</sup> Authorization was granted on 24 April 1952. Two trial installations were



T-65 AUV/APC with a flame gun

sent to Fort Knox, Kentucky, for testing and establishing doctrine. A Canadian “Iroquois” flame gun was operated from a commander’s cupola. The range of a flame gun equipped with a 0.89-inch nozzle was 180 yards at a pressure of 2,000 pounds per square inch (psi). While this vehicle appeared promising, it was not further developed and the project was discontinued in favor of the M67 flamethrower tank.

### **M67 Flamethrower Tank**

The Marine Corps did not concur with the Army’s decision to halt development of main armament flamethrower tanks in 1948. Therefore, the Marines submitted a requirement for a medium tank armed with an integral flamethrower to support amphibious operations.<sup>6</sup> This was not surprising since main armament flamethrower tanks played a key role in Pacific operations during World War II—especially in Okinawa and Iwo Jima.

The prototype T66 tank was completed in May 1952—too late for participation in the Korean War, where Marine Corps M4A1 POA-CWS-H5 tanks fit the bill. The test results were promising; the new flamethrower delivered flame up to 250 yards at a firing angle of 30° through a dummy 90-millimeter gun tube. The design, however, was quickly superseded when the M48 became available for development as a flamethrower tank.

The M48A2 medium tank was modified with an M7A1-6 flamethrower tank turret, resulting in the M67 flamethrower tank, which was finalized in 1953. The flamethrower could be installed as the main armament of the M48 tank or as T-89 kits manufactured by the Chrysler Corporation.<sup>7</sup> The T-89 was a complete kit

that, in 8 hours, could be used to convert an M48 main gun turret to an M67 configuration, with 365 gallons of fuel storage where 90-millimeter shells had been stored in turret racks in the M48. Refueling for the M67 was supported by a dedicated, 2½-ton, truck-mounted service unit.<sup>8</sup> The fuel storage limitations of the M67 could, therefore, be overcome with the aid of a refueling truck deployed to the area of operations.

The flame gun was installed in a dummy 90-millimeter gun tube equipped with vent holes to allow air to enter the combustion chamber and a removable top cover to allow access to ignition components. Several modifications to the outer tank fixtures were required. For example, headlight covers were flattened and—since the loader’s hatch was taken up by flamethrower controls—top entry to the tank was restricted to the commander’s hatch. The flame gun featured a firing range of +45° to -12°. With a ⅞-inch nozzle and a pressure of 300 psi, the gun fired thickened fuel up to 280 yards. The use of interchangeable ⅞-inch and ¾-inch nozzles resulted in firing times of 55 and 61 seconds, respectively.<sup>9</sup> The M67 was operated by a three-man crew. The gunner fired the flame gun and the coaxial machine gun.

The Marine Corps developed the M67 to its highest level by using the M48A3 to update and upgrade M67 tanks to M67A2 standards. The M67A2 was used extensively in Vietnam; however, it was not the only flamethrower vehicle employed in Vietnam. In 1963, the flamethrower APC concept was revived. The M113 APC was coupled with a flame gun, resulting in the M132 self-propelled flamethrower carrier.

### **Flamethrowing Armored Personnel Carriers**

The M113 APC, which was developed by FMC Corporation, quickly lent itself to a number of roles that took advantage of its small size, low weight, amphibious abilities, and ability to operate on nearly all types of terrain. The development of the M113A1 into the M132A1 in March 1963 was a U.S. Army Chemical Corps concept. A number of changes were necessary for the M113 to be used as a flamethrower vehicle.

The M10-8 flamethrower was added to a specially designed cupola on the M113A1 hull. The M10-8 gun was capable of a full 360° rotation and could fire at angles of +55° to -15° from the



**M67 flamethrower tank**

vehicle turret. With 200 gallons of fuel, the gun could fire up to 200 meters (approximately 650 feet) for 32 seconds.<sup>10</sup> In some cases, the flame gun fired an initial “wet burst” of unignited fuel that stuck to a target and then fired a second “flaming burst” that achieved a more damaging effect.

The rear compartment of the APC was stripped, and a removable rack system was installed in place of the troop seats. Inside the APC, the 200 gallons of fuel were stored in four 50-gallon spherical fuel tanks. This was enough fuel for 32 seconds of continual flame or 200 one-second bursts. With the 200-meter range and a 7.62-millimeter machine gun in a coaxial mount as a secondary armament, the M132A1 could effectively suppress and then engage an enemy in fortifications in urban areas or jungles stripped by Rome plows. The M132A1 could also keep pace with M113A1 APCs and M48 tanks. A two-man crew operated the M132—one person drove the APC, and the other operated the flamethrower.

Weapon performance in the field was impressive, and the demand for the M132 as a support weapon was high. Several tactics were employed to adapt the M132 for use with supported Army, Marine, and Navy units. For example, the Navy backed M132 APCs onto two armored troop carrier (ATC) vessels on the Mekong River and fired the flamethrowers over the sides. The flamethrowers were nicknamed “Zippos” due to the lighter used to ignite the napalm fuel when the electrical igniters failed.<sup>11</sup> A 2½-ton fuel truck was placed onboard a third ATC vessel. In other engagements, the M132 participated in convoys in which the devastating effect of the flamethrower was used against ambushers operating from within thick vegetation along roadsides. One story of the Battle of Ap Tau O in 1966 recounts how an M132 destroyed a Vietcong 57-millimeter recoilless rifle team with a 3-second flame burst.<sup>12</sup>

The aluminum armor of the M132 was incapable of withstanding artillery fragments, large-caliber weapons, mines, or rocket-propelled grenades. Because the APC was vulnerable to enemy attacks, it was completely relegated to a support role, operating in conjunction with infantry and armor support. In addition, the M132 had a high fuel consumption rate and required significant time to return to a safe area for refueling.<sup>13</sup> These limitations required the selective use of the gun and targets engaged. However, the M132 was somewhat successful given that headquarters companies of U.S. armor and cavalry units

were assigned at least one M132 and Republic of Vietnam units were assigned four M132s per armored regiment. Many individual vehicles were also assigned to other units for temporary duty due to their effectiveness against bunkers and other fortifications.<sup>14</sup>

The M132 was a valuable contribution to the American war effort in Vietnam. Modifications based on the M10 turret later came to be major components of riverine strategy as Navy vessels were mounted with flamethrowers. However, the M132 flamethrower design was not retained in the U.S. military. And in the 1980s, flame weapons were gradually phased out of U.S. Army and Navy inventories. The last flame weapon in Army service is the M202, which is armed with four triethylaluminum-filled rockets. Flamethrower vehicles and man-packed flamethrowers are no longer being used in combat.

#### Endnotes:

<sup>1</sup>U.S. Army Chemical Museum Notes: T-35 tank photo and T-35 development.

<sup>2</sup>Ibid., E-24-29 and photo 18169, M26 and E-24-29.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid., Deturreted M26 Flame Thrower [*sic*] and photo. (The T65 mechanized flamethrower vehicle was an experimental vehicle derived from the AUV/APC vehicle class that was recommended for a variety of roles by the Ordnance Branch in the early 1950s.)

<sup>5</sup>Ibid., T-65 Flame Thrower [*sic*] AUV/APC and photo.

<sup>6</sup>Ibid., T-66.

<sup>7</sup>Ibid., T-67.

<sup>8</sup>Ibid., AGO 2661A, p. 4.

<sup>9</sup>R.P. Hunnicutt, *Patton: A History of the American Main Battle Tank*, Volume 1, Presidio Press, Novato, California, 1984, p. 250.

<sup>10</sup>Fred W. Crismon, *U.S. Military Tracked Vehicles*, Motorbooks International, Osceola, Wisconsin, 1992.

<sup>11</sup>“9th Infantry Division Flame Throwers APC’s In Vietnam Served Many Units—Affectionately called ‘Zippos,’ 1967,” *River Currents*, Mobile Riverine Force Association, Vietnam, Volume 13, Number 1, Spring 2004, p. 6 (mistakenly labeled “Volume 12, Number 4, Winter 2003” on the front page of the publication), <<http://www.mrfa2.org/PDF/spring04.pdf>>, accessed on 19 March 2008.

<sup>12</sup>“The FReeper Foxhole Remembers Battle of Ap Tau O (6/8/1966)—June 8th, 2003,” <<http://www.freerepublic.com/focus/f-vetscor/925211/posts>>, accessed on 13 March 2008.

<sup>13</sup>After-Action Report (AAR) 56, Headquarters, 25th Infantry Division, 22 October 1968.

<sup>14</sup>*River Currents*, p. 6.

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