

4. LESSONS LEARNED AND HISTORY OF CONFLICTS

THE US ARMORED FORCES IN WW2: DEVELOPMENT AND ORGANIZATION

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ABSTRACT

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Armored and mechanized forces played a decisive role during the Second World War. The US Army at the start of the conflict was a small and underfunded organization, and when it became likely that the nation would join the conflict it was faced with the challenge of growing into a large and modern fighting force in a short time frame. German successes in the early phases of the war, largely due to their doctrine of armored warfare, led to a strong German influence in the initial plans for the creation of the US armored forces. With the progress of the war, and the analysis of the lessons from the battlefields in Europe and North Africa, the US army adopted more distinct solutions for armor organization and doctrine. Some of the solutions and choices taken by the US Army reflected misunderstanding and confusion about the role of the tank. However the organization of the US armored divisions evidenced also innovation and flexibility, particularly in the creation of tactical combat commands.

KEYWORDS

Armored warfare; organization and doctrine; tactical combat commands

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Introduction

The Second World War was the first major conflict that saw a massive employment of mechanized forces. The development and doctrine of armored warfare was widely influenced by German practice and doctrine, which had a revolutionary effect in most armies after the Wehrmacht victory in France in 1940. After this campaign it became evident in most military establishments that armored forces were a crucial element in land warfare and were able to conduct decisive, long-range operations. However

their development during the war followed different lines depending on the characteristics and needs of the armed forces and the industrial capabilities of the major powers involved in the conflict.

As a newcomer to the war, emerging from years of neglect and disinterest towards the army, the USA were particularly challenged in developing from scratch a huge land force for employment in Europe and the Pacific, and to incorporate and assimilate the rapidly evolving experiences from the

battlefields of Europe and North Africa. The following article will give a brief description of how the USA coped with the problem to create an armored force able to fulfill their operational and strategic aims.

Early Developments and the “Victory Plan”

None of the nations that participated to World War Two entered the conflict perfectly prepared. But, while countries like Germany and the USSR began an intensive military buildup already in the early 1930s, the United States were woefully unprepared when the conflict began in Europe in 1939.¹ The armored forces were of course affected by this situation. With a single mechanized cavalry brigade and a few independent tank battalions equipped with obsolete material, the US armored and mechanized forces were third rate and their rebirth started only when the clouds of wars began to darken ominously the American horizon.

The first step to upgrade the US Army was the decision to raise the manpower from 174,000 to 210,000, reinforcing the garrison of the Panama Canal and the USAAF (US Army Air Forces). On 1 September 1939, the very day of the German invasion of Poland, General George C. Marshall was appointed Chief of Staff of the US Army.² On September 8th President Franklin D. Roosevelt declared a state of “limited national emergency”, and authorized the expansion of the Army personnel in active service from the previous 210,000 to 227,000 men, and of the National Guard to 235,000 men.³ The year 1939 also saw the completion of the 7th Mechanized Cavalry Brigade, which was nominally created in 1932 and comprised two mechanized cavalry regi-

ments. Besides it, there were six independent battalions of tanks for infantry support.⁴ On May 1, 1940, the tank park of the Army comprised only 464 vehicles.⁵

Compared to the millions of men on the European fronts the US Army was almost a negligible force. Even worse was the scarcity of trained reserves, apart from the National Guard. The equipment was for the major part of WWI vintage, antitank and antiaircraft weapons were very scarce (for instance in February 1939 there was a single 37 mm antitank gun in the arsenal)⁶, cadres, transmissions and services were inadequate. Up to that time the American public opinion had opposed any increment in military spending.

The German invasion of France in the spring 1940 brusquely changed this attitude. At once the world balance was disrupted: France was eliminated from the ranks of major powers, and Britain itself was threatened with invasion. As General Marshall wrote, the pendulum of American public opinion swung to the opposite extreme⁷: enormous and immediate increments of modern equipment and personnel were loudly requested. Already on 16 May 1940 the President, in a message to the Congress, requested an appropriation of one billion dollars and an increase of 28,000 men for the Army. Compulsory conscription was approved on 16 September 1940, and by December 1941 the strength of the US Army had raised to more than 1,600,000 men,⁸ over 300,000 of which belonged to the National Guard, on federal service since 27 August 1940 (303,027 men on 30 June 1941).⁹

⁴ Ogorkiewicz, R.M. *Armoured Forces: A History of Armored Forces and their Vehicles*, New York, NY: Arco Publishing Company, 1970, pp. 194-195.

⁵ *Ibid.*, p. 195.

⁶ Weigley, R.F. *History of the United States Army*, Bloomington, IN: University Press, 1984, p. 419.

⁷ Marshall, King, Arnold, op. cit., pp. 7-8.

⁸ 1,638,086 according to Weigley, op. cit., p. 435.

⁹ Marshall, King, Arnold, op. cit., p. 42.

¹ Marshall, G.C., King E.J., Arnold H.H. *Relazione del Comando Supremo Americano (it.)*. New York, NY: Overseas Editions, 1944, p. 5.

² <https://www.georgecmarshall.org/early-career>

³ Marshall, King, Arnold, op. cit., p. 5.

In 1941 War Undersecretary Robert Patterson proposed a study about the total resources that the United States would need to mobilize in case of intervention against the Axis powers. Called "Victory Program"¹⁰ the study was for the most part conducted under the direction of Major Albert C. Wedemeyer of the War Plans Division of the War Department's General Staff. Wedemeyer estimated that the maximal amount of manpower that could be mobilized without damaging the national economy amounted to about 10% of the country population. Thus, with a population of around 135 million, it was calculated that the United States would be able to mobilize about 13,500,000 men and women. The Navy personnel requirements were estimated at 1,500,000 a gross underestimation (in 1945 the Navy and the Marine Corps together fielded almost 3,900,000 men), thus it was thought that 12,000,000 personnel remained available for the Army and the USAAF. Counting on American industrial superiority, the planned size of the US Army was finally established at 8,795,658 men, figure close to that eventually reached on 31 May 1945 (8,291,336, including about 600,000 personnel hospitalized or *en route* overseas).¹¹ However the latter figure includes the USAAF, whose actual size would in the end exceed the original plans. Because the proportion of forces allocated to the USAAF and the services was grossly underestimated, it was originally planned to constitute a force of 213 divisions, about 60 of which armored. The staff study, entitled *Joint Board Estimate of the United States Over-all Production Requirements*, was approved on 11 September 1941.¹²

In reality only 91 divisions were eventually raised, but because most of the German land forces were committed against the Soviet Army (whose survival was in doubt in 1941) this force was enough to achieve the American strategic and operational goals.¹³ One should however consider that these division numbers are somewhat misleading because the US Army allocated a much higher proportion of its combat and combat support troops to non-divisional units, compared to its opponents.¹⁴

The development of the armored forces was included in these ambitious plans. The success of the Panzer divisions in France was a key factor in convincing the American military leadership about the importance of the armored forces. It also led to the change of the pre-existing doctrine, which limited the role of tanks to merely auxiliaries to infantry and cavalry.¹⁵ Already during the spring maneuvers in 1940 a truck-borne infantry regiment was added to the new 7th Mechanized Cavalry Brigade. In this first experiment in the combined use of tank units and motorized infantry several deficiencies were found, and useful lessons were learned. In particular it was realized that armored units needed to be complemented with half-track infantry carriers and with artillery support.¹⁶

The US Armored Force was officially constituted (even if only experimentally) on 10 July 1940, combining all armored units under a single command and thus ending the spurious division between "infantry tanks" and mechanized cavalry. With its creation the tasks of the Armored Force Commander were also established, including

¹⁰ Kirkpatrick, C.E. *An Unknown Future and a Doubtful Present: Writing the Victory Plan of 1941*, Honolulu, HI: University Press of the Pacific, 2005.

¹¹ Weigley, *History of the United States Army*, op. cit., p. 435. Idem, *The American Way of War*, New York, NY: MacMillan, 1973, p. 317.

¹² Ross, S.T. *American War Plans 1941-1945*, London: FRANK CASS & CO. LTD, 1997, pp.13-15

¹³ Less than half of the 7,700,000 Army effectives in 1945 were actually employed as ground combat troops. Forty, G. *US Army Handbook*, Stroud: Sutton Publishing, 2003, p. 18.

¹⁴ Dunnigan, J.E. and Nofi, A.A. *Little Dirty Secrets of World War II*, Morrow Paperbacks, 1996.

¹⁵ Ogorkiewicz, op. cit., p 88.

¹⁶ *Ibid.*, p. 88.

both tactical and organizational functions. He was tasked with developing the tactical doctrine and the training for all armored units, and at the same time he had an advisory function regarding transport, weapons and equipment of such units.¹⁷ The creation of the Armored Force also terminated the spurious distinction between infantry and cavalry tanks. As in Germany, armored vehicles were seen at that time as the decisive component of land warfare. The key components were to be the armored divisions, flexible mechanized units including components from all arms.¹⁸

Initially the Armored Force was constituted by the I Armored Corps, including the 1st and 2nd Armored divisions (created during the summer), and the 70th truck-borne battalion of the Supreme Command reserve. The 2nd Armored was constituted at Fort Benning, Georgia, and the 70th truck-borne battalion at fort Mead, Maryland.

In November 1940 the Armored Force School started its activity at Fort Knox. It required a complement of 182 officers and 1,874 men. The School was designed to instruct 26,000 men a year.

Between November 1940 and January 1941 four truck-borne reserve battalions of the National Guard were activated and placed in federal service: the 191st at Fort Meade, the 192nd at Fort Knox, the 193rd at Fort Benning and the 194th at Fort Lewis, in Washington state.

In February 1941 the Headquarters of the I GHQ Reserve Tank Group was activated. All the reserve tank battalions of the GHQ were at that time placed under this command. In early March the Replacement Center was also activated. It initially consisted of 240 officers and 1241 men and had a capacity of 9,000 men. In the same months it welcomed the first recruits, who

were subsequently assigned to the new armored units. On 15 April 1941 the 3rd Armored division was activated at Camp Beauregard in Louisiana, and the 4th Armored division at Camp Pine in New York state. The Armored Force Command and its Headquarters Company were activated in May 1941 at Fort Knox. In early June five light tank and five medium tank battalions entered service in the GHQ reserve. The cadres for these units came from the 1st and 2nd Armored divisions, while the personnel came from the Replacement Center. In this period the equipment was still scarce,¹⁹ but production was under way and the situation was gradually improving. An infantry motorized division was also created, and by 1 July 1941 the Army had 33 divisions in active service, forming nine corps and four armies:²⁰

- 26 infantry divisions, of which 18 were “square” divisions (with four infantry regiments) of the National Guard and 8 were “triangular” divisions (with three infantry regiments) of the regular army.
- 1 motorized divisions (triangular)
- 2 cavalry divisions (one incomplete)
- 4 armored divisions, with two more forming.²¹

On the same date the USAAF had 54 combat groups. The numerical strength of the US Army amounted to about 1,400,000 distributed as follows: 456,000 men were in the 29 infantry and cavalry divisions; 43,000 men in the armored forces; 308,000 men were in 215 regiments or other non divisional units of artillery, FLAK, engineers, transmissions etc. They were at disposition of army corps or the GHQ and complemented the divisions. 167,000 men belonged to the USAAF; 46,000 were reserved to harbor defense; 120,000 were in garrisons overseas, including Alaska and Newfoundland;

¹⁷ Marshall, King, Arnold, op. cit., p. 26.

¹⁸ Ogoriewicz, op. cit., p. 88.

¹⁹ Marshall, King, Arnold, op. cit., p. 27.

²⁰ Ibid., p. 17.

²¹ Ibid., pp., 17, 25-26.

160,000 more were in about 550 military bases, depots and embarkation points; finally between 100 and 200,000 recruits were in various training centers (preliminary training lasted 13 weeks).²²

Early American armored divisions comprised in total 108 medium and 273 light tanks,²³ about 650 armored half-tracks, and over 12,500 men.

The divisions were organized on a recon battalion, an armored brigade, a two battalion infantry regiment, an artillery battalion with 105 mm howitzers, an engineer battalion and support units. The armored brigade – the main component of the division – was constituted by two light tank regiments each with three M3 light tanks battalions, a medium tank regiment with two M3 medium tanks battalions, and an artillery regiment with two battalions of 105 mm self-propelled howitzers.

The initial organization of the US armored divisions was quite similar to that of the originally German Panzer divisions, with an armored brigade and an infantry regiment. Despite the German influence however, the American armored divisions had also original characteristics, influenced by the earlier armored cavalry brigade. Henceforth their development will follow a more independent and original path.

The first organizational scheme of the armored division was experimented during the 1941 maneuvers and - as expected - a number of flaws were evidenced, primarily the disproportion between the numbers of tanks compared to other arms. There were at least 25 tank companies compared to only 7 rifle companies, an underestimation of the importance of the infantry element common to most of early armored formations.

The brigade HQ, interposed between divisional and regimental HQs, made the command structure unnecessarily complicated and slowed the delivery of orders. Thus the TO&E (Table of Organization and Equipment) of the armored division was modified to create a more balanced, flexible and powerful unit. The number of tanks units was reduced while an infantry battalion was added. The brigade HQ was eliminated.

In the new TO&E the armored division consisted of a reconnaissance battalion, two tank regiments with one light and two medium tanks battalion each, an armored infantry regiment with three battalions, three artillery battalions equipped with 105 mm howitzers, and, as before, an engineer battalions and support units. The new organization was more balanced and effective. The total tank number was slightly reduced from 381 to 375, but the proportion of medium tanks was greatly increased and the division improved on nearly every other respect.²⁴ There were now 14,620 men, 4,848 in the tank units, 2,389 in the armored infantry, and 2,127 in the armored artillery.²⁵ An innovative and important characteristic was the creation of two tactical HQs at brigade level. Denominated Combat Command A and B, they were directly subordinated to the divisional HQ and were intended to command an *ad hoc* "mix" of units of the division. Tactical combat commands responded to the necessity to operate with inter-arm formations at sub-divisional level and increased operational flexibility.

The tactical headquarters and the mechanization of the divisional artillery and infantry (equipped with self-propelled guns and armored half-tracks respectively) allowed an increased flexibility and mobility compared to foreign armored units that

²² Ibid., pp. 14,17,31.

²³ Ogorkiewicz, op. cit., p. 88.

²⁴ Ibid., p. 89.

²⁵ Weigley, History of the United States Army, op. cit., p. 467.

were not organized and equipped in the same way. Combined tactical task forces were not a novelty in itself, as the Germans had already used them with their "Kampfgruppen". Likely these German innovations had a great influence in the development of the US Army forces, which were likewise influenced by the importance attributed in Germany to the tactical autonomy of smaller units. But, even if the Germans started those developments, they never brought them to fulfillment, as they simply did not have the ability to equip their armored units to achieve full mechanization and integration of their

elements. With few exceptions, the Panzer divisions did not have all the artillery self-propelled, and only part of their infantry was equipped with armored half-tracks. Their Kampfgruppen were improvised and were commanded by regimental headquarters, quite effective but not as efficient as the American system where the combat command headquarters were specifically equipped and trained to lead combined-arms teams.²⁶

Despite this progress, the combat command system and other aspects of the organization of the armored divisions was open to further improvements. These were carried on in 1943, in the frame of a general reorganization. At that time however the assessment of the role and importance of the armored forces had changed. In the conditions that ruled the war during 1941 and 1942 the armored and mechanized forces were seen as the masters of the battlefield. Almost all armies of the era, even the German one, were two-tier organizations: a large infantry force, who moved at the pace of soldier and horse legs, and a relatively small mechanized force, which spearheaded offensive operations. Time and again armored formations were able

to break through the enemy front, and to penetrate deep in the enemy rear, cutting their lines of communication and encircling large, less mobile enemy units. The North African deserts and the immense flatlands of Russia were ideal ground for tank operations.

As Prof. R. Ogorkiewicz wrote: "Infantry, on its own, when faced with enemy Armour was hard put to it to defend itself and had to seek refuge in built-up areas or behind vast natural or artificial obstacles, such as extensive minefields".²⁷ The limited importance

given in that period to traditional infantry units is reflected by the statement of the commander of the US Armored Force in July 1942: "The triangular (infantry) division has its place in the scheme of affairs to protect lines of communications, to hold ground, to assist the armored units in supply and the crossing of obstacles like rivers, defiles, etc. They do not carry the spearhead of the fight and never will when tanks and guns are present".²⁸

Successive developments and the tank-destroyer doctrine

In the last months of 1942 combat experiences seemed to point to a change in the assessment of the role and importance of armor. The British offensive at El Alamein (October 1942), and particularly the long battle for Stalingrad, resulted in immense attritional struggles, where the role of the infantry resulted much increased, particularly due to the increase of the number and effectiveness of anti-tank weapons, which appeared as a growing threat to armored vehicles. The Allied campaigns in Tunisia

²⁷ Ogorkiewicz R.M. *Ten Phases in the Evolution of the Tank*, 1953, Liddell Hart Collection, LH 9/28/101, London, p. 338. *Ibid*, Armoured Forces, op. cit., p. 23.

²⁸ Weigley, *History of the United States Army*, op. cit., p. 467.

²⁶ Ogorkiewicz, op. cit., p. 90.

and Sicily in 1943 seemed to confirm this tendency. The American and British armored forces found their movements severely hampered by the nature of the terrain, which favored a static defense. They had to operate with greater caution, in small formations in close contact with the infantry. Even so they continued to offer an incalculable contribute, operating on many kinds of terrain, including the broken terrain of the Italian theatre. These experiences rather confirmed the importance of the combined arm tactical groups, able to provide the kind of flexibility necessary in diverse terrain and operative conditions. However, after years of outstanding success the first failures, even if more apparent than real, created a certain disappointment towards the armored forces.

As a consequence in the United States they were placed under the control of the Army Ground Forces and of men who had a limited vision of their importance. Their opinions was shared in Great Britain, where even Winston Churchill (one of the earliest proponents of armor) stated: "Tanks are finished".²⁹ The commander of the Army Ground Forces, Gen. Leslie McNair, regarded the role of armored divisions as similar to traditional cavalry, useful to exploit success and pursue the enemy after a breakthrough. The breakthrough of defensive positions, according to McNair, was the task of the infantry supported by tank units under its control. McNair wrote: "An armored division is of value only in pursuit or exploitation. For plain and fancy slugging against an enemy who is unbroken or at least intact the tank battalion is adequate".³⁰ It is therefore not surprising that the result of the general reorganization in 1943 was a restriction of the role of armored formations

and the transfer of most tanks to infantry support.³¹ The armored divisions planned under the Victory Program were reduced to 46 in May 1942, and further reductions in the plans meant that only sixteen were actually created. Such number was even at risk to be further reduced when the infantry divisions were short of reinforcements and supplies in the 1944 campaign in North-western Europe.³²

Originally the armored divisions had been intended to operate in Armored Corps, each of which should have included a motorized division.³³ Infantry motorized divisions were supposed to include a quantity of motorized vehicles enough to allow the simultaneous movement of all their elements. But when they were created, it was realized that their equipment was too cumbersome for the requirements of sea transport. Theater commandants refused them, preferring a greater number of standard infantry units carried by the same amount of transport ships. Standard infantry divisions included motorized transport for all their components except the infantry, which however in case of necessity could be motorized by truck companies at disposition of the Army Corps. Motorized divisions were reconverted to standard infantry divisions and disappeared from the Army organization.³⁴ Army corps were reorganized on two infantry divisions and one armored divisions, thus the latter became more closely bound to the infantry.³⁵ Actually standard infantry divisions proved to be very mobile, thanks to the vehicles from the Corps park, or simply by the expedient of mounting infantrymen on tanks and self-propelled guns. They often could match the mobility of the armored divisions. For instance the 83rd In-

³¹ Ogorkiewicz, *Armoured Forces*, op. cit., p. 91.

³² Weigley, *History of the United States Army*, op. cit., pp. 467-468.

³³ *Ibid.*, p. 469.

³⁴ *Ibid.*, p. 469-470.

³⁵ Ogorkiewicz, *Armoured Forces*, op. cit., p. 91.

²⁹ Ogorkiewicz, *Ten Phases in the Evolution of the Tank*, cit., p. 338.

³⁰ Weigley, *History of the United States Army*, op. cit., pp. 468.

fantry divisions (Gen. Robert C. Marcon) together with the 2nd Armored division were the spearhead of the Ninth US Army in the lightning advance through central Germany in April 1945. The 83rd (nicknamed "The Ragtag Circus") made use of every vehicle his men could lay their hands on.³⁶ Both divisions managed to create bridgeheads on the Elbe river as vanguards of the Allied advance on 13 April 1945 (the 2nd Armored was repulsed from the left bank by a sudden German counterattack).

The 1943 reorganization reserved a great number of independent tank battalions for infantry support. In case of necessity such battalions could be added to armored divisions, because the organization created by Gen. McNair placed great importance on flexibility. "Although the (armored) division organically probably will aggregate something like 11,000 men" stated McNair "you may make it 20,000 if you desire, simply by adding armored or infantry battalions".³⁷ In practice this did not happen because the tank battalions were semi-permanently assigned to infantry divisions. The result of this reorganization meant that at the end of the war there were no less than 60 independent tank battalions, compared to about 50 in the armored divisions. Considering that there were also 68 battalions of tank-destroyers, with vehicles similar to tanks, it is evident how a major portion of AFVs (Armored Fighting Vehicles) were destined to infantry support.³⁸

In conclusion it can be said that the US Army did not fully appreciate the value of armored divisions, and several factors influenced their organization and use, often in a negative way. The efficacy of anti-tank weapons was overestimated, and the changes in the organic of the Panzer divi-

sions were mistakenly interpreted in Britain and USA. The Germans increased considerably the proportion of infantry in their armored divisions at the expense of tanks. This change was seen by the Western Allies as a fruit of experience, while in reality it was simply due to a scarcity of armored vehicles. Moreover, the 1942 TO&E was still seen as too heavy and cumbersome, especially because of the multiplication of HQs. On this respect the situation was better than in the early Panzer divisions, where there were up to five brigade and regiment commands for only seven infantry and tank battalions. Even so, in the 1942 Armored division there were still two regimental commands in addition to the two combat commands.³⁹

This problem was solved with the TO&E adopted in September 1943, which introduced further modifications. The armored division received a third, smaller Combat Command

HQ (denominated R, for "Reserve"). Now the divisions comprised 3 tank battalions, with 3 medium and 1 light tank company each, 3 battalions of armored infantry, each with 1037 men, 74 armored half-tracks and 3 SP (self-propelled) howitzers,⁴⁰ 3 battalions of SP artillery, with three 6-gun batteries, plus a combat engineer and a reconnaissance battalion, and support units.

³⁶ Ryan, C. *The Last Battle*, London: Hachette, 2015.

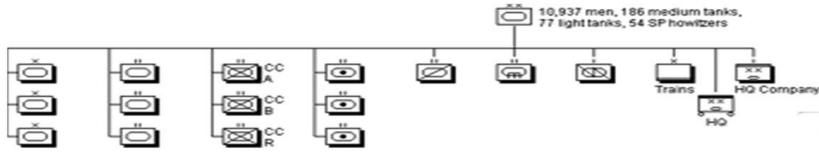
³⁷ Weigley, *History of the United States Army*, op. cit., pp. 468.

³⁸ Ogorokiewicz, *Armoured Forces*, op. cit., p. 19.

³⁹ Forty, op. cit., p. 67.

⁴⁰ Jacobs J. *Evolution of Small Unit Infantry Tactics*, *Asian Defence Journal*, No 12, Dec. 1983, p. 72.

Fig. 1. US Armored Division, Sept. 1943 (mod. from: http://www.niehorster.org/013_usa/43_org/43_usa_div-armd/div-armd.gif)



Tank battalions were reduced from 6 in the 1942 TO&E to only 3, with a total of 263 tanks.⁴¹ However now there was a greater proportion of medium tanks. The elimination of regimental commands resulted in a leaner but equally powerful unit. Even so the resources and cost of maintaining and moving such units was immense. This was true for mechanized units of every country, but even more for the American ones on account of their lavish equipment. In 1944-45 for instance a battalion of 18 SP-howitzers M-7 (105 mm L 22), each with a 7 man crew, comprised 741 officers and men, 3 medium tanks for forward observation, 2 towing vehicles, 30 half-tracks, 34 trucks and 21 jeeps.⁴² In all armies a mechanized unit require a great numbers of vehicles

and personnel for support, supply, maintenance and communications. In general, in an armored battalion there are at least one or two men assigned to support roles for every man in the crews, and for each tank there is at least another vehicle.

American units generally required more supply than those of other armies, and an US armored division consumed over 300 tons of fuel to travel 100 miles on road (the 1941 British armored division required 60,000 imperial gallons - about 190 tons - on the same distance). Movement on rough terrain more than doubled these requirements. For transport, a WW2 armored division of the latest type required 71 trains with about 2,300 cars, o 45 "Liberty" cargo ship⁴³

Table 1. Tank strength of the US armored divisions in the ETO, spring 1945 (Zaloga, S.J. US Armored Divisions. The European Theater of Operations, 1944-45, Oxford: Osprey, 2004, pp. 30, 33-34). * 75 mm / 76 mm gun

Division	March			April			May		
	M24 lt. tanks	M4 med. tanks*	M26 hy. tanks	M24 lt. tanks	M4 med. tanks	M26 hy. tanks	M24 lt. tanks	M4 med. tanks	M26 hy. tanks
2nd	17	143/65	0	17	143/87	19	33	95/95	21
3rd	13	143/51	10	17	119/40	10	46	86/90	18
4th	0	91/49	0	17	48/68	0	24	54/105	0
5th	17	114/35	0	17	106/66	0	17	77/62	17
6th	0	87/56	0	0	45/74	0	20	30/128	0
7th	17	118/50	0	30	77/61	0	51	72/80	0
8th	82	116/47	0	79	80/70	0	82	77/70	0
9th	0	50/116	10	16	55/97	10	51	52/96	17
10th	0	86/43	0	0	84/84	0	0	66/100	0
11th	0	91/61	0	0	88/61	0	18	68/74	32
12th	0	78/90	0	0	84/84	0	0	86/83	0
13th							79	91/70	0
14th				0	83/88	0	5	65/68	0

⁴¹ Forty, op. cit., p. 73

⁴² Ibid., p. 80.

⁴³ Ogorkiewicz, Armoured Forces, op. cit., p. 133.

16th		83	117/51	0	83	115/49	0
20th		83	117/51	0	83	0/165	0

This huge outfit could however move with greater efficiency thanks to the elimination of regimental commands, then greater self-sufficiency of the battalions and the increased role assigned to the tactical combat groups, which made the division leaner and more flexible. The new TO&E was adopted by all the US armored divisions except for two exceptions, and they fought in Europe in that configuration. The exceptions were the 2nd and 3rd Armored divisions, which retained a modified 1942 TO&E and were referred as "heavy divisions".⁴⁴ Fifteen armored divisions were eventually deployed in the European Theater of Operations (ETO). As already mentioned, besides the armored divisions and the independent tank battalions a large number of tank-destroyer units were created, specialized for anti-tank defense.

The belief that a tank was the best weapon against another tank existed since the dawn of armored warfare. Later however prevailed the idea that fighting other armored vehicles was not the task of tanks. As a consequence on the eve of WW2 a vast array of anti-tanks weapons was developed. This was also due to economy reasons, as towed/SP guns were less expensive than tanks. These were the most important anti-tank weapons employed during the war. The Soviets and the Germans however soon realized that besides these means – particularly indispensable for the infantry – it was necessary to have powerful tanks able to directly take on their armored opponents. At the beginning of the war the British employed tanks with high-velocity 40 mm guns, able to defeat the armor of any German tank of the time. Subsequently both the British and the Americans

converted to the doctrine that the main tank armament was to consist of relatively low-velocity, general purpose guns firing shells with a powerful high-explosive charge rather than high-velocity, armored piercing rounds. The Americans in particular failed to appreciate the fast development and evolution in German tank design. The consequence was that often Allied tanks found themselves outgunned by their German opponents.⁴⁵ In this situation it was urgent to deploy large numbers of cheap and easily built anti-tank weapons.

The importance of anti-tank defense was already evidenced in 1937 during field trials of the new "triangular" division. From these trials derived the proposal that every division should be equipped with a battalion of 24 and every regiment with a company of 14 anti-tank guns. This proposal began to be implemented in 1939-40.⁴⁶ Experimental units of lightly protected SP guns were employed in a dynamic and aggressive way during Army maneuvers in 1941 and the results seemed to justify the "tank-destroyer doctrine". To avoid that these units were absorbed by other arms as the infantry, tank-destroyers were directly placed at the dependence of the GHQ. The anti-tank battalions assigned to infantry divisions were withdrawn and used for the creation of new tank-destroyer battalions under the direction of a "Tank-Destroyer Center". The first organizational layout, in December 1941, prescribed two battalion types, "light" and "heavy". About 53 battalions were formed, and no doubt the composition of these units was due to the availability of

⁴⁵ Muller, J.M. (2012). *Ronsons, Zippos, Brews-ups, and Tommycookers: The M4 Sherman Tank and American Armored Development during World War II* (Master's thesis). University of Texas (TX).

⁴⁶ Bellis, M.A. *U.S. Tank Destroyers of World War Two*, DataFile, 1990, p. 4.

⁴⁴ *Ibid.*, p. 93.

equipment at least as much as to tactical considerations. Infantry divisions were left with 37 mm towed anti-tank guns (later replaced by 57 mm guns), which soon turned out to be inadequate to the task at hand. In June 1942 there was a further reorganization, and the distinction between "light" and "heavy" battalions was discounted after August of the same year. Tank-destroyer units entered the North African campaign based on this organization. In November 1942 the light company of the TD battalion was substituted by a third heavy company. June 1942 saw also the publication of the field manual FM 18-5, which laid out the fundamentals of tank-destroyer doctrine.⁴⁷

In January 1943 the administrative and logistical components were reorganized and the personnel was reduced from 898 to 673 men. The battalions were equipped with a single

type of weapon, the 76,2 mm anti-tank SP-gun. There were no further major changes, and successive modifications were related to equipments and technical skills.⁴⁸ The difficulty of concealing the SP-guns led during the campaign in North Africa to the adoption of a towed 3" gun, and in May 1943 personnel was raised to 816, as the towed guns required each 10 servers. To save manpower the reconnaissance company was abolished and substituted by 2 platoons in the HQ company. The towed guns proved to be much less mobile and versatile than the SP-guns, and by early 1945 most of the towed battalions had been reequipped with the latter. Actually there weren't many occasions - particularly on the Italian front - where the tank-destroyer battalions had occasion to play their designed role, summarized by the motto "Seek, Strike and Destroy". Battalions, and even single companies, were

increasingly assigned to other units, particularly to infantry divisions. During the Italian campaign these periods of assignment were lengthened, even if the tank-destroyer units never adopted the symbols of the formations in which they served.

Twenty-four Tank-Destroyer Groups were also created to group individual battalions, but these were dispersed to a degree that the groups were principally restricted to administrative functions at Corps level. The same applies to two TD brigade commands formed in November 1942.⁴⁹

The tank-destroyer force peaked at 106 battalions towards the end of 1943, when it was realized that such an elevated number was unnecessarily for the role devised for them.⁵⁰ Subsequently many battalions were disbanded, and the equipment and personnel employed elsewhere. At the end of the war 68 battalions remained, which were inactivated during the following months, while the Tank Destroyer Center was also abolished. In general it can be said that the TD battalions weren't a brilliant solution. They were too small to conduct independent operations, and when left behind the front they constituted a waste of resources desperately needed on the forward lines. Thus they were distributed among the divisions, particularly infantry. Probably it would have been wiser to disband the TD Center altogether and assign the towed guns to the infantry divisions and the SP tank destroyers to the armored divisions on a permanent basis, to complement their tank units. The US tank destroyer organization was unique and was not adopted by any other army during WW2, even if the Soviet army deployed a number of specialized anti-tank brigades.

⁴⁷ FM 18-5 Tank Destroyer Field Manual, Washington: United States Government Printing Office, 1942.

⁴⁸ Bellis, *op. cit.*, p. 4.

⁴⁹ *Ibid.*, p.7.

⁵⁰ *Ibid.*, p. 4.

Table 2. Personnel and equipment of US SP tank destroyer battalion, March 1944 (Zaloga, S.J. *US Tank Destroyer Battalions in the ETO 1944-45*, Oxford: Osprey, 2005, p. 37).

Personnel and equipment	
Officers	35
Enlisted men	738
.30-cal LMG	30
.50-cal HMG	44
2.36in. bazooka	62
81mm mortar	3
Armored cars	36
SP tank destroyers	36
Other vehicles	119

The American doctrine about the employment of tanks and tank-destroyers, and the logistic constraints due to oversea deployment, had a direct effect on technical development and on equipment choices, particularly regarding protection and armament.

The importance attributed to mobility, and the wish to transport the greatest possible amount of vehicles by sea routes dictated a limitation on the size and weight of American AFVs. So did the necessity to quickly increase production to match the rapid expansion of the army. Instead of developing new designs from scratch, in general the US military preferred to develop existing models, in order to maximize the use of component already in use to avoid disruptions in the production lines. Thus the main US tank of the war, the medium M4, was a development of the M3, itself largely derived from the M2, a flawed model designed before the war. This machine was already obsolete when it entered service, and reflected the lack of experience of American designers and the lack of interests and funds for the army in pre-war years. The decreased importance attributed to tanks in 1943 - as discussed above - resulted in a delayed development of machines designed to meet on equal

footing the latest models fielded by Germany (on the Pacific theater tanks had a limited role, and Japanese models were generally inferior to those in Allied service). The main armament of the M4 (widely known as "Sherman") was a medium barreled 75 mm gun. This was adequate until 1942 but had limited armored piercing capabilities against the latest versions of the German PzKpfw-IV, and was totally inadequate against the new Tiger and Panther tanks. The Americans fielded also a new, longer barreled 76 mm gun. Since this gun fired less effective HE rounds, and the US doctrine stressed the infantry support role against "soft" target, even after the beginning of the campaign in NW Europe several US commanders opposed an extensive adoption of this weapon. Only after the Battle of the Bulge (December '44-January '45) General Eisenhower asked that only M4s armed with 76 mm guns should be sent to Europe.⁵¹ By then however even this weapon was inadequate against the German heavy tanks. The 76 mm was also the armament of towed TD battalions, and of many of the SP battalions as well.

The USA had also developed a more powerful 90 mm gun, capable of firing high velocity rounds able to defeat enemy heavy tanks.⁵² But this weapon was only fitted to the M36 tank destroyers and to the new M26 heavy tank, of which only about 20 participated to operations in Europe before the end of the war. The latter, and a special version of the Sherman (M4A3E2, nicknamed "Jumbo") were also the only US tanks with a protection adequate to the conditions of the late war years.

These equipment and armament choices were criticized by several military experts after the war, who claimed that they were responsible for unnecessary losses. The

⁵¹ Zaloga, S.J. *Armored Thunderbolt*. Mechanicsburg, PA: Stackpole Books, 2008, p. 268-269.

⁵² Bellis, *op. cit.*, p. 3.

inability to develop and field more powerful tanks in time to have an impact on operations in Europe was mainly due to decisions by – and disagreements between – the AGF and the Ordnance Department. It should however be noticed that, even at a late stage in the war, not all tank and tank destroyers fielded by the Germans were heavy models, and there have been exaggerations about the losses inflicted by the latter on Allied AFVs. A British statistical study from 1946, analyzing about 200 actions between Allied and German armor, found that in tank vs. tank engagements the Anglo-Americans needed a 1.3 to 1 numerical superiority to achieve a 50% probability of success.⁵³ On the positive side American AFVs were generally more serviceable and less prone to mechanical breakdowns than those of their opponents.

Conclusions

In general it can be said that the organization and development of the US armored forces in WW2 suggests an uncertainty about their functions and doctrine. Such uncertainty is not surprising considering that the country switched in few years from an almost total disinterest towards the army to the creation of one of the most powerful land forces in the world. Without the aid of personalities like Guderian, Fuller or Liddell Hart the US were still able to create armored forces that were in some ways more effective than those of the British, and a divisional organization in some respects more efficient than that adopted by the Germans. On the positive side, starting from a blank slate they were less constrained by erroneous preconceived notions, and the innate American pragmatism induced them, through trial and error, to devise and experiment new ideas. While not perfect,

the organization and employment of the US armored divisions was in general successful. They proved able to satisfactorily fulfill different tasks, disproving the opinion that they were only suitable to exploitation and pursuit.⁵⁴ Less brilliant were the choices of equipment, which resulted in vehicles that were often inferior to those fielded by Germany. These technical choices were in part due to logistical constraints, and in part to a misunderstanding of the role of the tank and of the characteristics of the enemy on the European battlefields.

Because of the flexibility of the tactical combat commands and the independent battalions, the US armored divisions had ample possibilities to test different tactical formations. Some divisions tended to have the composition of their tactical combat commands relatively fixed, while others altered their grouping for every new operation, or even for different phases of the same operation - a choice which tended to generate confusion. In the divisions whose tactical combat commands had a more permanent composition, some had a preponderance of tanks in one command and of infantry in another, so that they could be used in different tactical situations. This system, which reminded the original organization of the German Panzer divisions, seemed advantageous in theory, but experience showed that the most successful (and most frequently adopted) configuration was having combat commands with a balanced ratio of tank and infantry units.⁵⁵

This successful organization based on tactical combat commands was retained in the US armored divisions even after the war. Even the brigade organization adopted by US divisions during the Cold War reflected in some ways the concepts heralded by the tactical combat commands of the WW2 armored divisions.

⁵³ Military Operational Research Nr. 33, Tank Battle Analysis, Department of the Scientific Adviser to the Army Council, Nov. 1946, Public Record Office, PRO, WO 291/975, London.

⁵⁴ Ogorkiewicz, op. cit., p 93.

⁵⁵ Ibid., p. 93.

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