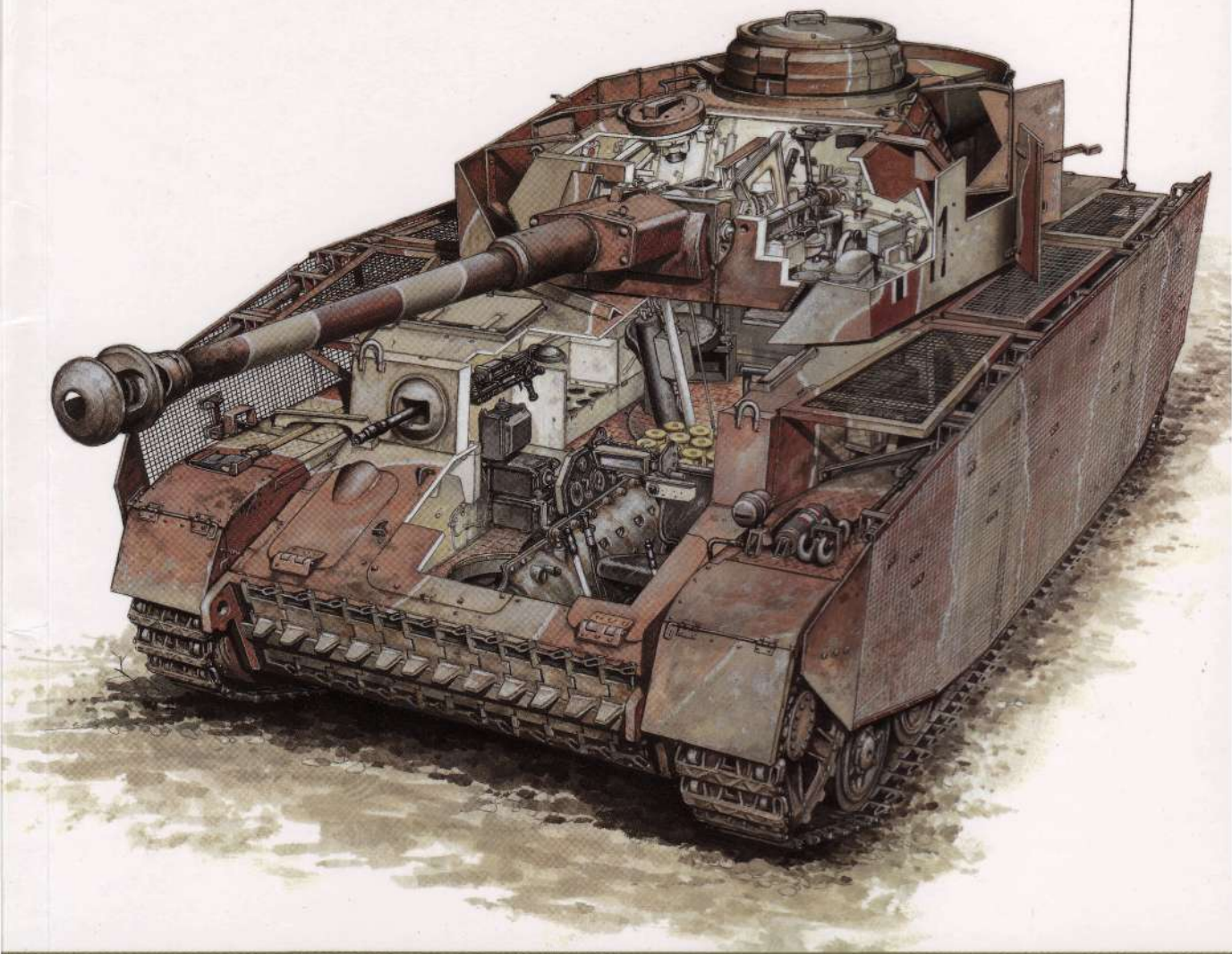
New Vanguard

OSPREY PUBLISHING

Panzerkampfwagen IV Ausf.G, H and J 1942–45



Hilary Doyle & Tom Jentz • Illustrated by Tony Bryan

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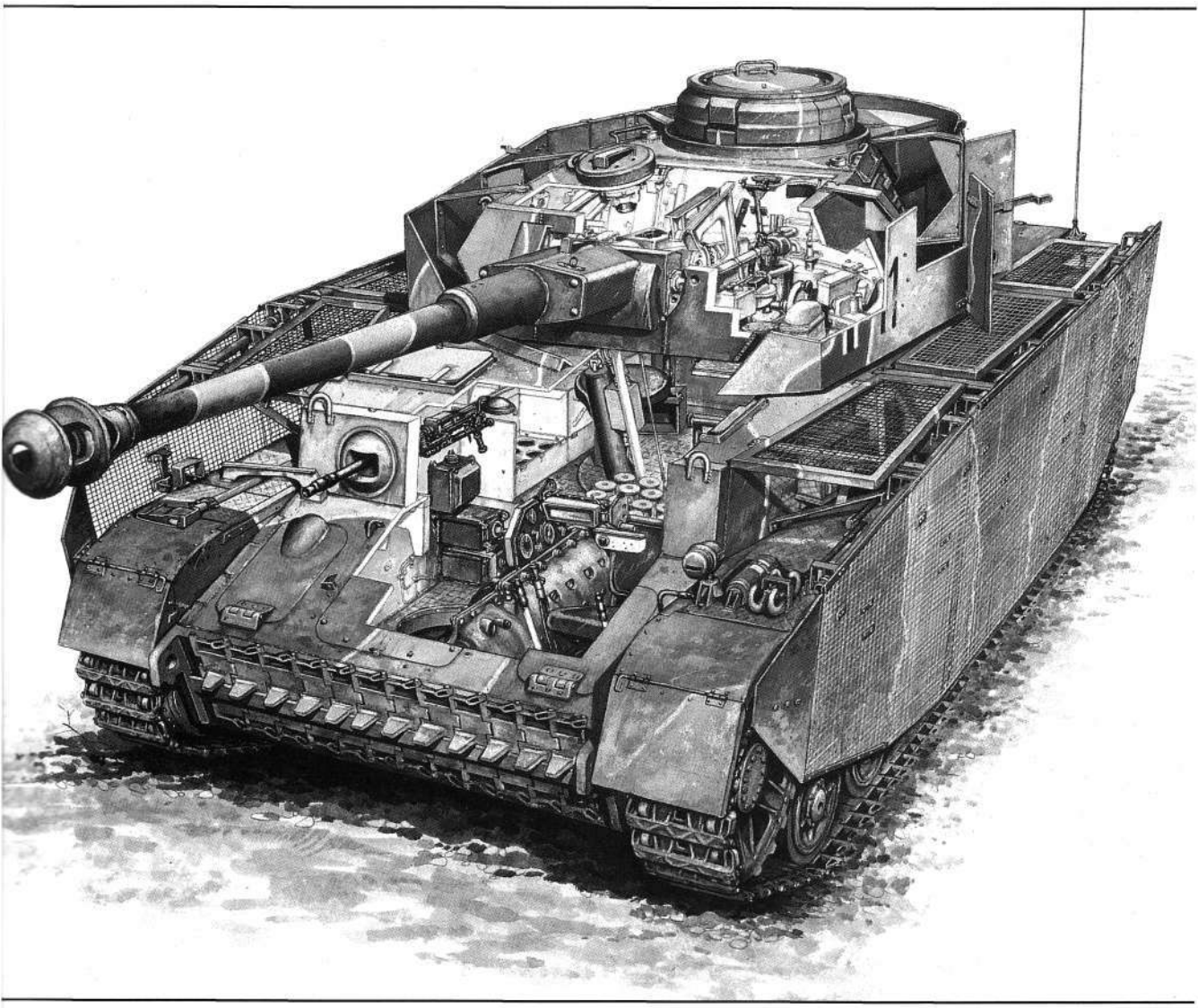

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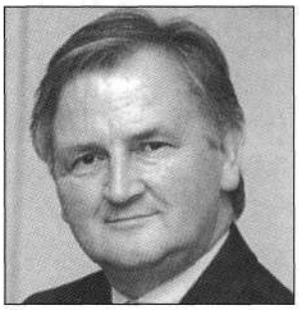
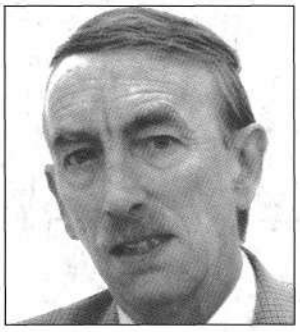


HILARY LOUIS DOYLE, born 1943, is an expert on German armoured vehicles and has written numerous books on AFV's including the *Encylopedia of German Tanks*. Hilary lives in Dublin with his wife and three children.

TOM JENTZ is one of the world's leading AFV researchers and is best known for the *Encyclopedia of German Tanks*. Tom lives in Maryland with his German wife and two children.



TONY BRYAN is a freelance illustrator of many years experience. He initially qualified in Engineering and worked for a number of years in Military Research and Development. He also has a keen interest in military hardware – armour, small arms, aircraft and ships. Tony has produced many illustrations for partworks, magazines and books, including a number of titles in the New Vanguard series.

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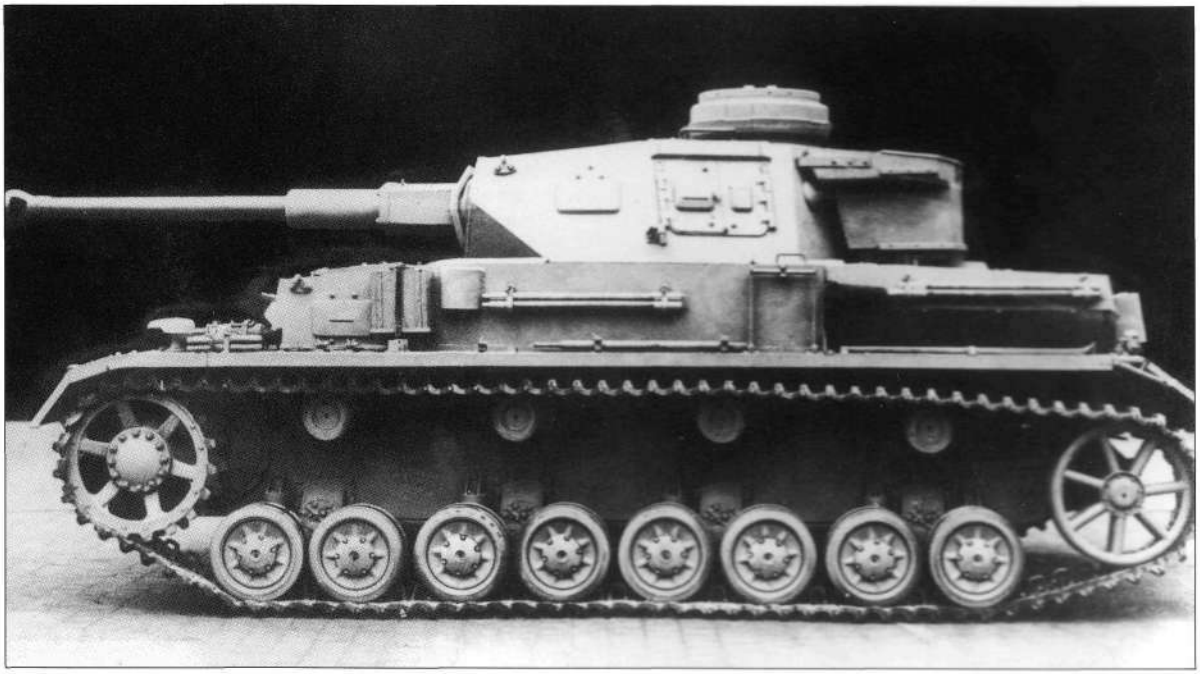
PANZERKAMPFWAGEN IV AUSF.G, H AND J 1942–45

DESIGN AND DEVELOPMENT

The Pz.Kpfw.IV had a reputation as the 'work horse' of the German Panzer forces in the Second World War. While it did not have the sleek appearance of the Panther, or the awe-inspiring bulk of the Tiger, it could get the job done. However, many misconceptions have surfaced in post-war publications about the Pz.Kpfw.IV, its combat role and capabilities. Many stories were the result of veterans' hearsay, with allegations that a Sherman could easily knock out a Panzer IV by ricocheting an armour-piercing round off the ground into its belly, or that a Sherman could blow a Panzer IV apart with a high-explosive shell. While such stories may serve to impress civilians, the reality is that a Pz.Kpfw.IV was difficult to kill, much to the regret of many Allied tankers.

This is not a story packed with amusing anecdotes. It is a factual documentary of the Pz.Kpfw.IV, generated by over 30 years of research in

Pz.Kpfw.IV Ausf.J. Fgst.Nr. 89589, assembled by Nibelungenwerk in February 1944, was issued to 2.Pz.Division. (BA)



A newly produced Pz.Kpfw.IV Ausf.F2 assembled by Krupp-Grusonwerk in Magdeburg in April 1942. Mounting the 7.5 cm Kw.K.40 L/43 in the turret of a Pz.Kpfw.IV Ausf.F created the Ausf.F2. Initially a single baffle spherical muzzle brake was used. In June an order was made that all Pz.Kpfw.IV with the Kw.K 40 were to be referred to as Ausf.G.

the original records from design and production firms, the Heeres Waffenamt (Army Ordnance Department), the office of the Generalinspekteur der Panzertruppen (General Guderian), and operational reports from units. This book is based solely on the contents of these original documents. The research is backed by observations made by the authors climbing over, under, around and through most of the Pz.Kpfw.IV that still exist in the West.

The Pz.Kpfw.IV with the short-barrelled 7.5 cm Kw.K.[1] L/24 was highly successful in its intended combat role, living up to its code name Begleitwagen (escort tank – abbreviated to B.W.) by providing effective high-explosive fire. After encountering the Russian T-34/76 and KV-1 tanks in the summer of 1941, however, the troops wanted a tank gun that could knock out enemy tanks at long range. This version of the Pz.Kpfw.IV was created by replacing the shorter-barrelled gun in the turret with a long-barrelled 7.5 cm Kw.K.40 L/43 or L/48.

Development History

When development of the Pz.Kpfw.IV began in October 1935, the German army considered mounting a long 7.5 cm gun in a medium tank. They knew that the French had planned to produce 1,000 tanks with 40 mm-thick armour by the end of 1935, so German planners intended to install the 7.5 cm Kanone L/24 in the Begleitwagen (B.W.). Firing a 7.5 cm Panzergranate (armour-piercing shell) with a muzzle velocity of 430 m/s, it was calculated that 43 mm of armour plate at 30 degrees could be cleanly penetrated at a range of 700 metres. Therefore this short gun seemed adequate to penetrate the newest French tanks.

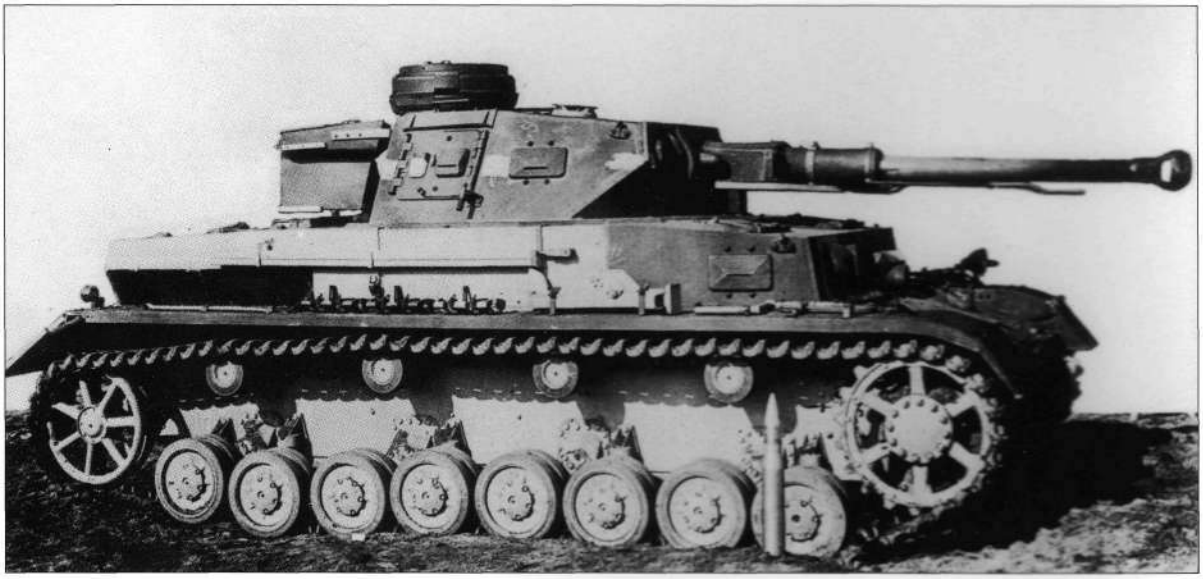
(1) Kw.K. = tank gun and L/24, L/43 or L/48 = the barrel length divided by calibre, i.e. 3,233 mm divided by 75 mm = L/43.

April 1942, one of the first Pz.Kpfw.IV Ausf.F2 (G) is shown to Adolf Hitler. (National Archives)

However, German army intelligence estimated that the armour on the heaviest French tanks, Char 2C, 3C, and D, was much thicker than 40 mm, and engineers calculated that the muzzle velocity of the 7.5 cm Kanone would have to be increased to 650 m/s in order to penetrate these heavy French tanks. They thought that the tank would have to be completely redesigned in order to mount such a powerful gun. It was estimated that this new tank would weigh at least 30 tons with armour only 20 mm thick (which wasn't even proof against 2 cm Pzgr.). This conceptual design was not pursued, since the general in command of the army had recently spoken out against such a heavy tank.

During the invasion of France in 1940, the 7.5 cm Kw.K. L/24 proved effective in penetrating the armour of the Renault, Hotchkiss and Somua tanks, but failed against the French Char B1 bis and the British Matilda tanks. Then, during December 1940 and January 1941, a single battalion of 50 Matildas enabled a weaker British force to defeat the Italian army at Sidi Barrani, Bardia and Tobruk. The Germans now became concerned about their ability to penetrate the 78 mm armour of the Matildas. On 19 February 1941, on Hitler's orders, the long 5 cm Kanone was immediately mounted in a Pz.Kpfw.III and a Pz.Kpfw.IV to give these tanks a much stronger armour-penetrating ability. In early March 1941 Krupp began to design a 5 cm Kw.K. L/60 with interior dimensions that matched the Rheinmetall 5 cm Pak 38 L/60. A 5 cm Kw.K. L/60 was mounted in the turret of the Pz.Kpfw.IV Ausf.D Fgst.Nr.80668 (chassis number) for a demonstration for Hitler's birthday on 20 April 1941. Plans to produce 80 Pz.Kpfw.IV with 5 cm Kw.K. L/60 at the Nibelungenwerk from August 1941 were subsequently cancelled.

In March 1941 Krupp began to consider other high-performance guns for the Pz.Kpfw.IV. Krupp had already designed a 7.5 cm Kanone



In June 1942 an extended radio antenna deflector was fitted on the 7.5cm Kw.K.40 L/43. Pz.Kpfw.IV Ausf.G but this was dropped again in July 1942. (WJS)

L/40 for uparming the Sturmgeschütz (mobile assault gun used for infantry support), which could penetrate 70 mm of armour at 30 degrees at a range of 400 metres. To prevent tank guns from being damaged by striking obstacles, the Waffenamt had specified that the gun length was not to extend beyond the forward edge of the tank. Therefore this gun had to be shortened from 3,023 mm to 2,470 mm (equal to L/33, i.e. 33 calibre lengths), which reduced the penetrating ability of a normal 6.8 kg APCBC-HE (armour-piercing shell capped with ballistic cap and high explosive filler) to 59 mm of armour at 30 degrees at a range of 400 metres. A Triebspiegelgeschoss HK (discarding sabot round with tungsten carbide core) was also to be developed that could penetrate 86 mm of armour at 30 degrees at a range of 400 metres. One 7.5 cm Kw.K. L/34.5 was completed by December 1941, and in April 1942 Krupp decided to mount this gun in Turm Nr. 80979 (Ausf.E) (turret number) on Pz.Kpfw.IV Ausf.F Fgst.Nr. 82091.

Meanwhile, Germany had invaded Russia on 22 June 1941 and soon encountered the heavy 75–105-mm thick armour on the KV-1, and the well-sloped 45 mm-thick armour on the T-34 tanks. A special Panzerkommission was sent to Russia in November 1941 to acquire a first-hand impression of the problems encountered by the front line troops when tackling the heavy Russian tanks. The Panzerkommission advised improving available tank types by installing a new gun able to penetrate Russian tank armour at a range beyond the retaliatory capabilities of the Russian tank gun. Under no circumstances would production interruptions be allowed in the current series of tanks. They understood that substantial improvements in the armour and suspension could not be initiated immediately. However, it was decided that the troops would accept this if the requirement for a new gun was fulfilled.

On 18 November 1941, Wa Prüf 4 ordered development of a new gun for the Pz.Kpfw.IV with the same capabilities as the Rheinmetall 7.5 cm Pak 44 L/46 (later renamed Pak 40). Originally known as the 7.5 cm Kw.K.44, the gun was developed jointly by Krupp in co-operation with

Pz.Kpfw.IV Ausf.G of Panzer Division 'Grossdeutschland' in the summer of 1942. (BA)

Rheinmetall. Rheinmetall dealt with the interior ballistics and Krupp was responsible for the design. When firing a normal 6.8 kg APCBC-HE shell, it was to be capable of penetrating 80 mm of armour plate at 30 degrees at a range of 1,000 metres.

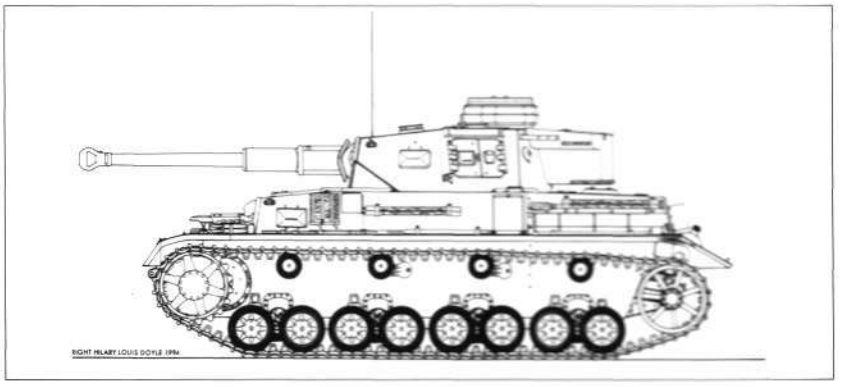
The recoil length of the 7.5 cm Pak 40 (900 mm) was too long for a Pz.Kpfw.IV turret, and at 969 mm the complete round was also too long. The new gun had to be designed with a shorter recoil and shorter rounds. The unaltered rifled gun tube (2,470.5 mm long) was retained from the 7.5 cm Pak 44 L/46, but a shorter loading chamber was added with a larger diameter, resulting in the 7.5 cm Kw.K.44 L/43. Shorter, thicker shell casings made loading the gun in the restricted confines of a closed turret far easier, and also allowed a greater number of rounds to be stowed in ammunition bins inside the tank.

Plans had been made to complete the first 30 7.5 cm Kw.K.40 L/43 in March, followed by 70 in April and 90 in May 1942. In actual fact, 18 were completed in March, 104 in April, and 56 in May 1942. Initially, a single-chamber, ball-shaped muzzle brake with two large side ports was fitted, which provided about 49 per cent of the braking ability of the recoil system.

Official Designations

The names for the Pz.Kpfw.IV with long guns evolved as follows. At first it was known as the 7./B.W.-Umbau (7th series of the Begleitwagen conversion), or the Pz.Kpfw.IV Ausf.F-Umbau. From March to May 1942 it was known as the Ausführung F2, with its full title stretching out to Pz.Kpfw.IV (7.5 cm Kw.K.40) (Sd.Kfz.161), 7./B.W., Ausf.F2. On 5 June 1942, the Waffenamt ordered that all Pz.Kpfw.IV mit Kw.K.40 be known by the code words 8./B.W., (Ausf.G) which on 1 July 1942 was further clarified that all

Pz.Kpfw.IV with 7.5 cm Kw.K.40 be named 8./B.W., (Ausf.G) instead of 7./B.W., (Ausf.F2). Three months later, Ausf.F2 was officially changed to Ausf.G. There was no difference between a Pz.Kpfw.IV Ausf.F2 and a Pz.Kpfw.IV Ausf.G – they were simply different names for the same model of Pz.Kpfw.IV. The model designation 'Ausf.F2' only survived because two manuals were printed in the period when the name was used: D 653/7 dated 1 April 1942 and a Vorläufige K-Gerätverzeichnis (parts manual) dated June 1942.



A 1:76 scale side view drawing of the Pz.Kpfw.IV Ausf.F2 (G) with the 7.5 cm Kw.K.40 L/43. (Hilary Louis Doyle)

General Description

The 7.5 cm Kw.K.40 L/43 (75 mm gun, 43 calibres long) was mounted in a pivoting gun mantle in the turret front. It had a semi-automatic vertical sliding breech block and electric primer firing. The gun could be elevated by hand through an arc from –10 degrees to +20 degrees, and the turret traversed by hand or electric motor through 360 degrees. A 7.92 mm MG34 was coaxially mounted to the right of the main gun. Both weapons were aimed by the gunner using the T.Z.F.5f articulated telescope which had 2.5x magnification and a 24 degree field of view.

Another MG34 machine gun was mounted in a traversable ball mount in the superstructure front plate. It had a limited elevation arc from –10 degrees to +20 degrees and could be traversed by hand 15 degrees to the left and right of centre. This machine gun was sighted with a K.Z.F.2 gunsight registered at a range of 200 metres. A total of 87 rounds for the main gun were stowed in sheet metal bins or in

Pz.Kpfw.IV Ausf.G Fgst.Nr. 83072 assembled by Vomag in September 1942. The 7.5 cm Kw.K.40 L/43 was fitted with a double baffle muzzle brake. This tank was captured and sent to England for examination in 1943. The rack for seven spare track links mounted on the glacis was introduced from June 1942. (TTM)

The rear view of Pz.Kpfw.IV Ausf.G. Fgst.Nr. 83072. On the left mudguard are the remains of the rack for mounting two spare wheels. (TTM)

collapsible bins on the turret platform. 3,150 rounds of belted MG ammunition were carried in bags each containing 150 rounds of S.m.K. (armour-piercing) ammunition.

A crew of five manned this medium tank. The commander, gunner and loader were located in the turret, and the driver and radio operator in the hull front. Hatches were provided in the superstructure roof directly above the driver's, and radio operator's positions. The driver had a Fahrersehklappe 50 (visor) mounted in the front plate. When in combat, he could use the K.F.F.2 twin periscopes. A vision port with viewing slits was mounted to the driver's left in the superstructure wall, but he had no view at all to the right side. The radio operator's view to the front when in combat was through the K.Z.F.2 sight for the ball-mounted machine gun, which had a 1.8x magnification and 18 degree field of view. In addition, there was a vision port with a vision slit mounted to the radio operator's right in the superstructure wall. A hatch was provided in the cupola for the commander, and there was a hatch in each turret side for the gunner and loader. Pistol ports were installed in the side turret hatches in addition to the two pistol ports in the turret rear plate. The commander was provided with five vision slits in the cupola with overlapping field of view. The gunner normally used the T.Z.F.5f telescopic gun sight with 2.5 x magnification and 24 degree field of view. Both he and the loader had vision ports in the turret front and vision ports with vision slits in the hull sides.

In 1942, each Pz.Kpfw.IV issued to a platoon leader or company commander was equipped with a Fu 5 ultra short-wave transmitting and receiving radio set, an Fu 2 ultra short wave receiver, and an intercom set. The remaining three Pz.Kpfw.IV in each platoon only had one short wave receiver and an intercom set. The commander, gunner, driver and radio operator all had headsets and microphones; the loader had none.

Armour protection consisted of a 50 mm-thick gun mantle, 50 mm turret front at 10 degrees, driver's front plate at 9 degrees, 50 mm hull front at 14 degrees, 30 mm turret sides at 25 degrees, 30 mm superstructure and hull sides at 0 degrees, 30 mm turret rear at 14 degrees, 20 mm tail plates at 10 degrees, 10 mm turret roof at 84–90 degrees, 10 mm deck at 85–90 degrees, and 10 mm belly plate at 90 degrees. Both the 50 mm-thick frontal armour and 30 mm-thick side plates were face-hardened to greater than 200 kg/mm^2 (equal to 588 Brinell Hardness).

Power was delivered to the tracks by a drive train consisting of a high-performance 12-cylinder water-cooled Maybach HL 120 TRM gasoline engine delivering 265 metric hp at 2,600 rpm, through a six-speed Zahnradfabrik Friedrichshafen SSG 76 transmission, onto the planetary gear steering and final drives to the drive sprockets. The combat weight of 24 metric tons was distributed over eight sets of 470 mm-diameter rubber-tyred twin roadwheels per side sprung by leaf springs. The unlubricated Kgs 61/400/120 track (380 mm-wide track with 400 mm-long track pins) provided a relatively high ground pressure of 0.89 kg/cm^2.

MODIFICATIONS DURING PRODUCTION RUN

As was the practice with every German armoured vehicle produced over a long period, major modifications were introduced within the production run of each model without changing the Ausführung designation. So all Pz.Kpfw.IV of the same Ausführung did not look exactly alike, but each Ausführung had distinctive identifying characteristics.

Pz.Kpfw.IV Ausf.G Fgst.Nr. 82924 assembled by Krupp-Grusonwerk in October 1942. The 7.5 cm Kw.K.40 L/43 was fitted with a double baffle muzzle brake. The visors have been dropped from the turret sides. (TTM)

One of the 12 Pz.Kpfw.IV Ausf.G issued to Pz.Rgt.15 of 11.Pz.Division for the Summer offensive of Heeres Gruppe Süd in 1942. (BA)

Pz.Kpfw.IV Ausf.G, Fgst.Nr.Serie 82394–84400

With the exception of the longer gun and larger armour guard for the recoil and recuperator cylinders, the external appearance of the first Pz.Kpfw.IV Ausf.G was identical to its predecessor, the Ausf.F. Internal changes included: ammunition racks for 87 longer rounds for the 7.5 cm Kw.K.40, strengthened internal travel lock, and an auxiliary hand traverse for the loader. The following list of modifications includes all significant changes to the external appearance of the Pz.Kpfw.IV Ausf.G as well as those introduced to improve automotive performance.

April 1942: To simplify production the vision ports on the left and right turret side and on the left turret front were dropped (starting in April, completed by October 1942).
May 1942: Frontal armour protection was increased by welding 30 mm Zusatzpanzer (30 mm face-hardened plates welded onto the 50 mm face-hardened base) onto the hull and superstructure front starting with eight tanks in May, 16 from June, 50 per cent after November, and all after January 1943.
June 1942: A rack for two spare roadwheels was mounted on the left track guard. Brackets to hold seven spare track links were welded onto the glacis plate. All Ausf.G were outfitted for operation in higher temperatures: slits were cut into the engine and radiator hatches on the rear deck to increase engine compartment ventilation. In June and July, a longer antenna guard was mounted to prevent the antenna from being grounded by the gun.
September 1942: A searchlight with removable blackout cover (commonly known as the 'Bosch headlight') replaced the 'Notek'

Starting in May 1942 a proportion of Pz.Kpfw.IV had additional 30 mm plates welded to the front of the hull and superstructure. By January 1943 all were so modified. This Pz.Kpfw.IV Ausf.G Fgst.Nr. 83672 was assembled by Nibelungenwerk, Austria, in March 1943. It has the new commander's cupola introduced from February 1943. The smoke candle dischargers on the turret were introduced in February but were dropped again in May 1943. (BA)

blackout headlight. The signal ports on the driver and radio operator hatches were removed. To improve the engines' ability to start in cold weather, a system was added for heated coolant transfer between Panzers; a Fuchs heating device was installed to heat the coolant with a blowtorch, and a starter fluid injector was installed. The ball-shaped muzzle brake was replaced by a double-chamber muzzle brake with four side ports.

November 1942: A deflector for the antenna was welded to the gun mantle in front of the machine gun.

February 1943: Sets of three smoke candle dischargers were mounted on the left and right turret side from February through May 1943. They were discontinued after it was discovered that the smoke candles were set off when hit by small arms fire, and the smoke incapacitated the crew. The K.F.F.2 driver's twin periscopes were dropped and the holes in the driver's front plate plugged until new plates without these holes were available. A new cupola was introduced, with a single-piece hatch lid and thicker side armour.

March 1943: The signal port on the turret roof was deleted.

April 1943: Instead of being welded, the 30 mm Zusatzpanzer plates were bolted onto the hull and superstructure front. The longer 7.5 cm Kw.K.40 L/48 replaced the 7.5 cm Kw.K.40 L/43 and a redesigned muzzle brake with side baffle plates was introduced in early April 1943. As a defence against Russian anti-tank rifles, Schürzen (side skirts) were mounted on both sides of the hull and surrounding the sides and rear of the turret.

May 1943: A large cylindrical Filzbalgvorschaltluftfilter (prefilter) for engine air intake was mounted on the right track guard. The radio antenna, mounted on a flexible rubber base, was relocated to a position on the left rear corner of the rear deck.

Pz.Kpfw.IV Ausf.G 7.5cm Kw.K 40 L/43 in Tunisia. (BA)

Pz.Kpfw.IV Ausf.H, Fgst.Nr.Serie 84400–89540

The characteristics that differentiate an Ausf.H from its predecessors are the strengthened final drives with new cast drive sprocket and strengthened turret roof. The forward turret roof plate was increased from 10 mm to 16 mm thick, and the rear plate supporting the cupola was increased to 25 mm thick. The rest of the armour, automotive and weapons systems features remained the same as the Ausf.G. The following list of modifications includes all significant changes to the external appearance of the Pz.Kpfw.IV Ausf.H as well as those introduced to improve automotive performance:

May 1943: Due to delays at Krupp steel works in completing the new final drives, the first 30 Ausf.H tanks from Vomag were completed using the older model final drives and drive sprockets.

June 1943: Because they were easier to manufacture as a single piece, the hull front and superstructure front plates were made from 80 mm-thick plates, instead of 50 mm base plates with 30 mm Zusatzpanzer bolted on. With Schürzen mounted, the vision ports in the superstructure sides were no longer needed and were dropped from June 1943.

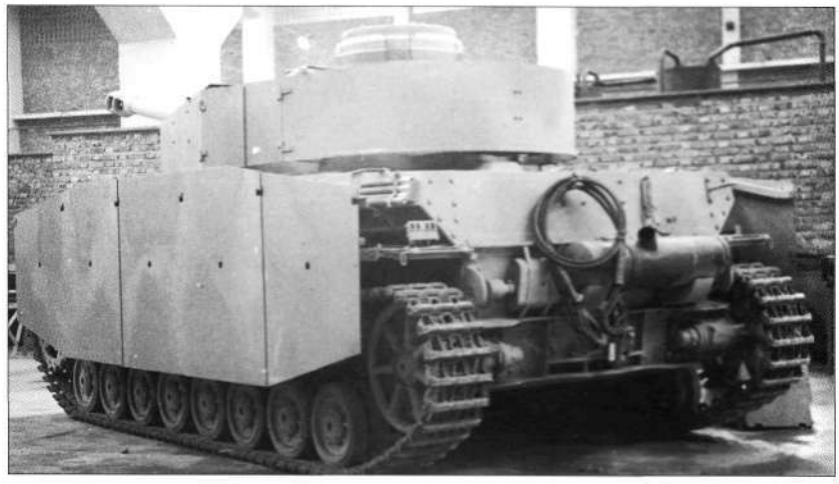
September 1943: To prevent magnetic grenades from sticking to the armour, Zimmerit anti-magnetic coating was applied to the vertical armour surfaces. To simplify production, cast bump stops for the roadwheel arms replaced the welded brackets, and forged hub caps replaced the cast hub caps on the roadwheels.

October 1943: Cast steel return rollers replaced rubber-tyred return rollers and cast idler wheels replaced welded idler wheels. To help prevent the loss of Schürzen side skirts, the holders were redesigned with triangular supports on the side rails.

December 1943: The hull front was strengthened by interlocking the sides of the 80 mm-thick front plate, with slits cut into the extended side plates.

January 1944: A Nahverteidigungswaffe (close defence weapon) was to have been mounted in the turret roof on the right side, but because of a shortage of weapons, the hole in the turret roof was covered by an armour disc secured by four bolts.

February 1944: Due to dust clouds raised by the track being retained behind the Schürzen, the Filzbalgvorschaltluftfilter was no longer mounted on the right track guard.



A newly produced Pz.Kpfw.IV Ausf.G assembled in April 1943 shows the design of the Schürzen plates used at this period. Schürzen (apron) were introduced to protect the side armour from Russian anti-tank rifle fire.

Pz.Kpfw.IV Ausf.J, Fgst.Nr.Serie 86394-97000

The key feature identifying an Ausf.J from its predecessor, the Ausf.H, is the lack of a muffler on the hull rear for the auxiliary electrical generator set. The hole in the hull rear for the exhaust pipe penetration was initially plugged by bolting on a square armour plate. This auxiliary electrical generator set had provided power for the electric motor-driven turret traverse in the Pz.Kpfw.IV Ausf.A through H. Having dropped the electric generator and motor, the hand traverse was modified to a low and high range so that it would be easier to traverse on a slope yet could still be traversed faster when setting flat.

May 1944: The pistol ports in the turret rear and in the side doors, as well as the vision ports in the turret doors were removed from May 1944 (but this modification had not been completely implemented on all Pz.Kpfw.IV by the end of the war). The raised housing over the radiator filler caps on the rear deck was simplified by squaring off the sides instead of using slanted plates.

Pz.Kpfw.IV. Ausf.G 7.5cm Kw.K 40 L/48, welded 30 mm extra armour on the front surfaces, Schürzen, smoke candle dispensers. The wider 'Winterketten' (winter tracks) have been fitted for better flotation on snow. (BA)

June 1944: S-hooks for attaching the towing cables replaced the C-hooks. Three Pilze (sockets) were welded to the turret roof for mounting a 2-ton job boom to be used for lifting out component parts such as the engine from the Pz.Kpfw.IV itself, or from an adjacent tank.

July 1944: A 200-litre fuel tank was mounted in the space in the left side of the engine compartment from early July, but due to leaks was dropped in early August and not reinstated until September 1944. The superstructure roof was strengthened with 16 mm-thick plates, but the thinner driver and radio operator hatch covers were still used until supplies were exhausted. A larger-diameter armour cover was installed to protect the fume extractor fan on the turret roof. Since this interfered with firing the Nahverteidigungswaffe to the right front, a crescent was cut out of the side of this armour cover from October 1944.

August 1944: Two Flammentöter (flame-suppressing) exhaust mufflers replaced the large cylindrical exhaust muffler that had been mounted across the hull rear. The armour guards were retained to cover the penetrations in the hull rear for the exhaust pipes.

September 1944: The assembly firms were ordered to stop applying the Zimmerit anti-magnetic coating. Drahtgeflecht Schürzen (wire mesh skirts) replaced the soft steel plates on the hull sides. The steel wire mesh was supported by steel strips and fastened to a steel pole running the length of the Pz.Kpfw.IV. The wire mesh skirts could be repositioned to accommodate the Ostketten (wide tracks used for muddy conditions on the Eastern Front).

October 1944: A flat cupola lid, which could be raised and pivoted to the right, replaced the hinged lid. The hull sides were extended and cut to form tow eyes, at which time the bolted-on tow brackets were dropped.

December 1944: In order to reduce production time, the number of return rollers on each side was reduced from four to three. A large vertical coupling for attaching rigid towing bars was welded onto the centre of the lower hull rear. Rigid towing bars allowed better control of a Pz.Kpfw.IV under tow than when steel cables were used.

Photographed in southern Italy this Pz.Kpfw.IV Ausf.G Fgst.Nr. 83884 was assembled by Krupp-Grusonwerk in May 1943. It has the extra 30 mm armour plate bolted to the superstructure front. The K.F.F.2 driver periscope has been eliminated. Schürzen plates for protection against anti-tank rifles were fitted from April 1943. This photograph shows the side Schürzen and mounting rails removed while the tanks are being shipped. The gun of this Pz.Kpfw.IV Ausf.G is the longer 7.5cm Kw.K 40 L/48.

Retrofitted Modifications

Announcements in the H.T.V.Bl. (army technical bulletin) authorised troops to perform the following modifications to their Pz.Kpfw.IV: change to Winterketten (tracks with ice cleats) from November 1942; mount Schürzen skirts on the turret and hull sides in May 1943; apply Zimmerit anti-magnetic coating in January 1944; drop the Filzbalgvorschaltluftfilter on the right track guard in February 1944; change to Ostketten (wider tracks for better flotation in the mud) only on the Eastern Front in May 1944; weld three Pilze sockets to the turret roof for a 2 ton jib boom in July 1944; weld a centred coupling for rigid tow bars onto the hull rear in December 1944; and modify the hinged cupola lid so that it would lie flat in January 1945.

This Pz.Kpfw.IV Ausf.G assembled in May 1943 was issued to the Pz.Rgt.2, 16.Pz.Division. It was captured in southern Italy and sent to the USA for examination. (APG)

Production

Mass production of the Pz.Kpfw.IV with the 7.5 cm Kw.K.40 began in March 1942 with 80 completed and accepted by the Waffenamt in April 1942. Three assembly firms were involved: Krupp-Grusonwerk in Magdeburg, Vomag in Plauen, and Nibelungenwerk in St.Valentin (now Austria). All three were contracted to complete fully operational tanks, with turrets and armament component parts provided by other suppliers. Krupp in Essen, Eisenwerke Oberdonau in Linz and Boehler in Kapfenberg produced the plates, made the castings and welded the armour bodies together. Maybach in Friedrichshafen, Nordbau in Berlin, M.A.N. in Nuremberg and M.B.A. in Nordhausen assembled and tested the HL 120 TRM engines. Zahnradfabrik Friedrichshafen had three facilities to assemble the S.S.G.76 transmissions. Over 10 firms were involved in the production of 7.5 cm Kw.K.40 guns, from extruding the barrels, machining the lands and grooves for the rifling, casting the breech, machining the breech and breech blocks, manufacturing the recoil cylinders and recuperators, to assembling and testing the entire gun. Altogether over 100 firms were involved in producing the parts and components needed to complete a single Pz.Kpfw.IV.

The efforts of all of these companies had to be carefully co-ordinated in order to meet the demands of rapid increases in the production schedules. An average of 39 Pz.Kpfw.IV were produced per month in 1941, which was increased to an average of 83 per month in 1942, 252 in 1943 and 300 per month up to August 1944. Krupp-Grusonwerk had been diverted to producing Sturmgeschütz IV in December 1943 and Vomag was phased out in the spring of 1944 to produce the Jagdpanzer IV. This left Nibelungenwerk as the only assembly plant making the Pz.Kpfw.IV, at a rate of 300 per month.

Production decreased in September 1944 due to two factors: the main steel plant completing armour components for the Pz.Kpfw.IV had been heavily hit in a bombing raid, and part of the Pz.Kpfw.IV chassis production was diverted to producing the Panzer IV/70(A) with a 7.5 cm Pak 42 L/70. Nibelungenwerk itself was extensively damaged in a bombing raid in mid-October 1944. Finally, in early 1945 the entire system collapsed under the weight of the Allied attacks on heavy industry, the rail network and electricity generating stations. The end result was that allegedly only 55 Pz.Kpfw.IV were completed in March 1945 and about the same number in April 1945.

TABLE 1: PRODUCTION STATISTICS*

	Pz.Kpfw.IV (new)	Pz.Bef.Wg.IV (rebuilt)	Pz.Beob.Wg.IV (converted)
Mar42	1		
Apr42	80		
May42	85		
Jun42	72		
Jul42	88		
Aug42	84		
Sep42	93		
Oct42	99		
Nov42	123		
Dec42	155		
Jan43	163		
Feb43	171		
Mar43	205		
Apr43	213		
May43	272		
Jun43	253		
Jul43	244		
Aug43	283		
Sep43	289		
Oct43	328		
Nov43	238		
Dec43	354		
Jan44	300		
Feb44	252		
Mar44	310	15	
Apr44	299	30	
May44	302	30	
Jun44	300	9	
Jul44	300	4	7
Aug44	300	8 #	18
Sep44	180	9 #	21
Oct44	187		25
Nov44	200		20
Dec44	195		11
Jan45	170		16
Feb45	160		0
Mar45	55		15
Apr45	*c.* 50		

* Number accepted each month by the Waffenamt inspectors.
# The last 17 Pz.Bef.Wg.IV were converted from newly produced Pz.Kpfw.IV and not rebuilt.

OPERATIONAL CHARACTERISTICS

Operational characteristics demonstrate the effectiveness of an armoured fighting vehicle by relating its capabilities of firepower, manoeuvre and survival on the battlefield.

Firepower

The effectiveness of firepower delivered by the main gun is dependent upon the penetration ability of the armour-piercing rounds, the inherent accuracy of the gun, the characteristics of the gun sights and the ability to get quickly and accurately on target. Penetration statistics

for armour plate were expressed in terms of the thickness in mm that could be penetrated when the plate was laid back at an angle from the vertical of 30 degrees. The penetrating ability of armour-piercing rounds fired from the 7.5 cm Kw.K.40 L/48 was determined by tests conducted at firing ranges which proved that the results shown in Table 2 could be achieved:

TABLE 2: ARMOUR PENETRATION

	Pzgr.39	Pzgr.40	Gr.38 HL/C
Shell Weight:	6.8 kg	4.1 kg	5.0 kg
Initial Velocity:	750 m/s	930 m/s	450 m/s
Range			
100 m	106 mm	143 mm	100 mm
500 m	96 mm	120 mm	100 mm
1,000 m	85 mm	97 mm	100 mm
1,500 m	74 mm	77 mm	100 mm
2,000 m	64 mm		100 mm

Of the total ammunition load of 87 rounds, it was recommended that the Pz.Kpfw.IV carry about 50 per cent Pzgr.39 (armour-piercing, capped, ballistic-capped with explosive filler and tracer) to fight tanks and the rest as Sprgr. (high-explosive shells). When available, a few rounds of Pzgr.40 (high-velocity, sub-calibre, tungsten core) were carried for use against the heaviest armoured Russian tanks and tank destroyers. Lacking an explosive filler charge, the Pzgr.40 was not as lethal after penetration as the Pzgr.39. A fourth type of round was the Gr.38 HL (HEAT) based on the hollow charge principle. With far less penetrating ability, the Gr.38 HL was also less accurate and much less destructive than the Pzgr.39. However, the Gr.38 HL could be carried in place of Sprgr., and used either to combat armour, or as an effective high-explosive round against soft targets.

The 7.5 cm Kw.K.40 was a fairly accurate gun capable of first round hits at ranges up to 1,000 metres. The estimated accuracy shown in Table 3 is given as the probability (in percentages) of hitting a target 2 metres high and 2.5 metres wide, representing the target presented by the front of an opposing tank. These tables are based on the assumption that the actual range to the target has been determined and that the distribution of hits is centred on the target. The first number shows the accuracy in percentage terms that was obtained during controlled test firing of the gun to determine the pattern of dispersion. The second number in parentheses was calculated by doubling the dispersion obtained from controlled test firing. The Germans considered that 'doubled dispersion' was a close approximation of the accuracy obtained by the troops in practice and, if they remained calm, in combat.

These accuracy tables do not reflect the actual probability of hitting a target under combat conditions. Due to errors in estimating the range and many other factors, the probability of a

This Pz.Kpfw.IV Ausf.G Fgst.Nr. 83920 was assembled by Krupp-Grusonwerk in May 1943. It was converted to a Panzerbefehlswagen (Command vehicle) by adding additional radio equipment and its associated antenna. The ammunition stowage was reduced to accommodate a special auxiliary generator for powering the radios and various other equipment. (WJS)

first-round hit was much lower than shown in these tables. However, the average gunner could achieve the accuracy shown by the number in parentheses after adjusting his fire onto the centre of the target – if he remained calm.

TABLE 3: ACCURACY OF THE 7.5 CM KW.K.40

Ammunition:	Pzgr.39	Pzgr.40	Gr.38 HL/C
Range	Per cent	Per cent	Per cent
100 m	100 (100)	100 (100)	100 (100)
500 m	100 (99)	100 (98)	100 (100)
1,000 m	99 (71)	95 (58)	82 (45)
1,500 m	77 (33)	66 (24)	42 (15)
2,000 m	48 (15)	21 (6)	20 (6)
2,500 m	30 (8)		
3,000 m	17 (4)		

The main gun sight in the Pz.Kpfw.IV was the T.Z.F.5f articulated telescope mounted to the left of the gun. The pattern in the reticule consisted of 7 triangles, separated by 4 mils. Placing the target on the point of a triangle allowed the gunner to aim without obstructing his view of the target. The distances between triangles were used to lead moving targets. The triangle height and separation distances in mils were also used as an aid in estimating the range to a target. The gunner set the range to the target by moving an 'arrow' pointer in the telescope. Range scales for each type of ammunition were marked on the reticule. The reticules were graduated at 100 metre intervals out to a range of 2,500 metres for the Pzgr.39, 1,500 metres for the Pzgr.40, and 3,300 metres for the Sprgr.34.

Mobility

The ability of the Pz.Kpfw.IV to negotiate obstacles and cross terrain was equivalent to or better than most Allied tanks, as shown by the performance characteristics listed in Table 4.

TABLE 4: PERFORMANCE CHARACTERISTICS

Maximum speed	38–42 km/h
Maximum sustained road speed	25 km/h
Average cross country speed	20 km/h
Radius of action, road	210 km (320 km for Ausf.J)
Radius of action, cross country	130 km (210 km for Ausf.J)
Trench crossing	2.3 m
Fording	0.8 m
Step climbing	0.6 m
Gradient climbing	30 degrees
Ground clearance	0.40 m
Ground pressure	0.89 kg/cm^2
Power to weight ratio	10.6 metric hp/ton
Steering ratio	1.43

Survivability on the battlefield

The 80 mm-thick frontal armour of the Pz.Kpfw.IV was capable of withstanding attack from AP shells fired by the Russian T 34/76 and American

75 mm M3 gun. However, it was quite vulnerable at normal combat ranges when engaged by the American 76 mm M1A1 and the Russian 85 mm and 122 mm guns. The side and rear armour protection was only adequate to keep out 2 cm armour-piercing shells or hits from larger-calibre shells at steep angles. The tables extracted from a Wa Prüf 1 report dated 5 October 1944 relate the relative ability of the major opponents to penetrate the Pz.Kpfw.IV and vice versa as shown in the Penetration Range Tables 1 and 2. The penetration ranges were based on the assumption that the tanks stood at a side angle of 30 degrees to the incoming round.[2]

PENETRATION RANGES TABLE 1: PZ.KPFW.IV VS. CROMWELL AND CHURCHILL

	Pz.Kpfw.IV 7.5 cm Kw.K. penetrates Cromwell at ranges up to	Cromwell penetrates Pz.Kpfw.IV 7.5 cm Kw.K. at ranges up to	Pz.Kpfw.IV 7.5 cm Kw.K. penetrates Churchill at ranges up to	Churchill penetrates Pz.Kpfw.IV 7.5 cm Kw.K. at ranges up to
Front: turret	1,000 m	100 m	700 m	100 m
mantle	1,600 m	100 m	500 m	100 m
D.F.P.*	1,800 m	100 m	300 m	100 m
nose	1,400 m	100 m	100 m	100 m
Side: turret	1,800 m	3,000 m	3,000 m	3,000 m
super	3,000 m	3,000 m	3,000 m	3,000 m
hull	1,800 m	3,000 m	3,000 m	3,000 m
Rear: turret	2,100 m	3,300 m	1,300 m	3,300 m
hull	3,500 m+	3,500 m+	2,800 m	3,500 m+

*D.F.P. = Driver's Front Plate

PENETRATION RANGES TABLE 2: PZ.KPFW.IV VS. M4A2 AND M4A4

	Pz.Kpfw.IV 7.5 cm Kw.K. penetrates M4A2 at ranges up to	M4A2 penetrates Pz.Kpfw.IV 7.5 cm Kw.K. at ranges up to	Pz.Kpfw.IV 7.5 cm Kw.K. penetrates M4A4 at ranges up to	M4A4 penetrates Pz.Kpfw.IV 7.5 cm Kw.K. at ranges up to
Front: turret	1,000 m	100 m	1,000 m	1,700 m
mantle	100 m	100 m	100 m	1,500 m
D.F.P.	0 m	100 m	0 m	1,700 m
nose	1,300 m	100 m	1,300 m	1,600 m
Side: turret	3,000 m	3,000 m	3,000 m	3,500 m+
super	3,500 m+	3,000 m	3,500 m+	3,500 m+
hull	3,500 m+	3,000 m	3,500 m+	3,500 m+
Rear: turret	3,000 m	3,300 m	3,000 m	3,500 m+
hull	3,500 m+	3,500 m+	3,500 m+	3,500 m+

*D.F.P. = Driver's Front Plate

(2) Wa Pruf 1 made an error in calculating the penetration ranges for the front of the turret and gun mantle of the Pz.Kpfw.IV by using 80 mm instead of 50 mm. The turret front and gun mantle could be penetrated by the 75 mm M3 ranges up to about 1,500 metres.

OPERATIONAL HISTORY

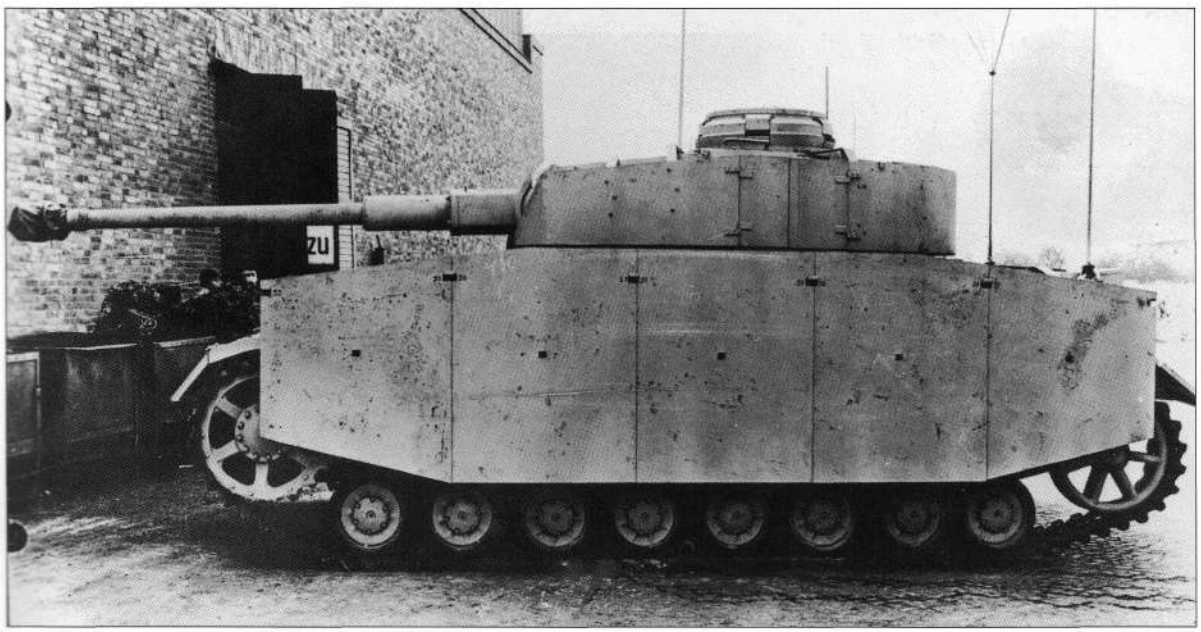
In presenting an overview of how this tank fared in combat, we have drawn on original combat experience reports from the troops that fought in the Pz.Kpfw.IV. The reader should be aware that these reports are biased and do not describe the 'routine'. Most were written with the motive of initiating improvements or changing tactics.

Pz.Kpfw.IV with the long-barrelled 7.5 cm Kw.K.40 L/43 were first employed in a major offensive during Operation Venezia – Rommel's pre-emptive strike against the British 8th Army in Libya in late May 1942. Known in the Deutsches Afrika-Korps as the 'Pz.Kpfw.IV Spezial', only nine of the ten sent to North Africa had arrived by May, and most arrived at front line units a few days after the start of the offensive. At the same time there were 416 Allied Grant tanks in the Middle East, of which 138 were at the front with the 8th Army. German army intelligence had discovered a photograph of the pilot model of the Grant medium tank with the caption 'Pilot' and mistakenly thought that this was its name.

On 11 August 1942 the Deutsches Afrika-Korps reported on their tactical experience with the Pz.Kpfw.IV with the 7.5 cm Kw.K.40 L/43 along with suggested improvements:

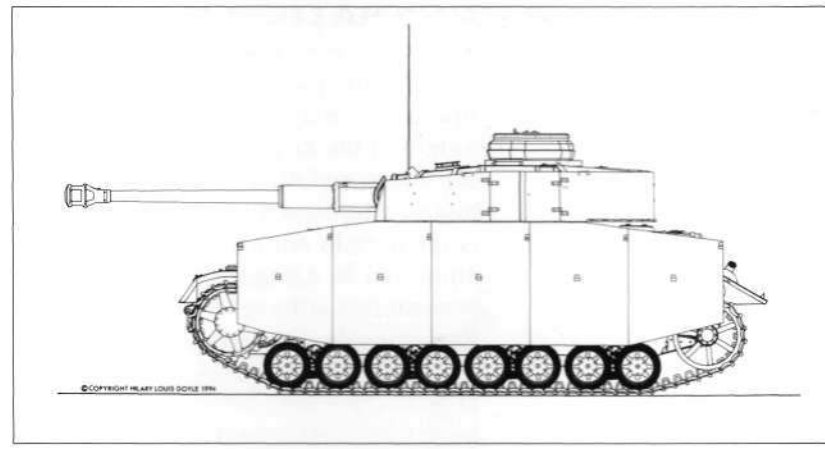
'From the first time it was used, the 7.5 cm Kw.K.40 tank gun with its higher armour-penetrating power and accuracy showed that it was superior to all weapons that had previously been mounted in a Panzer. At ranges up to 1,500 metres the armour-piercing shell penetrates the front of all of the American and British tank types (including the 'Pilot') that have been used in the African theatre of war. Accuracy decreases at ranges exceeding 1,500 metres because observation of the target is hampered by the shimmering atmosphere. Lighter tank types have been destroyed at ranges up to 2,000 metres when the view was clear.

'The opponent quickly recognised the Pz.Kpfw.IV Spezial as being especially dangerous. Because of its distinctive form, it drew concentrated



This side view of Pz.Kpfw.IV Ausf.G Fgst.Nr. 83920 converted to a Panzerbefehlswagen shows the additional rod antenna on the turret roof and the 'Sternantenne' (star antenna) for the long-range Fu 8 radio set. (WJS)

fire down on itself from aircraft, artillery and anti-tank guns. It is therefore necessary to screen the Pz.Kpfw.IV Spezial with several Pz.Kpfw.III. In general, the Pz.Kpfw.IV Spezial should join in the firefight only after the appearance of targets that were worthwhile such as the 'Pilot'. Then flank protection is especially important. It therefore appears not to be useful to always employ the Pz.Kpfw.IV Spezial as a concentrated group.



1:76 side view drawing of the Pz.Kpfw.IV Ausf.G with the Kw.K.40 L/48, additional 30 mm armour plates welded to the front and Schürzen plates for protection from anti-tank rifles. (Hilary Louis Doyle)

'It should not be employed in reconnaissance troops or for flank defence. It should only be assigned to Schwerpunkt [the point of main emphasis] tasks.

'It is usually incorrect to fire more than a few rounds from one position. The muzzle flash and the especially large dust cloud very quickly draw concentrated fire from the opponent's artillery.

'The Pz.Kpfw.IV Spezial should not be used as a command vehicle. However, it should be outfitted with both transmitting and receiving radio sets.

'As long as the Pz.Kpfw.IV Spezial is only available in small numbers, during combat it is necessary to resupply them with ammunition brought to them in armoured vehicles. The divisions are testing the possibility of delivering ammunition by using armoured carriers,

Photographed in Italy in summer 1943 with the 16.Pz.Division this Pz.Kpfw.IV Ausf.G was assembled in June 1943. It has the new rubber base mount for the radio antenna on the left rear of the engine compartment. The gun is the 7.5 cm Kw.K 40 L/48. (BA)

This Pz.Kpfw.IV Ausf.H. was assembled by Vomag in July 1943. The additional 30 mm plates were bolted on the 50 mm frontal armour to speed production. The hull front was made from an 80 mm-thick plate that had become available. This Pz.Kpfw.IV Ausf.H. is now on display in Belgrade, Serbia. (TLJ)

armoured half-tracks or other armoured vehicles.

'It is difficult to observe fire due to the muzzle flash and dust, especially in the desert.

'Up to now, the long gun tube extending far past the front has not been a problem even in terrain cut through with many gullies'.

'Softer springs are desired for the suspension to reduce the rough impacts when driving in stony terrain.

'Strengthen the armour plate on the turret roof and strengthen the superstructure. Install a shot deflector on the turret roof to protect the commander's cupola.

'Mount a travel lock on the front of the Pz.Kpfw.IV to hold the gun barrel in a depressed position. If possible, this travel lock should be releasable from inside the Panzer so that up to the last moment, the Panzer can be driven with the gun supported by the travel lock. Rearward impacts cause the gun tube to vibrate so strongly that the guide rings inside the armour sleeve are knocked out.

'Install ammunition racks on the turret floor in front of and behind the foot rest for the commander.

'Install another fume exhaust fan for improved and quicker discharge of burnt propellant fumes. Because of burnt propellant fumes, it is almost impossible to see out of the vision slits. In addition, the biting stench of the burnt propellant severely taxes the crew. For this same reason, it is necessary to quickly throw spent cartridges out of the fighting compartment.'

Problems with spent propellant fumes in the turret and difficulty observing due to the muzzle flash and dust cloud were not unique to the Pz.Kpfw.IV. The same problems occurred with all of the high velocity guns used by the Germans and Allies in the Second World War. In fact, these problems were worse with the British 17-pdr. and the American 76 mm M1A1 both lacked smokeless propellant which made it almost impossible for gunners to observe the tracers.

An additional 37 Pz.Kpfw.IV Spezial were sent as replacements to North Africa between July and October 1942, but this number was insignificant compared to the 318 Shermans and 426 Grants and Lees among 2,670 tanks in the Middle East at the start of the British 8th Army offensive at El Alamein on 23 October 1942. After Panzer-Armee Afrika was almost wiped out at El Alamein, British and American forces landed in neutral countries in north-west Africa. Germany

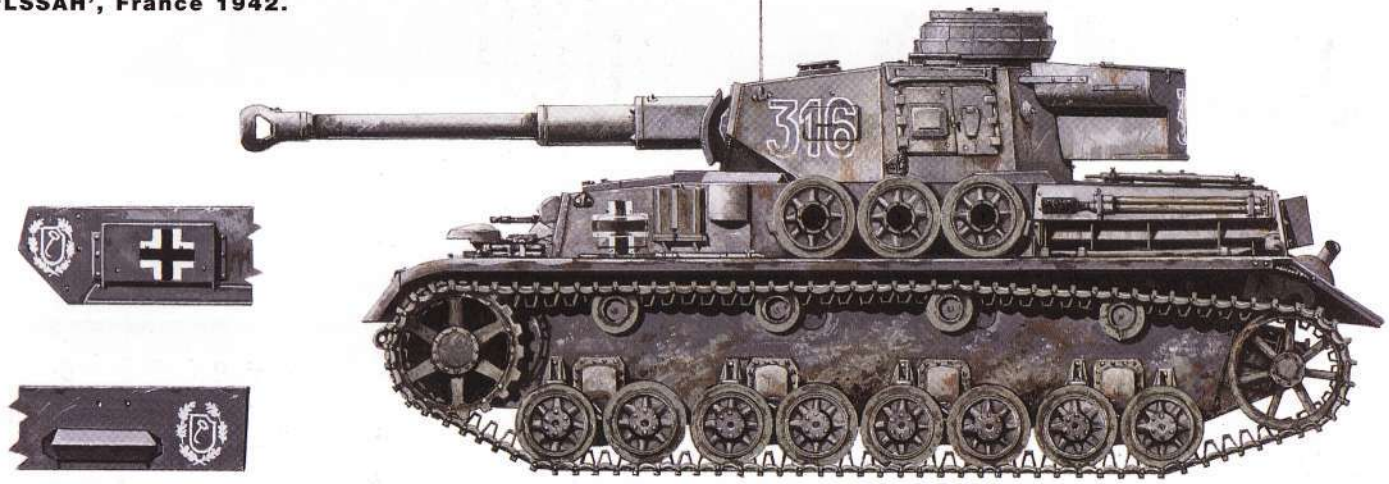
This Pz.Kpfw.IV Ausf.H. Fgst.Nr. 84611 assembled by Krupp-Grusonwerk in September 1943 has the Filzbalgfilter pre-filter air filters fitted after May 1943. This Pz.Kpfw.IV was one of a number exported to Spain. It is now on display in the WTS Koblenz. (WTS)

responded by sending units to Tunisia including Panzer-Abteilung 190 with 10 Pz.Kpfw.IV in November 1942, Panzer-Regiment 7 in 10.Panzer-Division with 20 Pz.Kpfw.IV (although 12 were sunk in transit) in November and December 1942, and 3.Kompanie/Panzer-Regiment Hermann Göring with 8 Pz.Kpfw.IV in 1943.

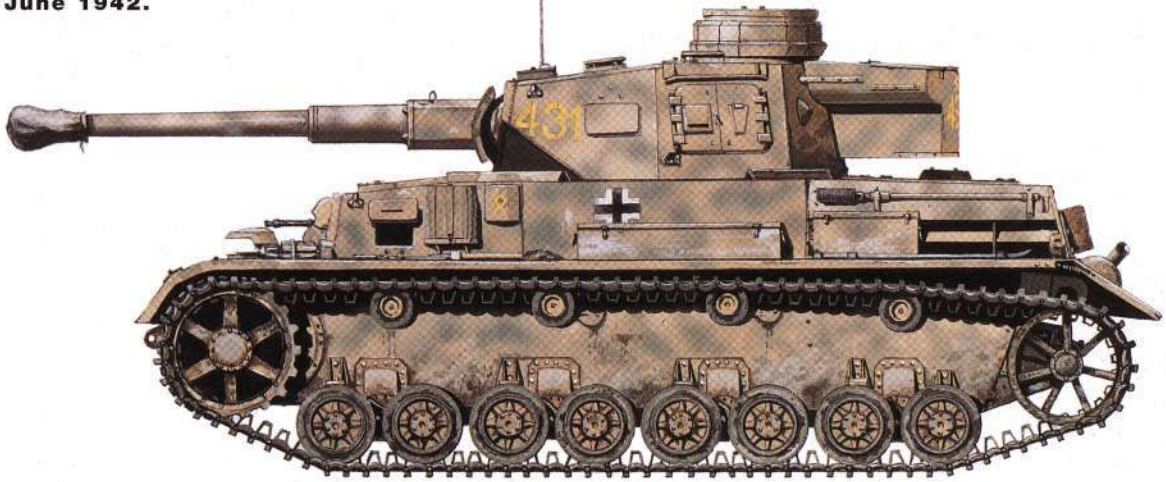
No new organisation was created for units with the longer barrelled Pz.Kpfw.IV in 1942. They were still assigned to the mittleren Panzer-Kompanie (medium tank company) and organised in accordance with K.St.N.1175 (wartime strength guide number 1175) dated 1 November 1941. According to this guide, the Kompanie-Trupp (headquarters section) was to have two Pz.Kpfw.IV, the leichte Zug (light platoon) five Pz.Kpfw.II, and four Pz.Kpfw.IV in each of the 1., 2., and 3.Zug (first, second, and third platoons). Units were not automatically authorised to have the equipment listed in a new K.St.N. when it was published. First, the Organisations-Abteilung in the army high command had to issue official orders authorising the unit to be organised in accordance with a specific K.St.N. Then Inspektorat 6 created orders for the ordnance depot to issue a specific number of Panzers by type to each unit. Between 1940 and 1942, with few exceptions, medium tank companies were not allowed to create a third platoon and were allocated only 10 Pz.Kpfw.IV each.

In early 1942 Panzer-Abteilung Grossdeutschland and LSSAH were the first units created with three medium tank companies. But even they were granted only 10 Pz.Kpfw.IV per company. Only 12 of Grossdeutschland's 30 tanks were Pz.Kpfw.IV with 7.5 cm Kw.K.40 L/43. In December 1942 Panzer-Abteilung 138 was permitted three medium tank companies, and all their Pz.Kpfw.IV were armed with the long gun, although there were still only 10 per company.

A1: Pz.Kpfw.IV Ausf.F2 (G). SS-Panzer-Abteilung 1, SS-Division 'LSSAH', France 1942.

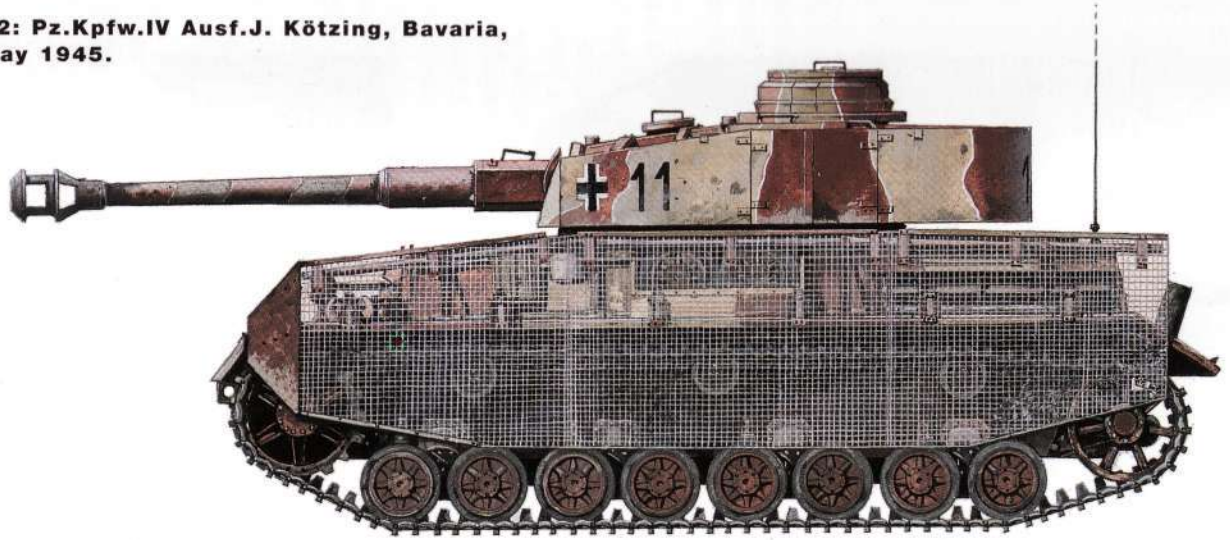


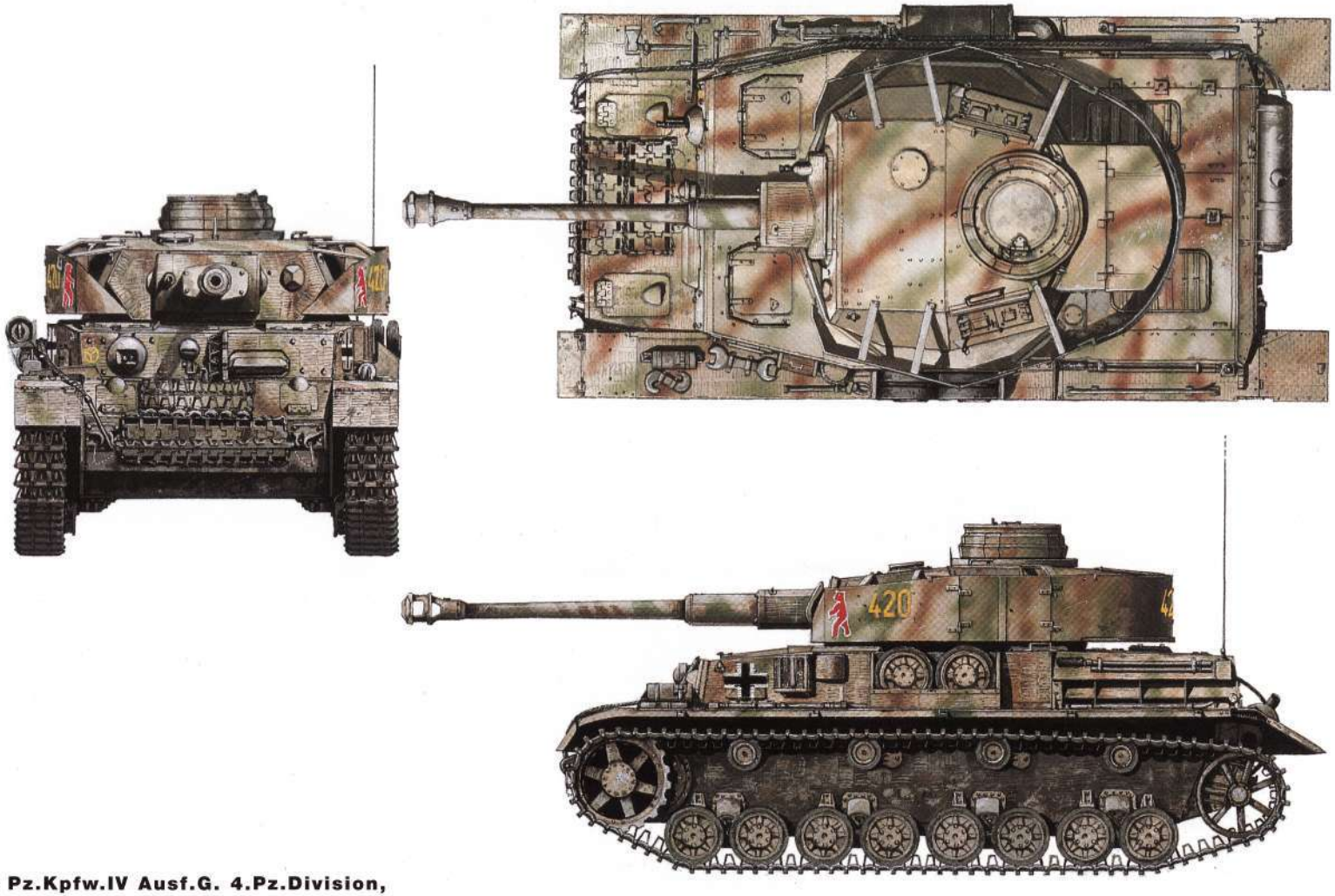
A2: Pz.Kpfw.IV Ausf.F2 (G), Pz.Rgt. 36, 14.Panzer Division, southern Russia, June 1942.



B1: Pz.Kpfw.IV Ausf.H. Fgst.Nr. 86984, 2.Panzer Division, November 1943.

B2: Pz.Kpfw.IV Ausf.J. Kötzing, Bavaria, May 1945.





C: Pz.Kpfw.IV Ausf.G. 4.Pz.Division, 1943.

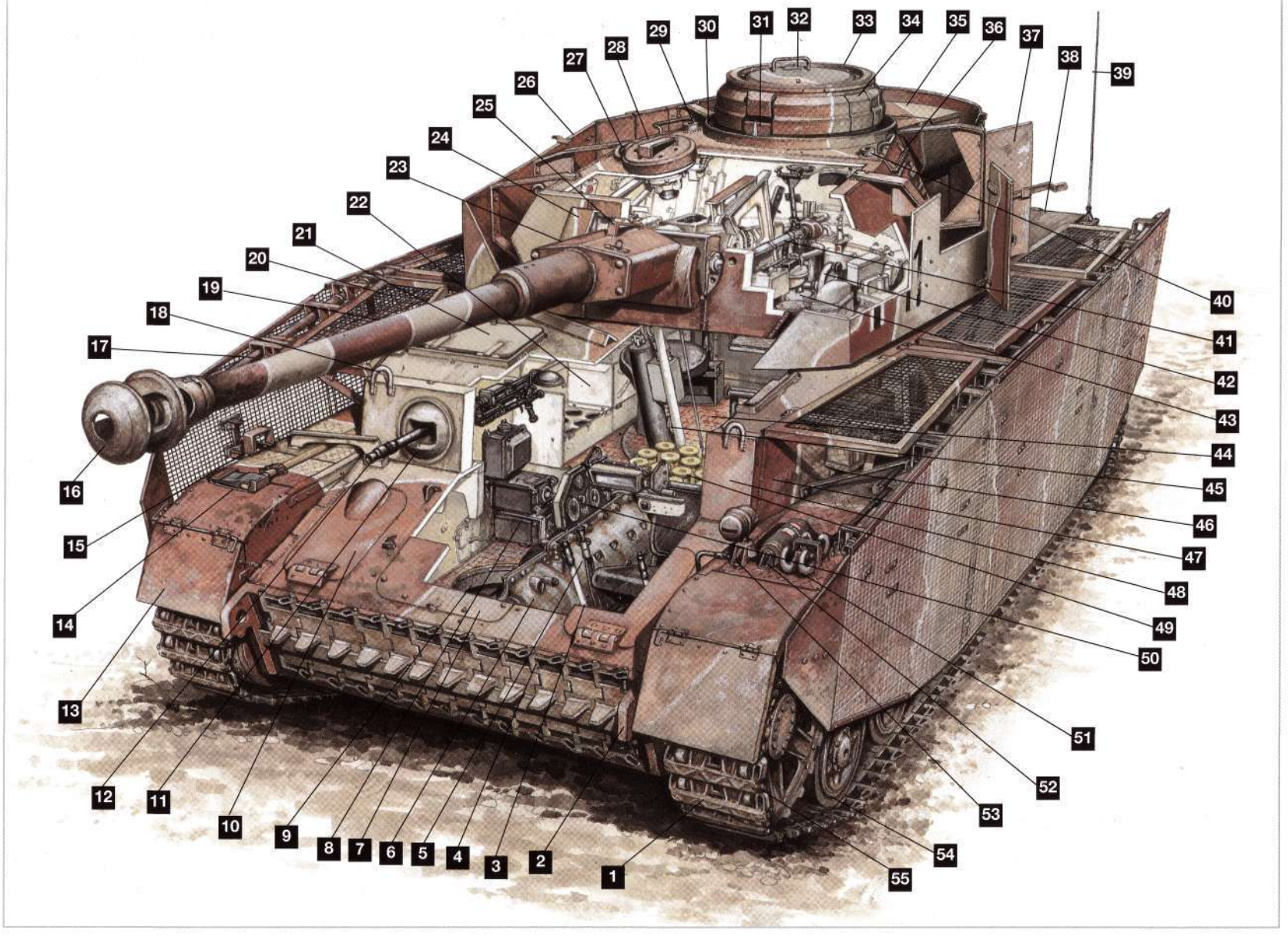
D: PZ.KPFW.IV AUSF. J. 1945.

KEY

1 Track links 380 mm wide type Kgs /400/120
2 Extended side armour tow brackets
3 Steering levers
4 80 mm front armour
5 SSG76 gearbox
6 Steering unit
7 Inspection hatch for steering unit
8 Belly escape hatch under radio operator's seat (folded against hull side)
9 Radio transformers
10 Inspection hatch with air intake for right side steering brake
11 Machine gun armoured ball mounting
12 7.92 mm MG 34
13 Hinged track guard
14 Axe
15 Folding bracket for hanging Drahtgeflechtschürzen (Mesh apron) when the wider Winterketten were fitted
16 Muzzle brake
17 Tubular rail for hanging Drahtgeflechtschürzen plates to protect 30 mm side armour from anti-tank rifle fire
18 Lifting rings welded to front armour
19 Mesh covers to prevent charges being placed on fender alongside superstructure
20 Dual position hanger bracket on Drahtgeflechtschürzen for mounting mesh for normal or wide track
21 Radio operator's hatch
22 Ammunition racks on right of fighting compartment
23 Recoil brake and recuperator cylinders armour guard
24 Gun mantlet
25 Bracket for mounting poison gas detector
26 Turret Schürzen 5 mm steel plate to protect against anti-tank rifles
27 Nahverteidigungswaffe
28 Fume extractor fan for turret
29 Pilze, socket for mounting 2 ton auxiliary crane
30 5 mm guard ring for cupola base
31 Sighting vane for commander
32 Raise and swivel hatch for Commander's cupola
33 Commander's cupola
34 Armoured covers raised and lowered to protect vision blocks
35 Stowage bin
36 Gunner hatch on turret side
37 Doors on schürzen
38 Engine deck
39 2 m rod antenna for FuG radio system
40 Roof armour 25 mm
41 T.Z.F.5f gun sight
42 Commander's seat
43 Gunner's traverse hand wheel
44 Turret turntable floor
45 Gun compensator
46 Wooden block for use with jack
47 30 mm side armour
48 Superstructure front armour 80 mm
49 Ammunition bunker behind driver's seat
50 Driver's instrument panel
51 C-hook for use with tow cables
52 Fire extinguisher
53 Bosch headlight with blackout cover
54 Rubber tyres 470 mm diameter road wheel
55 Drive sprocket

SPECIFICATION

Maximum speed 38–42 km/hr
Maximum sustained road speed 25 km/hr
Average cross-country speed 20 km/hr
Radius of action, road 320 km
Radius of action, cross country 210 km
Trench crossing 2.3 m
Fording 0.8 m
Step climbing 0.6 m
Gradient climbing 30 degrees
Ground clearance 0.40 m
Ground pressure 0.89 kg/cm^2
Steering ratio 1.43
Combat weight 25,000 Kg
Motor
11.9 litre V-12 cylinder Maybach HL 120 TRM
265 metric horse power at 2,600 rpm
Fuel 680 litres
Power to weight ratio 10.6 metric HP/tonne
Overall length 7.02 m
Width 2.88 m
Height 2.68 m
Track on ground 3.52 m
Transmission S.S.G.76 6 forward, 1 reverse
Armament 7.5cm Kw.K.40 L/48
Main gun ammunition
7.5cm Pzgr. 39 (Armour piercing)
7.5cm Pzgr. 40 (Armour piercing – tungsten core)
7.5cm Sprgr. (high explosive)
Sight T.Z.F.5f
Stowed main gun rounds 87
Stowed main MG rounds 3,150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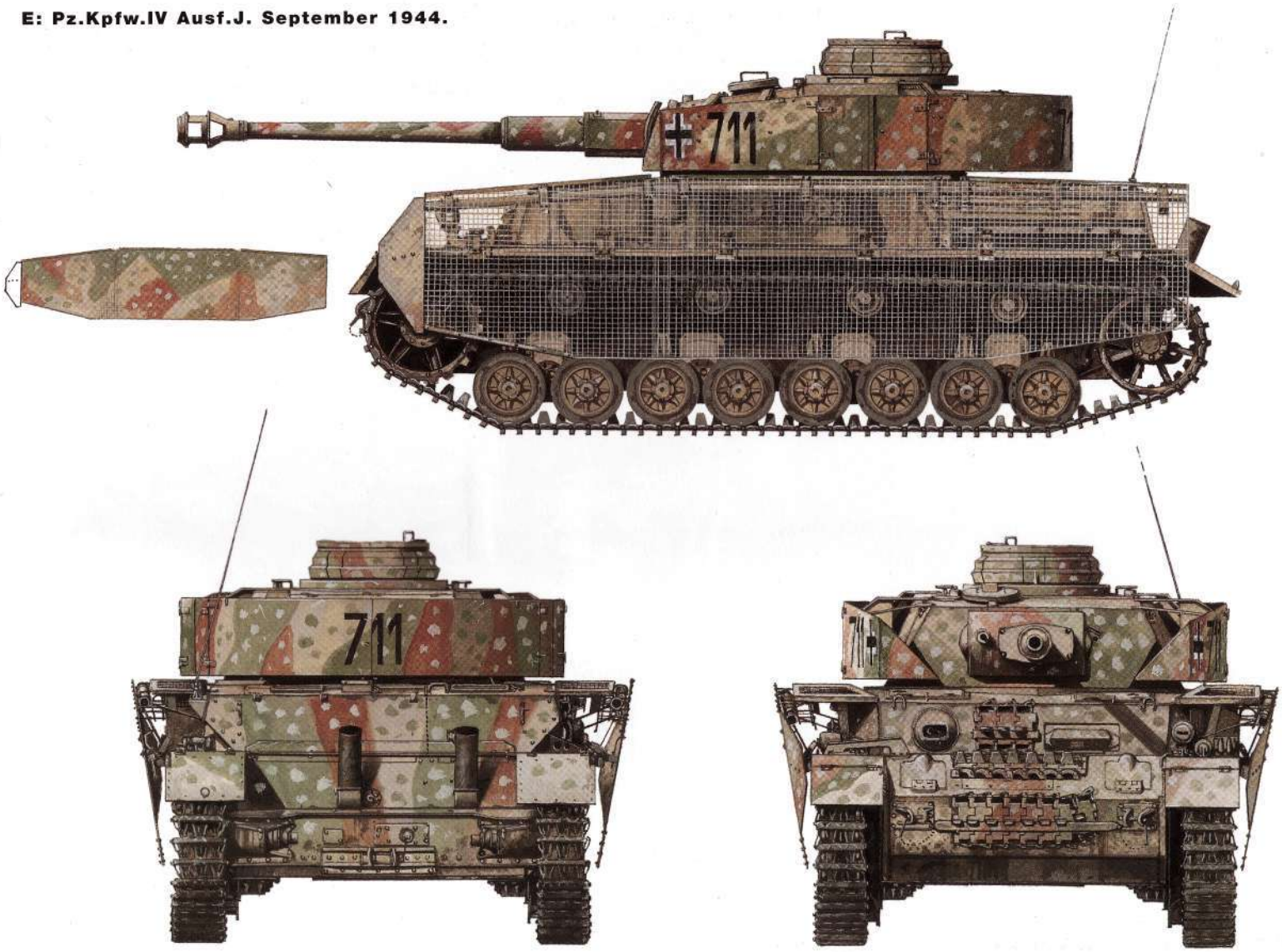
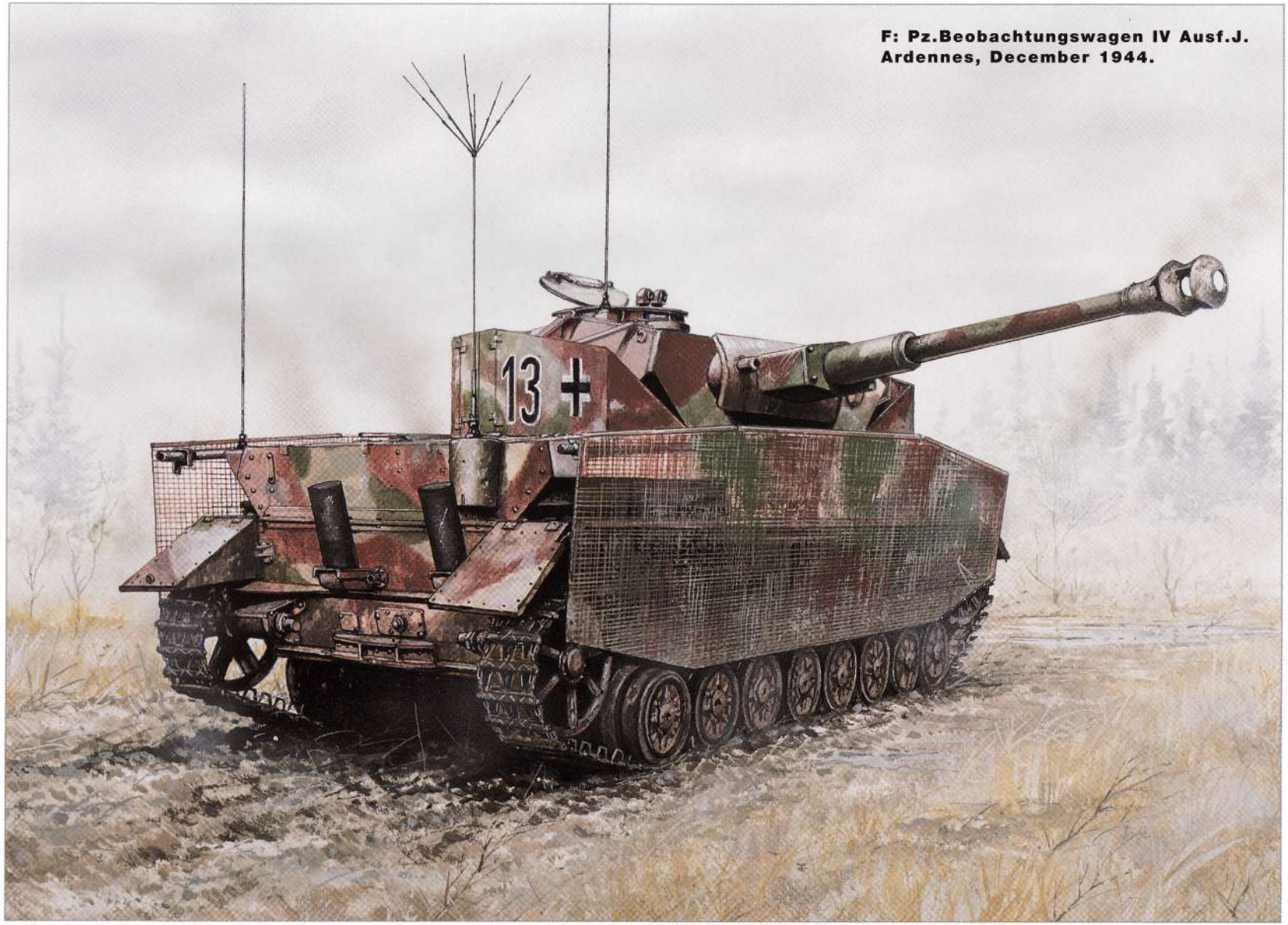
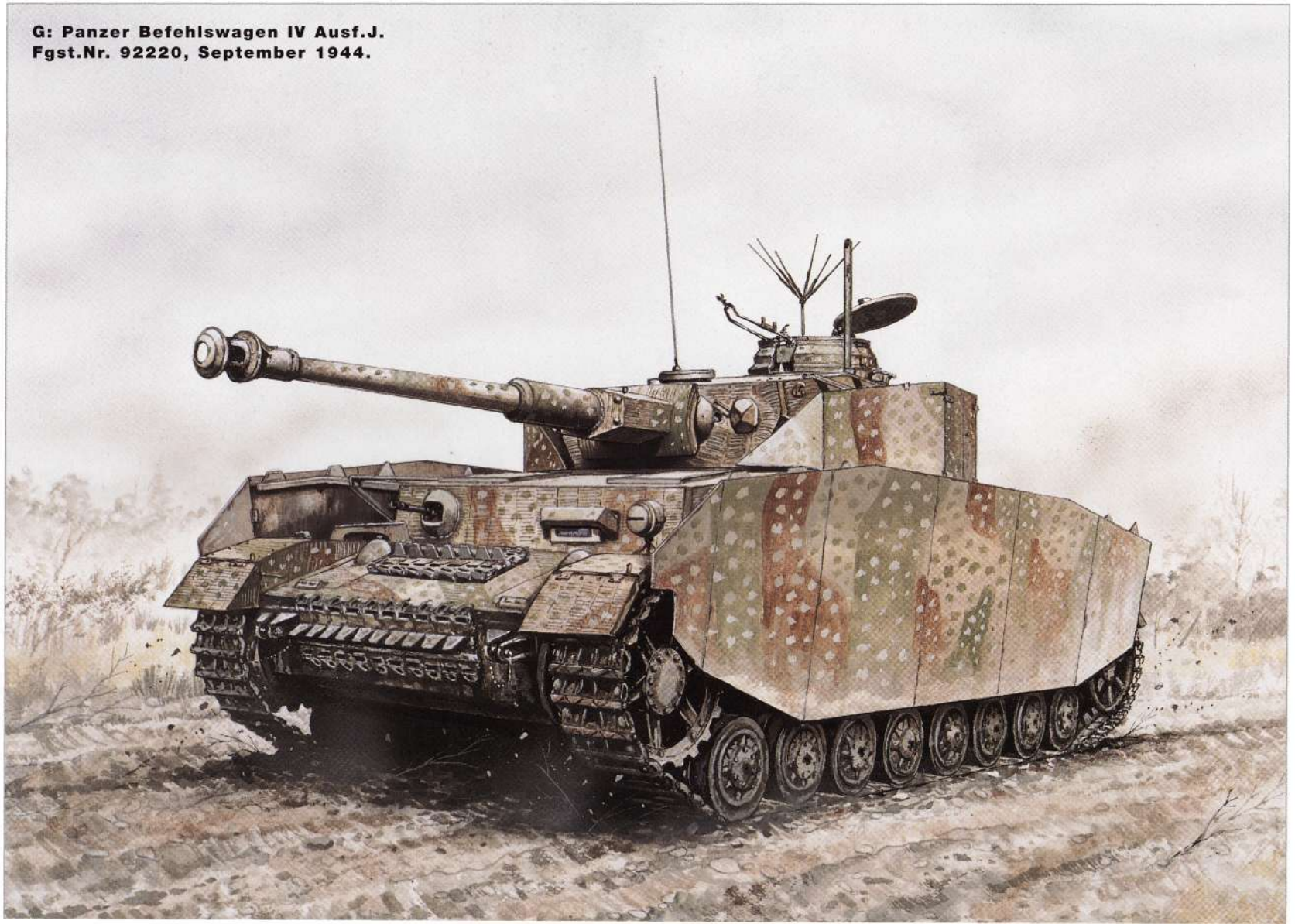
E: Pz.Kpfw.IV Ausf.J. September 1944.





F: Pz.Beobachtungswagen IV Ausf.J.
Ardennes, December 1944.

G: Panzer Befehlswagen IV Ausf.J.
Fgst.Nr. 92220, September 1944.



A Pz.Kpfw.IV Ausf.H. Fgst.Nr. 84599 assembled by Krupp-Grusonwerk in September 1943. It is one of the first vehicles coated in Zimmerit anti-magnetic paste, which was introduced to protect vehicles from magnetic grenades. The practice of coating the side Schürzen with Zimmerit was discontinued after a short period. (BA)

After surviving the winter of 1941–42 on the Eastern Front, the Panzer-Division and Infanterie-Division (mot) under Heeres Gruppe Sued (Army Group South) were refurbished for the summer offensive. Each Panzer-Division was to have three Panzer-Abteilungen, each with a medium tank company. A single Panzer-Abteilung with a medium tank company was created and assigned as an integral part of the 3., 16., 29., and 60.Infanterie-Division (mot), as well as SS-Division Wiking. At the beginning of the first summer offensive on 28 June 1942, there were about 135 Pz.Kpfw.IV lang (the abbreviated designation for Pz.Kpfw.IV with 7.5 cm Kw.K.40 L/43) with units in Army Group South. Most of their medium tank companies only had four Pz.Kpfw.IV lang – the rest were still Pz.Kpfw.IV kurz (short-barrelled 7.5 cm Kw.K. L/24). After about one month of experience with the new weapon, on 21 July 1942 Panzer-Regiment 33 of 9.Panzer-Division reported:

'The Pz.Kpfw.IV with the long 7.5 cm Kw.K.40 must be absolutely positioned at the front of the formation so that they can immediately go to work when Russian KW-1 or KW-1 with reinforced armour are encountered. While at least half of the Panzers are not equipped with the long 7.5 cm Kw.K.40, an attack and defensive position in open flat terrain is hopeless against Russian KW-I and T-34 tanks. Our own Panzers will be knocked out without firing any shots in return.

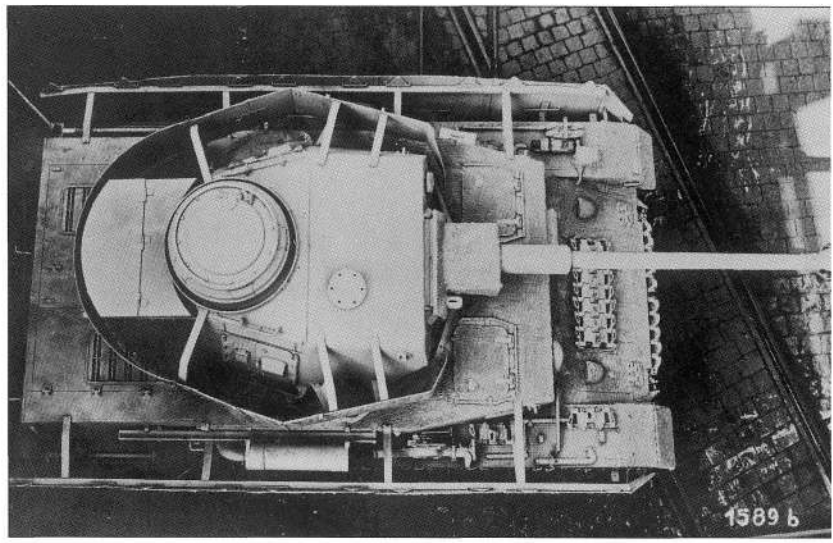
'At ranges up to 1,200 metres, the T-34 is cleanly penetrated at every angle that it is hit by the Pzgr.39 fired from the 7.5 cm Kw.K.40 L/43. No experience is available on the KW-I with reinforced armour. Engagements were aggravated by the frequent occurrence of shell casings failing to eject from the gun. Usually they could be cleared only by knocking the shell casing back out from the front with cleaning rods. This greatly restricted the firepower.

'The T-34 that was far superior to the German Panzers until the beginning of the spring of 1942 is now inferior to the German long 5 cm Kw.K. L/60 and 7.5 cm Kw.K.40 L/43 tank guns. After the Russians received heavy losses in several battles by attacking

Pz.Kpfw.IV Ausf.H. Fgst.Nr. 84599 from the right rear. (National Archives)

German Panzer forces with the T-34, they withdrew or employed the Russian tank types KW-I and KW-I with reinforced armour instead. Because these heavy tanks were never or seldom led as a unit, their destruction was usually ensured.'

Further north 2.Panzer-Division with Panzer-Regiment 3 under Army Group Centre was engaged in stopping local Russian tank attacks. This unit received their first five Pz.Kpfw.IV (7.5 cm Kw.K.40 L/43) on 11 August 1942. Their experience in fighting with Russian T-34 and KW-I tanks between 11 and 17 August was reported by the commander of the 8.Kompanie/Panzer-Regiment 3.



Pz.Kpfw.IV Ausf.H. Fgst.Nr. 84599. This top view shows the positioning of the Filzbalgfilter pre-filters. (National Archives)

'At about 1800 hours, I received an order to drive to Jelnja to support Gruppe von Bischoffshausen with the Panzers that had just been repaired and the four Pz.Kpfw.IV (7.5 cm Kw.K.40 L/43) that had just arrived.

'The Panzer-Kompanie counter-attacked Jelnja, which was surrounded and taken under heavy fire by all of our Panzers. The Russian forward elements pulled back and most of the houses in the village went up in flames. It was observed that two T-34s drove off in reverse out of burning sheds.

'As dawn broke, the Russians renewed the attack with tank and infantry forces. The tanks were immediately spotted and two T-34s on the road were knocked out at a range of about 300 metres. The rest of the tanks must have quickly retreated, as determined by the noise from their engines.

'During the evening hours of 13 August, the Russians again attacked with tanks and a few infantry riding on them. In spite of night falling, a further two T-34s and a KW-I were knocked out – two enemy tanks burned brightly – upon which the rest of the Russian tanks turned back. The attack was repulsed.

'During the night, the enemy tanks took up positions in the depression by Shulebino and at dawn attempted to break through the woods by Point 208. At the same time eight to ten KW-I attacked on the road. Of these, two were knocked out in our position by a Pz.Kpfw.IV with a long gun at a range of 15 to 20 metres. The rest were persuaded to turn back. It should be noted that it was necessary to use about eight Hohlraumgranaten [shaped charge shells] to set each of the KW-I on fire. At Point 208, three T-34s managed to break into the position but didn't exploit the opportunity any further. The company commander of the infantry urgently requested Panzer support because these enemy tanks had hidden in the woods. One Pz.Kpfw.IV and two Pz.Kpfw.III were sent to the area where the enemy tanks had broken in.

Pz.Kpfw. IV Ausf.H of 2.SS Panzer Division 'Das Reich' in Winter 1943/44

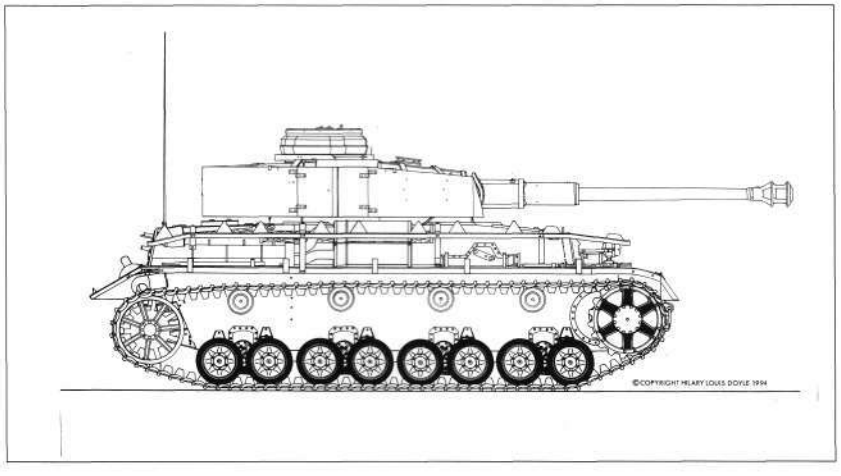
'In the afternoon, the Russians again attacked with strong tank forces. This time the attempt occurred south of the road. Several tanks landed in the swamp and remained stuck there. In the evening, these tanks were knocked out by 5.Kompanie/Panzer-Regiment 3, while on the road four additional KW-I were knocked out by 8.Kompanie. An 8.8 cm Flak (anti-aircraft gun) played a large part in this last defensive battle. The gun was located in an alley south of the road, fell out when damaged by gun fire, and was pulled back.

'On this day, several smaller Russian tanks were knocked out that had attacked separately. In addition, a Pz.Kpfw.IV lang was knocked out by a KW-I. One of the crew was killed, two severely wounded and one lightly wounded. Another Pz.Kpfw.IV lang fought yet another T-34 but was itself knocked out. This Pz.Kpfw.IV lang immediately burned out. The commander and gunner were wounded, three of the crew were killed immediately.

'During these defensive actions from 11 to 17 August 1942, 8.Kompanie/Panzer-Regiment 3 knocked out 43 enemy tanks, of which 11 were T-60s, and the rest T-34s and KW-Is.'

The first Pz.Kpfw.IV with Zusatzpanzer were sent to the Eastern Front in the summer of 1942. Fourteen were used to outfit 1.Kompanie/Panzer-Abteilung z.b.V.66 (z.b.V. = 'for special employment') which was sent to Army Group North for an offensive against Leningrad. Others were sent to units such as 13., 14., and 16.Panzer-Division in Army Group South to support the drive toward Stalingrad and the Caucasus. In spite of the drawbacks associated with the tanks' additional weight, reports from the front were favourable and orders were given to produce 50 per cent of the Pz.Kpfw.IV with Zusatzpanzer from November 1942, and to incorporate it on all new production models from January 1943.

A 1:76 side view drawing of a Pz.Kpfw.IV Ausf.H. that was assembled in December 1943. (Hilary Louis Doyle)

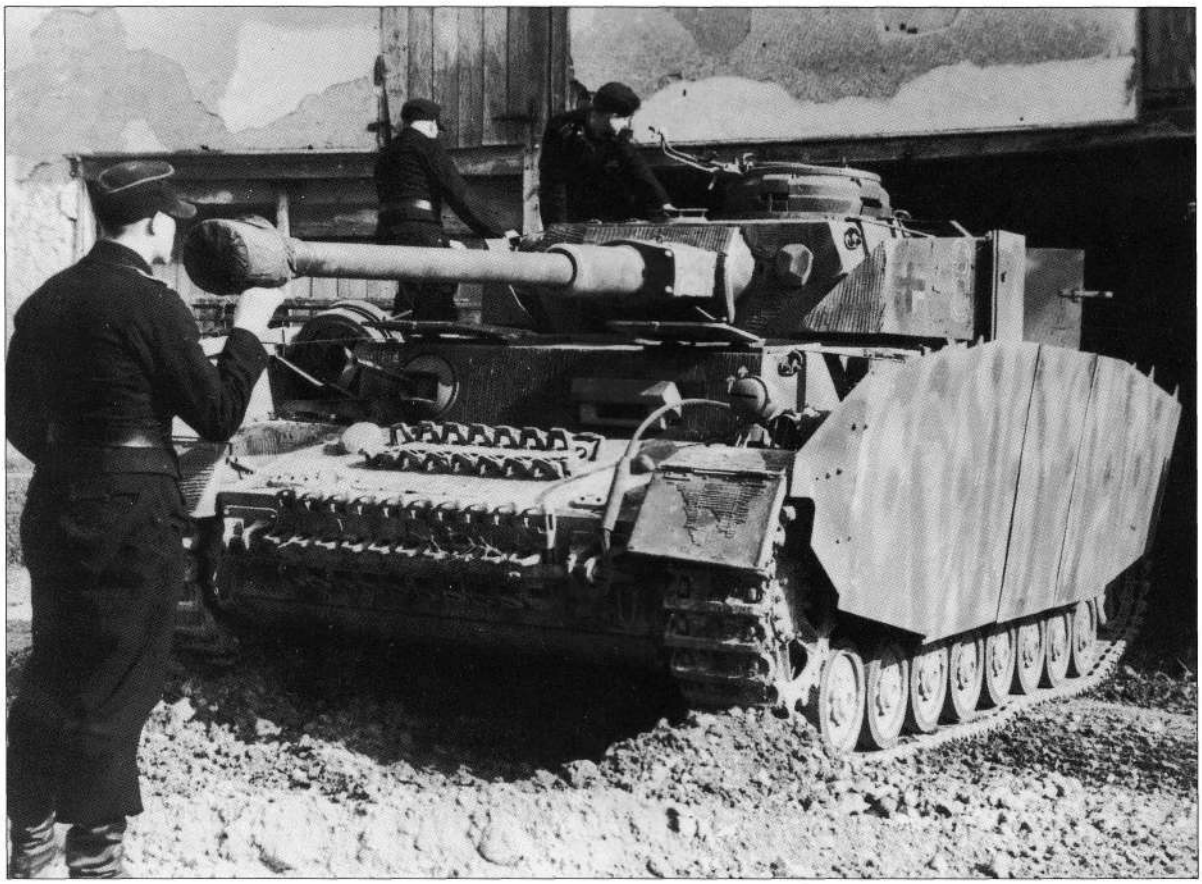


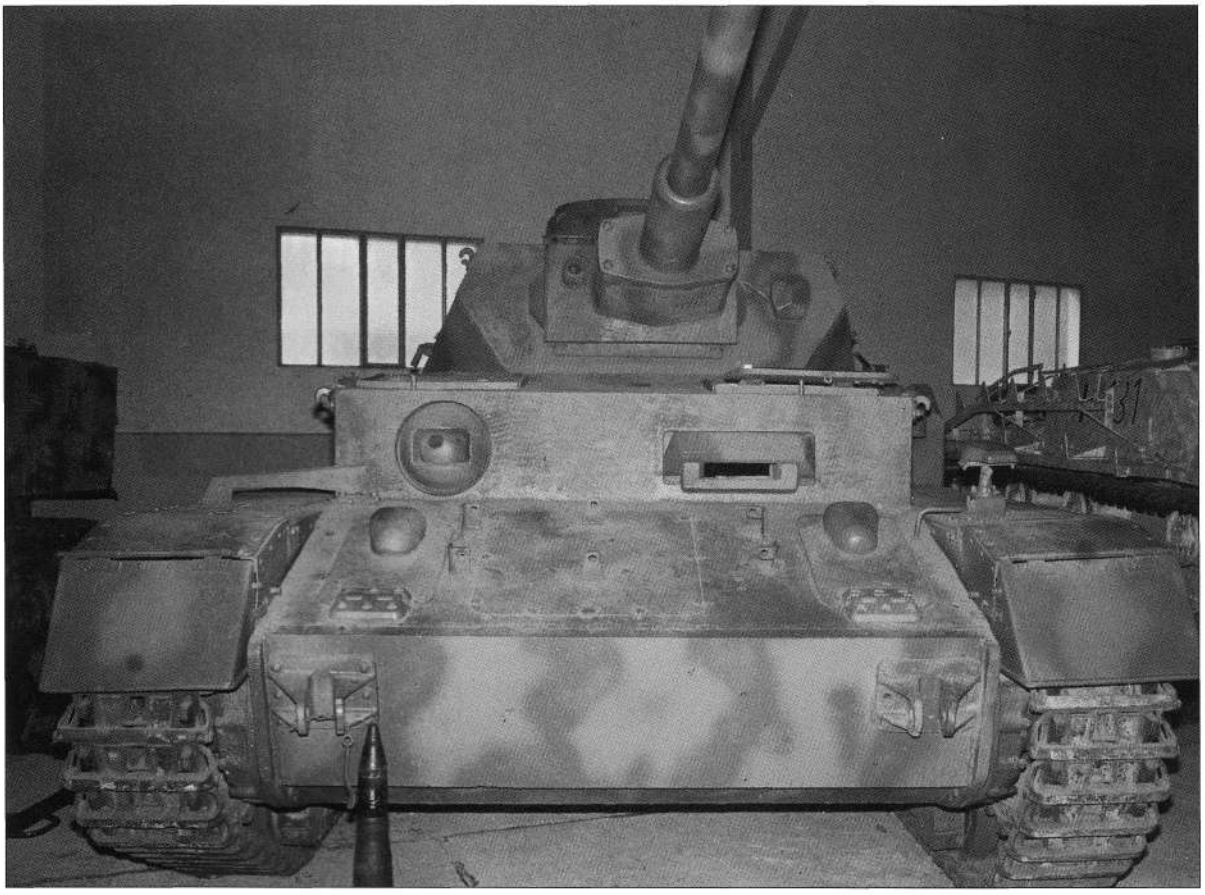
On 14 October 1942 1.SS-Panzer-Regiment was

created, the first unit with two Panzer-Abteilungen each with three medium tank companies. However, this was still organised under K.St.N.1175 dated 1 November 1941, with 10 Pz.Kpfw.IV per company. The other two SS-Panzer-Regiments created by the same order still had one medium tank company in each of their two Abteilungen. In January 1943 Panzer-Regiment Grossdeutschland was the first army unit to be authorised to have two Panzer-Abteilungen with three medium tank companies (II.Abteilung was issued 14 per company).

All four of these units were sent to the Eastern Front in February 1943 and helped to salvage a disastrous situation in a counter-offensive toward Charkov after the Russians surrounded Stalingrad. Between 7 and 20 March 1943 Infanterie-Division Grossdeutschland claimed to have knocked out 250 T-34, 16 T-60 or T-70, and 3 KW-I tanks (of which 188 kills were claimed by the Pz.Kpfw.IV 7.5 cm lang). Panzer-Regiment 31 of 5.Panzer-Division provided details of the effectiveness of the two different types of armour-piercing ammunition. Their four Pz.Kpfw.IV with 7.5 cm Kw.K.40 L/43 (of which one was a total loss) had knocked out 17 KW-I, 26 T-34, 1 T-26, 1 Mark II, 3 Mark III, and 1 General Lee between 22 February and 20 March 1943 in the area north of Shisdra. It took two to three shots at 1,200 to 1,600 metres range to knock out each tank when firing Pzgr.39 (APCBC-HE). Each hit set the tank on fire and destroyed it. When firing Gr.HL/B (hollow charge shells), one to five shots were needed per tank and they seldom caught fire.

Pz.Kpfw.IV Ausf.H. Fgst.Nr. 86984 assembled by Nibelungenwerk in December 1943 was issued to the 2.Pz.Division. (BA)





Pz.Kpfw.IV Ausf.J. Fgst.Nr. 86432 assembled by Vomag in February 1944 and on display in Museé des Blindes, Saumur. The interlocking side and front hull plates were characteristic of the Ausf.J but were introduced with some of the final Ausf.H.

After the front was stabilised in March 1943, Germany began to build up its forces for the next major summer offensive, Operation Zitadelle. Manufacture of the Pz.Kpfw.III rapidly tailed off in early 1943 as production capacity was diverted to assembling the Tiger, Panther and Sturmgeschütz. However, the production rate of the three assembly plants producing the Pz.Kpfw.IV had not increased sufficiently to replace losses from 1942. Most of the medium tank company were still officially under the older K.St.N.1175 dated 1 November 1941. Only three Panzer-Abteilungen in 4., 5. and 13.Panzer-Division had official orders to convert to the new K.St.N.1175a dated 25 January 1943, allocating four medium tank companies, each with 22 Pz.Kpfw.IV. Most of the rest of the Panzer-Divisions had only one Panzer-Abteilung with one or two medium tank companies. But many of the units still under the older K.St.N. actually assigned the Pz.Kpfw.IV lang to their light as well as the medium tank company, so that they were close to the same number of Pz.Kpfw.IV lang and Pz.Kpfw.III lang and kurz in each company. Based on the strength reports for 1 July 1943, there were 56 Pz.Kpfw.IV with 7.5 cm Kw.K.L/24, 583 Pz.Kpfw.IV with 7.5 cm Kw.K.40 L/43 and 302 Pz.Kpfw.IV with 7.5 cm Kw.K.40 L/48 available on the Eastern Front at the start of Operation Zitadelle.

On 14 June 1943 the Organisations-Abteilung of the army high command had issued the following general order to reorganise the Panzer-Regiment and Panzer-Abteilung on the Eastern Front:

Pz.Kpfw.IV Ausf.J. Fgst.Nr. 86432. With the elimination of the electric turret drive on the Ausf.J the auxiliary generator set was removed along with the associated exhaust muffler.

'It is foreseen that it will be possible to fill a Panzer-Abteilung in all of the Panzer-Divisionen in the East with 96 Pz.Kpfw. (most Pz.Kpfw.IV, several Pz.Kpfw.III lang) by December 1943. In addition, it is intended to create at home bases a Panther-Abteilung for most of the Panzer-Divisionen. All Panzer-Regiments and Panzer-Abteilungen on the Eastern Front are to be built up and reorganised with a Regiment Stab (if still available), an Abteilung Stab and Stabs-Kompanie (headquarters and headquarters company), and four medium tank companies each with 22 Pz.Kpfw.IV in accordance with K.St.N.1175a dated 25 January 1943.'

By December 1943, most of the Panzer-Abteilungen on the Eastern Front had been converted to the new organisation with four medium tank companies (some of which only had permission to fill each company with 17 Pz.Kpfw.IV). Exceptions were units such as Panzer-Abteilung Feldherrnhalle, which had three companies each with 14 Pz.Kpfw.IV, and III.Abteilung/Panzer-Regiment 24 and III.Abteilung/ Panzer-Regiment 36, each with two companies of 22 Pz.Kpfw.IV and two companies of 22 Sturmgeschütz.

On 1 June 1944 16 Panzer-Divisionen and two Panzer-Grenadier-Divisionen with a total of 605 Pz.Kpfw.IVs awaited the opening of the great Russian summer offensive (it began on 22 June 1944, the third anniversary of Operation Barbarossa, the German invasion in 1941). Overall, these units were well under strength as their official organisation authorised them to possess 1,502 Pz.Kpfw.IV. Within two months the Russians offensive overwhelmed the weaker German forces and virtually eliminated Army Group Centre.

In the West, 11 Panzer-Divisionen awaited the Allied landing at Normandy on 6 June 1944. They reported a total strength of 863 Pz.Kpfw.IV (authorised strength of 965) on 10 June 1944. Further replacements were issued to 9. and 11.Panzer-Divisionen, and 1. and

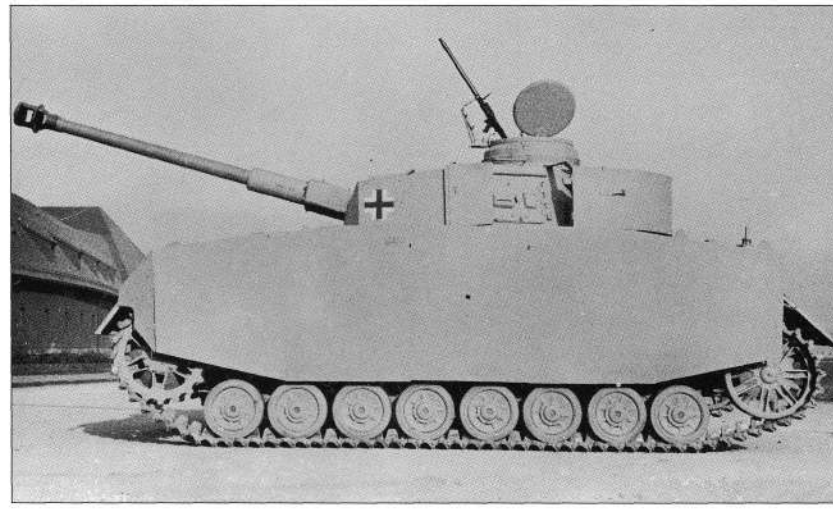
2.SS-Panzer-Divisionen before they were transported to the front. While there are reports that Sturmgeschütz had difficulties in engaging targets in the hedgerow landscape of the bocage in Normandy, this was not true of the Panzers. In a memorandum to Hitler on 29 June 1944 concerning the conversion of Pz.Kpfw.IV to Sturmgeschütz with L/48 or L/70 guns, General Guderian advocated production of the Pz.Kpfw.IV.

'At the average range in combat of 600 to 1,200 metres, the 7.5 cm Kw.K. L/48 firing Panzergranate 39 ammunition is adequate for engaging all British, American and Russian tanks (including the British Cromwell tank) that have appeared to date. Experience reports from Sicily, Italy and Normandy comparing the Pz.Kpfw.IV to the Sturmgeschütz unanimously state that when employed on coastal roads, in mountainous terrain, and in the sunken lanes and hedges of Normandy, the Sturmgeschütz is both tactically and technically considerably less favoured than the Pz.Kpfw.IV. The terrain makes it impossible or at least severely limits aiming the Sturmgeschütz to the sides. Based on the latest observations reported by General Thomale in Paris and reports from the Panzer-Offizier Ob.West, employment of Sturmgeschütz in the sunken lanes and the hedges of Normandy is difficult because the gun is mounted too low. In contrast, the Panzerkampfwagen can fire out of the sunken lanes and also over the hedges because of the height of the gun and traversable turret.'

As shown in Penetration Range Tables 1, 2, and 3, the Pz.Kpfw.IV with the 7.5 cm Kw.K.40 was superior to the American M4 Medium Tank (known as the Sherman in British service) with the 75 mm M3 gun and the Russian T-34/76. However, as the calculations from Wa Prüf 1 on 5 October 1944 show, the Pz.Kpfw.IV was no longer superior to their opponents' newest tanks such as the Russian T-34/85 and IS-122, or the American M4 medium tanks armed with the 76 mm M1A1 and the British Sherman armed with the 17-pdr. gun. Superiority in a frontal engagement does not imply that the better armed and armoured tank

Pz.Kpfw.IV Ausf.J. assembled by Nibelungenwerk in August/September 1944. The application of Zimmerit was discontinued during September 1944. (WJS)

will always win, however. Detailed statistics from several fronts during the war show that 65–70 per cent of the tanks were knocked out by penetration of the side armour. Therefore, a tank with superior frontal protection only had a 3:2 advantage over his opponent.

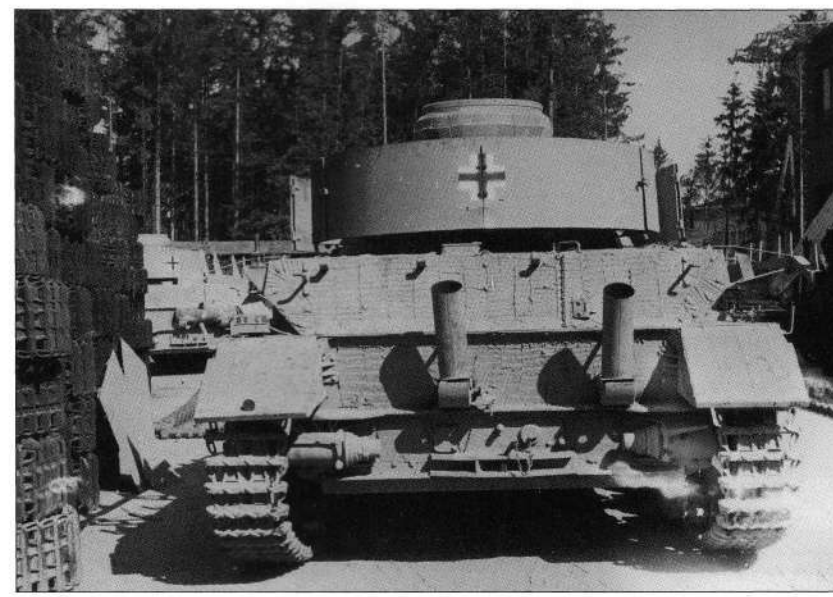


Pz.Kpfw.IV Ausf.J. assembled by Nibelungenwerk in August/ September 1944 with side Schürzen fitted and the anti-aircraft mounting for an MG34 on the cupola. (WJS)

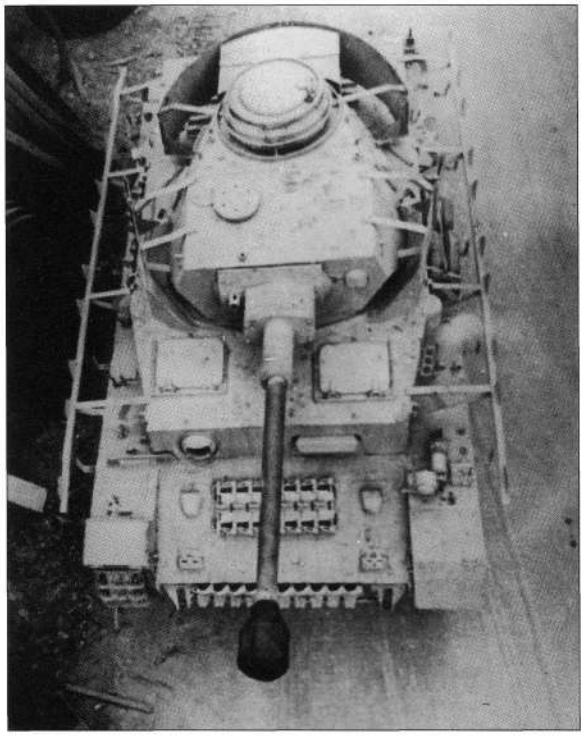
After the breakout from Normandy, American and British forces surrounded the mobile German Panzer divisions in the Falaise Pocket. Having abandoned most of their Panzers and equipment when fuel supplies failed, only remnants of these units managed to escape across the River Seine. The German army still had to rely heavily on the Pz.Kpfw.IV in the last great offensive in the West, although numbers were reduced. Ausf.A of K.St.N.1177 (fG) dated 1 November 1944 authorised 17 per company (two for headquarters and five per platoon) for a Panzer-Kompanie 'Panther' or 'IV'; and Ausf.B authorised 14 per company (two for headquarters and four per platoon). Most of the Panzer divisions were back where they had started in 1939, with two Panzer-Kompanien outfitted with Pz.Kpfw.IV. At the start of the offensive, on 16 December 1944, the 11 Panzer-Divisionen and two independent Panzer-Abteilungen reported a total of 349 Pz.Kpfw.IV.

Rear view of a Pz.Kpfw.IV Ausf.J. assembled by Nibelungenwerk in August/September 1944. The Flammentöter exhaust system replaced the cylindrical muffler in August 1944. (WJS)

Further declines in production and mounting losses on all fronts resulted in further decreases in the number of Pz.Kpfw.IV. At the end, K.St.N.1177a (fG) dated 1 April 1945 for the Panzer-Kompanie 'Panther' or 'IV' was back down to the strength authorised at the start of the war, with 10 per company, although they were organised differently, with one Pz.Kpfw.IV for the company commander and three Pz.Kpfw.IV in each of three platoons.



The Germans also sent the Pz.Kpfw.IV to their allies in exchange for raw materials and to bolster their morale. In September 1942, when they were desperately needed by their own forces fighting in Russia and Egypt, 10 Pz.Kpfw.IV with 7.5 cm



Overhead view of Pz.Kpfw.IV Ausf.J. assembled by Nibelungenwerk in August/ September 1944. It features a new fan cover, plated over opening for the planned Nahverteidigungswaffe (close defence weapon) and pilze sockets for mounting a 2t Jib crane. (WJS)

Kw.K.40 were sent to Hungary and 11 to Romania. With the very real threat of the Allies attempting a landing on the mainland after the loss of Tunisia in May 1943, Germany sent 12 Pz.Kpfw.IV Ausf.G to Italy. Fifteen Pz.Kpfw.IV Ausf.G were sent to Turkey in March and May 1943, and 20 Pz.Kpfw.IV Ausf.H were sent to Spain in November 1943.

Following major setbacks on the Eastern Front, Germany attempted to arm her allies with more effective weapons. A total of 91 Pz.Kpfw.IV were sent to Bulgaria from February 1943 to August 1944. This was a sufficient number to outfit an entire battalion of four companies with 22 Pz.Kpfw.IV in each. An additional 127 were sent to Romania from November 1943 to August 1944, enough to outfit a full regiment of two battalions with three companies. Twenty Pz.Kpfw.IV were sent to Finland in August 1944, but the Finns only record having received 15 before they changed sides. A total of 72 Pz.Kpfw.IV Ausf.J were sent to their last remaining ally, Hungary, between August and December 1944. However, 20 of these were diverted to outfit German Panzer divisions.

VARIANTS

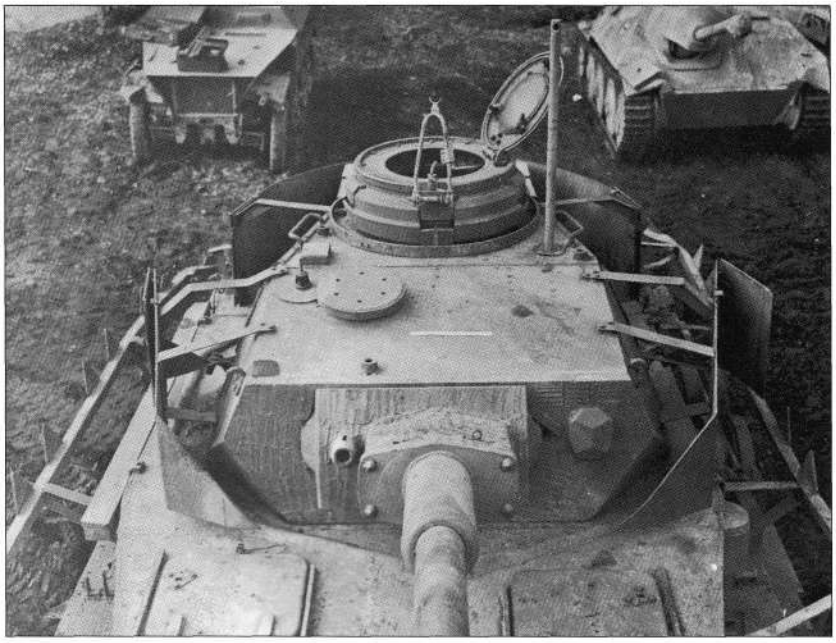
Panzerbefehlswagen IV

From March 1944 refurbished Pz.Kpfw.IV were converted to Panzerbefehlswagen (Pz.Bef.Wg.) by installing additional radio sets and peripheral equipment such as mounting racks, transformers, junction boxes, wiring, antenna mounts and GG400 auxiliary electrical generator sets. Stowed ammunition was reduced from 87 to 72 7.5 cm rounds to make room for the radio equipment.

As a normal command vehicle for long-range communications to other ground stations, the Sd.Kfz.267 was outfitted with a Fu 8 radio set (30 watt transmitter and medium wave receiver, frequency band 0.83 to 3 MHz), and a Fu 5 radio set (10 watt transmitter and ultra short wave length receiver, frequency band 27.2 to 33.4 MHz). The Sternantenne D (star aerial) for the Fu 8 was mounted on an Antennenfuss Nr.1 (flexible antenna base, 104 mm base diameter) with a white porcelain insulator protected by an armour guard. The 2 metre rod antenna for the Fu 5 was mounted on a flexible base on the turret roof. For communication with aircraft the Sd.Kfz.268 was outfitted with a Fu 7 radio set (20 watt transmitter and ultra short wave length receiver, frequency band 42.1 to 47.8 MHz) and a Fu 5 transmitter/receiver radio set for ground communication. The 1.4 metre antenna for the Fu 7 was mounted on a flexible base bolted to a support on the left side at the rear.

The T.S.R.1 observation periscope and the SF14Z scissors periscope were to be issued as basic equipment on all Pz.Kpfw.IV not just for the Pz.Bef.Wg. The SF14Z mounted on a pivoting arm at the base of the cupola, could be used only with the cupola hatch open. The T.S.R.1 was

extended through a pivotable mount in the turret roof. Only 17 Panzerbefehlswagen IV were created as new production Ausf.J in August and September 1944. An additional 88 Pz.Bef.Wg IV were apparently converted from refurbished Pz.Kpfw.IV from March to July 1944.



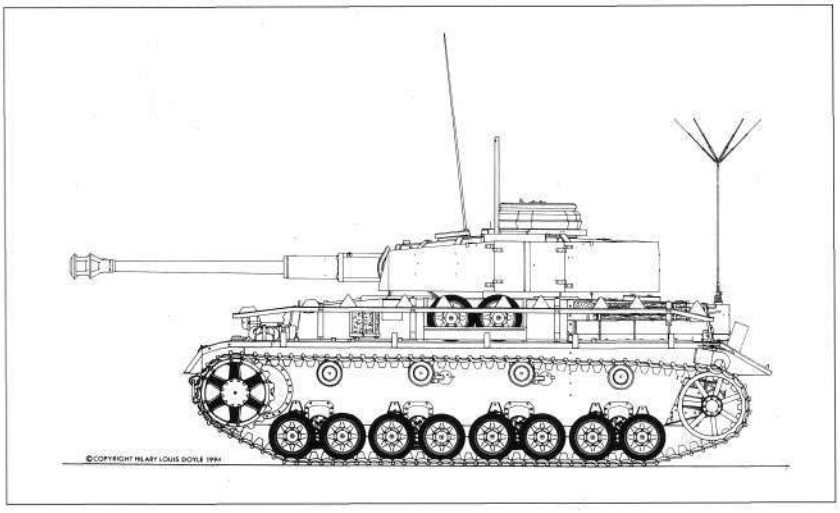
Pz.Bef.Wg.IV. Ausf.J. Fgst. Nr. 92220 was assembled by Nibelungenwerk in September 1944. This tank was completed as a new command vehicle. The turret antenna was mounted in the blanked-off opening for the Nahverteidigungswaffe. The periscopic observation TSR1 is raised to its full extent in this photo. (TTM)

Panzerbeobachtungswagen IV

In September 1943 plans were made to convert rebuilt Pz.Kpfw.IV to observation vehicles after the completion of the series of 270 Panzerbeobachtungswagen III (which had also used rebuilt Pz.Kpfw.III). It had been determined that the Pz.Kpfw.IV, together with a commander's cupola from the Sturmgeschütz, was usable as an armoured observation vehicle. The first experimental Pz.Beob.Wg.IV was to be completed by the end of January 1944. From April 1944, they planned to convert every 25th newly assembled Pz.Kpfw.IV to a Pz.Beob.Wg.IV instead of using rebuilt Pz.Kpfw.IV.

The shorter Sturmgeschütz-Kommandantenkuppel with seven periscopes replaced the normal Pz.Kpfw.IV commander's cupola with

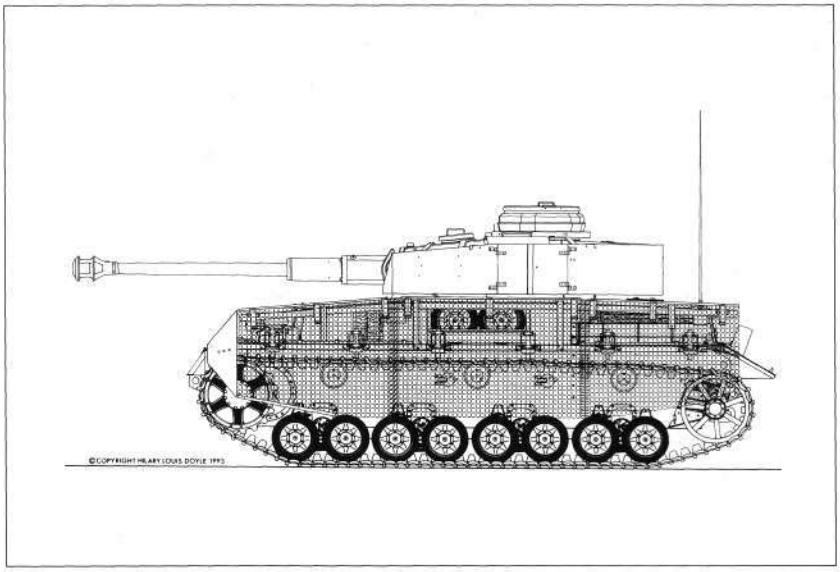
Pz.Bef.Wg.IV. Ausf.J. Fgst.Nr. 92220. The mounting for the 'Sternantenne' was moved to the rear plate. The tripod fitting on the rear antenna base is the bottom section of a unit that raised the height of the antenna by 0.7 m extension pieces. (TTM)



A 1:76 side view drawing of a Panzer Befehlswagen IV Ausf.J. Fgst.Nr. 92220 assembled by Nibelungenwerk in September 1944. (Hilary Louis Doyle)

five vision slits. The SF14Z scissors periscope could be extended through a flap at the front of the commander's cupola lid without opening the entire lid. In addition, a T.S.R.1 observation periscope could be extended through a pivotable mount in the turret roof. Other equipment was installed to aid the artillery observer, including an Orterkompass and Nachdreheinrichtung (plotting boards). Three radio sets were installed for the battery commander in a Wespe or Hummel (self-propelled artillery) battery in accordance with K.St.N.431 dated 1 June 1944: the Fu 8 (30 watt transmitter and medium wave receiver, frequency band 0.83 to 3 MHz), the Fu 4 (medium wave receiver, frequency band 0.83 to 3 MHz) for long-range ground communication and an Fu.Spr.f (short wave length transmitter and receiver, operated in the frequency band of 19.9 to 21.4 MHz). The co-axial machine gun and its mount were removed to make room for the radio sets in the turret. Power for the radio sets was provided by a GG400 electrical generator set installed in the left rear corner of the fighting compartment.

From Pz.Kpfw.IV Ausf.J. Fgst.Nr. 92301 in September 1944 a completely new design of side Schürzen made from wiremesh was introduced. This improved camouflage and the associated rails allowed use of the Schürzen even when the wide Ostketten (tracks for the east front) were fitted. The hatch of the commander's cupola was now modified to pivot to the side. (TTM)



A 1:76 side view drawing of a Pz.Kpfw.IV Ausf.J. as completed in December 1944. (Hilary Louis Doyle)

COLOUR PLATES

PLATE A1: PZ.KPFW.IV AUSF.F2 (G). SS-PANZER-ABTEILUNG 1, SS-DIVISION 'LSSAH', FRANCE 1942.

From mid-1940 to early 1943 all German army vehicles were painted in the single colour, Dunkelgrau – RAL 7021 (dark grey) with the exception of vehicles sent to the Tropen (hot climates) from the spring of 1941.

The Balkankreuz (black cross with white outline) was painted on either side of the superstructure and on the rear of the armour guard for the smoke grenade rack on the rear of the motor compartment. The unit emblem for the SS-Division LSSAH was stencilled to the left of the driver's visor and on the rear left of the motor compartment. Tactical Number 316 outlined in white was stencilled on either side of the turret and on the rear of the turret stowage bin.

PLATE A2: PZ.KPFW.IV AUSF.F2 (G), PZ.RGT. 36, 14.PANZER DIVISION, SOUTHERN RUSSIA, JUNE 1942.

14.Panzer Division was allocated to Army Group South in preparation for the summer offensive of 1942. Their offensive power was enhanced by four Pz.Kpfw.IV Ausf.F2 (G) equipped with the long-barrelled 7.5 cm KwK.40 L/43.

From a published colour photograph it appears that this Pz.Kpfw.IV of Pz.Rgt. 36 was prepared for the tropics with the 1942 specification of two-thirds of the surface coated with Braun – RAL 8020 (brown) and one-third with Grau – RAL 7027 (grey).

The unit emblem for 14.Pz.Division was painted on the transmission air outlet on the left superstructure, on the right superstructure and on the rear of the stowage bin. The Balkankreuz was painted in black with a white outline on either side of the superstructure and on the rear armour cover for the smoke candle rack. Each Pz.Kpfw.IV carried a three-digit tactical number, in this case 431, stencilled in yellow on either side of the turret and on the rear of the stowage bin.

PLATE B1: PZ.KPFW.IV AUSF.H. FGST.NR. 86984, 2.PANZER DIVISION, NOVEMBER 1943.

Pz.Kpfw.IV Ausf.H from this period were delivered from the assembly plant with a base coat of Dunkelgelb – RAL 7028 (tan) paint over the Zimmerit anti-magnetic coating. The troops were authorised to apply camouflage patterns of stripes and patches of Olivgrün – RAL 6003 (dark olive green) and Rotbraun – RAL 8017 (dark chocolate brown) as local conditions required.

Detail of the final version of the pivoting cupola hatch on Pz.Kpfw.IV Ausf. J Fgst.Nr. 92833, which is on display at Lešany, Czech Republic. This tank has three return rollers on each side and hull sides extended to create tow brackets. (Hilary Louis Doyle)

Pz.Kpfw.IV Ausf.J, converted to a Panzer Beobachtungswagen IV with the Sturmgeschütz commander's cupola, in service during the Ardennes Offensive.

The 2.Pz.Division 'trident' emblem was painted in white on the left of the front superstructure plate and the vehicle Fahrgestell Nummer (chassis number) on the right. The Balkankreuz was painted in black with a white outline on either side of the turret Schürzen (armour 'apron'). Each Pz.Kpfw.IV carried a three-digit tactical number, in this case 821, stencilled on either side and on the rear of the turret Schürzen in white.

PLATE B2: PZ.KPFW.IV AUSF.J. KÖTZING, BAVARIA, MAY 1945.

This Pz.Kpfw.IV Ausf.J incorporates most of the modifications that were introduced by the end of the production run. The most important were the three return rollers per side, hull side armour extended at the front and rear to form tow brackets, centred tow coupling for towing bars at the rear, and a commander's cupola hatch that pivoted to the side.

For the winter of 1944–45 a number of modifications were made to the camouflage, which was applied at the factory. White was added and the amount of dark olive green reduced and confined to lower areas. The camouflage consisted of a thin base coat of Rot – RAL 8012 (red brown primer) about 50 per cent of which was over-painted with well-thinned stripes and patches, with sharp outlines in Dunkelgelb (RAL 7028). In turn this was outlined with stripes of thinned Weiss – RAL 9002 (white). Some patches of thinned Olivgrün (RAL 6033) were applied on lower areas.

The Balkankreuz was painted in black with a white outline on either side of the turret Schürzen. Each Pz.Kpfw.IV carried a tactical number, in this case 11, stencilled in black on either side and on the rear of the turret Schürzen.

PLATE C: PZ.KPFW.IV AUSF.G. 4.PZ.DIVISION, 1943.

This Pz.Kpfw.IV Ausf.G was produced in May 1943 and has the extra 30 mm plate bolted to the superstructure front plate – a modification introduced in April 1943.

Pz.Kpfw.IV Ausf.G from this period were delivered from the assembly plant with a base coat of Dunkelgelb (RAL 7028) paint over the Zimmerit anti-magnetic coating. The troops were authorised to apply camouflage patterns of stripes and patches of Olivgrün (RAL 6003) and Rotbraun (RAL 8017) as local conditions required.

4.Pz.Division adopted a variety of markings. The standing bear was painted outlined in white at the front of each side of the turret Schürzen. The 4.Pz.Div. emblem was painted in yellow on the right front of the superstructure front plate. The three-digit tactical number, 420, is painted in white on either side and on the rear of the Schürzen. The Balkankreuz is painted in black with a white outline on either side of the structure.

PLATE D: PZ.KPFW.IV AUSF.J. 1945.

This Pz.Kpfw.IV Ausf.J was assembled by Nibelungenwerk. St.Valentin, Austria. It has all of the modifications that were introduced by the end of the production run.

A number of modifications were made to the camouflage in the winter of 1944–45, which were applied at the factory. White was added and the amount of dark olive green reduced and confined to lower areas. The camouflage consisted of a thin base coat of Rot, about 50 per cent of which was over-painted with well-thinned stripes and patches, with sharp outlines, of Dunkelgelb (RAL 7028). In turn, this was outlined with stripes of thinned Weiss (RAL 9002). Some patches of well-thinned Olivgrün (RAL 6003) were applied on lower areas.

Orders towards the end of 1944 stated that the interiors were not to be painted, but left in the Rot (RAL 8012). Following complaints from the troops, however, interior painting was permitted once more in January 1945. This cutaway drawing shows the interior of the fighting compartment and turret painted in Elfenbein – RAL 1001 (ivory) while the floors were left in Rot. Radio sets were Dunkelgrau. The motor compartment was also painted in Rot.

The 7.5 cm Panzergranate 39 projectile (APCBC/HE. shell) was black (Schwarz – RAL 9005) with a white cap (Weiss). The 7.5 cm Sprenggranate (high explosive shell) was painted in Olivgrün (RAL 6003).

PLATE E: PZ.KPFW.IV AUSF.J. SEPTEMBER 1944.

From August 1944 camouflage patterns painted on Panzers were applied at the factory. The scheme is often referred to in post-war publications as 'ambush' camouflage, and consisted of a thin base coat of Dunkelgelb (RAL 7028). It was over-painted with well-thinned stripes and patches, with sharp outlines, of Olivgrün (RAL 6003) and Rotbraun (RAL 8017). To simulate sunlight passing through foliage, spots of the alternate colour paint were applied over the stripes and patches.

The Zimmerit anti-magnetic coating was cancelled by an order issued on 7 September 1944.

The Balkankreuz was painted in black with a white outline on either side of the turret Schürzen. Each Pz.Kpfw.IV carried a tactical number, in this case 711 stencilled in black, on either side and on the rear of the turret Schürzen.

PLATE F: PZ.BEOBACHTUNGSWAGEN.IV AUSF.J. ARDENNES, DECEMBER 1944.

The Panzerbeobachtungswagen (Armoured Observation Vehicle) was created by modifying the Pz.Kpfw.IV Ausf.J. Changes included replacing the commander's cupola with that from a Sturmgeschütz and fitting additional radio equipment. The Sturmgeschütz cupola allowed use of a scissors periscope when the main cupola hatch was closed.

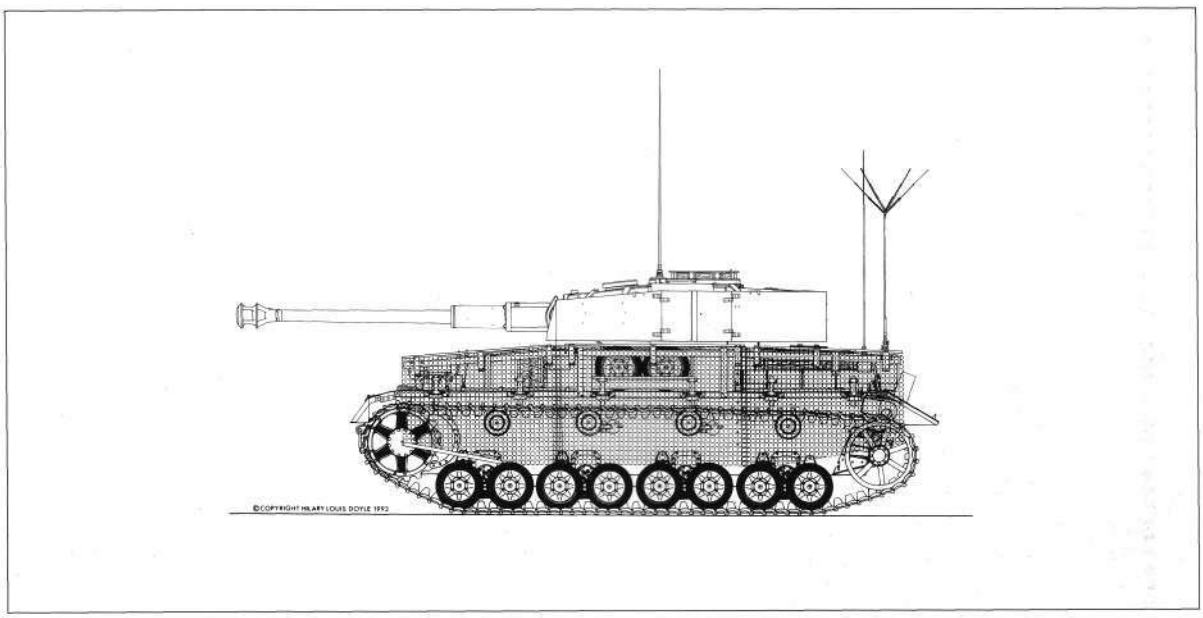
Pz.Kpfw.IV from this period were delivered from the assembly plant with the camouflage already applied. This consisted of a thin base coat of Rot (RAL 8012) about 50 per cent of which was over-painted with well-thinned stripes and patches, with sharp outlines, of Dunkelgelb (RAL 7028) and patches of Olivgrün (RAL 6003). Wheels were always left in a single colour.

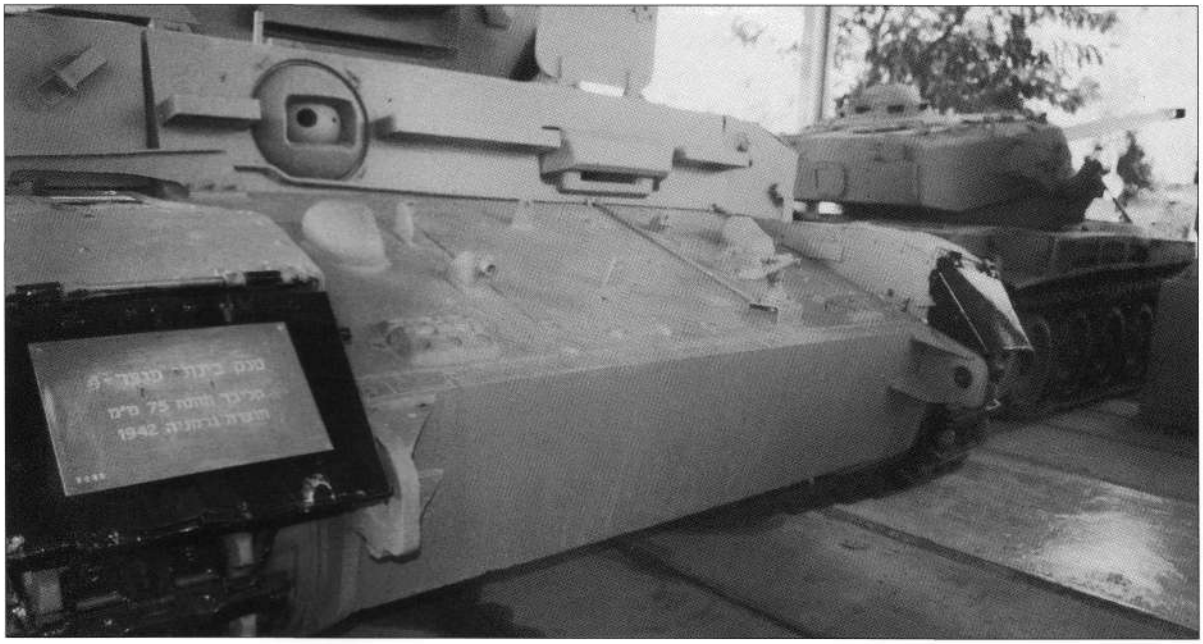
PLATE G: PANZER BEFEHLSWAGEN IV AUSF.J. FGST.NR. 92220, SEPTEMBER 1944.

This Pz.Bef.Wg.IV Ausf.J was assembled in September 1944. It has Pilze sockets for a 2 ton jib crane, and a Nahverteidigungswaffe (a traversable close defence weapon) on the turret roof. It still has the Zimmerit anti-magnetic coating, which was discontinued in September 1944.

The additional Fu 8 long range radio set used the Sternantenne (star aerial) fitted on an insulated mount surrounded by armour on the rear of the motor compartment.

A 1:76 side view drawing of a Pz.Kpfw.IV Ausf.J that was converted to a Pz.Beob.Wg.IV. (Hilary Louis Doyle)





ABOVE **Pz.Kpfw.IV Ausf.J. Fgst.Nr. 110021 on display at the Israeli Defence Forces Museum, Jaffa, has the extended hull sides forming tow brackets. Additional strengthening pieces are welded to the inner face of the tow bracket to reduce the possibility of breakage. (Hilary Louis Doyle)**

BELOW **Rear view of Pz.Kpfw.IV Ausf.J. Fgst.Nr. 110021 shows the extended hull sides forming tow brackets and final form of tow bracket for use with towbars. (Hilary Louis Doyle)**

The Fu 5 in the turret had its own 2 metre rod arial on the roof of the turret. This Pz.Bef.Wg.IV is currently on display in the Brussels Tank Museum.

From August 1944 camouflage was applied at the factory. The scheme is often referred to in post-war publications as 'ambush' camouflage. This consisted of a thin base coat of Dunkelgelb (RAL 7028) over the Zimmerit anti-magnetic grenade coating. This was over-painted with well-thinned stripes and patches, with sharp outlines, of Olivgrün (RAL 6003) and Rotbraun (RAL 8017). To simulate sunlight passing through foliage, spots of alternate paint colour were applied over the stripes and patches.

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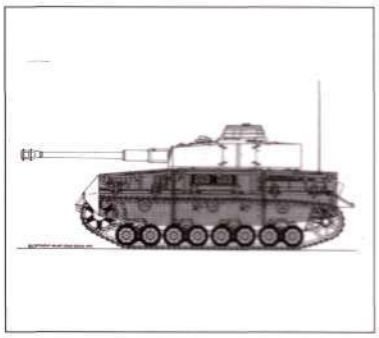

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Panzerkampfwagen IV Ausf.G, H and J 1942–45

The Panzerkampfwagen IV was one of the most numerous and successful German tanks of World War II. Despite the introduction of the Panther and Tiger tanks, the PzKpfw IV remained the backbone of the German armoured units until the end of the war. This book details all of the variants of the Panzerkampfwagen IV with the long guns 7.5cm KwK 40 L/43 and L/48. Until 1942, armed with a short 7.5cm KwK L/24, it was used primarily in an infantry support role. However, with the upgrading to the long 7.5cm it became the main battle tank of the Panzer Divisions.

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