

PANZER JÄGER

GERMAN ANTI-TANK BATTALIONS OF
WORLD WAR TWO



W.J.K. Davies

©1979 Almark Publishing Co. Ltd.

Text W. J. K. Davies

Line Illustrations by Kenneth M. Jones © Almark Publishing Co. Ltd.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted by any means electronic, mechanical, or by photocopying, without prior permission of the publishers.

First Published 1979.

ISBN 0 85524 312 0

PANZER JÄGER

W.J.K. Davies

Distributed in the U.S.A. by
Squadron/Signal Publications Inc.,
3461 East Ten Mile Road,
Warren, Michigan 48091.

Typeset by Reproprint
Leatherhead, Surrey.

Printed in Great Britain by
Staples Printers Kettering Ltd.,
Trafalgar Road, Kettering,
Northamptonshire,
for the publishers, Almark Publishing Co. Ltd.
49 Malden Way, New Malden,
Surrey KT3 6EA, England.

Almark Publishing Co. Ltd., London

Panzer Jaeger Abteilungen, 1939-1945: Organisation and Weapons

Contents			
Part 1	Organisation		
	General Introduction		3
	General Abteilungen organisation		6
	Abteilung Headquarters Units		8
	Support company		9
	Towed anti-tank gun company		9
	Assault gun company		10
	Light Flak company		10
	Note on Heavy Abteilungen		12
Part 2	Weapons and equipment		
Section 1	Introduction		14
Section 2	Towed Guns:	General notes	15
		Light guns	16
		5cm Pak 38	18
		7.5cm Pak 40 & 41	20
		Impressed guns in 7.5cm range	22
		Heavy anti-tank guns	24
Section 3	Weapons on	Introduction	26
	Self-	Guns on Pzkwfw I	27
	propelled	Guns on Pzkwfw II	28
	Chassis	Guns on Pzkwfw 38 (t)	31
		Guns on Pzkwfw IV	32
		Heavy self-propelled guns	35
		Guns on miscellaneous chassis	38
		Guns on captured chassis	40
		Motor vehicles	43
Section 4	Small arms	Small arms	45
	and	Uniform notes	46
	Uniforms		
Appendices 1	Basic weapons data		47
2	Typical SP carriages: data		47
3	Tactical signs & symbols; camouflage note		48

PART 1:

Panzerjaeger Abteilungen: General Introduction

In the *Wehrmacht* Divisional Organisation the provision of anti-tank capacity had special importance. From the time they started rearming the Germans recognised the necessity of having effective anti-armour protection; they had after all seen the effectiveness of mass tank attacks in 1917-18. They therefore made a generous allocation of anti-vehicle weapons throughout the Division. Reconnaissance and Infantry components both had their anti-tank companies or sections while other elements had a limited organic anti-tank capacity. The Division as a whole, however, was also provided with a specialist anti-tank unit which had its own, positive role to play. This, initially was called the *Panzer Abwehr Abteilung* (Anti-tank Abteilung or Battalion) was a Battalion-sized unit reporting direct to Divisional HQ and seen from the start as not only providing defence against enemy attacks but also as accompanying the assault units in an attack to destroy enemy armoured counterthrusts. Accordingly it was, from the start, fully motorised even in otherwise horse-drawn Divisions and the motorisation was not regarded merely as transport; it gave tactical mobility. Thus each gun detachment had two medium cars, one towing the weapon while the other towed a light two wheeled limber trailer with ready-use ammunition. The platoon had its own command vehicle and dispatch rider and the organisation was extremely flexible.

This offensive/defensive principle was applied throughout the organisation of the Abteilung and continued through the 1939-45 war. Its importance was symbolised in March 1940 by an official change of name to the Panzer Jaeger (tank-hunter) Abteilung and was emphasised from mid-1940 on, by the development of specialised self-propelled weapons on obsolete tank chassis. At least one company of these lightly armoured but highly mobile weapons was theoretically allocated to every Abteilung from 1942 onward and the concept was developed into the even more specialised *Jagdpanzer* or hunting tank which was basically a long-barrelled assault gun; it is interesting that these were initially classified as light Panzerjaeger and it was only by a *Führer* Directive of 12.4.44 that the more impressive name was adopted; even then some were not reclassified until September of that year.

As with other divisional units, one must note that reality did not always match expectation. There were always 'standard' or ideal establishments such as those shown on pp. 4 and 5, but these *Grund Gliederungen* were rarely achieved in practice after the first two years of war. When a new or refitted Division was projected, it was more common to provide a *Soll Gliederung* or intended establishment which laid down what the formation might reasonably expect to receive. Even this might not be fully achieved, or might be achieved only by substituting 'ersatz' equipment for that originally specified. Once in action, of course, the Division had to depend on whatever replacements it could acquire and the anti-tank units inevitably had a high rate of attrition. Its actual establishment, or *Ist Gliederung*, might, therefore, bear very

little resemblance to even its intended one, let alone the ideal standard. To give some idea of the quantities and problems involved, it may be worth looking at a German assessment of the situation in mid 1943 – i.e. just before the real holocaust began. At that time:

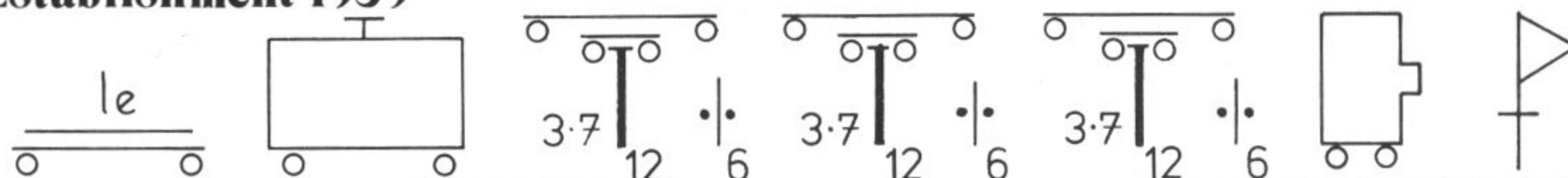
Twenty-three Panzer Divisions had between them only twenty effective Abteilungen, though composition and distribution was somewhat uneven. Thus that of 24 Panzer Division, formerly a Cavalry formation, was virtually non-existent; 21 Panzer Division, then newly reformed for the defence of France, had only two motorised companies in its Abteilung but also had a, so-called, assault gun Abteilung of four companies each with four *leFH16* gun howitzers and six *7.5cm Pak 40* on captured French chassis; 26 Panzer Division had a heavy *8.8cm* gun Abteilung attached in lieu of the normal one. The other seventeen Abteilungen totalled 13 motorised companies and 32 self-propelled ones of various strengths with one light *Flak* company, so certainly some Divisions were under establishment at the time. The twelve Panzer Grenadier Divisions had between them only six Abteilungen, largely motorised, plus one complete *Flak Abteilung 'als ersatz'* but this was mainly because many were reforming from infantry formations or being scabbled together from the remains of other divisions. Thus 15 Panzer Grenadier had only a single motorised company in its *Schnelle Abteilung* (mobile force) and others similarly had anti-tank components incorporated in other parts of the Division. It may be interesting to note that between them the *Wehrmacht's* Infantry Divisions in their Abteilungen had no less than 317 motorised companies but only 47 equipped with self-propelled guns of one sort or another and even the ten mobile infantry or Jaeger Divisions were not yet fully equipped. They had between them sixteen motorised companies and four self-propelled ones but only one of the *flak* companies that should have completed the establishment. The picture is clear that in practice many of the more static Divisions were still equipped mainly with towed guns and it was not until 1944 that the hoped-for balance of one (Sfl) company and one motorised company became common practice for front line units.

Nonetheless, the anti-tank capability of all Divisions was always maintained at as high a level as possible and was always a considerable hindrance to the allies. The actual guns, once an initial reliance on the inadequate *3.7cm* weapon had been overcome, were always capable of dealing with contemporary armour.

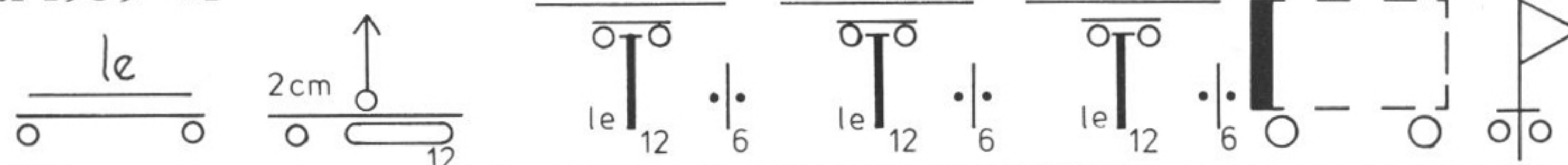
NOTE: The author has used the accepted English spelling of *Panzerjäger* viz *Panzerjaeger* throughout the text. Where *Panzerjäger* appears in its Native Form it has been italicised. Wherever the German word *Abteilung* (Battalion) appears it has not been italicised except where it forms part of a designation.

Fig1. Grund Gliederungen for Main Types of *Panzerjäger Abteilungen* 1939-45

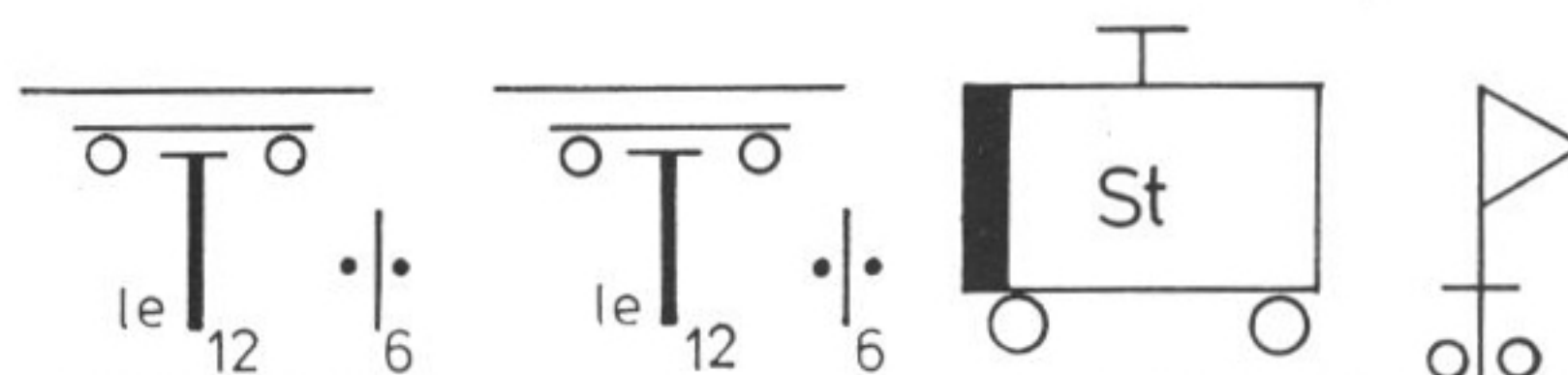
Base Establishment 1939



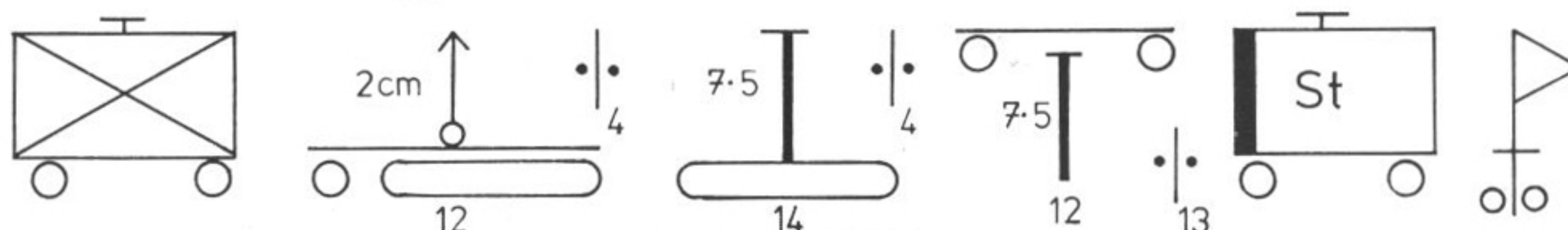
Normal 1939-41



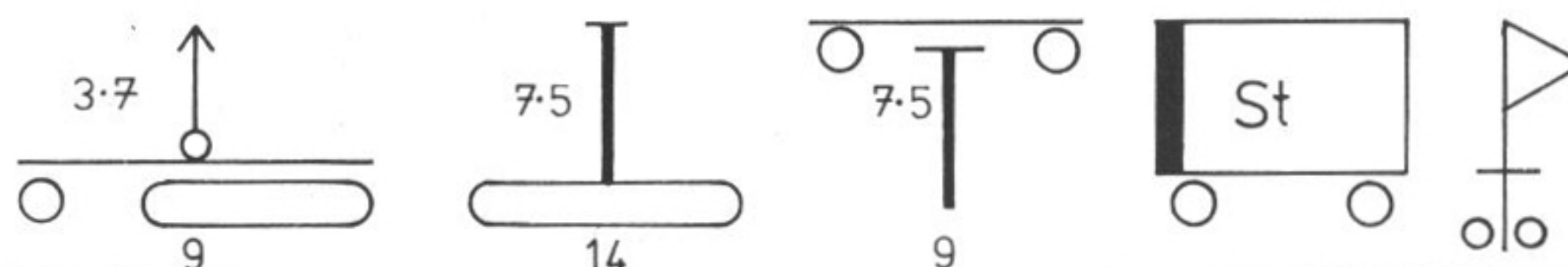
Mountain Division 1939-45



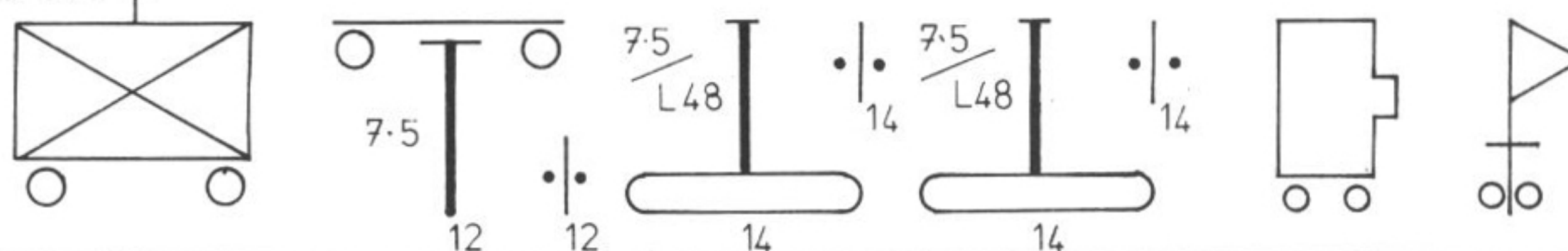
Infantry Division (NA) 1944 type



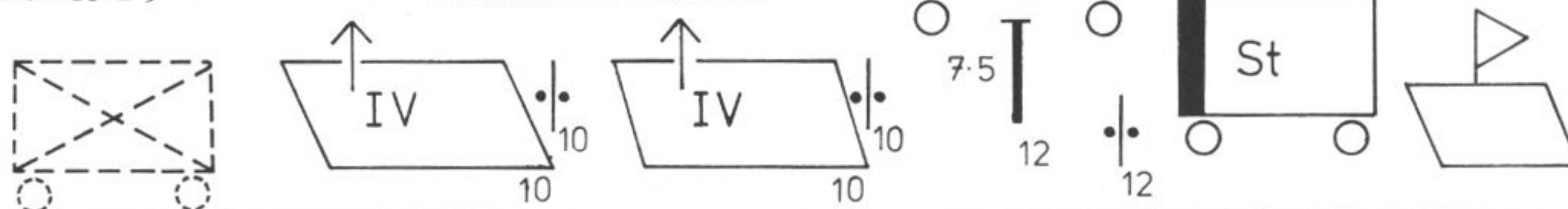
Volksgrenadier Division (1944-5)



Panzer Division 1943



Panzer Division 1944 lower establishment



Panzer Division 1944 higher establishment

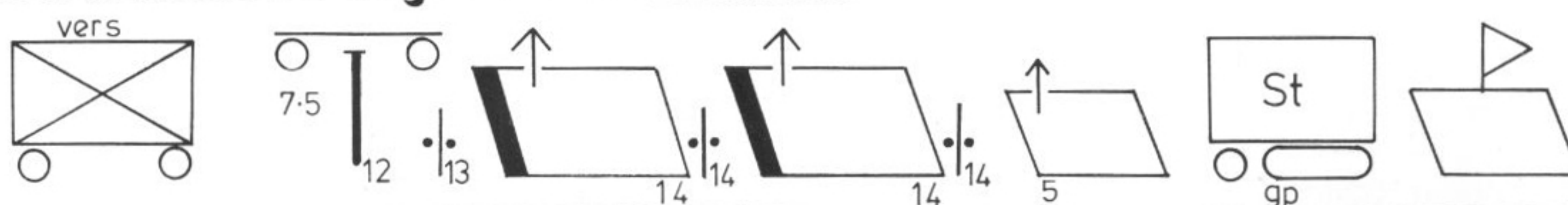
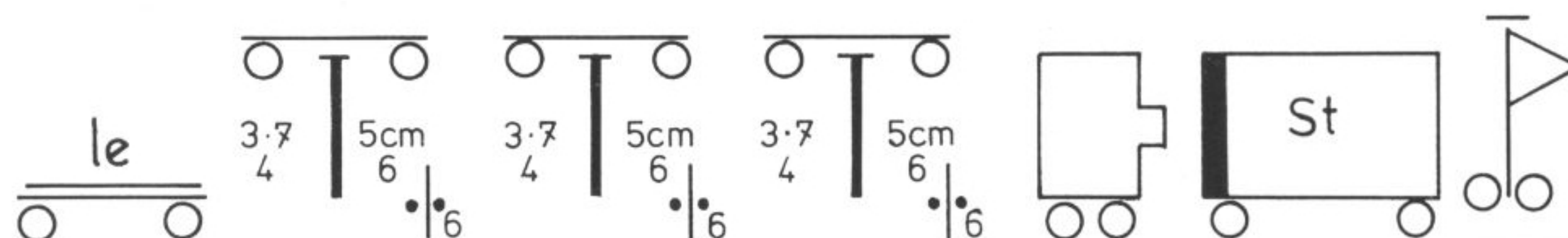
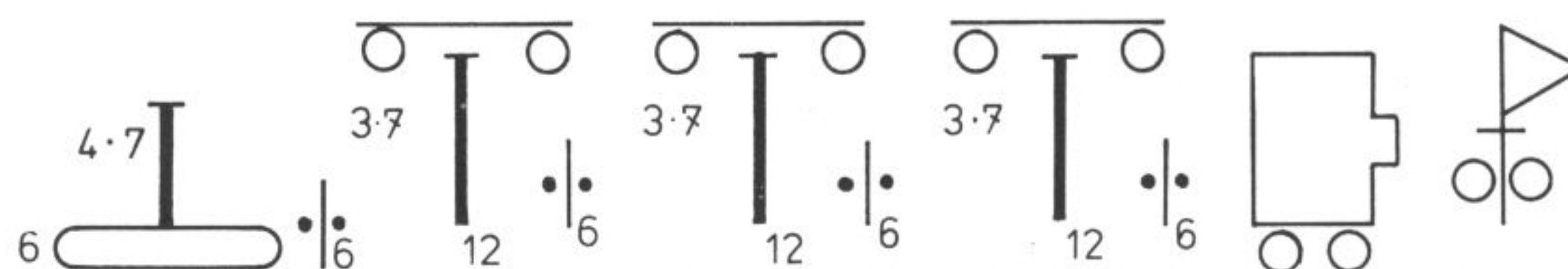


Fig2. Variations on the *Panzerjäger Abteilung*

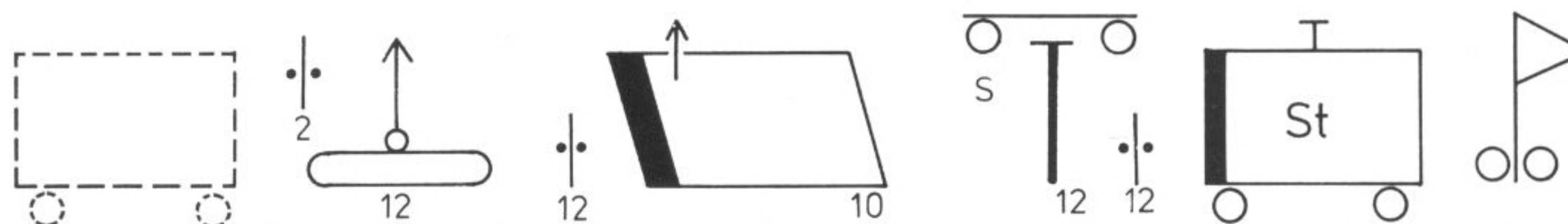
Motorised Infantry 1941 (notional)



1. Panzer Division 5/40



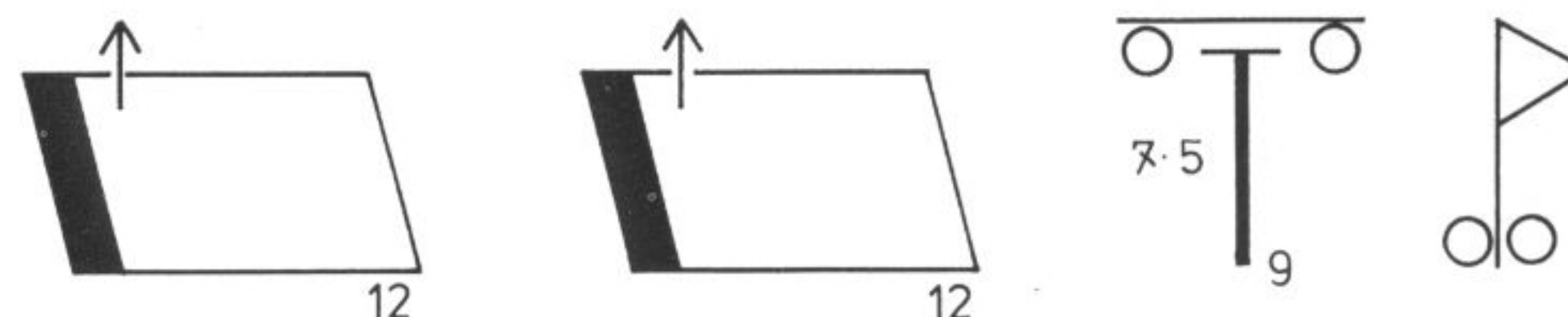
Infantry Division 1944



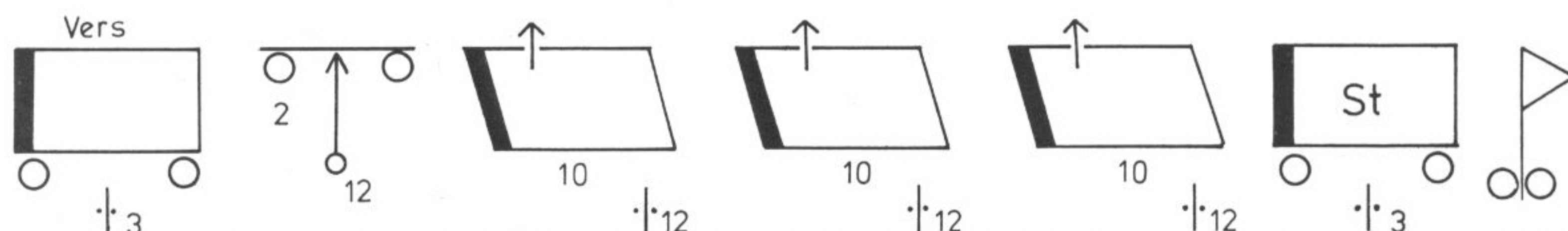
Infantry Division 1944



24. Panzer Division 1944 (soll)



4. Kavallerie Bde. 1944 (Grund)



Panzer Jaeger Abteilungen – General Organisation

As has been mentioned, the anti-tank Abteilung within a Division was almost invariably motorised and so differed less between Divisions than any other organic unit except the artillery; main differences were in strength and in size of weapons.

At the outbreak of war there was basically one pattern of *Panzer Abwehr Abteilung* for all purposes. This (Fig 1) consisted of a Headquarters support company; three motorised anti-tank companies each with twelve towed 3.7cm anti-tank guns; a motorised anti-aircraft (*Flak*) company with twelve towed 2cm guns; and either an Abteilung maintenance and support (*Versorgungs*) company or a light (60t) supply column. It was common to all armoured and regular infantry Divisions; it should be noted that at this time the Panzer Divisions were essentially tank formations but 'standard' anti-tank Abteilungen Nos 37-39; 49 and 53 were allocated to them. The major exceptions to the rule initially were the four (later five) mountain Divisions which had a reduced establishment of only two 3.7cm gun companies, an HQ and an HQ company. Their supply services were in any case more centralised and it was presumably thought that motorised flak might be more of a hindrance than a help in their intended sphere of operations. In practice, of course, the organisation was never so neat and the weapon establishment might be more fairly described as 3.7cm equivalent. Captured weapons of similar calibre such as the Czech 4.7cm gun could be substituted where available.

The 3.7cm gun was quickly found to be obsolescent and, during early and mid 1940, attempts were made to increase the firepower of the Abteilung while renaming it 'Panzer Jaeger Abteilung'. To start with early in 1940 the first attempts were made to make the units more mobile by mounting some Czech 4.7cm guns on *Pzkw IV* chassis and simply issuing them 'als ersatz' to companies in the Abteilungen of a few motorised infantry Divisions (note: this was official policy but at least one armoured unit, 6th Panzer Division, had a half-company of six guns attached for the French campaign.)

The initial issue of self-propelled guns had little effect on the basic organisation but later in the year the excellent *5cm Pak 38* became available and the standard Abteilung organisation was altered to take account of it. In effect all companies of front-line formations were given a mixed establishment of either nine 3.7cm guns plus two 5cm guns. An *OKH* decree of November 1940 allowed for a possible alternative establishment of no less than forty-five 5cm weapons per Abteilung but there is no available evidence that this was ever put widely into practice. What seems to have happened is that, as they became available, first the *5cm Pak 38* and then the 7.5 cm Pak 40 or its equivalents were simply issued in place of the 3.7cm gun with appropriate adjustments to vehicles and crew strengths within the existing organisation. Certainly for the remainder of the war the standard full establishment for a towed-gun company in the Abteilung was twelve guns of a single calibre in four, three-gun platoons although there was one interim variant in 1942 which had six 3.7cm guns and six 5cm ones.

From early 1942 onwards, however, both the theoretical and actual compositions of the anti-tank units changed and there was greater variation in their roles within

Divisions. This was due to two major factors: the introduction of self-propelled weapons on obsolete tank chassis and the changing roles and organisations of the Divisions themselves. In effect, given the intended 'tank-hunting' role of the Panzer Jaeger Abteilung, those in the armoured formations were greatly strengthened. The *Grund Gliederungen* for these are given in Fig 1 and it will be seen that they take account of improved equipment. As intended they were expected to be self-contained units, each with two 'hunting' companies of 7.62 or 7.5cm guns on self-propelled chassis and one defensive company of twelve towed guns backed up by administrative and maintenance sub-units. A major improvement was that as the specialist *Jagdpanzer*, mainly on the *Pzkw IV* chassis, became available these were formed into 'assault gun' companies which were formerly designated as such. The official 'higher' establishment gave fourteen guns per company in four platoons of three with two in the HQ group but this was not often achieved; a more realistic establishment of ten SP guns per company (three platoons of three and one in HQ) was actually issued from mid-1944 on.

In practice even this was not normally achieved in everyday service. Thus the *Soll Gliederung* of 40th Panzer Jaeger Abteilung late in 1942 was only three companies with no support and the companies themselves were to contain: 9 × 7.5cm SP guns; 9 × 5cm Pak 38 (mot); 9 × 7.5cm Pak 40 (mot) – ie the motorised companies had only three platoons instead of the normal four and there was only one SP company (under strength). In active service matters could be far worse. On reconstruction after its mauling in Africa, 90th Panzer Grenadier Division had simply a single motorised company of twelve 7.5cm guns – though it did have a heavy *flak Abteilung* – and 15th Panzer Grenadier Division had a similar motorised company attached to its *Schnelle Abteilung*. As another example, in the summer of 1944, 19th Panzer Division was down to only six 7.5cm towed guns and even after re-equipment in September of that year it had only eighteen *Jagdpanzer IV* and a company of nine 7.5cm towed weapons. Clearly the lower establishment was more realistic than the frequently quoted one of 12 + 14 + 14 and it would appear that the 'spare' SP gun in company HQ was often omitted in practice. Indeed it is quite clear why a projected 1943 establishment of three companies, all with 14 SP guns was short lived; by their very nature once the army was on the defensive anti-tank units bore the brunt of the fighting and their attrition rate was considerable.

The Infantry units were never equipped or established at the same level as the armoured ones but, again, standard establishments were provided and, so far as possible, were maintained since the Abteilung was a very important part of the Infantry Division's defence capability. The standard establishments of the 1943-45 period differed slightly between Infantry, *Volksgrenadier* and Mountain Divisions and are shown in Fig. 1. (it should be remembered that Infantry regiments in addition normally had their own anti-tank company). The intention was always to have one company of self-propelled guns, often *Marder III* or *Hetzer*, to give a limited counter attack capability, a company of towed heavy anti-tank guns and a company of light *flak* guns on SP chassis which could also be used in a ground support role against motorised troops. The Mountain Division tended to retain its 1939 organisation but, like paratroops, was often upgunned with 5cm weapons or the 2.8cm coned bore *Pak 41*. Some, however, retained the 3.7cm *Pak* to the end.



ABOVE: 5 cm Pak 38 engaging tanks on the Eastern Front. The loader – positioned to the left of the gun breech – has a leather sling with a swivel fitted across his shoulder which is used for manhandling the piece when changing deployments. A tank which the gun has just hit is in the background directly above the gun commander's hand. This Pak 38 with its low silhouette was probably invisible – even in the open countryside shown here – to the closed down Soviet tanks.

BELOW: Many captured Soviet 7.62 cm Model 36 field guns were impressed into Wehrmacht service and some saw action in North Africa as pictured here. This gun does not have a muzzle brake that was fitted to guns re-chambered to take German ammunition and designated 7.62 cm Pak 36(r). A large rock has been placed against the trail as an aid to the retarding efforts of the trail spades into the rocky terrain seen here.



Abteilung HQ Units

As normal with battalion sized units in the *Wehrmacht*, official establishments divided the Headquarters (HQ) into two parts. First there was the command group or *Stabs* (lit: staff), usually composed of the Abteilung commander, his adjutant, ordnance officer and, possibly, signals officer with an orderly, drivers and a dispatch rider or two. Secondly there was the HQ support unit or *Stabs Kompanie*, whose strength varied with its equipment and with the Division type. Typically it varied between 50 and 70 personnel, normally with only one officer, the company commander, but with a high proportion of warrant officers and NCOs (16-20). Some organisations give a separate signals platoon but this was commonly incorporated within the HQ company, having its own three or four specialist motor vehicles and a motorcycle or *Kettenkrad*. Typical infantry and motorised or armoured Divisional Abteilung HQ units for 1939-44 are shown below.

1. Infantry Division

HQ Group: 5 officers; 7 NCOs and men. 2 light cars; 2/3 motor cycles or *kettenkräder*.

HQ Company: 4 officers; 20 NCOs; 29 men. 23 motor vehicles of various types plus 2 motor cycles and 4 trailers.

2. Panzer and Panzer Grenadier Division

HQ Group: 4 officers; 7 NCOs and men. 2 light cars; 2 *kettenkräder* or motor cycles (1 solo, 1 combination).

HQ Company: 1 officer; 47 NCOs and men. 15 motor vehicles, 1 motor cycle. The company included a platoon of three 7.5cm self-propelled guns which acted as local defence and battalion reserve.

Note: Early detail establishments show motor cycles. Later ones provide for substitution by *Kettenkräder* where available but motor-cycle combinations were always more common.

This general organisation appears to have remained fairly constant, even *Volksgrrenadier* Divisions being given the same pattern although a slightly amended version was issued for 1944-type Panzer Divisions on the lower establishment. This had a total of 5 officers, 16 NCOs and 32 other ranks. The HQ company vehicle allocation was spelt out in detail, as follows:

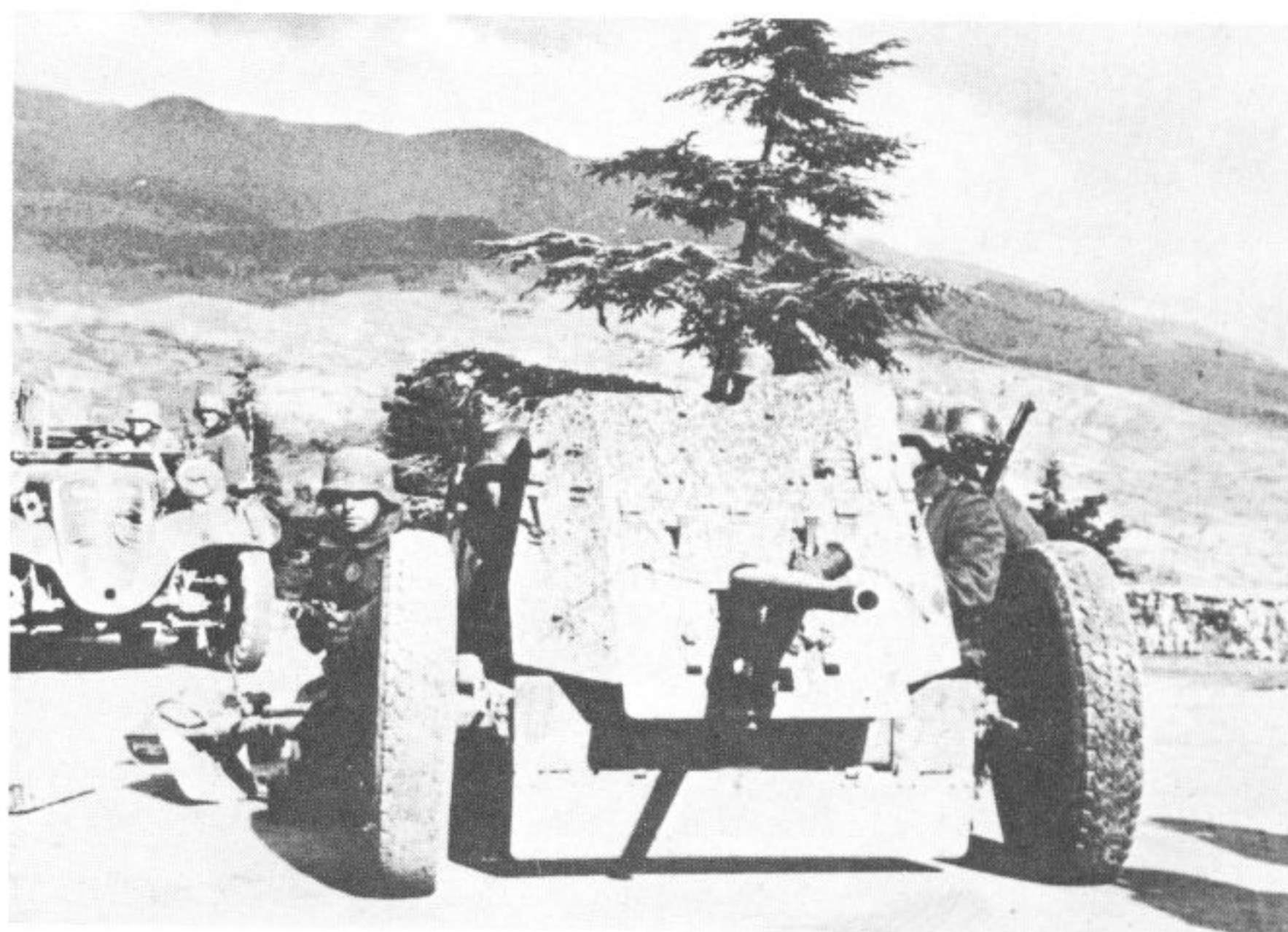
Two 7.5cm guns on self-propelled chassis, normally one 7.5cm *Pak 39 (sf)* and one *Jagdpanzer IV* as battalion reserve; one medium armoured personnel carrier (*Sd Kfz 251*), presumably as a command vehicle; six light cars; two medium cars; three light lorries; 2 medium lorries; three *Kettenkräder* or motorcycles. In principle these would all be vehicles with a limited cross-country capability.



The 3.7 cm Pak 35/36 with 'harnessed' crew members. Four metal ammunition boxes are slung on the gun shield in the upper photograph.



BELOW: A 3.7 cm Pak 35/36 and its crew pose for the camera. A Kfz 12 (Adler 3 Gd) towing vehicle is visible in the background.



Abteilung Support Company (Versorgungskompanie)

Where a proper support company was provided – usually in infantry and armoured formations from 1943-on if they included self-propelled guns – the organisation appears to have varied little from Division to Division. It was normally organised as:

HQ section; One ordnance maintenance and repair platoon (known as a *staffel*); one general m/t workshop platoon (*Instandungsetzen Staffel*); three workshop sections or *gruppen*, one for each fighting company in the Abteilung.

Typical strength was 3 officers; 45 warrant officers and NCOs and 140 other ranks with 3 civilian *Beamten*.

Equipment (see notes on motor vehicles p. 43) comprised: 2 *Bergepanzer III* or similar recovery vehicles; 6 light cars; 7 light, 21 medium (3t) and 3 heavy lorries with cross country capability – i.e. 4 × 4 or 4 × 6 wheel drive; 1 light and 10 medium supply lorries; 9 *Maultiere* half-tracked lorries; 2 *Kettenkräder*; 3 trailers; 2 light half-tracked tractors of the 1-tonne series (*Sd Kfz 10*); two 18 tonne half-tracks (*Sd Kfz 9*) for vehicle recovery and maintenance purposes.

Apart from the changes caused by changes in equipment, the basic organisation and vehicle allocation of the motorised company appears to have changed little. As the 5cm gun superseded the 3.7cm gun and the 7.5cm gun replaced the 5cm one, so towing and limber vehicles

became bigger; vehicles in the 1.5 tonne range superseded the medium car and were themselves replaced by 3-tonne vehicles, in particular the *Sd Kfz 11* half-tracked tractor, the *Raupenschlepper Ost* tracked vehicle and, on occasion, the standard 3-tonne truck or the *Maultier*. A typical 7.5cm gun company had a slightly reduced strength of three officers; 24 warrant officers and NCOs; 107 other ranks, and a vehicle strength of 35 plus 5 motorcycles or *kettenkräder* but this was probably because part of the company 'train' was absorbed in the Abteilung HQ unit. The only real change was where the company was, from late 1943 on, part of an Abteilung with a proper support company attached. In that case both numerical strength and vehicle allocation went down markedly.

Typically such a company lost its 'train' completely and its ready-use ammunition was carried on the towing vehicles which were *Sd Kfz 11* or else *Maultiere*. The establishment, totalling 3 officers; 20 warrant officers and NCOs and 94 other ranks, thus comprised an HQ with one or two light cars and two or three *kettenkräder* or motorcycles; and three, four-gun platoons each with three 7.5cm Pak 40 or 7.62 Pak 36(r) towed by *Maultiere* and each allocated one light command car for command purposes and one light machine gun for local defence. Total allocation was 5 light cars; 4 *kettenkräder*; 12 *Maultiere*.

Towed Anti-tank gun Company Panzer Abwehr later – Panzerjaeger kompanie Mot.z.

The basic towed anti-tank gun company was to be found not only in the Panzer Jaeger Abteilung of a Division but also within its infantry regiments, each regiment theoretically having its 14th company allocated to this role.

In 1939 the motorised anti-tank gun company formed the equipment of all *panzer-abwehr* units and its organisations – though not its weapons – remained fairly stable throughout the war. Basically it consisted of:

Company HQ: 1 officer; 3 NCOs (including warrant officers where appropriate); 7 other ranks. 1 light car for the company commander (*Kfz 1* or 2); 2 motorcycle combinations, allocated to the CSM and the quartermaster sergeant; 3 motorcycles for dispatch riders.

Four Anti-tank Platoons, each consisting of: 1 officer; 5 NCOs; 25 other ranks. 6 medium cars (*Kfz 12*) of which three towed 3.7cm guns and three towed limber trailers; 1 light car for the platoon commander; a motorcycle combination and a solo motorcycle. The platoon had one light machine gun for local defence, besides the normal allocation of personal weapons.

Support Group: 7 NCOs; 12 other ranks. This had a motor vehicle maintenance section with a light repair vehicle (*Kfz 2/40*); a motorcycle combination; a medium supply lorry. It also contained the *Gefechtstross* – lit: battle train – which was the immediate resupply section and had a fuel lorry (not necessarily a tanker); a mobile field kitchen; a light car and a motorcycle combination.

As soon as the obsolescence of the 3.7cm gun became clear, measures were taken to 'up-gun' the motorised companies in whole or part with the 5cm Pak 38. An official OKH organisation of November 1941 (reproduced in 'Feldgrau' for 1957) shows a typical compromise solution and illustrates in detail the breakdown of vehicles and personnel. Other variants allowed for eight 3.7cm guns and three 5cm guns (possibly in only three platoons) or six 3.7cm guns and six 5cm guns.

Captured French 25 mm anti-tank guns which were taken onto the German inventory as 2.5 cm Pak 113(f) and saw only very limited war service.



Panzer Jaeger (Sfl) Kompanie, later Sturmgeschütz Kompanie

From 1942 onwards, when heavy anti-tank guns on self propelled chassis became widely available, it was normal intention to equip at least one company of every Panzer Jaeger Abteilung with these weapons.

The basic company was that allocated to Infantry and, later, *Volksgrenadier* formations and, at least up to 1944, to most armoured formations as well. Initially there was no support unit in the Abteilung and the company therefore contained its own 'train'. Detail organisation varied but a typical one for the 1942-44 period provided for a total strength of 3 officers, 44 warrant officers and NCOs and 72 other ranks. Equipment comprised fourteen 7.5cm or 7.62cm guns on *Pzkpfw II* or *Pzkpfw 38(t)* chassis, twenty-eight motor vehicles of all types with seven trailers and four motorcycles or motorcycle combinations. Exact distribution is not clear but is likely to have been:

HQ 2 light cars (*kfz 1*); 2 motorcycles; 2 × 7.5cm Pak 39 (Sf).

1 Pln. 1 light car; 4 × 7.5cm Pak 39 (Sf)

2 & 3 Plns: as Pln 1.

'Train': A total of some 22 motor vehicles including one motorcycle combination or *Kettenkrad* and one solo motor cycle. The support vehicles would include a munitions column, probably with 12-14 *Maultiere* or four wheel drive three-ton lorries; a field kitchen; a patrol lorry and at least one light car. The remainder would be maintenance vehicles for the ordnance, m/t maintenance, and signals repair sections.

So far as the normal self-propelled gun company was concerned this organisation is likely to have varied little even up to 1945. From late 1943 onwards, however, armoured formations and then certain 1944-pattern Infantry Divisions had all their Abteilung support services concentrated in a support company (qv) and the fighting companies were drastically pruned. It was envisaged that they would be equipped with specialist assault guns or *Jagdpanzer* and become much more like tank units, although this aim was never entirely achieved; they were also renamed assault gun companies. Initial scales for such a company envisaged a total strength of 3 officers, 40 warrant officers and NCOs, and 30 other ranks, the number of motor vehicles being cut to 19 by the removal of the maintenance sections; armament was still, in this form, to comprise fourteen 7.5cm Pak 39 (Sf) or fourteen *le. Panzerjäger IV*. In practice this establishment proved difficult to maintain, particularly in the Panzer Divisions where the Abteilung had two such companies, and an even further reduced establishment was therefore authorised. This, which became 'standard' for the remainder of the war, gave a strength of 3 officers, 32 warrant officers and NCOs, 22 other ranks; it had a total of ten 7.5cm Pak 39 (Sf) or, more commonly, *Jagdpanzer IV* or *Stug. IV* with long barrelled gun. These were organised in three platoons of three with one in the HQ group. The 'train' was completely assimilated in the support company, the *Sturmgeschütz* unit having only five or eight motor vehicles (normally 2-5 in HQ and one in each platoon) and four motorcycles.

Light Flak Company (Le Fla. Kompanie)

The so-called Light anti-aircraft company which made up the third companies of most Infantry and *Volksgrenadier* Abteilungen was an attempt to get the best of both worlds. It had the main purpose of protecting Divisional units (particularly its sister companies) against aircraft attack but it was also expected to act in an anti-vehicle role against motorised troops. The company was in general organised like the *Panzer Abwehr Kompanie (Mot.)* shown on p. 9. Its armament comprised twelve 2cm Flak 30 or Flak 38 organised in four platoons of three; Initially towed behind *Sdkfz 81* or similar vehicles in the 1.5 tonne range, these were, from about 1941-on, more often mounted on light half-tracked chassis as self propelled weapons and the general organisation then became similar to that of a *Panzerjäger (Sfl) Kompanie*. A typical overall strength was 2 officers, 34 warrant officers and NCOs, and 113 other ranks. Apart from the gun vehicles themselves, the unit had 24 motor vehicles, mainly in the support group, and six motorcycles or motorcycle combinations. This strength was normally retained right up to the war's end since the unit rarely operated in Abteilungen having a full support company; where it did, there is evidence that the supporting vehicle strength was drastically cut to about 5-8 cars or light lorries and four motorcycles.

A variant organisation reported by U.S. Intelligence and generally confirmed from German sources (though no official establishment has been found) was that for the 1944-pattern *Volksgrenadier* Division. This envisaged the same numerical strength (which seems odd) with a reduced establishment of nine 3.7cm Flak in three platoons, and with a vehicle strength of nineteen motor vehicles and five motor cycles. The reason for switching to the 3.7cm gun is not clear but 2cm weapons may have been in short supply.

RIGHT: The Jagdpanzer IV mit 7.5 cm Stuk 40 L/48 Sdkfz 163 (Stug IV) was quite a rare bird. It was a combination of a PzKpfw IV hull with PzKpfw III automotive parts mated to a stretched Stug III superstructure. Note the extended driver's compartment.



BELOW: A Sdkfz 10/4 mounting a 2 cm Flak 38. The gun has armoured shields fitted. This combination was often employed against armour using 2 cm anti-tank ammunition.



A Note on Heavy Anti-Tank Abteilungen

Armies and Corps were allocated a proportion of heavy anti-tank units equipped with either self-propelled or towed 8.8cm guns based on the *Pak 43*, and GHQ also had a number of such units in general reserve; they were organised as independent Abteilungen, and most were numbered in the 5XX series.

Basic Abteilung organisation appears to have been very similar to that of a Divisional unit but the equipment tended to be homogenous; that is, it comprised either towed guns of the *Pak 43* and *43/41* series or one of three major self-propelled weapons: *Nashorn*; *Elefant* (initially *Ferdinand*); *Jagdpanther*. A few were equipped with the long-barrelled *7.5cm Jagdpanzer IV* or towed *7.5cm* guns. Equipment largely depended on (or dictated) the envisaged role. Those having towed guns or the lightly armoured *Nashorn* were, perforce, largely used in a defensive role similar to that of the motorised companies of the Divisional units. It was

intended to use the *Elefant* in an offensive role but it proved very vulnerable as did the few *Jagdtigers* introduced later, and it was soon relegated to defence. The *Jagdpanthers* and *Jagdpanzer IVs* on the other hand were true specialised tank hunters and were used for that purpose.

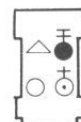
Official establishments give the 'towed' Abteilungen as having the normal three companies of towed guns including a full support company which would have been essential for their detached role. A heavy assault gun Abteilung was established for three companies of fourteen self-propelled guns, a full support company and a company headquarters: the latter normally had the usual two SP guns attached but was likely to have an armoured command vehicle – usually a *Panzerbefehlswagen III* or *IV* – in place of the more normal light command car.

A Panzerjäger covers a road in Russia. Built on the chassis of the Praga 38 light tank, PzKpfw 38(t) in German service, these tank hunters served the Wehrmacht well.



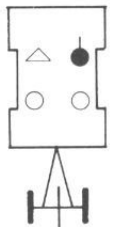
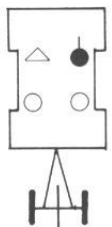
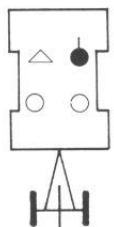
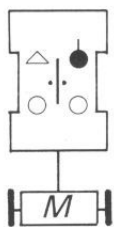
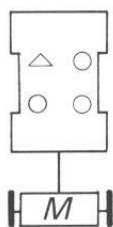
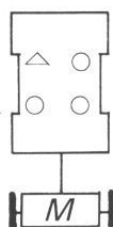
Establishment for Motorised Anti-Tank Company 1.11.41

H.Q.



kfz 1 or 2
Company Cdr.

I Pln

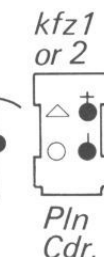
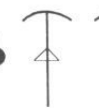
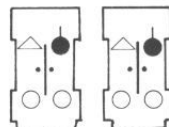
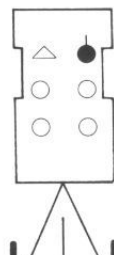
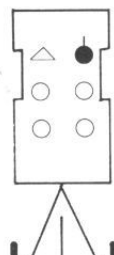
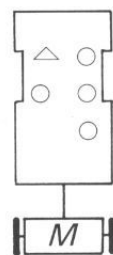
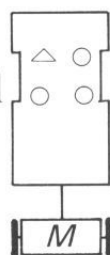


kfz 12

3.7cm Pak 35/36

2 & 3 Plns as 1 Pln

4 Pln

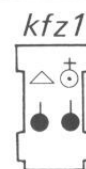
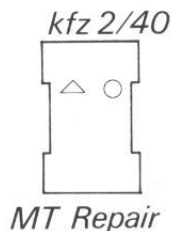
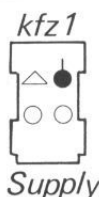


kfz 69

kfz 1

5cm Pak 38

Support Group



Key

⬤ ⬤ *Offizier*

⬤ ⬤ *Feldwebel*

⬤ *U'offizier*

○ *Private*

△ *Driver*

⤴ *Motorcycles solo*

⤴ *combination*

PART 2: WEAPONS AND EQUIPMENT

Section 1: Introduction

Anti-tank artillery, whether towed or self-propelled, has certain characteristics common to all other explosive projectile weapons and some special characteristics of its own. First of all there is nomenclature. In German parlance an artillery piece could be a genuine gun (*kanone*) which fires high velocity projectiles over a flat trajectory; a gun-howitzer (*haubitze*) which can fire either on a flattish trajectory or by lobbing the shell up into the air through an arc; or a howitzer (*Mörser*) which just lobbs the shell through the air (to add to the confusion the German term for mortar was *Werfer*). Anti-tank weapons were definitely guns and were usually referred to as *Panzerabwehrkanone* (anti-tank guns!) with the abbreviation *Pak*. A later common designation was *Panzerjägerkanone* but in practice the *Pak* abbreviation was retained; it is not therefore correct to refer to a *Pak* gun, as so many books do.

As to the common characteristics, any piece of mobile artillery – sometimes casually referred to as a weapon or 'gun' (G: *Geschütz*) – is made up of separate elements which need to be clearly noted in any description. The major part is what in British parlance is called the ordnance: This basically comprises the barrel and breech assembly with any fixed appurtenances such as muzzle brakes: The Germans usually classified it in terms of the inside diameter of the barrel (calibre) and the barrel/calibre length ratio (e.g. L/71) which influenced the muzzle velocity and accuracy and, hence, was important in an anti-armour weapon. The same ordnance can of course be used in a number of mountings for different roles: thus in the German army a basic standard 8.8cm ordnance might be used in tanks (*Kampfwagenkanone*); assault guns (*Sturmkanone*); on anti-tank mountings (*Pak*); and as an anti-aircraft weapon (*Flak*) with only minor modifications, usually to the breech arrangements.

The ordnance was always fitted in a mount which might be fixed, as in an assault gun, or combined with a trail (for towing) and an axle/wheels assembly to form a carriage. In towed guns the mounting carried all the sighting, traversing and elevating mechanisms; the arrangements for absorbing recoil (usually hydraulic cylinders or buffers); recuperation mechanisms to return the ordnance to firing position and some means of balancing the weapon to ease changes in elevation. The carriage comprised the road wheels and axle(s) together with either a single or split trail comprising a long box or pair of girders extending backwards to counter-balance the weight of the ordnance and provide a pick-up point for the towing gear. These were usually fitted with 'spades', angled pieces of steel designed to dig into the ground as the weapon recoiled and thus help retain it in position. The only exceptions to this in the German army were the weapons developed from anti-aircraft guns and mounted on cruciform carriages carried on two bogies; in their case the bogies were detached for firing, the four arms of the cross being spread

to form a firm base. This was largely a legacy from their *Flak* ancestry where the weapon was usually firing at a high elevation and the main recoil thrust was downward.

The main special characteristic of anti-tank guns was its ammunition. Unlike most allied equivalents, the German guns were designed from the start to fire high explosive and smoke shells as a secondary function but their main task was to destroy armoured vehicles. For this they needed armour-piercing shot – solid, hardened projectiles as opposed to hollow shell – which could be fired at great speed against the armour plate. The standard projectiles were thus finely pointed slugs of hardened metal but there were variants designed for special use. Most of these were intended to upgrade ordinary artillery but two variants were used by anti-tank units.

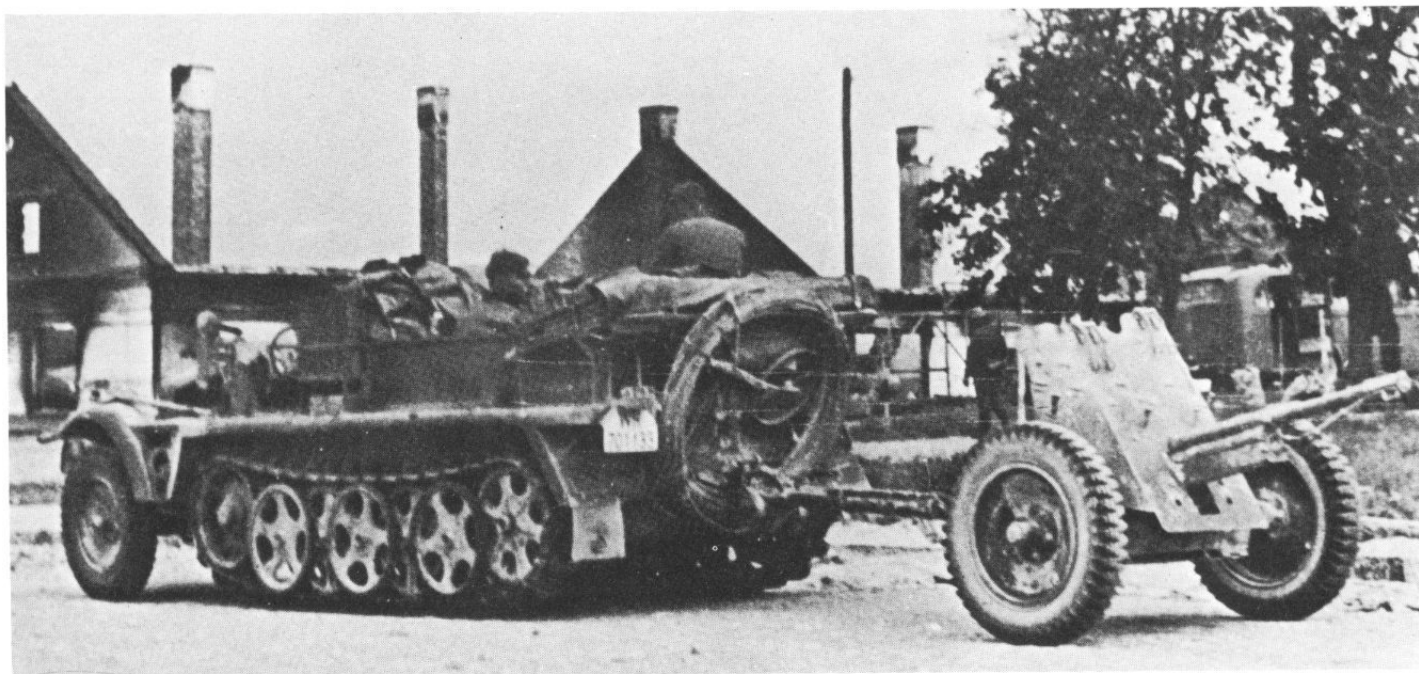
The first was the 'skirted' projectile designed for use in the coned-bore guns such as the 7.5cm *Pak 41*, where the barrel was wider in diameter at the breech than at the muzzle. The otherwise solid shot had collapsible soft 'skirts' at base and shoulder which were squeezed into annular slots in the shot as it progressed down the barrel; the idea was to give maximum base area for the propellant to act and to ensure maximum accuracy.

The other type of ammunition was the hollow-charge missile designed to give low-velocity weapons a chance. It was a hollow 'shell', usually with a solid stem and filled with a shaped incendiary charge which ignited on contact and burned its way through armour. It was mainly used in the form of projectiles such as the *Stielgranate 41* and *42* in an attempt to improve the effectiveness of light guns. It was also the principle behind the bazookas (*Panzerschreck*) used by some late infantry formations.

OPPOSITE TOP: SdKfz 10 prime mover towing a 3.7 cm *Pak 35/36*.

OPPOSITE BOTTOM RIGHT: The 2.8 cm SPzB 41 with tapered bore on the Gerlich system.

OPPOSITE BOTTOM LEFT: The ubiquitous 8.8 cm *Flak* saw extensive service in the anti-tank role in the North African theatre.



Section 2: Towed Anti-Tank Guns

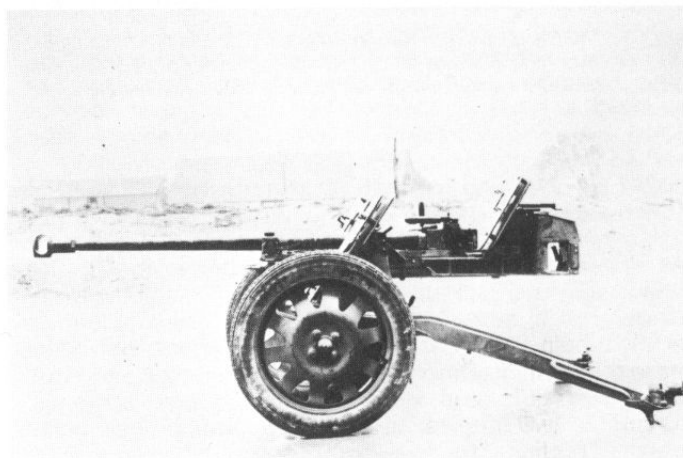
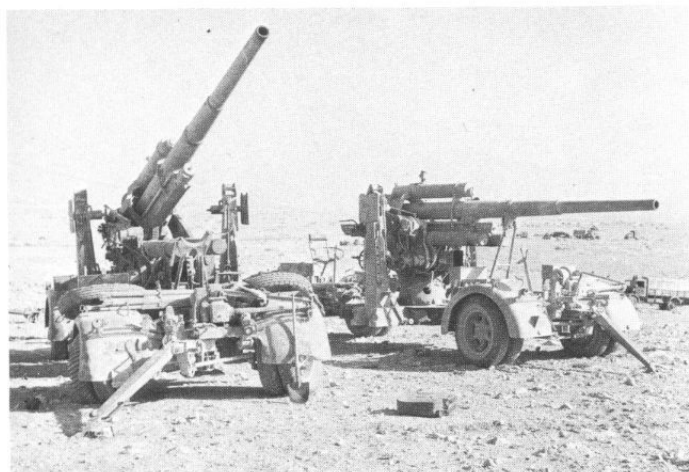
The basic weapon of the anti-tank units at the beginning of the war, and one that was always important, was the motorised, towed anti-tank gun. It started out at a calibre of only 3.7cm (c.1½ inches) but by the spring of 1945 guns with calibres as large as 12.8cm (c.5 inches) were being put into the field in small numbers – a reflection on the increasing weight and toughness of the armour they had to penetrate.

In general terms the German towed guns were always at least equal to allied designs and often superior; if there was a hiatus for some reason they were adept at taking the best designs of other countries, captured on the field, and improving them to act as stopgaps. The carriages were designed to be as light and easily handleable as possible and the ordnance itself was unusually versatile for specialised weapons. This section describes those guns,

German and foreign, that are known to have been taken in general use. At least two others the 4.2cm Pak 41, otherwise known as the 2.8cm heavy anti-tank rifle, since it had a coned bore, and the very heavy 12.8cm Pak 44 were produced but did not reach Abteilungen in significant numbers; various 8.8cm anti-aircraft guns were also used in an anti-tank capacity but it is felt that their description belongs elsewhere; only their specialised anti-tank developments are discussed here.

A note on designations: The official designation comprised

- a) the calibre, expressed in centimetres
- b) the 'anti-tank' designation (*Pak*)
- c) the year in which the development started
- d) the calibre/length ratio.



Light Anti-Tank Guns

3.7cm Pak 35/36 L/45

3.7cm Pak 37 (t)

4.7cm Pak 36 (t)

4.7cm Pak 181 (f)

4.7cm Pak (Böhler)

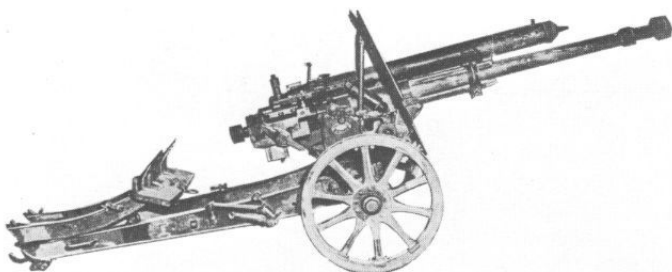
The standard anti-tank weapon of the *Wehrmacht* at the start of the war was the home-produced 3.7cm Pak 35/36. The design of this was started late in 1933, in parallel to that of the equivalent tank gun intended for the *Pzkw III* and both its size and design were typical of the period. (The French developed a 3.7cm gun, the British a 2-pounder). It was a neat, lightweight equipment designed for easy manhandling and mounted on an efficient pneumatic-tyred carriage with split, tubular trails incorporating spade ends. A light sloping shield was normally fitted and traversing was by means of handwheels. The equipment had a low silhouette and was designed to be towed behind the medium car series; special slings and bandoliers were provided for manhandling into firing position.

As an anti-tank weapon it could theoretically master any armoured vehicle envisaged at the date it entered service, being able to penetrate 35mm of sloped armour at 500 metres. Nonetheless by late 1939 it was already obsolescent and, after serving in the Polish and French campaigns, it was relegated mainly to secondary roles in infantry anti-tank companies and as light anti-vehicle protection for the panzer grenadiers. Some, however, remained in service with anti-tank units of mountain and static formations where heavy enemy armour was less likely to be encountered or where the light weight and portability gave the weapon an advantage. Various attempts were made to upgrade the guns performance in this defensive role by fitting it to fire the *Stielgranate 41* or 42 from 1943-on (see below).



Pak 35/36 with the 3.7 cm Stielgranate 41. This was a hollow charge spigot grenade.

ABOVE: The Skoda 37 mm Kanon PUV Vz 37 in German use as 3.7 cm Pak 37(t). This gun has a spoked-wheel carriage. BELOW: The larger Skoda 47 mm Kanon PUV Vz 36 also used by Germany as 4.7 cm Pak 36(t).





The other four equipments were all captured weapons impressed into German service and only the *4.7cm Pak 36(t)* saw service in any numbers with the regular anti-tank Abteilungen. This was the standard weapon of the Czech army at the time of the 1939 occupation. A rather more cumbersome-looking gun than the German model, it was nonetheless some 170 lb lighter and fired a shot over double the weight to almost twice the effective range. The carriage was much less sophisticated, with solid-tyred wheels and a rather odd folding trail which ended in a large 'spade'. It was designed for horse or man haulage when needed, having special attachment points for dragropes and was used only in comparatively small numbers – mainly by infantry Divisions in towed form and also as the first anti-tank weapon to be mounted on a self-propelled chassis (qv).

Of the other three weapons, the *Czech 3.7cm Pak 37(t)* was essentially similar to the German gun and was issued only to training units; the *French 4.7cm Pak 181 (f)* was a cumbersome weapon whose poor performance was not in keeping with its impressive appearance. Its carriage had large artillery-type wheels with solid tyres and had long, split trails; a low shield was fitted. The equipment was captured in some numbers in 1940 and was issued to the anti-tank units of various static divisions. It was still in use by them during the 1944 Normandy invasion, some weapons having been modified to fire the *Stielgranate 41 or 42*. The *Austrian 4.7cm Pak (Böhler)* was fairly similar to the *3.7cm Pak 35/36* and merits inclusion only because a few were issued to the anti-tank units of second line mountain Divisions.

5cm Pak 38

During the late 1930s, the German designers realised that more powerful guns than the 3.7cm series would be needed and in 1938 started development of a family of 5cm calibre weapons. The *Pak* variant was, inevitably, known as the *5cm Pak 38* and was, for its time, a very advanced weapon. The ordnance itself had a monobloc barrel with double-baffle muzzlebrake and had a semi-automatic breech mechanism to aid rapid fire. Recoil and recuperation gear was hydropneumatic and the gun was mounted on an interesting carriage incorporating several, then novel, features. It had cast disc artillery-type wheels with thick solid rubber tyres, split tubular trails with spade ends and with torsion-bar springing which automatically locked solid when the piece was put into firing position; a small castoring wheel under the trail end aided manhandling and crew protection was given by a curved, sloping steel shield with a hinged lower portion. The whole weapon had a very low silhouette, a fast rate of fire (10-15 rounds per minute) and an effective range (ie lethal to contemporary armour) of

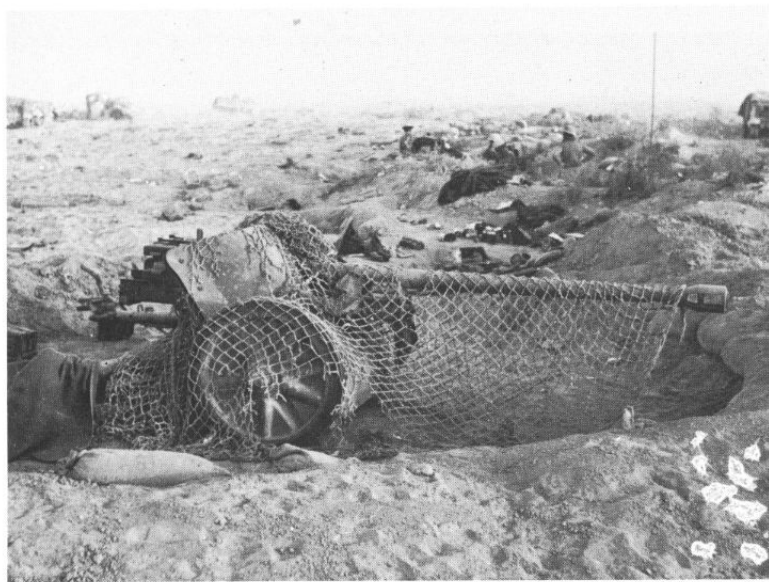
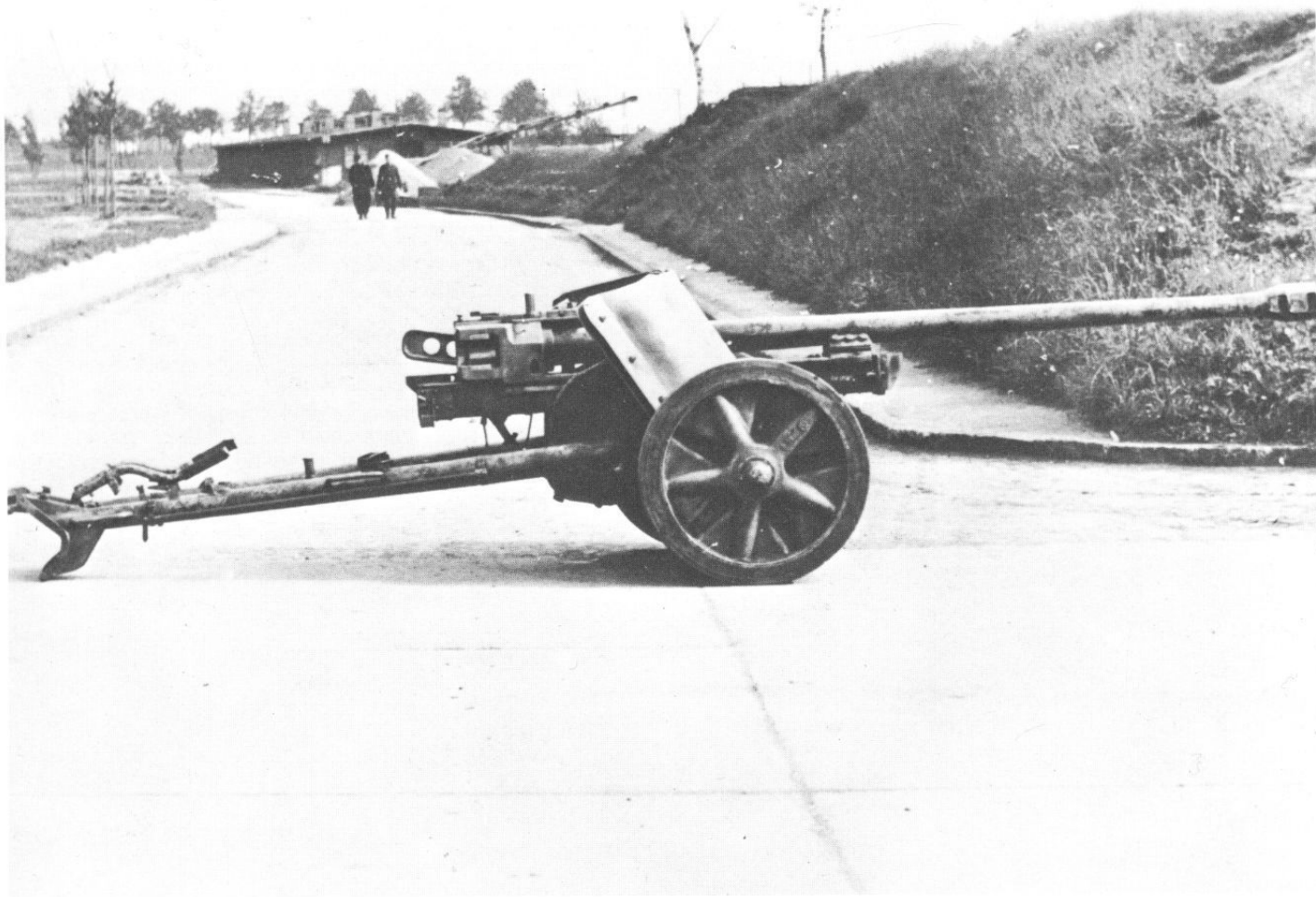
about 880 yards (804m). Maximum range using solid shot was about 1,580 yards (1,445m) and it could also fire high explosive shells at line-of-sight targets up to about 2,000m; appropriate ammunition was provided. The piece was served by a detachment of eight who normally rode on the prime mover. In practice this latter varied with what was available but was officially either a light standard lorry of the 1½ tonne series or a 1-tonne half-track tractor.

The *5cm Pak 38* came into service during the Greek and Balkan campaigns of 1941 and was subsequently used in both Africa and Russia. It was standard equipment for towed companies of the Divisional Abteilungen well into 1943 and, in spite of intended 'establishments' listing only 7.5cm guns, it was never entirely supplanted. Many were subsequently used by the anti-tank sub-units of infantry regiments though the weapon was never mounted in any numbers on self-propelled (*Panzerjäger*) chassis; by the time these were ready the 7.5cm and 7.62cm guns were available.



LEFT: 5 cm Pak 38 in France during 1940. The metal ammunition boxes containing four rounds apiece are clearly shown in the foreground. Two knocked-out British light tanks are visible in the background of this photograph which is probably a posed shot.

OPPOSITE PAGE: The 5 cm Pak 38 was difficult to spot because of its low silhouette, especially if dug in as illustrated in the lower photograph showing an emplaced weapon position overrun by the British in North Africa. The gunshield was curved and doubled skinned which shows clearly in the lower photographs. The metal ammunition containers of four rounds capacity are clearly shown too.

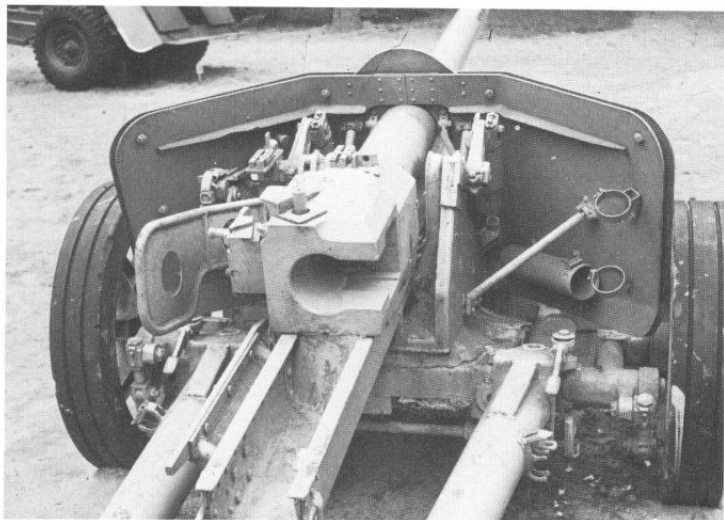
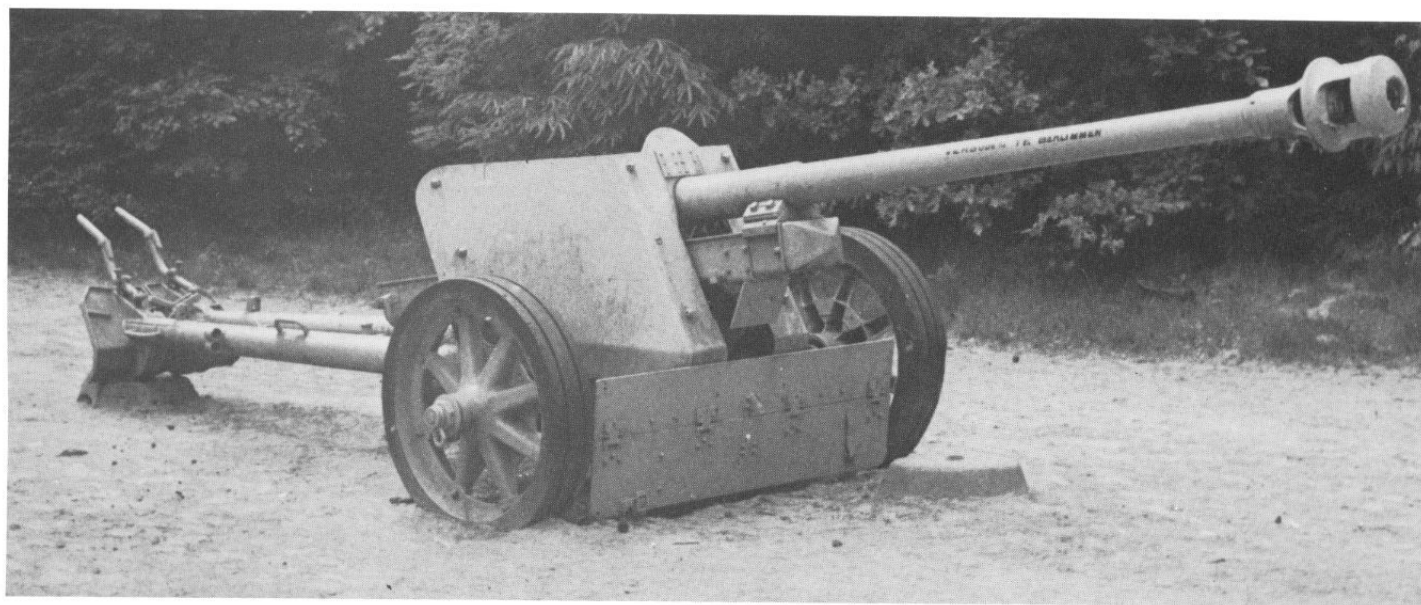


7.5cm Pak 40 L/46 and L/48

Probably the best general service anti-tank gun on either side was the 7.5cm Pak 40 developed as usual in parallel with its tank (*Kwk*) and assault gun (*Stk*) variants. The 40 in the designation is slightly misleading since, although general development may have started in that year, the final weapon was produced extremely quickly as a result of the first encounters with Russian T34 tanks in the summer of 1941. It was designed by Rheinmetall-Borsig actually in competition with a similar, but coned bore equipment designed by Krupp (the 7.5cm Pak 41). The latter was indeed lighter and had a superior performance up to about 1000 metres but it was complicated to produce and, with the coned bore design, barrel wear was high. In consequence only about 150 were built and they were issued largely to non-Divisional units.

The *Wehrmacht* certainly never had occasion to regret its choice of the 7.5cm Pak 40. It was basically a scaled-up 5cm Pak 38 in appearance and both ordnance and carriage had all the features of that weapon save for the castor

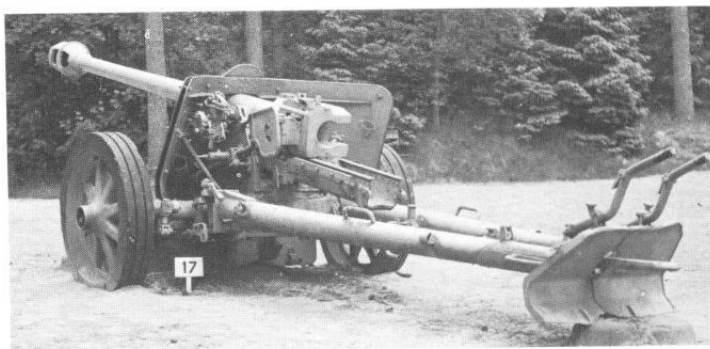
wheel. Again the weapon had a very low silhouette and the shield, though angled for simplicity instead of being curved, gave effective protection against stray small-arms fire. With a total traverse of up to 65° the gun could command a wide area; with an effective range of some 3000m and an armour penetration of up to 90mm at 1000m it had a good chance of destroying any contemporary allied armour which entered that area and could also fire high explosive and hollow-charge projectiles to increase its versatility. The gun was immediately adopted as the standard weapon for Divisional Abteilungen and was widely produced in both towed and self-propelled form. It was normally towed by the 3-tonne half-track series, both armoured (*Sd Kfz 251*) and unarmoured (*Sd Kfz 11*) but numerous other vehicles of similar power were used from time to time. There were never enough to go round but all front line armoured and panzer grenadier formations certainly had them in the latter stages of the war.



Two photographs of a preserved 7.5 cm Pak 40. The family likeness to the 5 cm Pak 38 is clear and these photographs should be compared with those of the 5 cm Pak 38 on the previous page.

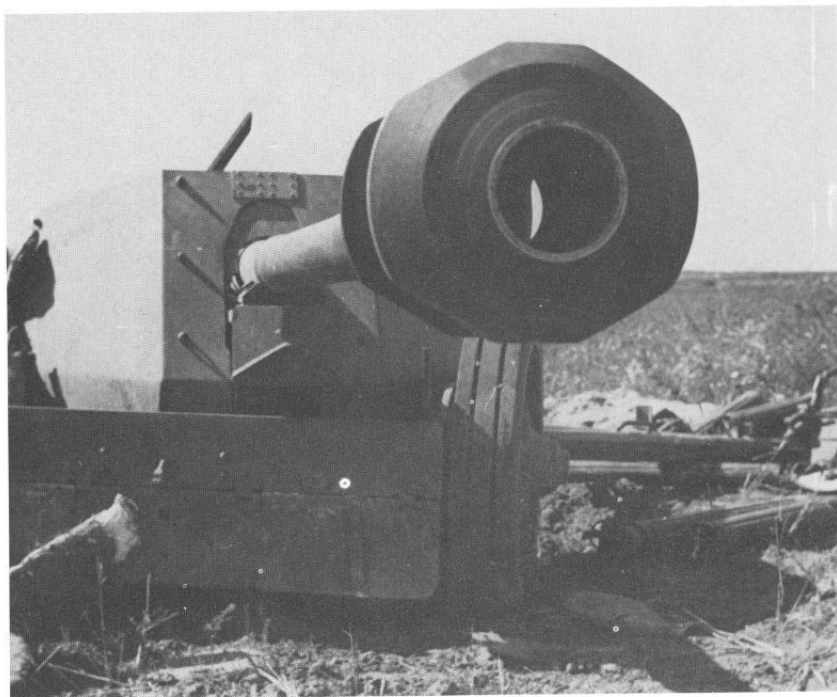


ABOVE: A rare photograph of a 7.5 cm Pak 41 in action. Only 150 units of this tapered bore Gerlich system gun were built. Note the periscopic sight. This Krupp design had a taper bore, 7.5 cm at the breech, reducing to 5.5 cm at the muzzle end. The bore was prone to wear and tungsten cored ammunition was not available in large enough quantities were two factors which reduced the chances of this gun being adopted for production. Its competitor the 7.5 cm Pak 40 was produced instead.



RIGHT: A preserved 7.5 cm Pak 40. The tail spades are clearly visible in this view.

RIGHT LOWER: The muzzle brake of a 7.5 cm Pak 40 in close-up.



Impressed Guns in the 7.5cm Range

7.5cm Pak 97/38

7.62cm Pak 36(r) and 39(r)

'Als ersatz' for both the *5cm Pak 38* and the *7.5cm Pak 40*, the *Wehrmacht* made extensive use of two enemy equipments which it captured in large numbers. These were the old French '75', or 7.5cm field gun and the family of Russian field guns which the Germans classified loosely under the designation *7.62cm Pak (r)*. These, it should be noted, were all guns rather than gun-howitzers and were therefore already long-barrelled, flat-trajectory weapons with many of the features desirable in anti-tank guns; their major defects were unsuitable carriages and these were comparatively easy to rectify.

7.5cm Pak 97/38. The basis for this was the evergreen Schneider 1896 model 7.5cm field gun which had, since the 1914-18 war, been the standard light field gun of the French army. The ordnance was still an effective weapon

and in 1942 large numbers were accordingly modified to counter the T34 threat. The antiquated carriage was discarded, being replaced completely by the carriage of the *5cm Pak 38*, and a perforated, drum-type muzzle brake was fitted to counter the effect of the higher velocity obtainable from German 7.5cm anti-tank ammunition. As was to be expected in a gun of that vintage, the breech was of the outdated Nordenfeldt screw type, giving a slower rate of fire, but effective range was still over 1000m and armour penetration at that range was described as 'satisfactory'. The gun was widely used by the anti-tank *Abteilungen* of Infantry Divisions especially and some remained in service until the end of the war. Some were adapted for SP chassis as an interim measure, especially in Africa, but the practice was not widespread; main carrier was the old French Hotchkiss Model 39 tank.



RIGHT: Germans examining captured Model 36 field guns. Some were converted into 7.62 cm Pak 36(r) by re-chambering and impressed into German service where they proved to be very successful in action.



RIGHT LOWER: Close-up of the business end of the Pak 97/98 with its easily recognised muzzle brake.



OPPOSITE PAGE: The 7.5 cm Pak 97/98 was a conversion of the French Schneider 1896 Model 75 mm field gun. This one has the year of manufacture, 1918, stamped on the breech.

7.62cm Pak 36(r) and 39(r). The basic 7.62 gun from which both these models were derived was the standard Russian light field gun in 1941. It was captured in huge numbers during the 1941-42 campaigns together with vast stocks of ammunition, and was promptly adopted as a *Wehrmacht* standard weapon though no more were produced.

The original gun, as might have been expected from its origin, was a simple but rugged equipment which had been designed from the start to have a limited anti-tank capability. The barrel was without muzzle-brake, and conventional recoil and recuperation cylinders were mounted beneath it. The carriage had large, pneumatic tired disc wheels, split box-type trails with a spade end, and a straight shield made of two thicknesses of armour plate bolted together to give a 'spaced armour' effect. Its general performance even in its original state gave satisfactory armour penetration at medium ranges and many examples were simply used in this form firing Russian ammunition. The Germans, however, also used their vast design experience to improve the weapon materially, though the modified version intended specifically for the anti-tank role was still designated *7.62cm Pak 36 (r)*. In effect the ordnance was modified to take the standard German long cartridge case with AP

round, substantially increasing the possible muzzle velocity and, hence, hitting power. The gun in this form was fitted with the double-baffle muzzle brake of the *7.5cm Pak 40* and this can easily be identified in photographs. In towed form, the *Pak 36 (r)* was used extensively by anti-tank units in all types of Division and was also mounted on various types of SP chassis (qv). It may be assumed that any Division established for *7.5cm Pak* in its Abteilung might at some time be issued with the Russian substitute.

The other major equipment acquired in large numbers was the so-called *7.62cm Pak 39 (r)* – often misidentified by allied intelligence as the *Pak 36 (r)*. The error was easily made since the gun was based on an updated version of the 7.62cm field gun, identifiable by its third, over-barrel recoil cylinder, shorter barrel and smaller, pneumatic-tired wheels; it was also somewhat lighter than the *36(r)*. As with the former it was used both in the original form and modified to take German ammunition; in the latter case it, too, had a modified breech and a *Pak 40*-type muzzle brake. It was used in some numbers, mainly in its towed version, and was issued to Divisions – especially Infantry Divisions – on most if not all fronts.

Heavy Anti-Tank Guns

8.8cm Pak 43 8.8cm Pak 43/41

Heaviest of the German purpose-built anti-tank guns to see service in any numbers, were the *8.8cm Pak 43* and its minor derivative the *8.8cm Pak 43/41*. These originated in the well-known 8.8cm Flak series of anti-aircraft weapons which had great success when used as extemporised anti-vehicle weapons both in Africa and on the Russian front. Their main defect was their vulnerability since they had a high silhouette and poor crew protection from ground fire; even the final development, the *Flak 41* which was regarded as a dual purpose weapon from the start, suffered from these defects.

Accordingly the German designers took the ordnance of the *8.8cm Flak 41* which was outstandingly good and modified it to fit a completely new two-axle carriage and mount. The carriage was still of cruciform pattern with demountable bogies but was much easier to set up for firing and was arranged so that, in limited circumstances, the gun could actually fire while on its wheels; this was normally within a 30° arc on each side of the carriage centre line. The mount was exceptionally low slung with a large, sharply sloped shield and, when off its wheels and dug in, the weapon offered excellent protection to its crew. As might be expected from its *Flak* ancestry the gun was unusually versatile, having a capability for 360° traverse and up to 40° elevation. Firing high explosive, it could provide a highly lethal shrapnel air burst at up to 17,000 metres theoretically and its range in the anti-tank

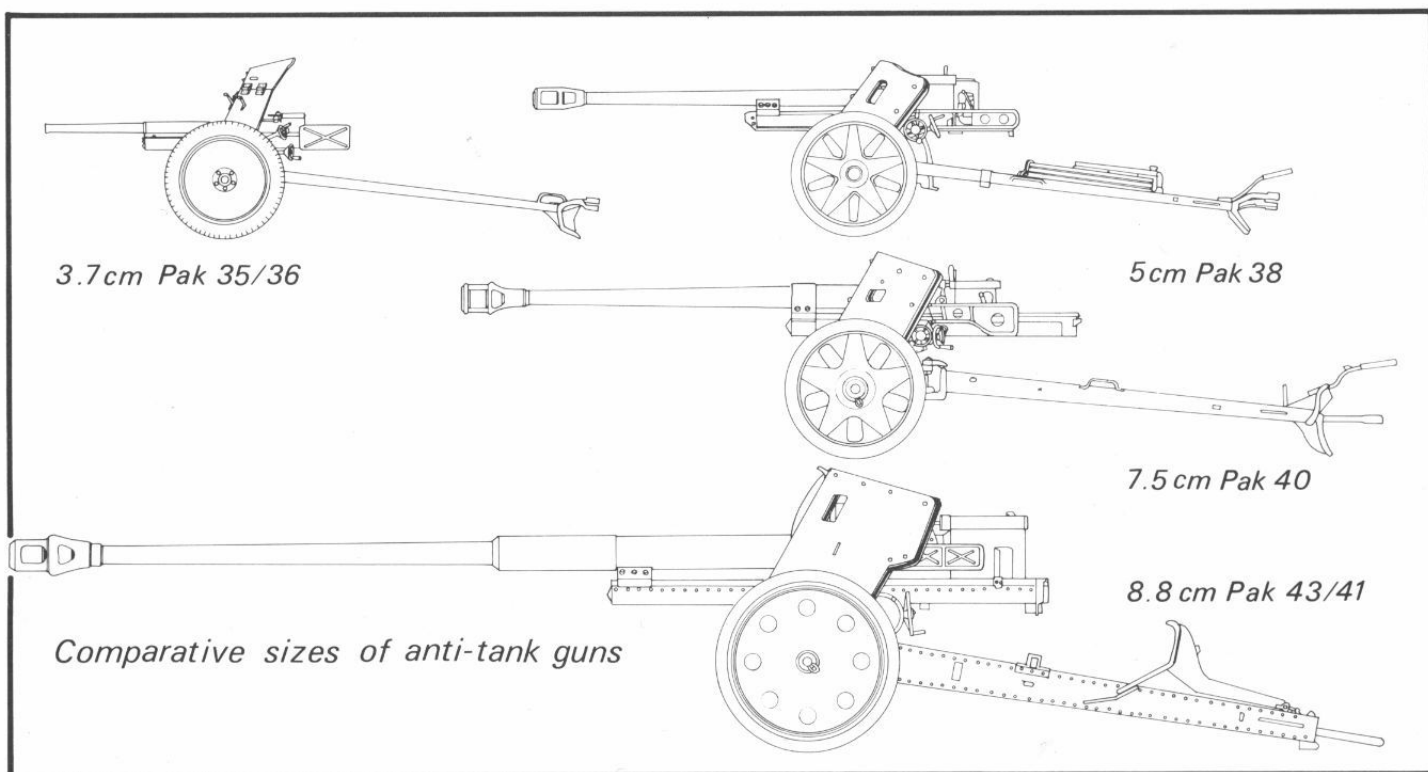
role was effectively limited by visibility. Armour penetration at the 'standard' fighting range of 1000 metres was no less than 163mm on sloped armour. The *Pak 43* was an excellent weapon and was used extensively on all fronts by Army and GHQ Panzer Jaeger Abteilungen but does not appear to have entered Divisional service in any numbers.

8.8cm Pak 43/41: The *Flak 41* and its *Pak 43* derivative proved extremely successful in dealing with Russian tanks but slow production of their complex carriages meant that they could not be built quickly enough to meet demand. As a stop-gap, therefore, the ordnance of the *8.8cm Flak 41* was mounted on a hybrid two-wheeled carriage consisting of the split trail carriage of the standard *leFH 18/40* gun-howitzer combined with the wheels, balancing cylinders and, apparently, the buffer-recuperator of the *s.FH 18* gun-howitzer. The result was the *8.8cm Pak 43/41*, a conventional towed anti-tank gun capable of being hauled by the 8-tonne half-track series of artillery tractors. It was widely used on the Russian front and, from various references, appears to have been issued at times to the Panzer Jaeger Abteilungen of some of the more hard-pressed Divisions – in particular *SS Panzer* formations. It was also used on the western front towards the end of the war, mainly by Heavy Abteilungen. Performance was similar to that of the *8.8cm Pak 43* except for the more limited elevation and traverse; a muzzle brake was fitted.





ABOVE: An 8.8 cm Pak 43/41 L71 under tow by a SdKfz 6.5 tonne prime mover. The barrel has been wound with wire to hold foliage as camouflage.



OPPOSITE PAGE: Although it was designated as an anti-aircraft gun the Flak 41 was used as an anti-tank gun when supplied with the appropriate ammunition.

Section 3: Weapons on Self-Propelled Chassis

Introduction

Self-propelled anti-tank guns of the German Army fell into two major categories: First were the *Panzerjäger* or 'tank hunters' – which might be more correctly translated as 'tank stalkers'. These were improvisations mounting standard tank guns on obsolescent tank chassis; they were fast, highly mobile and effective but were lightly armoured and generally had a high silhouette. The *Jagdpanzer* or true hunting tanks, were specialist, fully armoured vehicles usually mounting a heavier gun than the equivalent tank chassis and were in effect a development of the assault gun concept.

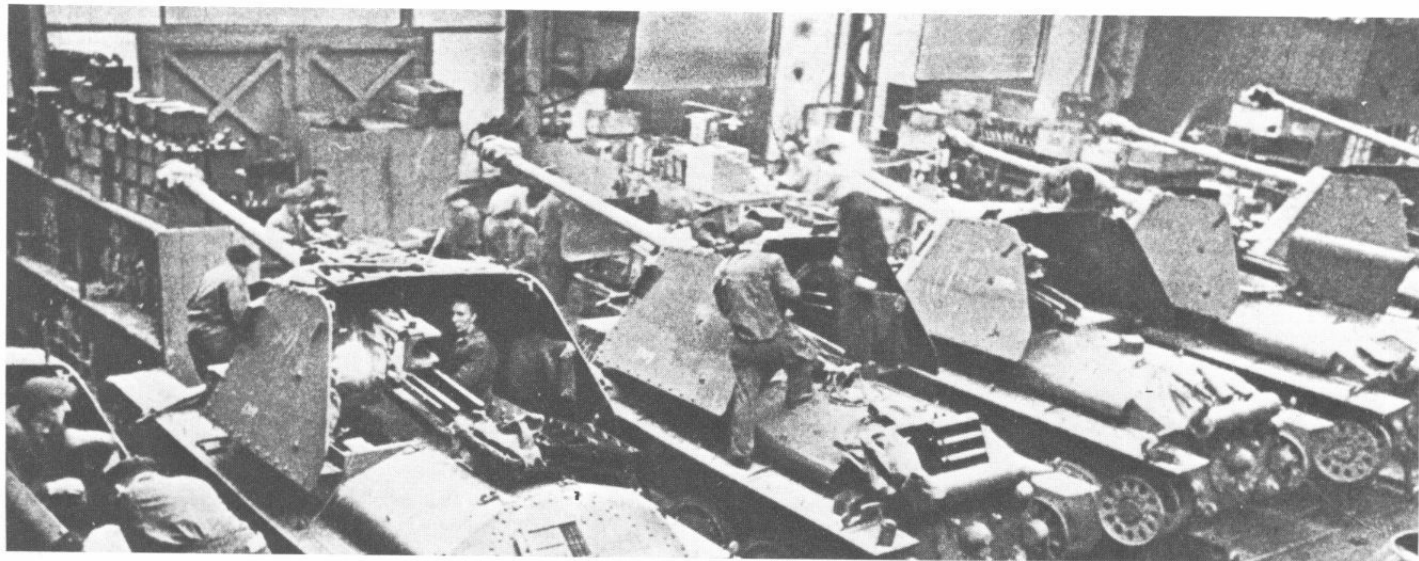
As mentioned earlier, Panzerjaeger, or as they were originally called, *Pak-auf-Selbstfahrlafette* (anti-tank guns on self propelled chassis) were the first form of mobile weapon used by the anti-tank units. They were initially straight installations of standard ordnance and mounts on tank chassis with the turrets removed, and included both German and foreign types; the gun occupied a 'fighting compartment' perched on the former turret position. From late 1942 on, however, the Germans also developed the semi-specialised '*Geschützwagen*' or gun-carrier concept to improve performance. In this the tank chassis concerned was modified to some extent to make it more suitable for its new task. Thus the Czech *Pzkw 38(t)* had its engine moved forward in the hull to make room for a rear fighting compartment and elements of the *Pzkw III* and *IV* were combined to produce the *Geschützwagen III/IV* – basically a modified *Pzkw IV* chassis with relocated engine and *Pzkw III* transmission units. *Jagdpanzer*, on the other hand, were specifically developed for offensive defence with low, fully armoured superstructures in place of the

open-topped compartments of the Panzerjaeger, and came into service from the beginning of 1944. It may be of interest that they were initially classed as light or heavy Panzerjaeger, the *Jagdpanzer* designation only being made official on Hitler's orders in Spring 1944.

It may be worth noting that the self-propelled anti tank-weapons appear to have been very susceptible to rather fancy names – perhaps it was felt that these increased morale. Thus the major series of *Pzkw II* and *38(t)* chassis were, from 1943-on, known as the *Marder* (Marten) series, *Marder II* being the early variants and *Marder III* the later version on the *Geschützwagen 38(t)*; *Marder I* was applied retrospectively to certain conversions of captured French chassis. *Hetzer* (Badger) *Elefant*, *Nashorn* (Rhinoceros) and *Panther* were also later applied to anti-tank equipments which had animal names in general – though exceptions were the original designations of *Elefant (Ferdinand)*, after its designer and *Nashorn (Hornisse, or Hornet)* presumably because it was thought of as an artillery piece; artillery took the names of stinging insects). Whether flippantly or not, a few improvisations also took type names, two half-track conversions in particular being named classically (cf *Artemis* and *Diana*). It may also be worth noting that official designations could take one of two forms: most common was the practice of specifying the gun and then noting its chassis (eg *4.7cm Pak (t) auf Pzkw I*) either with or without the qualifying note (*sf* or *sfl*). It was also possible to note the chassis first (eg *Panzerjäger 38(t) mit . . .*) though this latter pattern was confined to the 1943-5 period.

Details of the various tank chassis involved are given in our companion volume 'Panzer Regiments'.

A Marder production line. Mounting the 7.5 cm Pak 40 onto the Czech Praga 38 tank chassis enabled the Germans to field a highly mobile anti-tank force, though supply never satisfied demand.



Weapons on Pzkwf I chassis

4.7cm Pak(t) (Sf) auf Pzkwf 1 Ausf.B

This, the first of the self-propelled anti-tank guns, was a straight conversion of the *Pzkwf 1 Ausf.B*; the tank turret was simply removed and replaced by a Czech 4.7cm gun with a new, fabricated steel box shield and a limited traverse. An extra storage bin was fitted to the engine covers. The vehicle retained the 100hp motor of the *Pzkwf 1* but weighed 6.4t in battle order and had a crew of three. Armour was of 13mm thickness and 86 rounds were carried for the main armament; height overall, probably the weakest feature of all *Panzerjaeger*, was no less than 2.25m.

As a weapon this was very much an improvisation but was a reasonable success since no one else yet had anything similar. It came into service early in 1940 with *Abteilungen* of both infantry and panzer divisions, some 100 in all being available for the French campaign according to official records. Total production was less

than 200, official records showing a peak of 132 in use in mid 1941 (some sources quote 171 but the lower figure is more likely), and use declined rapidly thereafter. It appears that the early stages of the Russian campaign (May 1941-on) showed the deficiencies of this particular combination when exposed to superior armour and many were shipped to Africa where they gave good service.

Panzerjägers on a French road in 1940. Mating the Czech 4.7 cm anti-tank gun to the PzKpfw I Ausf B produced the resulting combination pictured here. The crew of this vehicle are wearing the black panzer uniform with a grey feldmütze. This combination was evident after the crews discarded their black berets during the French campaign and were awaiting the supply of the black feldmütze for panzer troops.



Weapons on the Pzkw II Chassis

7.62cm Pak 36(r) auf Fahrgestell Pzkw II (sf) (Sd Kfz 132) Marder II

7.5cm Pak 40/2 auf Sfl II (Sd Kfz 131) Marder II

Despite the deficiencies of the 4.7cm self-propelled gun, the Russian campaign quickly showed the need for mobile anti-tank weapons and in December 1941 orders were issued to provide heavy anti-tank weapons on two battle tank chassis then considered obsolescent: the *Pzkw II Ausf. D and E*, and the Czech *Pzkw 38(t)*. The *Pzkw II Ausf. D and E* had originally been constructed as fast tanks for the light divisions but lost their role when the Divisions were converted to full panzer formations. The original superstructure and turret were identical with other versions of the *Pzkw II* and had been diverted to help production so that, in 1941, only bare hulls were available. The firm of Alkett took advantage of this to build-on a full length fighting compartment; thus the driver and wireless operator sat in a semi-open compartment behind a frontal screen, the gun, complete with a small protective shield, being mounted above and behind them within an open-topped box. The gun in this case was the Russian 7.62cm field gun of which many had been captured and the whole vehicle was a neat illustration of how to use up surplus equipment. It retained the engine and transmission of the *Pzkw II* but had a four-man crew and weighed 11.5 tonnes in working order. 185 in all were produced between December 1941 and mid 1942 and they were issued mainly to Infantry formations on the Russian front. Early versions

can be recognised by the absence of a muzzle brake and it is understood that a few of the later ones were fitted with the 7.5cm *Pak 40/2* gun with modified shield. The vehicles appear to have served almost entirely in Russia.

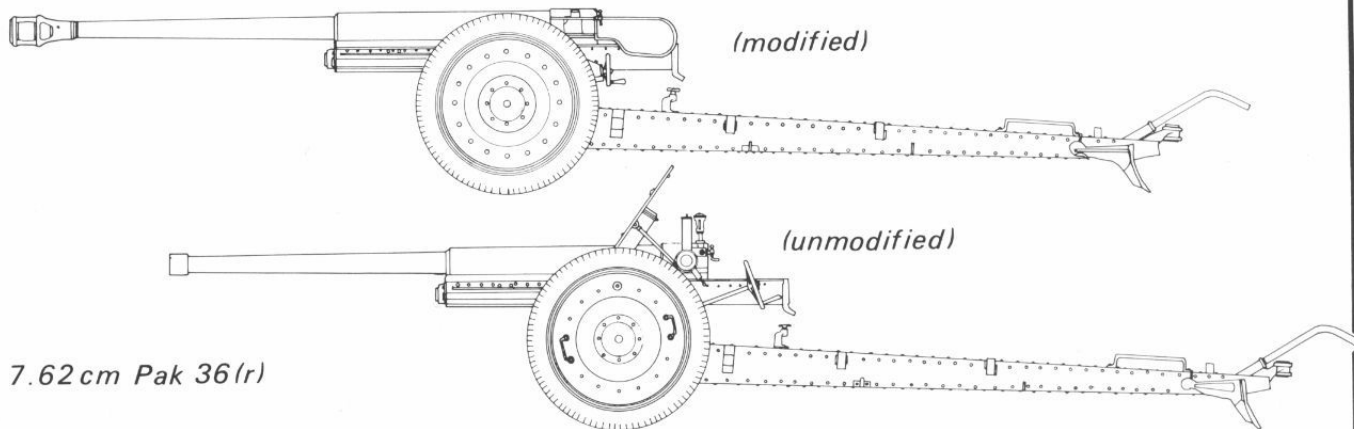
In May 1942, the OKH issued specification for improved versions on both *Pzkw II* and *38(t)* chassis, retaining the same type numbers. Since the *Ausf D and E* chassis were almost used up, chassis from the normal A, B, C and F variants were used instead, being fitted with the superb German 7.5cm *Pak 40/2* gun. (Prototypes were actually tried with the 5cm *Pak 38* but proved ineffective). The chassis was somewhat modified, the engine being moved and the gun mounted on the original hull surrounded by fairly elaborate superstructure. The gun was installed complete with its own front shield and mounting and had very limited traverse; a massive storage locker was provided behind the fighting compartment. Crew was four and all-up weight 10.8 tonnes. Some 1216 were ordered, the first ones coming into service in June 1942 but official records show only 531 delivered by the time production ceased in 1943. As a weapon the *Sd Kfz 131* suffered from the usual disabilities of a high silhouette and light armour but it did provide cheap mobility for the 7.5cm gun and was widely used. Most if not all went to Russia and most were used by Infantry formations.





OPPOSITE PAGE: The famous 'Kohlenklau' a much photographed 7.5 cm 40/2 auf Sfl II (SdKfz 131) Marder II. This combination used the chassis of the PzKpfw II Ausf A to C & F tank. The crew are wearing Infantry style tunics.

The obsolete PzKpfw II Ausf D or E chassis was employed as a Panzerjäger and it can be recognised by its Christie type suspension. These units were designated 7.62 cm Pak 36(r) auf Fahrgestell II(Sf) SdKfz 132 Marder II. This photograph shows the Russian Model 36 field gun with the muzzle brake fitted by German ordnance when they re-chambered it to take Pak ammunition.



7.62 cm Pak 36(r)



The Marder III Ausf M SdKfz 138 had its engine mounted forward and its 7.5 cm Pak 40 aft. This necessitated a special drivers compartment and new upperworks on the Czech tank chassis. The bar across the fighting compartment was fitted to take a tarpaulin cover in inclement weather.



The first Marder on the PzKpfw 38(t) chassis was the SdKfz 139. The version pictured here was captured in North Africa. The gun mounted is the German-modified Soviet 7.62 cm Model 36 field gun.



The Marder III Ausf H SdKfz 139 mounted the 7.5 cm Pak 40 on a virtually unmodified PzKpfw 38(t) chassis which even retained the bow machine gun of the tank.

OPPOSITE PAGE: The compact Jagdpanzer 38 Hetzer was the first genuine tank hunter on the PzKpfw 8(t) chassis and mounted the 7.5 cm Pak 39 L/48 in an armoured cast mounting.

Weapons on Pzkw 38 (t) Chassis

7.62cm Pak 36 (r) auf Sfl 38 (t) (Sd Kfz 139) Marder III

7.5cm Pak 40/3 auf Sfl 38 (t) (Sd Kfz 138) Marder III

Panzerjäger 38(t) mit 7.5cm Pak 40/3 (Sd Kfz 138) Marder III

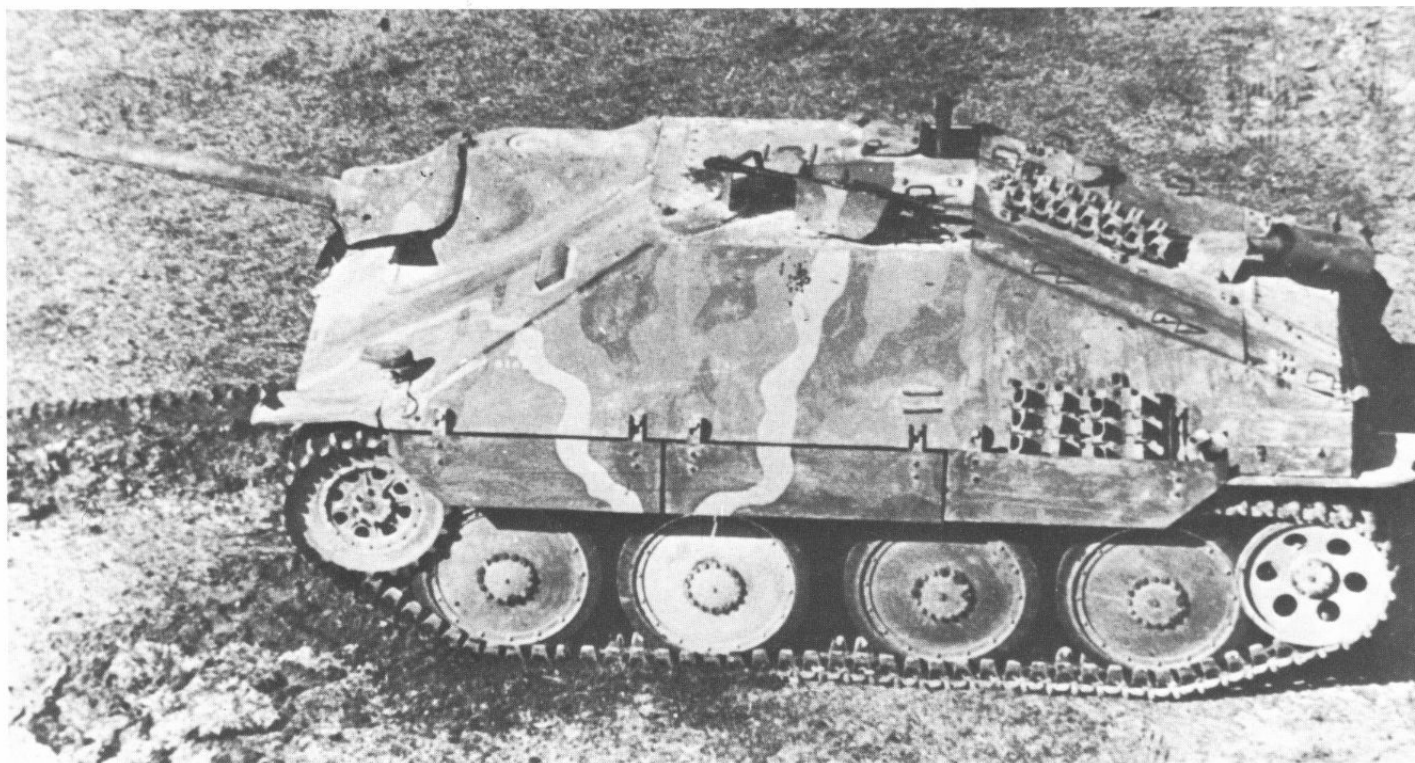
Jagdpanzer 38 Hetzer mit 7.5cm Pak 39 L/48

Most successful of the early Panzerjaegers were undoubtedly those based on the Czech Pzkw 38(t) chassis and which were known collectively from 1943-on as *Marder III*. The first ones were ordered in December 1941 as a stop-gap for the Russian front and were the simplest of the series. In effect the gun was simply mounted complete on top of the tank hull in place of the turret, a low fighting compartment being formed by rivetted plates. The weapon used was the Russian 7.62cm field gun, with or without muzzlebrake, 78 rounds being carried. All-up weight was about 10.5 tonnes and the crew numbered four. Production started in March 1942 and 344 were produced during that year, most going to Divisions on the Russian front; Infantry formations again benefited to a great extent.

In May 1942, in parallel with developments on the Pzkw 38(t) chassis, orders were placed for the *Marder III* to be fitted with the indigenous 7.5cm Pak 40/3. Initially this was again a simple conversion, the Pak 40 being mounted complete with its shield on the hull decking and a tall armoured fighting compartment being built round it. The engine was uprated to 150hp and all-up weight became 10.8 tonnes. The first vehicles were delivered in June 1942 and the type continued in production until March 1943, 418 being built before it was replaced by an improved version, the *Panzerjäger 38(t)*. This which appears to have started the fashion for 'Panzerjaeger.mit..' designations, was a more comprehensive redesign, the engine being moved forward

in the chassis and a new, lower fighting compartment taking its place at the rear. In this form the weapon had a rather more limited traverse but the crew was better protected. Many were issued to Panzer Division Abteilungen on all fronts and some 799 were produced before production ceased in May 1944. All-in-all the Panzerjaegers on the modified chassis were among the best of their type and production was only stopped in favour of the even better *Hetzer Jagdpanzer* design.

The *Hetzer* (badger) was designed late in 1943 as a genuine tank hunter, receiving its name officially at the beginning of 1944. It was based on the Pzkw 38(t) chassis with an uprated engine, strengthened transmission and a widened track; a completely new, closed armoured fighting compartment with 60mm frontal armour was built on the chassis, the 7.5cm Pak 39 L/48, without muzzlebrake, being mounted in the nose alongside the driver. A *saukopf* mantlet gave limited traverse and an externally mounted machine gun was provided for local defence; narrow side skirts protected the vulnerable join between hull and superstructure. The armour was well sloped and the result was an effective fighting machine. Official records show 1577 as having been built and they served on all fronts. Theoretically they were intended for issue to Infantry formations, the Panzer Divisions being established for the *Jagdpanzer IV*, but there is evidence that some at least served with Panzer units.



Weapons on the Pzkw IV and Geschwulzen III/IV chassis

8.8cm Pak 43/1 auf Fahrgestell Pzkw III/IV (Stf) (Nashorn)
(Sd Kfz 164)

Sturmgeschütz IV mit 7.5cm Stuk 40 L/48 (Sd Kfz 163)

Jagdpanzer IV mit 7.5cm Pak L/48 (Sd Kfz 162)

Jagdpanzer IV mit 7.5cm Stuk 42 L/70 (Sd Kfz 162 and 162/1)

First main anti-tank vehicle on the Pzkw IV chassis was the heavy panzerjaeger 'Nashorn' (Rhinceros). This was basically a late 1942 improvisation to provide mobility for the heavy 8.8cm gun on the Russian front and took advantage of a vehicle which had been designed to carry the 15cm gun-howitzer as self-propelled artillery (*Hummel*). It consisted of a modified Pzkw IV chassis which had Pzkw III drive and transmission elements and in which the complete engine and transmission unit was moved forward into the former crew space to allow for a rear fighting compartment. In this open-topped compartment was mounted a complete 8.8cm Pak 43 with limited traverse. The armour was designed to stop only small arms fire so the vehicle was hardly even a true Panzerjaeger but it did provide much needed mobility. It had a crew of five men, an all-upweight of 24 tonnes and carried 40 rounds for the main armament. It came into service in November 1942 and 473 were built before production was phased out in 1944 in favour of the purpose designed *Jagdpanther* (qv). It was originally named *Hornisse* (Hornet) in the artillery 'insect' series of names presumably because of its lethal sting, but in February 1944 a Führer directive instructed that it be renamed *Nashorn*, in keeping with the animal names then being given to anti-tank guns.

The next weapon, of which little service information is available, was the *Sturmgeschütz IV*. This, described in detail in Panzer Regiments, was essentially the superstructure of the *Sturmgeschütz III* assault gun modified to fit the Pzkw IV chassis and equipped with a long-barrelled 7.5cm gun. It is understood to have been used mainly by the armoured Abteilungen of Panzer Grenadier Divisions and as a tank substitute but some were sent to Panzerjaeger Abteilungen before the *Jagdpanzer IV* became available.

Final design on the Pzkw IV chassis, in this case unaltered, was the *Jagdpanzer IV* which stemmed directly from the success of the long-barrelled *Sturmgeschütz III* and IV. Originally classed as a light Panzerjaeger, it was conceived late in 1942 as a specialised offensive tank hunter and largely replaced the interim *Stug IV* in production late in 1943. Basically it was a standard Pzkw IV chassis up to trackguard level but with an entirely new superstructure comprising a low, fully armoured fighting compartment mounting a long 7.5cm gun in a *saukopf* mantle with limited traverse. In production models the well-sloped armour started at deck level and the driver's visor was incorporated into it. Armour was ballistically well shaped and thick, later variants having up to 80mm in front and 60mm on the sides; light armour skirts were fitted to protect the hull against shaped charges.

Originally designated light Panzerjaeger IV, and shown as such on establishments, the vehicle mounted a 7.5cm Pak 39 (L/48) complete with muzzlebrake. Crew was four, all up weight 24 tonnes and it carried no less than 79 rounds for the main armament, a light machine gun being provided for local defence. The name *Jagdpanzer IV* was

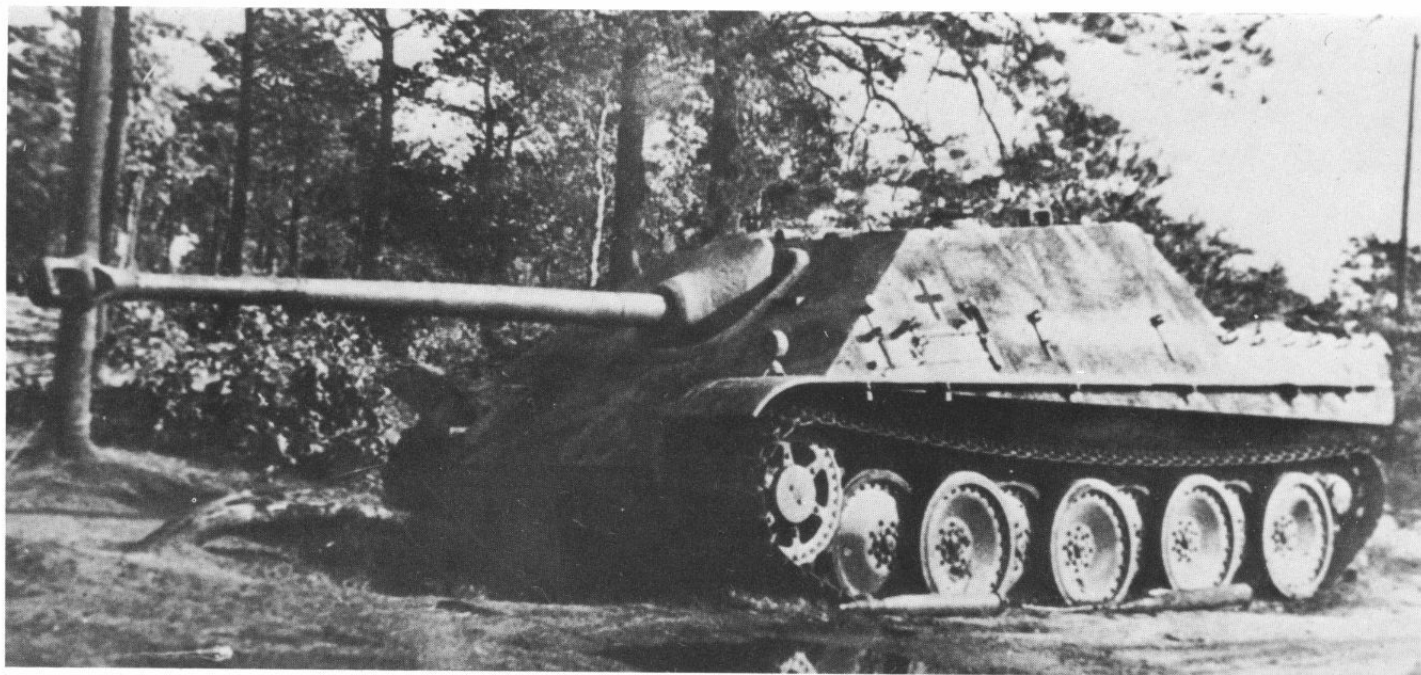
substituted by Hitler's order in September 1944.

The main variants of the design were attempts to upgun the basic chassis with the 7.5cm L/70 gun of the *Panther* tank. Prototypes, in mid 1944, had a higher and more angular superstructure based on the complete Pzkw IV hull and were tried out on the Russian front. Production versions simply substituted the L/70 gun without muzzlebrake on a slightly shortened *Jagdpanzer IV*. From various reports, the vehicle was not well liked as the standard *Jagdpanzer IV*, being nose heavy and difficult to manoeuvre because of the great length of the fixed gun. It was produced only in small quantities, being issued mainly to the assault gun companies of both infantry and armoured formations. The standard L/48-equipped *Jagdpanzer IV* was, however, built in considerable numbers and was 'established' as standard equipment for the Panzer Jaeger Abteilungen of Panzer Divisions from April 1944 on. Needless to say there were never enough to go round although 1531 of all variants were produced before the war ended.

OPPOSITE PAGE TOP: The Panzerjäger 39 SdKfz 162 mounted a 7.5 cm Pak 39 L/48. This version does not have a muzzle brake. The bow markings show this well photographed vehicle to belong to the 116 Panzer Division. The divisional badge is the 'running hound'. The lower marking is the 3rd Panzerjäger company. The two open flaps on the nose plate allow access to the steering brakes. Compare this vehicle with the Stug IV on page 11.

OPPOSITE PAGE BOTTOM: A whitewashed Nashorn receiving ammunition from a Maultier on the Eastern Front. The size of the 8.8 cm Pak 43 mounted on the Panzer IV chassis along with its tremendous overhang can be judged from this photograph.





Heavy Jagdpanzer on Panther and Tiger Chassis

Jagdpanzer V 'Jagdpanser' mit 8.8cm Pak 43/3 L/71 (Sd Kfz 173).

Jagdpanzer Tiger (P) 'Elefant' mit 8.8cm Pak 43/2 L/71 (Sd Kfz 184)

Jagdpanzer VI 'Jagdtiger' mit 12.8cm Pak 44 L/55 (Sd Kfz 186)

These three equipments can be conveniently grouped together since they were all used for the same purpose and all were produced in relatively small numbers. The designations quoted above are those officially used for most of their careers but both *Elefant* and *Jagdpanser* started life as *Panzerjaegers*.

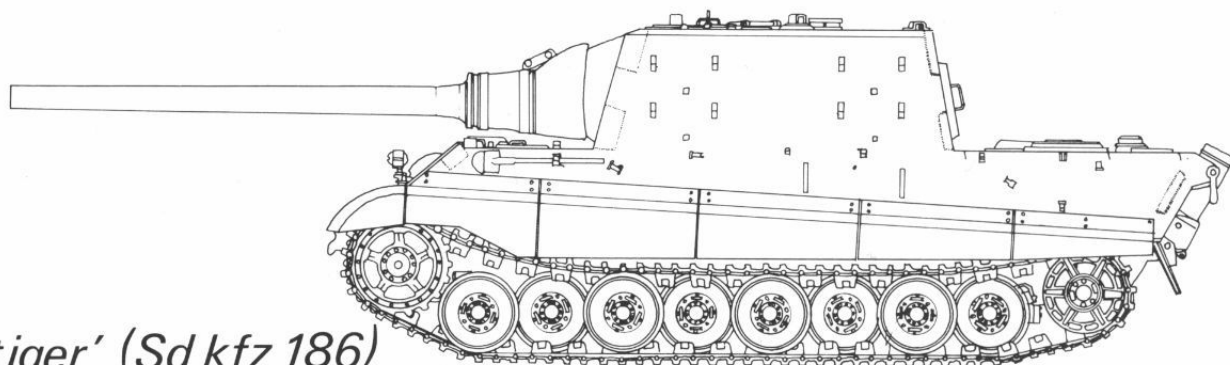
Earliest of the three designs was the *Jagdpanzer Tiger (P) Elefant*. This was designed in 1942 basically in order to use up 90 chassis built by Porsche in anticipation of winning the contract for a heavy tank – the *Pzkw VI Tiger*. When the contract was won by Henschel, the Porsche firm proposed to convert their chassis into heavy anti-tank equipments and their suggestion was accepted. The resulting vehicle was the first genuine attempt to build a fully armoured *Jagdpanzer*; it consisted of a low boxlike hull with a heavily armoured fighting compartment at the rear. The 8.8cm L/71 gun was provided with only limited traverse and elevation and the armour was up to 200mm thick in places. Crew was six and 50 rounds of ammunition were carried for the main armament. Unfortunately the vehicle was distinctly overweight for its rather delicate petrol-electric drive and was not reliable. Originally called '*Ferdinand*' in honour of its designer, Dr Ferdinand Porsche, most of the 90 produced were used in an offensive role during the Kursk campaign of July 1943. The result was disastrous; not only were their transmissions unreliable but with no means of local defence and restricted visibility for the crew, they were easily silenced by Russian troops.

They were hastily withdrawn and the survivors of the two Abteilungen which had been formed were sent out to the Italian front where they were used in a defensive role. A light hull machine gun was hastily fitted to give some form of local defence though this was never adequate, and a cupola was provided for the commander. Possibly because of the debacle, possibly to bring them into line with other *Jagdpanzers*, the name was changed to *Elefant*. It is worth noting that the problem of retrieving such massive vehicles was taken into consideration from the start and five hulls were completed as recovery vehicles.

These did not have the supplementary armour of the *Jagdpanzer* version but had a smaller compartment at the rear and were equipped with a mounted machine gun for local defence.

The *Elefant* may not have been successful; the *Jagdpanser*, the second equipment of the three to come into service was certainly the best German self-propelled gun of the war. Its design, finalised in October 1943, took account of all the lessons learnt from the *Nashorn* and *Elefant* and the first production vehicles came into service in February 1944. It was an elegant solution to the *Jagdpanzer* problem. A complete *Panther* chassis with strengthened transmission was fitted with entirely new superstructure providing a well-armoured closed fighting room mounting the 8.8cm Pak 43/3 gun. The gun had a reasonable elevation (-8° to $+14^{\circ}$) though limited traverse and armour thickness varied from 80mm on the sloping

OPPOSITE PAGE: The *Jagdpanser SdKfz 173* entered service in early 1943 and was considered by many to be the best German self-propelled gun of World War II. The vehicle in the upper photograph has side plates fitted to counteract hollow charge projectiles whereas the vehicle in the lower photograph is devoid of these although the mounting strip is clearly visible. Notice the size of the complete 8.8 cm rounds on the ground at the side of this vehicle. The 8.8 cm Pak 43/3 L/71 mounted in *Jagdpanser* could pierce any allied vehicle in service which made it a formidable tank hunter.

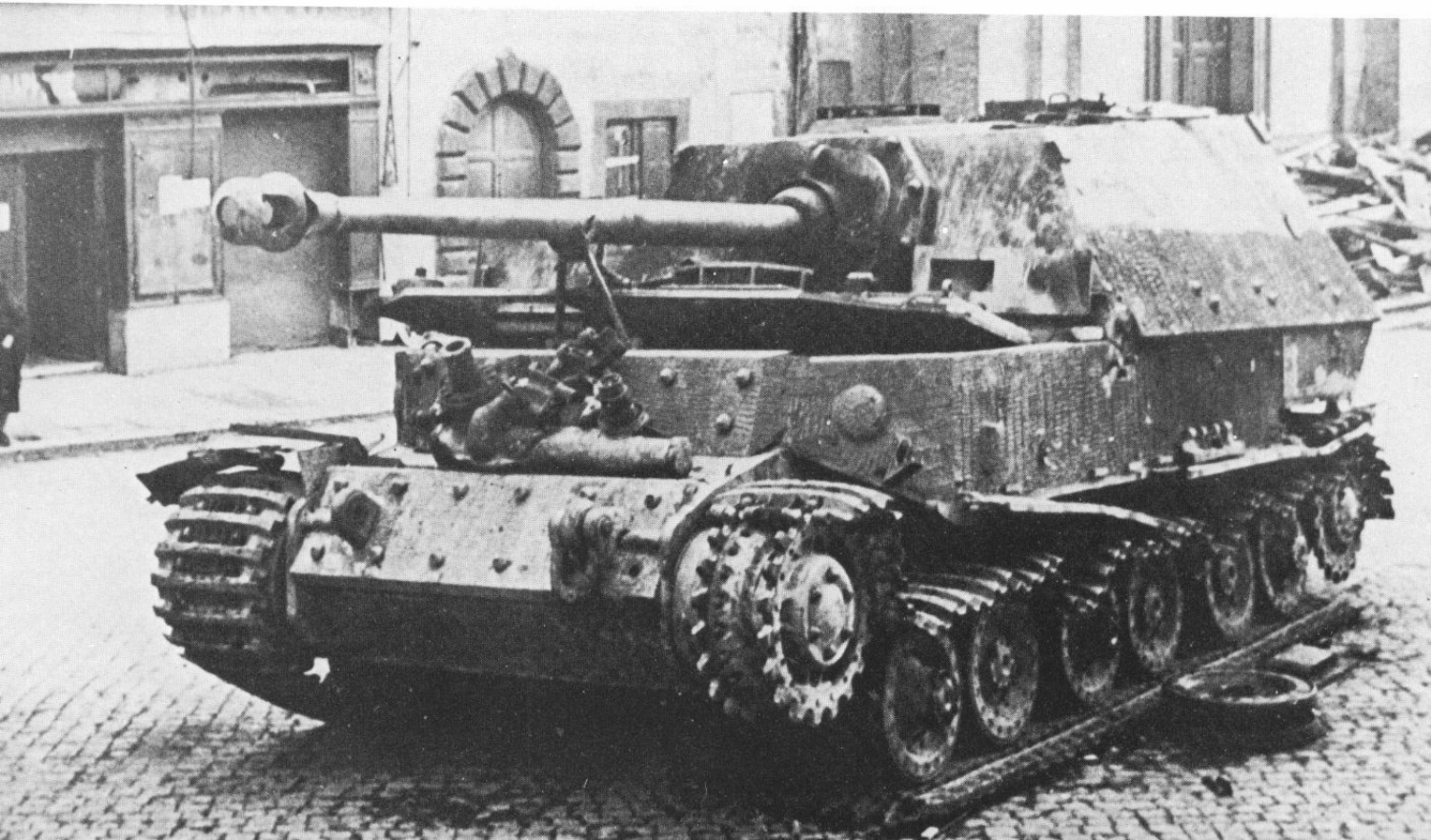


'Jagdtiger' (Sd kfz 186)

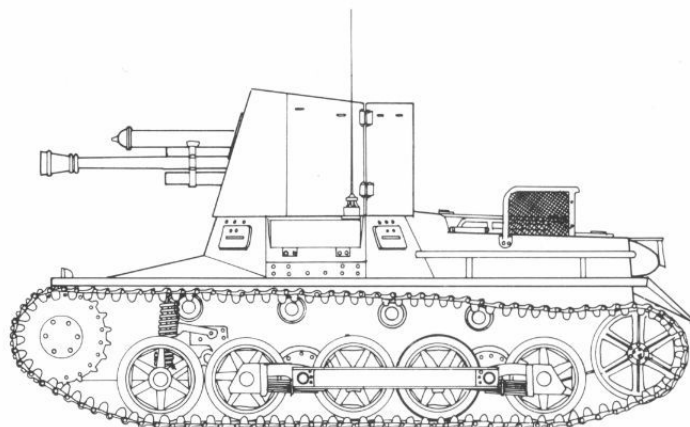
front sheet to 40mm at the rear; the body was ballistically well shaped. The vehicle weighed 46 tonnes in fighting order, had a crew of five and carried 60 rounds for its main armament. 382 were produced before the war ended, being issued to Army heavy Abteilungen; the majority served on the Eastern front, proving invaluable.

The third heavy vehicle in the series is included because some did see service but its use was not significant. This was the *Jagdtiger* – so called from September 1944 – produced in small numbers to utilise the 12.8cm Pak 44, a gun adapted for this vehicle directly from the equivalent anti-aircraft weapon. It was basically a Henschel *Tiger Ausf.B* hull with a massive armoured fighting room on top mounting the gun in a *saukopf* mantlet. All-up weight was 71.7 tonnes, crew 6 and maximum armour thickness 250mm. Although 48 were built and some were issued to heavy Abteilungen, they were not very successful. The vehicle suffered from all the defects of the *Tiger Ausf. B*, in particular its unreliability and difficulty of transport, and was so unmanoeuvrable that it was little more than a mobile pillbox.

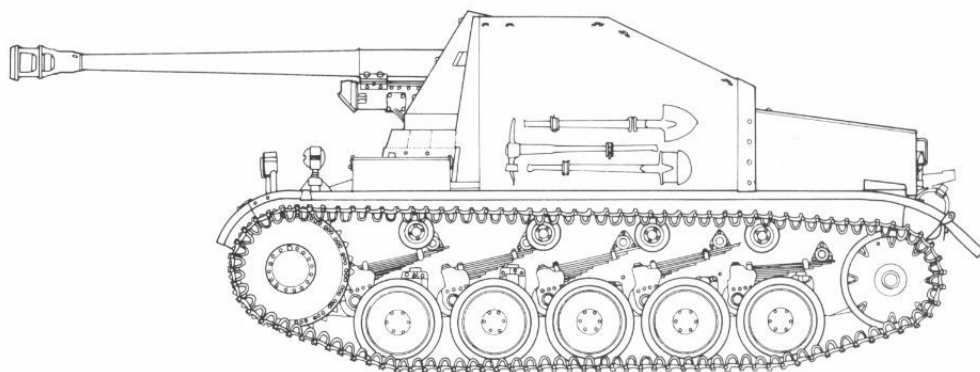
This Elephant knocked out by the allied forces in Italy appears to have been racked by internal explosions, probably its stowed ammunition. The object on the hull front is one of the bogie suspension units. This later version mounted a hull machine gun – invisible behind the suspension unit on the hull front – and commanders cupola, added after shortcomings discovered with this vehicle from action on the Eastern Front.



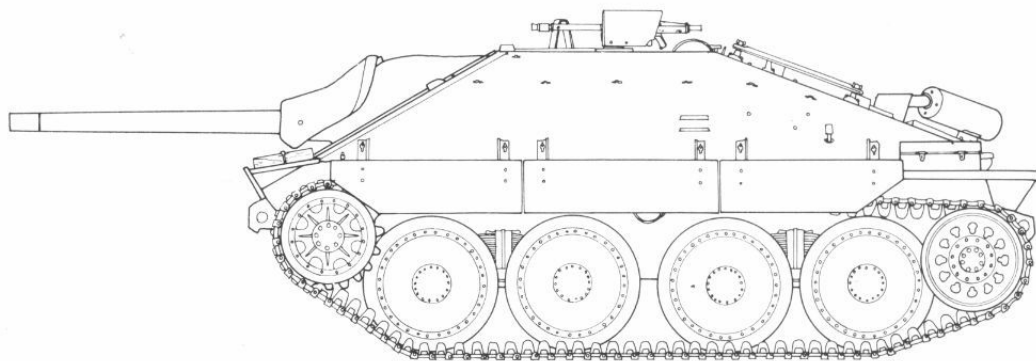
Panzerjäger 1



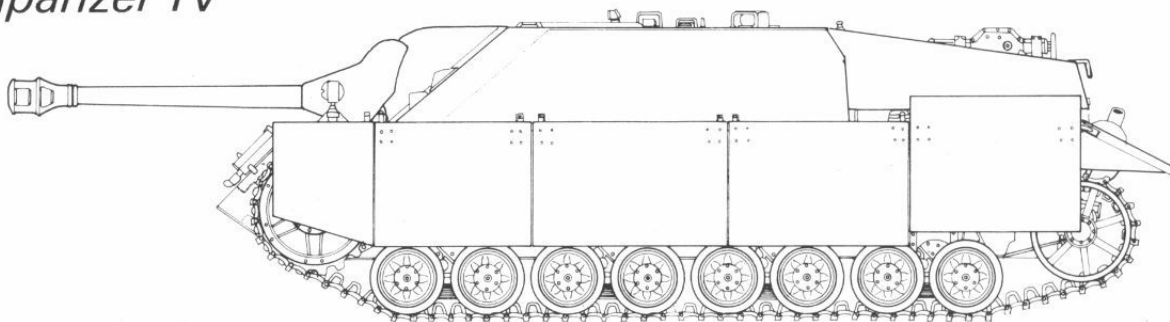
Marder II



Hetzer



Jagdpanzer IV

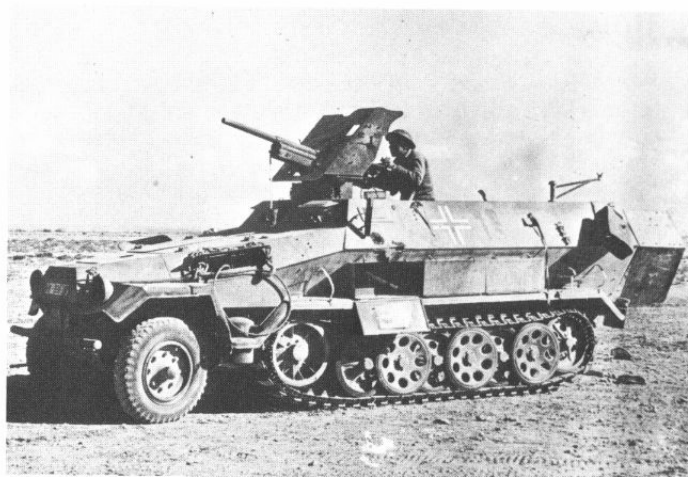


Panzerjaeger Abteilung Weapons on Miscellaneous half-tracked chassis

3.7cm Pak 35/36 auf Zgkw 1 tonne (Sd Kfz 10)
5cm Pak 38 auf Zgkw 1 tonne (Sd Kfz 10)
7.62cm Pak 36(r) auf Zugkraftwagen 5t (Sd Kfz 6) Diana
7.62 Pak 36(r) auf Zugkraftwagen 8t (Sd Kfz 7) Artemis
7.5cm Pak 40 auf m.SPW (Sd Kfz 251/22)

Little detailed information is available about these self-propelled equipments which were all classed officially as panzerjaegers. The 3.7cm and 5cm may have been improvised from the normal *Sd Kfz 10* half-track mount for the 2cm and 3.7cm Flak, and details of employment are not known. 'Diana' was a more complex improvisation, nine being produced for the SP company of 21 Panzer Division in North Africa in 1941-42. It consisted of a standard 5-tonne series half-tracked tractor with the normal body cut off behind the drivers seat and replaced with a crude, slab-sided open 'fighting compartment'. Access to this was by hinged steel doors at each side and the Russian 7.62cm gun, complete except for wheels and trail was mounted slightly off centre, to the right; a muzzlebrake was fitted. The conversion was roughly equivalent to the British 'Deacon' in that it gave little more than mobility and it was not developed further. 'Artemis' appears to have been a very similar improvisation using the chassis of the 8-tonne series half-track and also used only in small numbers.

It is believed that various captured half track chassis were experimented with to provide self-propelled mounts for local defence units in France but the only fully authenticated 'standard' design was that on the medium armoured personnel carrier (*Sd Kfz 251/22*). This was an experimental improvisation used on the Russian front in 1945 and which a complete gun, with just wheels and trails removed, was fitted in an SPW body. As with a similar conversion on the heavy wheeled armoured car chassis, it is likely to have been used by reconnaissance units rather than by any anti-tank Abteilungen (the Divisional Recce unit was at this time established for three 7.5cm anti-tank guns).

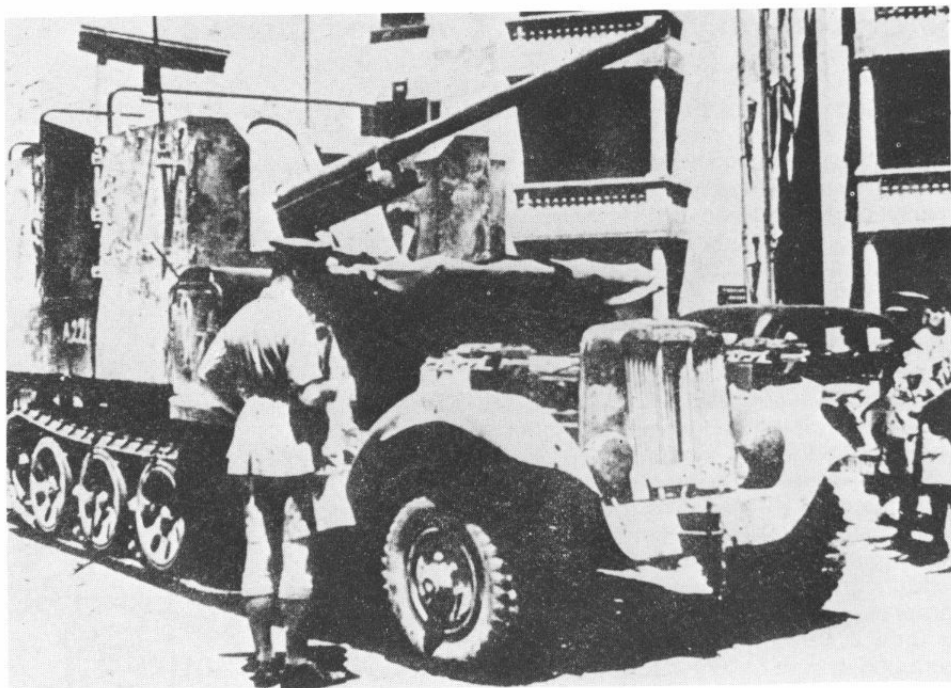


The SdKfz 250/10 mounted a 3.7 cm Pak 35/36 which gave the half track an added punch. This vehicle was captured in North Africa by the British.

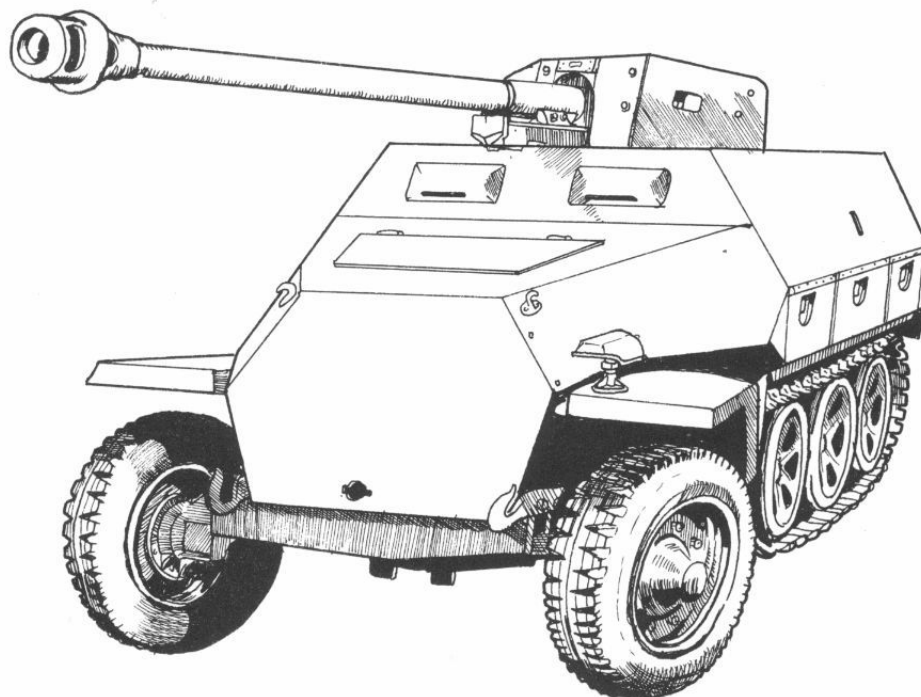
Self-propelled 3.7 cm anti-aircraft guns firing AP ammunition were often used against ground targets. This gun is mounted on a half tracked prime mover.



*An extemporised 'Diana' in British hands.
The Pak 36(r) was mounted on a 5 tonne
SdKfz 6 prime move for greater mobility.*



*7.5cm Pak 40 auf m.SPW
Sd k f z 251/22*



Self Propelled Weapons on Captured Chassis

During the course of the war, a number of former enemy tracked vehicles were impressed for use as *selbstfahrlafetten* and some were fitted with anti-tank guns as improvised Panzerjaeger. The known chassis were mainly of French and British origin, being drawn from stocks acquired when France was overrun in 1940. Most conversions appear to have been used in the Western sector by local defence units or by new formations raised or reformed in France. They are best classified by gun type:

3.7cm Pak 35/36 auf Sfl Bren (e)

3.7cm Pak 35/36 auf Infanterie Schlepper UE (f)

Two chassis were used for mounting the 3.7cm gun, the family of British light carriers collectively known as Bren Carriers, and the very similar French UE-type infantry carrier built by Renault. The first conversion was produced in small numbers by mounting the gun directly on the carrier hull immediately behind the driver's position (actually on the engine casing). All models of the British carrier, Bren, Scout and Universal, were used indiscriminately, Scout carrier conversions having their open left sides boarded up to form a crude fighting compartment. The conversions were undertaken mainly in 1940-1, presumably inspired by the success of the *4.7cm Pak auf Pzkw I*, and appear to have seen little service. The conversion of the UE carrier was similarly produced in 1941 and again mounted the gun complete on top of the hull behind the enclosed driving position. The basic vehicle was a fast light squad carrier with well-sloped frontal armour protecting driver and commander and with an open rear compartment, so was well suited to its new role. It was used mainly in France but photographic evidence shows that some did see service on the Russian front.

*The grey 'Panzer' uniform
(see page 46)*

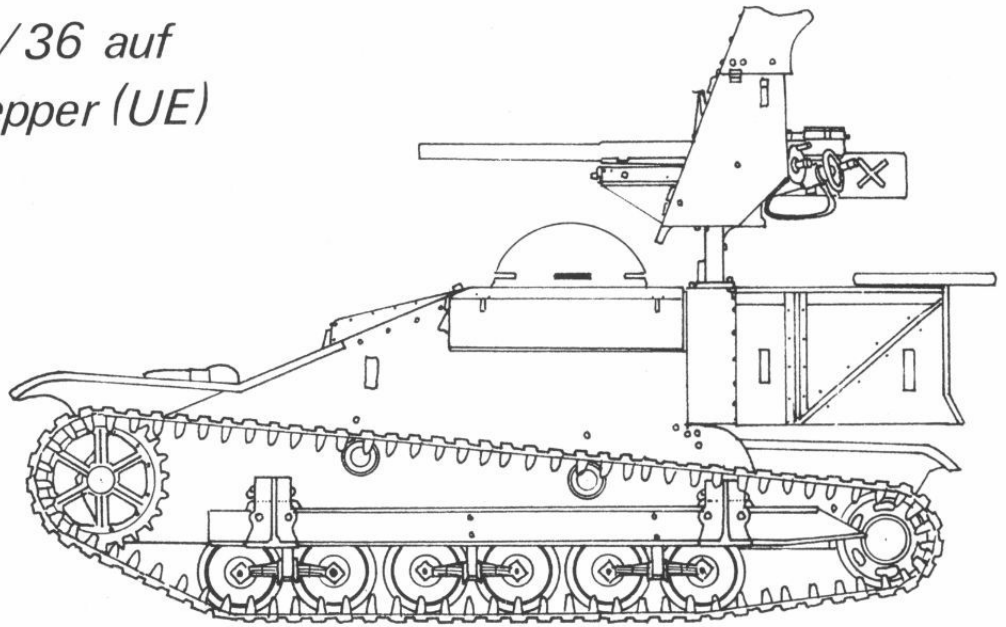
4.7cm Pak 181/183(f) auf Pz. Jag. Lorraine Schlepper

4.7cm Pak (t) auf Pz.Jag. Renault R 35 (f)

Both Czech and French 4.7cm guns were applied to captured French chassis in 1942/3 for use with local defence units in France and were sometimes designated as being '*auf GW*' (*geschutzwagen*) so and so. The 'all French' conversion utilised the hull of the Lorraine light armoured tractor, a fast, low-profile vehicle with armoured driving position. The gun, without additional protection, was simply mounted complete in the carriers load space. The Czech gun was a slightly more elaborate conversion using the turretless hull of a captured Renault Model 35 tank (see 'Panzer Regiments' for details). On the hull was built an open, tall, lightly armoured fighting compartment in which the gun was enclosed, giving it a rather top-heavy appearance. The conversion was produced in small numbers during 1943 to build up the SP companies of the Divisions manning the *Westwall* and did see service during the 1944 invasion.



3.7 cm Pak 35/36 auf Infanterie Schlepper (UE)



A Marder I SdKfz 135 edges its way off a flat railway truck. The French Tracteur Blinde 38L formed the basis of this Panzerjäger mounting a Pak 40 L/48.



7.5cm Pak auf GW Lorraine Schlepper (f)

7.5cm Pak 40 auf GW 39 (f)

7.5cm Pak 40 auf GW FCM

Most common of these three conversions mounting the 7.5cm gun was the *7.5cm Pak 40 auf GW Lorraine Schlepper* which was produced in sufficient numbers to rate a type number, *Sd Kfz 135*, and a name, *Marder I*. Converted in 1942/3 for use by Divisions in the west, this mounted the 7.5cm Pak 40 complete with shield in the big rear cargo space of the Lorraine carrier and surrounded it with a lightly armoured fighting compartment. It was certainly the most effective captured-vehicle conversion and was on a par with the early *Marder II*.

The other two were very similar to each other in appearance. On the bare hull of the appropriate tank was built a big, angular, open-topped fighting compartment in which the basic 7.5cm gun was mounted. Both had a very high silhouette and the protection was more apparent than real. Some 72 of the Hotchkiss model were earmarked for conversion but only 24 (ie. enough for two companies) were produced. Only ten of the FCM version (ie. one company) saw service.



TOP: A 6×4 Kfz 69 'Protze' towing a 3.7 cm Pak 35/36. Ammunition lockers are stowed over the rear wheels of the truck.



RIGHT: A Pak unit in Russia. Note the tactical signs on the rear mudguards of these medium cars.

BELOW: SdKfz 7 towing a trailer with a Panzerjäger I aboard. The tactical sign on the front mudguard of the prime mover is for a fully tracked Pak unit. This tactical sign would be carried by all vehicles in the Pak unit regardless of function. The 21st Panzer Division sign is visible on the original print on the opposite mudguard.



Motor Vehicles of the Panzerjaeger Abteilung

Note: It is not intended here to cover individual vehicles in detail: a later volume in this series will describe the various types of Divisional support equipment.

As a fully motorised unit, the Panzerjaeger Abteilung had a comprehensive collection of standard personnel-carrying and maintenance vehicles besides its more specialist tractors and munitions carriers. Theoretically, standard types were allocated but, in practice, as a unit which had to remain mobile at all costs, it was given the nearest equivalent when the 'real thing' was not available. Hence a very wide variety of equipment in use during the war including quantities of impressed French and British vehicles.

The German army high command never indicated in its establishments' precisely what chassis were to be used; the people who were landed with that problem were the

supply depots and, even more, the motor-vehicle repair sections which could find all sorts of vehicles, from fifteen to twenty different makers, within a single unit. Officially the unit was simply allocated specific vehicle types to do the specific jobs and these were designated by *Kfz* (*Kraftfahrzeug*, or motor vehicle) numbers, or by *Sd Kfz* (*Sonderkraftfahrzeug* or special motor vehicle numbers. Thus *Kfz 11* simply indicated 'medium passenger car', irrespective of whether it was a standard vehicle or, say, an impressed British 8cwt personnel carrier modified for the job; so long as it was acquired in sufficient numbers to be taken onto the inventories as standard equipment it was eligible for a *Kfz* designation. The notes below show more common *Kfz* types to be found in a typical Panzerjaeger Abteilung.

Towing Vehicles:

Kfz 12: Initial equipment for towing the 3.7cm and other light guns was the medium personnel-carrying car (*Kfz 11*) equipped with a towing hook. This was usually a four-wheeled open touring car built by such firms as Horch or Wanderer and having a modified body and limited cross-country capability. Typically it had an engine of between 1.5 and 3 litres capacity, developing about 70bhp. *Als ersatz* were various vehicles including the *Einheits* (Standard series) equivalent; impressed captured vehicles such as the British 8cwt truck and the French Unic-Kegresse half-track (German designation light towing vehicle *U304(f)*); even the specialist six-wheeled *Krupp L2H143* artillery tractor.

Kfz69 and Kfz81: Two designations for specialist artillery tractors in the 1.5t heavy car or light lorry range. These were purpose-designed vehicles carrying ready-use ammunition in special lockers and were classed as '*Protzkraftwagen*' or limber vehicles. Officially *Kfz 81* was the variant reserved for light flak units. Typical examples were the *Krupp L2H143* six-wheeled light lorry, also known as the '*Schnauzer*'* or *boxer* because of its flat-four air-cooled engine; and the heavy standard car.

Sd Kfz 10: Designation for the standard light half-tracked tractor in the 1-tonne series. This was a combined personnel and limber vehicle used mainly for towing the 5cm Pak 38 and its equivalents.

Sd Kfz 11: Designation for the standard medium half-tracked tractor of the 3-tonne series. In its artillery tractor form, this was a combined limber and personnel vehicle used for towing the light gun-howitzer and anti-tank guns in the 7.5cm range. Any cross-country vehicle in the 3-tonne range might be substituted, common ones including the *Raupenschlepper Ost* tracked lorry and the medium *Maultier*, or Mule, a half-tracked lorry adapted from a standard 3-tonner by substituting a tracked unit for the rear axle and wheels.

Sd Kfz 7: Designation for the standard half-tracked prime mover in the 8-tonne series. In anti-tank use this was employed by the army Abteilungen to tow the 8.8cm Pak 41/43 series guns.



SdKfz 11 pictured at speed in North Africa.

Support Vehicles:

On the light cross-country chassis these would certainly include:

Kfz 1: Light-personnel carrier.

Kfz 2: Light signals truck – effectively a *Kfz 1* with certain telephone or radio equipment built-in.

Kfz 2/40: A light maintenance vehicle for servicing MT and weapons.

On various medium chassis:

Kfz 42: Signals maintenance vehicle, with 'hut' body.

Kfz 51, Kfz 79: Workshop trucks.

The ordinary supply lorries were not normally given *Kfz* numbers but were simply allocated as so many of each particular load capacity. They would have included vehicles both of commercial derivation (o) with two-wheel drive, and purpose-built vehicles with four-wheel drive and a limited cross country capability (*gelände-gängiger*, or 'gl'). The latter, from about 1942-on, could also include *Maultiere* – among them the heavy *Maultier* produced by fitting a 4.5t. truck with half-tracked drive units adapted from *Pzkpfw II* components. The main load classes were: Light (*leichte* or *le*): 1-1.5 tonne capacity
Medium (*mittlerer*, or *m*): 3 tonne capacity
Heavy (*Schwerer*, or *s*): 4.5 tonne capacity and above (the only other standard load class was 6.5 tonne).

Specialised Vehicles:

These were mainly tracked or half tracked but included such useful pieces of equipment as mobile field kitchens on a light or medium lorry chassis, fuel tankers normally on standard medium lorry chassis, various solo and combination motorcycles and the light motorcycle or *Kettenrad* (see the Almark volume for a very detailed treatment of these latter). Munitions were normally brought up by ordinary truck but an Abteilung operating under particularly exposed conditions (eg. with a Panzer Division in Russia) might have some armoured *Maultiere* in its support group. The support company, where established, would also have one or more recovery vehicles, either specialist *Bergepanzer* – armoured recovery vehicles on a *38(t)* or *Pzkpfw III* chassis were typical – and/or the purpose-built *Sd Kfz 9*. This was an adaption of the standard 18-tonne half-tracked prime mover which was equipped for heavy winching and haulage and which could be fitted with a 6-10t. crane for maintenance work in the field.

A *Stug III* unit re-ammuniting from half-tracked *Maultiers*. The *Maultier* was an ideal munitions supply truck because of its good cross country mobility when compared against conventional two and four wheel drive lorries.



Overloaded NSU Kettenrad which could be used to tow light guns.



Section 4: Small Arms

In general all units within the Abteilung were issued with an adequate allowance of small arms for personal and local defence, the exact apportionment depending on the type of company. Thus a typical motorised anti-tank company on the latter years, with a strength of 3 officers, 20 NCOs and 94 other ranks had some 59 rifles, or carbines, and 41 pistols but only 17 machine pistols while a similar period *Sturmgeschütz* unit with 3 officers, 32 NCOs and only 22 other ranks had only 21 rifles but 11 machine pistols and 35 pistols – nearly as many of the latter as the much larger towed unit. The difference is accounted for by the constricted conditions under which the crews of self propelled guns had to work.

In principle the main small arms, excluding pistols, were the Model 98k short carbine and the *MP 38* or *40* – though the *MP 43* and *44* assault rifles were certainly issued in later years. The Model 98k, dating from pre-world war 1 days, was a solid, reliable bolt-operated weapon of Mauser pattern and 7.92mm calibre. The *MP38* and *MP40* were basically short range automatic weapons, firing standard 9mm calibre pistol ammunition from a 32-round magazine and analogous to allied sub machine guns. The *MP43* and *44* were developed as assault rifles along the same lines but were of 7.92mm calibre taking special ammunition.

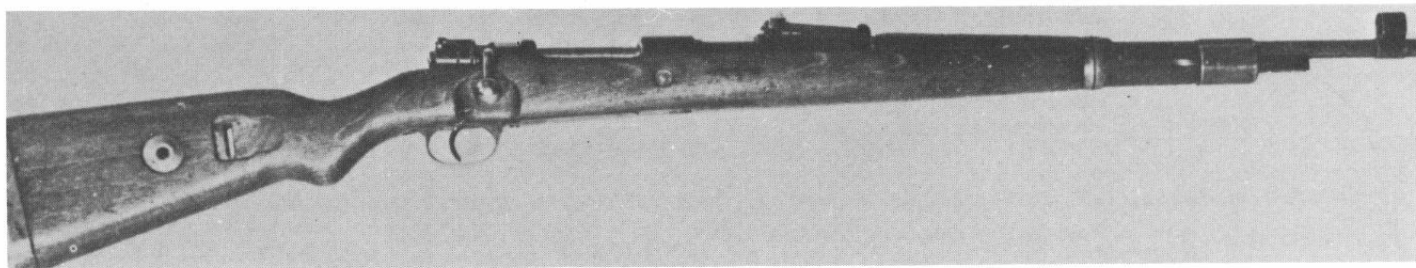
Light machine guns – either the standard *MG34* or its successor the superb *MG42* – were normally issued on the scale of one light machine gun section per sub-unit (HQ; fighting platoon; support company section) for a motorised unit, the section often having its own light car as transport. Typical gun distribution in a 1941 motorised company was 1 in HQ; 2 guns per platoon; 3 guns with the company 'train'. Self-propelled gun companies normally had an allocation of one LMG per armoured vehicle, either fixed – in *Jagdpanzers* – or demountable for local defence. Both the *MG34* and *MG42* were 7.92mm calibre, air-cooled weapons with a very high rate of fire and could be used either on a bipod or, as a heavy machine gun, on a tripod.



TOP: Paratrooper cocking an MP40.

ABOVE: MG34 mounted for the sustained fire role.

BELOW: Mauser Model 98K, the standard issue, bolt action service rifle of the Wehrmacht.



Notes on Uniforms

Originally the anti-tank units wore normal *Wehrmacht* uniforms consisting of the service jacket and trousers in field grey with black leather equipment and high jackboots or marching boots. The only distinguishing features were a metal 'P' on their shoulderstraps and the distinctive red *waffenfarbe* of the artillery arm to which they belonged; exceptions were the anti-tank companies in Infantry, Jaeger and Mountain Infantry regiments which wore the *waffenfarbe* of their adopted unit (ie they were infantry men manning guns rather than artillerymen attached to an infantry unit). From 1942, however, personnel manning self-propelled guns were issued with the special panzer uniform in field grey and with the accompanying green denim 'fatigue' uniforms of similar design. These are fully described in our companion volume 'Panzer Regiments' but in brief, consisted of a short, double breasted jacket with grey shirt and black tie; long grey trousers tucking into short ankle boots in black leather or worn gathered over normal jackboots; and the appropriate head-dress. This

was originally the standard '*feldmütze*' or forage cap and later the peaked *einheitsmütze*. SP gun crews often had the pink *waffenfarbe* of the Panzer arm and this might be applied to the whole unit in a Panzer or Panzer Grenadier Division. Collar patches initially bore the '*Totenkopf*' device of Panzer arm but were later altered to the normal *doppellitzen* on a green or grey patch.

From 7th May, 1944, the official regulations for Panzer Jaeger units were altered to accord with the following:

- 1) Motorised units: normal service dress with standard collar patches.
- 2) SP units in armoured formations: black special panzer uniform with *Totenkopf* patches.
- 3) SP units in other divisions: grey special panzer uniform with *Totenkopf* patches.
- 4) SP units in Army or GHQ service: grey special panzer uniform with *Totenkopf* patches.

Rose pink *waffenfarbe* were then standardised.

German/English Glossary

'als ersatz'	Replacement or substitute	<i>Panzerbefehlswagen</i>	Armoured Command Vehicle
<i>Ausführung (Ausf.)</i>	Term used to indicate sub type or mark. esp. vehicles e.g. PzKpfw IV Ausf. E	<i>Panzerkampfwagen (PzKpfw)</i>	Armoured Fighting Vehicle
<i>Bergepanzer</i>	Armoured recovery vehicle	<i>Panzerschreck</i>	'Tank Terror' The 8.8 cm Rocket Launcher Raketen Panzerbuchse 43 (a type of 'Bazooka')
<i>Einheits</i>	'Standard series'	<i>Protzkraftwagen</i>	Limber vehicles or ammunition carriers
<i>Feldmütze</i>	Field cap	<i>Raupenschlepper Ost</i>	Caterpillar Tractor for use on the Eastern Front
<i>Flieger Abwehr Kanone (Flak)</i>	Anti-Aircraft Gun	<i>Schnelle Abteilung</i>	Mobile Battalion
<i>Gefechtstross</i>	lit. 'Battle Train'	<i>Schwerer</i>	Heavy
<i>Gelände gangiger (gl)</i>	Cross country capability limited, pert. to vehicles	<i>sFH</i>	Heavy Field Howitzer (German abbreviation)
<i>Geschützwagen</i>	Gun carrier or vehicle	<i>Selbstfahrlafette (Sfl)</i>	Self propelled mounting
<i>Grund Gliederungen</i>	Standard structure or establishment	<i>Soll Gliederung</i>	Intended establishment
<i>Gruppen</i>	Groups	<i>Sonderkraftfahrzeug (Sd.kfz)</i>	Special motor vehicle. (pert. to vehicles specifically developed for military service)
<i>Haubitze</i>	Howitzer	<i>Sturmgeschütz (Stug)</i>	'Assault gun (pert. to the actual vehicle, a fully armoured vehicle mounting an anti-tank gun with limited traverse in a purpose built superstructure on a standard tank chassis which eliminated the need for a revolving turret)
<i>Instandungsetzen Staffel</i>	Workshop platoon	<i>Sturmkanone (Stuk)</i>	'Assault' gun (pert. to the ordnance itself)
<i>Jagdpanzer</i>	Tank hunter	<i>Totenkopf</i>	'Death's Head' usually refers to the skull and crossbones badge of panzer or armoured troops and also the SS.
<i>Kampfwagenkanone (KwK)</i>	Fighting Vehicle Gun	<i>Versorgung</i>	Maintenance (pert. to maintenance units)
<i>Kanone</i>	Gun	<i>Volksgrenadier</i>	Peoples Grenadier Units (home defence)
<i>Kettenkrad</i>	A small half-track, the front end having the forks and wheel of a motorcycle. (Sd.Kfz 2 kleines Kettenkraftrad)	<i>Waffenfarbe</i>	The coloured piping on uniforms denoting the arm of service
<i>Kompanie</i>	Company	<i>Wehrmacht</i>	'die Wehrmacht' the Armed Forces
<i>Kraftfahrzeug (kfz)</i>	Motor Vehicle	<i>Zug</i>	Platoon
<i>Leichte</i>	Light		
<i>leFH</i>	German designation for light field howitzer		
<i>Maultier</i>	'Mule' (a half tracked lorry)		
<i>Maschinengewehr (MG)</i>	Machine gun		
<i>Maschinenpistole (MP)</i>	Machine pistol. Loose term for pistols with a fully automatic mode to sub machine guns		
<i>Mittlerer</i>	Medium		
<i>Mörser</i>	Mortar		
<i>Oberkommando des Heeres (OKH)</i>	High Command of the Army		
<i>Panzerabwehr Abteilung</i>	Anti-tank Battalion		
<i>Panzerabwehrkanone (PAK)</i>	Anti-tank Gun		

Appendix 1

Data for Basic Towed Anti-Tank Guns (German Official Figures)

	3.7cm Pak 35/36	4.7cm Pak (t)	5cm Pak 38	7.5cm Pak 97/38	7.5cm Pak 40	7.62cm Pak 36(r) unmodified	7.62cm Pak 36(r) modified	8.8cm Pak 43	8.8cm Pak 43/41
CALIBRE (cm)	3.7	4.7	5.0	7.5	7.5	7.62	7.62	8.8	8.8
BARREL LENGTH (m)	1.665		2.975	2.720	3.450	3.200	3.895	6.350	6.360
CALIBRE/LENGTH RATIO	45	43.4	60	36.3	46	42	54	71	71
ELEVATION (m°)	-8 + 25		-8 + 27	-8 + 18	-5 + 22	-6 + 40	-6 + 18	-8 + 40	-5 + 38
TRAVERSE (m°)	60		65	65	65	57	?	360	56
WT IN FIRING ORDER (kg)	4500		986	1190	1425	1150	1710	3600	4350
MUZZLE VELOCITY (m/sec)	1030	755	1198		933	740	990	1130	1130
LENGTH (m)	3.450		4.805	4.020	6.185	7.320	6.300	9.200	9.144
WIDTH (m)	1.650		1.830	1.850	2.080	2.000	1.700	-	2.527
HEIGHT in firing position (m)	1.170		1.105	1.050	1.245	1.400	1.450	1.700	1.981
PENETRATION AT 60°									
mm/at m	35/500	54/500	60/500	c70/1000	90/1000	58/1000	65/1000	163/1000	163/1000
RATE OF FIRE (rpm)	15		14	12	14	12	12	?	?

Appendix 2

Details of typical Self-Propelled Carriages

	4.7cm Pak (t) auf Pzkwfw I	7.5cm Pak 40 auf Pzkwfw III	7.5cm Pak40/3 auf Sd kfz 138	HETZER	JAGDPANZER IV	NASHORN	ELEFANT	JAGDPANTHER
LENGTH OVER HULL (m)	4.42	4.62	4.65	4.87	6.62	*8.44	6.80	6.87
WIDTH OVER HULL (m)	1.85	7.27	2.16	2.63	3.18	2.95	3.43	3.28
HEIGHT OVERALL (m)	2.25	2.20	2.48	2.10	1.86	2.65	2.97	2.72
ARMOUR MAX	14.5	15.0	25.0	60.0	80.0	25.0	200.0	80
THICKNESS (mm) MIN	8.0		10.0	40.0	60.0	10.0	30.0	
ALL UP WEIGHT (t)	6.6	10.8	10.5	16	24	24	68	45.5
MOTOR hp	100	140	125	150	300	300	640	700
MAX SPEED (Rd) kph	40	40	42	40		40		
ROUNDS FOR MAIN ARMAMENT	86	78	38			40		60
CREW	3	4	4	4	4	5	6	5
						*over gun		

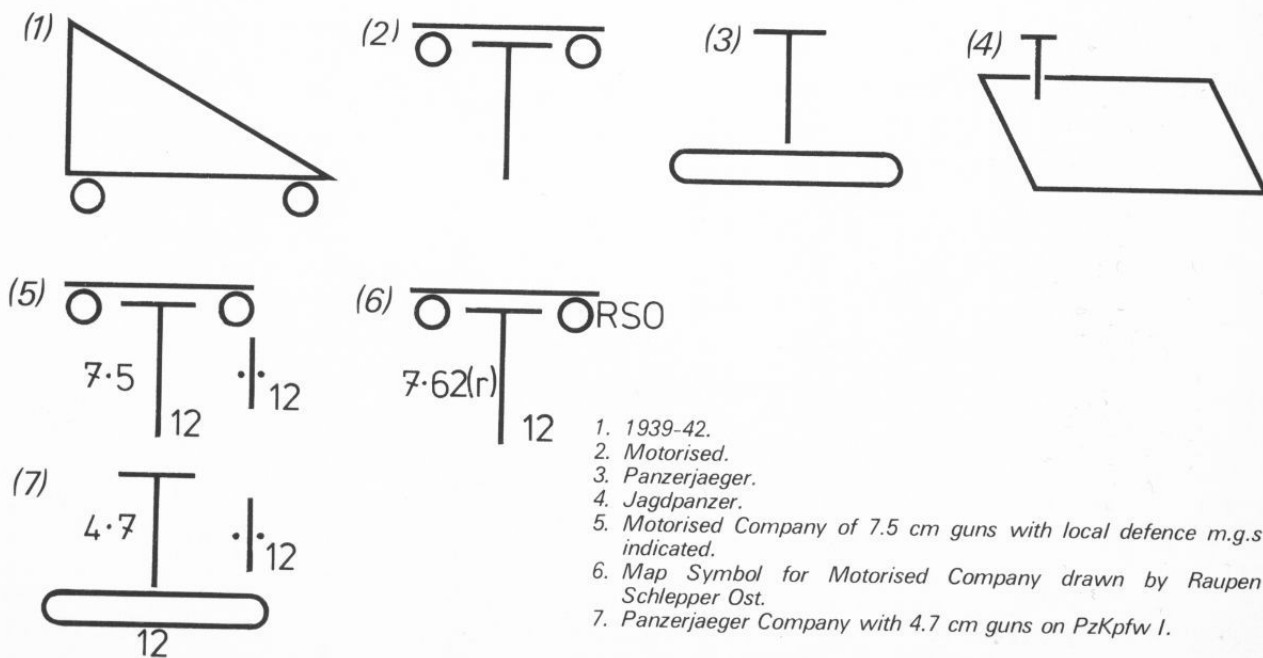
Appendix 3 Tactical Signs and Symbols peculiar to Anti-Tank Units

1. Tactical Numbering: Initially, self-propelled vehicles within an Abteilung had no tactical numbering but this was applied as soon as they began to be used in an offensive role. Basically, if there was only one company of 10-14 guns, the vehicles bore an individual number from 1 upwards since this was sufficient as a call sign (it is possible that some units used a two digit sign of which the first was the platoon number, but no confirmation of this is available). Where two or more companies were working together, or where there was a full heavy Abteilung, a variant of the normal tank numbering was used. This required a three digit number of which the first digit indicated the company within the Abteilung – note that an SP company could be the 2nd or 3rd Company – and the other two digits gave the individual vehicle position within that company. As with tanks this was arranged so that the second digit showed the platoon or *Zug* and the third gave the individual vehicle within the platoon; the cipher '0' in the second position was reserved for company HQ vehicles (thus 201 was company commander of 2nd company; 213 was the third vehicle of the first platoon of that company). The writer has not seen any photographic evidence showing whether Abteilung HQ vehicles used Abteilung coding as with tanks (ie 101....) but it seems unlikely. HQ vehicles were normally regarded as Abteilung reserve rather than staff command vehicles. Numbering went through all the forms common to tanks, from plain-black or white numerals to black or red elaborately outlined in white and were normally placed on the sides of the armoured fighting compartment; elaborately lettered personal names for vehicles were also placed there and were quite common.

2. Tactical Symbols (fig. 4). All motor transport in the Abteilung carried the appropriate Divisional sign and also the particular tactical symbol indicating it belonged to an anti-tank unit. At the beginning of the war this was a right-angled triangle mounted on two circles to show the unit was motorised (1). In 1942, however, the sign was officially changed to conform with the standard pattern for marking artillery. The anti-tank artillery sign was then an elongated 'T' placed under or over the appropriate transport symbol (2-4). A company number might be placed to the right of the T. It is interesting that, although *Jagdpanzer* officially were indicated by (4), the ordinary *Sturmgeschütz* (assault gun) symbol was often used instead – mainly where the company was officially designated an assault gun company. For other establishments or map notations the appropriate symbol was used but surrounded by other information as shown in (5-7).

3. Camouflage: There were no special peculiarities as regards camouflage. The anti-tank units started off basic grey and, when dark yellow became the favoured base, it was substituted. Owing to their need for concealment, Panzerjaegers were more prone, however, to overdaub the basic colour with mottle appropriate to the terrain and made considerable use of camouflage netting interwoven with foliage. Concealment was important to the gun crews since their weapons used virtually flashless propellant and, if well camouflaged, a gun might get off several shots before being detected.

fig 4



1. 1939-42.
2. Motorised.
3. Panzerjaeger.
4. Jagdpanzer.
5. Motorised Company of 7.5 cm guns with local defence m.g.s indicated.
6. Map Symbol for Motorised Company drawn by Raupen Schlepper Ost.
7. Panzerjaeger Company with 4.7 cm guns on PzKpfw I.

Almark

ISBN 0 85524 312 0