

## 6. Tables of Organisation and Equipment (TOE)

TOE is essentially a US term, and the description ‘Tables of Organisation and Equipment’ best describes the concepts we need for our land and air models. The Soviet equivalent term is *Shtaty* and the German term is *Kriegstarkenachweisungen* (KStN), so we will stick with TOE!

Almost every combat unit has a TOE. It is important because it is created by the military high command in order to meet the perceived demands that they believe are most likely to be placed on their forces. As such, TOEs reflected the state of the tactical, operational, and even strategic thinking in the armed forces at the time. The TOE in the land and air models is used to establish the organisational structure and authorised equipment for that particular unit. The TOE establishes the maximum combat power that can be achieved by that combat unit, and is used to control the distribution of replacements among frontline units. Along with the unit’s actual strength, and in the absence of overriding operational orders, the TOE also affects the priority allocated to a combat unit to receive replacements: in general, combat units with the lowest actual strength compared to their TOE strength will have a higher priority for replacements.

Traditionally TOE’s are shown in the form of an organisation chart, or an organisation list with sub-lists for the various substructures. Chart Sov RD Apr 1941 shows a typical divisional TOE structure represented in the organisation chart format. The example used is the Soviet Rifle Division TOE (or *Shtat* no 04/400-417) issued 5th April 1941.<sup>1</sup> This was the standard Soviet rifle division structure at the start of Operation Barbarossa. The chart illustrates well the overall organisation of the division, its command lines and what sort of primary mission it was likely to have. However information presented in this way, or in a list format, doesn’t readily allow us to compare true relative strengths. It is difficult to gain a quick and accurate picture of the personnel and equipment employed in the division as a whole, or in its immediate sub-organisations such as its regiments and battalions. Even if the required information is presented as lists on the chart, the reader is forced into the laborious and rather error prone process of calculating the total personnel and equipment for each company, battalion, regiment and finally the complete division. In addition, TOE organisation charts invariably give little to no information on transport and support infrastructures.

For these reasons we will be representing TOE information in the FILARM and PILARM models in a more detailed table format (refer entry below). The table format used will still enable the reader to rapidly gain an overview of the combat unit’s overall organisational structure.

### 1) TOE Representation in a Table Format

In each country’s FILARM or PILARM model, the initial chapters are concerned with reviewing, analysing and defining the specific resources that were available to that country from June 1941 to January 1942. The resultant list of defined resource entities is termed ‘The Personnel and Equipment Resource Database’, or simply the ‘Resource Database’, for that country. It includes equipment such as tanks, aircraft, artillery and trucks, as well as small self-contained personnel based entities such as infantry squads, cavalry squads and combat engineer squads. The methodology used to calculate the specific combat attributes of the resource entities in the Resource Database is detailed in Volume I, Part II of this work.<sup>2</sup>

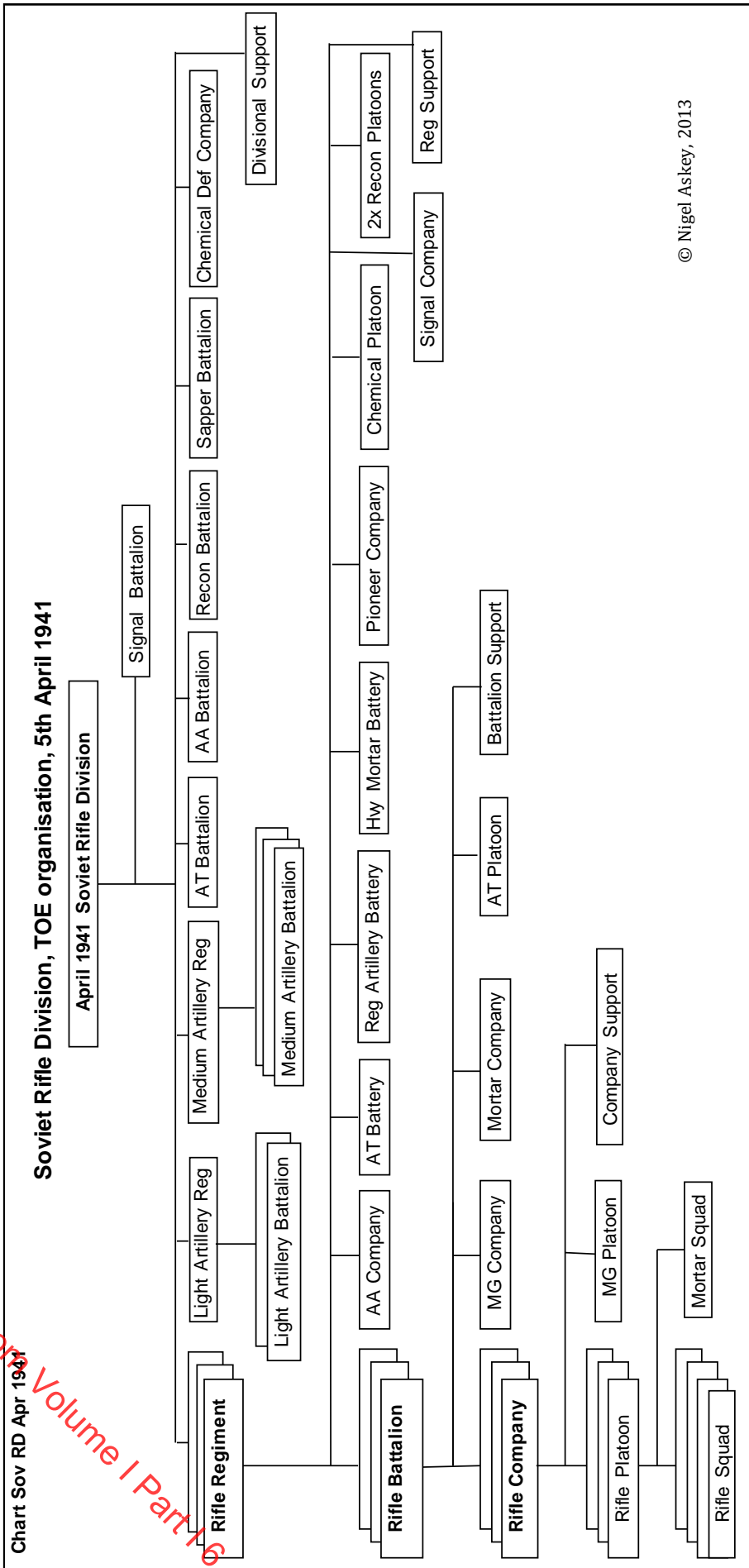
In the respective country’s land and air models, all combat units’ TOEs have been broken down into the Resource Database entities for that country. Thus each combat unit’s TOE displays details on the tanks, trucks, artillery pieces and infantry squads authorised for that unit. The word authorised is stressed here, because the authorised strength (or TOE) was often very different to the unit’s actual historical strength.

Continuing with our example of the Soviet April 1941 Rifle Division; table Sov RD Apr 1941 shows the information represented in chart Sov RD Apr 1941, but this time in table format. We will now use this example to demonstrate how to read TOE’s in the FILARM and PILARM models.

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<sup>1</sup> Sharp, C, C, ‘Red Legions’: Soviet Rifle Divisions Formed Before June 1941, Soviet Order of Battle WWII: Volume VIII, George F. Nafziger, West Chester, OH, 1996, pp. 104 and 105. Also, Zaloga, S, J, Ness, L, S, Red Army Handbook 1939-1945, Sutton Publishing, Stroud, UK, 1998, pp. 5-10, tables 1.2 and 1.3.

<sup>2</sup> Refer Volume I Part II – ‘The Methodology Used for Analysing Weapon System Effectiveness, and the Structure of the 1941 Soviet and Axis Resource Database’.



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Extract from Volume I Part 10

Extract from Volume 1 Part 5

Table Sov RD Apr 1941																									
TOE, Soviet Rifle Division, 5th April 1941 (Combat, Signal, Transport and Supply Elements)																									
Manpower	51	177	65	79	775	50	56	137	53	113	84	77	287	3182	1038	1277	69	230	287	273	278	521	58	906	14483
	R	RCo	HRCs*	B Sup^	R Bat	AAC	ATC	ArP	MOP	PG**	Rep**	Sig Co	R Sup^	R Reg	LAR	MAR	Art HQ^	ATB	AAB	R Bv^*	Sig B***	SAB**^	CheC^	D Sup^	R Div
Rifle Sqd	4	(x3) 12		(x3) 36									1	113						9					348
L Rifle Sqd										2				2											6
Cav Sqd											3			3											9
50mm Mor	1	3		9										27						3					84
LMG															12	18						1	4		35
MMG		2	12	18										54							4				166
82mm Mor			6	6										18											54
Horse Team ^**		2	15	24	45			9	7	7	10	109		299	153						16	29	5		1100
Trucks^^*												8		17	7	120	7	20	35	28	18	47	18	234	585
Light Transport												1		1	1	1		5	1	1	1		8		22
120mm Mor														4											12
76mm Inf G								6						6	16										18
76mm Gun																									16
76mm AAG																			4						4
45mm ATG			2		2			6						12				18							54
37mm AAG																									8
Tractors																									99
12.7mm AAMG																									15
Quad MMG																									18
152mm How																									12
122mm How																									32
Light Eng Sqd																									36
Ferry Br Sqd																									4
Tankettes^^																									16
BA 20 A Cars^^																									13

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Refer attached notes for organisational details.

**Notes for: TOE Soviet Rifle Division, 5th April 1941 (Combat, Signal, Transport and Supply Elements).**

\* Includes Battalion Mortar Company, MG Company and Anti-Tank Platoon

^ Includes Battalion HQ, Signal Platoon, Supply Platoon and Medical Platoon

\*\* The PiC and REP are not shown on Divisional Shtat 04/400-417, but are shown on the more detailed Infantry Regiment Shtat 04/401.

The PiC includes the Battalion Chemical Defence Platoon. The ReP includes 1 Infantry Reconnaissance Platoon and 1 Cavalry Reconnaissance Platoon.

\*\* Includes Regiment HQ and Staff, Supply Department, HQ Platoon, Transportation Company, Medical Company, Veterinary Hospital, Workshops and Band.

^^ Divisional Artillery Command HQ

^^\* Includes a Motorised Rifle Company, an Armoured Car Company, a Light Tank Company, and all support units. The (very) large majority of Rifle Division Tankettes (T37s or T 38s) and armoured cars had been withdrawn by June 1941 to form the new Mechanised Corps. Relatively few rifle divisions had any AFVs at all. In some cases, additional motorised rifle units or (more likely) cavalry units may have been added to compensate.

\*\*\* Includes a Radio Company with 3 armoured cars, 2 Telephone / Wire Companies and supporting Quarter Master (QM) units.

\*\*\*^ Includes 3 Sapper Companies, a Technical Platoon, a Blocking Platoon (with the 4 MMGs), a Bridging Column, and supporting Quarter Master (QM) units.

\*^^ A motorised Chemical Defence Company equipped with 30 flame throwers. Included because Shtat 04/409 authorised 4 flamethrower equipped squads for supporting assault operations.

^^^ Divisional service troops include the Division HQ and Staff, 1 Motor Transport (Truck) Battalion, 1 Medical Battalion, 1 Field Bakery Company, 1 Traffic Control Platoon, 1 Artillery Maintenance Section, 1 Veterinary Hospital, 1 Staff Judge Advocate Section, 1 State Bank Field Section, and 1 Field Post Office. The Motor Transport (Truck) Battalion included a Signal Section, an Ammunition Column, a Fuel Column, a Ration Column, a Maintenance Section and additional QM units.

The Division was also authorised 16 motorcycles (in total).

^^\*\* Horse Team figures include: wagons, carts (including single horse carts), all artillery hitch and limbers (4-8 horses each), and horse drawn field kitchens.

The total number of limbers in the Division was 78. The total number of horse-drawn field kitchens was 75. The total number of horses authorised in the division was 3039.

^^^\* Comprised of 447 general transport trucks, 117 special purpose trucks (e.g. radio or fuel trucks), and 21 kitchen trucks.

**Principal References,**

C.C.Sharp, "Red Legions", Soviet Rifle Divisions Formed Before June 1941: Soviet Order of Battle WWII, Volume VIII, George F. Nafziger, West Chester, OH, 1996, pp. 104-105.

S. J. Zaloga, L.S. Ness, Red Army Handbook 1939-1945, Sutton Publishing Ltd, Stroud, 1998, pp. 5-10, table 1.2, 1.3., and pp. 206-207.

D.M. Glantz, Stumbling Colossus, University Press of Kansas, Lawrence, Kansas, 1998, pp. 111 and 152, table 5.2.

The Initial Period of War on the Eastern Front, Proceedings of the 4th Art of War Symposium, Garmisch Oct 1987, ed. D.M.Glantz, Frank Cass, London, 1993, pp. 16 and 19.

Purnell's Illustrated Encyclopedia of Modern Weapons and Warfare: part 60 and 64, Phoebus Publishing, London, 1979, pp. 1191-1199, and 1273-1280.

I.V. Hogg, Infantry Weapons of WWII, Saturn Books Ltd, London 1997, pp. 58, 83, 84, 144, 109 and 110.

Websites <http://niehorster.orbat.com>. Also, <http://rkkk.ru>

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**The columns in the TOE table represent the principal divisional substructures.**

A list of the most common abbreviations and nomenclature used in the columns of the TOE tables, to describe the **principal substructures**, is shown below.

TOE Tables of Organisation and Equipment	
<b>Squads</b>	
Sqd	Squad
R Sqd	Rifle Squad
LR Sqd	Light Rifle Squad
HR Sqd	Heavy Rifle Squad
<b>Infantry Units</b>	
IPI	Infantry Platoon
ICo	Infantry Company
MgPl	Machine Gun Platoon
MgCo	Machine Gun Company
HIC	Heavy Infantry Company
MG/Art Bat	Machine Gun and Artillery Battalion
<b>I Bat</b>	Infantry Battalion
<b>I Reg</b>	Infantry Regiment
<b>I Div</b>	Infantry Division
<b>Rifle Units</b>	
RPI	Rifle Platoon
RCo	Rifle Company
SMGC	Sub Machine Gun Company
HRC	Heavy Rifle Companies (HMG/Mortars)
<b>R Bat</b>	Rifle Battalion
<b>R Reg</b>	Rifle Regiment
<b>R Div</b>	Rifle Division
<b>Reconnaissance and Mobile Inf Units</b>	
ReP	Reconnaissance Platoon
ReC	Reconnaissance Company
ReB	Reconnaissance Battalion
SchBat	Schnell Battalion
BicBat	Bicycle Battalion
MoCyPl	Motor Cycle Platoon
MoCyCo	Motor Cycle Company
MoCyBat	Motor Cycle Battalion
<b>Cavalry Units</b>	
Cav	Cavalry
CavP	Cavalry Platoon
MGS	Machine Gun Squadron
MGT	Machine Gun Troop
SapS	Sapper Squadron
CavS	Cavalry Squadron
HCavS	Heavy Cavalry Squadron
CavT	Cavalry Troop
CavSC	Cavalry Support Company
Cav B	Cavalry Battalion
Cav Reg	Cavalry Regiment
Cav Brig	Cavalry Brigade
<b>Weapon Types</b>	
SMG	Sub Machine Gun
LMG	Light Machine Gun
MMG	Medium Machine Gun
HMG	Heavy Machine Gun
Mor	Mortar
ATG	Anti-Tank Gun
AAG	Anti-Aircraft Gun
Gun/Can	Gun/Cannon
How	Howitzer
<b>Artillery and Rocket Artillery Units</b>	
ArP	Artillery Platoon (or Battery)
ArB	Artillery Battalion
ArR	Artillery Regiment
LAR	Light Artillery Regiment
MAR	Medium Artillery Regiment
HAR	Heavy Artillery Regiment
InG P	Infantry Gun Platoon/Battery
InG Co	Infantry Gun Company
RARP	Rocket Artillery Platoon (or Battery)
RARB	Rocket Artillery Battalion
NerW Bat	Nerbelwerfer Battalion
<b>Mortar Units</b>	
MoP	Mortar Platoon (or Battery)
MoC	Mortar Company
MoB	Mortar Battalion
<b>Anti Tank Units</b>	
ATP	Anti-Tank Platoon (or Battery)
ATC	Anti-Tank Company
ATB	Anti-Tank Battalion
<b>Anti Aircraft Units</b>	
AAP	Anti-Aircraft Platoon
AAC	Anti-Aircraft Company
AAB	Anti-Aircraft Battalion
<b>AFVs</b>	
A Cars	Armoured Cars
AcCo	Armoured Car Company
TankP	Tank Platoon (or Pz P)
TankS	Tank Squadron
TankC	Tank Company (Pz Co)
TankB	Tank Battalion (or Pz Bat)
TankR	Tank Regiment (or Pz Reg)
StuGP	StuG Platoon
StuGC	StuG Company

<b>Engineer, Sapper, Pionier, Bridging Units</b>	
Eng	Engineering
PiC	Pionier Company
SaP	Sapper/Pioneer Platoon
SaC	Sapper Company
SaB	Sapper/Pioneer Battalion
EnP	Engineering Platoon
EnC	Engineering Company
EnB	Engineering Battalion
EnR	Engineering Regiment
Cons Bat	Construction Battalion
Br	Bridging
BrP	Bridging Platoon (pontoon)
BrC	Bridging Company (pontoon) or Bridging Column (pontoon)
BrB	Bridging Battalion (pontoon)
BrCB	Bridge Construction Battalion

<b>Signal Units</b>	
ASig Pl	Armoured Signal Platoon
Sig Pl	Signal Platoon
Sig C	Signal Company
Sig B	Signal Battalion

<b>Support Infrastructures</b>	
Tra	Transport Infrastructure
B Sup	Battalion Support
R Sup	Regimental Support
Bri Sup	Brigade Support
D Sup	Divisional Support

<b>German Irregular Units</b>	
LS	Landesschutzen, (Local Def Unit)
LS Reg	Landesschutzen Regiment
W	Wach
W Bat	Wach Battalion

<b>Military Police, Security Units</b>	
MP	Military Police
MPBat	Military Police Battalion

In some cases a column contains the total personnel and equipment for several smaller substructures which don't justify a separate column. To save space, all components of the basic common company are not shown separately. In our example (above) the rifle company (RCo) TOE includes three rifle platoons (RPIs) and a machine gun platoon. The machine gun platoon only had two MMGs and a wagon. Therefore the rifle platoons are shown separately, while the rifle company column contains all the resources in the three rifle platoons and the machine gun platoon. In other cases notes at the bottom of the table indicate were a column represents several smaller substructures.

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**The rows in the TOE table represent the defined resource entities (hence termed resources) from the relevant country's Resource Database.**

In cases where no resource in the database exactly fits the piece of equipment or squad in the TOE, the closest resource in terms of size and function is used.

Generally, the rows near the top of the table contain the most common resource types, or/and the resources found in multiple divisional substructures. In our example the rifle squad and other equipment in the rifle company is at the top of the list, because these will be repeated in several divisional substructures up to the division total. In some cases database resources are grouped together to enable easier analysis. For example, different types of MG or artillery may be grouped together, to enable an easier comparison of total MGs or total artillery pieces between various combat units.

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**The TOE tables are always read from left to right, with the most common substructures on the left.**

For this reason the TOE tables start with the most common substructure larger than an infantry squad in the left most column.<sup>3</sup> In rifle or infantry units this is usually the rifle platoon (RPI). Continuing with our example; in the rifle platoon column is the multiple (x3) and an arrow pointing to the next most common substructure, which is the rifle company (RCo). This indicates that there are three rifle platoons in the rifle company. The (RCo) column then indicates the total number of rifle squads and other equipment in the rifle company.

<sup>3</sup> The squad or half squad was usually the smallest tactical unit identified by command and control systems, and which operated as a complete combat entity in WWII. This has not changed much since WWII. Normally, only 'special forces' operated smaller combat units than this. Note, some armies and sources refer to a squad as a 'section', or a full squad as a 'squad' and a half-squad as a 'section'.



The rifle platoon and rifle company are identified in bold, and often highlighted in a light grey box, to indicate that they are common divisional substructures. ‘Common’ in this sense means that multiples of this substructure will be found in the next most common substructure. For example, multiples of the rifle company are found in the next most common substructure, which in this case is the rifle battalion (R Bat). The multiple (x3) in the rifle company column, and the arrow from (RCo) to (R Bat), indicates that there are three rifle companies in the rifle battalion. The rifle battalion (R Bat) column then indicates the total number of rifle squads and other equipment in the rifle battalion, and is identified as another common divisional substructure. This process is repeated until the total personnel and equipment for the division is shown in the rifle division (R Div) column.

Between the most common substructures, which in this case are the rifle platoon, rifle company, rifle battalion and rifle regiment, are other divisional substructures. These are the support platoons, companies, battalions and regiments, attached to the division and its various substructures. ‘Support’ means that, in most cases, only one of these substructures is found in the next common substructure. In our example only one anti-aircraft company (AAC) is found in each rifle regiment (R Reg), and only one light artillery regiment (LAR) is found in each rifle division (R Div). Notes on the table indicate if more than one support substructures is included in the next most common substructure. The term ‘support’ is appropriate here because in general the support substructures (or units) were designed to support other combat units in combat, even though these support units were usually capable of direct independent action if required.

In order to assist in the rapid identification of the common divisional substructures (or organisations) within the TOE tables, the following colour code is usually used in the appropriate column:

- Platoon sized organisations – blank box (no fill).
- Company, Battalion and Regimental sized organisations – light grey box.
- Divisional or larger sized organisations – dark grey box.
- Support organisations – no colour or enclosed box.

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### **The TOE tables include all combat, signal, transport and supply elements.**

These are included because the vital signal, transport and supply elements within combat units are often neglected and underestimated in many military simulations (and publications). In particular, the subject of battlefield logistics is cursorily treated in the majority of WWII history books. Similarly, the effects of inadequate signal infrastructure upon command and control within large combat units (brigades and larger units), and their ability to coordinate activities with other units, are often not well understood.

In many current military simulations, the impact of inadequate signal and supply elements on the combat power of combat units is often supposedly represented by abstract rules. These ‘rules’ may include limited cooperation between combat units, lengthy artillery set up times, and temporary loss of control. However these abstractions tend to underestimate the impact of poor signal, transport and supply elements on overall combat power. By including the main equipment of these elements in the TOE tables (usually in the form of personnel and vehicles), it becomes much clearer where the strengths and weaknesses of specific types of combat units lay.

For example, we can see from our example that the Soviet April 1941 rifle division had two artillery regiments capable of indirect artillery fire. The light and medium artillery regiments (LAR and MAR) had 60 76-152mm calibre artillery pieces between them; a formidable number. In comparison a German first wave infantry division had a single artillery regiment with 48 105-150mm calibre artillery pieces. Therefore, based on weapon numbers alone, the April 1941 rifle division appears to have more indirect artillery fire capability than a German first wave infantry division. However the Soviet division’s signal battalion had only 19 trucks and light transports to service the division, while the German division’s signal battalion had 96: over five times as large. Indirect artillery fire requires a lot of artillery support parameters to be in place, particularly a large and sophisticated signals system.<sup>4</sup> When one considers that the Red Army also suffered from a chronic shortage of radios in almost all their combat units (even compared to the relatively few radios authorised in the TOE), and equipment and training shortages in other areas, it becomes apparent that most Soviet rifle divisions in 1941-42 were not capable of indirect fire operations in a mobile battle. This is confirmed by German combat reports which mention the ineffectiveness of Soviet artillery support during 1941. In effect, most Red Army artillery units in 1941 could only fire effectively at what their gun crews could see.

<sup>4</sup> Refer to Volume V – ‘Relative Overall Combat Proficiency (ROCP): the ROCP of Soviet and Axis Forces from 1941-1945’ for discussion on artillery support parameters required to enable indirect artillery fire, as well as the relative ability of the Red Army and Wehrmacht to conduct indirect artillery fire operations in 1941.

Frustratingly, some current military simulations assume that giving the Soviet 1941 artillery a longer set up time after movement compensates for all the above problems. Once set up, the Soviet artillery is assumed to have had the same indirect fire capability as the average Wehrmacht division, or even a modern day division. In actuality, regardless of how long the artillery units took to set up, the sophisticated signal network required to enable flexible indirect artillery fire missions simply didn't exist in most rifle divisions in 1941. In addition, indirect artillery fire cooperation with units in the same corps, let alone units in other corps or armies, was almost impossible. The average Soviet 1941 rifle division had major problems providing any effective indirect artillery fire support, even to its own subunits in a relatively static defensive situation.

The often severe impact of inadequate signal, transport and supply elements on the combat power of combat units is demonstrated in various sections and chapters of this book, and is why these elements are shown in all TOEs if possible.

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In summary, the advantages of the TOE table format include the following.

- The table format still enables the overall organisation of the combat unit and its command lines to be easily understood.
- The reader is able to establish individual company, battalion, regimental and divisional strengths at a glance without any calculations. This enables true relative strengths to be easily compared for similar sized combat units.
- Information on signal, transport, supply and support infrastructures are represented and more easily shown. This also enables truer relative strengths to be easily compared when assessing the overall potential combat power of a combat unit.
- Small and large TOE variations between divisions of the same type can be easily identified. Sometimes divisions of the same type appear to have almost identical TOEs. On an organisation chart (or list) the small and subtle differences can be difficult to spot, and are sometimes underestimated or ignored completely. With the table format these differences are immediately apparent. For example, the subtle differences between German first wave and second wave infantry divisions in the German land model are very apparent in the table format, but appear insignificant and hard to identify in the more traditional organisation chart format.<sup>5</sup>

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<sup>5</sup> Refer Volume IIA 3. 2) – ‘The Tables of Organisation and Equipment (TOE) for German Land Combat Units from 22nd June to 31st December 1941, and the Units Actual Organisation and Equipment in 1941 - German Army Infantry Units’.



Extract from Volume I Part I 6.