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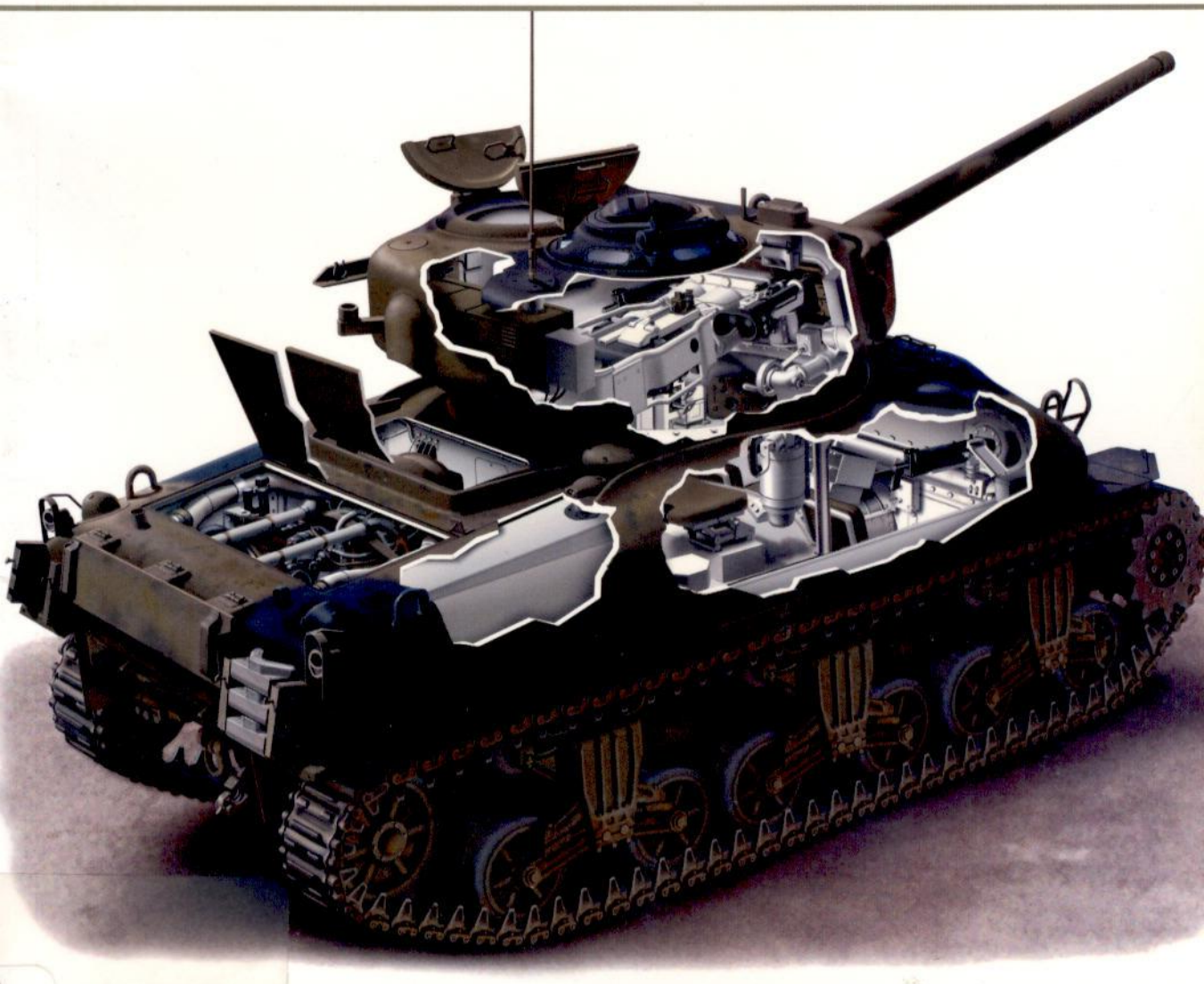
M4 (76mm) Sherman Medium Tank 1943–65



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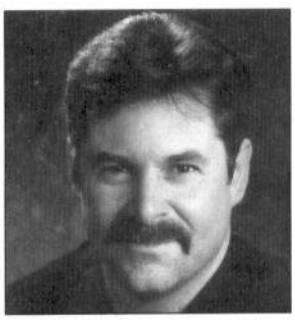

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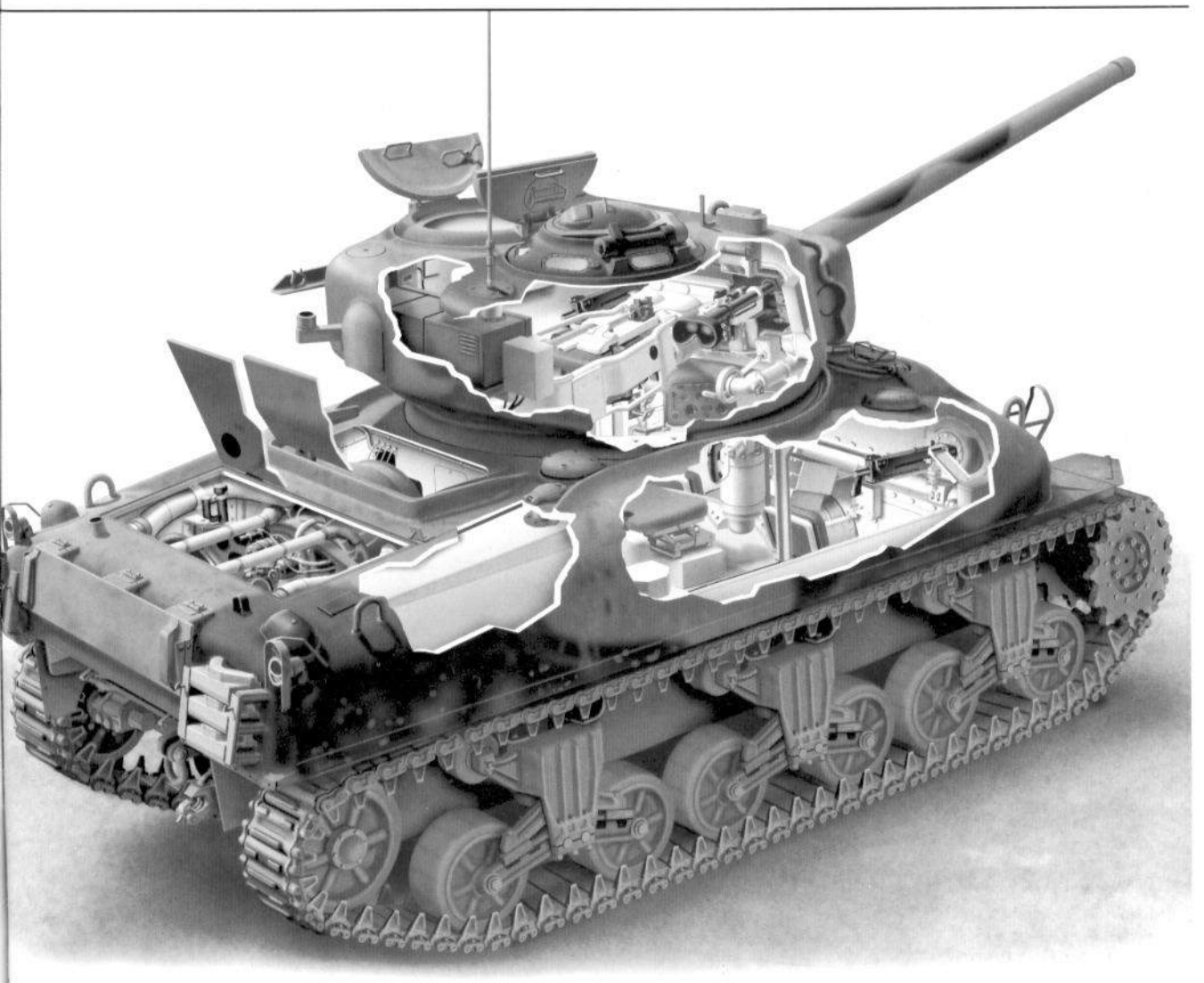

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M4 (76MM) SHERMAN MEDIUM TANK 1943–1965

INTRODUCTION

In the summer of 1943, the US Army regarded its M4 medium tank as the best in the world. Yet the following summer of 1944, after encountering the German Panther tank, the US Army suddenly realized that the M4 tank was inadequate in tank-to-tank fighting. Although a new version armed with a 76mm gun was ready for combat in late July 1944, this still did not redress the balance with the panzers. This book examines the controversial question of why the US Army was so slow in developing an adequate gun for the Sherman tank. In addition, it examines the many expedients adopted by US tank units in the field to remedy the Sherman's inadequacies in firepower, armor, and mobility.

COMBAT DEBUT

The M4A1 medium tank first went into combat with the British Army at El Alamein in the autumn of 1942. It was well regarded by its British crews because of its excellent combination of armor protection and mobility, and its versatile 75mm gun was a significant improvement in firepower.

The combat debut of the M4A1 (76mm) was during Operation Cobra, the break-out from Normandy, which started on July 24, 1944. One of the new M4A1 (76mm) from the 2nd Armored Division is seen breaking over the top of a hedgerow near Pont Hebert with a T1 Rhinoceros hedgerow cutter fitted to the bow. (US Army)

While there was no standing requirement for a better gun, US Army Ordnance had been working on a 76mm gun since early 1942 on their own initiative.

There were already several 76mm weapons in development or service including the M7 76mm gun for the M6 heavy tank and the M10 tank destroyer. However, the M7 was a cumbersome weapon that would be difficult to fit into the small M4 turret, so the T1 gun was developed instead. This used the same projectiles as the M7, but a different propellant casing. This had the potential to cause confusion with the troops, so the M7 was subsequently labeled as a "3-inch gun," and the T1 as a 76mm gun, even though both were in fact of the same caliber of 76.2mm (3 inches).

The original test-bed for the T1 76mm gun was this M4A1. A white band has been painted on the gun tube to show the difference in length between the original 75mm gun and the new 76mm gun. (NARA)

The first two T1 guns were completed in the summer of 1942 and sent to the Aberdeen Proving Ground. One was placed on a proof stand and the other was mounted on an M4A1 tank using the usual M34 mount. The T1 gun had a length of 57 calibers, and this length caused traverse problems due to the excessive weight at the front of the turret. In an attempt to improve the turret balance, the engineers cut 15 inches from the front of the gun, reducing its length to 52 calibers, and added a counterweight to the breech. While this improved the balance, it decreased the anti-armor penetration performance of the gun. This was not of immediate concern, since, at the time, the existing 75mm gun had proved to be completely adequate on the battlefield, and the 76mm T1 gun, even with the barrel shortened, offered better armor penetration. On August 17, 1942, the Ordnance Committee recommended that the T1 gun be standardized as the M1 76mm gun while the shortened version became the M1A1 gun.

Compared to other tank guns being developed at the time, the M1A1 76mm gun offered mediocre anti-armor performance. The British Army at the time was developing its own 76.2mm tank gun, better known as the 17-pounder. This gun had a barrel length of 55 calibers compared to the 52 calibers of the US 76mm gun. The biggest difference was in the ammunition. Although both projectiles weighed about the same, the 17-pdr. round contained almost 9lbs of propellant compared to only 3.6lbs of propellant for the 76mm round. As a result, the 17-pdr. could fire its projectiles at a higher velocity, significantly improving its armor penetration capability. The high chamber pressure of the 17-pdr. led to faster barrel erosion, but the British gun designers were willing to trade-off barrel life for higher anti-armor performance. In contrast, US design practices were far more conservative and favored longer barrel life. While these practices might have been revised had there been a strong requirement from the Armored Force for superior anti-tank

A dozen of these M4A1 (76M1) tanks were built for operational trials seen here at Camp Young, California, with the Desert Warfare Board. Careful examination of the turret bustle will show the integral counterweight fitted at the rear to counterbalance the gun. Trials of these tanks suggested that the normal 75mm turret was too small for this gun. (NARA)

performance, this incentive was lacking. German tank gun development was similar to the British, opting for a high velocity 75mm KwK 42 gun with an extremely long 70-caliber barrel. Like the British gun, the German weapon had very high chamber pressures of about 48,000 psi compared to only 38,000 psi on the US 76mm gun, and the German ammunition featured a large 8.1lb propellant charge ensuring a very high velocity for the projectile.

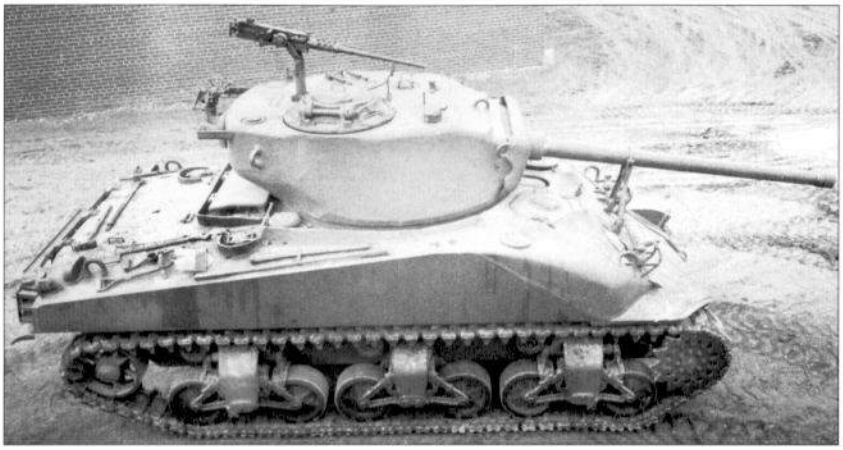
TANK GUN PERFORMANCE

Penetration in mm against armor at 0 degrees

Ammunition	**500m**	**1000m**
Initial anti-tank ammunition		
76mm M62 APC	116	106
17-pdr. APCBC	163	150
75mm Pzgr. 39/43 APCBC	168	149
Improved 1944 ammunition		
76mm T4 HVAP	208	175
17-pdr. APDS	256	233
75mm Pzgr. 40/43 HVAP	234	199

In August 1942, Ordnance recommended modifying the production contracts so that 1000 tanks would be built in the M4A1 (76M1) configuration with the new gun. The head of the Armored Force, General Jacob Devers, refused to support the plan, complaining that it had not been tested by his organization. In December 1942, Devers was a member of a team of US officers sent to the North African theater on a fact-finding mission that also included the Ordnance chief, General G. M. Barnes. Their report noted that "ranking officers of the British Eighth Army as well as members of British tank crews are convinced that the American M4 medium tank (General Sherman) is the best tank on the battlefield. This is the conclusion of the British Eighth Army and our own force on the Tunisian Front." The team also visited Britain, discussing future tank requirements with their British colleagues. They were briefed on the

next-generation British tank gun, the new 17-pdr. gun, and they witnessed demonstrations of both a towed version and a tank-mounted version. Although the British Army was content with the performance of the 75mm gun on the Sherman tank, they were convinced that the Germans would continue to increase the armor thickness on their panzers, and that this would require a continual escalation in gun power to retain parity on the battlefield. Devers changed his earlier opinion about the 76mm gun project and recommended after the trip that "The new high power 76mm gun should be immediately tested in the M4 tank to determine what percentage of these guns should be installed in future tanks. ... The further perfection of the M4 tank, the best on any front today, should be aggressively continued."



Two pilots of the M4E6 were built, which mated the turret from the new T23 tank to the M4 hull. This is the second pilot, evident from the turret roof which has the oval hatch; the first pilot had a rectangular hatch. This particular vehicle was also fitted with an experimental horizontal volute suspension. (Patton Museum)

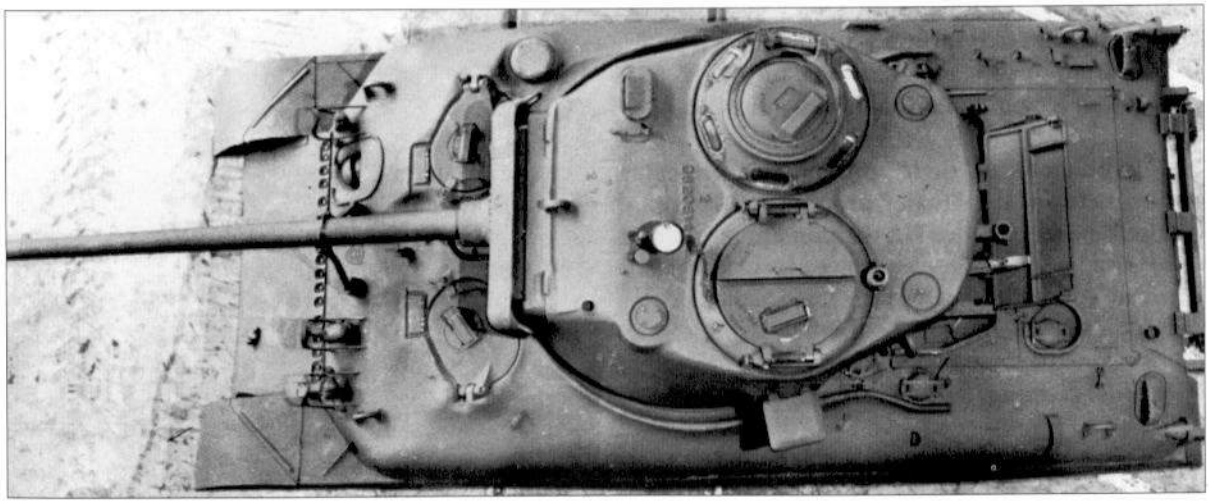
The fighting in North Africa revealed the inadequacy of periscopic sights for gun aiming, and both US and British officers recommended following the German example and shifting to a high-power telescopic sight. As a result, the M1 gun was mounted on the modified M34A1 combination gun mount with a new telescopic sight. Trials revealed that the internal counterweight was not adequate to balance the turret. Rather than simply graft another counterweight to the rear of the existing turret, Pressed Steel Car Company was authorized to manufacture 12 M4A1 (76M1) tanks with a modified cast turret with an integral counterweight. The first of these was delivered in February 1943 to the Armored Board at Fort Knox. The trials concluded that internal turret space in the tank was unsatisfactory, and the design was criticized as an improvised "quick fix" not suitable for troop use. The Ordnance plan to manufacture 1000 of these tanks was rejected in December 1942. Of the 12 M4A1 (76M1) completed, only three remained in their original configuration and the remaining nine were converted back to normal 75mm tanks.

In view of the strong recommendation of General Devers to accelerate the development of the 76mm gun for the M4 tank, Ordnance continued the effort by mounting the weapon on a larger turret. To simplify development, Ordnance decided to adapt the turret of the new T23 medium tank pilot to the M4 tank under the designation M4E6. Two pilots of the M4E6 were authorized on June 17, 1943. They were built by Chrysler's Detroit plant and delivered in July 1943. The trials were so successful that on August 17, 1943, the Armored Board recommended the M4E6 for production. This went up the chain of command to Headquarters, Armor Command, which on August 21, 1943 recommended that 1000 M4 tanks be procured. The letter to the Army Ground Forces (AGF) also noted that "As soon as the tank has been proven on the battlefield, it is recommended that we go to one hundred percent replacement of the M4 with 76mm gun."

This remark sparked a controversy. General Devers, after repeated clashes with General Lesley McNair, the head of AGF, was booted upstairs, departing Fort Knox in May 1943 to take over command of the European Theater of Operations (ETO). Devers was replaced by General Alvan Gillem, an infantry officer. Gillem's first action was to pay a visit to tank units in North Africa and Sicily to determine future requirements. He came back convinced that greater attention had to be paid to tank–infantry cooperation. On his return, Gillem stepped into the dispute over the August 21 letter that had been penned by his subordinates during his absence. He was troubled by the suggestion that production shift to the 76mm gun, as it was less suitable for infantry-fire support against unarmored targets than was the older 75mm gun. On September 1, 1943, Gillem sent a second letter to AGF clarifying the Armored Force's requirements. He noted that:

> The 76mm Gun M1 as a tank weapon has only one superior characteristic to the 75mm Tank Gun M3 ... armored penetrating power. The 76mm gun will penetrate on average one inch more armor than the 75mm tank gun M3 at the same range. The high explosive pitching power of the 76mm gun is inferior to that of the 75mm gun. The 76mm HE shell weighs 12.37lbs and has a charge of .86lbs explosive. The 75mm shell weighs 14.6lbs and has a charge of 1.47lbs of explosive. The exterior ballistics generally of the 76mm gun are less satisfactory for a general purpose medium tank weapon than the 75mm gun. The 76mm gun has an extremely heavy muzzle blast, such that the rate of fire when the ground is dry is controlled by the muzzle blast dust cloud. Under many conditions this dust cloud does not clear for some eight to thirty seconds. The presence of this heavy muzzle blast makes sensing the round extremely difficult for the tank commander and gunner.

Tank gun performance hinged on its high explosive round since the majority of rounds fired in combat were high explosive. During the war, US tankers on average employed 70 percent high explosive, 20 percent armor-piercing, and 10 percent smoke ammunition.



This overhead view provides a good overview of the early production M4A1 (76mm). In contrast to the pilot, it is fitted with a large hatch over the loader's station. Other details of the early production series include the initial M1A1 gun without muzzle brake threading, and the lack of a cover over the hull ventilation blower between the front hull hatches. (Patton Museum)

Gillem recommended that the M4 with a 76mm gun be deployed in a ratio of one per three tanks either on the basis of one tank platoon per company, or one company per battalion. He noted that the proposal to immediately manufacture 1000 M4 tanks with the 76mm gun seemed sound but that in the future it might be necessary to increase the production rate of the M4 with a 76mm gun to 50 percent of the total since so many 75mm M4 tanks were already on hand. However, he rejected the idea of shifting to 100 percent production of the M4 with a 76mm gun.

A snow-camouflaged M4A3 (76mm) of the 750th Tank Battalion moves through Salmchateau, Belgium, while supporting an attack by the 75th Division on January 16, 1945 during the Ardennes fighting. Once the ground froze hard in late December 1944, extended end connectors for the track were no longer needed and are absent on this tank. (US Army)

THE 17-PDR. OPTION

The British Army had a fundamentally different view of tank armament than their American allies, resulting from their more extensive experience in tank combat. Britain had started the war in 1939 with most of its tanks still armed with machine guns. By the time of the Battle of France in 1940, a transition was underway to the 2-pdr. (40mm) anti-tank gun, roughly similar in performance to the contemporary US Army's 37mm tank gun. British experiences fighting panzers in France and in the North African desert led to yet another shift to the 6-pdr. (57mm) tank gun, and by the battle of El Alamein in the autumn of 1942 the American 75mm tank gun was the next step forward. The continual escalation of German tank armor and firepower, largely propelled by the tank arms-race on the Eastern Front, had forced the British Army into a continual series of improvements in tank firepower. Having been caught unprepared on so many occasions, on March 9, 1943 the General Staff established a new "Policy on Tanks", which noted that:

> Fulfillment of their normal role necessitates that the main armament on the greater proportion of tanks of the medium class should be an effective HE weapon and at the same time as effective a weapon as possible against enemy armour of the type so far encountered during this war. The smaller proportion of tanks of the medium-class require a first-class anti-tank weapon for the engagement, if necessary, of armour heavier than that against which the dual-purpose weapon referred to above is effective.

In practice this meant that the future British tank force would be based around tanks with a dual-purpose 75mm gun, while two tanks per

troop would be fitted with the new 17-pdr. anti-tank gun. In contrast to the American 76mm gun program, which was pushed along by the development agencies with little enthusiasm from either the Armored Force or the AGF, the British 17-pdr. program was started earlier and enjoyed broad and official support from the development agencies, the tank force, and the general staff. It was optimized for tank fighting, and its poor high explosive performance was simply regarded as irrelevant.

The British liaison office in the United States raised the issue of equipping US tanks with the 17-pdr. in August 1943, but Ordnance was largely indifferent to the offer for a variety of reasons. US officers who had seen the gun fired in Britain were surprised by its substantial muzzle flash and by the unnerving tendency towards flashback at the breech, which hinted at design problems. More importantly, a variety of US guns were in development, including both the 76mm M1A1 and a new 90mm gun which were believed to be more than adequate to handle the German threat. The British first proof-tested the 17-pdr. in a Sherman turret only at the end of December 1943. Prodded by General Devers, a comparative shoot of the 90mm and 17-pdr was conducted at Aberdeen Proving Ground in the US on March 25, 1944, followed by a similar trial in Britain on May 23, 1944. The British offered to provide 200 guns and ammunition per month to the US within three months of notice. The comparative trials demonstrated that the 17-pdr. had superior performance over the American 90mm gun slated for new tank destroyers, to say nothing of the 76mm tank gun. However, by the time that these assessments were made, both the 76mm and 90mm tank guns and ammunition were already in production in the US, and the 17-pdr. would not be available until well after the Normandy landings. Ordnance was not keen on adopting the British gun for a variety of reasons. Its performance was slightly better than the 90mm gun, but Ordnance was

An M4A1 (76mm) of Co. E, 67th Armored Regiment, 2nd Armored Division is parked near a hedge in Champ de Boult on August 10, 1944 prior to the attack by Task Force A towards Gathemo later in the morning. This is one of the early production M4A1 (76mm) tanks issued to the First Army prior to Operation Cobra. (US Army)

developing the T4 high velocity armor-piercing (HVAP) ammunition that would boost 76mm gun performance to near the level of the 17-pdr. without the need to switch to yet another new gun and ammunition. There was also concern that British arsenals could not meet US demands for guns and ammunition. But the real problem was that the US Army in general did not have a realistic appreciation of the future tank threat. Attitudes about the 17-pdr. option would change abruptly after the Normandy fighting began in June 1944.

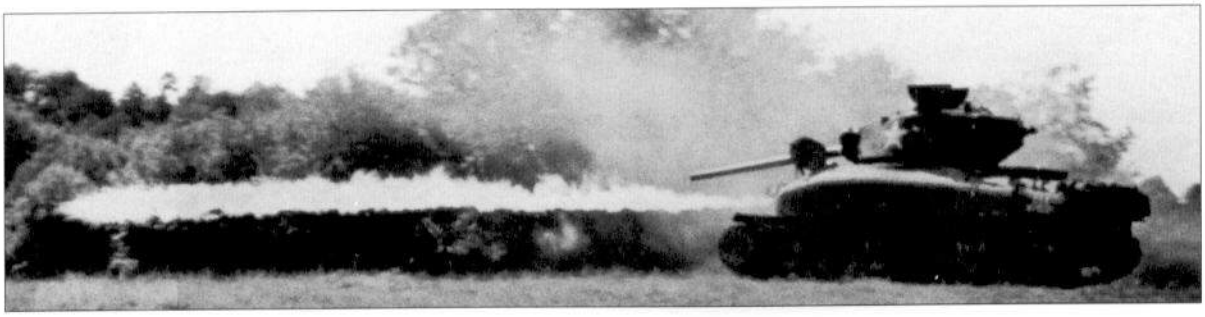
INTO PRODUCTION

The US Army considered mounting the 76mm gun on four Sherman tank variants, the M4, M4A1, M4A2, and M4A3, and all four were approved as standard on March 30, 1944. In the event, only three types were actually series manufactured, the M4 (76mm) never being built. This selection was based in part on a January 1943 AGF policy decision that the preferred choice for US tank units were the M4A3, M4A1, and M4 in that order.

The first production contract for the new M4A1 with 76mm gun was awarded to Pressed Steel Car Company in late 1943 and the first deliveries began in January 1944. These were followed by a contract to the Detroit Tank Arsenal for 1400 M4A3 (76mm) with deliveries beginning in March 1944. Both of these contract orders were intended primarily for delivery to US units, though some Lend-Lease shipments to Britain were contemplated. A third contract was awarded to Fisher's Grand Blanc Tank Arsenal in early 1944 for the M4A2 (76mm), which was intended for export to the Soviet Union under the Lend-Lease program.

Improvements to the M4 (76mm) tanks were underway even before production began. There were a continuing string of changes to the 76mm gun. Compared to the initial M1 gun, the standard M1A1 gun had a different barrel contour and a lengthened recoil slide surface to permit the trunnion to be located further forward in order to obtain a better turret balance. A major source of complaint was the amount of dust and debris kicked up when the 76mm gun was fired. This was caused by the barrel being much further forward than the 75mm gun, and also by the fact that the 76mm gun used 3.6lbs of propellant compared to only 1lb of propellant with the 75mm gun. This led to belated efforts to develop a muzzle brake to divert the gas sideways. Production of the muzzle brake did not begin until July 1944, but even

In anticipation of encounters with bunkers along the German Siegfried Line, the First Army was provided with flame throwers. Four E4-5 flame throwers were fitted to M4A1 (76mm) tanks of the 70th Tank Battalion on September 11, 1944, and this one is seen in Belgium during a training exercise on September 13. These tanks were used to attack a German pillbox three days later but the flame thrower did not prove to be effective. (MHI)



before this took place, the M1A1 76mm gun was modified to accept this device. A length of threading was added near the muzzle to accept the muzzle brake, and the resulting type was designated as M1A1C. Since the muzzle brake was not yet in production when the first of these guns were delivered, the threading was enclosed by a thread protector as an interim measure. This was followed shortly by the M1A2 76mm gun, which substituted a rifling twist of one turn every 32 calibers compared to the one turn every 40 calibers on the M1A1. This gun was also fitted with a thread protector until muzzle brakes became available.

With the new turret and gun, the M4 (76mm) series were heavier than the 75mm versions, and this resulted in greater ground pressure and less mobility for the tank. There had been a number of studies on improved suspensions for the M4 series undertaken in 1943, the most promising of which substituted a horizontal volute spring suspension (HVSS) for the usual vertical volute spring (VVS) suspension. Construction of pilots was approved on November 18, 1943 and they were based on various chassis types. The suffix -E8 was appended to the designation (e.g. M4A3E8) to identify pilots with the HVSS suspension. The new suspension used a wider 23 inch track which reduced the ground pressure from about 15 psi to 11 psi. In spite of minor problems with the initial T66 track, the initial tests were so successful that on February 3, 1944, Ordnance recommended that the suspension be accepted for production as soon as possible. AGF approved the production of the first 500 M4A3 (76mm) with the HVSS suspension on March 2, 1944, and production began in August 1944. The AGF approved the use of the HVSS suspension on all other types of M4 tanks in April 1944.

M4 (76MM) PRODUCTION

1944	M4A1	M4A2	M4A3	M4A3E8	Total
Jan	100				100
Feb	166				166
Mar	166		55		221
Apr	164		175		339
May	180	30	260		470
Jun	180	195	349		724
Jul	180	225	315		720
Aug	207	333	246	10	796
Sep	207	255	58	112	632
Oct	207	175	124	226	732
Nov	207	167	160	548	1082
Dec	207	214	183	549	1153
1945	1255	1321	0	1172	3748
Total	**3426**	**2915**	**1925**	**2617**	**10883**

INITIAL DEPLOYMENT PROBLEMS

Following General Gillem's visit to Sicily in the summer of 1943, Ordnance sent a team called the New Weapons Board to Italy in February 1944 to determine how the current generation of weapons was performing in combat and to determine what the troops thought would

be required in the immediate future. The team concluded that the M4 medium tank was performing well but noted that German armament development was not static, and recommended that the army continue to pursue progressive increases in tank firepower. The report noted that there was "an overwhelming demand for 76mm guns in M4 tanks."

The autumn of 1944 was unusually wet in Belgium and along the German border, and the mud created a significant mobility problem for the M4A3 (76mm). This 6th Armored Division tank was knocked out near Hellimer, Germany, on November 25, 1944 after first striking a mine. (US Army)

In spite of this attitude in the Italian theater, there was no such enthusiasm in the European Theater of Operations (ETO). The first batch of 130 M4A1 (76mm) tanks arrived in Britain on April 10, 1944. A conference was held at First US Army headquarters on April 20, 1944 to discuss how to distribute them. Since none of the officers present had seen the new type, an officer from the Armored Fighting Vehicles and Weapons (AFV&W) Section of the First Army presented a comparison between the 76mm gun tank and the more familiar 75mm gun tank. He stressed that the new tank offered greater accuracy and improved armor and concrete penetration but that it suffered from blast obscuration that hindered direct fire control. It also had an inferior HE projectile, lacked suitable smoke ammunition, and had decreased ammunition stowage. The officer suggested that the obscuration problem of the 76mm gun could be solved by training the tank commander to observe fire "from the ground, laterally displaced from the tank." In other words, when firing the gun, the tank commander would have to dismount and position himself some distance from the tank where he could observe the target without it being obscured by the gun blast and dust. However, no suggestions were made how the commander could communicate with his crew from this exposed position which rendered the plan a bit foolish.

The senior officer present was Major General Hugh Gaffey who had commanded the 2nd Armored Division but who was now assigned to Patton's embryonic Third Army. Gaffey complained that the new tank obviously had a lot of bugs. Since there were so few of these tanks available at the moment, he recommended that they not be issued to troops and be allowed to accumulate until Ordnance solved the problems. He argued that it was too late to introduce the type in view of the training burden it would impose, and he was concerned that it would also pose a logistics problem because of its new ammunition type. One of the younger armor officers stepped into the fray and pointed out that tankers in the Italian theater had requested that the 76mm gun tank completely replace the 75mm tanks, and that although the 76mm gun failed to provide the desired level of penetration against the German Panther and Tiger tanks, it was still far better than the 75mm gun. A chart shown at the conference indicated that the 76mm gun could penetrate the Panther gun mantlet at 400 yards and the Tiger at

200 yards, while the 75mm gun could not penetrate it at any range. A compromise was suggested by General W. B. Palmer that the 76mm tanks be allotted to separate tank battalions newly arriving in the UK and that the entire battalions be equipped with the new type rather than mixing the 75mm and 76mm guns in a single battalion as had been General Gillem's plan. In the interim, the new tanks were to be placed into depots in Britain until specific battalions were assigned to the task of converting to the new tanks. As a result, no M4A1 (76mm) tanks landed in Normandy in June 1944 even though they were available.

After the First US Army was committed to combat in Normandy in June 1944, the armor officers at Eisenhower's headquarters in Britain attempted to interest Patton's Third Army in the mothballed tanks prior to their deployment to France in late July. On June 12, 1944 a firing demonstration of the M4 tank with 76mm gun was conducted for Patton, the commanders of 2nd, 5th and 6th Armored Divisions, and several other senior commanders. "All the commanders were reluctant to see it take the place of the 75mm tank gun in any quantity." Patton was willing to accept some so long as they were confined to separate tank battalions, but none were allotted to the Third Army prior to its transfer to France.

The complacency among US tank officers in the ETO towards the new tank stemmed from a variety of factors. Very few of the tank units in the ETO had seen any combat experience except for the 2nd Armored Division which had fought on Sicily in the summer of 1943. Combat through early 1944 seemed to indicate that the 75mm gun was more than adequate to handle the German tank threat. The German Tiger I tank had been encountered in small numbers in Tunisia, and again in Sicily, and did not cause any particularly alarm. The poor performance of the Tiger I in Sicily was due to the poor performance of the Luftwaffe's Hermann Goering Panzer Division rather than to shortcomings in the

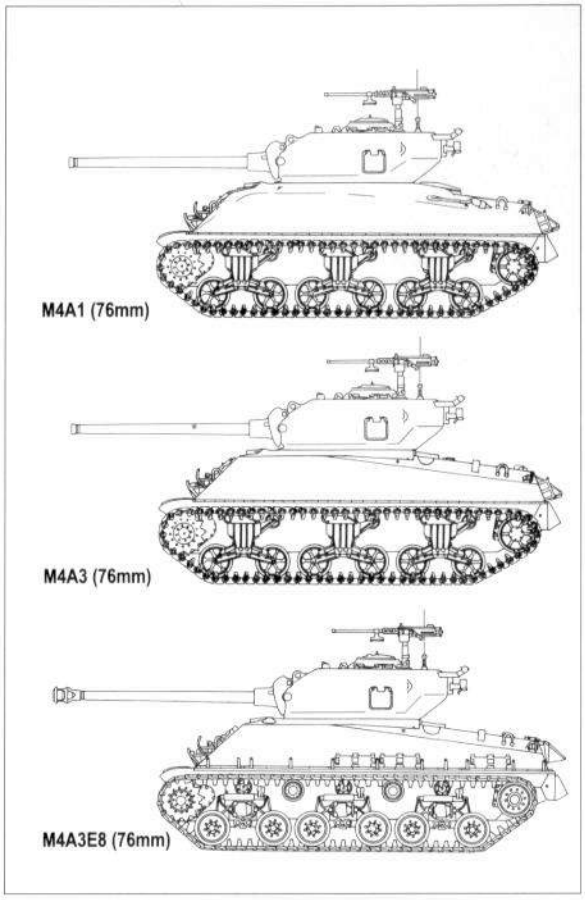
This M4A3 (76mm) of Co. C, 771st Tank Battalion sets out from Linnich, Germany, on February 24, 1945 while supporting the 84th Division during Operation Grenade. It shows the full panoply of devices for fighting in the mud, including extended end connectors on its track and corduroy matting consisting of logs bound together by wire to lay over the mud when it became impassable. (USMA)

tank design, but this was not immediately apparent to US tankers. A number of Tigers had been knocked out by tank fire in Tunisia and Sicily, and US tankers believed that they could be handled in future engagements in France as they expected that the type would be as rarely seen as in the Mediterranean theater.

What the tank officers in the ETO failed to appreciate was the threat posed by new German tanks, in particular the Panther. The Panther had been first deployed in the summer of 1943 during the battle of Kursk on the Eastern Front against the Red Army. Its performance was not particularly alarming as it had all the technical bugs typical of an unproven new design. Allied officers were able to inspect captured Panther tanks in Russia, and sent back detailed reports on armor thickness and gun performance. Details were published in widely circulated technical intelligence bulletins in the autumn of 1943. Allied intelligence at first expected that the Panther would be deployed much like the Tiger, i.e. in separate heavy tank battalions. This implied that it would be encountered in small numbers like the Tiger and that the main threat would remain the PzKpfw IV. The first inkling that this might not be the case came in a joint Allied intelligence report released on February 22, 1944 on the basis of a German prisoner of war who stated that the Wehrmacht was shifting the organization of its panzer regiments to a new configuration consisting of one battalion of PzKpfw IV tanks and one battalion of Panthers. This was formally recognized in an Allied report on the German panzer division on April 30, 1944. This was a critical change since it implied that the Panther would represent a fundamentally different sort of threat than the Tiger. Instead of being encountered in small numbers like the Tiger, the Panther would be almost as widely encountered as the older PzKpfw IV. US intelligence recognized this change so late that the implications were not appreciated at the time by senior American leaders.

The US Army was still segregated in World War II, and two black tank battalions saw combat service in northwest Europe in 1944. The 761st Tank Battalion is the more famous, receiving the Presidential Unit Citation for its combat performance. This is an M4A3 (76mm) of the unit operating near Nancy, France, on November 5, 1944. (MHI)

The first combat use of the Panther outside the Soviet Union did not occur until February 1944 when the first tanks were sent to Italy. They were deployed opposite the Allied beach-head at Anzio. But they did not see any significant combat action until March 1944, and the US Army did not capture a Panther in Italy until May 1944. The first Panther tanks were not deployed in France until late 1943. The proportion of Panthers to older tank types grew from 25 percent in December 1943, to 46 percent in June 1944.



Scale line drawings of M4 (76mm) Sherman variants. (Author)

By the spring of 1944, there was a belated recognition by the US Armored Command at Fort Knox that the Panther would present a greater threat than had previously been recognized by US tactical doctrine or technical intelligence. A report on the tank situation of April 17, 1944 noted:

> While it is conceded that the primary objective of our armor is to engage the enemy infantry, artillery, and rear installations, experience has shown that the enemy will always counter an armored penetration with his own armor. Therefore, in order to operate successfully against remunerative and desirable enemy installations, we shall first have to defeat the enemy armor. To do this, we must have a fighter tank which is superior to the fighter tank of the enemy. Available information on characteristics of German tanks compared to those of our nation show that no American tank can equal the German Panther in all-around performance.

This assessment came too late to affect the planning of US armored units slated for the invasion of France in June 1944. A conference at Fort Knox in early April 1944 concluded that the best option for rapidly deploying a tank capable of meeting the Panther would be to mount a 90mm gun on the M4A3 hull, since it was felt that the new T26E3 (Pershing) heavy tank would not be available for nearly a year. A single test example was built by mounting a T26 turret on an M4A3 hull. But in reality, such a vehicle would take months to develop, and Ordnance rejected further work as a distraction from the main T26E3 effort.

THE SHOCK OF WAR

US Army complacency about its medium tanks was badly shaken during the first month of tank fighting in Normandy. The US Army had expected to suffer attrition rates of about 7 percent per month. In fact, June losses were more than three times as high, at 21 percent, and July losses were nearly 15 percent. US tankers were shocked to find that their 75mm guns were useless against the thick front armor of the Panther tank and that the Panther could destroy the Sherman from any realistic combat range. As the 12th Army Group's armor section later reported, "Our experience in the early hedgerow fighting indicated that our main tank armament was no match for the front armor of the German Panther and Tiger tanks and we realized that more open operations would make this condition still more unpleasant."

On July 2, Eisenhower complained to his ordnance officers about the problem, and they urgently cabled back to the United States asking about

any new ammunition that might be available to improve the situation. On July 12, 1944, a special board was formed to determine which US weapons might be capable of defeating the Panther and Tiger. None of the available US weapons could penetrate the Panther frontally, though the 75mm gun could do so against the side and rear depending on range. None of the M4A1 (76mm) tanks were available yet in France, but the M10 3-inch GMC tank destroyer with similar gun performance was found to be incapable of penetrating the Panther glacis at any range but could punch through the Panther mantlet at a range of only 200 yards instead of the promised 400 yards.

The combat debut of the M4A3E8 (76mm) took place after Christmas with the 4th Armored Division during Patton's drive to relieve Bastogne. This tank is seen covering the H-4 road outside the city on January 8 during the attempts to link up with the First Army near Houfallize. (US Army)

There was no immediate technical solution to the problem. Aware of the better armed 17-pdr. on the British Sherman Firefly, on August 9, 1944 General Omar Bradley inquired of his British counterpart, General Bernard Montgomery, whether it might be possible to obtain some 17-pdr. tank guns for US tank units. Montgomery, suffering even higher tank losses in his own sector, pointed out that there was no surplus capacity in Britain and that his forces were themselves under-equipped with this much prized weapon. The British Army, which faced the bulk of the German tank units in Normandy, had suffered much higher tank casualties than the US Army, about 1530 tanks compared to about 875 US tanks.

The much maligned M4A1 (76mm) tanks sitting idle in Britain soon became a much sought-after wonder weapon. In the middle of July 1944, General Bradley ordered that as many as possible be shipped to France to take part in the upcoming Operation Cobra, an attempt to break out of the hedgerow country of Normandy. A total of 102 M4A1 (76mm) arrived and they were evenly divided between the 2nd and 3rd Armored Divisions which were to be the spearheads of the Cobra breakout. The M4A1 (76mm) medium tank first went into combat on July 25, 1944, the second day of the offensive. The attack itself was a spectacular success and the Cobra breakout was followed in early August by an equally spectacular drive through Brittany by Patton's newly activated Third Army. While British and American forces trapped most of the German Army in Normandy in the Falaise pocket in mid-August, Patton's Third Army switched its attention eastward, making its legendary drive to the Seine river. Paris was liberated by the end of August, and the German army in the west was decimated again by further encirclements on the Seine river and again in the Mons pocket in Belgium in early September. By the time of the fighting in Lorraine in September, a new version of

the M4 (76mm) arrived, the M4A3 (76mm) which used the Ford GAA engine instead of the Continental radial engine. These saw their combat debut in the first week of September 1944 with Patton's Third Army. Apart from the initial batch of M4A1 (76mm) which arrived in April, nearly all 76mm tanks that arrived subsequently were the M4A3 (76mm).

While the new M4A1 (76mm) played a role in many of these battles, it proved to be no solution to the Panther problem. US tank units in the ETO were quick to improvise innovative tactics to overcome equipment shortcomings. In confronting German armor, US tank platoons developed methods to keep the German tankers busy so that other tanks could maneuver and engage the Panthers from the side or rear where their armor was thinner. When told of the ineffectiveness of the M4A1 (76mm) against the Panther, Eisenhower bitterly remarked "You mean our 76 won't knock these Panthers out? Why, I thought it was going to be the wonder gun of the war. ... Why is it that I'm the last to hear about this stuff? Ordnance told me this 76 would take care of anything the Germans had. Now I find you can't knock out a damn thing with it."

The issue had far less urgency in September 1944 after the great summer victories. Brigadier General J. A. Holly, the chief of Eisenhower's armor section, wrote to a colleague in early September 1944: "Probably the problem of the Panther will no longer be with us for the remainder of the war. The German, we believe, has lost most of his armor." A few days later, Hitler ordered a local panzer counteroffensive against Patton's Third Army in Lorraine using four of the newly formed panzer brigades. The attacks were crushed in late September by US and French tank units still equipped with the 75mm versions of the M4 tank. Again, the better training of the US tankers overcame the technical shortcomings of their equipment. The Panthers performed poorly in these battles largely because of the inexperience and poor training of their crews.

On receiving their new M4A3E8 (76mm) tanks, Co. G, 66th Armored Regiment, 2nd Armored Division, staged a publicity event for army photographers to highlight the new tank. These two tankers show the difference in size between the 75mm ammunition on the left and the 76mm ammunition on the right.

By early September, British tank units had been able to replenish their Normandy losses, and an offer was made to convert up to 100 American M4 tanks per month to 17-pdr. Sherman Fireflies, taking over about 40 percent of British conversion capacity. Eisenhower's armor section reported back to Washington on September 17, 1944 that the effort had "slipped into the background because of the scarcity of German armor, the war successes, the shipment of 75mm gun tanks to the Continent instead of the UK and no apparent accumulation of

A M4A3 (76mm) of the 42nd Tank Battalion, 11th Armored Division, passes by an abandoned German PzKpfw IV tank outside Bastogne on January 15, 1945. The 11th Armored Division had been one of the units of Patton's Third Army used to widen the corridor into Bastogne at the end of December. Then it took part in efforts to break out of the encirclement on the eastern side of the town. (US Army)

tank reserves ... battle losses consumed our 75mm gun tank reserves." At the beginning of September 1944, Bradley's 12th Army Group was short of about 75 M4 medium tanks compared to its authorized table of organization and equipment (TO&E) strength. The problem stemmed from a serious underestimation of the likely attrition rate of tanks. The summer fighting had consumed so many tanks, and reserves were so low, that by the end of the month, US tank units in the ETO were short of 335 tanks. Ordnance officers in the theater were unwilling to divert several hundred tanks to the 17-pdr. program when the units in the field were significantly short of tanks. This situation continued to deteriorate throughout the rest of 1944, and worsened dramatically in December 1944 due to heavy combat losses during the Battle of the Bulge. By the beginning of January 1945, the deficit was 865 medium tanks, about 30 percent of authorized inventory, though some of this was made up locally by repairing a significant number of damaged and broken-down tanks. As a result of these shortages, the US Army's 17-pdr. program was put on indefinite hold throughout 1944.

NEW AMMUNITION

The only short-term technical solution to the inadequate performance of the 76mm gun was the deployment of better ammunition. The first change was the substitution of a long primer in the propellant for the short primer first used. This more efficiently ignited the propellant charge and reduced the smoke when the gun was fired. Ammunition with the long primer began to be distributed in August 1944. Ordnance had been working on a new generation of HVAP (high-velocity armor-piercing) ammunition since 1943. These rounds used a core made of heavy tungsten carbide surrounded by an aluminum shell. As a result, the shell was relatively light yet had a high velocity and very good armor penetration. On impact, the outer shell peeled away, and the smaller tungsten carbide core penetrated the armor. The main problem with these rounds was the scarcity of tungsten. A shipment of 2000 rounds of the T4 76mm HVAP was airlifted to France in August 1944. Its

A camouflaged M4A3 (76mm) of the 14th Armored Division supporting the 68th Armored Infantry Battalion near Ober Otterbach, France, on December 14, 1944. At this stage of the war, the Division had already begun to put sandbags on the glacis plate for added protection, but the attachment of full sandbag armor to the hull sides and turret did not take place until February 1945. (NARA)

performance in trials against actual Panthers was poorer than the predicted results from stateside tests against armor plate, but it was still significantly better than the standard M62 APC round. It could not penetrate the Panther glacis, but it punched the Panther mantlet at 800 to 1000 yards compared to only 200 yards for the normal M62 APC (armor-piercing-capped). An order for 20,000 HVAP rounds was issued in the late summer, but production never kept up to demand because of shortages of tungsten. This production was to be equally divided between 76mm and 3 inches, the latter for the M10 3-inch GMC tank destroyer. The HVAP ammunition underwent continual refinement throughout the autumn and was finally type-classified as the M93 76mm fixed shot HVAP-T in February 1945. The first distribution of HVAP ammunition to tank units took place in Belgium on September 11, 1944 to the 3rd Armored Division and the 746th Tank Battalion. Tankers were very enthusiastic about the performance of the new ammunition, but it was never available in adequate quantities – hardly one round per vehicle per month. By the end of February 1945, each 76mm tank had received, on average, only five rounds of HVAP. By early March 1945, a total of about 18,000 rounds of HVAP had been delivered to the ETO of which about 7550 were

Tankers of the 3rd Armored Division take a break near Houfallize, Belgium, during the Ardennes fighting in late December 1944. The M4A1 (76mm) to the left is from the original batch received in Normandy in July 1944, while to the right is an M4A3E2 assault tank. (NARA)

The numerous tank skirmishes during the Battle of the Bulge led to more complaints about the poor performance of US tanks against the German panzers. The greatest discrepancy was between the massive King Tiger, seen here on the left, and a snow-camouflaged M4A3 (76mm) photographed at the First Army headquarters near Spa, Belgium. (MHI)

76mm rounds (42 percent) and the rest 3-inch ammunition for the M10 tank destroyers. The 6th Army Group, fighting in Alsace in December 1944–January 1945, received little or no 76mm HVAP ammunition.

Some new tank units arriving from the United States were equipped almost entirely with the M4A3 (76mm). The first of these, the 9th Armored Division, entered combat in October 1944. In terms of distribution, armored divisions were favored in allotments of M4A3 (76mm) since it was felt that they had a greater likelihood of encountering German panzers. There were exceptions to this policy, and a few separate tank battalions arriving from the United States in the autumn of 1944 had a relatively large percentage of M4 (76mm). For example, the 774th Tank Battalion, which served in the First Army in November 1944, was equipped entirely with M4A3 (76mm). The tank units with Dever's 6th Army Group that landed in southern France on August 15, 1944 were slower to receive the M4 (76mm) since, initially, it received its allotments from the Mediterranean theater which had lower equipment priority. As a result, the first allocation of 70 M4A3 (76mm) did not occur until mid-September 1944, about four months later than Bradley's 12th Army Group. Owing to logistical problems in northwest Europe caused by the delayed opening of the port of Antwerp, the US Army began to ship more tanks directly from the United States through ports in southern France. As a result, the 6th Army Group began receiving the 76mm tanks in greater volume. Indeed by mid-March 1945 the situation had reversed, and the US tank units of the 6th Army Group had about 50–55 percent 76mm tanks compared to only about 35 percent in the 12th Army Group.

Although most tank units were in favor of the new 76mm tank gun, the feeling was not universal due to continuing concern over its poor high explosive ammunition. During a War Department observer's briefing in November 1944, Major General Grow of the 6th Armored Division indicated that he wanted to increase M4 (76mm) strength to the point where there would be a platoon of M4 (76mm) in each medium tank company. However, he rejected the idea of eliminating the 75mm M4 since his unit still preferred the high explosive firepower of the 75mm guns, and a white phosphorus smoke round was still not

available for the 76mm gun. His tank battalion commanders supported him in this view and Lieutenant Colonel E. D. Lagrew of the 15th Tank Battalion commented that "from our observation, the 76mm HE is not as good as the 75mm. We are satisfied with the 75mm gun and are willing to fight with it."

Many experienced tankers felt that the 75mm gun was more versatile because of the availability of a greater range of ammunition, and that its shortcomings in tank fighting were less critical since they could be overcome by tactics. For example, the 37th Tank Battalion of the 4th Armored Division proved very reluctant to shift to the M4 (76mm) even after the extensive tank fighting against Panther tanks in Lorraine in September 1944. The head of Combat Command A, Colonel Bruce Clarke, had to plead with his tank battalion commander, Lieutenant Colonel Creighton Abrams, to take an M4A3 (76mm) as his own tank, realizing that no crew would be willing to do so without Abrams's example. Attitudes remained quite mixed. Tank commanders from the 3rd and 5th Armored Divisions interviewed by observers in December 1944 stated that the M4A3 (76mm) tanks were "well liked, especially when using HV(AP) ammunition. It was the general complaint, however, that the muzzle blast made it impossible for the gunner to adjust his fire. Some units were employing a system of having one tank observe the fire of another and making adjustments by radio. This of course reduces the fire power of a unit. Even the HV(AP) ammunition left much to be desired as it would not penetrate the front plate of either the Mk V (Panther) or Mk VI (Tiger) tank and the various commanders appeared quite disturbed over the fact that their tanks were out-armored and out-gunned by the German tanks."

Attitudes towards the M4 (76mm) continued to move in its favor throughout the autumn owing to the weather and terrain conditions along the German border. The autumn of 1944 was unusually wet, and this forced tank units to move down roads or narrow approaches, limiting their maneuverability as a tactic to deal with German armored vehicles. Under such conditions, accurate, long-range engagement of German armored targets became more important, and this was one role for which the M4 (76mm) proved well suited.

An overall shortage of medium tanks in the ETO made US armored officers extremely reluctant to push for a cancellation of production of M4 tanks with the 75mm gun. In the autumn of 1944, the first steps were taken to ensure that priority was given to the shipment of M4 (76mm) tanks to the ETO,

The ultimate solution of the mobility problems with the M4 tank was the 23-inch track, which was introduced into production along with the new HVSS suspension in August 1944. This M4A3E8 (76mm) is fitted with the initial T66 steel tracks and is seen during trials at Fort Knox. It is fitted with a set of experimental smoke dischargers on the turret side. (Patton Museum)

and the relative percentage of these tanks gradually rose to almost a third of US Army medium tank strength by the time of the Battle of the Bulge in December 1944. These tanks remained concentrated in the armored divisions, with almost twice as many M4 (76mm) in the armored divisions as in the separate tank battalions supporting the infantry divisions.

As a result of the intense combat with German panzer units in the Ardennes, there was a marked change in opinion about the 76mm gun, and growing criticism of the large numbers of 75mm tanks still in service. While many units had been indifferent to the issue throughout most of the autumn when they faced little German armor, the Ardennes fighting shifted opinion decidedly in favor of the M4 (76mm). On January 29, 1945, the 12th Army Group formally requested that no more 75mm M4 tanks be shipped to Europe and that all future deliveries consist only of M4 (76mm) tanks. On February 15, 1945, the 12th Army Group refused to bring forward any further 75mm medium tanks from the stocks held in reserve, so that by April about 600 M4 75mm tanks had accumulated in rear area depots in Europe.

US 12TH ARMY GROUP M4 STRENGTH

75mm vs. 76mm Medium Tanks 1944–45

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
75mm tanks	646	781	1317	1367	1267	1521	1377	1695	1749	1937	1664	1449
76mm (arm'd div.)			95	117	202	406	418	350	542	624	726	987
76mm (tank bn.)				95	37	166	177	259	216	305	438	607
76mm Sub-total			**95**	**212**	**239**	**572**	**595**	**609**	**758**	**929**	**1164**	**1594**
Total M4	**646**	**781**	**1412**	**579**	**1506**	**2093**	**972**	**2304**	**2507**	**866**	**2828**	**3043**
% 76mm tanks	0	0	6.7	13.4	15.8	27.3	30.1	26.4	30.2	32.4	41.1	52.3

US 6TH ARMY GROUP M4 STRENGTH*

75mm vs. 76mm Medium Tanks 1945

	Jan	Feb	Mar	Apr	May
75mm tanks	422	381	332	434	523
76mm tanks	185	208	366	478	557
Total M4	**607**	**589**	**698**	**912**	**1080**
% 76mm tanks	30.4	35.3	52.4	52.4	51.5

*Includes US tank units only, excludes Free French

US 12TH ARMY GROUP M4 (76MM) TANK LOSSES

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
First Army	0	12	38	33	0	14	100	29	7	48	26	307
Third Army	0	0	0	61	0	7	72	127	25	82	38	412
Ninth Army	0	0	0	0	3	16	5	2	18	39	28	111
Total	**0**	**12**	**38**	**94**	**3**	**37**	**177**	**158**	**50**	**169**	**92**	**830**

PROBLEMS AND SOLUTIONS

The M4 tank used narrow 16.5 inch tracks that proved adequate in summer months, but did not provide adequate floatation in the autumn once rain created muddy conditions. The short-term solution was to fit the tracks with extended end-connectors, nicknamed duck-bills or duck-feet by the tankers.

The long-term solution was to use the new HVSS suspension that had been in production in the United States since August 1944. It took three months for the first 76mm tanks with these new suspensions to arrive. The first unit in the ETO to receive the type was the 8th Armored Division, which received 41 of these tanks prior to being shipped to England in November 1944. However, this unit did not deploy to combat until mid-January 1945. The first shipment of 109 replacement tanks for units in the ETO departed on December 4, 1944. The first to see combat was a batch of 21 tanks allotted to Patton's Third Army on December 22, 1944 and mostly sent to the 4th Armored Division during the fighting around Bastogne.

All four armies attached to Bradley's 12th Army Group received small numbers of these tanks in January 1945 as part of the effort to make up for losses in the Ardennes fighting. Initially these tanks were known to the troops as "M4A3 (76mm gun) with 23-inch track." This designation was too cumbersome, and by the spring of 1945 they were more commonly referred to by their experimental designation of M4A3E8. While this designation in fact applied to any of the developmental M4A3 tanks fitted with the HVSS suspension, in practice it was usually used to identify the 76mm M4A3 tanks with the HVSS suspension. Some units referred to these as "Easy Eights" but this appears to have been a post-war nickname. Some army records would suggest that some M4A1E8 (76mm) were deployed in the ETO in the spring of 1945, but no photographic evidence of this has emerged.

The HVSS suspension was also fitted to other versions of the M4 series, including the M4A1E8 (76mm) as seen here. Although US Army documents suggest that some of these were issued to tank units in the ETO in the spring of 1945, no photographic evidence has emerged of this type in combat. (Patton Museum)

DELIVERY OF M4A3E8 (76MM) TO ARMIES OF 12TH ARMY GROUP IN ETO 1944–45

Army	Dec	Jan	Feb	Mar	Apr	Total
First		29	19	57	153	258
Third	21	28	62	13	132	256
Ninth		33	72	45	64	214
Fifteenth		24				24
Total	**21**	**114**	**153**	**115**	**349**	**752**

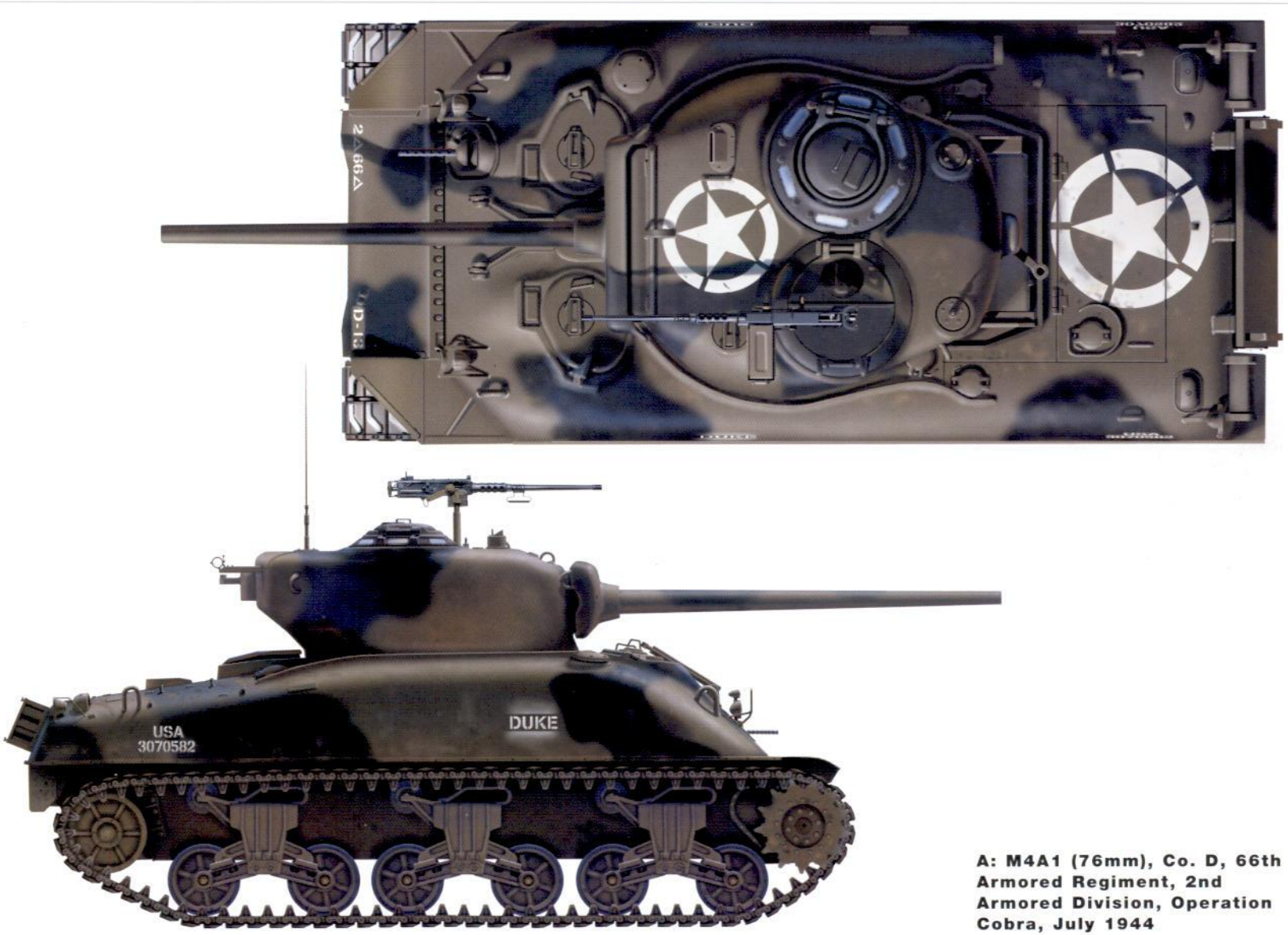
In addition to the problem of the inadequate firepower of the 75mm and 76mm gun on the M4, the armor was not proof against the broad range of German weapons including the 75mm tank guns, the 75mm PaK 40 anti-tank gun, and the various German infantry anti-tank rockets such as the panzerfaust. This led to a variety of improvised solutions.

During the summer of 1944, some units began to lay sandbags on the front glacis plate of their M4 tanks, believing that this would reduce the penetration of German anti-tank rockets. There was considerable controversy among Ordnance officers regarding the effectiveness of this practice. Most Ordnance officers felt that it was useless since the sandbags detonated the panzerfaust warhead at a stand-off range that permitted the high explosive jet to form more coherently before impacting the tank's armor, thereby actually enhancing its penetration power. Tankers disagreed, and cited numerous examples when sandbagged tanks were not penetrated by panzerfausts or panzerschreck hits.

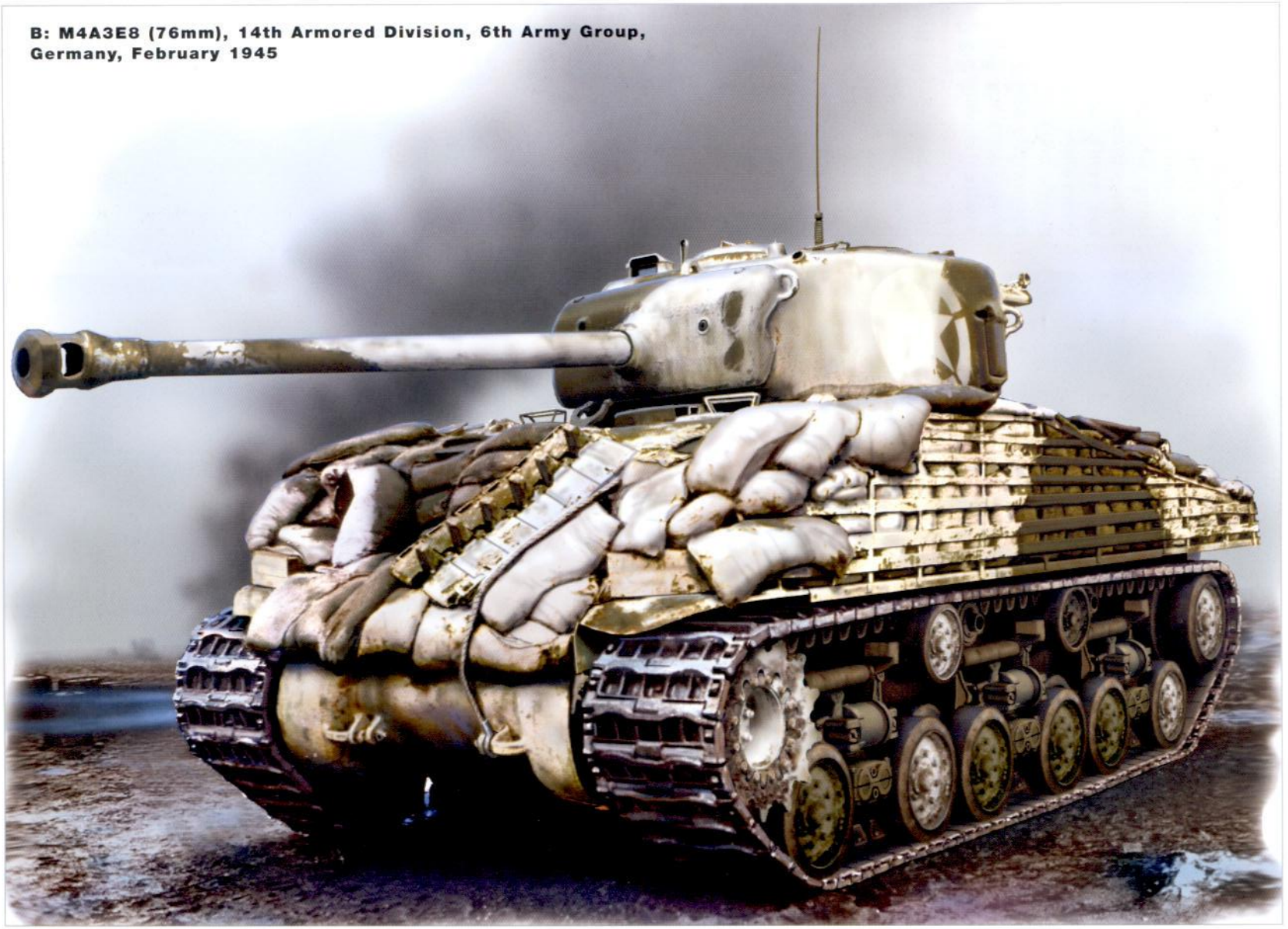
Early attempts at improving the armor on the M4A3E8 (76mm) were improvised from sandbags and spare track blocks. This is a tank of Co. A, 18th Tank Battalion, 8th Armored Division, at Bocholtz, Netherlands, on February 23, 1945. (USMA)

The exception to the sandbag armor practice was Patton's Third Army. Patton was convinced by his ordnance officers that the sandbag armor was ineffective and that the added weight put excessive strain on the suspension and power train. As a result, Patton ordered that no units under his command would use sandbag armor. This was not a particular problem for units regularly assigned to his army such as the 4th and 6th Armored Divisions, but units temporarily assigned to his command were faced with a dilemma since it was difficult to mount and dismount the sandbags. The complaints about the poor armor protection on the M4 continued, and grew especially loud after the fighting in the Ardennes in January 1945. As a result, ordnance units in the Third Army came up with the idea of using steel armor from disabled US and German tanks to up-armor the M4. In February 1945, Patton ordered that all M4 (76mm) in his units be fitted with additional front hull armor as well as turret armor if possible. Since this effort was too time-consuming for the limited number of ordnance units in the Third Army, the work was given to three Belgian factories near Bastogne. The tanks of three armored divisions (4th, 6th, 11th) were modified in this fashion, an average of 36 tanks per division. The program was immediately

Ordnance units of the Ninth Army developed an armor appliqué consisting of a steel track welded to the armor, covered with sandbags, and with a final cover of camouflage net as seen on these M4A3 (76mm) of the 747th Tank Battalion near Schleiden, Germany, on January 31, 1945. (NARA)



A: M4A1 (76mm), Co. D, 66th Armored Regiment, 2nd Armored Division, Operation Cobra, July 1944


B: M4A3E8 (76mm), 14th Armored Division, 6th Army Group,
Germany, February 1945

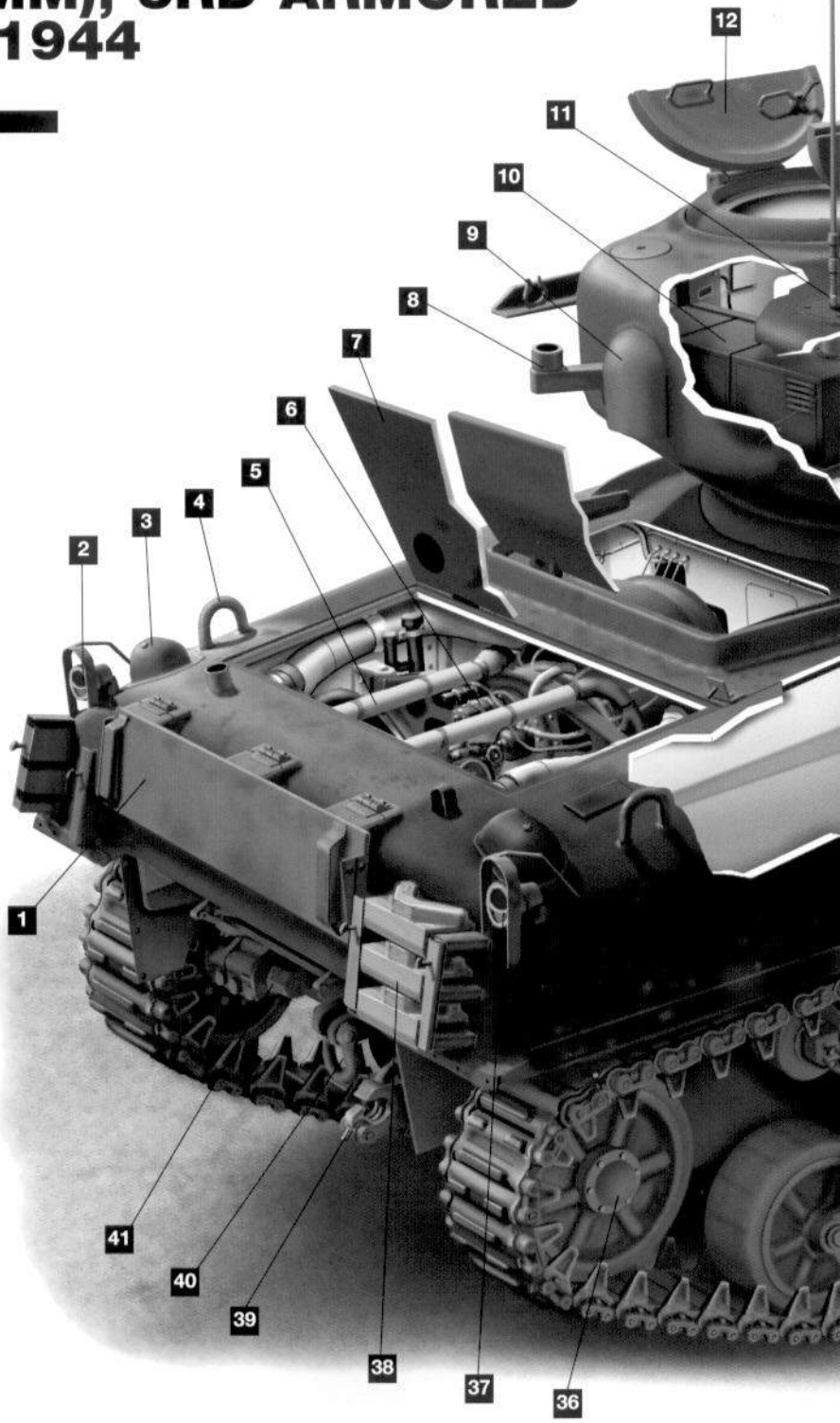
C1: M4A1 (76mm), 2e Regiment de Chasseurs d'Afrique, French 1st Armored Division, Germany, April 1945

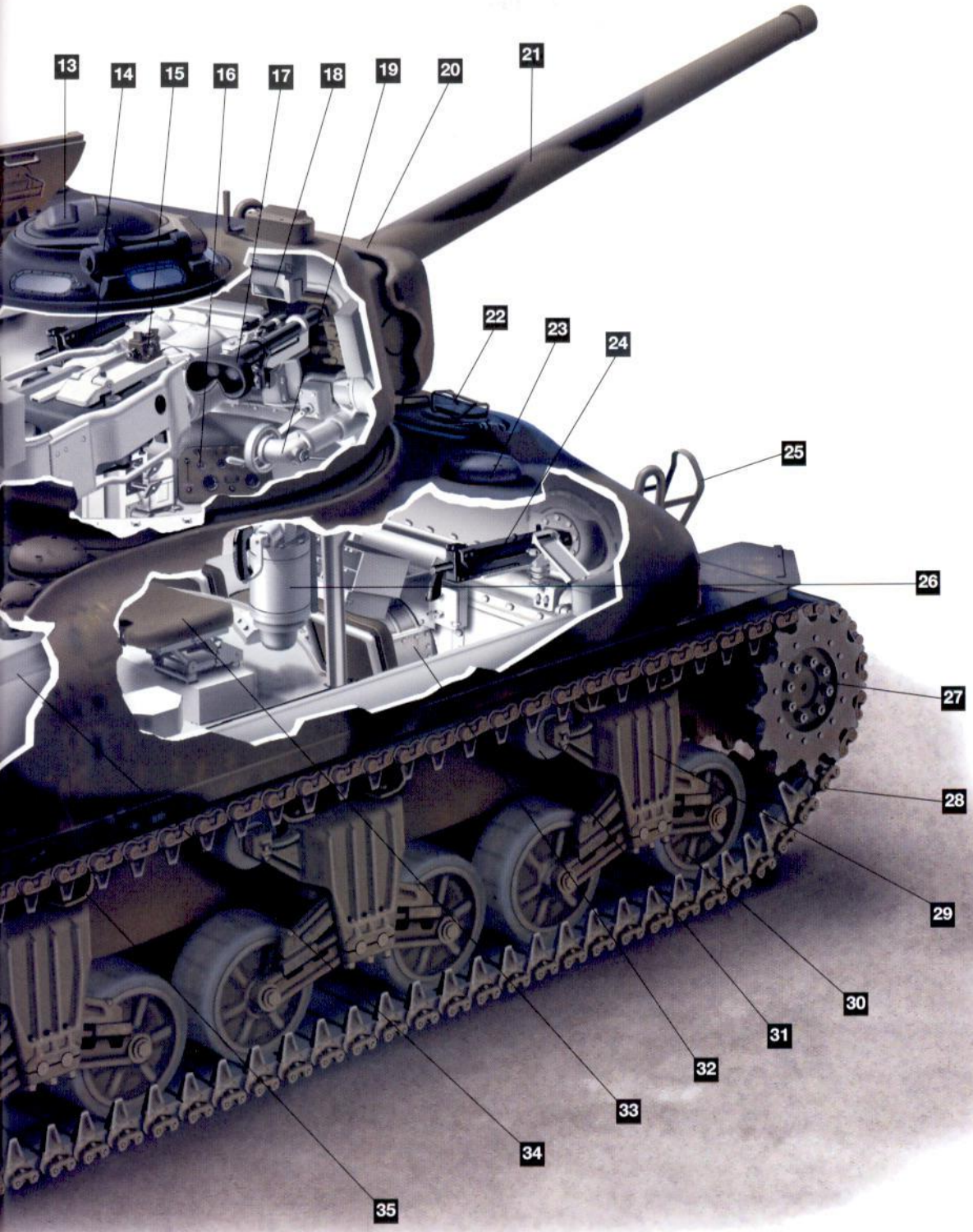
C2: M4A2 (76mm), 1st Guards Mechanized Corps, Red Army, Vienna, May 1945

D: CROSS-SECTIONAL DRAWING: M4A1 (76MM), 3RD ARMORED DIVISION, 1944

KEY

1 Rear stowage rack
2 Rear light
3 Grouser compartment vent
4 Lift hook
5 Engine exhaust hose
6 Powerplant
7 Engine access door
8 Machine gun stowage bracket
9 Turret vent cover
10 Radio
11 Radio antenna
12 Loader's hatch
13 Commander's cupola
14 Co-axial .30 cal. machine gun
15 76mm gun
16 Driver's instrument panel
17 Gunner's telescopic sight
18 Gunner's periscopic sight
19 Gunner's elevation control
20 Gun mantlet
21 Main gun barrel
22 Periscope protective guard
23 Hull vent cover
24 Hull .30 cal. machine gun
25 Headlight brush guard
26 Turret traverse system
27 Drive sprocket
28 Track end connector
29 Suspension bogie assembly
30 Road wheel
31 Return roller
32 Transmission cover
33 Commander's seat
34 Fuel tank
35 Track skid
36 Idler wheel
37 Rear light brush guard
38 Spare track block rack
39 Towing pintle
40 Tow hook
41 Track tensioning assembly

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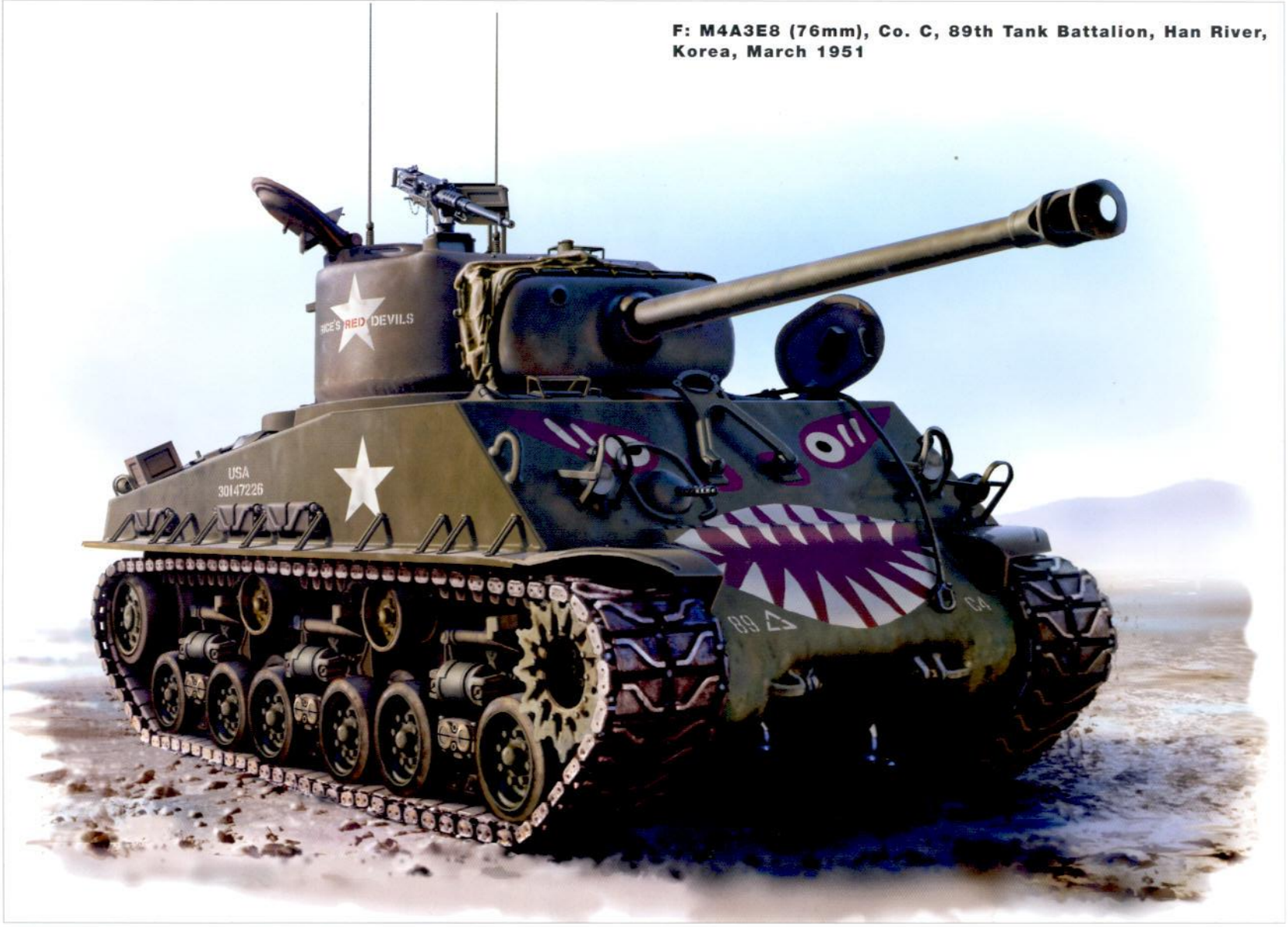
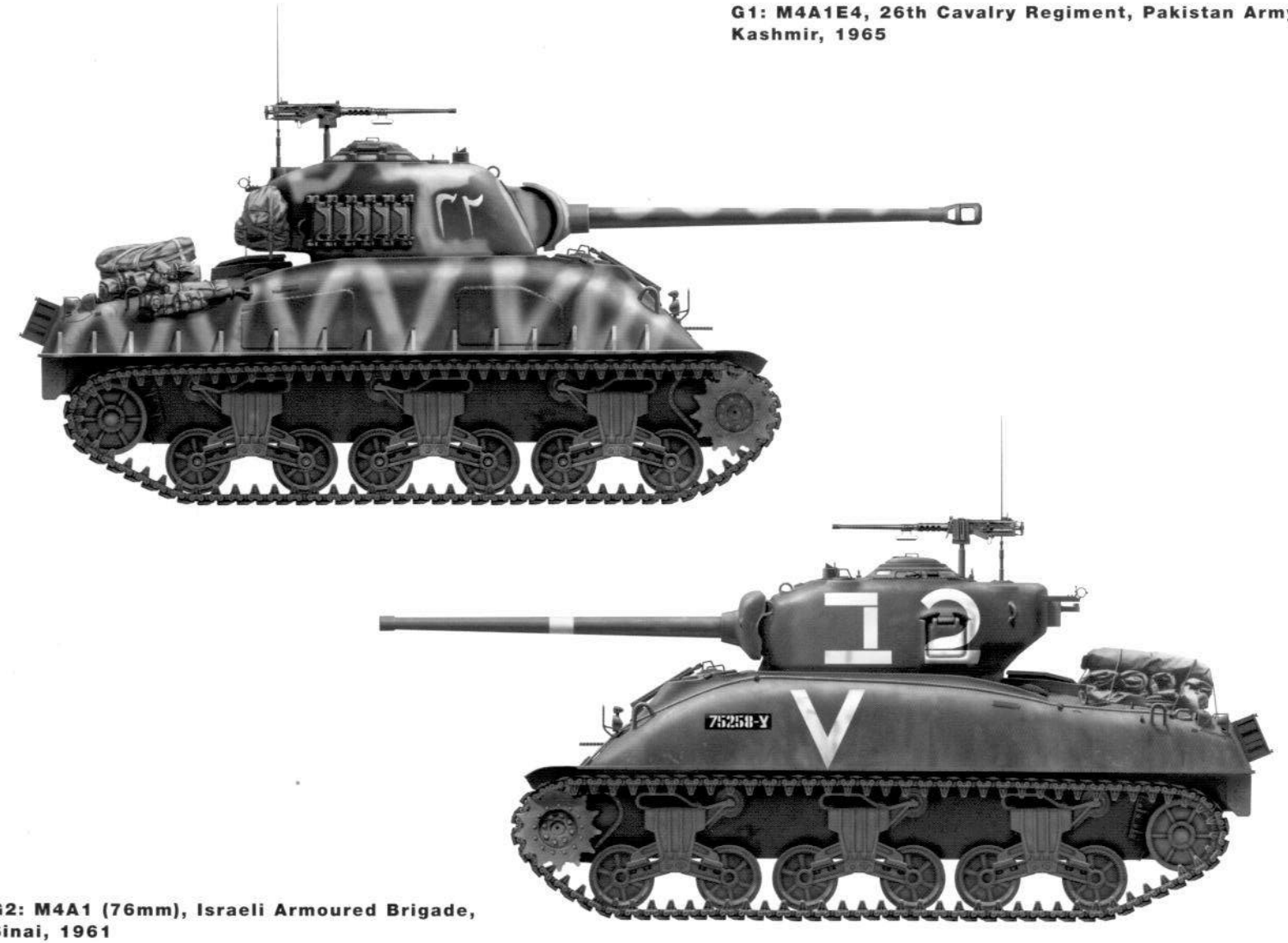
E: M4A3E8 (76mm), C Squadron, Lord Strathcona's Horse, Canadian Army, Korea, November 1951



F: M4A3E8 (76mm), Co. C, 89th Tank Battalion, Han River, Korea, March 1951



G1: M4A1E4, 26th Cavalry Regiment, Pakistan Army, Kashmir, 1965

G2: M4A1 (76mm), Israeli Armoured Brigade, Sinai, 1961

Having added the sandbag armor to this M4A3 (76mm) of the 14th Armored Division, the ordnance personnel are finishing the job by spray painting a camouflage pattern of black over the usual olive drab finish. These tanks were usually fitted with extended end connectors on the tracks to help compensate for the added weight of the sandbags. (US Army)

Some units of the Seventh Army were not convinced about sandbag protection. A number of tanks of the 12th Armored Division including this M4A3E8 (76mm) were fitted with poured-concrete armor, which was attached over a matrix of steel reinforcing bar using wood molds. (NARA)

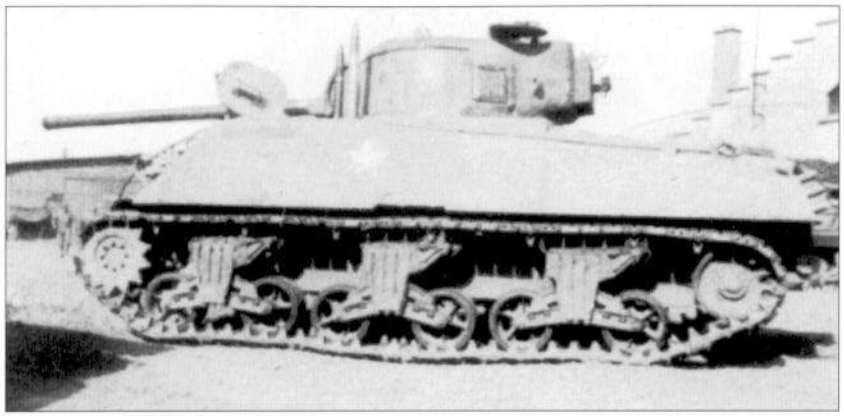
popular. A 6th Armored Division tanker recalled how shortly after his M4A3E8 had been fitted with the armor in February 1945, his tank was hit by a 75mm round from a German armored vehicle. The impact managed to separate a piece of the armor from the hull, but prevented it from penetrating. The German vehicle was taken under fire and destroyed. This program was continued in March 1945 after the Third Army was able to acquire another group of salvaged M4 tanks from the neighboring Seventh Army, which could be used for armor plate.

UPGUNNING THE M4 TANK

There was widespread criticism of the lack of effective tank guns on US medium tanks in the wake of the Battle of the Bulge in December 1944–January 1945. The issue became a major controversy in the United States in January 1945 when the *New York Times* ran a series of articles by their military correspondent, Hanson Baldwin, that led to calls for a Congressional investigation into the scandal. At the beginning of January 1945, only about a quarter of the M4 tanks in the ETO were the M4 (76mm). Senior Army commanders attempted to solve this problem in three ways: to stop the shipments of any further 75mm M4 medium tanks in favor of the 76mm tanks, to re-arm 75mm tanks with the 76mm gun, and to restart the long delayed effort to convert some 75mm tanks to the British 17-pdr.

The attempt to re-arm the 75mm tanks with the 76mm gun was undertaken by ordnance units in Patton's Third Army. A pilot was built using the 76mm M1A2 gun, but the larger size of the 76mm ammunition meant that only 58 rounds could be stored instead of the usual 90 75mm rounds. The pilot had a slab of steel welded to the back of the turret to act as a counter-balance to the new gun. However, the plan was to use a rear-mounted radio box instead, but in March

this was dropped because of problems locating enough armor plate. In mid-March 1945, the army began to collect supplies to begin modifying the first batch of 300 75mm gun tanks to 76mm guns, a process that was expected to take 45–60 days. In the event, the project was suspended on April 14, 1945 because of the much improved flow of M4 (76mm) tanks from the United States to Europe. By April, the supply of M4 (76mm) tanks exceeded combat losses and there was no perceived need for the conversion.



Dissatisfaction with the large number of 75mm gun tanks still in service led Third Army ordnance teams to attempt to mount the 76mm gun on the smaller turret in February 1945. Notice the counterweight behind the turret, a simple slab of steel. (MHI)

The one exception to this was the M4A3E2 assault tank. This was a version of the normal M4A3 tank with heavier armor and a special turret with thicker armor. A total of 250 were deployed in the ETO where they were widely praised since they were the only US tank at the time that could survive a direct hit on the front from the German 88mm tank gun. In February 1945, during initial discussion of re-arming other 75mm M4 tanks, Patton's Third Army decided to immediately re-arm all 45 M4A3E2 tanks in its units. These conversions presented fewer problems than converting the normal 75mm tanks since the uparmored turret was also considerably larger and had been designed to accommodate larger guns. The conversion was carried out by local ordnance battalions. Along with the new gun, the units also substituted a .50 cal. heavy machine gun for the usual .30 cal. machine gun. Other armies followed suit, and it would appear that a total of about 100 of the M4A3E2 were re-armed with the 76mm gun.

A total of 80 M4 and M4A3 were up-armed in British arsenals with the 17-pdr. tank gun in March and April 1945. These did not arrive in time to be deployed before the end of the war. This photo from the 3rd Armored Division shows an M4 (17-pdr.) fitted with an M1 dozer blade passing through a French or Belgian town in 1945. (Patton Museum)

The Ardennes fighting and the growing surplus of 75mm gun tanks in depots led to a revival of the long dormant US 17-pdr. program in February 1945. The US M4 (17-pdr.) differed from its British counterpart in a number of respects. A number of externally mounted items standard on British Shermans were omitted. In addition, the radio box on the turret rear was slightly larger to accommodate the US Army's SCR-508 or SCR-528 radio. Other features unique to the US vehicles were the attachment of an M9 elevating quadrant on the gun cradle and the attachment of the .50 cal. heavy machine gun stowage bracket on the back of the armored radio box. Two pilots for the US M4A3 (17-pdr.) were completed on March 15, 1945 and the first shipment of M4 medium tanks from France back to the UK for conversion arrived in Southampton on March 9, 1945.

The initial order was for 160 conversions, to be completed by April 30, 1945. The M4A3 with wet ammunition stowage was preferred for the

Although the plan to re-arm 75mm M4 tanks was abandoned, the gun tubes that were collected were used to re-arm most of the surviving M4A3E2 assault tanks. This M4A3E2 of the 32nd Armored Regiment, 3rd Armored Division, is seen in the ruins of Cologne during the fighting for that city in March 1945. (NARA)

conversion but M4 tanks were also used. A total of 11 conversions were completed by the end of March and the first batch of five converted M4 (17-pdr.) tanks left Southampton on March 31, 1945. On April 7, 1945, the US Army decided against proceeding with the planned conversion program beyond the first batch of 80 tanks. It was realized that with the war nearing its end, the tanks would probably never see action and that the process of adding a new caliber of ammunition into the logistics network was not warranted. By the time that news of the US change of plan was received by the British arsenals, a total of 100 tanks were already completed or in the process of conversion. As a result, the excess 20 vehicles were earmarked for transfer to Britain as Lend-Lease. After preparation, the M4 (17-pdr.) tanks were supposed to be issued to tank units of the First and Ninth Armies on an equal basis of 40 apiece. The last conversions were completed by May 7, 1945 and the last three left Southampton on May 10, 1945, after the war had ended. The excess 20 conversions at Hayes Arsenal were transferred to the British Army.

None of the M4A3 (17-pdr.) were actually deployed with US Army tank units, as by the time that they arrived on the Continent and were prepared for deployment, the war was almost over. In mid-May 1945, ETOUSA asked the 6th Army Group if they wanted the M4 and M4A3 (17-pdr) for units slated to be deployed in Japan. They recommended against deploying them to the Pacific and instead suggested they be retained in Europe for occupation duty. The fate of these tanks after the war is unclear.

THE M4 (76MM) IN OTHER THEATERS

Although the M4 (76mm) was most widely used in the ETO, some were deployed in much more modest numbers with US units in the Italian theater. Of the first batch of 250 M4A3 (76mm) tanks sent to Europe in the summer of 1944, 140 were allocated to units in the Mediterranean. A total of 70 were sent to the Fifth Army, with the 1st Armored Division receiving 53 and the remainder going into army reserves. The first 41

M4A3 (76mm) tanks went into service in mid-August on the basis of two companies in each of three tank battalions. An additional 70 were allocated to the US Seventh Army in mid-September, which at the time was in southern France following the amphibious landings on the Riviera on August 15, 1944 (Operation Dragoon). These were divided among three tank battalions, totaling 54 tanks with the remaining 16 going into army reserves. The reaction to the new tanks in the Italian theater was enthusiastic from the outset. An ordnance officer visited all five separate tank battalions in Italy as well as the 1st Armored Division in early September 1944 to inquire whether the units wanted any of the new 76mm gun tanks. He later reported that "The opinion was held by all commanders that each battalion should have its complement of these 76mm gun tanks. All were of the opinion that the added maintenance and ammunition supply problems would not be great and that in any case such considerations were outweighed by the need for additional gun power."

The M4A3 (76mm) appeared in Italy later than in France with the first being issued to the 1st Armored Division in August 1944. This tank of Co. A, 1st Tank Battalion, 1st Armored Division, is seen in Italy on September 7, 1944. (MHI)

The Fifth Army in Italy had lower priority than units in northwest Europe and so received a smaller percentage of 76mm M4 tanks. A total of 78 M4A1 (76mm) and M4A3 (76mm) were lost in combat in the Italian theater in 1944–45. A small number of the M4A3E8 (76mm) arrived in Italy before the end of the war.

Curiously enough, Italy was the only theater where 17-pdr. Fireflies were actually deployed with US units. These were not from the tanks modified to US specifications in Britain in March–April 1945, but rather were Fireflies taken from stocks of the British Eighth Army in Italy.

The M4A3 (76mm) that served with the 1st Armored Division in Italy had their own local modifications made. Many of the Division's tanks had a "donkey sight" added on the right front turret roof that was used for gun laying when the tank was being used in the indirect fire artillery role. This is very evident as a pair of semi-circular metal hoops were welded on either side of the sight to protect it. This tank, named Somme IV, belonged to the 4th Tank Battalion and is seen near St Lucia on October 19, 1944 prior to the attack on Bologna. (US Army)

This overhead view of an M4A3 (76mm) of Co. B, 13th Tank Battalion, 1st Armored Division, in Modena, Italy, on April 22, 1945 provides a good view of the features of the late production vehicles from the Grand Blanc tank arsenal with a muzzle brake fitted to the 76mm gun. A new turret casting was introduced in August 1944 which substituted an oval hatch for the loader instead of the previous round split hatch. This tank has the fittings to mount the dozer blade, though it is not attached here. (NARA)

In total, 12 Sherman IC (17-pdr.) tanks were transferred to the US Army in late March 1944, and were used to equip Company C, 755th Tank Battalion. Although the crews trained with the tanks, they were received too late for combat.

The M4 (76mm) was never deployed with the US Army's separate tank battalions in the Pacific. This was because of the poor quality of Japanese tanks, which were so thinly armored that they could be easily destroyed by the 75mm gun. The same applied to US Marine tank battalions, which also exclusively relied on 75mm versions of the M4 medium tank series.

LEND-LEASE M4 (76MM)

The principal recipient of the Lend-Lease M4 (76mm) was the Soviet Union. Since the M4A2 was the only version of the M4 series powered by a diesel engine, this type was preferred by the Red Army. A total of 2095 M4A2 (76mm) were shipped to the Soviet Union of the 2915 manufactured. This included 1482 M4A2 (76mm) in 1944 and 613 in 1945. Of those shipped, 2073 were actually received. The M4A2 was popularly called the "emcha" in Soviet service, a contraction of the Russian for M4 (M-Chetire). The 76mm tanks did not begin arriving until the late summer of 1944, and as a result were not commonly seen in combat until 1945. In contrast to previous periods of the war, it would appear that by 1945, the Red Army was making a greater effort to standardize on tank types within the tank and mechanized corps. So, for example, the 8th Guards Mechanized Corps in January 1945 had 185 M4A2s and only 5 T-34s. Other units that relied heavily on the M4A2 (76mm) in 1945 included the 1st Guards Mechanized Corps, and 9th Guards Mechanized Corps.

Most of the production run of the M4A2 (76mm) went to the Soviet Union as Lend-Lease. This tank of the 64th Guards Tank Regiment, 8th Guards Mechanized Corps, was photographed in Grabow, Germany, on May 3, 1945 after the link-up with the US 82nd Airborne Division. The slogan on the side is "Vpered k pobede!" ("Forward to Victory!"). (US Army)

The M4A1 (76mm) (Sherman IIA) was not used by British or other Commonwealth units in northwest Europe, but it was used to re-equip the Polish 1st Armored Division in the late autumn of 1944 when supplies of M4A4 (Sherman V) ran out. This Polish Sherman IIA is seen crossing a Bailey bridge in the Netherlands in 1945, and engineer tape can be seen on either side to mark the mine-cleared areas. The Polish Sherman IIA often had additional track welded to the hull and turret for added protection, and followed the practice used on Sherman Fireflies of camouflage-painting the front of the gun tube so that it would not attract undue attention from German anti-tank gunners. (Sikorski Institute)

In June 1945, the Soviet Union received some of the new M4A2E8 (76mm) and these arrived in time to take part in the lightning campaign in Manchuria against Japan. During "August Storm" in Manchuria, the Zabaikal Front had 250 M4A2s, mainly M4A2 (76mm) tanks consisting of the 9th Mechanized Corps (137 tanks), the 201st Tank Brigade (65 tanks) and small amounts in other units.

The second largest recipient of the M4 (76mm) was Britain, which received 1350 tanks. These consisted almost entirely of the M4A1 (76mm) totaling some 1330 tanks, all delivered in 1944, and a batch of 20 M4A2 (76mm) delivered in 1945 as part of a canceled order for DD tanks. The M4A1 (76mm) was designated as Sherman IIA in British service. The British Army did not request the M4A1 (76mm) but was obliged to receive them because of the termination of production of the preferred M4A4 with a 75mm gun. On receiving the M4A1 (76mm) in 1944, the British Army was at a loss as to their potential distribution and role. A study in the summer of 1944 concluded that "for a variety of technical considerations connected with the positioning of the trunnions, the telescope and the elevating gear, it would be necessary to carry out a major redesign and extensive modification of the turret" to convert the M4A1 (76mm) into a 17-pdr. tank. Furthermore, the first conversions would not be ready until April 1945. As a result, the conversion of the 76mm tanks into Fireflies was not pursued. The British Army was not very happy with the 76mm gun for much the same reasons as US tankers.

To simplify logistics, the Sherman IIA were mostly earmarked for the Italian theater where anti-tank performance was not as vital as it was in northwest Europe. As a result, by the end of 1944, four units in Italy were supplied with the Sherman IIA: the 6th Armoured Division (42 of 116 Shermans), the 2nd Armoured Brigade (116 of 126), the 7th Armoured Brigade (61 of 132), and the 6th South African Armoured Division (134 of 210). As a result, there were 418 Sherman IIA tanks in Italy at the end of 1944, of which 65 were in replenishment depots. This situation remained much the same through the rest of the war except that the Polish 2nd Armoured Division began receiving the Sherman IIA. On June 29, 1945, there were 484 Sherman IIA tanks in Italy, of which 329 were in units.

There was no intention to widely distribute the Sherman IIA to units in northwest Europe, but the growing shortage of 75mm tanks to convert

British and Commonwealth forces made much more extensive use of the Sherman IIA in Italy than in northwest Europe. This Sherman IIA of the Pretoria Regiment, 6th South African Armored Division, is seen leading a column through Poiana, Italy, on April 29, 1945 with a group of Recce Stuarts trailing behind. (NARA)

into 17-pdr. Fireflies changed this policy. The Polish 1st Armoured Division had been badly battered during the fighting in the Falaise Gap in August 1944, and so it was earmarked to begin receiving the Sherman IIA as replacements. The first batch of Sherman IIA were received by the Poles on November 20, 1944, eventually totaling 60 tanks in 1944. By the end of the war, over 180 Sherman IIA tanks were delivered to the 1st Polish Armoured Division, and it was the only unit of the British 21st Army Group to see combat with this type in northwest Europe.

No other allied army was supplied M4 (76mm) through Lend-Lease. However, the French did use the M4 (76mm) obtained through other channels. Since armored units of the French First Army fought as part of the US 6th Army Group, their M4A1 (76mm) and M4A3 (76mm) tanks were received as replacements from US 6th Army Group stocks. The French 2nd Armored Division, which fought for most of the war with the US Seventh Army, received at least 17 M4A3 (76mm) tanks, while the other two divisions in the First French Army, the 1st and 5th Armored Divisions, each received at least 16, including some M4A1 (76mm).

75MM VS. 76MM MEDIUM TANKS 1945

	Feb	Mar	Apr	May
75mm tanks	420	513	537	546
76mm tanks	53	52	51	50
Total M4	**473**	**565**	**588**	**596**
% 76mm tanks	11.2	9.3	8.6	8.3

POST-WAR EXPORT

In the haste to demobilize after World War II, a great many M4 tanks were scrapped, and much of the inventory was allowed to rot away without maintenance in depots around the world. Although the US Army had 6582 M4 (76mm) tanks on hand at the end of 1945, by 1950 there were only 3202 M4s still in US inventory, of which 1376 were unserviceable. This tank shortage affected the US supply of tanks to allied armies. Small numbers of M4 (76mm) were exported by the United States through the Military Defense Aid Program (MDAP) after World War II, especially to European allies. The largest single European

recipient was France, which received 1254 M4A1s (76mm) after the war. These remained in service for many years in dwindling numbers, with the last 76mm gun tanks in service with the armored group of the national gendarmerie (GBGN) into the early 1960s. Some of these took part in the generals' putsch of 1961. The last M4 tanks were retired from the army in 1967 but these were mainly M4 105mm assault guns. Some of the smaller NATO allies received M4 tanks in smaller numbers.

The shortage of M4A3E8 tanks due to post-war scrappings forced the US Army to rebuild many older 75mm M4 tanks to meet the needs of allies. This resulted in the M4A3E4 (76mm) seen here shortly after rebuilding, which mounted the 76mm gun in the standard M34A1 combination gun mount. (US Army)

The M4 (76mm) was also exported to other regions, including Japan which received 264 M4A3E8s. These formed the backbone of the armored force of Japan's new Self Defense Force well into the 1970s. South Korea received a dozen M4A3E8 tanks in 1950–51, but the M36 90mm tank destroyer was the preferred choice and was supplied in larger numbers.

The outbreak of the Korean War in 1950 found the US Army with a serious shortage of tanks. With few 76mm gun tanks remaining for export, the US Army decided to initiate a program to modernize about a thousand M4A1 and M4A3 75mm gun tanks with 76mm guns and other improvements specifically for the MDAP recipients. This program was conducted mainly by the Bowen-McLaughlin-York Co. (BMY) in York, Pennsylvania and Rock Island Arsenal in Illinois, and

Among the MDAP clients for the M4 conversions was Pakistan, which received both the M4A1E4 (76mm) as seen here, as well as the M4A3E4 (76mm). This particular tank served with the 26th Cavalry Regiment. (George Balin)

Israel obtained several hundred M4s from France in the 1950s, mainly consisting of the M4A1 (76mm). These were called M1 Super Shermans in Israeli service, the M1 referring to the gun type, and the "Super Sherman" nickname used to distinguish the 76mm tanks from the 75mm types. This particular tank is seen during exercises in the Sinai in July 1961. (Israeli GPO)

France's Bourges arsenal developed a mounting for the CN-75-50 75mm gun in the small 75mm turret. This gun was a French derivative of the 75mm gun used in the German Panther tank. The Israeli Army began upgrading its Shermans with this kit in 1956–57, mostly on M4A4 hulls. This type was called the M50 after its gun. These two are the less common varieties of M50, the lead vehicle on an M4 composite hull and the second on a late M4A1 hull, seen during an Independence Day parade in Tel Aviv. (Israeli GPO)

the refurbished tanks were designated as M4A1E4 (76mm) and M4A3E4 (76mm). The M4E4 (76mm) was supplied to a number of MDAP recipients, including Yugoslavia, Denmark, Pakistan, and Portugal. Pakistan was by far the largest recipient with 547 tanks. These took part in a number of the wars with India, most notably in 1965.

Besides direct US supply, the M4 (76mm) became a significant item in secondary sales. Several hundred M4 tanks that had been left behind in Belgium, France, and Italy were condemned for scrap but ended up on the arms black market. Israel obtained some of its Sherman tanks from such sources. The Israel Defense Force (IDF) was the most significant Sherman operator in the 1960s and after. With French help, they were upgraded with new weapons, engines, and other modifications, remaining in service well into the 1990s. Even then, many of these refurbished Shermans were then sold to tank forces in South America and Africa, remaining in service into the new century.

LEFT **The ultimate Sherman was no doubt Israel's M51 based on the M4A1 (76mm) tank. Another effort developed with French cooperation. The new type was armed with the D1504 105mm gun, a shortened low pressure version of the weapon developed for France's AMX-30 main battle tank. First converted in 1962, these tanks were gradually rebuilt over the years with new features, especially new Cummins diesel engines, and remained in Israeli service into the 1990s. (Israeli GPO)**

BELOW **During the fighting along the Han river in Korea in mid-February 1951, several US tank battalions decided to paint their tanks with gaudy tiger faces. This was started as a psychological warfare effort, the idea being that superstitious Chinese infantrymen would be scared by the fearsome faces. This is one of the most colorful of the schemes, painted on an M4A3E8 (76mm) of the 5th Infantry Regiment's Tank Company. (US Army)**

THE KOREAN WAR

In the wake of World War II, the US Army experienced a rapid demobilization, and most of its tank force was scrapped. With the outbreak of war in Korea in June 1950, the US Army began mobilizing tank units to rush to Korea. Because of America's heavy commitments in Europe, only three tank battalions were adequately prepared for shipment to Korea. Most were equipped with the M26 and M46 Pershing tanks, but the tank training school at Fort Knox was able to obtain two companies of M4A3E8 tanks from Rock Island Arsenal to equip its training unit, the 70th Tank Battalion. Besides this single M4 unit, the Eighth Army in Japan managed to collect 54 rebuilt M4A3E8 (76mm) and form them into the 8072nd (later the 89th) Medium Tank Battalion. The first company from this unit arrived in Korea in late July and was committed to combat on August 2, 1950. By the end of 1950, US tank units in Korea had received 1326 tanks including 679 M4A3E8 (76mm).

The heaviest tank-to-tank fighting of the Korean War took place from August to October 1950, pitting the M4A3E8 against North Korean T-34-85 tanks. There were 119 tank-to-tank actions during the war and the M4A3E8 saw more combat than any other type. In terms of performance, the North Korean T-34-85 and the American M4A3E8 were on fairly equal terms so far as technical performance was concerned. Although the M4A3E8 had a gun of smaller caliber, the widespread availability of HVAP ammunition made it quite capable of penetrating the T-34-85's armor. Likewise, the T-34-85 had no particular problem

ABOVE **A column of M4A3E8 (76mm) tanks of "Rice's Red Devils", Co. C, 89th Tank Battalion, named after the company commander, Captain Clifford Rice. This unit had colorful "devil" faces painted on the front of the tanks. (US Army)**

BELOW **A M4A3E8 (76mm) of C Squadron, Lord Strathcona's Horse, on the Imjin River while supporting the 25th Canadian Infantry Brigade of the 1st British Commonwealth Division in Korea. (Patton Museum)**

penetrating the armor of the M4A3E8 at normal combat ranges. The critical difference was the quality of the crew training, and in this respect the US Army had a clear edge that resulted in the lop-sided results in favor of US tank battalions during these summer battles. There were hardly any encounters with North Korean armor after November 1950, and M4A3E8 tanks were used mainly to provide fire support for infantry units. While US tank battalions preferred the more heavily armored and heavily armed M26 and M46 Pershing tanks in 1950 when tank-to-tank fighting was most common, by 1951 opinions began to change. The M26 was often described as being "lousy" and some tankers thought it was "a complete flop." It was powered by the same engine as the M4A3E8, but was 10 tons heavier, and its transmission was unreliable. Those tankers with experience in the M4A3E8 preferred it over the M26 since it was very reliable, easy to maintain, and far more nimble to drive. Its automotive performance in the hilly Korean countryside was much superior to the M26.

Following the war in Korea, the M4A3E8 was retired from front-line service in US Army tank battalions after the arrival of newer types such as the M47 Patton. Nevertheless, some still lingered on in secondary units such as National Guard tank battalions until the late 1950s.

COLOR PLATE COMMENTARY

The preferred solution to the protection problem in Patton's Third Army was to use added armor plates cut off derelict US and German tanks and fitted to the hull front and turret. This M4A3E8 (76mm) of the 11th Armored Division is from the initial production batch, still lacking the muzzle brake for its 76mm gun. (NARA)

A: M4A1 (76MM), CO. D, 66TH ARMORED REGIMENT, 2ND ARMORED DIVISION, OPERATION COBRA, JULY 1944

Prior to Operation Cobra, the First US Army instructed its tank units to paint their armored vehicles in a pattern of black sprayed over the usual lusterless olive drab. The intention was to break up the silhouette of the vehicle when hiding in tree lines. The use of "armored column cover" by P-47 Thunderbolt fighter bombers fostered some concern about air-to-ground recognition. As a result, units were also instructed to clean up the usual Allied star insignia. The 2nd Armored Division usually painted this twice, once on the turret and once on the engine deck. The 2nd and 3rd Armored Divisions also used large yellow tactical "speed" numbers on their tanks in Normandy, but some units over-painted them during the process of adding the camouflage. The other markings on this tank include the vehicle name "DUKE" (based on the company's first letter), and the vehicle registration number on the rear side of the hull. The unit bumper codes for this vehicle were 2^66^ D-13, and these were stenciled on the front and rear of the vehicle in 3-inch white letters. During Operation Cobra, US tanks also displayed both the cerise and electric yellow AP-50 air identification panels on their rear decks, a type of colored plastic/canvas banner used for air-to-ground identification.

B: M4A3E8 (76MM), 14TH ARMORED DIVISION, 6TH ARMY GROUP, GERMANY, FEBRUARY 1945

The 14th Armored Division made systematic use of sandbag armor in 1945, which was attached to the tanks by the division's maintenance units. This particular tank has also received a partial coat of whitewash over the usual lusterless olive drab paint finish. It has partly obscured the usual Allied star on the turret side.

C1: M4A1 (76MM), 2E REGIMENT DE CHASSEURS D'AFRIQUE, FRENCH 1ST ARMORED DIVISION, GERMANY, APRIL 1945

The French First Army had its own distinctive set of insignia,

the most conspicuous of which was the 1804 Napoleonic flag on the hull side. Behind this is the unit tactical insignia: a medium blue square identifying the 1st Armored Division, a C identifying a tank regiment, and the vertical bar indicating the 4th Squadron. This tank, commanded by Sergeant L.C. Laroche, replaced an earlier Sherman named Rivoli, hence the name Rivoli II. As part of the US 6th Army Group, French armor was painted in the usual US lusterless olive drab.

C2: M4A2 (76MM), 1ST GUARDS MECHANIZED CORPS, RED ARMY, VIENNA, MAY 1945

The 1st Guards Mechanized Corps was one of a number of mechanized corps reorganized in the autumn of 1944 with new M4A2 (76mm) tanks with 41 in each of the three mechanized brigades and 65 in the unit's 9th Guards Tank Brigade. During the 1945 offensive, Soviet tank units made greater use of geometric tactical insignia, though their meaning in many cases is still unclear. There are also numerous stencils evident on the hull side. The first large cluster is in Russian and appears to have been added in the United States prior to shipment, with various instructions regarding oil and fuel levels, the use of anti-freeze and so on.

The 14th Armored Division made the most systematic use of sandbag armor, and ordnance units of the Seventh Army developed a standardized kit for mounting the sandbags on the hull side and turret as seen here on an M4A3 (76mm) in Germany in March 1945. (NARA)

D: CROSS-SECTIONAL DRAWING: M4A1 (76MM), 3RD ARMORED DIVISION, 1944

See plate for full details.

E: M4A3E8 (76MM), C SQUADRON, LORD STRATHCONA'S HORSE, CANADIAN ARMY, KOREA, NOVEMBER 1951

Canadian armored units in Korea followed the British practice of arms-of-service insignia, seen here on the left hull front, and repeated on the left hull rear of a 41 in a red/yellow square. Opposite, on both front and rear, is the red Canadian Forces in Korea insignia. These tanks came from US stocks in Korea, and so are painted in the usual US lusterless olive drab. The red circle squadron insignia has been painted on the turret side over the American star, and the center filled in black to obscure the remnants of the star.

F: M4A3E8 (76MM), CO. C, 89TH TANK BATTALION, HAN RIVER, KOREA, MARCH 1951

Following the intervention of the Chinese People's Army in late 1950, many US tank units in Korea adopted gaudy tiger-face markings on their tanks. These were intended to scare the superstitious Chinese conscripts, though one might wonder whether the presence of tanks alone might not do the trick. Company C of the 89th Tank Battalion standardized this simple but effective tiger face, while other units with more time and artistic talent opted for even more elaborate images. The markings on this Easy Eight are otherwise fairly

George S. Patton storms back to his staff car after having chewed out the crew of an M4A3E8 (76mm) of 14th Armored Division for their use of sandbag armor. Patton personally disapproved of the practice, and this created problems when the 14th Armored Division was transferred from Patch's Seventh Army to his Third Army on April 22–23, 1945. (US Army)

standard, consisting of the usual white stars and registration numbers, and the usual assortment of stenciling barely evident on the hull side. US tanks during the Korean War were finished in the same lusterless olive drab as the World War II types.

G1: M4A1E4, 26TH CAVALRY REGIMENT, PAKISTAN ARMY, KASHMIR, 1965

Pakistan was one of the main recipients of the M4A1E4 and M4A3E4 conversions as part of the MDAP program. These vehicles were used in the 1965 war, and a small number were still in service at the time of the 1971 war with India. They were originally finished in US olive drab, although in this case a pattern of sand camouflage has been added to blend better with the local terrain. The turret number is 42 indicating the second tank of Company D.

G2: M4A1 (76MM), ISRAELI ARMOURED BRIGADE, SINAI, 1961

Israeli Shermans were generally left in the usual US or French olive drab, though this faded in the harsh sun of the Sinai. After the 1956 war, the IDF began experimenting with the use of prominent tactical markings to help in coordinating tank actions over the radio. The characteristic "spinning V" chevron insignia was introduced at this time, identifying the four companies of a battalion in a clockwise fashion starting with the first (12 o'clock), second (3 o'clock) etc. This vehicle belongs to the third company. The other practice introduced at this time was to assign each platoon a Hebrew letter and each tank a number. So on the turret is the Hebrew letter V, which being the third letter in the alphabet indicates third platoon, followed by the tank's number, 2. This tank also had the standard air identity marking of the period, a white band 30 inches wide running down the centerline of the engine deck and turret roof, edged in 1-inch black trim. On the hull side is the vehicle registration number in white on a black rectangle, with the Tsahal prefix indicating an army vehicle.

ABOVE **Although nearly all M4 (76mm) tanks issued in the ETO after July 1944 were based on the M4A3 chassis, in the spring of 1945 some new production M4A1 (76mm) again appeared in the supply chain like this tank of Co. B, 774th Tank Battalion supporting the 78th Division near Honsborn, Germany, on April 10, 1945. They can be distinguished by the muzzle brake on the 76mm gun, not present on the small batch of M4A1 (76mm) issued in July 1944. (NARA)**

BELOW **A M4A3E8 (76mm) of the 11th Armored Division fords the Muhl river during the advance of Patton's Third Army into Neufelden, Austria, on May 4, 1945. The tank had an improvised mount for a .30 cal. light machine gun in front of the commander's cupola, and the tank commander appears to be wearing an M3 steel helmet, a type issued to bomber crews, which had an armored flap over the ears. (US Army)**

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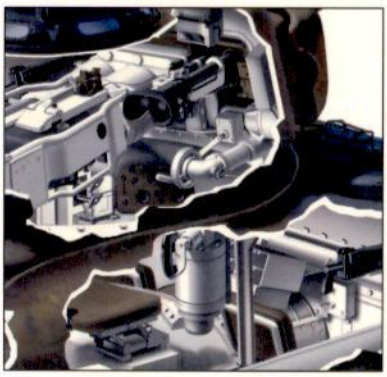

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M4 (76mm) Sherman Medium Tank 1943–65

The M4 Sherman tank was the mainstay of the Western allies between 1942 and 1945. Fast and modern, it was a big success and was transported as far afield as Russia and North Africa. The American Chief of Staff claimed in November 1943 that it was "hailed widely as the best tank on the battlefield today...". However, by the Normandy invasion of June 1944 this was not the case: the new German heavy tanks such as the Panther and Tiger were completely outclassing the Sherman. Using a wealth of new archive material, this title covers the M4 version armed with the 76mm gun, examining developments such as the HVSS suspension.

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