

PROFILE
AFV
WEAPONS



Schützenpanzerwagen SdKfz 251

by Walter Spielberger

SdKfz 250

by Peter Chamberlain and Hilary L. Doyle



AFV/Weapons Profiles

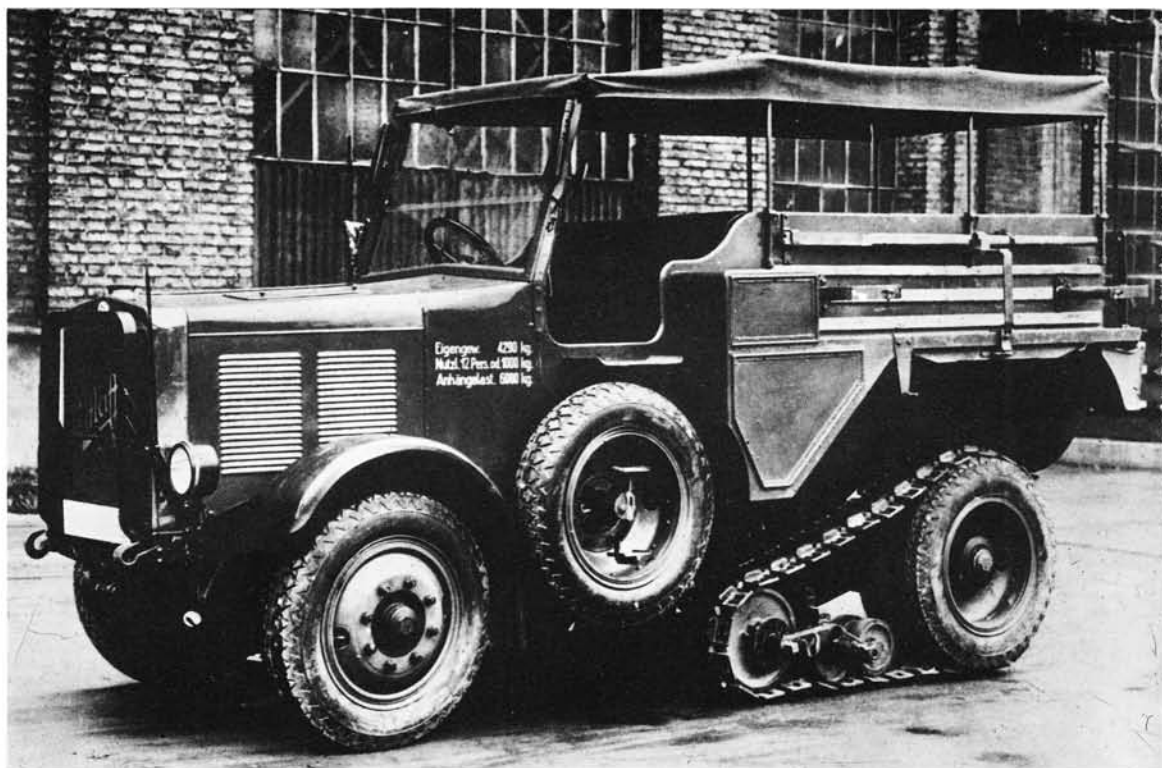
Edited by *DUNCAN CROW*

Check list of published titles:

- | | | |
|---|---|---|
| 1 Churchill—British Infantry Tank Mk. IV | 25 Cromwell and Comet | 46 Light Tanks M22 (Locust) and M24 (Chaffee) |
| 2 PanzerKampfwagen III | 26 Hellcat, Long Tom, and Priest, PLUS Complete Check List of All U.S. World War II SPs | 47 T-34 |
| 3 Tanks Marks I to V | 27 Saladin Armoured Car | 48 PanzerKampfwagen VI Tiger I and Tiger II ("King Tiger") |
| 4 Light Tanks M1—M5 (Stuart/Honey) | 28 S-Tank | 49 Japanese Medium Tanks |
| 5 Light Tanks Marks I—VI | 29 M4 Medium (Sherman) | 50 Swiss Battle Tanks |
| 6 Valentine—Infantry Tank Mark III | 30 Armoured Cars—Marmon-Herrington, Alvis-Straussler, Light Reconnaissance | 51 Abbot FV 433 Self-Propelled Gun |
| 7 Medium Tanks Mks A to D | 31 Australian Cruiser-Sentinel: and Australian Matildas | 52 M47 Patton |
| 8 Crusader—Cruiser Mark VI (includes Cruisers Marks I—VI) | 32 M6 Heavy and M26 (Pershing) | 53 The FV 432 Series |
| 9 Early (British) Armoured Cars | 33 German Armoured Cars | 54 Japanese Combat Cars, Light Tanks and Tankettes |
| 10 PanzerKampfwagen V Panther | 34 Scorpion Reconnaissance Tank | 55 Illustrated Summary of German Self-Propelled Weapons 1939-1945 |
| 11 M3 Medium (Lee/Grant) | 35 British Armoured Recovery Vehicles + Wheels, Tracks and Transporters | 56 Missile Armed Armoured Vehicles |
| 12 Mediums Marks I—III | 36 Chars Hotchkiss H35, H39, and Somua S35 | 57 Schützenpanzerwagen SdKfz 251 SdKfz 250 |
| 13 Ram and Sexton | 37 Russian BT Series | 58 French Infantry Tanks: Part I (Chars 2C, D and B) |
| 14 Carriers | 38 Conqueror Heavy Gun Tank | 59 French Infantry Tanks: Part II (including R35 and FCM36) |
| 15 PanzerKampfwagen I and II | 39 Panhard Armoured Cars | 60 Russian Armoured Cars (to 1945) |
| 16 Landing Vehicles Tracked | 40 U.S. Armored Cars | 61 Elefant and Maus (+E-100) |
| 17 Russian KV and IS | 41 M103 Heavy Tank + M41 Light Tank (Walker Bulldog) | 62 Commando, Twister and High Mobility Vehicles |
| 18 Chieftain and Leopard (Development) | 42 Modern Swedish Light Armoured Vehicles | 63 AMX-30 |
| 19 Chieftain and Leopard (Description) | 43 PanzerKampfwagen IV | 64 Armoured Personnel Carriers - A Survey |
| 20 Churchill and Sherman Specials | 44 Ferrets and Fox | 65 PT-76 |
| 21 Armoured Cars—Guy, Daimler, Humber, A.E.C. | 45 Vickers Battle Tank | |
| 22 PanzerKampfwagen 38(t) and 35(t) | | |
| 23 Soviet Mediums T44, T54, T55 and T62 | | |
| 24 The M48/M60 Series of Main Battle Tanks | | |

Available from model and bookshops or in case of difficulty, please write to:

Profile Publications Ltd., Dial House, Park Street, Windsor, Berks. SL4 1UU



Dating back to 1927, this Krauss Maffei MZ 10 four-wheel drive tractor could be converted into a half-tracked vehicle. It was one of the very first prototypes for a series of half-tracked vehicles used for towing purposes and equipped with armoured superstructures as armoured personnel carriers.
(Spielberger Collection)

Mittlerer Schützenpanzerwagen SdKfz 251

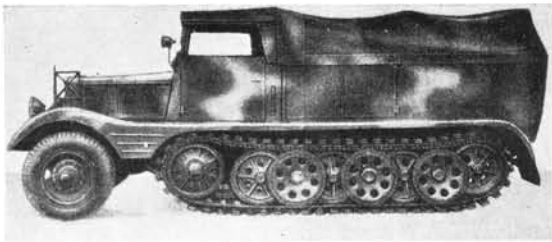
by Walter J. L. Spielberger

ONE of the first attempts to provide an armoured vehicle for infantry was made by the British as early as 1918 when the Mark IX, capable of carrying 50 men and a crew of four, was introduced. The years after World War I saw additional efforts in this direction, restricted at first only by economic conditions. The principal aim in attempting to motorize infantry units and their support elements, was to provide maximum mobility for these units and particularly to assure their compatibility with the expanding tank force. Mechanization, although strongly resisted, was inevitable. France and Britain appeared to lead the field in those early days and carried out numerous experiments, using soft-skinned wheeled, half-tracked and even full-tracked vehicles. But, while armour protection for these units was contemplated, it was never applied in mass production.

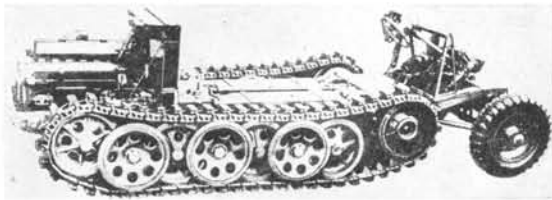
During this period Capt. B. H. Liddell Hart had already concluded, by comparing Genghiz Khan's attack of 1241 with the potentialities of a modern tank force, that "fully motorized armed forces have to be able to perform similar feats to the marauding hordes of the Mongol army." He considered it entirely possible for armoured groups to achieve strategic breakthroughs by eliminating enemy supply routes and maintenance bases in deep thrusts behind enemy lines.

He found it essential to support such an armoured force with mobile infantry, artillery, and engineers to enable them to operate completely independently. But such progressive thinking was not accepted and the lessons to be drawn from experimental vehicles and tactical exercises were not appreciated. By the early 'thirties, the tanks were again largely envisaged as infantry support weapons and slowed to their walking pace. The lead which the pioneers of armour in Britain and France had gained was now irrevocably lost. In Germany, on the other hand, where integrated, mobile, armoured forces found more favour, the creation of large armoured formations in division strength after 1933 was pushed ahead so fast that it taxed the already overburdened automotive industry virtually to breaking point. Spearhead armoured fighting vehicles had to be procured quickly and in substantial numbers and were given first priority, while the infantry remained largely foot-bound. This compromise was gradually overcome within the Light and Panzer divisions by the use of soft-skinned four or six-wheeled troop transport vehicles, mostly of commercial origin.

While such a solution assured reasonable mobility, given a good road network, the more forward-looking studies of future war conditions showed that units



The production version of the Leichter Zugkraftwagen SdKfz 11, a three ton tractor used mainly to tow the 10.5 cm. light howitzer. Its chassis was utilized almost unchanged as the basis of the medium armoured personnel carrier. (Spielberger Collection)



Some of the development prototypes were equipped with rear engines. They were designed as turreted armoured combat vehicles for cavalry units. The model shown is Hanomag type H8 (H). (Imperial War Museum)



Ausf. A and B of the medium MTW during the attack in France in 1940. Vehicles belong to 1st Panzer Division, with the Panzer Group of General Guderian, which spear-headed the drive into central France. At the left is one of the very early Sturmgeschütz units. (Spielberger Collection)

thus equipped would have no certainty of success. Wheeled vehicles could never match the cross-country ability of their fully-tracked counterparts. At the same time, a fully-tracked and armoured vehicle for transporting infantry was not officially considered to be feasible and was not seriously contemplated.

THE HALF-TRACK SOLUTION

As early as 1927-28, a highly-specialized industry already existed, turning out military half-track vehicles of extraordinarily high quality. They were in great demand by all units needing tractors to tow their equipment. But the usual production bottlenecks hampered efforts to meet this demand. Beginning in 1935, attempts were made to provide armour protection for some of these vehicles, resulting in prototypes with various drive-train layouts.

The most suitable chassis to carry a fully-equipped infantry squad under light armour protection which emerged from these trials was the standard 3-ton half-track tractor. Only minor modifications to the chassis were necessary, and prototypes of an armoured personnel carrier or *Gepanzertes Mannschafts Trans-*

portwagen (MTW) appeared in 1938. A company of the infantry regiment of the 1st Panzer Division, stationed at Weimar, received their first complement of these vehicles in the spring of 1939, and used them successfully in Poland.

The versatility of these vehicles was quickly appreciated and an ever-increasing number of armoured half-tracks left the production lines of various manufacturers throughout the War. They saw service in all theatres and almost every arm of the German forces used them in substantial numbers. Because of their application, generally in support or transport rôles, they never made headlines. But they became indispensable and served with such distinction that they are now seen in perspective as part of the history of German armour.

DEVELOPMENT HISTORY

The history of the half-track tractor from which the armoured vehicle was subsequently derived can be traced back to a parent development company, the Hansa-Lloyd-Goliath Werke AG. of Bremen which was charged in 1933 with the development of a tractor capable of towing loads of up to 3 tons weight. Design work was started in that year and the first prototype of the so-called "3 t. half-track and HK. 600 series" was completed by 1934. Equipped with a 3.5 litre Borgward six-cylinder petrol engine, the vehicle received the designation "HL kl 2". During 1936 a second prototype, the "HL kl 3", replaced the original vehicle. Production started in 1936 with the next development, the "HL kl 5", still equipped with the same engine, and 505 vehicles were built. During this period several other prototypes were built for development and trials with armoured superstructures. They all had the engine located at the rear and originally carried the designations "HL kl 3 (H)" and, in 1936, "HL kl 4 (H)" (H=hinter=rear). This development period was concluded in 1938, when models of the type "H 8 (H)" appeared. This year also saw the introduction of the final version of the half-track tractor, the type "H kl 6". Equipped now with a Maybach engine, it remained in production until the end of 1944. By the end of 1942 the German Army already had a total of 4,209 of these vehicles in use. Thus a chassis was developed and available in numbers which could be utilized as a basis for an armoured troop carrier capable of carrying a squad of nine men, a driver, and a commander. Armour protection was specified to 12 mm. thickness in front and 8 mm. on the flanks. This final solution was still a compromise, but time was short and only existing vehicle components could be considered.

The armoured personnel carrier was in fact never developed into a fully fledged fighting vehicle, as Guderian had originally envisaged. Like the soft-skinned vehicles pressed into this specialized rôle, it was intended merely to carry infantry units to the battle area, where they were expected to dismount and fight on foot. It was not sufficiently realized during the vital early development period that conditions later on would force Panzergrenadier units to fight from their vehicles as they swept forward with the tanks. But the development of a basically new infantry fighting vehicle was by this time no longer possible. It can be said that in Germany, at least, where the requirement

was foreseen, its realization was largely thwarted by the higher priorities given to other projects pressing on the fully extended German war industries.

The Ordnance number given to the vehicle finally developed was *Sonderkraftfahrzeug* 251 and the official designation: *Mittlerer Gepanzerter Mannschaftskraftwagen*. The Hanomag company of Hanover was charged with the development of the chassis to make it suitable for use with the armoured superstructure designed by Buessing-NAG of Berlin-Oberschoene-weide. The first prototypes underwent trials at Kummersdorf at the end of 1938 and the issue to troops commenced in the spring of 1939. A few companies were actually equipped with these vehicles for the campaign against Poland. They were intended to be used for many purposes. Among the rôles envisaged were the transport of machine-gun squads, engineer squads and towing the light, 75 mm. infantry howitzer. A special version was intended as an ambulance.

Three basic vehicle models, *Ausführung* A, B and C, had appeared by 1940, differentiated only by minor variations from each other.

Intensive training and exploitation of the battle experience gained in Poland resulted in much improved tactical use of these vehicles during the *blitzkrieg* against France. This campaign in turn produced valuable lessons which resulted in yet further improvements for the initial phase of the campaign against Russia in 1941. Now officially designated *Schützenpanzerwagen* (SPW) (=Armoured

Personnel Carrier (APC)), the basic vehicle was armed with machine-guns behind armoured gun shields. Platoon leader vehicles carried the 37 mm. anti-tank gun.

FIREPOWER

These vehicles wrote an entirely new chapter in armoured warfare. The tank at last had found a tactical partner. Of course, the half-tracks were handicapped by the shortcomings of an interim solution and particularly by their limited cross-country ability. The open top, while allowing for good observation and freedom of movement, also made them vulnerable to enemy defences. The relatively thin armour afforded protection only against small arms fire and shell fragments. Nevertheless, as the German armies plunged into the vast wilderness of Russia and extended their lines ever further across the Western Desert towards Egypt, the ubiquitous half-tracks, armed to fight with the Panzer spearheads, became the most numerous and valued vehicle of all arms.

Additional manufacturers joined in the production programme which was increased to such an extent that all Panzer divisions could at last be equipped with an SPW battalion. Even more important was the increase in fire power achieved by these battalions which were now able to carry the following weaponry: 30 light machine-guns, four heavy machine-guns, two medium 81 mm. mortars, three 37 mm. anti-tank guns and two 75 mm. L/24 tank guns. In addition, each regiment received a platoon of flame thrower SPWs, while some



A radio communication vehicle, SdKfz 251/3, during the French campaign, 1940. (Spielberger Collection)



French prisoners of war passing SdKfz 251 MTWs during the French campaign in 1940. Note the canvas to cover the open tops of the vehicles. (Spielberger Collection)

Illustration shows the large double door and hinging mechanism in the rear used on all but the late Ausf. D. vehicles. Also clearly indicated is the pivot for the second machine-gun. This an Ausf. B. captured from the Afrika Korps. (Imperial War Museum)



This picture shows clearly the front end arrangement and the drive sprocket of the same Afrika Korps vehicle. Exhaust system was located on both sides of the vehicle. Engine cooling was provided through the flap on the bonnet, which could be remotely-controlled from the driver's seat. (Imperial War Museum)





This unit, SdKfz 251/10, is equipped with the 3.7 cm. anti-tank gun and was issued to platoon leaders in 1940. It acted as a support vehicle until the 7.5 cm. gun became standard equipment. The chassis is that of an Ausf. A. (H. Nowarra)



A standard Ausf. C equipped with full armament including the armoured shield of the forward machine-gun. Earlier vehicles were modified to carry this shield. The rear machine-gun was demountable as part of the armament of the dismounted squad. Note the enlarged, flat, front armoured plate and protected air intakes on the sides of the engine compartment. (Spielberger Collection)

Rommel's command vehicle SdKfz 251/6 crossing a bridge in France, followed by motorcycle riders and an eight-wheeled armoured radio vehicle. (Col. Robert Icks)

Panzer divisions had SPWs equipped with launching platforms for heavy rockets.

In 1943 the SdKfz 251 Ausf. D appeared with a considerably modified superstructure. It had cleaner lines and was designed to accept the most modern mass production procedures. Matching of hull components was simplified and the ballistic properties improved. At least 20 different versions were now anticipated not only for the Panzergrenadier but also for artillery, engineer, anti-aircraft, medical and communication units. These vehicles remained in action until the very last days of the War. Unit price (without armament and radio equipment) was RM 22,560.

OTHER DEVELOPMENTS

Attempts to standardize production within the so-called "Schnell-Program" in 1939 resulted in new prototypes for the three-ton half-track series, named H 7 and built by Hanomag. Also in 1939 both Hanomag and Demag of Wetter-Ruhr worked on a successor vehicle for all three-ton half-track vehicles. While Hanomag developed a standard tractor version, Demag designed an armoured vehicle called HKp 602. Hanomag also developed yet another vehicle, the HKp 603, directly intended to replace the SdKfz 251. Weighing eight tons, all these vehicles were equipped with a Maybach HL 45 Z engine, delivering 120 b.h.p. The development cycle was concluded in 1941-42, when Demag designed the type HKp 606, which again was supposed to replace all existing SPW versions. With a total weight of seven metric tons, these prototypes had the Maybach HL 50 engine installed, coupled with a Maybach pre-selective transmission. They had Argus disc brakes. All these developments, as interesting as they might appear technically, never went beyond the prototype stage. Finally, evidence exists of attempts to utilize components of the Czechoslovak

Praga Panzer 38 (t) to create a fully-enclosed, full-tracked Armoured Personnel Carrier—a development which materialized only 20 years later with the introduction of the new HS 30 APC to the Bundeswehr.

PRODUCTION

Mass production of three-ton half-tracks was started by Hanomag in 1937. Only ten tractor chassis were built during this year. Since the chassis was developed for either the tractor or the SPW production figures were not separated. Hanomag thus built 6,270 chassis by the end of 1944, while Borgward (formerly Hansa-Lloyd-Goliath) had produced 2,572 units by the end of 1943. The official Speer Report—Nr. M 1362/45 g. Rs.—published on January 27th, 1945, mentions the following production figures for the 3 t. *Mannschafts-transportwagen*: 1940—348, 1941—947, 1942—1,190, 1943—4,250, 1944—7,800. Production figures for 1945 are no longer available.

Based on these figures, there can be no doubt that this unit was by far the most numerous armoured vehicle of the German Wehrmacht. To handle production on this scale, various other manufacturers had to be engaged and in addition to the aforementioned two companies, Weserhuetten of Bad Oeynhausen, Wumag of Goerlitz and F. Schichau of Elbing were involved. Chassis were supplied by Adler of Frankfurt, Auto-Union of Chemnitz and Skoda of Pilsen. The latter company, being located in Czechoslovakia, continued producing the same vehicle for the new Czech army until the mid-fifties. The superstructures for these vehicles were manufactured by the following companies: Ferrum of Laurahuette, Schoeller & Bleckmann of Muerzzuschlag, Boehmisch-Leipa of Bohemia and Steinmueller of Gummersbach. Production priority was indicated by a group "SS" classification, the highest priority available.

SdKfz 251 DESCRIBED

The standard half-tracked vehicle of the German Army had the front end of a conventional wheeled vehicle, with a front axle carrying a pair of pneumatic tyred, Ackerman-steered front wheels. Most of the weight of the vehicle, however, was borne on two flexible, endless tracks which were supported upon road wheels and which extended the full length of the chassis available behind the front wheels. The frame of the vehicle was a rigid, welded assembly consisting of two deep-webbed side members and thirteen closely-spaced cross-members. Armour plates were bolted beneath the frame, while smaller vertical plates protected the webs of the side members. The rigid construction of the frame itself, aided by the reinforcement of the "underbelly" armour plating and the armoured body, resulted in an extremely rigid body frame unit. The hull, open at the top, was welded and ballistically well shaped. It was made in two sections, secured together by bolted flanges behind the driving compartment. While *Ausf. A*, *B* and *C* had both bolted and welded armour plates, later versions starting with *Ausf. D*, had all welded construction.

Armour thickness of the frontal plate was 14.5 mm., while side plates were 8 mm. thick. The superstructure normally housed two seats for the driver and commander and two longitudinal benches to accommodate the rest of the crew. A centre aisle was provided, ending in a large double door in the rear of the vehicle for easy accessibility. Two visors were provided in the front vertical plate and one on each side of the driving compartment. Two large hatches on top of the engine compartment gave access to the power plant. The roof was open and covered only by a canvas tilt to protect the interior against the weather.

The engine was the standard six-cylinder water-cooled Maybach HL 42 TUKRRM petrol unit. Also built by Nordbau and Auto-Union, it had a bore of 90 mm. and a stroke of 110 mm. giving a displacement of 4,171 cc. Output was 100 b.h.p. at 2,800 r.p.m. It had an overhead camshaft.

The front axle beam was forged and was suspended on a single transverse leaf spring. Tubular wishbones braced the axle. Front wheels were of pressed steel with tyres of size 7.25-20 extra, or 190-18. Two shock absorbers completed the front axle assembly. No front wheel brakes were fitted. Each track of the rear suspension was carried by a driving sprocket at the front and an idler wheel at the rear. Between these two were six pairs of staggered, rubber-tyred, pressed steel road wheels which carried the weight of the vehicle. The road wheels were suspended by transverse torsion bars, one to each wheel. They were housed in cross tubes of elliptical section, each carrying two torsion bars. The idler wheels also acted as track tensioners.

UNIQUE TRACKS

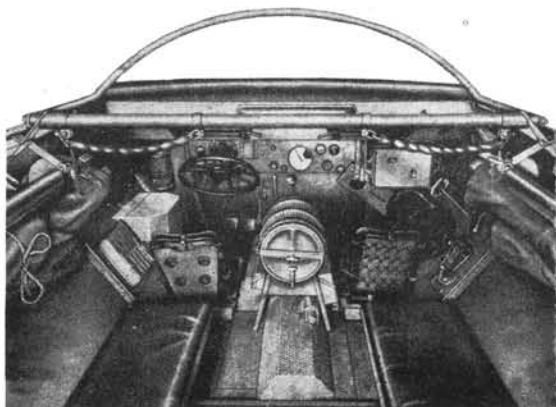
The light, flexible, lubricated track links were of unique and highly sophisticated construction—a special feature of the German half-track vehicles. The main body of each track shoe was cast and ribbed for strength, drilled and cored for lightness. Linked together by track pins, each was rigidly fixed to the forked end of one casting, while it was carried in needle

roller bearings in the opposite end of the adjacent shoe. A large tooth projected inwards from each shoe, while a rubber pad was fastened to the outside. The needle bearings were lubricated and thus required constant maintenance.

Torque from the engine was transmitted to the driving sprockets through a dry, twin-plate clutch (Fichtel & Sachs PF 220 K), a gearbox, a differential and two final drive units respectively. The gearbox was a Hanomag design, mounted in line with the power plant, but sufficiently set back to enable the differential unit to be situated transversely between the two. Short propeller shafts connected the clutch to the gearbox and the gearbox to the differential. The output shafts were connected to the final drive assemblies, which were part of the drive sprocket unit.

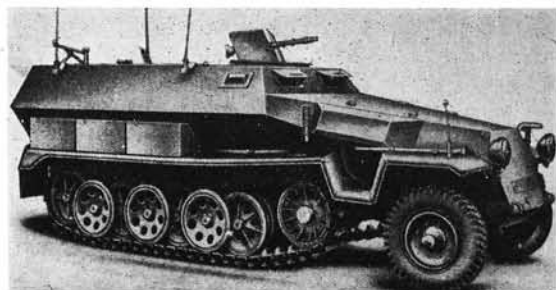


This SdKfz 251/1 shown here in Russia carried three frames on each side to mount either the 28 cm. high explosive or 32 cm. napalm rockets.
(Spielberger Collection)



Interior of the basic m.SPW as encountered in 1942 and 1943. This is normal squad vehicle, SdKfz 251/1.
(Col. Robert Icks)

SdKfz 251/3/11, with antenna. This was the radio vehicle for tank co-operation.
(Col. Robert Icks)





Engineer m.SPW Ausf. D, mounting bridging equipment and spare gasoline containers. They were used in numbers to assure mobility for tank formations. Mounting of both machine-gun 42s is clearly visible. (Col. Robert Icks)

SdKfz 251/11 shows the equipment as a telephone unit for the laying of field cables. (Col. Robert Icks)

m.SPW Ausf. C, in Russia. Spare tracks were carried on the front armour plate to provide additional protection. (Spielberger Collection)

The gearbox provided for a total of eight forward ratios and two reverse, since it was possible to select two alternative gear trains. A spur wheel differential was employed.

Steering was effected by a steering wheel, which had to be mounted at an inverted angle and connected to the steering column by angular gearing. The steering column itself incorporated disc type universal joints. The steering box was mounted on the left side and had two drop arms. The outer drop arm operated the front wheel steering in an orthodox manner, while the inner drop arm operated a spring connection to a cross-shaft and, via levers and cables, to internal expanding track brakes mounted on each side of the differential. Thus, normal steering through the front wheels was obtained by first movement of the steering wheel in either direction, while further movement brought the track brakes into operation. A front wheel position indicator was provided.

The hand brake operated through compensating cables to the track brakes on each side of the differential. The foot brake was air-servo assisted and operated on to internal expanding brake units, located inside the drive sprockets.

One fuel tank with a capacity of 35 gallons was mounted in the centre section of the frame. One Bosch, 300 watt, 12 volt generator supplied all electrical outlets and charged a battery on early models. Newer issues came equipped with two batteries. A 1.8 h.p. 12 volt Bosch starter was installed.

VARIANTS

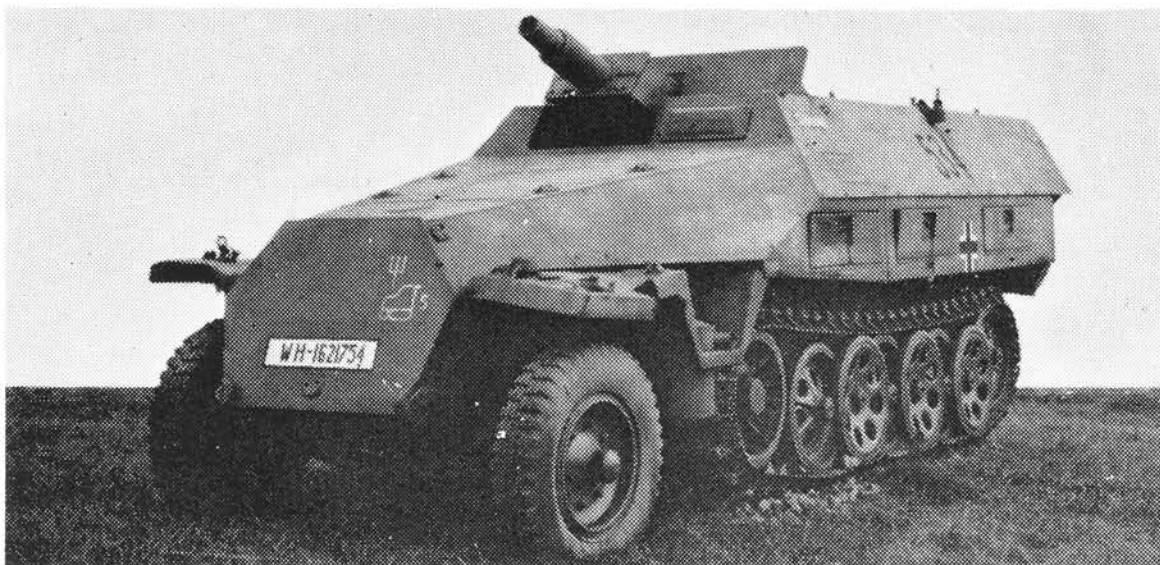
The *mittlerer gepanzerter Kraftwagen* SdKfz 251 or "medium armoured vehicle" served as a basis for all medium armoured personnel carriers of the German

Wehrmacht. The Hanomag type designation was H kl 6 p. The standard vehicle for the armoured infantry units was designated **SdKfz 251/1** *mittlerer Schützenpanzerwagen*. It carried a 12-man crew, two machine-guns 34 or 42, and two sub-machine-guns. It was followed by the **SdKfz 251/2**, a medium mortar carrier with a crew of eight, one machine-gun, two sub-machine-guns, and one 81 mm. mortar. Five versions of a wireless vehicle, *mittlerer Funkpanzerwagen* **SdKfz 251/3** were designated. Of these, SdKfz 251/3 V was the so-called *Kommando Panzerwagen*, a vehicle intended for higher general staff officers. It was easily recognisable by its obvious frame antenna suspended around its superstructure. All these versions had a crew of seven, one machine-gun and two sub-machine-guns, but varied considerably in their radio equipment. **SdKfz 251/4** towed the light 7.5 cm. infantry howitzer (le IG), it also carried the ammunition for this weapon. Again, it had a crew of seven with one machine-gun and one sub-machine-gun. **SdKfz 251/5** was issued as an engineer vehicle, with a crew of eight, two machine-guns 34 or 42, two sub-machine-guns and various engineer equipment.

In 1940, J. Gast KG. of Berlin-Lichtenberg was ordered to design modifications for SdKfz 251 or 251/1 to fire either 28 cm. H.E. or 32 cm. jellied gasoline rockets from frames attached to the sides of the vehicles. The device consisted of six individual frames, mounted on the armoured side plates of the vehicle. Three rockets were carried on each side.

Gaubschat of Berlin also modified the SPW for use as an artillery observation vehicle. The order was issued on September 1, 1940, and the first vehicles thus equipped were ready for troop trial in the spring of 1942.

Next on the official list was **SdKfz 251/6**, a *mittlerer Kommando Panzerwagen* again intended for general



The 3.7 cm Pak was soon replaced by the 7.5 cm L/24, the former main armament of the Panzer IV. A substantial number of these vehicles, SdKfz 251/9, were used during the last two years of the war. They acted as support vehicles and added the necessary fire power to Panzergrenadier units. This is a later version with an Ausf. D. chassis. (Col. Robert Icks)

staff officers. It was followed by two versions of an engineer vehicle, SdKfz 251/7 I and II. They carried a crew of eight, two machine-guns, two sub-machine-guns and assorted engineer equipment. The two versions of the *Kranken Panzerwagen* SdKfz 251/8 I and II, served as an armoured ambulance. With a crew of two, they were equipped to handle either four stretcher cases or up to ten lightly injured cases.

Buessing-NAG received an order from the Ordnance Department on March 31, 1942 to equip a proportion of the medium SPWs with the 7.5 cm. KWK L/24. These units were intended to serve as support vehicles and had a crew of three. 150 units were ordered initially with delivery starting in mid-June 1942. They were designated SdKfz 251/9.

In 1940 the platoon leader vehicles were equipped with a 3.7 cm. PaK and a crew of six. Designated SdKfz 251/10, these appeared with or without gun shields for their main armament.

Next on the list was SdKfz 251/11, a telephone cable vehicle with a crew of five. It was followed by the SdKfz 251/12, a survey section instrument carrier for artillery units. The artillery was also supplied with SdKfz 251/13, a sound recording vehicle. The artillery SdKfz 251/14, and 15 were a sound ranging vehicle and a flash spotting vehicle respectively. A flame-thrower unit was next, the *mittlerer Flammpanzerwagen* SdKfz 251/16. In addition to one machine-gun and two sub-machine-guns, it had two 14 mm. flame-throwers mounted on either side of the superstructure, plus one hand-operated 7 mm. thrower for close action. SdKfz 251/17 mounted a 2 cm. Flak 38 as a self-propelled mount. Only a few of these vehicles saw action, however. Their three-man crew had one additional machine-gun 42 for self-defence purposes. SdKfz 251/18 was an observation post vehicle, while 251/19 carried equipment for a telephone exchange unit.

The research with infra-red battlefield illumination in 1944 also utilized the basic medium SPW. The SdKfz 251/20 acted as a support vehicle mounting a

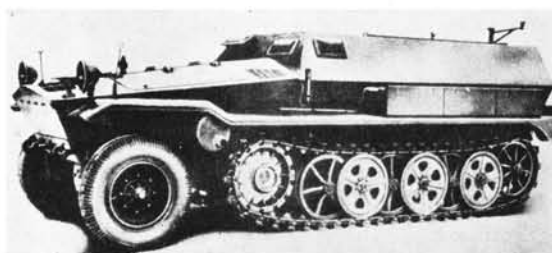
relatively large searchlight for Panther tank units equipped with infra-red sighting devices. The vehicle 251/21 appeared as a replacement for 251/17 at the end of 1944. It carried a triple AA. mount displaying 15 mm. former aircraft weapons. The series was concluded by SdKfz 251/22 mounting the 7.5 cm. Pak 40 L/48. It was heavily overloaded, since the complete anti-tank gun was installed with its original armoured shield. Only limited traverse was provided.

By 1944, the SdKfz 251/4, 5 and 10 were no longer in production. Some of the 3.7 cm. anti-tank guns had been replaced by the tapered bore, 2.8 cm. anti-tank rifle as early as 1942.



The version of the medium SPW SdKfz 251/22 mounted the 7.5 cm. Pak 40. This vehicle protected infantry against enemy tanks and appeared in ever-increasing numbers on the battlefield in 1944. (Col. Robert Icks)

The HKp 603, developed by Hanomag, was an improved version of the medium SPW. It never went beyond the prototype stage. (Imperial War Museum)



TACTICAL EMPLOYMENT

The beginnings of the *Panzergranadier* development can be traced as early as 1931, when Colonel Guderian became Chief of Staff to the Inspector of Mechanized Troops. There the foundation was laid, especially in the area of organization, for the use of armoured infantry units within the first three Panzer divisions. Proper equipment was one of the major concerns. With light tanks available only for the tank regiments, all other vehicles possessed neither cross-country ability, nor was armour protection provided.

At this time, the infantry section of a Panzer division consisted of an infantry brigade, including one rifle regiment with two battalions and one independent *Kradschützen* battalion of infantry equipped with sidecar motorcycles. The rifle regiment in turn was equipped with four or six-wheeled troop transport vehicles. Four Light divisions were also established, each having one tank battalion only. Their infantry elements, again, were equipped with soft-skinned wheeled vehicles. Thus, the basic requirement for the armoured forces to have infantry support available at all times could not yet be met. Only a token number of armoured troop carriers were ready when the war started in 1939.

The first battle experience was translated into explicit training instructions during the winter of 1939-40. This, coupled with the availability of additional armoured vehicles, resulted in rapid combined movements during the campaign against France in 1940. One of the anticipated improvements was an increase in fire power. During this campaign, 1st Panzer Division already had a rifle regiment with three battalions, of whose 15 companies seven were equipped with SPWs. Most of their fighting was done from the moving vehicle. Dismounted infantry squads were only necessary to overcome stubborn pockets of resistance. It soon became obvious that this close co-operation between tanks and SPWs resulted in fewer losses for the infantry.

Invaluable experience was gained during the initial phase of the war against Russia. Tremendous distances had to be covered in close-co-operation between the various branches of many Panzer divisions, many of them already equipped with an SPW battalion. Here the experience of stretched supply lines and overwhelming maintenance problems brought about considerable improvements which had lasting results during the War.

PANZERGRANADIERS

By the spring of 1942, all Panzer divisions were equipped with SPW battalions. And, from July 5, 1942, all rifle regiments within Panzer divisions were renamed *Panzergranadiers*.

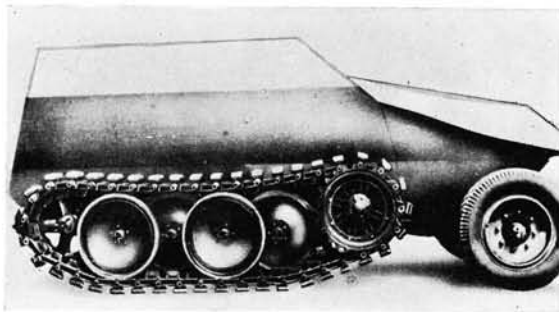
Well suited for attack and defence alike, the armoured infantry vehicle established itself as an invaluable tool of war. It developed into the "eye" of the tank, whose limited vision proved to be a considerable handicap if a determined enemy resorted to close-battle tactics. Radio communication between vehicles also played an important rôle. Thus, *Panzergranadier* units were exceptionally well suited for quick reconnaissance, protection of open flanks and carrying out raids against enemy flanks and rear.

During the winter of 1942-43, it was proven over and over again that *Panzergranadier* units were also quite capable of fighting dismounted. The few remaining SPWs were used to provide back-up fire protection.

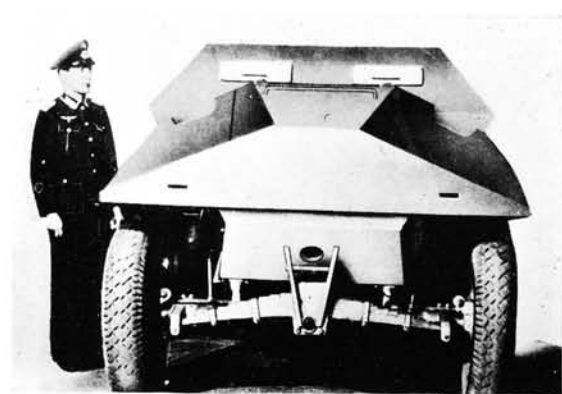
A tremendous increase in fire power was provided for the *Panzergranadier* regiments in 1943. Guderian also improved considerably the training of armoured infantry units, with particular emphasis on the following: support of tank attacks in obstructed terrain, in forests, across rivers and in villages; attack against fortified mine fields or against anti-tank gun barriers; attack at night. During defensive actions the main tasks of *Panzergranadier* units were: support of tank units during counter-attacks; attack against

A typical battle scene around Zhitomir in Russia in 1943 shows sand-bagged m.SPW (SdKfz 251/1 Ausf.C) during a counter-attack. PzKpfw IVs Ausf.H are in the background. (Spielberger Coll.)





As a final version, the HKP 606 was intended to replace all previous series of armoured half-tracks and to act as the standard vehicle for both the light and medium SPW. Economic conditions during the war made it impossible for these improved vehicles to reach production stage.



exposed enemy flanks; quick securing of important objectives and their incorporation into the defence perimeter. All the battle experience gained was transferred as quickly as possible into instruction manuals and the training centres were advised to change training methods as new experience became available.

The Battle of Kursk in 1943 indicated clearly that the number of SPWs in service was still insufficient to assure exploitation of breakthroughs achieved by tanks. At this time, more and more Panzer and *Panzergranadier* units found themselves acting as "Fire Brigades" to stop enemy attacks with resulting enormous losses which could not always be recovered.

The summer of 1944 saw *Panzergranadier* units and their SPWs fighting against the Allied forces in France. Experience there quickly indicated that no armoured force could sustain itself without adequate anti-aircraft protection. Movements of any sort, including the supplying of units, had to be done during the brief night time. Only a few days of bad flying weather allowed for the traditional counter-attack pattern.

Against the assault from both East and West, only sporadic counter-measures could be launched, resulting normally in heavy casualties on both sides and losses of irreplaceable material to the German Armies. The Battle of the Bulge in 1944 saw for the last time combined German tank and armoured infantry assaults. The mountainous terrain of the Ardennes favoured the SPW, since its smaller dimensions and better fuel economy made it better suited for this kind of warfare.

Finally, a combined force of tanks and SPWs was established which, together with armoured engineers and self-propelled artillery units, fought delaying actions until the very end without being able to stem the tide.

It has to be repeated here that, in the German Armies of World War II, the tank found its classical partner in the SPW. Together, they fought the greatest armoured battles in history. The *Sonderkraftfahrzeug* 251, despite its many shortcomings, served as an example for similar vehicles built by many other nations and established itself as one of the most important armoured fighting vehicles of its time.

SPECIFICATION

General

Designation: Mittlerer gepanzerter Mannschaftskraftwagen. Designation from 1942: mittlerer Schützenpanzerwagen. Ordnance No. SdKfz 251. Manufacturer's Type: Hanomag HL kl 6p.
Crew: 12—commander, driver, 10 men infantry squad in basic SdKfz 251/1.

Battle weight: 8.9 long tons.
Dry weight: 7.4 tons.

Dimensions

Length overall: 19 ft. (Ausf. A, B and C). 19 ft. 7½ in. Ausf. D.
Height: 5 ft. 9 in.
Width: 6 ft. 11 in.
Width over tracks/overall: 6 ft. 11 in.
Track centres/wheel base: 5 ft. 5 in./5 ft. 3 in.
Track width: 9½ in.

Armament

Main: See description of Variants.

Ammunition

Rounds stowed: 2,010 7.92 mm. machine-gun for basic SdKfz 251/1 with two MG 34 or 42.

Communications

Varies between models.

Armour

Homogeneous welded and riveted armour plate.
Hull: 14.5 mm. at 14°.
Glacis: 10 mm. at 80°.
Sides: 8 mm. at 35°.
Rear: 8 mm. at 35°.
Floor: 6 mm. horizontal.

Engine

Maybach "HL 42 TUKRM" or TUKRRM. Petrol, 6 cyl. in-line, 4,171 c.c. 100 b.h.p. at 2,800 r.p.m. Fuel: 35 gallons in one tank between frame.

Transmission

Hanomag "021-32785U50". 4 forward, 1 reverse speeds with reduction. Crash gearbox.

Suspension

Front transverse leafspring, two tyres, 7.25–20, starting Serial No. 795091.—190-18.
Rear transverse torsion bars, steel tracks, rubber cushioned, lubricated 55–56 links per track. Type: Zgw 50/280/140 cast links. Type Zpw 50/280/140 pressed links.

Electrical System

Power supply and generators: Starter, Bosch EJD 1,8/12. Generator Bosch RKC 300/12-1300. One or two batteries 12 volt 75 amp.

Performance

Max. road speed: 33 m.p.h.
Max. gradient: 24°.
Trench: 6 ft. 6 in.
Wading depth: 2 ft.
Fuel consumption 3.5 m.p.g.

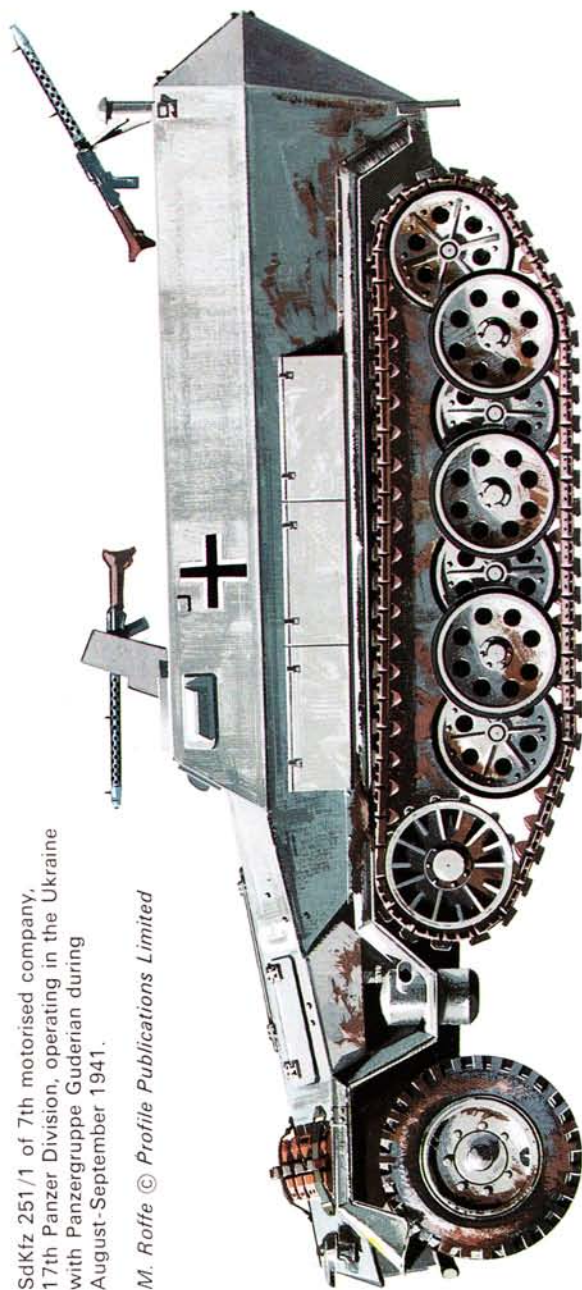
Special Features

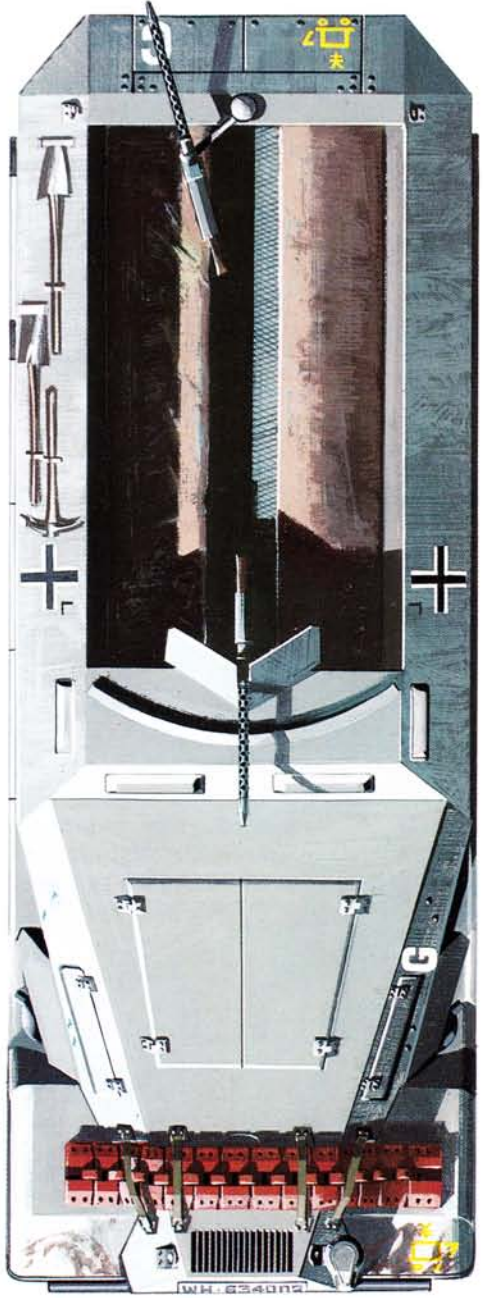
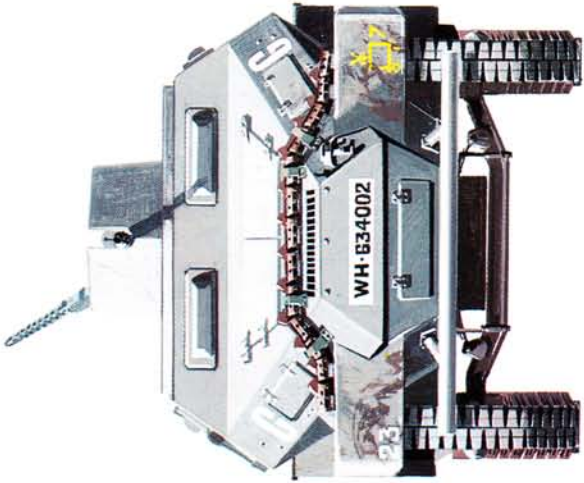
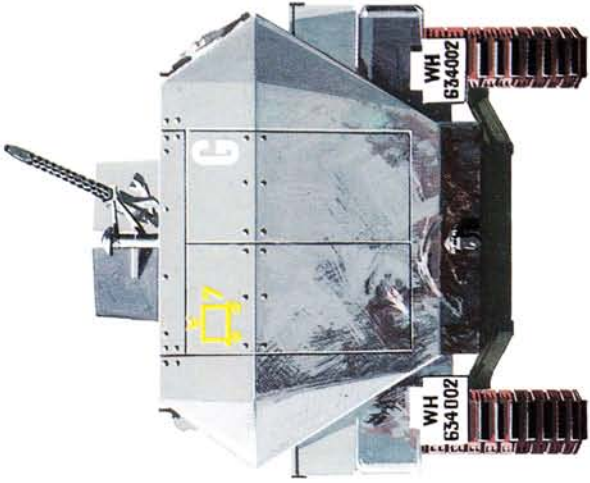
See SdKfz 251/1 to 251/22 listed in text under Variants.



SdKfz 251/1 of 7th motorised company, 17th Panzer Division, operating in the Ukraine with Panzergruppe Guderian during August-September 1941.

M. Roffe © Profile Publications Limited







Leichter Funkpanzer SdKfz 250/3.III. This was one of the four radio vehicles that were among the variants of the Leichter Schützenpanzerwagen SdKfz 250. It carried a Fu 7 and a Fu 8, which was characterised by the frame antenna. It was used for ground-to-air communication.

Leichter Schützenpanzerwagen SdKfz 250

by Peter Chamberlain and Hilary L. Doyle

DEVELOPMENT

ALTHOUGH the Ordnance number *Sonderkraftfahrzeug 250* suggests otherwise, chronologically the SdKfz 250 followed the SdKfz 251. In importance also the SdKfz 250 was overshadowed by the SdKfz 251 which was the main troop carrier of the German Wehrmacht.

The development of the SdKfz 250 had its origin in an order received by Demag AG., of Wetter/Ruhr, in 1932. This order from the Army asked Demag to develop an all terrain tractor capable of towing a 1 ton load. The half-track solution was once again adopted and by 1934 Demag had their model D II. 1 under test. Numerous prototypes and development models followed in the next few years and resulted in series production of the Demag D 6 during 1937 and 1938. Numerous special tasks were envisaged for these 1 ton vehicles in addition to the primary requirement of towing anti-tank and light artillery pieces for the motorised infantry units. The most important variation was the use of this chassis as the self-propelled carriage for the 2 cm. Flak cannon. The success of the pre-production D 6 series led to the order for mass production of the Demag D 7 in 1939. This vehicle was officially called the *Leichter Zugkraftwagen 1t* and received the Ordnance number SdKfz 10.

In 1939, following the introduction of prototypes of the SdKfz 251, investigations revealed that an

armoured superstructure could be mounted on the Zgkw 1t chassis. At this time the Army had outlined requirements for three special vehicles, smaller than the SdKfz 251, which would provide support for motorised forces. The first requirement was for an armoured personnel carrier to transport a half group (section) of infantry during reconnaissance in depth. The smaller numbers in each vehicle and therefore the greater number of vehicles per reconnaissance battalion would give the flexibility required. Buessing-NAG of Berlin-Oberschoeneweide were entrusted with the design of the armoured body because of their recent experience in the development of the SdKfz 251. Armour protection was to be 14.5 mm. at the front and 8 mm. on the sides while accommodation was to be provided for the driver, commander and four troopers. The armoured body was to be as compact as possible so as to keep the weight low and maintain performance. In view of the superstructure designed by Buessing-NAG the length of the chassis was reduced by Demag who were still responsible for the chassis development. This was achieved by reducing the track on the ground, by removing the first axle following the drive sprocket, and by moving the complete trackwork forward. The elimination of one set of road wheels on each side with associated torsion bars and suspension further reduced the weight. Trials were held at Kummersdorf and an order was placed for production almost immediately.

The Ordnance number Sonderkraftfahrzeug 250 was allotted and the official designation was *Leichter Gepanzerter Mannschaftskraftwagen*. The Demag name for this armoured carrier and its chassis was Demag D 7p. The p stood for panzer.

An external factor which had a great bearing upon the development of the Demag D 7p was the conclusion drawn from experiments with a battery of prototype Assault Guns which were held during the late 1930s. It was concluded that for really effective operation the infantry assault guns would depend upon special support vehicles, armoured and capable of cross country travel, to re-supply them with ammunition and to provide observation facilities. Thus an outline was formed for the additional two requirements for half-tracks using the chassis of the Demag D 7p. Demag continued to be responsible for the chassis and took these requirements into consideration during their design study. As both latter vehicles were to be fully enclosed and were to have heavier armour than the basic SdKfz 250 this was a major factor for Demag. The ammunition vehicle received the Ordnance number Sonderkraftfahrzeug 252 and the official designation *Leichter Gepanzerter Munitionstransportkraftwagen*. Due to the limited payload capacity of these armoured vehicles the superstructure was cut back sharply from the middle of the fighting compartment. In this steeply angled rear plate were large double doors permitting speedy loading and transfer of ammunition. A crew of two was carried, commander and driver. They gained access through individual hatches in the roof of the driver's compartment. A small armoured trailer containing further stocks of ammunition was normally towed. The firm of Waggonfabrik Wegmann AG in Kassel-Rothendit-mold were responsible for the armoured superstructure. The frontal armour of these vehicles was 18 mm. as opposed to the 14.5 mm. of the basic SdKfz 250.

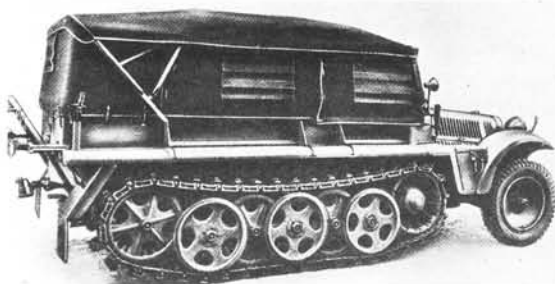
The third and final vehicle to be introduced on the Demag D 7p chassis was the observation vehicle for the Sturmgeschuetz battalions. This vehicle was also developed by Demag and Wegmann, but was simply a roofed-in version of the basic SdKfz 250 fitted with equipment which suited it for the task required. To the left middle of the fighting compartment roof was a large rotating circular hatch with two doors which incorporated further smaller opening covers which in turn permitted a scissors periscope to project while the main hatches were closed. To the rear left was a rectangular access hatch and on the right side was the antenna for the radio equipment, namely an Fu 16 ultra-shortwave transmitter and an Fu 15 receiver both operating on the 23000-24950 Kc/s. band for communication with assault gun units. The Ordnance number for these vehicles was Sonderkraftfahrzeug 253 and the official designation was *Leichter Gepanzerter Beobachtungskraftwagen*.

Early in 1940 the Sturmgeschuetz batteries were already being issued with the SdKfz 252 ammunition carriers, and a considerable number of the SdKfz 253 observation vehicles had been delivered by the time the Blitzkrieg on France began in May 1940. There is no indication of deliveries of the SdKfz 250 basic vehicle before the latter part of 1940. However, before long the special purpose versions SdKfz 252 and 253

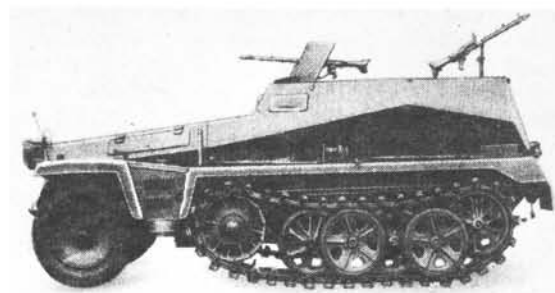
were dropped in favour of less expensive adaptations of the basic SdKfz 250. By 1943 there were twelve official sub-classifications of this vehicle which was being produced in large numbers.

PRODUCTION

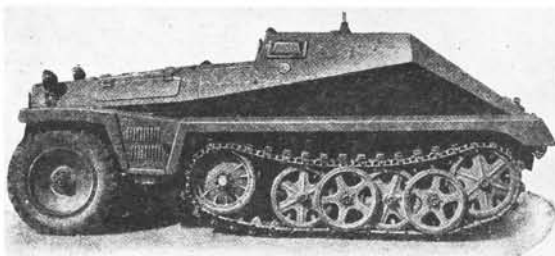
The basic SdKfz 250 *Leichter Gepanzerter Mannschaftskraftwagen* entered production in 1940 and was officially manufactured until the end of 1944, but due to disruption contracts were still uncompleted at the end of the war. Initially the chassis Demag D 7p



Leichter Zugkraftwagen 1t SdKfz 10. Manufacturer's type was Demag D 7. Mass production was ordered in 1939.

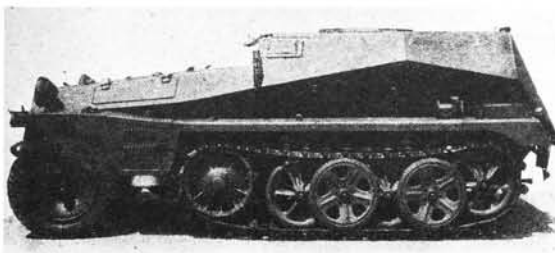


Leichter Schuetzenpanzerwagen SdKfz 250/1, the basic vehicle.



Leichter Gepanzerter Munitionstransportkraftwagen SdKfz 252, the ammunition vehicle of the series.

Leichter Gepanzerter Beobachtungskraftwagen SdKfz 253, the observation vehicle which was later replaced by the SdKfz 250/4.



was manufactured alongside the regular tractor chassis, Demag D 7, at the Wetter/Ruhr plant. However, as the importance of the SdKfz 250 and its derivations grew, Demag gradually substituted D 7p production lines for those of the D 7. The tractor production was taken up by the Saurer Werke in Vienna, while Buessing-NAG and Adler also participated. Mechanische Werke in Cottbus were responsible for production of both D 7 and D 7p chassis. DEW Hannover and Steinmueller of Gummersbach built the armoured bodies. Most of the armour plating used for the SdKfz 250 bodies was produced by the Bismarckhuette in Upper Silesia. The assembly of the SdKfz 250 took place at the works of Evens & Pistor in Helsa, Thuringia. In 1941 the two special variants SdKfz 252 and SdKfz 253 were removed from the production program in favour of increased production of the basic SdKfz 250 unit which could be readily adapted for the various roles. During 1942 a more suitable official designation was applied; *Leichter Schuetzenpanzerwagen* invariably abbreviated to *le. SPW*. Currently available official figures indicate that 5,930 *le.SPW* were manufactured in the years 1942 to 1944.

In 1943 the SdKfz 250 underwent a considerable redesign, simultaneously with the redesign of the SdKfz 251. The object of this exercise was to simplify production rather than to effect technical improvements, thus the chassis, running gear and automotive parts remained virtually unchanged. The new armoured body represented a considerable saving in fabrication time, having almost 50 per cent less separate armoured plates. The squared-off body was just as effective in providing protection against small arms fire and the internal capacity was considerably increased. The 3 ton SdKfz 251 Ausf. A, B and C had appeared by 1940 and the 1943 redesign of the SdKfz 251 became the Ausf. D. The smaller SdKfz 250 on the other hand arrived much later in the front line and no modifications were permitted lest they cause delays in production. Even when the vehicle was redesigned in 1943 no Ausf. code appears to have been allotted. During 1939 and 1940 Demag had projected an improved D 8 chassis but this was never advanced beyond the project stage. However, from 1940 to 1944 Demag cooperated with Hanomag to find a standard solution to replace both the 1 ton and 3 ton tractors and SdKfz 250 and SdKfz 251 carriers. This development was to be the HK 600 series described in the Profile of the SdKfz 251.

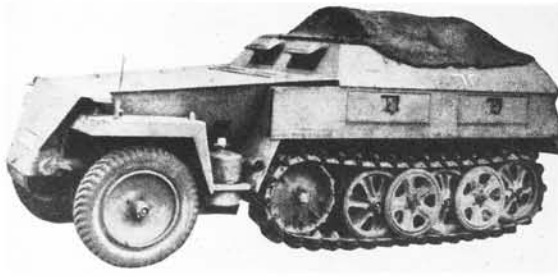
SdKfz 250 DESCRIBED

The layout and construction of the SdKfz 250 was very similar to that of the larger SdKfz 251. The front axle was suspended by a transverse leaf spring, and axle and suspension were anchored as on the SdKfz 251. The pressed steel disc wheels carried 600 x 20 tyres. Unlike contemporary US half-tracks the German vehicles did not have a powered front axle, which made the steering very heavy and driving tedious. For normal turns the front wheels steered the vehicle but when a hard turn had to be made the movement of the steering wheel automatically actuated a mechanical link to the steering brakes mounted in the differential unit. These steering brakes controlled the

drive to the tracks and allowed the tracks to assist steering. The steering wheel of these vehicles was inverted to accommodate the frontal sloped armour plate and this made the steering even more difficult. The only brakes provided on these vehicles controlled the tracks and these were operated hydraulically. The handbrake was a mechanical linkage to the same units. Lubricated needle roller bearing tracks similar to those of the SdKfz 251 were used, though the links were normally of forged steel on the SdKfz 250 and cast steel on the tractor version SdKfz 10. Track type was Zpw. 51/240/160, with a width of 240 mm. and a pitch of 160 mm.; 38 links completed each track. The running gear consisted of four transverse torsion bars each acting on a swing arm hinged in a forward direction. To accommodate the torsion bars the right side running gear was further forward than the left. The wheels were pressed steel discs fitted with solid rubber tyres. These wheels were of the interleaving and overlapping type common to most half-tracks. The drive sprocket at the front was connected to the differential by short propeller shafts while the sprockets themselves housed a final reduction gear. The idler sprocket at the rear could be adjusted for track tensioning and was fitted with a shear bolt safety device.

The SdKfz 250 and SdKfz 251 were powered by the same standard Maybach six-cylinder watercooled petrol engine: the 4171 cc. HL 42 TRKM which developed 100 b.h.p. at 2800 r.p.m. The transmission, however, was totally different. The SdKfz 10 and SdKfz 250 had a Maybach Variorex VG 1202128 H unit. This gearbox was a pre-selector type which provided seven forward and three reverse speeds, thus eliminating the normal requirement for a two speed transfer box. But the Variorex unit was complex and required good maintenance. The engine and gearbox were coupled through a Fichtel & Sachs PF 220 Komet clutch. A Cletrac differential completed the power train. The engine and power train of these vehicles was mounted offset to the right side so that the gearbox was alongside and to the right of the driver.

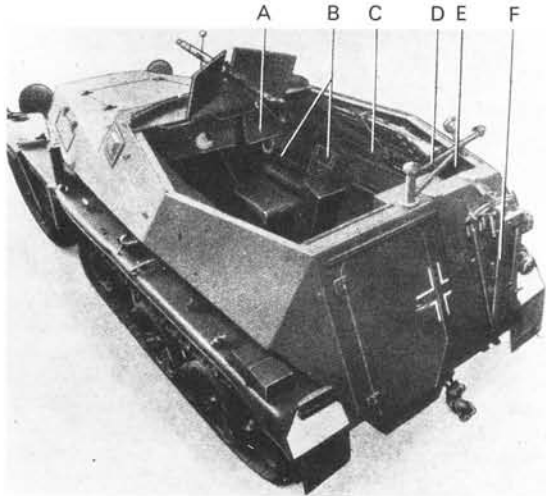
The armoured body was manufactured in two parts; the front section enclosed the engine while the back section included all the driver and crew compartments. The two halves were bolted together during final assembly. As mentioned already the driver sat alongside the gearbox on the left side of the vehicle. In front of him was a large vision port which could be opened and was fitted with splinter-proof glass blocks when closed. On the side wall was a single vision slit also with a glass block. Also in front of the driver was the inverted steering wheel, while slightly to the right was the main control panel, the most important instrument being a very large tachometer. The commander, on the right of the driver, had similar vision facilities and ahead of him was mounted the radio set which was the usual Fu Spr.Ger.f for inter-vehicle communication. Along the left wall of the vehicle was a bench seat for three soldiers and the remaining one was provided with an individual seat to the rear centre of the fighting compartment in front of the main petrol tank. The right wall of the vehicle was enclosed by a stowage box which was used to store the armament of the vehicle and troops along with other items, including ammunition.



SdKfz 250 with post-1943 body.



SdKfz 250/5.II. Originally classified as a Leichter Beobachtungspanzerwagen, together with the SdKfz 250/5.I, the vehicle was given the title of Leichter Aufklaerungspanzerwagen in 1944.



View of SdKfz 250/1 interior showing position of righthand side storage. A Radio B 1 x 9 mm. MP 38 with six ammunition magazines C 1 x 7-92 mm. MG 34 in storage D AA defence pivot for MG 34 E Verrey pistol and 12 rounds of signal ammunition F Heavy field mounting for MG 34.

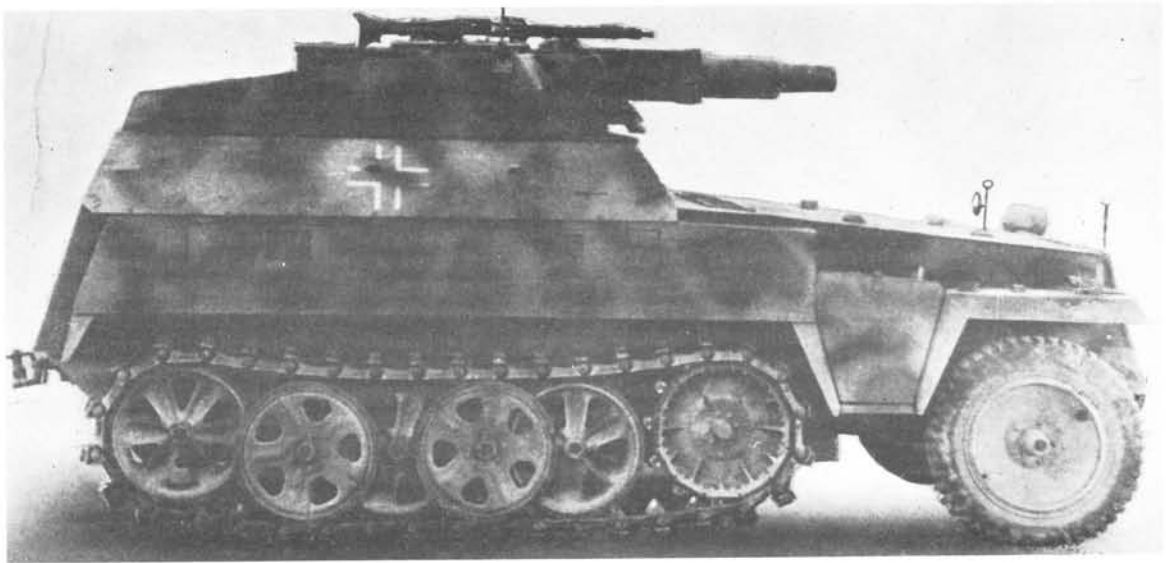


Late pattern SdKfz 250/9 with the new six-sided turret that was also being produced for the SdKfz 234/1 eight-wheeled armoured car. The vehicle also had the new pattern SdKfz 250 body.

Leichter Beobachtungspanzerwagen SdKfz 250/4 which replaced SdKfz 253.

(Courtesy A. L. Sohns)





SdKfz 250/8 was armed with the 7.5 cm. KwK 37 L/24.

The armament of a SdKfz 250 was one le.MG 34 which was mounted behind a pivoting shield on the roof of the driver's compartment. On the rear wall top there was a pedestal for an additional MG 34 which was carried either for AA defence or with a heavy field mounting for ground use. The crew were personally armed with four 7.92 mm. Kar. 98K rifles while the commander had a 9 mm. MP 38 machine pistol. A small saddle type seat was mounted on top of the gearbox for the front machine gunner to use when firing the gun.

The fuel tank at the rear right of the SdKfz 250 had capacity for 140 litres (31 gallons) which allowed a normal operating radius of between 300 and 175 kilometres (186/109 miles). The basic vehicle weighed 5.38 tonnes and had a maximum speed of 60 Km.p.h. (37 m.p.h.) on roads.

Normal exit and entry were effected through a single door in the tail plate. This door was also fitted with a vision port for rear observation. In action the troops frequently used the open roof as a quicker method of disembarkation. This open roof could be fitted with a tarpaulin, carried in the vehicle, during inclement weather.

VARIANTS (SdKfz 250/1-12)

The *Leichter Schuetzenpanzerwagen* was manufactured in twelve official variants each with a unique Ordnance number. However, there were often numerous different official models within each classification. Finally there were a number of other models for which no official records have been located.

The basic **SdKfz 250/1** has already been described in detail. This vehicle was intended to carry a half section (*halbgruppe*) into action. There was also another model of the SdKfz 250/1 which was very important. This was the vehicle carrying *schwerer MG 34 halbgruppe*. The MG shield was not fitted on the roof over the driver's compartment as these vehicles were to carry an MG 34 on the heavy mounting. This configuration permitted sustained heavy

automatic fire to be directed on distant targets at a moment's notice. These vehicles also carried a second MG 34 which could again be mounted in the rear AA pivot or taken out of the vehicle and fired from a heavy field mounting stowed on the rear armour plate. Both these versions existed in both the pre- and post-1943 body forms.

The next vehicle on the official list was the *Leichter Fernsprechwagen SdKfz 250/2*. This was a handy little vehicle used by the communications troops for laying field telephone cables. The cables were held on reels. Racks to hold these reels during laying operations were fitted to both the front mudguards and to the top of the petrol tank at the rear right-hand side of the vehicle. This meant that cable could be paid out on either side into a ditch for example, or simply reeled out to the rear as the driver moved forward across open country. Special equipment for these vehicles included long poles which were used to guide the cable clear from the side of a road during laying.

Four official versions of the **SdKfz 250/3 Leichter Funkpanzer** were in existence. Each of these was a radio vehicle with equipment to suit the particular formation which it was to accompany and the command to which it was to report. Thus the model attached to motorised forces was equipped with the Fu 12 radio set, which was the normal ground forces link with such formations. The Fu 12 was a medium wave receiver operating on the 835-3000 Kc/s. band and an 80 watt transmitter which used the 1120-3000 Kc/s. band. A 2 metre rod with star antenna at the top was the aerial for these Fu 12. This aerial was carried on the rear left of the fighting compartment while the usual 2 metre rod aerial for the inter-vehicle *Funksprechgeraet f* was on the front right. The radio set itself was carried on top of the petrol tank which was reduced in height. A crew of four operated these radio vehicles. The main armament was one MG 34. Again both pre- and post-1943 bodies were to be seen.

The second type of radio vehicle had an Fu 7 radio set which consisted of an ultra-shortwave receiver d1 and a 20 watt transmitter d which operated on the 42100-47800 Kc/s. band. The Fu 7 was used to contact Luftwaffe support groups inside a range of 50 km. The aerial was again a 2 metre rod aerial.

The third model was another ground-to-air co-ordination vehicle and as such was usually operated by Luftwaffe personnel and therefore had the WL number plate of the Luftwaffe. Not only did these vehicles carry a Fu 7, the aerial for which was mounted on top of an armoured container at the rear, but also a Fu 8 which was characterised by the massive frame antenna. These Fu 8 sets were for contact with the main divisional command at ranges up to 40 Km. On later models the frame antenna was replaced by an 8 metre winched mast aerial with a star antenna on top which could be raised and lowered as required. The 8 metre mast increased the range to 50 Km. The Fu 8 was a medium wave receiver c for the 835-3000 Kc/s. band while the earlier model b was for the 580-3000 Kc/s. band. The transmitter was a 30 watt unit operating between 1130 and 3000 Kc/s.

The final model of the radio vehicles seems to have been a general type with no specific radio sets mentioned in official documents. However, reports indicate that they were fitted with Fu 15 or Fu 16 for contact with assault gun formations, and with the Fu 10 when attached, for example, to armoured car groups. The Ordnance numbers for these vehicles were: SdKfz 250/3.I, SdKfz 250/3.II, SdKfz 250/3.III and SdKfz 250/3.IV.

The official list indicated that the next variant was ordered as a *Leichter Truppenluftschuetzpanzerwagen SdKfz 250/4*. This was to have been an anti-aircraft vehicle, but it never materialised and had been removed from the Ordnance list dated 7th June 1943. After the redesigned body was introduced the designation SdKfz 250/4 reappeared, this time for a *Leichter Beobachtungspanzerwagen*, an armoured observation vehicle specially for the assault gun formations. This was therefore a replacement for the earlier discontinued SdKfz 253 *Leichter Gepanzertes Beobachtungskraftwagen*. The observation equipment primarily consisted of a pivoting mount for a scissor's periscope type 14 Z Si, with an adjustable seat rotating with this equipment. As one would expect the radio sets were the Fu 15 and Fu 16 of the assault guns. The Fu 15 was an ultra-shortwave receiver h operating on the 23000-24950 Kc/s. band and the Fu 16 was a combination of an ultra-shortwave receiver h with a 10 watt transmitter h which also operated on the same wave-band. Two normal 2 metre rod aerials were used for these radios, and a third aerial for the Fu Spr.Ger. f intercom.

The SdKfz 250/5.I was also a *Leichter Beobachtungspanzerwagen* which was issued at a much earlier date to the artillery batteries. Since the radio equipment consisted of a Fu 8 and a Fu 4 the vehicle was difficult to distinguish from the radio vehicles SdKfz 250/3. Earlier models had a frame antenna for their Fu 8. The second version was in fact classed as a replacement for the first and was designated SdKfz 250/5.II. The main difference was the installation of the Fu 12 radio set. From 1944 these SdKfz 250/5.II were given a new official title *Leichter Aufklaerungs-*

panzerwagen or light reconnaissance vehicles. By this time only the late type of body would have been issued.

As already mentioned the special SdKfz 253 ammunition carrier for assault guns was discontinued in 1941. The replacement from the basic SdKfz 250 series was given the Ordnance number SdKfz 250/6. There were two models. The first was designated *Leichter Munitionspanzerwagen Ausf. A - fuer Sturmgeschuetz 7.5 cm. Kanone (Kurz) Ausf. A bis E*. As indicated by this official designation the carrier supported the assault gun batteries which were equipped with Sturmgeschuetz Ausf. A to E, that is those with the 7.5 cm. Stu.K L/24 cannon. These guns used a fairly small round of ammunition which was normally stored two to a small pressed steel box with a carrying handle. The SdKfz 250/6 Ausf. A had internal racks for 35 such boxes containing 70 rounds of ammunition. A trailer similar to that towed by the SdKfz 252 was used to transport a supplementary supply of ammunition. A crew of two had all the usual equipment provided in the SdKfz 250 series vehicles including one MG 34 as the main armament.

With the advent of the Sturmgeschuetz 40 Ausf. F and Ausf. G starting in 1942 a new model of the ammunition carrier had to be ordered. Externally similar to the Ausf. A the SdKfz 250/6 Ausf. B was internally modified to carry the long shells of the new more powerful 7.5 cm. Stu.K 40 cannons. The changes consisted of fitting a rack each side of the vehicle into which 30 canisters could be placed. These were tubular steel containers with a screw top; each carried one 7.5 cm. Stu.K. 40 round. A total of 60 rounds were carried internally; others might be towed in a trailer.

All the vehicles so far described were issued as transporters or carriers of equipment or men. The next five models were weapons carriers which were intended to act as fighting support vehicles. SdKfz 250/7 *Leichter Schuetzenpanzerwagen (Schwerer Granatenerwerfer)* mounted an 8 cm. Gr.W 34 mortar. In the centre of the fighting compartment was a fixed base which permitted a limited arc of traverse for the mortar. A mortar crew of three was accompanied by the usual vehicle commander and driver. Internal stowage was only for 21 boxes of mortar rounds due to the very crowded interior. However, it was essential to have a method of bringing the mortars into action quickly in support of the grenadiers who travelled in similar fast crosscountry vehicles. A normal ground base plate for the mortar was stowed on the rear of the carrier so that the mortar could be dismounted for firing and thus leave the carrier mobile. In order to provide a clear field of fire from within, these vehicles were never fitted with a forward machine gun position and its associated shield. However, there was a pivot mounting at the rear for the AA. MG 34 which was carried along with a field mounting inside the mortar carrier. To overcome the chronic shortage of mortar bomb space in the mortar carriers there was another version of the SdKfz 250/7 which was designated the *Leichter Schuetzenpanzerwagen (Munitionsfahrzeug)*. These Munitionsfahrzeug were identical to the mortar carrier, even having the fixed base plate to take a mortar, but by not installing a number of items, including the mortar itself, a total of 66 rounds could

be carried. A crew of only four also allowed the extra space for radio equipment in some of these vehicles. The normal MG 34 mounting at the front was provided. One Munitionsfahrzeug was issued for every two mortars and was commanded by the section leader. Where possible platoon commanders used the very same vehicle with the extra radio equipment, thus further increasing the ammunition supplies of the platoon.

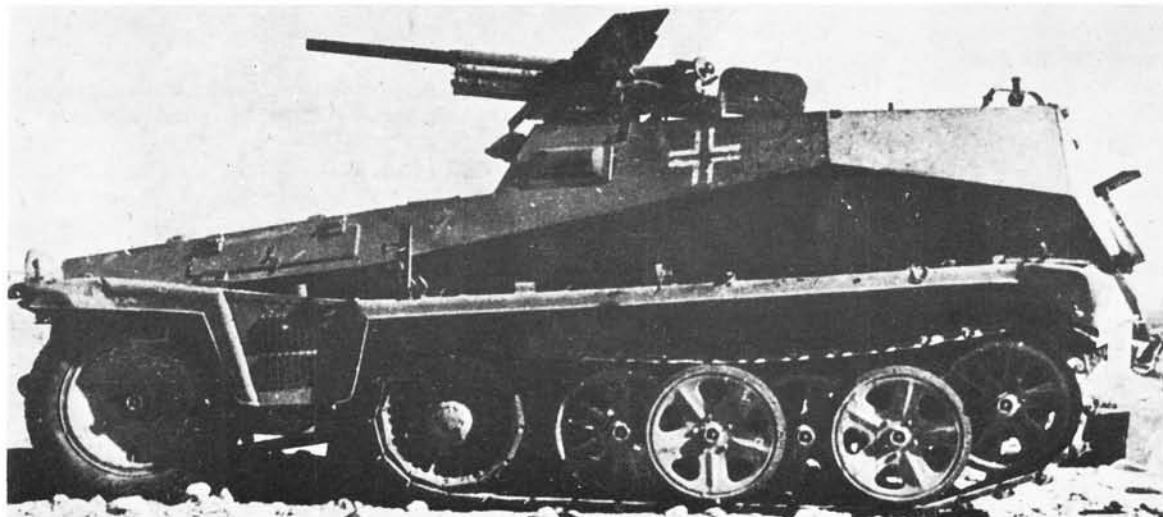
The designation **SdKfz 250/8** was reserved for a vehicle armed with the 7.5 cm. KwK 37 L/24 which was similar to the larger SdKfz 251/9. However, it was not until late 1943 that these *Leichter Schuetzenpanzerwagen mit 7.5 cm. KwK 37* actually entered production. The chassis was that of the late model SdKfz 250 and the mounting itself represented an improvement over earlier fittings in the SdKfz 251/9 and the SdKfz 233 armoured car. This mounting was fixed on top of the standard chassis and required no special structural modification unlike the earlier types. The silhouette was very high but speedy construction made this solution preferable. The 7.5 cm. KwK 37 L/24 became available in 1943 in large numbers when it was removed from the Panzerkampfwagen IV and Sturmgeschuetz for replacement by the long barrelled 7.5 cm. KwK 40 or Stu.K 40. Later models of the SdKfz 250/8 were also called *Leichter Schuetzenpanzerwagen fuer 7.5 cm. K.51 Sf.* A feature of these vehicles was the co-axial mounting for the MG 34 or MG 42 which permitted machine

gun fire to be laid on the target of the main armament. These vehicles were primarily seen as a replacement for the SdKfz 250/10 which was armed with the obsolete 3.7 cm. Pak anti tank gun.

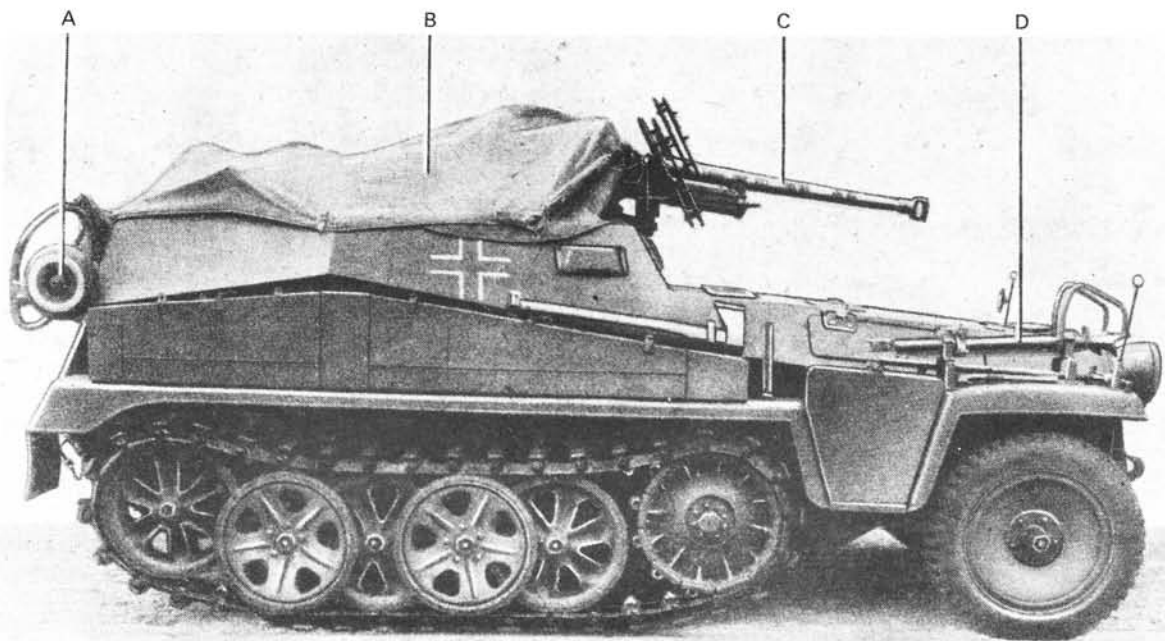
The **SdKfz 250/9** *Leichter Schuetzenpanzerwagen (2 cm.)* was a far more interesting vehicle than its official designation suggests. It was, in fact, a half-track armoured car introduced to make the operations of the reconnaissance patrols more effective. In Western Europe and North Africa the SdKfz 222 Horch 4 x 4 wheeled scout cars proved quite effective, but in Russia this was not the case and missions frequently failed due to the inability of these wheeled vehicles to negotiate the difficult roadless terrain especially during the winter. The urgency of this problem made it impossible to consider the design of new scout vehicles and the Ordnance department therefore ordered a compromise in the form of the SdKfz 250/9. The complete turret assembly of an SdKfz 222 armoured car was mounted on the SdKfz 250 body thus providing the troops with what was often unofficially known as the *Leichter Spaehpanzerwagen (2 cm.)* SdKfz 250/9. A crew of three operated these reconnaissance half-tracks. The basic vehicle was much the same as those of the SdKfz 250 series, but the rotating turret of the SdKfz 222 added a new dimension to its capabilities. The ten-sided turret was open topped so as to permit clear all-round vision. Wire mesh covers protected the crew from grenades and other such missiles. The armament was a 2 cm. KwK 38 L/55 autocannon with a coaxial MG 34. In addition to the 360 degree traverse provided by the turret mounting, the armament had an unusually high elevation of 80 degrees. This elevation made it possible to successfully engage air targets. 2 cm. ammunition was fed from ten-round boxes, so only limited automatic fire could be maintained. The radio equipment of these units was the Fu 12 already described. After 1943 the new pattern body was introduced and along with it came the new shaped



SdKfz 250/10 was armed with a 3.7 cm. Pak instead of the forward MG. (below)

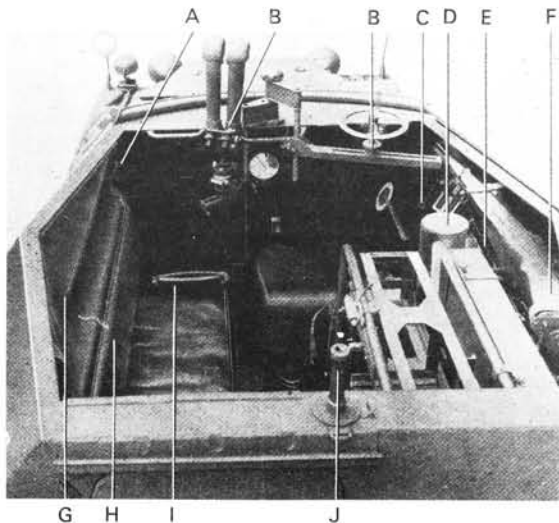


SdKfz 250/9 was a half-track armoured car which had the complete turret assembly of an SdKfz 222 armoured car on a SdKfz 250 body. The armament was a 2 cm. KwK 38 L/55 autocannon with a coaxial MG 34.



SdKfz 250/11 was similar to the SdKfz 250/10 but was armed with the 2.8 cm. schwere Panzerbuechse 41 which had a cone bore. A 2.8 cm. s.Pz.B. 41 field carriage wheel section B Tarpaulin cover C 2.8 cm. schwere Panzerbuechse 41 D Trail section of field carriage.

SdKfz 250/12 was an artillery survey vehicle. This view of the interior shows A Respirator B Scissors periscope and direction finder C 1 x MP 38 and ammunition D Tripod field mounting for dismantled use of periscope and direction finder E Stowed MG 34 F 4 x Kar 98K rifles G Baggage container H Cover hoops I Tarpaulin opening section J Pivot for AA MG 34 mount and armoured shield, or for survey equipment.



turret which was now in production for the SdKfz 234/1 eight-wheeled armoured car. By this time the four-wheeled cars were no longer manufactured. The turret was six-sided but other than that was similar to the earlier ten-sided type.

As early as 1940 the platoon leader of a grenadier unit was equipped with an SdKfz 251 in which a 3.7 cm. Pak anti-tank gun replaced the forward MG. A corresponding vehicle on the light half-track chassis was given the designation **SdKfz 250/10** and was introduced at an early stage. As on the SdKfz 251 there were several variations of gun shield protecting the gunners operating the 3.7 cm. Some vehicles had only the bare gun itself, others had a shield only for the gun layer, and finally there were those with the complete gun shield as found on the field mounting of the anti-tank gun.

Even by the time it was introduced on the SdKfz 250/10 the 3.7 cm. Pak was an ineffective and obsolete weapon and it was envisaged that all such units be replaced by the SdKfz 250/8 armed with the 7.5 cm. Due to production delays, however, the latter vehicle did not appear at the time expected and a replacement for the SdKfz 250/10 was found in the **SdKfz 250/11**, a similar vehicle armed with the 2.8 cm. s.Pz.B. 41. This light anti-tank gun was introduced for infantry use in late 1941. The main feature was the use of a cone bore. A 2.8 cm. round was squeezed down a cone-shaped barrel with the driving rings being forced into an annular recess in the shell. The effect was a greatly increased muzzle velocity as the round left

the 2 cm. muzzle, in this case over 4,600 feet per second. The performance at shorter ranges was far better than the 3.7 cm. Pak and the versatility of the SdKfz 250/11 was greatly increased since the s.Pz.B. 41 could be dismantled for field use. The gun wheels and carriage section were carried on the rear plate and the trail section on a rack along the right-hand front mudguard. The field carriage was of the "Airborne" variety, a very lightweight tubular unit normally issued to paratroops and airborne forces. Unlike the airborne gun a shield was provided for the crew. The official designation was *Leichter Schuetzenpanzerwagen (Schwere Panzerbuesche 41)*.

The final model of the SdKfz 250 which was shown on official Ordnance lists was the *Leichter Messtruppanzerwagen SdKfz 250/12*. This was an artillery survey vehicle equipped with an Fu 8 initially and with an Fu 12 in later models. A scissors periscope

with a special direction finder attachment could be mounted on either the front or rear MG pivots. A survey section of four men used these vehicles.

Obviously, with such a widely issued and much used vehicle as the SdKfz 250 there were many improvised modifications effected by field workshop units. These are of little importance to the overall story. However, pictorial evidence suggests that two further models were manufactured by factories rather than field units. It will be remembered that the *Leichter Truppenluftschuetzpanzerwagen* SdKfz 250/4 did not materialize and the designation was used for another vehicle. Photographs dating from late 1944 onwards indicate SdKfz 250 vehicles mounting 2 cm. Flak guns or 2 cm. KwK 38 in mountings suitable for anti-aircraft use. The second, apparently purpose-built version, is on display at the Yugoslav Military Museum in Belgrade. This version has a 5 cm. Pak 38 anti-tank gun. The interior of the vehicle is very carefully laid out and modified to suit the mounting of such a heavy weapon. The most notable change is the extension of the rear of the vehicle so that the back plate is at a negative angle unlike all others in the SdKfz 250 series. This vehicle used a post-1943 type body.

TACTICAL EMPLOYMENT

The tactical employment of the specialised types of SdKfz 250 is self-explanatory. The ammunition carriers and observation vehicles improved the performance of the assault gun batteries. The radio and telephone cable layers contributed to the communications of all branches of the Wehrmacht, while the survey vehicles supported the artillery batteries. The essential purpose of the SdKfz 250 *Leichter Schuetzenpanzerwagen* was to transport and provide support for the half groups of the armoured reconnaissance battalion or *Panzer Aufklaerungs Abteilung*. Obviously, the internal organisation of each *Panzer Aufklaerungs Abteilung* differed, depending upon the strength and location of the division to which it belonged; but the recommended requirements for these units indicated the importance of the SdKfz 250. The *Leichter Panzer Aufklaerungs Kompanie* was to incorporate four platoons each with seven SdKfz 250 vehicles, those of the first three platoons being the basic SdKfz 250/1 and, if available, the platoon leaders in the SdKfz 250/10 or SdKfz 250/11. The fourth platoon was the heavy support platoon and was normally to be equipped with four SdKfz 250/7 mortar carriers, two actually carrying the mortars while the section leader and platoon leader used the ammunition vehicles. Two SdKfz 250/8 armed with the 7.5 cm. KwK 37, and a section leader in an ammunition carrier completed the equipment. The headquarters section of the company used two SdKfz 250/3 radio vehicles.

Also in the battalion establishment for the 1944 type Panzer Divisions was the *Panzer Spaehwagen Kompanie* which had amongst its equipment twenty-five SdKfz 250 vehicles – sixteen being SdKfz 250/9 scout cars and the remaining nine being either SdKfz 250/8 (7.5 cm. KwK 37 guns) or basic vehicles. In the 1943 establishment there were sixteen SdKfz 250/9 and nine SdKfz 250/1 only. The total suggested establishment for the 1944 type Panzer Division was

fifty-five *le. SPW*. The *le. Panzer Spaehwagen Kompanie* of the *Panzer Grenadier Division* for 1943 and 1944 was also to have up to eighteen SdKfz 250 of various types.

The "Provisional Directive Program IV" which provided the guidelines for industry for 1945 was issued in mid-July 1944. This document shows that the SdKfz 250 was to be eliminated from production in favour of standardisation on the SdKfz 251 type, and with that in mind the establishment tables for Panzer and *Panzer Grenadier Divisions* for 1945 were adjusted to show only the SdKfz 251 in the *Panzer Aufklaerungs Abteilung*. This was logical since the material requirements for construction of the larger vehicle were not much greater while the simplification of manufacture would certainly have increased output. Versatility in the field would have been increased and above all spare parts duplication would have been eliminated. Finally, training would have been simplified. However, such measures were of little importance at such a late stage in the war with the Allied and Soviet Forces closing in on Germany.

SPECIFICATION

Designation: *Leichter Gepanzerter Mannschaftskraftwagen (le. MTW)*.
Designation from 1942: *Leichter Schuetzenpanzerwagen (le. SPW)*.
Ordnance No.: SdKfz 250.
Crew: 6 – commander and driver, 4 men of Infantry section in basic SdKfz 250/1.
Battle weight: 5.7 tons.
Dry weight: 5.4 tons.

Dimensions

Length overall: 15 ft.
Height: 5 ft.
Width: 6 ft. 4½ in.
Track centres/wheel base: 5 ft. 3½ in./5 ft. 2 in.
Track width: 8 in.

Main armament

See description of variants.

Communication

Varies between models, but all have Fu.Sp.Gr.f inter-vehicle radio telephone.

Armour

Homogeneous welded and riveted armour plate.
Hull: 14.5 mm. at 12°.
Glacis: 10 mm. at 83°.
Sides: 8mm. at 40° upper, and 28° lower.
Rear: 8 mm. at 23°.
Floor: 6 mm. horizontal.

Engine

Maybach HL 42 TUKRM or TUKRRM petrol, 6 cyl. in line. 4171 cc. 100 b.h.p. at 2,800 r.p.m. Fuel: 31 gallons in tank on rear right hand side of fighting compartment.

Transmission

Maybach Variorex VG 120128 H. 7 forward and 3 reverse speeds. Preselector gearbox.

Suspension

Front: transverse leaf spring, two tyres 600 x 20.
Rear: transverse torsion bars, forged steel tracks, rubber cushioned, lubricated, 38 links per track. Type Zpw 51/240/160 or cast links type Zgw 51/240/160.

Electrical system

Power supply and Generators: Starter Bosch EJD 1, 8/12. Generator Bosch RKC 300/12-1300. 12 volt battery 75 amps.

Performance

Max. road speed: 37 m.p.h.
Max. gradient: 24°.
Wading depth: 2 ft. 4 in.
Range: 186 miles on roads/109 miles cross country.

Special features

See SdKfz 250/1 to SdKfz 250/12 described in text.