



Art by Jody Harmon

# Development of the American Tank-Infantry Team During World War II in Africa and Europe

by Captain J. L. Mudd

The American tank-infantry team was the key maneuver element that led to the overwhelming number of tactical successes enjoyed by the United States in the Second World War.<sup>1</sup> However, this winning combination of men and machines had developed throughout the course of the war, and included a number of variations based on the theater and areas within each theater. Original development came from training and lessons learned in the decades between the two world wars by infantry tank and cavalry combat car units.<sup>2</sup> When General Marshall was made Army Chief of Staff on 1 September 1939 (the day of Germany's attack on Poland), he began a major reorganization of the service in order to put it on a wartime footing more like that of its European counterparts.<sup>3</sup> One of the changes was the creation of the Armored Force, a combination of the armored elements of the infantry and cavalry branches, as well as sufficiently mobile components of artillery, communications, and other services.<sup>4</sup>

## Tanks

Tank combat doctrine developed in the 1920s and '30s called for two types of tanks: a light tank armed with machine guns and a small-caliber cannon to engage "soft" targets and a medium tank with machine guns and a heavier cannon

to destroy antitank weapons, bunkers, and unarmored or lightly-armored vehicles.<sup>5</sup> When the United States Army entered World War II, the two main tanks in its arsenal were the M3 light tank and the M3 medium tank.<sup>6</sup> The Light Tank, M3 Series weighed approximately 14-16 tons, depending on the model, and was armed with a 37-mm cannon and up to five .30-caliber machine guns. Its thickest effective armor was 1.75 inches on the turret front and 3 inches on the hull front. However, most units armed with M3s replaced them with the M5 light tank prior to combat overseas. The M5 was very similar to the M3, but had some engine and other design improvements. (Later models of the M3 incorporated some of these improvements.)<sup>7</sup>

The Army's first wartime medium tank was the M3 series, nicknamed variably "Lee" or "Grant" by the British.<sup>8</sup> The Medium Tank, M3 mounted a 75-mm cannon in a starboard hull sponson, a 37-mm gun in the turret, and three .30-caliber machine guns — one each in the bow, coaxial in the turret and in the commander's cupola. Its heaviest effective armor was 6.5 inches on the turret front and 4.3 inches on the front slope of the hull.<sup>9</sup> During the fighting in North Africa, the M3 began to be replaced by the Medium Tank, M4 — the Sherman. The M4 appeared in a number of varia-

tions, and its weight ranged from 33 to almost 36 tons. Typically, the tank carried a 75-mm gun, but many were later fitted with a 76-mm higher velocity cannon. It bristled with bow and coaxial .30-caliber machine guns and a flexible turret-mounted Browning .50 caliber machine gun for anti-aircraft use. Armor on the turret front was 3.75 inches in effective thickness, while the hull front was effectively up to four inches thick.<sup>10</sup>

Both medium tanks employed five-man crews. The tank commander's job was to select targets, defensive positions and routes of advance, and supervise and lead the tank crew at all times. In the five-tank platoon, the platoon leader (usually a first or second lieutenant) and the platoon sergeant, a staff sergeant, each commanded a tank. Sergeants commanded the remaining three. The gunner, a corporal or technician 5th grade, was to identify and engage targets with either the main gun or the coaxial machine gun. The remaining three crewmen were junior enlisted soldiers — technicians, privates first class or "buck" privates. The driver controlled the speed and direction of the vehicle in accordance with the commander's orders. The assistant driver/radio operator ensured that vehicular communications (both internal and external) were functional, and engaged targets with the bow-mounted machine gun. The

loader was typically the most junior crewmember. His job was to load the main gun during engagements and to assist the commander in looking for targets when not in actual combat. Only four crewmen manned light tanks; the tank commander assumed the duties of loader as well.<sup>11</sup> All members participated in crew-level maintenance of their tank, and usually assisted mechanics assigned to the company.<sup>12</sup>

Normally, all tankers underwent initial training at Fort Knox, Kentucky's Armored Replacement Training Center (ARTC).<sup>13</sup> In theory, men inducted under the Selective Service Act were to be trained in accordance with their civilian occupations, prior training, even hobbies, whenever possible. Under this theory, if a man were a professional wilderness guide, he went to the infantry; if a ham radio buff, to the Signal Corps; a heavy equipment operator, to the engineers or the Armored Force. Although this consequently benefited some of the more technical services of the Army, the combat arms received mainly "any arm or service" inductees.<sup>14</sup> Training was lengthened from 12 to 13 weeks in 1941, and was later increased to 17. Conducted in two phases, the first was devoted to basic soldier skills such as infantry drill, physical fitness training, and small arms marksmanship. The second phase introduced the trainees to tank skills: driving, maintenance, tactical movement, and gunnery. Much of this was conducted under "combat conditions," including flares, explosions, gunfire sound effects, and even a special aggressor unit dressed as German soldiers.<sup>15</sup> Upon completion of training, the majority of new tankers reported to the armored divisions or separate tank battalions.

The combat elements of a tank battalion included the reconnaissance and assault gun platoons of the headquarters company, three companies of medium tanks and one of light tanks.<sup>16</sup> Each tank company had three platoons of five tanks and two tanks in the headquarters section. Additionally, a medium company boasted an assault gun — an M4 armed with a 105-mm howitzer as its main armament. Each medium company was assigned five officers and 117 enlisted men; a light company was somewhat smaller with only 92 enlisted personnel. The tank's advantage in close battle was its relative imperviousness to small arms and indirect fires. Its array of weapons gave the

tank awesome firepower against almost any target. However, the tank was highly vulnerable to both antitank guns and infantry antitank teams, as well as antitank mines and obstacles. Against these foes, the tank had a partner in a man and his rifle — the infantryman.

## Infantry

The American infantry squad in World War II consisted of 12 men armed mainly with M1 semiautomatic .30-caliber rifles.<sup>17</sup> The linchpin of the squad was the Browning Automatic Rifle (BAR), a light automatic weapon with a cyclic rate of fire of either 300-350 or 500-600 rounds per minute. The rifle squad of the armored division's armored infantry battalions was similar, but one squad member was assigned as the M3 half-track personnel carrier driver who normally remained with the vehicle, and had no BAR.<sup>18</sup> The mechanized rifle platoon was mounted on five M3 halftracks and boasted a vast array of weapons. There were three rifle squads, as in a dismounted infantry platoon, but the armored infantry platoon leader also had a 60-mm mortar squad (an eight-man mortar crew) and a light machine gun squad (12 soldiers manning one .50-caliber machine gun and two .30-caliber machine guns). The dismounted infantry company centralized these special squads in a separate weapons platoon. There, the platoon fielded a section of three 60-mm mortars and a section of two .30-caliber machine guns. Additionally, the mechanized company had a platoon of towed 57-mm antitank guns, each operated by a ten-man squad.

Both mechanized and traditional infantry battalions possessed three rifle companies plus an additional complement of organic combat forces. The armored infantry battalion had a reconnaissance platoon of half-track mounted scouts, an assault gun platoon with three 75-mm self-propelled assault guns, a mortar platoon with three 81-mm tubes, and a machine gun platoon with four .30-caliber machine guns. The infantry battalion had a single antitank platoon of three 57-mm guns, and a heavy weapons company with a platoon of six 81-mm mortars and a platoon of four .30-caliber machine guns.

The age-old mission of infantry is to close with and destroy the enemy. The usual method employed by the American infantry squad was based on the covering

fire tactics as used in the final phase of World War I,<sup>19</sup> referred to as "fire and maneuver."<sup>20</sup> Two riflemen, often accompanied by the squad leader scouted ahead of the squad.<sup>21</sup> When they encountered an enemy force, the leader called for his four-man fire team (Baker) to place suppressive BAR and rifle fire on the enemy position. With the enemy pinned, the leader ordered his remaining five-man maneuver and assault team (Able) into a position where they could assault by fire, then overrun the enemy. If enemy fire was such that assaulting riflemen were unable to maneuver, tank support was necessary. Infantry units from squad to corps used a variation of this tactic under most circumstances in all theaters of the war, typically sending specialized reconnaissance units to scout the front and flanks; providing supporting fires with artillery, machine-gun and antitank fires; and finally assaulting with infantry and tanks.

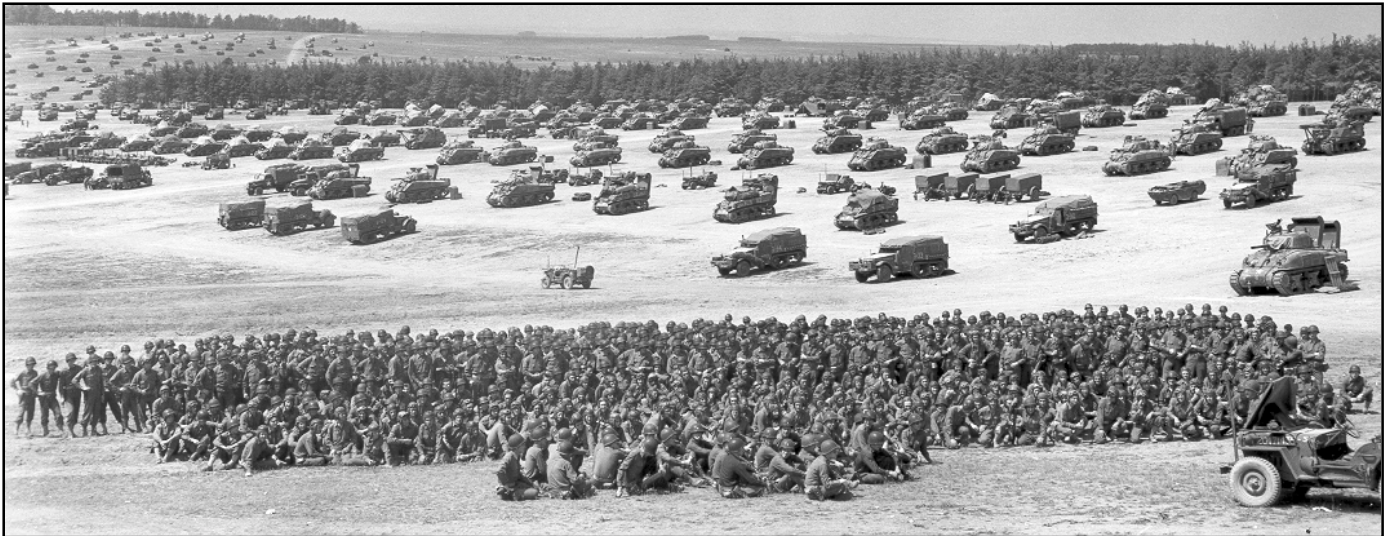
Another style of assault tactic developed during the war — the marching fire offensive.<sup>22</sup> General Patton's 3rd Army used it to good advantage in northwestern Europe, and though it was sometimes effective in Italy, the terrain generally did not favor it. The method placed tanks and halftracks at intervals within dense skirmish lines of dismounted infantry. The entire line moved abreast, firing at possible strongpoints and other targets as they advanced. Although it maximized mutual support, it reduced shock effect and tended to increase casualties. Its use was often the result of a lack of mental flexibility on the part of commanders.<sup>23</sup>

## Officers

The main roles of the Army officer in World War II were to plan operations and training, administer military justice under the Articles of War, and lead soldiers in combat. Officers held their commissions not only in the Army, but also in one of the several arms or services, called a "branch." When the Armored Force was established, it was not created as a separate branch, but was made up of personnel of all arms and services. Tank officers and crewmen typically came from the infantry or cavalry branches, but wore the Armored Force insignia: the profile of a World War I British Mark IV tank.

Tank and infantry officers came from one of four commissioning sources: the United States Military Academy at West Point, New York (USMA); the Reserve





Officers' Training Corps (ROTC); one of the officer candidate schools (OCS) run by the Armor or Infantry Training Centers; and for a deserving few, direct battlefield commissions. USMA graduates were appointed Regular Army officers, and their pre-commissioning training included instruction in all of the arms. Graduates of ROTC programs located at civilian universities trained in one of the arms or services as cadets and were commissioned into their respective branches.<sup>24</sup> Until the mobilization of 1940-42, the majority of these officers did not enter active service, but were placed in an inactive status in the Officers' Reserve Corps (ORC).<sup>25</sup> The ORC provided a trained pool for the great number of officers needed when the Army expanded in the early 1940s. The Armored Force School at Fort Knox, Kentucky, and the Infantry School at Fort Benning, Georgia, each established an officer candidate school to train and commission qualified enlisted soldiers and warrant officers.<sup>26</sup> Candidates were carefully screened and selected based upon demonstrated performance and leadership aptitude. As combat losses began to take their toll on the officer corps, the practice of commissioning combat-experienced sergeants with proven leadership talents was revived in the form of the battlefield commission.<sup>27</sup>

For USMA and ROTC graduates, as well as officers transferring into the Armored Force from other branches, the Armored Force School conducted an orientation course to familiarize students with tank tactics, gunnery, maintenance, Armored Force organization, and to refresh other military skills.<sup>28</sup> The three-month Infantry and Armored Force OCS courses taught candidates the skills needed to be effective platoon leaders in their respective specialties, including small-unit tactics, Army organization, philosophy of leadership, and enemy

combat doctrine. Those veteran combat leaders selected by their commanders to become officers generally were young noncommissioned officers who had proven their abilities under fire. They received no additional training; their experience was considered sufficient.

### Growing Pains

The fighting elements of the Armored Force consisted originally of the 1st and 2nd Armored Divisions, which formed the I Armored Corps,<sup>29</sup> and a number of separate tank battalions. The divisions reflected the new "triangular" infantry division organization, with a brigade comprised of two light tank regiments and a medium tank regiment. By March of 1942, as the number of armored units grew, this was changed to two tank regiments, each now with two medium and one light battalion, and an armored infantry regiment — three infantry battalions equipped with halftracks.<sup>30</sup> The assignment of infantry to the armored division eventually afforded commanders the opportunity to develop combined arms tactics and train their soldiers to use and refine them.<sup>31</sup>

The separate tank battalions were to keep an infantry flavor. Doctrine for these "infantry tanks" specified a two-echelon attack.<sup>32</sup> The lead echelon consisted of medium tanks and would destroy enemy antitank weapons. The second wave included light tanks advancing with infantry to neutralize machine guns and targets of opportunity. Infantry divisions and separate tank battalions rarely enjoyed the benefits of sufficient combined training prior to actual combat. Habitual associations between tanks and infantry generally did not develop until well into the war, but there are examples of early training relationships. One of these was the partnership of the 3rd Infantry Division with the 756th Tank Battalion (L) while they were stationed at Fort Lewis, Wash-

**This photograph shows all of the men and machines that made up the 66th Armored Regiment, part of the 2nd Armored Division, assembled on a hillside in Southern England about a month prior to entering the war in Europe.**

ington, from the summer of 1941 until spring 1942.<sup>33</sup> The tankers took advantage of all possible training time to improve their abilities to use their speed and firepower in support of dismounted infantry. On two occasions in the immediate aftermath of the Japanese attack on Pearl Harbor, the tank-infantry teams reacted to alerts that brought them to the mouth of the Columbia River on the Washington coast, prepared to repel Japanese invasion.

As part of Amphibious Corps Pacific Fleet, the soldiers of Fort Lewis were expecting to be employed in the Pacific Theater. Company B of the 756th and the 15th Infantry moved to Monterey Bay to practice amphibious landings at Fort Ord, California.<sup>34</sup> At this very early stage of the war, the specialized equipment and techniques that would later make amphibious tank assaults a realistic proposition were not yet available. The Navy's solution was to lower the new M3 light tanks by crane from the ship's deck into violently bobbing landing craft several yards below. A number of tanks were lost this way before the naval crane operators became reasonably proficient.

The combined arms training undertaken by the 3rd Infantry Division and the 756th Tank Battalion (L) reflected a major push by the Armored Force to increase infantry-tank proficiency.<sup>35</sup> In early 1942, COL Edwin K. Wright, Armored Force Assistant Chief of Staff, G-3

(Operations and Training), began stressing the need for combined arms training, emphasizing tank support of infantry divisions in the attack. Army Ground Forces, the Armored Force's higher headquarters, "replied with a supplement to its initial training directive, stating that 'combined infantry division-tank unit training will be emphasized,' and that problems for the maneuver period should include infantry-tank unit operations."<sup>36</sup> However, this training often did not occur, or at least not to levels which made for real combined operations proficiency. COL Wright, in analyzing reports from the North African battlefield in May 1943, wrote the following:<sup>37</sup>

*In spite of constant attempts to provide infantry division-tank battalion cooperative training in this country, practically no success has been obtained. All infantry division commanders, whether contacted direct or through Army Ground Forces, have indicated the desirability of such training but fend it off on the excuse that "Time is not available," "After we complete our unit training," "After we finish maneuvers," etc. Army Ground Forces has been of no assistance to us in forcing this training.*

*The results of this failure to provide cooperative infantry-tank training is being reflected in the combat zone. For example, Lieutenant Colonel Lou Hammack's very fine 751st Tank Battalion (M) was practically wiped out because in four successive attacks, the infantry refused to follow him. Four times he took the objective and each time had to pull back, trying to pull the infantry forward, the Germans in the meantime re-obtaining the position.*

Finally, by September 1943, Army Ground Forces had published *FM 17-36, Employment of Tanks With Infantry*. The publication of this field manual allowed units still training in the United States to learn some of the lessons learned the hard way by forces already in contact with the

Troops and equipment disembark from one of the tiny LCMs used to land in Algeria, North Africa in 1942. Compare this quiet beach landing scene with the complexity of the later Normandy invasion. But at the time, this was the largest seaborne invasion in history.

In photo at right, opposite page, troops are crammed in a landing craft. They wear American flag patches for identification, in the hope that Vichy French in Algeria would capitulate and not fire on Americans.

enemy. Unfortunately, the manual alone was insufficient. The commanding general of the 84th Infantry Division wrote: "We have worked constantly with armor, and with no training in the U.S., it was hard to receive our training on the battlefield. I cannot stress too much the absolute necessity for combined tank-infantry training even in replacement training centers. We have worked with the 2nd, 3rd, 5th, and 7th Armored Divisions. They are all excellent units, but it is difficult to teach infantry-tank tactics actually on the battlefield. We now have our own tank battalion, and I spend every available minute in training my infantry to operate with tanks."<sup>38</sup> The tactics kept evolving, however, and tankers and infantrymen continued to send hard-fought lessons home from combat theaters around the world.<sup>39</sup>

### North Africa

The first major employment of tanks with infantry by the United States was on November 8, 1942 — the *Operation Torch* landings on the North African coast. Amphibious assault technology still required the use of LCMs (Landing Craft Mechanized) to transport heavy vehicles from ship to shore. The LCM was capable of carrying only one tank or large artillery piece at a time.<sup>40</sup> Nevertheless, tanks made it ashore and were able to assist the infantrymen right from the outset of combat. During the initial assault from the beaches, the tank's speed and armor were exploited to seize key mission objectives and destroy enemy positions.

One example comes from the 3rd Infantry Division's landing at the town of Fedala, about ten miles northeast of Casablanca. The 7th Infantry Regiment

had as an initial objective the seizure of French anti-aircraft, coastal and field artillery batteries located on the Cape north of Fedala. COL William H. Wilbur, a senior liaison officer from MG George S. Patton Jr.'s headquarters, took control of 2nd Platoon, Company A, 756th Tank Battalion (L), which was just coming off landing craft. COL Wilbur sped through town to assist the regiment's first battalion in silencing the coast artillery battery, which had been engaging landing craft en route to the beach.<sup>41</sup> After the tanks assumed an assault position, Company A, 7th Infantry opened fire on the battery's fire direction center. The M5 tanks made an initial breach in the defensive wire, and infantry quickly seized the objective.<sup>42</sup>

Units not in contact in North Africa continued to train while others eventually met the enemy in Tunisia. By the spring of 1943, Allied forces had made considerable progress in driving the Germans out of Africa. While the British 8th Army under General Bernard Law Montgomery pressed from the east, American, British and Free French units advancing from the west beat back the *Afrika Korps* into a tight perimeter on the Tunisian peninsula. At the end of April, the American II Corps was attacking German defenses along an east-west row of hills near the town of Mateur. The main defenses were atop Djebel Tahent, identified on U.S. maps as Hill 609. Riflemen from the 34th Infantry Division had fought their way to the base of the hill, but by April 29, had reached an impasse. Both sides had been exchanging mortar and artillery fire incessantly and the infantry could advance no further. Company I of the 1st Armored Division's 1st Tank Regiment, another II Corps unit, was assigned to assist in breaking the stalemate. In the early morn-





ing of April 30, the tanks picked up the infantry and proceeded up the hill, at times literally pulling the riflemen along where the slope was too steep. The tanks destroyed a number of enemy positions, and when antitank fire became too deadly, the American infantry conducted a bayonet charge against the gun crews, allowing the tanks to continue. The absolute summit of Hill 609 was inaccessible to the tanks, but they supported the infantry with cannon and machine-gun fire until the position was secure. The tank-infantry team repelled counterattacks both at 609 and at the neighboring Hill 531. On May 2, the GIs saw heavy traffic moving north. The Germans were leaving.<sup>43</sup>

The North African Campaign of 1942-43 demonstrates some of the earliest combat techniques of the tank-infantry team. There was yet no permanent affiliation of specific units with one another, so there was often no way to retain lessons learned from one engagement to the next. The infantry typically fought without the aid of armored forces, and called on the tanks to penetrate defenses or advance in the face of heavy small arms and artillery fire. Tank units were used to break through enemy formations, destroy tanks and other pieces of equipment, and reduce hardened fortifications and wire obstacles. However, the general lack of prior training created some major deficiencies in effective prosecution of the campaign.<sup>44</sup>

## Italy

The push against the Germans in Italy, which had been launched by General Mark Clark's 5th Army in September of



1943, was to prove a long and bitter struggle that would continue for most of the next two years. Italy was not particularly suited to tank warfare, but the infantry went, and they needed tanks to see them through. One of the hardest-fought engagements of the entire Italian campaign was the first phase of the Battle of Cassino. Cassino was the anchor of the German "Gustav" defensive line to which they had steadily withdrawn by the end of November. Located near the western coast of Italy, Monte Cassino overlooked the main highway to Rome. By the end of January 1944, when the Americans were ready to launch an attack against the town as a diversion to attract the German 10th Army's attention away from the imminent amphibious invasion at nearby Anzio, the soldiers of the XIV *Panzerkorps* had been digging in for two months.

On the night of January 20, two regiments of the U.S. 36th Infantry Division conducted an opposed river crossing of the Rapido River just downstream from where Cassino stood.<sup>45</sup> The German defenders soon repulsed the Americans, so the U.S. II Corps decided to try for another foothold, this time with the 34th Infantry Division slightly upriver from Cassino. The division began its attack on the 24th of January, but the Germans had demolished a small dam about two miles north of Cassino. North of town, the Rapido was fordable and normally only about 50 feet wide; now, however, the dam's destruction had allowed the river to flood the east bank and the land had become a marsh hundreds of yards across — impossible for tanks to negotiate. For more than two days, the riflemen of the 34th tried to establish a bridgehead on the west bank of the river. Opposing them were barbed wire entanglements, antipersonnel mines and a series of machine gun nests stretching from the water's edge nearly to the top of the towering hills. These were supported by hidden mortar pits and artillery dug into the back side of the mountain.

Finally, on the morning of the 27th, combat engineers had emplaced enough "corduroy road" to allow CPT Charles "Wilkie" Wilkenson's Company B, 756th Tank Battalion to cross at a small bridge.<sup>46</sup> However, it still was not sufficient. The battalion had transitioned from M5 light tanks to M4 mediums in December. All but four of the company's 18 tanks became stuck in the mud. Those four crossed and tore through the enemy defenses near the shore. The infantry failed to cross with the tanks, and the

absence of dismounted support allowed the Germans to lay out antitank mines quickly. One of these stopped a tank. The remaining three began to move back across the river, but the first got hung up on the bridge and blocked passage of the other two, one of which had been commandeered by CPT Wilkie. As the crew on the bridge dismounted and ran for friendly lines, the tank's commander, LT Wayne Henry, was machine-gunned down. It was his first day in combat. The crews of the remaining two tanks were captured.

The tanks managed a more successful crossing in the late afternoon of the 29th. Again, the bulk of the infantry hesitated, but the tank battalion commander, LTC Harry W. Sweeting called for them to cross. A smaller, grass-covered hill nicknamed "the Pimple" was an initial objective for the 34th Division, which it seized soon after dark. The maneuver elements of the division closed on the objective area and expanded up the hills over the next few days and into the village of Cairo. The division next turned its attention south toward the town of Cassino and the narrow path between the sheer rock face and the abrupt drop to the river that led to it. On the morning of February 2nd, elements of the 133rd Infantry and Company B of the 756th moved south to secure the road to Cassino. As the tank-infantry team progressed, the file of tanks poured armor piercing shells (high explosive would have been too close to friendly riflemen) and machine-gun fire onto any suspicious-looking points on the hillside above. The infantrymen followed through and captured about 150 prisoners.

The 34th Division never did secure Cassino. At one point in the first week of February, the division held about four square blocks on the northern edge of town, but they were relieved soon thereafter by the 4th Indian Division.<sup>47</sup> The experience of the 34th Infantry Division and the attached 756th Tank Battalion is an example of some of the problems often faced by units without a standing support relationship. The tankers were unfamiliar with the strengths and weaknesses of the particular infantry leaders and the infantry were not used to using the tanks' advantages in combat. This unfamiliarity took time to overcome, and in war, wasted time can mean wasted lives. Eventually, the men of the 756th were reunited with their old friends from Fort Lewis and Morocco — the 3rd Infantry Division. The battalion remained

attached to the 3rd from August of 1944 (Operation ANVIL) until the end of the war in Europe. MG O'Daniel writes, "The extent to which the various expedients adopted to increase mutual confidence succeeded was well exemplified by a statement made by an officer of the 3rd Infantry Division toward the close of the campaign. He was asked his opinion of the relative merits of the various tank battalions then doing duty in the Sixth Corps, to which the division belonged. He listed a number of the battalions in the order of his opinion of their efficiency. His questioner then remarked:

'Funny you didn't include the 756th.'

'Oh!' He replied hastily. 'That's part of the Division. They don't come any better than that.'<sup>48</sup>

### Northwest Europe

Another tank-infantry team that enjoyed "permanent" attachment was the 745th Tank Battalion and the 1st Infantry Division.<sup>49</sup> Attached in April 1944, the battalion remained part of the division until the war's end. However, until the Normandy invasion was completed, the companies of the battalion had no support relationship with any unit in the division, nor did the tanks and infantry conduct serious training together. In France, a company of medium tanks was attached to each of the infantry regiments, and the regimental commanders attached a tank platoon to each battalion. Save for certain missions, this arrangement remained unchanged. Within the infantry battalions, the tank platoon could be further attached to a rifle company for a particular task. This permanency fostered mutual respect and trust in the other's capabilities and made it easy for standing operating procedures (SOPs) to develop.

Upon landing on June 7, the tanks were able to help speed the infantry into the hedgerow country by protecting the division's exposed flanks and being alert to the enemy armored threat. The advancing infantry, meanwhile, was available to repel potential tank-hunting infantry teams and clear away antitank mines. Once in the hedgerow country, tanks aided the highly vulnerable infantry by spraying the next and flanking hedgerows with machine-gun fire and clearing enemy machine gun nests with white phosphorus rounds. Advancing infantry made sure to shoot or take fleeing Germans prisoner. When attacking wood lines, tanks placed machine gun fire into the trees from 400-500 yards while the infantry advanced below the covering fire. If

antitank guns were suspected, the infantry infiltrated into the positions at night, then destroyed the gun positions at dawn. In breaching the Siegfried Line, the 745th's tanks moved into the woods, where engagement ranges were much shorter. There, often as close as fifty yards, the tanks opened concrete pillboxes with armor-piercing rounds, then dispersed the occupants with white phosphorus shells. This allowed the infantry and engineers to destroy the remnants in detail with grenades and explosives.

In Aachen, small teams of two tanks and an infantry platoon cleared blocks building by building. As the riflemen cleared, the tanks provided security with longer range fires. At intersections especially, tanks fired at all four corners and down cross-streets to suppress possible enemies. In turn, the dismounted soldiers protected their protectors with constant reconnaissance against antitank rocket (*Panzerfaust*) teams and antitank gun positions. Additionally, four infantrymen were detailed to stay with the tank as last-line defenders and runners. In small towns, the tanks provided an initial attack by fire, then accompanied the infantry in clearing the town. In crossing rivers, the tanks provided direct suppressive fires on the far side as the infantry made the initial crossing. When all was secure, engineers laid bridges for the tanks to cross. Although tank fire was not too accurate in night attacks, their presence was a morale booster to American infantry and a psychological weapon against the Germans. In the defense, 1st Infantry Division units sometimes used tanks as part of the main defense, at others they were kept back as a mobile counterattack force. The experience of this tank-infantry team shows the benefit of a close, long-term support relationship. Early in the hedgerow fighting, the veterans of the "Big Red One" recognized the value of what the tanks brought to the fight, and in the spirit of mutually beneficial cooperation, did what they could to help the tankers.

### The Tank-Infantry Team In the Armored Division

The Armored Force expanded from two to sixteen armored divisions during the course of American involvement in World War II. As mentioned above, the organization of the division was materially altered several times. The overall trend of the modifications was to reduce the number of tanks, eliminate middle levels of command, increase the amount of infantry in the division, and favor the

use of medium tanks over light.<sup>50</sup> The armored divisions developed two ways of employing the tank-infantry team.<sup>51</sup> The use of the armored division reflected its origins in cavalry tactics. The essence of armor is speed, firepower and shock effect. The armored division was used to gain ground rapidly and to exploit penetrations of enemy defenses and attack his rear or flank.

The division consisted of five basic elements: command, reconnaissance, striking, support, and service.<sup>52</sup> The chief command structures of the armored division were its divisional headquarters and three subordinate "combat commands" — CC A, CC B and CC R(serve).<sup>53</sup> These combat commands were in control of one tank and one infantry battalion. The division's cavalry reconnaissance squadron fielded four recon troops, an assault gun troop, and a light tank company. The squadron performed the reconnaissance function for the division, advising the commander on terrain navigability, obstacles, and enemy presence.

The support echelon consisted of the division artillery's three field artillery battalions, which provided indirect fire support; the armored engineer battalion conducted mobility (obstacle and mine clearing), countermobility (obstacle building and mine laying), and survivability (defensive earthworks) operations; and the signal company established the division's communications networks. The armored division trains formed the service echelon. This included an armored medical battalion, which provided ambulance service and medical clearing facilities for the wounded; the maintenance battalion gave repair support beyond the abilities of the mechanics on the front lines; and the division's military police platoon provided security to the rear areas occupied by the trains.

Three tank battalions and three armored infantry battalions comprised the striking echelon. There were two possible ways to create the armored division's combined arms team under control of the combat command.<sup>54</sup> The first was to create "tank-heavy" and "infantry-heavy" teams by attaching an infantry company to the tank battalion and a tank company to the infantry battalion, respectively. This way, each team had strengths suited for certain types of missions. Crossing rivers, clearing woods, and seizing towns were prime examples of tasks assigned the "infantry-heavy" team. The "tank-heavy" team would assume the lead mission if, for example, enemy tanks or other armored





Infantry find cover behind an M4 Sherman as it brings fire on a German pillbox in Lammersdorf, Germany. They communicated with the tankers by hand signals, wire phone, infantry radios, and sometimes by banging on the hull with their rifle butts.

vehicles were expected. Either way, the team not in the principal role would remain in close support, prepared to react to any change in the situation.

The second method of forging the armored infantry-tank team was to meld the two battalions together fully, creating a sort of “super battalion.” The staffs of the two headquarters would combine to run the combined arms battle. Each line company joined with its counterpart, giving tremendous fire- and manpower to the company command team. This “dual captaincy” did not violate the principle of unity of command; rather, each commander assumed the lead on those missions in which his unit specialized. For example, if the mission was to destroy a series of bunkers, the tank commander took charge and the infantryman assisted. On the other hand, if the company was ordered to secure a tree line, the infantry commander planned and directed the operation.

MAJ Edward Bautz notes that the armored division conducts two types of offensive operations: the “Rat Race” and the “Slugging Match.”<sup>55</sup> The former is essentially an exploitation or pursuit, characterized by rapid terrain gains of up to a hundred miles a day against light to moderate resistance. In this type of operation, the infantry would ride in their half-tracks or on the tanks, while the battalions’ “specialty platoons” and light tanks secure an exposed flank or provide a more robust reconnaissance force. Proper spacing and placement of elements within the moving force was critical in ensuring the ability to “crash through moderate resistance, to remove obstacles, or to provide a base of fire for other elements deeper in the column to maneuver.”<sup>56</sup> Typical objectives were essentially strategic — key terrain, road and

rail centers, bridges, sealing a pocket of resistance, etc.

The goal of the “Slugging Match” was to seize a series of dominant terrain features until the main objective was secured. Characterized by constant and heavy resistance, the armored team counted its gains in thousands of yards per day. Here, the balanced or combined team was used. The division assigned CC A and CC B a series of objectives, which they then attacked in a leapfrogging sequence; after one team secured its objective, it could support the other team in its advance with direct and indirect fires. This left one whole team in reserve to reinforce one of the other teams as necessary or react to possible counterattack. Again, the infantry and tanks worked nearly shoulder-to-track to seize their goal. The light tanks would normally provide rear or flank security while the medium tanks and riflemen conducted the attack.

### Tank-Infantry Communications

A serious problem faced by the combined arms team at the tank company, platoon, and individual tank levels was that of communication with the supported infantry. The soldiers in World War II developed a number of methods to communicate, some of which were impractical, while others were quite efficient.<sup>57</sup> The six that were developed are: radio, external tank interphone, wire, visual signals, sound signals, and messenger or liaison.

During the war, the radio sets used by the infantry platoon (SCR-536) and by the tank platoon (SCR-508, SCR-528, AN/VRC-3) weren’t compatible. Although the tank platoon leader could talk to the infantry company commander’s SCR-300 via his AN/VRC-3, no one else

could talk via radio to anyone on the ground. Several fixes were tried, and some units made them work, such as placing an additional infantry-compatible radio in the tank with the antenna through the hatch, or even through a bolt hole.

An important means of communication was an external telephone handset mounted in a steel box on the tank linked with the tank crew’s intercom system — the interphone. This developed from a series of field expedient methods. At first, the tank would trail a phone wire connected to a field telephone inside the tank. Accompanying infantry could connect the end to another field telephone and talk to the crew. This was ineffective because the wire was constantly torn off the tank.

Wire was an effective option if the tank was to remain in position for any considerable length of time. In the defense, for example, field telephones could be installed and quickly dismantled. However, in World War II, tanks were rarely used as a defensive weapon.

Visual signals included standard hand and arm signals, pyrotechnics (flares and smoke) tracer ammunition, and lights. Sound signals, such as tapping on the hull of a tank were also used. These signals were, however, somewhat limited in their use and had to be supplemented by the external interphone or radio.

Finally, the use of messengers or command liaison was a necessity. At the tank platoon level and below, it was necessary for the infantry commander and the supporting tank commander to make face-to-face contact from time to time. Typically, at the tank company and above, a representative from the tank unit remained with or near the supported commander’s headquarters.

### Summary

The World War II American tank-infantry team was the product of numerous factors, foremost among which were the men who fought the tanks and the

*“By the late summer of 1944, as the Allies began the final long drive to Berlin, the tank-infantry team had come together and were finding ways to use their respective talents to the utmost.”*

men who carried the rifles. These men were willing to come together as a team, frankly recognize each other's strengths and weaknesses, and use the best of what they had to drive the enemy from the field of battle. For their commanders, this coming together was a sort of laboratory experiment, with sometimes frustrating, even disastrous results. In North Africa, the United States Army began to realize that without closer cooperation between tanks and infantry, the war could be lost. In Italy, the desire to build a team was there, but it often took some painful experiences to make it work. By the late summer of 1944, as the Allies began the final long drive to Berlin, the tank-infantry team had come together and were finding ways to use their respective talents to the utmost.

## Notes

<sup>1</sup>CPT James J. Butler, “Individual Tank-Infantry Communications,” *The Armored Cavalry Journal*, v. LVI #4, July-August 1947, p. 43.

<sup>2</sup>Geoffrey Perret, *There's a War to Be Won* (Ballantine Books, New York: 1991) p. 40.

<sup>3</sup>*Ibid.*, p. 26.

<sup>4</sup>*Ibid.*, p. 41.

<sup>5</sup>David E. Johnson, *Fast Tanks and Heavy Bombers: The United States Army and the Development of Armor and Aviation Doctrines and Technologies, 1917 to 1945*, Duke University Ph.D. Dissertation, 1990 (UMI Dissertation Services, Ann Arbor, Mich.: 1993) p. 365.

<sup>6</sup>Charles M. Baily, *Faint Praise: American Tanks and Tank Destroyers During World War II* (Archon Books, Hamden, Conn.: 1983) p. 5.

<sup>7</sup>Ian V. Hogg, ed., *The American Arsenal* (Stackpole Books, Mechanicsburg, Pa.: 1996) pp. 13-17.

<sup>8</sup>Baily, p. 148.

<sup>9</sup>Hogg, p. 23.

<sup>10</sup>*Ibid.*, p. 29.

<sup>11</sup>Armored Division Organizational Charts, T/O 17, 15 September 1943 (Reprint, Armor School Library, Ft. Knox, Ky.: 1985) p. 15 (T/O 17-27) & 16 (T/O 17-17).

<sup>12</sup>Interview with David W. Redle, 5-6 March 1999 at his home in Akron, Ohio. Captain Redle was commissioned in 1941 ROTC from Creighton University, Omaha, Nebraska. He served as a tank platoon leader, company executive officer and company commander in Co. B, 756th Tank Battalion. He served in North Africa, Italy, Southern France, and Central and Southern Germany. His awards include the Silver Star, Bronze

Star, Purple Heart, Presidential Unit Citation and French Croix de Guerre.

<sup>13</sup>Historical Section, Army Ground Forces, Study #27: The Armored Force Command and Center (Headquarters, AGF: 1946) pp. 71-83.

<sup>14</sup>Lee Kennett, *G.I. — The American Soldier in World War II*, 2nd ed. (University of Oklahoma Press, Norman, Okla.: 1997) pp. 37-38.

<sup>15</sup>Historical Section, AGF, pp. 76-78.

<sup>16</sup>Armored Div Org Charts, pp. 15-16 (T/O 17-27 & 17-17).

<sup>17</sup>George Forty, *U.S. Army Handbook 1939-1945*, 2nd ed. (Sutton Publishing Ltd., Gloucestershire, UK: 1995) p. 74.

<sup>18</sup>Armored Div Org Charts, pp. 19-20 (T/O 7-26 & 7-27).

<sup>19</sup>Forty, p. 174.

<sup>20</sup>Redle interview.

<sup>21</sup>*FM 21-100, Soldier's Handbook* (War Department Basic Field Manual: July 23, 1941) p. 181.

<sup>22</sup>Forty, p. 175.

<sup>23</sup>LTC William D. Duncan, “Tanks With the Infantry Division” *Military Review*, v. XXIX #3 p. 49.

<sup>24</sup>*The Officer's Guide*, 9th ed. (Military Service Publishing Co., Harrisburg, Pa.: 1942) p. 107.

<sup>25</sup>CPT Addison F. McGhee, Jr., *He's in the Armored Force Now* (Robert M. McBride & Co., New York: 1942) p. 226.

<sup>26</sup>*The Officer's Guide*, pp. 78-79.

<sup>27</sup>Redle interview.

<sup>28</sup>McGhee, pp. 234-235.

<sup>29</sup>Edwin P. Hoyt, *The GI's War* (Da Capo Press, New York: 1988) p. 10.

<sup>30</sup>Forty, pp. 71-76.

<sup>31</sup>MG John W. O'Daniel, “The American Infantry-Armor Team” *The Cavalry Journal*, v. LV #3, May-June 1946, p. 42.

<sup>32</sup>Johnson, p. 365.

<sup>33</sup>Redle interview.

<sup>34</sup>*Ibid.*

<sup>35</sup>Historical Section, AGF, Study #27: p. 52-54.

<sup>36</sup>*Ibid.*, p. 52.

<sup>37</sup>*Ibid.*, p. 54.

<sup>38</sup>*Ibid.*, p. 69.

<sup>39</sup>*Ibid.*, p. 59.

<sup>40</sup>Donald D. Taggart, ed., *History of the Third Infantry Division in World War II* (Washington D.C., 1947) pp. 13-14.

<sup>41</sup>*Ibid.*, p. 18; see also Ralph Zumbro, *Tank Aces — Stories of America's Combat Tankers* (New York, 1997) pp. 106-107.

<sup>42</sup>Taggart, p. 18.

<sup>43</sup>Zumbro, pp. 110-113. The account comes from a CPT Gwinn, the tank company commander.

<sup>44</sup>O'Daniel, p. 42. See also Historical Section, AGF, p. 54.

<sup>45</sup>Fred Majdalany, *The Battle of Cassino* (Riverside Press, Cambridge, Mass.: 1957) pp. 67-76.

<sup>46</sup>Roger Fazendin, ed., *The 756th Tank Battalion in the Battle of Cassino* (Stories Unlimited, Carefree, Ariz.: 1991) pp. 43-48. Majdalany describes this action, but indicates that infantry crossed with the tanks and were able to consolidate a bridgehead, but Dave Redle in Fazendin's book specifies that no infantry followed.

<sup>47</sup>Majdalany, p. 99.

<sup>48</sup>O'Daniel, p. 44.

<sup>49</sup>MAJ William R. Campbell, “Tanks With Infantry,” *The Armored Cavalry Journal*, v. LVI #5, September-October 1947, p. 49-51.

<sup>50</sup>Forty, p. 78.

<sup>51</sup>MAJ Edward Bautz, “The Tank-Infantry Team in an Armored Division,” *The Cavalry Journal*, v. LV #3, May-June 1946, p. 21.

<sup>52</sup>*The Officer's Guide*, p. 38.

<sup>53</sup>The 2nd and 3rd Armored Divisions did not adopt this new organization in September 1943, but retained the previous structure of one regiment each of tanks and armored infantry.

<sup>54</sup>Bautz, p. 21.

<sup>55</sup>*Ibid.*, p. 22.

<sup>56</sup>*Ibid.*

<sup>57</sup>CPT James J. Butler, “Individual Tank-Infantry Communications,” *The Armored Cavalry Journal*, v. LVI #4, July-August 1947 p. 43-45.

Captain J. L. Mudd is a 1990 ROTC graduate of the College of William and Mary. He served in the Regular Army for four years as a platoon leader in the 82d Airborne Division and in the XVIII Airborne Corps G-3, operations staff. Additionally, he spent two years as a platoon leader in the Kentucky ARNG and served in the 100th Division (IT) in a number of staff assignments. An Armor officer, he is currently a Tactical PSYOP Detachment Commander in the 10th PSYOP Battalion in St. Louis and is a graduate student at Southern Illinois University in Edwardsville.