



(Bundesrepublik Deutschland) Republic of Federal Germany



Flag Description: Three equal horizontal bands of black (top), red, and gold.

Background: As Europe's largest economy and second most populous nation, Germany remains a key member of the continent's economic, political, and defense organizations. European power struggles immersed Germany in two devastating World Wars in the first half of the 20th century and left the country occupied by the victorious Allied powers of the US, UK, France, and the Soviet Union in 1945. With the advent of the Cold War, two German states were formed in 1949: the western Federal Republic of Germany (FRG) and the eastern German Democratic Republic (GDR). The democratic FRG embedded itself in key Western economic and security organizations, the EC, which became the EU, and NATO, while the Communist GDR was on the front line of the Soviet-led Warsaw Pact. The decline of the USSR and the end of the Cold War allowed for German unification in 1990. Since then, Germany has expended

considerable funds to bring Eastern productivity and wages up to Western standards. In January 1999, Germany and 10 other EU countries introduced a common European exchange currency, the euro.

Geography. Location: Central Europe, bordering the Baltic Sea and the North Sea, between the Netherlands and Poland, south of Denmark. Geographic coordinates: 51 00 N, 9 00 E. Area: total: 357,021 sq km. Area - comparative: slightly smaller than Montana. Land boundaries: total: 3,621 km. Border countries: Austria 784 km, Belgium 167 km, Czech Republic 646 km, Denmark 68 km, France 451 km, Luxembourg 138 km, Netherlands 577 km, Poland 456 km, Switzerland 334 km. Coastline: 2,389 km. Climate: temperate and marine; cool, cloudy, wet winters and summers; occasional warm mountain (foehn) wind. Terrain: lowlands in north, uplands in center, Bavarian Alps in south. Natural resources: coal, lignite, natural gas, iron ore, copper, nickel, uranium, potash, salt, construction materials, timber, arable land. Natural hazards: flooding. Environment - current issues: emissions from coal-burning utilities and industries contribute to air pollution; acid rain, resulting from sulfur dioxide emissions, is damaging forests; pollution in the Baltic Sea from raw sewage and industrial effluents from rivers in eastern Germany; hazardous waste disposal; government established a mechanism for ending the use of nuclear power over the next 15 years; government working to meet EU commitment to identify nature preservation areas in line with the EU's Flora, Fauna, and Habitat directive. Geography - note: strategic location on North European Plain and along the entrance to the Baltic Sea. (CIA Factbook 2006)



Right: A Germany Army Fuchs in support of ISAF in Afghanistan circa 2010. Immediately behind is a German Army Dingo 4x4 APC. (Photo: ISAF)



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Germany 1890 to 1929

1906 Car, Armd, 4x2. Opel Kriegswagen

1908 Carr, Anti-Aircraft. Panzerkraftwagen Ehrhardt 5cm BaK.

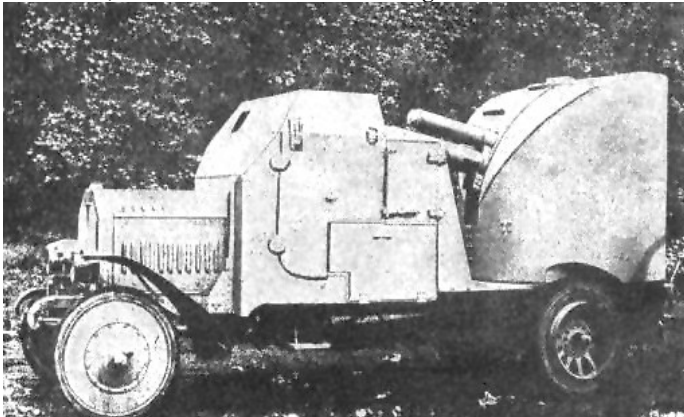


Above: The Panzerkraftwagen Ehrhardt 5cm BaK. (Photo: Author's collection)

Remarks: Development work started on the Panzerkraftwagen Ehrhardt in 1906 with testing continuing into 1908. The vehicle was intended to defeat the tethered observation balloons then common in European armies, and was based on the chassis of light truck. Using a 50 hp gasoline motor and chain drive to the rear wheels, the vehicle lacked cross country ability and it was difficult to fire the 5cm weapon in a full 360 degree circle. Work on the Ehrhardt was stopped in 1909 in favor of the Daimler-Krupp Panzerkraftwagen 5.7cm BaK.

Vehicle Data: Drive, 4x2. Armor, none. **Armament:** (1) Krupp 50 mm BaK. Elevation & traverse, manual. Fire Control, optical. **Capacity:** Fuel, gasoline. Crew, 4-5. **Engine:** Ehrhardt, 4-cylinder, gasoline, water-cooled engine, producing 50 hp (37 kW). Location, front. **Transmission:** Manual. Model, chain drive. **Suspension System:** Leaf spring. Wheels steerable, front pair. No of wheels, 4. **Usage:** Ehrhardt completed the one test vehicle. **Manufacturer:** Ehrhardt and Krupp, Germany.

1909 Carr, Anti-Aircraft. Panzerkraftwagen Daimler 5.7cm FlaK.



Above: The single Daimler-Krupp 5.7cm FlaK completed in 1909. (Photos: Daimler-Benz Archiv)

Remarks: A further improvement of the armored version of the Daimler-Krupp 5cm BaK. No production was undertaken as the German Command decided that an unarmored anti-aircraft vehicle would be sufficient to meet anticipated needs.

Vehicle Data: Drive, 4x4. Armor, .14 in (3.5 mm). NBC Protection, individual. **Armament:** (1) Krupp 57mm L/30 AA. Elevation & traverse, manual. Fire Control, optical. Aux wpns, crew sidearms. **Capacity:** Fuel, gasoline. Crew, 5. **Engine:** (1) Daimler, water-cooled, gasoline engine. Location, front. **Transmission:** Manual. **Suspension System:** Leaf spring. Wheels steerable, front pair. No of wheels, 4 (solid rubber front/pneumatic rear). **Performance:** Speed (est), 25 mph (40 km/h). **Usage:** Only the one prototype vehicle was completed, no production orders. **Manufacturer:** Daimler and Krupp, Germany.

1910 Veh, Recce, Schlater, 4x2

1913 Car, Armd, 4x2. Panz Auto

1915 Car, Armd, 4x2. Panzerkraftwagen Daimler Mod 1915.



Above: The single Daimler M1915 as received by the German Army. (Photo: Daimler-Benz)

Remarks: The Daimler armored car was active with Panzerkraftwagen-MG-Abteilung 1, with the German Army from 1916 to 1919 mostly on the Eastern Front. The Daimler was equipped with a wireless set, which could only be used when the vehicle was brought to a complete halt. Part of a three-car group being tested for further development (along with an Ehrhardt and Bussing-NAG), the Ehrhardt car ended up being chosen.

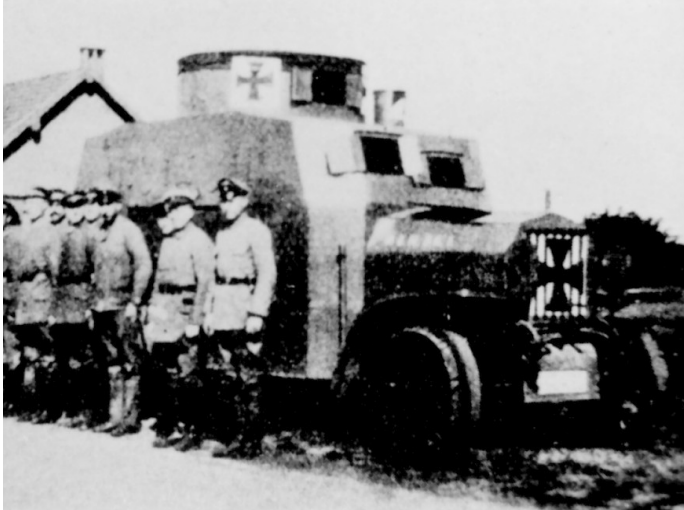
Vehicle Data: Weight loaded, 19,492 lbs (8849 kg). Length, 226 in (5740 mm). Width, 81 in (2057 mm). Height (est), 112 in (2845 mm). Armor, .2 to .28 in (5 to 7 mm). NBC Protection, individual. **Armament:** (3) 7.92 mm Maxim 08 MMG. Elevation & traverse, manual. Fire Control, optical. Aux wpns, crew side arms. **Capacity:** Fuel, Gasoline. Crew, 8-9. **Engine:** (1) Daimler 4-cylinder M1464 gasoline water-cooled engine producing 80 hp (59 kW) @ 1200 rpm. Location, front. **Transmission:** Manual. **Suspension System:** Leaf spring. Wheels steerable, front pair.



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No of wheels, 4 (duals at rear). *Performance:* Speed, 37 mph (60 km/h). Range, 155 mi (250 km). *Usage:* Only one prototype Daimler M1915 was completed. *Manufacturer:* Daimler MFb.

1915 Car, Armd, 4x4. Ehrhardt Mod 1915.

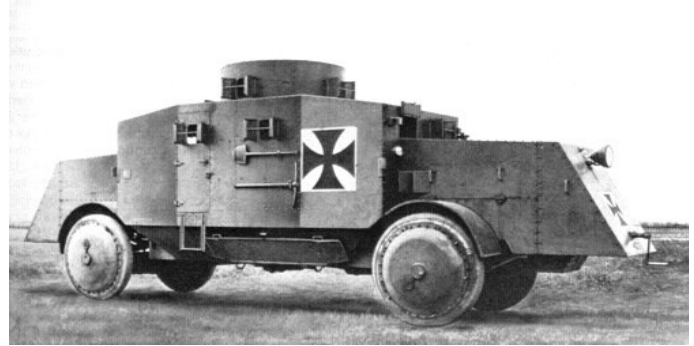


Above: The Ehrhardt 1915 with curved fenders. (Photo: Author's collection)

Remarks: In the early months of WWI, when German forces encountered Belgian and British armored cars on the Western Front, they were impressed with their possibilities. As a result, in October 1914, the German High Command ordered the design and construction of a set of armored cars. Three firms were asked to complete prototypes. Daimler, the Daimler/15, Bussing-NAG the A5P and Ehrhardt the E-V/4. All three were ready for testing by July 1915. The Daimler and Ehrhardt were very similar being standard four-wheel drive cars with a box body. The Bussing was the exception, with a very large, long, body. Even though the fighting had stalled in the west, the situation was still fluid in the east, and in the autumn of 1916 the three vehicles were formed into Panzerkraftwagen MG-Zug 1 and sent first to the Alsace and then to Romania fronts. There they met with promising results and in late 1916 more cars of the Ehrhardt type 1917 were ordered.

Vehicle Data: Weight loaded, 17,720 lbs (8745 kg). Length, 221 in (5613 mm). Width, 79 in (2007 mm). Height (est), 120 in (3048 mm). Drive, 4x4. Armor, unk. NBC Protection, individual. *Armament:* (3) 7.92mm MMG. Elevation & traverse, manual. Fire Control, optical. Aux wpns, crew sidearms. *Capacity:* Fuel, gasoline. Crew, 8-9. *Engine:* (1) Ehrhardt 4-cylinder, water-cooled, gasoline engine, producing 85 hp (63 kW). Location, front. *Transmission:* Manual with 4-fwd and 4-rev gears. *Suspension System:* Leaf spring. Wheels steerable, Front pair (two driving stations, front and rear). No of wheels, 4 (hard rubber tires). *Performance:* Speed/Land, 37 mph (60 km/h). Range, 155 mi (250 km). *Usage:* Only one Ehrhardt 1915 was completed, this is recognizable by its curved front fenders. *Manufacturer:* Ehrhardt, Düsseldorf, Germany.

1915 Car, Armd, 4x4. Panzerkraftwagen Bussing A5P.



Above: The single Bussing A5P. (Photo: Author's collection)

Remarks: One of the three cars completed in 1915 (the other two being the Ehrhardt M15 and Daimler M15). The largest of the three cars, it was found that the four-wheel drive incorporated in the design wasn't necessary as the vehicle was restricted to roads and hard surfaces regardless. Despite its large size the Bussing was reasonably successful but both Daimler and Bussing were committed to other manufacturing (including trucks) and the production order went to the Ehrhardt.

Vehicle Data: Weight loaded, 22,440 lbs (10188 kg). Length, 374 in (9500 mm). Width, 83 in (2108 mm). Height, 114.5 in (2908 mm). Ground Clearance, 12.5 in (320 mm). Drive, 4x4. Armor, .2 to .28 in (5 to 7 mm). NBC Protection, individual. *Armament:* (3) 7.92 mm Maxim 08 MMG. Elevation & traverse, manual. Fire Control, optical. Aux wpns, crew sidearms. *Capacity:* Fuel, gasoline. Crew, 8-9. *Engine:* (1) Bussing 6-cylinder gasoline water-cooled engine producing 90 hp (65 kW). *Transmission:* Manual with 5-fwd and 5-rev gears. *Suspension System:* Leaf spring. Wheels steerable, all-wheel steering. No of wheels, 4. Tire Size, unk (hard rubber). *Performance:* Speed, 25 mph (40 km/h). Range, 155 mi (250 km). *Usage:* Only one Bussing A5P was completed. The vehicle was used on the Eastern Front from at least 1916 to 1918. *Manufacturer:* Bussing NAG, Germany.

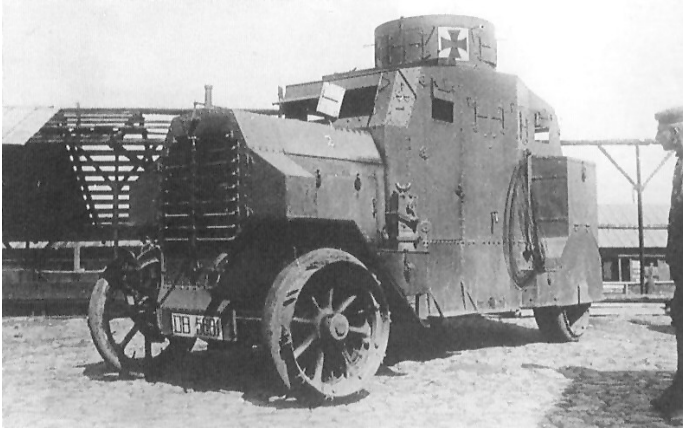
1916 Veh, Recce, Marien-Zwitter HT

1916 Carr, Pers, Armd, 4x4. Panzerkraftwagen, Mannesmann-Mulag



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1917 Car, Armd, 4x4. Ehrhardt Mod 1917.



Above: One of the Ehrhardt's still in use in 1919 for internal security. (Photo: Author's collection)

Remarks: In the autumn of 1916, with the selection in Ehrhardt as the new standard German armored car, twelve Model 1917 were completed and delivered in 1917. These first cars were used to equip Panzerkraftwagen MG-Zug 2,3,4,5 and 6. An additional 20 cars were ordered toward the end of 1917 with some of these cars appearing on the Ukrainian Front in 1918. A final order for a further 20 cars was issued and completed in 1919. A wireless set was standard on the Model 1917 but was unpopular with the crews; it took up a lot of space in the fighting compartment and could only be used when the car was at a complete stop. While not a groundbreaking design, the Ehrhardt was fairly reliable and met German requirements.

Vehicle Data: Weight loaded, 16,500 lbs (7491 kg). Length, 209 in (5300 mm). Width, 79 in (2000 mm). Height, 112 in (2850 mm). Ground Clearance, 14 in (350 mm). Wheel base, 154 in (3900 mm). Wheel tread, 63 in (1600 mm). Drive, 4x4. Armor, .16 to .35 in (4 to 9 mm). NBC Protection, individual. **Armament:** (6) Maxim 7.92mm MMG. Elevation & traverse, manual. Fire Control, optical. Aux wpns, crew sidearms. **Capacity:** Fuel, 50 gals (190 L) Gasoline. Crew, 8-9. **Engine:** Ehrhardt, 4-cylinder, water-cooled, gasoline engine producing 80 hp (59 kW) @ 1200 rpm. Location, front. **Transmission:** Manual with 4-fwd and 4-rev gears. **Suspension System:** Leaf spring. Wheels steerable, front pair (two driving stations front and rear. No of wheels, 4 (hard rubber). Tire Size, 6x48 in (160x1220mm). **Performance:** Speed, 37 mph (60 km/h). Range, 155 mi (250 km). **Usage:** A total of 52 Ehrhardt Model 1917s were completed over a three year period from 1917 to 1919. Captured Ehrhardts were also used by Poland, and in The Netherlands Ehrhardt bodies were switched to new chassis. **Manufacturer:** Ehrhardt, Düsseldorf, Germany.

1919 Car, Armd, 4x2. Notwagen (Trk chassis)

1920 Car, Armd, 4x2. Car, Armd, Imp, 4x2 (Kapp)

1920 Car, Armd, 4x2. DZVR SdKfz 3

1920 Veh, Recce. Kleinkraftwagen Maschinengewehr.



Above: Small Reichswehr reconnaissance cars from 1920. Although armed, the cars themselves were unarmored. (Photo: Author's collection)

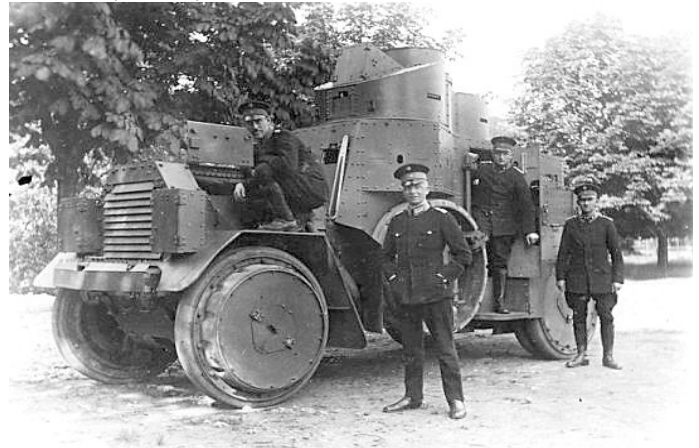
1921 Car, Armd, 4x2. Daimler Mod 1921

1921 Car, Armd, 4x2. Ehrhardt Mod 1921



Above: Post World War 1 German Ehrhardt armored car with full crew of ten.

1921 Car, Armd, 4x2. Ehrhardt SdKfz 3



Above: Ehrhardt SdKfz 3.



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1921 Car, Armd, 4x2. Schutzpolizei Sonderwagen, Benz

1921 Car, Armd, 4x2. Ursula (Trk chassis)

1928 Car, Armd, 4x4, Bussing NAG Streamlined

1928 Car, Armd, 6x4, sPzSpWg G3p

1929 Veh, Recce, Bussing-Nag ZRW 10x10

1929 Carr, Pers, Armd, 8x8. ARW/MTW I



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Germany 1930 to 1945

1931 Car, Armd, 6x6. Bussing-NAG Q31P



Above, armored cars employed by the Baden State Police at Karlsruhe, Germany, in the early 1930's. The 6 wheeler at left is a Bussing-NAG Q31P; while the vehicle to the right is a Daimler L2000 Pskw or Sonderkraftwagen Mercedes-Benz 14/31, that could double as an APC. Both vehicles started as prototypes.

1934 Car, Armd, 4x2. Maschinengewehr-kraftwagen Kfz 13.



Above: An SdKfz 13 during a pre-war exercise.

Remarks: Both the Kfz 13 Maschinengewehrkraftwagen (machine gun carrier) and the Kfz 14 Funkkraftwagen (radio carrier) were based on the same Adler 4x2 light passenger car chassis. Powered by a 6-cylinder gasoline engine producing 59 hp (43.5 kW), and carrying a .32 inch (8 mm) thick armored hull, both vehicles were still able to reach approximately 43.5 mph (70 km/h) on an improved surface and had acceptable if not outstanding cross-country performance. The major difference between the two vehicles was that while the Kfz 13 carried a single 7.92mm machine gun, the Kfz 14 had an antenna that could be folded upwards and carried only individual Top and Above: Maschinengewehr-kraftwagen Kfz 13s in the field. The top view shows just how small the early vehicles were with a

crew of two in the Kfz 13 and three in the Kfz 14 radio vehicle. The Kfz 13 had a 7.92mm light machine gun while the Kfz 14 had only crew weapons for protection. Both vehicles were issued to reconnaissance units starting in 1932 and remained in service until 1941 after seeing combat in both Poland and France. Approximately 150 Kfz 13s and 40 Kfz 14s were completed.

Vehicle Data: Weight empty, 4,700 lbs (2134 kgs). Weight loaded, 4,850 lbs (2202 kgs). Length, 165 in (4191 mm). Width, 67 in (1702 mm). Height, 59 in (1499 mm). Ground clr, 7.2 in (183 mm). Wheel base, 112 in (2845 mm). Wheel tread, 56 in (1422 mm). Drive, 4x2. Armor, .32 in (8 mm). NBC protection, individual. **Armament:** (1) 7.92 mm MG13 or MG34. Elevation, -35 to +65 degrees. Traverse, manual. Fire control, optical. Aux wpns, crew side arms. **Capacity:** Fuel, gas 18.5 gals (70 liters). Ammo/Qty, (7.92mm) 1000 rds. Crew, 2. **Engine:** (1) Adler Standard 2.9 L gasoline engine producing 59 hp (43.5 kW). No. of Cyls, 6. Location, front. Cooling, liquid. **Transmission:** Manual. Gear Fwd/Rev, 4/1. Mfr, Adler. **Suspension System:** Leaf spring. Steering, front axle. No/wheels, 4. Tire Size, 6.75x18. **General Data:** Radio, as fitted by user. **Performance:** Speed, 43.5 mph (70 km/h). Range, 155 mi (250 km). Fording depth (est), 12 in (305 mm). **Usage:** German Army during the 1930's and WWII. **Manufacturer:** Chassis, Adlerwerke. Armored hull, Deutsche Edelstahlwerke.

1934 Veh, Cmd, Funkkraftwagen Kfz 14.



Above: Even though pressed into continued service, the Kfz 14 was obsolete by the start of WWII.

Remarks: Both the Kfz 14 Funkkraftwagen (radio carrier) and Kfz 13 Maschinengewehr-kraftwagen (machine gun carrier) were based on the same Adler 4x2 light passenger car chassis. Powered by a 6-cylinder gasoline engine producing 59 hp (43.5 kW), and carrying a .32-inch (8 mm) thick armored hull, both vehicles were still able to reach approximately 43.5 mph (70 km/h) on an improved surface and had acceptable if not outstanding cross-country performance. The major difference between the two vehicles was that while the Kfz 13 carried a single 7.92mm machine gun, the Kfz 14 had an antenna that could be folded upward and carried only individual weapons



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for protection. Both vehicles were issued to reconnaissance units starting in 1932 and remained in service until 1941 after seeing combat in both Poland and France. While approximately 150 Kfz 13s were built, only 40 Kfz 14s were completed.

Vehicle Data: Weight empty, 4,700 lbs (2134 kgs). Weight loaded, 4,850 lbs (2202 kgs). Length, 165 in (4191 mm). Width, 67 in (1702 mm). Height, 59 in (1499 mm). Ground clr, 7.2 in (183 mm). Wheel base, 112 in (2845 mm). Wheel tread, 56 in (1422 mm). Drive, 4x2. Armor, .32 in (8 mm). NBC protection, individual. **Armament:** (1) 7.92 mm MG13 or MG34. Elevation, -35 to +65 degrees. Traverse, manual. Fire control, optical. Aux wpns, crew side arms. **Capacity:** Fuel, gas 18.5 gals (70 liters). Ammo/Qty, (7.92mm) 1000 rds. Crew, 2. **Engine:** (1) Adler Standard 2.9 L gasoline engine producing 59 hp (43.5 kW). No. of Cyls, 6. Location, front. Cooling, liquid. **Transmission:** Manual. Gear Fwd/Rev, 4/1. Mfr, Adler. **Suspension System:** Leaf spring. Steering, front axle. No/wheels, 4. Tire Size, 6.75x18. **General Data:** Radio, (3) as fitted by user. **Performance:** Speed, 43.5 mph (70 km/h). Range, 155 mi (250 km). Forging depth (est), 12 in (305 mm). **Usage:** German Army during the 1930's and WWII. **Manufacturer:** Chassis, Adlerwerke. Armored hull, Deutsche Edelstahlwerke.

1934 Car, Armd, 8x8, sPzSpWg SdKfz 231



Above: Pre-WWII SdKfz 231 six-wheeled reconnaissance vehicle.

1935 Car, Armd, 4x4, 1e PzSpWg SdKfz 221.

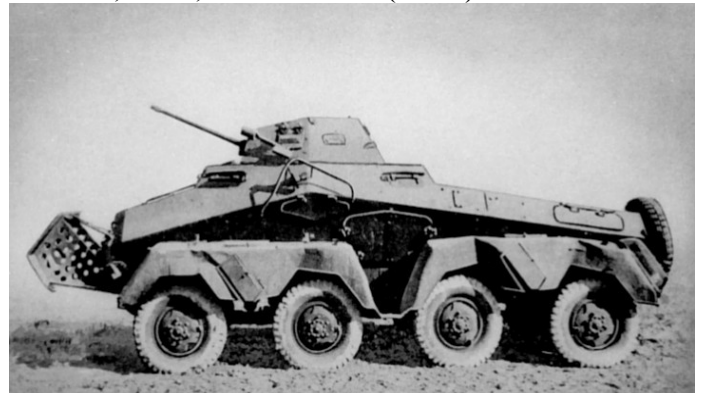


Above: Early SdKfz 221, note lack of radio antenna.

Remarks: Developed in 1934 as a replacement for the Kfz 13/14 series of light armored vehicles. Production started in 1935 and ran through 1939 with an estimated 340 SdKfz 221 vehicles being completed. Rather than using a light chassis as on the Kfz 14, a standard Horch heavy four-wheeled passenger car chassis with armored body and turret was used giving greater interior volume for the crew and better protection. The turret was small and open topped carrying a single 7.92mm MG 34 machine gun. A few cars were later fitted with the taper bore 28mm sPzB 41 anti-tank rifle. Although obsolete, by the start of World War II, both the SdKfz 221 and 222 continued in service (although in diminishing numbers) until the end of the war.

Vehicle Data: Weight loaded, 10,500 lbs (4767 kgs). Length, 189 in (4800 mm). Width, 79 in (2007 mm). Height, 71 in (1803 mm). Ground clr, 7.75 in (197 mm). Wheel base, 110 in (2794 mm). Wheel tread, 63 in (1600 mm). Drive, 4x4. Armor, .2 - .31 in (5 - 8 mm). NBC protection, individual. **Armament:** (1) 7.92mm LMG MG34. Elevation, manual. Traverse, 360 deg manual. Fire control, optical. **Capacity:** Fuel, 29 gals (110 liters) gasoline. Ammo/Qty, 7.92mm (1050 rds). Crew, 2. **Engine:** Gasoline V8. HP, 75 hp (55.4 kW). Model, 3.5 Liter. Mfr, Horch. No. of Cyls, 8. Location, rear. Cooling, liquid. **Transmission:** Manual. Gear Fwd/Rev, 5/1. Model, Sliding pinion. Mfr, Büssing-NAG. **Suspension System:** Coil spring. Steering, four wheel. Turning radius, 26 ft 3 in (8 m). No/wheels, 4. Tire Size, 8.27x18. **Performance:** Speed, 56 mph (90 km/h). Range, 175 mi (281.5 km). Forging depth, 23.6 in (600 mm). Max grade, 35 % (20 deg). Trench, 49 in (1240 mm). Step, 9.8 in (250 mm). **Usage:** Besides service with the German Army, 18 were sold to China along with 12 SdKfz 222 in 1938. **Manufacturer:** Primary contractor, Eisenwerk Weserhütte AG.

1936 Car, Armd, 8x8, SdKfz 231 (8-Rad).



Above: SdKfz 231 (8-Rad), the vehicle was able to cross a ditch up to four feet one inch (or 1.24 meters) wide. (Photo: U.S. Army)

Remarks: The SdKfz 231 (8-rad) was developed as a replacement for the 6x4 SdKfz 231 (6-rad), using the Büssing-NAG 8x8 GS chassis with an armored body. While cross-country and road performance were improved, the price was a complicated vehicle. The 8-rad sported all-wheel drive and steering, and independent suspension, all driven by a 155 hp (later 180 hp) V8



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engine. In all 1250 vehicles were completed in four sets, the SdKfz 231 (with a 20mm cannon and 7.92mm machinegun in rotating turret); the SdKfz 232 (fu) (same as the 231, but with a large "bed frame" radio antenna mounted above the turret); the SdKfz 233 (this vehicle mounted a short barrel 75mm cannon in a fixed forward mount) and finally the SdKfz 263 Schwerer Panzerfunkwagen (command vehicle with extra antenna and raised housing over the crew compartment).

Vehicle Data: Weight empty, 16,648 lbs (7550 kgs). Weight loaded, 18,302 lbs (8300 kgs). Length, 230 in (5850 mm). Width, 92.5 in (2350 mm). Height, 86.5 in (2200 mm). Ground clearance, 10.5 in (270 mm). Wheel base, 161.5 in (4102 mm). Wheel tread (est), 76.5 in (1943 mm). Drive, 8x8. Armor, 2-5.7 in (5-14.5 mm). NBC protection, individual. **Armament:** Main – Cal, (1) 20mm KwK 30 L/55. Elevation, 360 deg (manual). Traverse, -10 to +26 degrees. Fire control, optical TZF 6. Aux wpns, (1) 7.92mm MG 34 (coax mount). **Capacity:** Fuel, gasoline 39.6 gals (150 liters). Ammo/Qty, 20mm (180 rds), 7.92mm (2100 rds). Crew, 4. **Engine:** (1) Büssing-NAG L8V-G gasoline engine producing 150 hp (111 kW) @ 3000 rpm. Location, rear. Cooling, liquid. **Transmission:** Büssing-NAG GS, manual with 6-Fwd and 6-Rev gears. **Suspension System:** Leaf spring. Steering, all wheel. Turning radius, 34.5 ft (10.5 m). No/wheels, 8. Tire Size, 8.25x18. **Performance:** Speed, 53 mph (85 km/h). Range, 186 mi (300 km). Forging depth, 39 in (1000 mm). Max grade, 45 %. Trench, 49 in (1240 mm). Step, 19 in (480 mm). **Usage:** Used by the German military from 1936 until the end of WWII, although production switched to the SdKfz 234 series in 1942. **Manufacturer:** F. Schichau, Elbing, Germany.

1936 Car, Armd, 4x4, 1e PzSpWg SdKfz 222.



1936 Car, Armd, 6x4, sPzSpWg SdKfz 232 (Fu) (6-Rad)



Above: The early SdKfz 232 six-wheeled reconnaissance and radio car. (Photo: National Archives)

1936 Car, Armored, 8x8. SdKfz 232 (Fu) (8-Rad)



Above: A 232 with the Waffen-SS carrying a frame antenna. Some vehicles also included a telescoping high power antenna on the rear deck. (Photo: Author's Collection)

Remarks: The SdKfz 232 (Fu) (8-rad) was developed along with the SdKfz 231 (8-rad) and was identical except for weight, height over the frame antenna and minor internal details. The



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large antenna was attached to the turret with a three armed brace centered on a pivot. While the vehicle weapons were able clear the antenna supports on the rear deck it was still possible to damage the supports when firing over the rear deck or firing at high angles. Crew for the vehicle remained at four with the addition of a medium power radio and receiver fitted.

Vehicle Data: Weight empty, 16,978 lbs (7700 kgs). Weight loaded, 19,404 lbs (8800 kgs). Length, 230 in (5850 mm). Width, 92.5 in (2350 mm). Height, 114 in (2900 mm). Ground clearance, 10.5 in (270 mm). Wheel base, 161.5 in (4102 mm). Wheel tread (est), 76.5 in (1943 mm). Drive, 8x8. Armor, 2-57 in (5-14.5 mm), NBC protection, individual. **Armament:** Main – Cal, (1) 20mm KwK 30 L/55. Elevation, -10 to +26 deg (manual). Traverse, 360 degrees. Fire control, Optical TZF 6. Aux wpns, (1) 7.92mm LMG. **Capacity:** Fuel, gasoline 39.6 gals (150 liters). Ammo/Qty, 20mm (180 rds), 7.92mm (2100 rds). Crew, 4. **Engine:** (1) Büssing-NAG L8V-G gasoline engine producing 150 hp (111 kW) @ 3000 rpm. Location, rear. Cooling, liquid. **Transmission:** Büssing-NAG GS, manual with 6-Fwd and 6-Rev gears. **Suspension System:** Leaf spring. Steering, all wheel. Turning radius, 34.5 ft (10.5 m). No/wheels, 8. Tire Size, 8.25x18. **Performance:** Speed, 53 mph (85 km/h). Range, 186 mi (300 km). Fording depth, 39 in (1000 mm). Max grade, 45 %. Trench, 49 in (1240 mm). Step, 19 in (480 mm). **Usage:** Used by the German military from 1936 until the end of WWII. By late WWII the large frame antenna had been replaced by rod antenna. **Manufacturer:** F. Schichau, Elbing, Germany.

1936 Veh, Cmd, Panzerfunkwagen SdKfz 263.



Above: Heavy Armored Communications Car during the Polish Campaign.

1936 Veh, Cmd, le PzSpWg (Fu) SdKfz 223.



1936 Veh, Util, Car, Light, 4x4 (Tempo G1200)

1937 Veh, Cmd, s. gl. gp. Pkw SdKfz 247 (6 rad) Krupp

1937 Vehicle, Command, 8x8. Schwerer Panzerfunkwagen SdKfz 263 (Fu) (8-Rad).



Above: SdKfz 263 (fu) (8-Rad) showing the early deep blue-gray color scheme.

Remarks: The Schwerer Panzer-funkwagen (s.Pz.Fu.Wg) SdKfz 263 (8-Rad) was introduced in 1937 as part of the heavy armored reconnaissance series with production running through January of 1942 when the vehicle was dropped in favor of the 250/251 halftrack series with the better cross-country performance. While the chassis remained the same as the 231 and 232 (8-rad), the armor hull was only produced by the Deutschen-Werke in Kiel. As first introduced the vehicle had a large frame antenna but by the end of production large rod antenna had been introduced.



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Vehicle Data: Weight empty, 16,648 lbs (7550 kgs). Weight loaded, 19,139 lbs (8680 kgs). Length, 230 in (5850 mm). Width, 92.5 in (2350 mm). Height, 114 in (2900 mm). Ground clr, 10.5 in (270 mm). Wheel base, 161.5 in (4102 mm). Wheel tread (est), 76.5 in (1943 mm). Drive, 8x8. Armor, .2-.57 in (5-14.5 mm). NBC protection, individual. *Armament:* (1) 7.92mm MG34. Elev & Trav, ball mount in front of command structure. Fire control, optical. Aux wpns, crew sidearms. *Capacity:* Fuel, gasoline 39.6 gals (150 liters). Ammo/Qty, 7.92mm (1000 rds). Crew/Pass, 5. *Engine:* (1) Büssing-NAG L8V-G, gasoline, 150 hp (111 kW), V8. Location, rear. Cooling, liquid. *Transmission:* Manual. Gear Fwd/Rev, 6-Fwd and 6-Rev. Model, Büssing-NAG GS. *Suspension System:* Leaf spring. Steering, all wheel. Turning radius, 34.5 ft (10.5 m). No/wheels, 8. Tire Size, 8.25x18. *General Data:* Elec voltage, 24V. Radio, High Power. Night Vision: as fitted by user. *Performance:* Speed, 53 mph (85 km/h). Range, 186 mi (300 km). Forging depth, 39 in (1000 mm). Max grade, 45 %. Trench, 49 in (1240 mm). Step, 19 in (480 mm). *Usage:* Used by the German military from 1937 until the end of WWII. By late WWII the large frame antenna had been replaced by rod antenna. *Manufacturer:* Deutschen-Werke, Kiel, Germany.

1938 Veh, Cmd, s. gl gp. Pkw SdKfz 247 (4 rad)

1939 Car, Armd, 4x2. Car, Armd, Imp, Danzig

1940 Car, Armd, 4x4, Panhard AMD 178 (PzSpWg P-204).



Above: PzSpWg P-204 in service with a Waffen-SS unit. (Photo: Author's collection).

Remarks: Captured French AMDs were used by German forces, (see France for vehicle details).

1940 Car, Recce Pkw. K1 Type 82.

1941 Veh, Recce. Beute Panzer (Dingo Mk I).



Above: Captured British Dingo Mark I Scout Car in North Africa.

Remarks: (see UK for vehicle details).

1941 Car, Armd, 6x4. Beute Panzerspähwagen L202 (Dutch M36).



Above: Captured Dutch M36 rebuilt and used by German occupation forces.

Remarks: The Netherlands had two nearly identical versions of the Landsverk 6x4 armored cars. Both the M36 and M38 were listed as Panzerspähwagen L202 in German service (see Netherlands for vehicle details).



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1941 Car, Armd, 6x4. Beute Panzerspähwagen L202 (Dutch M38).



Above: Dutch M38 (PzSpw L202) captured and put into German service. (Photo: Author's Collection)

Remarks: The Netherlands had two nearly identical versions of the Landsverk 6x4 armored cars. Both the M36 and M38 were listed as Panzerspähwagen L202 in German service (see Netherlands for vehicle details).

1941 Car, Armd, 6x4. Beute Panzerspähwagen Ba-203(r) (Russian BA-10).



Above: Typical Russian BA-10 put back in service with German forces as the Ba-203(r).

Remarks: A fairly large number of these cars were put into service with some lasting until 1945.

1941 Car, Armd, 4x4. Le. Sp. Beute Panzerdraisine (Marmon-Herrington Mk 3).



Above: Captured M-H Mk 3 in German service in North Africa. (Photo: Author's collection).

Remarks: Among the captured vehicles used in North Africa was the Marmon-Herrington Mk 3 (Early) other wise known as the South African Reconnaissance Car, Mk 3. With the difficulty of delivering replacement vehicles to the North African theater, both sides began to use whatever operable vehicles they could piece together, no matter what their origins. At least one Mark 3 was modified to run on railroad tracks (see South Africa for vehicle details).

1941 Veh, Cmd. Marmon-Herrington Armored Car Mk 3 (Beute).

Remarks: Like the Marmon-Herrington AC Mk 2 before it, in order to provide armored command vehicles able to keep up with the mobile reconnaissance and armored units, British and Commonwealth forces converted damaged or excess Marmon-Herrington Mk 3 cars by removing the turret and adding extra radios. Some of these cars were captured by Germany and pressed into service with their units as well.

Data: Weight loaded (est), 12,500 lbs (5675 kg). Length, 209 in (5309 mm). Width, 90.5 in (2299 mm). Height, 72 in (1829 mm). Ground Clearance, 11 in (279 mm). Wheel base, 117.5 in (2985 mm). Wheel tread, 60 in (1524 mm). Drive, 4x4. Armor, .24 to .47 in (6 to 12 mm). *Armament:* (1) Light machine gun. Aux wpns, crew sidearms. *Capacity:* Fuel, 40 gals (151 liters) gasoline. Crew, 3. *Engine:* Ford, V8 producing 95 hp. *Transmission:* Manual, 4-fwd and 1-rev gear w/2-spd trnsf.



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Suspension System: Leaf spring. Wheels steerable, front pair. No of wheels, 4. *General Data:* Radio, as fitted by user. *Performance:* Speed, 55 mph (88.5 km/h). Range, 200 mi (322 km). *Usage:* Pressed into service with the German forces in North Africa. *Manufacturer:* Converted in Field Maintenance and Depot shops by British and Commonwealth forces.

1941 Car, Armd, 8x8. SdKfz 233 (7.5cm) (8-rad).



Top: SdKfz 233 (7.5cm) (8-Rad) captured in Tunisia by American Forces. This vehicle had only been introduced in late 1942. (Photo: US Army)

Remarks: 199 SdKfz 233 (7.5cm) vehicles were built new or converted from existing radio and reconnaissance vehicles with the first introduced to combat units in October of 1942. A fairly mobile vehicle, the KwK 37 L/24 cannon besides smoke and high explosive four anti-tank rounds were also available. The high explosive round had a range of 4923 yds (4500 m) while at 1094 yds (1000 m) the cannon was able to defeat from 1.4 in (35 mm) to 3.9 in (100 mm) of armor plate at 30 degrees angle.

Vehicle Data: Weight empty, 16,648 lbs (7550 kgs). Weight loaded, 18,919 lbs (8580 kgs), Length, 230 in (5850 mm). Width, 92.5 in (2350 mm). Height, 86.5 in (2200 mm). Ground clearance, 10.5 in (270 mm). Wheel base, 161.5 in (4102 mm). Wheel tread (est), 76.5 in (1943 mm). Drive, 8x8. Armor, .2-.57 in (5-14.5 mm). NBC protection, individual. *Armament:* Main – Cal, (1) 7.5cm KwK 37 L/24. Elevation, -10 to +12 degrees. Traverse, 12 degrees left and right of center. Fire control, optical Rblf 32. Aux wpns, (1) 7.92mm MG42. *Capacity:* Fuel, gasoline 39.6 gals (150 liters). Ammo/Qty, 7.5cm (32 rds). 7.92mm (1500 rds). Crew, 3. *Engine:* Type, gasoline. HP at Rev/Min, 180 hp (133 kW). Model, L8V-G. Mfr, Büssing-NAG. No. of Cyls, V8. Location, rear. Cooling, liquid. *Transmission:* Type, manual. Gear Fwd/Rev, 6-Fwd and 6-Rev. Model, GS. Mfr, Büssing-NAG. Turning radius, 34.5 ft (10.5 m). No/wheels, 8. Tire Size, 8.25x18. *Performance:* Speed/Land, 49.5 mph (80 km/h). Range, 186 mi (300 km). Fording depth, 39 in (1000 mm). Max grade, 45 %. Trench, 49 in (1240 mm). Step, 19 in (480 mm). *Usage:* Used by the Ger-

man military during WWII. *Manufacturer:* F. Schichau, Elbing, Germany.

1941 Veh, Cmd, kl Pz Fu Wg 4x4 SdKfz 260

1941 Veh, Cmd, kl Pz Fu Wg 4x4, SdKfz 261

1942 Veh, Cmd, Panzerfunkwagen 8 rad SdKfz 263.

1943 Car, Armd, 6x4. Chevrolet 1937.



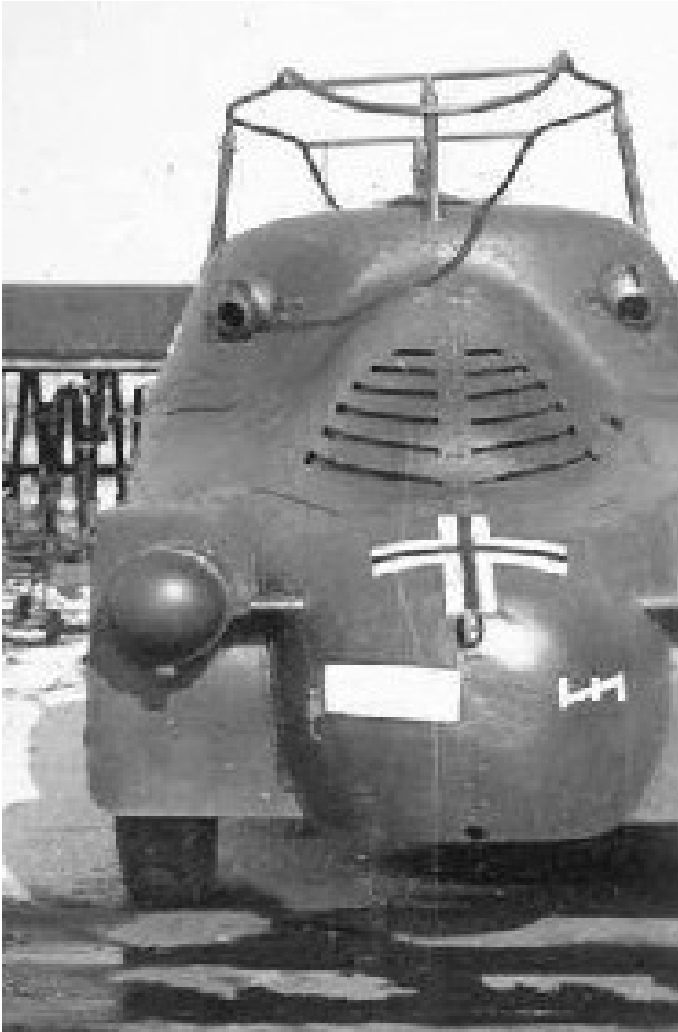
Above: Ex-French, Ex-Spanish Autometralladora Blindado medio Chevrolet 1937. The car illustrated has a 37mm French cannon in the turret.

Remarks: It appears that at least a few of these cars were impounded by the French at the end of the Spanish Civil War when retreating units brought them across the border into France. These same cars were then captured by German forces and sent to the Eastern Front.



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1943 Car, Armd, 4x4. Skoda PA-II.



Above: Skoda PA-II of the 2nd Panzer Division as seen from the rear.
Remarks: (See Czechoslovakia for vehicle details).

1943 Car, Armd, 6x4. Car, Armd, Imp, GAZ-AAA

1943 Car, Armd, 8x8. sPzSpWg 234/2

1943 Car, Armd, 8x8. sPzSpWg 234/3 (75mm How)

1943 Car, Armd, 8x8. sPzSpWg SdKfz 234/1

1944 Car, Armd, 4x2. Lancia IZM.



Above: Italian Lancia in service with German units in Northern Italy.
Remarks: (see Italy for vehicle details).

1944 Car, Armd, 8x8. sPzSpWg 234/4 (75mm PAK)



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WEST GERMANY 1946 TO 1990

1950 Car, Armd, 6x6. M8 Light Armored Car.



Above: M8 Greyhound with 37mm cannon removed and converted to a border patrol vehicle. Photo: Author's collection.

Remarks: Used by West German Border Police, these cars had the 37mm gun removed (see US for vehicle details).

1955 Veh, Util, Car, Field, 4x4, Cmd, P2M (E Ger)

1955 Veh, Util, Lastkraftwagen, Kubel, ¾-ton, 4x4

1956 Veh, Util, Trk, Util, ¼-ton, 4x4 Munga F91/4

1958 Veh, Util, Unimog S404 1 ½-ton 4x4

1960 Car, Armd, 4x4, Henschel HW R07

1960 Carr, Pers, Armd, 4x4. Unimog U34/411

1962 Veh, Util, Kubelwagen 0.75-MP P3

1963 Car, Armd, 4x4, Henschel HW R40

1963 Car, Armd, 4x4, Henschel HW R42

1963 Car, Armd, 4x4, Henschel HW R44

1963 Carr, Pers, Armd, 4x4. Geschutzter Sonderwagen SW1

1963 Carr, Pers, Armd, 4x4. Henschel HW R41

1963 Veh, Cmd, Henschel HW R45

1963 Veh, Util, Henschel HW R46

1964 Car, Armd, 4x4, Spahpanzer (Daimler-Benz) Unimog SH

1966 Car, Armd, 4x4, Sondernwagen SW 2

1968 Veh, Recce, Transportpanzer (4x4) TPZ 2

1969 Carr, Pers, Armd, 4x4. Rheinstahl-Henschel UR-416. At least 130 vehicles were delivered to Peru for internal security operations.

1969 Veh, Util, Unimog 416 2 ½-ton 4x4

1969 Veh, Util. VW181 Kurier, 4x2.



Above: Type 181 with soft-top and brush guards. (Photo: Author's collection)

Remarks: In the 1960's. West Germany, France and Italy were waiting for the development of a tri-service vehicle to replace their aging 0.25-ton utility vehicles. When it became evident that development was going to take longer than expected, the Bundeswehr put forward a requirement for an interim vehicle. Volkswagen put forward the Type 181 and from 1969 to 1972 built over 16,000 vehicles for the West German requirements. While further production started in Mexico from 1973 to 1980. In total over 70,000 vehicles were completed by all sources. The last remaining vehicles were still found in service until at least the late 1990's.

Vehicle Data: Weight empty, 1,985 lbs (900 kg). Weight loaded, 2,955 lbs (1340 kg). Length, 149 in (3780 mm). Width, 64.5 in (1640 mm). Height, 64 in (1620 mm). Grd clearance, 8 in (203 mm). Wheel base, 94.5 in (2400 mm). Wheel tread, front 52 in (1324 mm), rear 56 in (1416 mm). Drive, 4x2. Armor, n/a. NBC protection, individual. **Armament:** LMG. **Capacity:** Fuel, gas 10.5 gals (40 liters). Crew/Pass, 2/2. Cargo Vol/Wgt, 10.7 cu ft (.3 cuM). **Engine:** (1) rear-mounted, VW model 1500 air-cooled, 4-cyl gasoline engine producing 46 hp (34 kW). **Transmission:** Manual, with 4-fwd and 1-rev gears. Mfr, VW. **Suspension System:** Torsion bar. Steering, front axle. Turning radius, 18 ft (5.6 m). No/wheels, 4. Tire Size, 6.50x15. **General Data:** Elec voltage, 12V. **Performance:** Speed/Land, 62 mph (100 km/h). Range, 217 mi (350 km). Max grade, 55%. **Usage:** Used by Austria, Belgium, Denmark, France (units in W Germany), West Germany (approx 16,000), Greece (including Greek Navy), Indonesia (assembled from kits), Mexico (built in Mexico), Morocco, The Netherlands (Air Force), and Turkey. **Manufacturer:** Volkswagen-Germany and Volkswagen-Mexico.

1970 Carr, Pers, Armd, 4x4. Mercedes-Benz LG 496

1970 Carr, Pers, Armd, 8x8. Mercedes-Benz LG 495



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1971 Veh, Util, Kraka 640 4x4
1975 Veh, Recce, Spah Pz 2 Luchs. As of December 2003, Germany held 408 SpPz Luchs.
1976 Veh, Util, Lastkraftwagen 0.5-ton VW Iltis
1976 Veh, Util, MB 240GD 4x4
1978 Veh, Recce, Thyssen-Henschel 4x4 TM-90.
1978 Carr, Pers, Armd, 4x4. Thyssen-Henschel Condor. Remarks: Vehicles were supplied to: Malaysia (500), and Portugal (10), Uruguay (?) 1980.
1979 Carr, Pers, Armd, 6x6. TPz-1 Fuchs.
Remarks: Carriers were delivered to: Iraq (20) after OIF, and (64) vehicles to the United Arab Emirates. As of December

2003, Germany had 359 TPz-1s on hand.
1980 Carr, Pers, Armd, 8x8. TPz 8x8.
1981 Carr, Anti-Aircraft, Krauss Maffaei Wildcat
1984 Veh, Recce, Desert Fox, 4x4.
1984 Veh, Recce, TH-400, Radpanzer, 6x6
1984 Veh, Recce, Thyssen-Henschel 4x4 TM-170
1985 Carr, Anti-Aircraft, Fla Rak Rad 8x8 Roland
1986 Carr, Pers, Armd, 8x8. Daimler-Benz EXF Tech Demonstrator
1988 Carr, Pers, Armd, 4x4. Geschutztes Fahrzeug TH 444.



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**EAST GERMANY: GERMAN
DEMOCRATIC REPUBLIC
(DDR) 1946 TO 1990**

GEOGRAPHY *Size:* Approximately 108,568 square kilometers, including East Berlin. *Topography:* The former DDR was located on the northern European plain. Lowlands and low hills covered coastal and central sections, while mountains and hills were found in the south. *Climate:* Maritime in north; gradually changes to continental in center and south. *Population:* Approximately 16,692,000, including East Berlin (July 1986); average annual growth rate in the late 1980s, 0 percent.

NATIONAL SECURITY *Armed Forces:* National People's Army which in 1987 included ground forces of approximately 120,000; People's Navy 16,300, and Air Force / Air Defense Force 39,000. All forces were organized under Ministry of Defense. *Ground Forces:* Two tank divisions, four motorized rifle regiments, two surface-to-surface missile brigades, two artillery regiments and one anti-aircraft artillery regiment, eight air-defense regiments, one airborne battalion, two antitank divisions, and several support units. Frontier troops (50,000) were organized and equipped as motorized rifle battalion. *Paramilitary:* Included People's Police (12,000), Transport Police (8,500), Feliks Dzierzynski Guard Regiment (7,000) of Ministry of State Security (secret police), Civil Defense officers and non-commissioned officers (3,000), and Working Class Combat Groups (500,000), all of whom received some military training. All police forces were centralized under the Ministry of the Interior.

1954 Car, Armd, 4x4, SK-1

1955 Carr, Pers, Armd, 6x6. Trk, 3 ½-ton, 6x6. Riot, SK-2

1965 Veh, Recce. BRDM-1.



Above: DDR reconnaissance unit during river crossing.

Remarks: During the Soviet years, an unknown number of BRDM-1 reconnaissance vehicles were supplied to East Germany for their armed forces and internal security (see Russia for vehicle details).

1965 Carr, Wpns. 9P27 (AT-1 Snapper Carrier).



Above: DDR 9P27 Snapper Launcher.

Remarks: When fitted to the 9P27 Launcher vehicle, a total of three AT-1 Snapper missiles were ready for launch at any one time (see Russia for vehicle details).

1968 Carr, Wpns. 9P110 (AT-3 Sagger Carrier).



Above: An unknown number of AT-3 Sagger carriers were supplied to the DDR from Russia. (Photo: Author's collection).

Remarks: The Sagger was a wire guided weapon and the last missile system to be fitted to the BRDM-1 chassis.

1970 Carr, Pers, Armd, 8x8. OT-64/SKOT, (see Czechoslovakia for vehicle details).



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Unified Germany 1991 to Present

1993 Veh, Recce, Spahfahrzeug 4x4 Zobel

1996 Car, Armd, 6x6. Thyssen-Henschel TH400.



Above: The prototype HT400 6x6 aside from internal differences, the Henschel H400 was very similar. (Photo: Henschel)

Remarks: Thyssen-Henschel Wehrtechnik GmbH, now part of Rheinmetall DeTec AG, had been developing, as private venture, a family of wheeled armored fighting vehicles since the early 1980s that could undertake a wide range of roles on the battlefield. These were the TH200 (4X4), TH400 (6X6) and the TH800 (8X8). Circa 1996, a prototype of the TH400 was built and tested armed with a 105 mm gun mounted in a three-man powered turret firing standard NATO ammunition including APFSDS. Heavier turrets mounting the Rheinmetall 120 mm smoothbore could also be fitted. Typical roles envisioned were armored reconnaissance, medium weapons carrier, heavy weapons carrier, fire support (AFSV), anti-tank and anti-aircraft vehicles using both guns and missiles. Independent suspension using the double trailing arms with central tire inflation at each wheel. The powerpack was modularly mounted at the rear of the hull allowing for quick maintenance and replacement. While the drive train was installed inside the vehicle for added crew protection.

Vehicle Data: Weight Loaded, 54,022 lbs (24500 kg). Length (OA), 244 in (6203 mm). Width (OA), 117 in (2980 mm). Height (hull top), 82 in (2083 mm). Drive, 6x6. NBC Protection, central air. **Armament:** (1) 105mm cannon and (1) 7.62mm LMG coax. Elevation & traverse, power. Fire Control, optical. Aux wpn – Cal, crew sidearms. **Capacity:** Fuel, diesel. Crew, 4. **Engine:** Type, diesel. HP at Rev/Min, 435 hp (321 kW). Location, rear. Cooling, liquid. **Transmission:** Automatic. **Suspension System:** Independent double trailing arms. Wheels steerable, front. No of wheels, 6. **Performance:** Speed/Land, 71.5 mph (115 km/h). Range, 621 mi (1000 km). Fording depth, 47 in (1200 mm). Max Grade, 60%. Trench Crossing, 39 in (1000 mm).

1998 Carr, Pers, Armd, 8x8. Gepanzertes Transport Kraftfahrzeug - GTK Boxer.



Above: Prototype GTK Boxer. Production vehicles were sent to Afghanistan in 2012. (Photo: Rheinmetall Landsysteme GmbH).

Remarks: In 1998 an agreement was reached between the United Kingdom, Germany and France to develop a tri-national wheeled armored combat vehicle known as the Multi-Role Armored Vehicle (MRAV/GTK) Boxer. As sometimes happens with multi-national projects within just a year or two, differences in desired outcomes resulted in the French withdrawing from the project to work on their own carrier. While the United Kingdom and Germany continued with a less ambitious plan, but in 2002 the UK decided that their budget wasn't going to meet development costs and they dropped out of the project as well, putting the GTK Boxer program on hold. As originally planned, a total of 12 pre-production vehicles were to be completed, six for Germany and six for the UK. The Boxer itself consisted of two parts, the propulsion module (engine, transmission, chassis, etc.) and the interchangeable mission module, which attached to the rear of the vehicle chassis. The mission modules themselves were to weigh up to 17,620 pounds (8,000 kgs) and be interchangeable within an hour. Although the original project was finished, the Netherlands and Germany came to an agreement on a new Boxer program in 2003.

Vehicle Data: Weight empty, 55,066 lbs (25000 kg). Loaded, 72,687 lbs (33000 kg). Length, 310 in (7880 mm). Width, 142 in (3610 mm). Height, 118 in (2990 mm). Wheel base, 197 in (5000 mm). Drive, 8x8. NBC Protection, vehicle over-pressure. **Armament:** As fitted by user. **Capacity:** Fuel, Diesel. Crew/Passengers, 1/10. **Engine:** MTU diesel producing 710 hp. Location, front left. Cooling, liquid. **Transmission:** Allison automatic. **Suspension System:** Independent coil. Wheels steerable, two front axles. Turning Radius, 65.5 ft (20 m). No of wheels, 8 with central tire inflation. **General Data:** Radio, as fitted by user. Night Vision Devices: as fitted by user. **Performance:** Speed/Land, 64 mph (103 km/h). Speed/Water, n/a. Range, 652 mi (1050 km). Fording depth, 59 in (1500 mm). Max Grade, 60%. Trench Crossing, 79 in (2000 mm). Step, 31.5 in (800 mm). Usage: Only prototype vehicles were completed for Germany and the UK. Manufacturer: Armoured Tecnology (ARTEC).



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1999 Veh, Recce, KMW 4x4 Fennek

1999 Carr, Pers, Armd, 4x4. KMW APCV Dingo-1.



Above: This Dingo-1 has been up-graded with a remotely operated weapons station. (Photo: Krauss-Mafei Wegmann GmbH)

Remarks: The Dingo-1 uses a Unimog chassis produced by Daimler-Chrysler, and after development and testing by KMW, went into service with the German Army in 2000. Of the 145 Dingos so far delivered, approximately 90 were Dingo-1s, the rest being the improved Dingo-2. The Dingo can be airlifted by the C-130 or similar aircraft. They can also be carried externally by the CH47 or CH53 series of helicopters. The German Army has used the Dingo-1 in Kosovo and Macedonia, as well as Afghanistan.

Vehicle Data: Weight, empty 9,692 lbs (4400 kg). Loaded, 13,656 lbs (6200 kg). Length (short version), 215 in (5460 mm). Width, 91 in (2310 mm). Height, 92.5 in (2350 mm). Ground Clearance, 16.5 in (420 mm). Wheel base, 127 in (3225 mm). Wheel tread, 78 in (1980 mm). Drive, 4x4. Armor, proof against 7.62mm rounds and 155mm shell fragments, as well as grenades and standard AP mines. NBC Protection, optional central system. **Armament:** Main, 7.62mm LMG, 12.7mm HMG or 40mm Grenade launcher. Elevation & Traverse, manual. Fire Control, optical. **Capacity:** Fuel, diesel. Crew/Passengers, 2/4. **Engine:** (1) Mercedes-Benz, turbo-charged diesel, producing 122 hp (90 kW). Location, front. Cooling, liquid. **Transmission:** Manual. **Suspension System:** Coil spring. Wheels steerable, front pair. No of wheels, 4 with anti-skid and Central Tire Inflation. **General Data:** Radio, as fitted by user. Cargo Volume, 274 cu ft (2 m³). Night Vision Devices: As fitted by user. **Performance:** Speed/Land, 62 mph (100 km/h). Range, 435 mi (700 km). **Usage:** The Dingo-1 has only been used by German units. **Manufacturer:** Krauss-Mafei Wegmann GmbH, Germany.

2000 Carr, Pers, Armd, 4x4. KMW Terrier

2000 Carr, Pers, Armd, 4x4. Krauss Maffei Wegmann Mungo 1.



Above: Mungo 1 serving in Afghanistan with German forces, circa 2005. (Photo: Krauss-Mafei Wegmann)

Remarks: The ESK (Einsatzfahrzeug Spezielle Operationen) Mungo is the special operations protected cross-country and universal transport vehicle of the German Army. The vehicle uses the Multicar commercial chassis with a protected body and fittings from KMW. Over 388 vehicles to be produced with a further 600 required. About the same size as the Mercedes-Benz Wolf 4x4 utility vehicle, the Mungo has all-wheel drive, electronic traction control, an anti-skid system, run-flat tires and the ability to use "creeper" speeds of less than one mile per hour (1.6 km/h). An air-portable and airdrop design, the Mungo has been issued to German forces with NATO in Afghanistan. There are two more variants of the Mungo under development, the Mungo 2 for use as an engineer, logistics or maintenance vehicle, and the Mungo 3 with larger enclosed cabin, full protection against artillery bursts, air conditioning and on board NBC protection.

Vehicle Data: Weight loaded, 11,660 lbs (5294 kg). Length, 157 in (3990 mm). Width, 76 in (1940 mm). Height, 85 in (2170 mm) 74 in (1890 mm) folded. Ground Clearance, 15 in (390 mm). Wheel base, 81 in (2065 mm). Wheel tread, 55 in (1400 mm). Drive, 4x4. Armor, steel plate & Kevlar. NBC Protection, individual. **Armament:** As fitted by user. **Capacity:** Fuel, diesel (est) 21 gals (80 liters). Crew/Passengers, 2/10. **Engine:** IVECO Mod. 8140.43 B, 4-cyl diesel turbo-charged. Location, center mounted behind driver. Cooling, liquid. **Transmission:** Euro III automatic with 5-fwd and 1-rev gear tied to a 2-spd transfer case. **Suspension System:** Coil spring. Wheels steerable, front pair. Turning Radius, 19 ft (5.8 m). No of wheels, 4 with electronic traction control. Tires, run-flats. **General Data:** Radio, as fitted by user. **Night Vision Devices:** As fitted by user. **Performance:** Speed/Land, 56 mph (90 km/h). Range, 280 mi (450 km). Fording depth, 19.5 in (500 mm). Max Grade, 60%. Step (est), 6 in (150 mm). **Usage:** In service with German



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Army, under test with US Marine Corps in 2005. *Manufacturer:* Krauss Maffei Wegmann GmbH and Multicar Spezialfahrzeuge GmbH.

2001 Carr, Pers, Armd, 8x8. ARTEC Boxer.



Above: Pre-production ARTEC Boxer. The Netherlands confirmed their order in 2006 and production vehicles should be in service by 2007. (Photo: Rheinmetall Landsysteme GmbH)

Remarks: In 1998 an agreement was reached between the United Kingdom, Germany and France to develop a tri-national wheeled armored combat vehicle known as the Multi-Role Armored Vehicle (MRAV) Boxer. Within just a year or two, differences in desired outcomes resulted in the French withdrawing from the project. The UK and Germany continued with a less ambitious plan, but in 2002 the UK decided to drop out of the project as well, leaving Germany and the Netherlands (which had joined in 2001) to carry on the project. The number of variants was reduced from over a dozen to just six, including an APC, Command Post, Ambulance, Logistics and Field Re-pair Unit. The Boxer itself consists of two parts, the propulsion module and the interchangeable mission module.

Vehicle Data: Weight, empty, 55,400 lbs (25,152 kg). Loaded, 72,560 lbs (32,942 kg). Length, 312 in (7,930 mm). Width, 118 in (2,990 mm). Height, 93 in (2,370 mm). Ground Clearance, 19.5 in (500 mm). Wheel base, 197 in (5,000 mm). Drive, 8x8. Armor protection, up to 12.7mm fire. NBC Protection, vehicle over-pressure. **Armament:** As fitted by user. **Capacity:** Fuel, diesel. Crew/Passengers, 1/10. **Engine:** Type, diesel. HP at Rev/Min, 720 hp @ 2300 rpm. Mfr, MTU. Model, 8 V 199 TE20. No. of Cyls, 8. Location, front left. Cooling, liquid. **Transmission:** Allison HD 4070 automatic with 7-fwd and 1-rev gear. **Suspension System:** Independent coil. Wheels steerable, two front axles. Turning Radius, 65.5 ft (20 m). No of wheels, 8 w/central tire inflation. **General Data:** Radio, as fitted by user. Cargo Volume, varies with module. **Night Vision Devices:** as fitted by user. **Performance:** Speed/Land, 64 mph (103 km/h). Speed/Water, n/a. Range, 652 mi (1,050 km). Forging depth, 59 in (1,500 mm). Max Grade, 60%. Trench Crossing, 79 in (2,000 mm). Step, 31.5 in (800 mm). **Usage:** First versions to be in service by 2007. **Manufacturer:** Armoured Technology

(ARTEC) and Stork of the Netherlands.

2002 Carr, Pers, Armd, 4x4. Wolf ESK/LIV.



Above: Wolf ESK/LIV with passenger module. (Photo: Rheinmetall Landsysteme)

Remarks: Development started in 2002 on the ESK/LIV (Light Infantry Vehicle). Specially designed for the requirements of Special Forces operations, the ESK/LIV is a reinforced, air-portable vehicle, based on the MB G270 CDI chassis. To provide flexibility the design uses modules to change the rear configuration of the vehicle. Available mission modules include among others, personnel carrier, cargo carrier and a command and control radio vehicle. The LIV is delivered with partial ballistic protection against rifle fire and hand grenade fragments, while additional protection against anti-personnel mines can be added as an option. Air transportable, besides the C-130 series aircraft, the ESK/LIV can be carried inside a CH-53 series helicopter.

Vehicle Data: Weight empty, 11,440 lbs (5,194 kg). Length, 205 in (5,210 mm). Width, 72 in (1,840 mm). Height, 85.5 in (2,170 mm). Ground Clr (est), 12 in (305 mm). Wheel tread (est), 58 in (1,475 mm). Drive, 4x4 (permanent). Armor, composite armor, proof against 5.56mm or 7.62mm fire with upgrade. NBC Protection, individual. **Armament:** As fitted by user. **Capacity:** Fuel, 25-gals (96 L) diesel. Crew/Passengers, 2/8. **Engine:** (1) Mercedes Benz water-cooled DC 270 Cdi five cylinder diesel, producing 156 hp (115 kW) @ 2600 rpm. Location, front. **Transmission:** Type, automatic. Speeds Fwd/Rev, 5/1. Mfr, Daimler-Chrysler. **Suspension System:** Type, leaf spring. Wheels steerable, front pair. Turning Radius, 43.5 ft (13.3 m). No of wheels, 4 (run-flat). Tire Size, 265/7.5XR15. **General Data:** Cargo Volume, depends on module. **Performance:** Speed, 75 mph (120 km/h). Range, 372 mi (600 km). Forging depth (est), 20 in (508 mm). Max Grade (est), 60%. Step (est), 12 in (305 mm). **Usage:** As of 2005 only the German Army had bought the ESK/LIV for their airborne units in Afghanistan. **Manufacturer:** Rheinmetall Landsysteme GmbH, Kiel, and DaimlerChrysler AG Stuttgart, Germany.



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2003 Carr, Pers, Armd, 4x4. Dingo-2 (APV).



Above: The Dingo-2 in service with the German Bundeswehr, this is the long wheelbase version. (Photo: Krauss-Maffei Wegmann GmbH.)

Remarks: The biggest change in the Dingo-2 from the Dingo-1, was a drastic increase in weight. This was brought about by a significant increase in protection from deployed mines and IEDs, which have much larger explosive yields. However, with the new UNIMOG U5000 chassis, performance was maintained, and driving characteristics and transmission performance improved. The Dingo-2 is still air-mobile by the C-130 (2), Transall C-160 (1) and as an exterior load from the CH-47 or CH-53 helicopter series. As part of the standard fittings the Dingo comes equipped with GPS navigation, rear-view camera, Anti-lock braking system, and a radio and internal communication system.

Vehicle Data: Weight empty, 23,284 lbs (10571 kg). Loaded, 27,092 lbs (12300 kg). Length, 216 in (5480 mm). Width, 94 in (2390 mm). Height, 98.5 in (2500 mm). Ground Clearance, 19 in (480 mm). Wheel tread, 78 in (1990 mm). Drive, 4x4. Armor, steel & Kevlar, proof to 7.62mm API rds and 155mm shell fragments. NBC Protection, vehicle over pressure. *Armament:* Main, 7.62mm LMG, 12.7mm HMG or 40mm Grenade launcher. Elevation & Traverse, manual. Fire Control, Day/Night passive. *Capacity:* Fuel, diesel. Crew/Passengers, 2/6. *Engine:* (1) Mercedes-Benz, OM 924 LA, turbo-charged diesel producing 218 hp (160 kW) @ 2200 rpm. Location, front. Cooling, liquid. *Transmission:* DaimlerChrysler, Elec Quick Rev, automatic with 8-fwd and 6-rev gears. *Suspension System:* Coil spring. Wheels steerable, front pair. Turning Radius, 47.5 ft (14.5 m). No of wheels, 4 with anti-skid and Central Tire Inflation. Tire Size, 365/80R20 run-flats. *General Data:* Intercom standard, radio, as fitted by user. *Night Vision Devices:* As fitted by user. *Performance:* Speed/Land, 62 mph (100 km/h). Range, 621 mi (1000 km). Forging depth, 47 in (1200 mm). Max Grade, 60%. Step, 20 in (500 mm). *Usage:* As of 2005 the German Army had ordered 55 Dingo-2, Austria 20, and Belgium 220 with an option for 132 more. *Manufacturer:* Krauss-Mafei Wegmann GmbH,

Germany and Textron Marine & Land Systems, USA.

2003 Veh, Recce. Wolf LIV/SO.



Above: Wolf LIV/SO. (Photo Binz GmbH)

Remarks: The Wolf Light Infantry Vehicle Special Operations (LIV/SO) is based on the chassis of the Daimler-Chrysler 270 CDi G-wagon with a body fabricated by Binz GmbH. Part of a contract issued in early 2002, the initial amount covered the design, development and production of 21 vehicles. To shorten the development time, the decision was made to use the existing Wolf chassis and running gear. Able to carry a crew of four, the LIV/SO can also carry a 7.62mm LMG (at either the front or rear), plus a heavy weapons mount (RLS 609 K) for either the 12.7mm HMG or a Heckler & Koch 40mm automatic grenade launcher. The Binz custom body includes floor protection from hand grenades, and side armor proof against 7.62mm fire and to keep the vehicle air-mobile, the weapons mount and protective rollbar can be dismantled so the vehicle can be carried within a Sikorsky CH-53G or similar helicopter.

Vehicle Data: Weight empty, 7,718 lbs (3500 kg). Loaded, 10,364 lbs (4700 kg). Length, 217 in (5508 mm). Width, 71.5 in (1814 mm). Height, 90 in (2297 mm). Ground Clr (est), 12 in (305 mm). Wheel base, 129.5 in (3290 mm). Wheel tread (est), 58 in (1475 mm). Drive, 4x4 (permanent). Armor, composite armor proof against 5.56mm (or 7.62mm with upgrade). NBC Protection, individual. *Armament:* 7.62 or 12.7 mm machine gun or 40 mm grenade launcher. *Capacity:* Fuel, 34-gals (130L) diesel. Crew/Passengers, 2/2. *Engine:* (1) Mercedes-Benz, 5-cylinder, DC 270 CDi, turbo-charged diesel producing 156 hp (115 kW) @ 2600 rpm. Location, front. Cooling, liquid. *Transmission:* Type, automatic. Speeds Fwd/Rev, 5/1. Mfr, DaimlerChrysler. *Suspension System:* Type, leaf spring. Wheels steerable, front pair. Turning Radius, 46 ft (14 m). No of wheels, 4 (run-flat). Tire Size, 265/7.5xR15. *Night Vision Devices:* As fitted by user. *Performance:* Speed, 75 mph (120 km/h). Range, 497 mi (830 km). Forging depth (est), 20 in (508 mm). Max Grade (est), 60%. Step (est), 12 in (305 mm). *Usage:* As of 2005 only the German Army had



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bought 21 of the LIV/SO for their airborne units in Afghanistan. *Manufacturer:* Rheinmetall Landsysteme GmbH, Kiel, DaimlerChrysler AG Stuttgart, and Binz GmbH, Germany.

2006 Carr, Pers, Armd, 4x4. Mercedes-Benz Enok.



Above: Prototype DaimlerChrysler (Mercedes-Benz) Enok APC.
(Photo: Mercedes-Benz)

Remarks: The German company Armoured Car Systems (ACS), introduced its new Enok light vehicle in 2006. Based on the Mercedes-Benz G chassis, the car has good road ability and acceptable cross-country performance. Built through a joint effort between DaimlerChrysler and Armoured Car Systems, the Enok boasts a maximum total permissible weight of 5.4 tons (11,880 lbs) with a one-ton (2200 lbs) payload. A permanent four-wheel-drive system is pushed by a five-gear automatic drive train, itself fed by a 156-hp, five-cylinder diesel. Armoured Car Systems has given the Enok a fully armoured bulletproof body, and the vehicle seats between two and six persons and can be transported by a CH-53 helicopter.

Vehicle Data: Weight empty, 11,880 lbs (5394 kgs). Weight loaded (est), 14,000 lbs (6356 kgs). Length, 269 in (4500 mm). Width, 118 in (1900 mm). Height (est), 76 in (1930 mm). Drive, 4x4. Armor, proof against 7.62mm AP. NBC protection, central. *Armament:* As fitted by user. *Capacity:* Crew/Pass, 2/4. Cargo, Vol/Wgt (est) 2,200 lbs (999 kgs). *Engine:* (1) DaimlerChrysler 5-cyl diesel producing 156 hp (115 kW). Location, front. Cooling, liquid. *Transmission:* Automatic w/5-fwd and 1-rev gear. *Suspension System:* Coil. Steering, front axle. No/wheels, 4. *General Data:* Elec voltage, 24V. Radio, as fitted by user. *Performance:* Speed/Land, (est) 62 mph (100 km/h). Range, 500 mi (1000 km). Fording depth, 20 in (500 mm). *Usage:* Prototype only as of 2007. *Manufacturer:* DaimlerChrysler (Mercedes-Benz) chassis and Armoured Car Systems, Germany.

2006 Veh, Cmd. Rheinmetall/Panhard Gavia.



Above: Rheinmetall/Panhard Gavia under trials, this vehicle doesn't yet mount the WS 609L remote controlled weapons station.
(Photo: Rheinmetall Landsysteme)

Remarks: The Gavia, a special configuration of the French Panhard A4 PVP is fitted with the Iveco 8140.43N Turbo diesel and a pneumatic suspension which can lower the height of the vehicle for transport in a CH-53 helicopter. The Gavia can also be transported in the C-130, C-160 and A-400 transport aircraft. The Gavia will be produced under cooperation between Rheinmetall Landsysteme and Panhard General Defense (Auverland). In the configuration preferred by the German Army, Gavia will be equipped with the WS 609L weapon Station, co-produced by Rheinmetall and the Norwegian company Kongsberg.

Vehicle Data: Weight empty, 9,349 lbs (4240 kg). Loaded, 11,025 lbs (5000 kg). Length, 164.5 in (4180 mm). Width, 77.5 in (1970 mm). Height, 85.5 in (2170 mm). Ground Clearance, variable. Wheel base, 118 in (3000 mm). Wheel tread, 64.5 in (1640 mm). Drive, 4x4. Armor, .24 in (6mm) armor plate & .39 in (10mm) aluminum plate. NBC Protection, central. *Armament:* Fitted with Rheinmetall & Kongsberg WS 609L Weapon Station, able to fit 5.56mm, 7.62mm, 12.7mm machine guns or a 40mm grenade launcher. *Capacity:* Fuel, 33 gal (125 l) diesel. Crew/Passengers, 2/3. *Engine:* (1) water-cooled, IVECO 8140.43N 4-cyl turbo-diesel producing 124 hp (92 kW) @ 3600 rpm. Location, front. *Transmission:* ZF Friedrichshafen, automatic with 4-fwd and 1-rev gear. *Suspension System:* Coil and pneumatic (veh raised or lowered for clearance). Wheels steerable, front pair. Turning Radius, 20.5 ft (6.25 m). No of wheels, 4. Tire Size, 225/100Rx16 Run-flat. *General Data:* Elec Voltage, 24/12 V. Radio, as fitted by user. *Night Vision Devices:* As fitted by user. *Performance:* Speed/Land, 74 mph (120 km/h). Range, 466 mi (750 km). Fording depth, 21 in (535 mm). Max Grade, 100 %. *Usage:* As of 2006 the Gavia was only slated to be delivered to German airborne units. *Manufacturer:* Rheinmetall and Auverland.