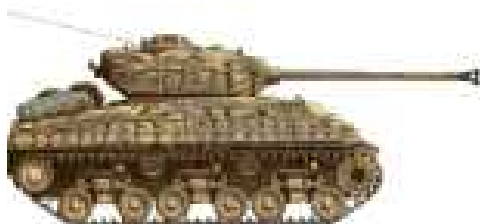
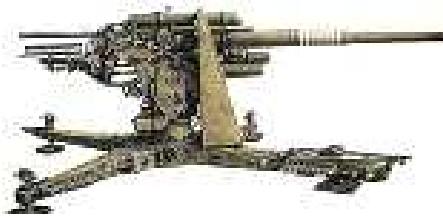


WORLD WAR II
WARGAMES MANUAL



THE COMPLETE WORLD WAR TWO WARGAMES MANUAL

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www.wanowandthen.com



Dedication.

To all the people I have played wargames with (All those I can remember are listed below) and to the lasting friendships which have developed.

Ian Sibert
Mike Kirkwood
Craig
Nick Conway
Chris Mitchell
Ian Swenke
Sven
Chris Pollock
Corey Jones

and many others whose names I have forgotten over the years.

And to Tim Pine who started a wargames group in Rockingham all those years ago and first got me interested in serious wargames.

To the shops which have supplied many of our essential requirements and which have (on occasion) given generous discounts to club members. (Most of these are sadly closed by now.)

Perth Hobby Centre
Simulations
Rockingham Toyworld
Brownes Toys
Littlefields Fremantle

And lastly to my wife Rosabelle who has long endured weekend marathons of Waterloo and D-Day in the garage or games room and whose timely snacks have turned defeat into victory.



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INTRODUCTION

I have been a wargames enthusiast for over 20 years, and in all that time I have never found a set of rules which covers all the aspects which wargamers are famous for arguing over.

It was in that regard that this book was written. Although some may not agree that it covers all possible aspects, it will, I think, save many from the more common disagreements that hold games up.

Many of the objective rules have been formulated from a great deal of research. Unfortunately some mean values were used since not all information on vehicle specifications was consistent in different books..

Other rules, where specific information was not available, were made using approximations. Use the subjective rules only when agreement cannot be reached. I hope the rules contained herein will provide many enjoyable hours of games for all.

ACKNOWLEDGMENTS

Bruce Quarrie. For his magnificent series of wargaming books which inspired me to write this manual.

Donald Featherstone. For the same reason.

I recommend the Tank Battles in Miniature series to anyone interested in WWII wargames.

Note: These rules were initially written with 1/72nd & 1/76th scale miniatures in mind but they are slowly being adapted to 1/300th scale as this provides a relatively larger playing area.



PREPARATION.

To begin with you will need a large flat board, preferably larger than an ordinary table, although that will do if you have nothing else. (Experience has taught me that the floor is definitely out.) The ideal board is about the size of a table tennis table. The best answer seems to be two or three large chip board pieces which can be used for one large table or two to three smaller ones. I do not suggest that you attach permanent displays to the boards as that will limit the different setups of hills and buildings that can be achieved.

To get the effect of a hilly terrain, it may be best to cover piles of magazines with a cloth. If at all possible, get a green or brown cloth of your own (mothers and wives don't appreciate the stains left on table cloths by spilt drinks and the dye from bushes).

Next is the question of setting up the board. Here you will see the reason for having a table of your own. In the midst of a seaborne invasion or a brilliant counter attack, dinner will almost certainly be served. Unless you have a table other than the dining table, the battle will surely be postponed indefinitely.

If you have a spare room, an unused garage, a garden shed, make the most of what they have to offer. If you have children or younger brothers (or dogs with long legs), lock the room containing your table and models so no harm can befall them.

Most types of scenery can be purchased from specialised model stores at fairly reasonable prices. The best range of scenery, models, and accessories (in Perth W.A.) are available from the Perth Hobby Centre in Murray St. or Valhalla on Wellington St. Readers from other countries will certainly know the stores in their locality.

If you do not want (or cannot afford to buy) ready made bushes, buildings, and bridges, I would advise you to read some books on modelling which give details on building construction and scenery layouts.

Other items you will need to operate these rules include, at least one retractable tape measure per player, two six sided dice (2xd6), two percentage dice (2xd10) and one twelve sided die. (1d12), one 4 sided die and one 8 sided die.

Now you should be ready to select the men and vehicles for the battle. Remember not to overload your board as the game will become bogged down and many areas of detail forgotten. Usually the attacker will have an advantage in man and vehicle power, and the defender should have a slight advantage in field gun support (Not artillery).

When you construct your vehicles, it may be a good idea to reinforce areas that are prone to excessive handling. Don't bother with details like aials and lights as they are the first to go.

Cannon and machine guns will also suffer a great deal of damage but are essential to the realism of the model.

If you have only just begun to play wargames, you may find some of the detail in this book a little tiresome. Therefore use the major rules and familiarise yourself with the procedures of firing and movement first, then move on to the sections on visibility and points values at a later stage.

THE UMPIRE

It is desirable that at least 3 people play each game. Two will be opposing players, and the third will act as an umpire "GOD". The umpire is responsible for setting up the game board, allocating the forces for each side, determining weather, and deciding outcomes. This avoids many of the conflicts over who can shoot whom.

The ideal wargame consists of five or more people:

- 1 - The umpire & message bearer
- 2 & 3 - The supreme commanders in a separate room.
- 4 & 5 etc. - The field commanders who move figures and make local decisions.

It's a bit boring for the supreme commanders at times but it is the ultimate in realism.



FIRE & MOVEMENT SEQUENCE

If you want to get to know these rules quickly, I suggest that you set up a board complete with men and vehicles and run through the rules as they appear. (Don't try to fight a complete battle, instead, test the rules as they appear and set vehicles and men in positions so that you can test the rules under different conditions.)

Firstly, movement is not divided into sections (as fire is), except, where tanks are firing on each other or where anti tank/tank duel takes place (then each moving vehicle fires one round moves a third, fires again, moves a third etc.). You and your opponent(s) will move all vehicles and men at the same time. Firing is not quite so simple.

There are three segments of a move in determining cannon fire results.. This was the only way I have found of avoiding the unrealistic situation of one player winning a dice roll and firing all shots off at once. (This does not apply to cannons that are firing for the first time and are hidden from the target.)

The player who fires first is determined by each player rolling one six sided die. The player with the highest number can decide who has first fire. (He may not always elect to fire first, especially if he has a camouflaged anti tank gun ready to fire and it is directly in front of an oncoming tank. (If he fires second, the opponent loses the opportunity of his first shot.) If the dice roll is a draw, they must roll again.

Before you start firing, check the following items;

- 1 -The distance between the gun and the target at the start of the move.
- 2 - The effective range of the gun. (If you fire too early and do not destroy the target, the element of surprise is lost and the gun and crew are placed at grave risk.
- 3 - The visibility. (You can see all things at all times on the games board, the gunners can not.)

Once the gun is in range and the target is visible, fire can begin. (Target identification should also be taken into account.)

Fire segments are broken into three rounds because the majority of main cannons had a fire rate of six rounds per minute (rpm)., As each move is presumed to be thirty seconds long, this breaks down easily into three separate segments.

If a gun can only fire 2 rpm, then it can only fire in the LAST fire segment. If it can fire 4 rpm, it can fire in the second and last segments. If it can fire 6 rpm, it has one shot in each segment. If 8 rpm, then a single shot in the first and second and two shots in the last segment. If 10 rpm, then a single shot in the first and two shots in the second and last segments. If 12 rpm, then 2 shots in each segment. Basically, you will find that guns fired 6 rpm, 8 rpm, and 12 rpm.

These rules only apply when the vehicle is stationary. If either the target or the firer is moving (depending on the speeds and terrain) one or more shots may be lost. In some cases, you may decide to fire in one move, only to find that you cannot actually send a shot until the following move.

You must always remember that each move is broken up into two halves. The first is the fire segments and the second is movement. Since you fire first, you must take into account moving targets, ranges, and 'hitability' (being able to range in on a target). These will alter according to the direction the target (and the firer) are moving and obstacles that may get in the way of a shot.

REDUCTIONS IN VEHICLE MOVEMENT

OBSTACLE / CONDITION	REDUCTION	VEHICLE TYPE
THROUGH BUSHES	-50%	A
REVERSING	SEE MISC	
PLOUGHED GROUND	-30%	T
	-50%	H
	-60%	W
UP A HILL	-1% PER DEGREE	
HEAVILY WOODED AREA	-50%	W
	-30%	H T
WET ROADS (SEALED)	-18%	W
	-10%	H T
WET ROADS (UNSEALED)	-25%	W
	-15%	H T
MUDDY ROAD	-60%	A
ICY ROAD	-25%	W
	-15%	H T
NIGHT (NO LIGHTS/ROAD)	-60%	A
NIGHT (LIGHTS/ROAD)	-10%	A
NIGHT (NO LIGHTS/CRS CTRY)	-80%	A
NIGHT (LIGHTS/CRS CTRY)	-30%	A
RIVER CROSSING	-80%	A
20-35 DEGREE CORNER	-20%	A
36-80 DEGREE CORNER	-25%	A
81-90 DEGREE CORNER	-50%	A
91-120 DEGREE OVER	-75%	A
SAND DUNES	-25%	W
TOWING A GUN	-30%	W

CODES = A - ALL T - TRACKED H - HALF TRACK W - WHEELED

FOR FOUR WHEEL DRIVE ADD 10%

So far we have only discussed main armament (cannon) fire. Infantry are not subject to the same fire segments. Each side fires all infantry weapons at one time. The

survivors will be able to return fire. Even those killed by the first round of fire in a move, will be able to return fire at a reduced rate. (Allowing for a certain amount of spontaneous fire.)

Since this chapter covers only movement and firing sequence, we have not looked at the mechanics of how fire takes place. This will be covered under two separate chapters dealing with tank and anti tank fire, and infantry fire.

It was general practice for tanks to use their secondary armament against infantry in the open and use HE shells against those in buildings.

One area involved with movement that should be considered is the combat readiness of both vehicles and men. Not all vehicles were manned at all times, and infantry had to take some time out to sleep. You should, at the beginning of the game, decide which vehicles are unmanned, which have their crews nearby, which are manned etc. Also decide which infantry groups are dressed, armed, asleep etc. The following table shows the number of moves taken for such groups to be combat ready.

COMBAT READINESS

CONDITION	MOVES TO BE COMBAT READY
VEHICLES	
UNMANNED CREW ASLEEP	6
UNMANNED CREW AWAKE	4
UNMANNED CREW WORKING ON VEHICLE	2
INFANTRY	
ASLEEP	5
AWAKE BUT UNREADY	3

Starting engines (6 sided die)
Spring/Summer 1 does not start
Winter/Autumn 1,2 does not start

If an engine does not start after 5 attempts, then a crewman must be assigned to check the engine over taking 2 moves before the engine may be restarted.

The last area to consider is the situation in which vehicles run over infantry. (Either deliberately or by accident.)

If a group of infantry is in the path of a tank and are unable to get out of the way, a die must be rolled for each man to determine whether he managed to dodge out of the way in time. A roll of 1, 3, or 6 means he survives.



Example of fire & movement sequence. Both players roll to see who fires first (1D6).

All infantry from the winner of the roll fire full rate.

All artillery & mortar fire is conducted for both sides.

One third of field gun and tank fire is done for the winner.

One third of field gun and tank fire is done for the other side.

One third movement is done for all mobile vehicles.

All surviving infantry from the other side fire full rate and all infantry killed fire half rate.

One third of field gun and tank fire is done for the winner's surviving vehicles.

One third of field gun and tank fire is done for the other side's surviving vehicles.

One third movement is done for all mobile vehicles.

One third of field gun and tank fire is done for the winner's surviving vehicles.

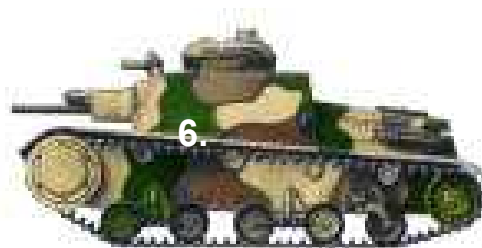
One third of field gun and tank fire is done for the other side's surviving vehicles.

One third movement is done for all mobile vehicles.

All infantry movement is done.

(See notes at the end of this guide)

Remember FIRE is done BEFORE movement and all mobile vehicles must adjust ranges accordingly. This fire and movement sequence is a little complex but it attempts to simulate reality where vehicles move and fire at differing ranges. A turn based system is the only way to run a wargame but it isn't all that realistic.



AFV & AT FIRE

VISIBILITY AND IDENTIFICATION.

This section deals with the ability of a tank or anti tank crew to locate, and identify a target as hostile. Visibility will depend on;

- 1 -the weather
- 2 -the terrain
- 3 -position of the observer
- 4 -whether the observer has visual aids
- 5 -which direction the observer is looking

The Visibility Table gives information on how far an observer can see under different conditions. There is also a Sound Location Table and a table to determine whether an observer can identify a target as hostile. (You would do well to remember that more than one tank was destroyed by its own forces due to faulty identification.)

Remember the Visibility Table will only tell you if there are men and vehicles about. You must use the Identification Table to decide whether they are the enemy or not.

VISIBILITY TABLE

Looking at	Range
1 - 5 men	500
6 - 10 men	600
11 - 20 men	800
21 - 30 men	900
31 - 40 men	950
more than 40	1050
1 vehicle	600
2 - 5 vehicles	800
6 - 10 vehicles	1000
11 - 15 vehicles	1500
more than 15	2000

THE VISIBILITY TABLE ASSUMES ALL MEN ARE STATIONARY.



VISIBILITY ADDITIONS & DEDUCTIONS

OBSERVER	ADDITION / REDUCTION
ON A HILL TOWER OR BUILDING TOP	+30%
IN A BUTTONED VEHICLE (MOVING)	-20%
IN AN UNBUTTONED VEHICLE (MOVING)	-10%
IN A BUTTONED VEHICLE (STATIONARY)	-15%
IN AN UNBUTTONED VEHICLE (STATIONARY)	- 5%
WITH BINOCULARS	+35%
MOVING	-10%
TARGET	
MOVING (MEN)	+10%
MOVING (VEHICLES)	+20%
IN A BUILDING (MEN)	-10%
CAMOUFLAGED	-85%
IN LIGHT SCRUB	-20%
IN MEDIUM SCRUB	-30%
IN HEAVY SCRUB	-40%
CONDITION	
DUST CLOUD	+50%
GUN FLASH	+40%
SMOKE	-50%
DUSK/DAWN	-35%
NIGHT	-80%
MOONLIGHT	+30%
POOR LIGHT	-15%

TARGET IDENTIFICATION

IDENTIFICATION OF TARGETS			
OBSERVER			
TARGET	F.O.O.	N.C.O.	INEXPERIENCED
1-10 MEN	30%	30%	25%
11-40 MEN	45%	40%	35%
>40 MEN	55%	50%	45%
1 VEHICLE	50%	45%	35%
2-5 VEHICLES	60%	55%	45%
6< VEHICLES	70%	65%	55%

This table is used when units are seen. It only applies to units over 300mm away. Targets under 300mm are automatically identified.

IDENTIFICATION +/-

DEDUCTIONS & ADDITIONS	
TARGET STATIONARY	+15%
TARGET IN COVER	-20%
100-200 mm	-10%
201-400 mm	-20%
401-600 mm	-30%
600<	-40%

NOTE - This table should only be used when circumstances demand.

IDENTIFYING SOUNDS

SOUND	SHOUTS	SMALL ARMS	CANON	ENGINES
(COVERING) SHOUTS	-	550	1500	1300
SMALL ARMS	250	-	1300	1100
CANNON FIRE	100	350	-	900
ENGINES	175	350	700	-
NO SOUND	350	700	2000	1500

How to use this table :

The Sound Identification Table allows troops to determine whether weapons fire or engines can be heard at a distance.

For example, if a tank commander is listening (in a tank with its engine off) for sounds of other vehicles, he would be classed as listening for vehicle engines. If there were no other sounds about the vehicle, engines could be heard at a range of 1500 yards (mm). If small arms fire was going on in the immediate locale, then the range would be reduced to 1100 yards. Although sounds could be heard at far greater distances than those given the distances, in this case, they are given to indicate that the direction the sound comes from can be given with more precision.

TANK & ANTI-TANK RANGING TABLES

You will remember that at the start of Chapter One, we looked at fire segments and the effect they have on the game. These will be used exclusively in tank/anti-tank fire.

To begin with, measure the distance between the target and the gun which will fire. Next, check the range and penetration rates for the gun. Now apply the following procedure:

First, use the Ranging Tables to determine whether the shot(s) hit the target. (Use the Fall of Shot Table for those shots which missed.) Always remember to check the target's armour (adding any appropriate amounts for added protection, ie. sandbags, tracks, spaced armour etc.) and check the penetration amount at the measured range. If penetration cannot occur then the shot is nullified.

INFANTRY FIRE SUPPRESSION

FIRE SUPPRESSION				
Small arms HE fire	Hard cover	Medium cover	Soft cover	No cover
	-20%	-40%	-60%	-80%
	-25%	-50%	-75%	-100%

VEHICLE FIRE SUPPRESSION

AFVs are suppressed when hit by shell fire. The results are as follows:

Gun size	Movement Deduction	Fire Deduction
15-47mm	10%	15%
48-75mm	20%	25%
76-105mm	30%	35%
>105mm	40%	66%

DEDUCTIONS FROM RATE OF FIRE FOR VEHICLES

GROUND	SPEED				
	0-10	11-20	21-30	31-40	41<
Flat	0	-1	-2	-3	-4
Bumpy	-1	-2	-3	-4	-5
Rough	-2	-3	-4	-5	-6

The degree of traverse will also effect the number of shots which can be fired as shown below;

Degree of traverse	Deduction from rate of fire
0-20 degrees	0
21-30 degrees	-1
31-40 degrees	-2
41-50 degrees	-3
51-60 degrees	-4
>60 degrees	-5

ADDED PROTECTION FOR VEHICLES.

ADDED PROTECTION	
i) Track	5mm
ii) Sandbags	10mm
iii) Concrete	10mm
iv) other equipment	2mm

For shots failing to hit a specific target, use the Undirected Fall of Shot Table (see Artillery Rules) to see which path the shell will take.

7.1 ANGLE OF STRIKE

The angle of hit may detract from the shot's ability to penetrate the armour. Use the following table to decide what effect this will have on any shots hitting a vehicle.

Armour Slope	Angle of hit									
	90	80	70	60	50	40	30	20	10	0
30	0	5	7	9	11	15	20	25	30	35
20	5	7	9	11	15	20	25	30	35	40
10	7	9	11	15	20	25	30	35	40	45
0	9	11	15	20	25	30	35	40	45	50

Check the target's armour slope and the angle of hit. The corresponding number in the above table gives the number of mm's to deduct from maximum armour penetration at the appropriate range.

ALLIED WEAPONS TABLE

GUN	Range	HEAP Range	RPM (move)	Blast circle
15mm	400	267	6	7
20mm Oerlekon	931	621	6	10
20mm shvak	815	546	6	10
25mm 1104	736		4	12
37mm 1407	938		4	16
37mm sa 18	1450	967	4	16
37mm sa 38	1411	941	4	16
40mm 2pdr		936	3	20
45mm l/46	1368	912	3	22
47mm	1590	1060	3	23
57mm 6pdr	2196	1451	3	28
75mm m21632		1088	3	37
75mm m33556		1283	3	37
75mm m61515		1011	3	37
76mm 3343		1219	3	38
76mm l/51	1941	1294	3	38
76.2mm 17pdr	3708	2472	4	38
76.2mm	2152	1435	3	38
77mm	2203	1469	3	38
85mm	2736	1824	3	42
88mm 25pdr	1816	1211	3	44
90mm	2509	1673	3	45
95mm	2466	1644	3	47
100mm	2755	1837	3	50
105mm	3674	-	2	52

GUN	Range	HEAP Range	RPM (move)	Blast circle
122mm m1943	3385	2257	2	61
152mm	3604	-	2	76
3" howitzer	3322	2215	3	37
8" howitzer		-	1	82

NOTE : RPM. refers to rounds per MOVE. For rounds per minute, multiply the number given by 2. (Moves are 30 seconds, not one minute.)

AXIS WEAPONS TABLE

Gun	Range	HEAP Range	RPM (move)	Blast circle
20mmkwkI/55	1041	694	6	10
20mm kwk 30	891	594	6	10
20mm kwk 38	949	633	6	10
20mmflak 38	949	-	6	10
37mmkwkI/45	997	665	4	16
37mmflk43/1	997	-	6	16
47mm pak	1489	993	3	23
50mm I/60	2463	1642	3	25
50mm I/42	1905	1270	3	25
75mm I/24	1546	1031	3	37
75mm I/33	1854	1236	3	37
75mm I/40	1980	1272	3	37
75mm I/43	2154	1436	3	37
75mm I/48	2197	1465	3	37
75mm I/70	2757	1825	3	37
75mm pak 40	1840	1227	3	37
75mm pak 39	2722	1815	3	37
75mmstkl/43	1846	1231	3	37
75mmstkl/48	2172	1448	3	37
75mmstuk 37	1800	1200	3	37
88mmflak 41	9760			44
88mm I/56	2509	1673	4	44
88mm I/71	3400	2267	3	44
88mmpak 3/1	3396	2264	4	44
88mmpakI/48	3396	2264	4	44
105mmstuh42	3674	-	2	52
128mmpak 44	3906	2604	2	62
150mmst18/1	3604	-	1	75
150mmsg33/1	3604	-	1	75
380mm I/54		-	.5*	160

♦ NOTE : .5 means one shot every two moves.

The tables on the following pages give the armour penetration rates for all major types of cannons. Both the Allied and Axis Weapons Tables given above and the Armour Penetration Tables must be consulted to determine the weapon's range, firing and the possibility of destroying the target.

In the following Penetration Tables, you may dispute some of the penetration figures as being too low. Although I admit that penetration increased with the use of tungsten shot, it was not always available and was particularly scarce in Germany at the end of the war. Also, these figures represent penetration of 30 degree sloped armour. Shot striking 90 degree flat plate would also have a greater effect.

Players may consult Weapons Range Tables before a shot is taken but they MUST NOT be allowed to consult penetration tables until the shot has been confirmed.

ARMOUR PENETRATION TABLES FOR AXIS GUNS

GUN	000	100	200	300	400	500	600	700	800	900	1000
20mm I/55	30	25	20	15	11	6	1				
20mm k 30	28	23	18	13	9	4					
20mm k 38	30	35	32	28	23	16	1				
28mm Pak	102	94	85	77	68	66	52	43	24	15	
37mm m 94	62	57	52	46	43	38	32				
37mm PL45	64	59	55	51	46	42	38	34	29	21	
37mm pak3	52	47	42	37	36	28	23	18	13		
37mm Tngs					65						
37mm Hllw						180					
7mm KL45	61	55	52	48	43	40	37	34	26		
42mm Pk41	119	112	105	99	92	86	80	74	67	60	
47mm 01						70					
47mm m1						70					
47mm m 39						43					
47mm shvk	69	64	59	54	50	45	40	35	31	26	
47mm pak	142	135	129	120	112	105	98	91	84	74	
47mm Jap					70						
50mm I/42	98	93	88	83	79	74	69	65	60	55	
50mm I/60	89	85	82	78	75	71	67	64	61	54	
50mm p40	147	144	141	139	136	133	130	127	124	121	
50mm p38	69	67	65	63	61	58	56	54	52	50	
75mm Jap	39	34	29	24	20	15	10	6	1		
75mm p 40	115	113	111	107	104	101	98	95	91	89	
75mm p 46	144	139	134	129	125	120	111	106	101	82	
75mm Ita	44	39	34	29	25	20	15	11	6	1	
75mm I/24	60	54	53	49	45	42	40	38	30	21	
75mm I/33	87	82	77	72	68	63	52	49	44	25	
75mm I/40	96	91	86	81	77	72	67	63	58	39	
75mm I/43	115	112	107	104	102	99	97	94	93	82	
75mm I/48	116	111	106	101	97	92	87	83	78	73	
75mm I/70	145	140	135	130	126	121	116	112	107	102 (*)	
75mm P 41	239	232	225	218	211	204	198	191	184	177 (*)	
75mm I/46	144	142	138	135	132	130	126	124	121	115 (*)	
88mm I/56	130	129	128	122	117	114	110	107	99	97 (*)	

GUN	000	100	200	300	400	500	600	700	800	900	1000
88mm l/71	197	193	189	185	183	182	178	173	169	165 (*)	
88mm p 43	299	288	277	266	255	244	233	222	201	190 (*)	
88mm f 41	171	166	161	156	152	147	142	138	133	128 (*)	
88mm f 36	130	125	120	115	111	106	101	97	92	87 (*)	
88mm K 43					182					(*)	
128m l/55	250	245	235	231	226	221	217	212	207	188 (*)	

K - KWK / P - PAK / F- FLAK / (*) - heavy anti tank

L - is a measure of a gun's calibre. The higher the number the longer the barrel. If you are not sure which weapon a particular AFV carries, then the length of the barrel will give some indication.

The figures given in these tables have been taken from ranges of 500 yds and 1000 yds at 30 degree slope of armour. All other figures are estimates from these two figures. Where figures are unavailable use another weapons figures with similar characteristics. Ie. For 47mm m1 use figures for 50mm l/60.

ARMOUR PENETRATION TABLES FOR ALLIED GUNS

GUN	000	100	200	300	400	500	600	700	800	900	1000
15mm besa	14	9	4								
20mm orlk	30	25	20	15	11	6	1				
20mm shvk	28	23	18	8	9	4					
25mm	36	31	26	31	17	16	15	14	13	12	
37mm m36							51				
37mm m3							61				
37mm 1937						36					
37mm m5	56	51	46	41	37	85	27	23	18	13	
37mm sa18	54	49	44	39	35	30	26	21	16	11	
37mm m3a1	78	75	72	69	66	63	60	57	54	51	
37mm sa38	59	54	49	44	40	35	30	26	21	16	
40mm 2pdr	66	62	58	55	57	46	45	44	43	42	
40mm bofr						40					
45mm 1942	74	68	62	59	54	45	34	26	19	11	
45mm	60	55	50	45	41	36	54	27	22	17	
47mm	69	64	59	54	50	45	40	36	31	26	
57mm m1							73				
57mm 1943	95	94	93	92	91	90	89	88	87	86	
57mm 6pdr	92	90	88	86	84	82	80	78	76	74	
57mm m1	100	96	84	70	68	56	80	30	19	12	
75mm m2	76	64	70	67	64	60	58	55	53	47	
75mm m3	87	83	80	76	70	69	66	62	59	53	
3 in m5							100				
75mm m6	78	73	68	63	59	54	49	45	40	35	
75mm m20	106	104	100	94	89	76	70	61	54	42	
76mm							128				
76mm m7						100					
76mm 1942	91	86	81	76	94	67	62	58	53	48	
76.2 17pd	235	230	225	220	215	211	206	202	197	192 (*)	
76.2mm	116	111	106	101	98	96	94	92	90	88	
77mm	109	104	99	94	90	85	80	76	71	66	
85mm	135	130	125	120	116	111	106	102	97	92 (*)	

GUN	000	100	200	300	400	500	600	700	800	900	1000
88mm 25pd	89	81	78	71	68	67	66	62	58	52	
90mm	131	130	129	128	127	126	125	124	123	122 (*)	
95mm	137	132	127	122	118	113	108	104	99	94 (*)	
100mm	240	230	220	210	200	190	181	170	160	150 (*)	
122mm	196	191	186	181	177	172	167	163	158	153 (*)	

(*) - Heavy anti tank

You will note that the above tables deal with ranges from 0 to 1000 yards. If a gun is capable of firing beyond 1000 yd's, as many are, simply continue deducting 7mm for each additional 100 yd's.

TANK RANGING TABLES

Base percent chance of a hit

Range mms	Field gun	Stop	Smooth	Bumpy	Rough
0 - 50	100	98	90	85	75
51 - 100	100	96	87	80	70
101 - 200	98	94	85	72	65
201 - 300	96	90	80	67	60
301 - 400	90	86	75	58	55
401 - 500	85	80	70	49	40
501 - 600	80	76	65	41	35
601 - 700	75	70	55	37	30
701 - 800	70	66	45	30	25
801 - 900	65	60	40	27	20
901 - 1000	60	50	35	21	15
1001 - 1100	55	45	30	18	10
1101 - 1200	50	40	25	15	5
1201 - 1300	45	25	20	10	0
1301 - 1400	40	30	15	60	
1401 - 1500	35	25	11	10	
1501 - 1600	30	20	9	00	
1601 - 1700	25	15	7	00	
1701 - 1800	20	12	5	00	
1801 - 1900	15	7	2	00	
1901 - 2000	10	5	0	00	

% DEDUCTION FOR SPEED,

		Target speed							
		MMs	120	240	360	480	600	720	840
Firer speed	MPH	10	20	30	40	50	60	70	
	10	10	14	18	23	27	34	40	
	20	20	23	27	31	35	39	44	
	30	30	33	35	40	45	50	55	
	40	40	45	50	55	60	65	70	
	50	50	55	60	65	70	75	80	
	60	60	65	70	75	80	85	90	
	70	70	75	80	85	90	95	-	

APPARENT AREA OF TARGET

Area in square feet												
1	10	20	30	40	50	60	70	80	90	100	110	120
34	32	30	28	26	24	22	20	18	16	14	12	
% deduction from ranging shot												

Area in square feet										
120	130	140	150	160	170	180	190	200	210	220
10	9	8	7	6	5	4	3	2	1	
% deduction from ranging shot										

The apparent area of a target is based on the SINE of the strike angle multiplied by the exposed area of the vehicle. For example, if you were firing at 45 degrees to the side of a vehicle, it would be possible to hit part of the front/rear or side. Find the vehicle's height x length x the SINE of the strike angle plus the height x width x the sine of the angle of strike. This will give the apparent visible area. (You will need a calculator).

If both firer and target remain stationary, add 5% for each shot fired after the first shot. Once you have determined that a ranging shot is successful you must find the area of the vehicle that has been struck by the shell. It should be apparent whether you have hit the front or rear. You then need to roll dice to find the exact area struck.

When a vehicle is hull-down you reduce the apparent area. If a ranging shot is achieved, then the exposed area of the vehicle is hit and the AREA OF HIT TABLE may be disregarded. If a vehicle is moving through woods or across a bridge and it is partly obscured by trees or girders, then deduct 5% for each 5mph the vehicle is travelling and then add 40%. Deduct this figure from 100. Roll % dice, and if the number is less than the remainder %, then a hit was scored. (See Notes on last page)

AREA OF STRIKE.

Roll 2d10 :

ARMOUR

Front / Rear	
0-50	hull
51-90	turret - fighting compartment
91-99	track - wheels
Side	
0-25	turret - fighting compartment
26-85	hull
86-99	track - wheels

SEMI ARMOUR

Front / Rear	
0-90	hull
91-99	track - wheels
Side	
0-35	hull
36-70	carrying compartment
71-99	track - wheels

SOFT SKINNED

Front / Rear	
0-90	hull
91-99	track - wheels
Side	
0-40	hull
41-80	carrying compartment
81-99	track - wheels

EFFECT OF STRIKE

Use the appropriate Vehicle Damage Table and roll dice as follows.

TARGET	Armour	Semi	Soft
GUN TYPE	Armour		Skinned
Light A.T. 0-37mm	1 (10)	2 (10)	3 (10)
Medium A.T. 38-75mm	2 (10)	3 (10)	4 (10)
Heavy A.T. 76mm <	3 (10)	4 (10)	5 (10)
Mortar	1 (4)	1 (6)	1 (8)
Artillery 75-105	1 (8)	2 (8)	3 (8)
Artillery 106 <	2 (8)	3 (8)	4 (8)

The table above shows how many effect dice to use for effect of hit. ie. 3 (8) = roll 3 eight sided dice and add the numbers on each dice. The resulting number is the number of boxes marked off on the damage sheet.

CRITICAL HITS

DIE	1	2	3	4	5
4	1/4	2/8	3/12	4/16	5/20
6	1/6	2/12	3/18	4/24	5/30
8	1/8	2/16	3/24	4/32	5/40
10	1/10	2/20	3/30	4/40	5/50
12	1/12	2/24	3/36	4/48	5/60

The table above shows when a hit which has penetrated the hull becomes critical and brews up a vehicle. ie. When rolling 5 eight sided dice, the following rolls will brew

the vehicle up: 5,8,16,24,32,40 (The first figure in each column is included only for the applicable number of dice rolled.) This must always be a roll of all 1s. All other numbers can be made up of any sequence of dice.

If a driver is killed by shell or small arms fire, the vehicle will not just stop on the spot. It will, in most cases, continue on for some distance and will stray either to the left or right. This could run it into a ditch, wall, or even vehicles passing by.

To determine which way the vehicle will slew, roll a six sided die. A roll of 1,2, or 3 will send it to the right, a roll of 4,5, or 6. will send it to the left.

The distance a vehicle will travel depends on its speed. For the sake of convenience, we will say that it will travel half the distance it travelled the previous move. ie. If it travelled 220mm in the previous move, then it will travel 110mm in the move the driver was killed.

DEGREE OF SLEW

CONDITION	SPEED				
	0-10	11-20	21-30	31-40	40<
Turning a corner	5	10	15	20	25
Bumpy ground	5	10	15	20	25
Up a hill	-5	-5	-10	-10	-10
Down a hill	5	5	10	10	10
Lost front wheel	10	15	20	25	30
lost rear wheel	5	7	12	15	17
Track lost	10	15	20	25	30
HE hit on side	10	20	30	40	50

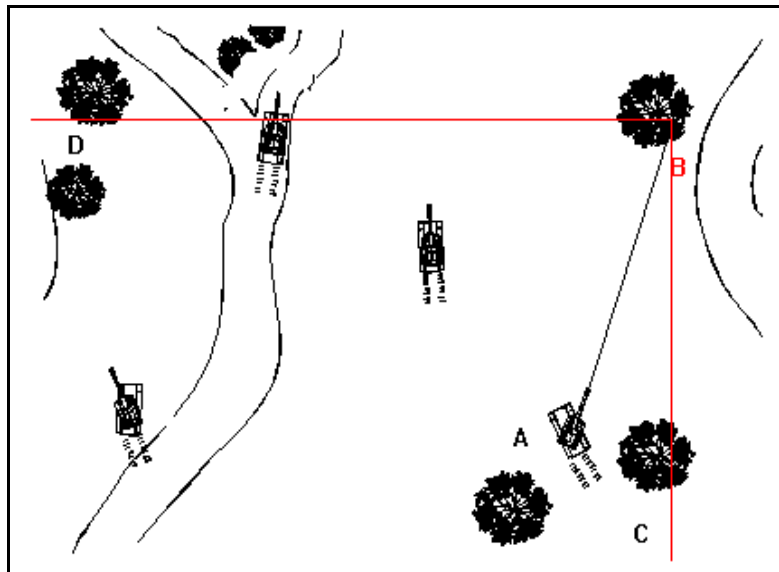
If a vehicle moving at 25mph, had lost a front wheel and was hit in the side by an H.E. shell the degree of slew would be 50 degrees.

So far we have looked at Tank vs. Tank and Anti tank vs. Tank. The next step is to look at Tank vs. Anti tank.

Anti tank weapons were usually well concealed, and many were dug in, placed behind walls or in pill boxes. In the case of emplaced or protected guns the protection had to be removed before any damage could be done to the gun or crew. This section deals with direct fire from A.F.Vs. and does not cover fire laid down by artillery.

Direct fire from AFVs against buildings. Range in using the same method as for artillery (described later).

DIRECT AFV FIRE



If an AFV is firing at a target hidden in bushes or in buildings the player controlling the AFV must estimate the distance from the base of the board (C) to the target, and from the edge of the board (D) to the target (B). Where these lines intersect is the point at which the shot lands (A-B). This applies to AFVs who cannot directly see their targets, but if the target is in view the targeting is done in the normal manner.

HIGH EXPLOSIVE DAMAGE TO STRUCTURES

At the end of this manual you will find various damage sheets for gun emplacements, pill boxes, buildings and bridges. Each of these structures has a surrounding coat of boxes. The table below shows the number and type of dice to roll to block out these protective boxes. Once high explosive fire breaks through this protective layer, the occupants roll under the ARTILLERY vs INFANTRY table which is found under the chapter on Artillery Fire.

H.E. DAMAGE TO BUILDINGS

Gun type	Wood	Earth	Brick	Steel	Stone	Concrete
15- 47mm	2d12	2d10	2d8	2d6	1d10	1d8
48- 75mm	3d12	3d10	3d8	3d6	2d8	1d12
76-105mm	4d12	4d10	4d8	4d6	2d10	2d8
106-155mm	5d12	5d10	5d8	5d6	3d8	2d10
156mm <	6d12	6d10	6d8	6d6	3d10	3d8

The number rolled is the number of boxes blanked out on the appropriate structure damage sheet.

You will find, that, in many cases, once a tank crew had located a field gun, the field gun would be withdrawn to another position. This was true for most anti tank guns, except, the German 88mm. The '88' was a fearsome weapon. There

are stories of 88s knocking out allied tanks at ranges of over 3000 yards, and a single shell passing through more than one tank. In fact, it has been claimed, that the reputation of the 88 was such, that some tank crews would bail out if the 88's first shot did no damage.

Field guns above 50mm cannot be moved by their crews. Guns below 50mm can be wheeled along at 10mm per move by 3 men.

The question now arises how a tank crew can locate an enemy weapon that has been carefully concealed. During the first move in which an anti tank gun fires, the crew of an AFV would be unaware of the location of the gun. Unless the AFV is actually hit. If a tank is hit and left undamaged, then the crew would have a fair idea where the shot had come from. If the tank is buttoned, it is much harder to find an attacking weapon than it would be if the commander was watching from the turret.

If an anti tank gun is concealed and only fires one shot then it is most unlikely that the position would be discovered. All these factors have to be taken into account when determining whether an AFV can return the fire of an anti tank gun.

The following table deals with most of these areas.

SPOTTING GUNFIRE

Weapon	Range										
	000	100	200	300	400	500	600	700	800	900	1000
Small arms	50	40	30	20	10	5	0	-5	-10	-15	
Infantry A.T.	60	50	40	30	20	10	5	0	-5	-10	
Mortar	65	55	45	35	25	15	5	0	-5	-7	
Anti-tank	70	60	50	40	30	20	10	5	0	-5	
Artillery	80	70	60	50	40	30	20	10	5	0	
Tank fire	90	80	70	60	50	40	30	20	10	5	

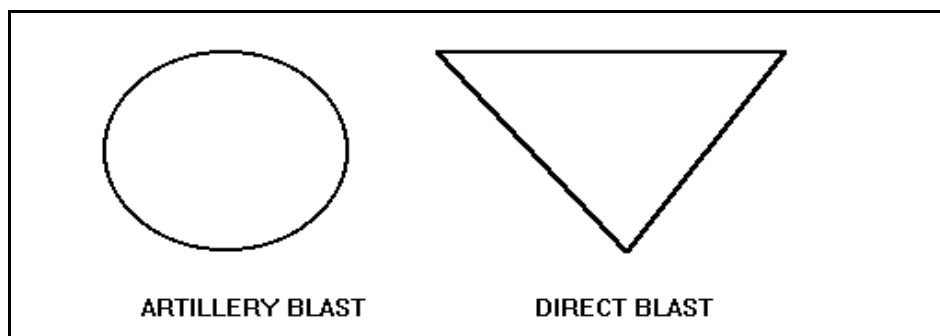
% chance of spotting gunfire



ADDITIONS & DEDUCTIONS	
fire from flank	-20
fire from rear	-15
fire from front	+20
night	+40
dusk/dawn	+20
Smoke	-25
rain	-20
snow/sleet	-30
woods	-25
tank buttoned	-20
tank unbuttoned	+20
a/t gun camouflaged	-25
a/t gun in open	+10
each shot fired	+ 5
each hit scored	+40

H.E. FIRE

Direct (as opposed to artillery) high explosive blast patterns will be different than indirect fire. Artillery blast areas are round. Direct fire blast areas are triangular. Eg.



ARTILLERY & RADIOS

In this chapter we will look at both the effects of artillery fire and the influence of radios.

The reason we have not looked at radio contact in any previous chapter is that most vehicles were equipped with internal, short range, and long range sets. The internal and short range sets would be tested and a radio net would have been set up before the battle began. Because artillery guns are some distance from the front line, their only means of directing fire was to have a F.O.O. (forward observation officer) at the front line. The F.O.O. would call down the fire and give corrections as the shots fell. All this would have to be carried out over a radio.

Although artillery was a major factor in the outcome of large battles, it was rarely used for small engagements such as those you will fight on a wargames board. If you only use a handful of men and vehicles, then it is unrealistic to expect support from a battery of artillery pieces. Also because the size of a playing board will be limited, I would suggest that all artillery fire be restricted to ranges of over 700mm. Of course, if a battery is under attack, then they would use direct fire (the same method as tank - anti tank fire.)

If you decide to use artillery, then you must decide at the beginning of the game how many guns are available. If a general offensive is in progress, then the artillery will be switching targets and will not always be available when it is needed.

To receive artillery support, you must first establish radio contact with HQ to get permission. You must also have a F.O.O. in the area to direct fire. (Artillery fire without direction is hazardous as the gunners are firing blind.)

To establish radio contact roll a six sided die, if you roll a 2,4, or 6, then radio contact has been made. (Remember that the radio sets used in WWII lacked the sophistication and reliability of modern sets, and the fact that they were in combat made matters worse.) Once you have made contact with HQ you must consult the following table to determine the number of moves before the guns will be available.

RADIO INTERCEPTION

Specialised radio interception equipment **MUST** be available to attempt this. (Points value 200). Messages transmitted may be true or false but must be written and given to the umpire. If radio detection equipment is available, then the umpire must decide whether false messages are passed on. A roll of 10 on a 1D10 will intercept the message.



ARTILLERY AVAILABILITY

Number of Moves before artillery becomes available

Guns	F.O.O.	no F.O.O.	% availability
1-2	6	10	45
3-4	8	14	35
5-6	10	16	25
7<	12	18	10

Once radio contact has been made roll % dice to determine whether the artillery is available. If it is not, you must break radio contact and try again in three moves. If it is available, you must wait the given number of moves before it can start to fire. You will notice that if you do not have a F.O.O. present, the request receives a low priority. Also the fewer guns you require the higher the % chance of getting support.

When a F.O.O. is present, the artillery fire may be directed at specific targets. Make sure that the F.O.O. can actually see what he is directing fire against. To begin with, the artillery may fire one shot per gun every two moves. (ie.. If you have two guns, they may fire one shot each, wait a move, and then fire again.) Once the F.O.O. reports the target has been hit, then the guns may open fire at full rate. Until the target is hit the F.O.O. relays new fire coordinates each time he spots a fall of shot, then the guns fire again.

The player firing artillery gives 2 coordinates based on an estimate of where the shot will land. The coordinates are measured from one end of the playing surface and from one side as well. The player whose units are being fired on will measure up and across the board, then place a marker where the lines intersect.

It is important not to allow the player firing artillery to make the measurements as this will unduly increase his accuracy in the following rounds of fire. Use the following table to determine actual fall of shot.



8.1 FALL OF SHOT

FOO fall of shot table.

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Mark this out on a clear plastic sheet and place it over a target once the ranging measurements have been made. Roll 2d6 to find the actual fall of shot, and then apply the appropriate blast circle for the gun firing.

Each square in this sheet should be approximately 2.5 x 2.5 cm. For fall of shot when no FOO is used, design a similar table but make the area 12 x 12 squares and roll 12 sided dice to determine fall of shot. This simulates the greater accuracy when a F.O.O. is available.

To determine where a shot will fall, follow the procedure outlined below;

- 1) For guns on the board :
Estimate the distance to the target by giving the range in mm's up the board (0 degrees to the gun) and then the range in mm's across the board (90 degrees to the gun.)
- 2) For guns off the board :
(Artillery were long range weapons and do not actually need to be on the playing board.) Mark a point at the edge of the board behind your lines and then use the same method as above.

For off-board guns, it takes two moves from the time artillery markers are placed until the shell lands. One move for on board guns and mortars.

Although the estimated distance is measured up and across the board, the actual shot goes direct from the gun to the target.

Once the estimates have been made the opposing player measures out the distances and places a marker where the shot would have fallen. If you have a F.O.O. present, you now place a F.O.O fall of shot table over the target and roll 2 six sided die to determine the actual fall of shot.

If there is no F.O.O. present, you must use a fall of undirected shot sheet. (See above)

Once the shot has been placed, a blast sheet is used to determine the area effected. After the first estimate the blast sheet is moved 100mm left, right, up or down (firing player's choice) as the area is blanketed by barrage fire.

COUNTER BATTERY FIRE

Sound & flash ranging was used to detect enemy artillery fire. This was not as accurate as later radar methods but was the only method available through most of the war.

0-5km 6-10km 11-20km
 15% 10% 5%

Each shot fired by the target battery +2%
 Target using rockets +10%
 Target using mortars -5%
 Target is camouflaged -5%

ARTILLERY PIECE TABLE

Gun	Range	RPM	Blast	Country	Elevation	Calibre	Traverse
75mm how	3780	3	37	Ger	-10 +75		
105mm	8699	2	52	Ger	-15 +42		
150mm	13325	2	75	Ger	- 3 +46		60
F18							
150mm	24500	1	75	Ger	- 2 +43		60(11)
K18							
150mm	24700	1	75	Ger	- 4 +45		60
K39							
170mm	29600	1	85	Ger	0 +50	172mm	360(16)
210mm	16700	1	105	Ger	0 +50	210.9	
240mm	37500	.5	120	Ger	- 1 +56	238mm	360
355mm	20850	.5	177	Ger	+45 +75	356.6	360(6)
70mm	3050	2	35	Jap	- 4 +75		
75mm	11990	3	37	Jap	- 8 +18		
95mm	8000	2	47	UK	- 5 +30		
105mm	7250	2	52	USA	- 9 +30		
155mm M1	23221	2	77	USA	- 2 +65		60
Gun	Range	RPM	Blast	Country	Elevation	Calibre	Traverse

3 inch	3322	3	37	UK			
7.2 in V	15453	2	90	UK	0 +45	183mm	8
7.2 in VI	17984	2	90	UK	- 2 +65	183mm	60
8 in M1	16596	1	100	USA	- 2 +65	203mm	60
25 pdr	1816	3	44	UK			
152mm	17265	2	76	USSR	- 2 +65	58 (gun)	
152mm	12400	2	76	USSR	- 3 +63	35 (how)	
203mm	18025	1	101	USSR	0 +60		8

Now that we've got artillery support and decided where the shots have landed on the board, we must go on to look at what effect the shots have when they fall on infantry, vehicles and buildings.

ARTILLERY FIRE ON INFANTRY

8.2

Infantry is	Calibre of gun				
	12-37	38-57	58-90	91-128	129<
Enclosed	10	8	6	4	2
Grouped/open	15	11	9	4	4
Grouped/bush	20	15	11	8	6
Spread/open	25	20	15	11	8
Spread/bush	35	30	20	15	10
Trenches	50	40	30	20	15
Fox hole	65	60	55	40	30
In Buildings	40	35	30	25	20
Bunker	70	65	60	55	50

% change of infantry survival

Use the % dice to determine how many men survived from those that were caught in the damaged area. A % dice roll is made for each man caught in the blast area.

The other targets for artillery fire are vehicles. The effect of fire in this case depended on the calibre of the gun and the type of vehicle that was hit. Artillery or HE fire has the same effect at 100 yards as it does at 1000 yards because the explosive charge does the damage. This is not effected by range as are armour piercing shots.

For artillery fire on vehicles, consult the section in anti tank fire for effect and use the Fall of Shot Sheet to determine if a vehicle has received a hit.

You also have the situation of near misses by artillery. The table below shows the effect of these shots.

NEAR MISSES FROM H.E.

A near miss occurs when a vehicle is caught in a blast circle but is not directly struck by the shell.

Gun size	Armour	Semi Arm	Soft Skinned
15 - 47mm	1d4	1d6	1d8
48 - 75mm	1d6	1d8	1d10
76 -105mm	1d8	1d10	1d12
106 -155mm	1d10	1d12	2d8
155mm <	1d12	2d8	2d10

Once again damage is recorded on the Vehicle Damage Sheet by blocking off boxes to indicate the area effected.

Another type of fire which could have similar consequences to artillery fire is rocket fire.

Although this was not accurate, it was employed by both Allied and Axis forces. Use the same method for rocket fire (ground based rocket fire) as Artillery Fire without a F.O.O.

ROCKETS.

(Velocity data is included for reference only.)

Type	Weight	Blast	Velocity	Damage	Range	Nationality
15cm	70 lbs	75	1120 fps	2d8	7715 yds	Ger
21cm	241 lbs	105	1050 fps	6d10	8585 yds	Ger
28cm 181 lbs		140		6d6	2337 yds	Ger
32cm	174 lbs	160		6d4	2217 yds	Ger
30cm	277 lbs	150	754 fps	6d12	4975 yds	Ger
20cm	44 lbs	100		2d6		Jap
82mm	17 lbs	41	1033 fps	1d10	6450 yds	USSR
132mm	93 lbs	66	1165 fps	2d10	9295 yds	USSR
300mm	201 lbs	150	836 fps	6d8		USSR
4.5inch	38 lbs	100	850 fps	2d6	4600 yds	USA
2inch	10 lbs	25	1500 fps	1d10		UK
3inch	54 lbs	35	1500 fps	2d6	4070 yds	UK
LILO	39 lbs	100		2d6		UK
LILO	78 lbs	75		2d8		UK
LandMatt	67 lbs	75	1100 fps	2d8	7900 yds	UK

As a final note, these are the % chances of setting fire to different types of buildings.

Thatch 70% Wood 50% Brick 30% Stone 20% Concrete 10%

NOTE : You will note that in these rules casualties are always referred to as killed not wounded. This is unrealistic as most hits caused wounds are not necessarily fatal. This method is employed for ease of use. At one time these rules contained tables with areas of hit for infantry similar to the ones applied to vehicles. This was far too detailed for a reasonably quick game, but you could always add your own tables if you wanted to go into great depth. As it stands, a hit means an infantry man is out of action and should be removed from the board.



INFANTRY FIRE & MOVEMENT

Unlike cannon fire, small arms fire is done in one fire segment. If one side gets first fire and kills a section of infantry, the dead soldiers are given return fire at a reduced rate of 50%. This allows for some amount of spontaneous return fire.

Like cannon fire, small arms fire is limited to the range of individual weapons. Small arms fire includes mortar fire and infantry anti tank fire

INFANTRY WEAPONS.

Weapon	Type	Nation	Magazine	RPM.	Range
Webbley	pistol	UK	6		100
Enfield	pistol	UK	6		100
Smith Wes	pistol	UK	6		100
Browning	pistol	USA	13		90
Nagant	pistol	Ger	7		90
Luger	pistol	Ger	8		100
Walther	pistol	Ger	8		100
Baretta	pistol	Ita	7		80
Meji	pistol	Jap	6		80
Sten	SMG	UK	32	550	300
Owen	SMG	Aus	33	700	300
Austen	SMG	Aus	28	500	250
Thompson	SMG	USA	50-100	800	300
PPD 1940	SMG	USSR	71	800	250
MP 28	SMG	Ger	32	500	300
Sowthurn	SMG	Ger	32	500	300
MP 34/35	SMG	Ger	32	650	300
MP 38	SMG	Ger	32	500	300
Baretta	SMG	Ita	25	900	250
Type 100	SMG	Jap	30	450	250
Lee enfld	rifle	UK	10		500
Garand	rifle	USA	8		500
Carbine	carbine	USA	15		450
Browning	rifle	USA	20	500	500
1930 g	rifle	USSR	5		450
Gwher 41	rifle	Ger	10		500
Sturm 44	rifle	Ger	30		500
FJG 42	rifle	Ger	20		700
Meji 38	rifle	Jap	5		450
Bren	LMG	UK	30	500	600
DD 1928	LMG	USSR	47	550	600
MG 15	LMG	Ger	75	850	600
MG 34	LMG	Ger	75	850	600
Weapon	Type	Nation	Magazine	RPM.	Range

Tashio	LMG	Jap	30	500	600
Vickers 1	MMG	UK	250	450	700
Brnng 303	MMG	USA	250	500	700
Maxim	MMG	USSR	250	550	700
Fiat	MMG	Ita	50	400	700
Brnng .5	HMG	USA	belt		800
MG 42	HMG	Ger	belt	1200	800

Once you know that a particular target is in range, you must then determine the % chance of killing the target and the number of men a rifle or machine gun can kill in 30 seconds.

The following table shows the number of kills a particular weapon can make per move. After that, there is a table showing the deductions from the % chance to make a kill, and finally the table showing the % chance of making a kill for different weapons at different ranges.

INFANTRY KILLS

WEAPON	POSSIBLE KILLS
Pistol	1
SMG	3
Rifle	2
LMG	4
MMG	5
HMG	6

15 - 20 mm (as per rate of fire x 2)

DEDUCTIONS FROM % CHANCE OF KILL ,

CONDITION	% DEDUCTION
Firer moving (on foot)	50
Target moving	10
Both moving	65
Target prone Heads down no fire	25
Target prone Heads up firing	10
Target in soft cover	10
Target in medium cover	30
Target in hard cover	40
Firer in moving vehicle with mounted gun	20
Target in moving vehicle over 350 yds	35 32 35
Target in moving vehicle under 350 yd	20 15 10
	A SA SS

Light, medium and heavy machine guns may not fire while on the move unless they are bolted to a vehicle.

% CHANCE OF A KILL

Range (mms)	Type of weapon					
	HMG	MMG	LMG	SMG	Rifle	Pistol
0-100	80	75	70	65	65	50
101-250	75	70	65	60	55	60
251-500	65	60	55	50	50	
501-700	55	50	45		40	
701<	40					

add 10% for snipers

If, for example, one rifle is firing at a range of 210mm. A rifle can kill a maximum of 2 men per move. It has a % chance of kill at that range of 55%. If the target is moving in the open, a deduction of 10% is made giving a final result of 45%. Since it is possible for a rifle to kill twice during one move, the % dice are rolled twice. If the number on the dice is 45 or less, then the target has been killed.

If infantry fire is directed against soft skinned vehicles or the tyres of armour and semi armour, use the following tables to determine the outcome.

INFANTRY FIRE ON VEHICLES

Weapon type	Number of each type	Damage Dice
Rifle	4	1d4
SMG	3	1d4
LMG	2	1d4
MMG	1	1d4
HMG	1	1d6

Infantry weapons cannot penetrate armour and may only do damage to tyres. All excess damage is disregarded.

If grenades are used against tracked vehicles, they can damage the tracks. 1d6 for damage to armour, 1d8 for damage to semi armour, and 1d10 for damage to soft skinned.

One man can throw one grenade per move. Grenades can be thrown a maximum of 40mm. An ordinary grenade has a blast circle of 30mm. This only applies to hand held grenades.

Rifle grenades are discussed under infantry anti tank. 50% chance of survival in the open, 40% in a confined space.

MORTAR FIRE

Mortar fire is done in the same way as artillery fire. Although there are no restrictions on when they can be used.

The effects on buildings and vehicles are the same as artillery. The table below shows different mortars and their capabilities.

MORTAR TABLE

TYPE	ELEVATION	NAT	Range		Rounds
			Min	Max	per Move
2 inch	40-90	UK100		500	4
3 inch	45-80	UK275		1600	9
45mm	45-85	Italian/French		585	12
50mm	45 or 70	USSR		900	15
50mm gwf86	42-90	German		600	20
50mm	45	Japanese		700	12
60mm				1860	
60mm M2	45-80	USA		1985	18
81mm M1	40-85	USA		3290	18
81mm gwf34	40-90	German		2625	7
81mm	45-85	Italian		1640	9
81mm	45-70	Japanese		2200	7
81mm		French		3116	
82mm	45-80	USSR		3400	7-10
90mm	5-70	Japanese		4050	7
120mm gwf42	45-85	German		6615	7



9.1 GRENADES

HAND HELD AND RIFLE GRENADES

Type	H/R	Blast type	Fuse length	Nation	Blast Circle	Range mms	Penetration
No36m	H/R	Blast	4 or 7	UK	25		50-100
No68	S	AT impact		UK	-	100	50-100
No69	H	fragment	impact	UK	32	50	
No70	H	fragment	impact	UK	25	50	
No74	H	AT5 sec		UK	-	50	
N076	H	incendiary		UK	30	50	
No85	R	AT impact		UK	-	150	
M11A1	H	Fragment	4 to 5	USA	35	50	
m11a2	H	blast	4 to 5	USA	40	50	
m11a9	R	AT impact		USA	-	150	60
m15	H	smoke	4 to 5	USA	25	50	
1H		fragment	4 to 5	USS	25	50	
rpg43	H	AT impact		USS	25	50	40
stg39	H	blast	4 to 5	Ger	25	50	
stick	H	blast	4 to 5	Jap	25	50	

H - hand held R - Rifle S - Smoothbore AT - Anti tank

INFANTRY ANTI-TANK

9.2

Below is a table describing other types of infantry anti tank weapons;

Type	Range	Penetration	Date	NA	RP M.
PIAT	100	100	1942	UK	1
2.36" m1	300	80	1942	USA	2
P/Faust 30k	60	140		German	
P/faust 30	60	200		German	1
P/faust 60	120	200		German	1
P/faust 100	200	200		German	1
P/faust 150	300	200		German	2
Panzerschek	100	300		German	2
Rifle gren68	100	60		UK	1
Rifle g/gross	200	40		German	1
Rifle g/klien	200	40		German	1
Rifle g/gew	200	90		German	1
Rifle g/ssgew	400	125		German	1
Magnetic mine	impact	110		German	

Type	Range	Penetration	Date	NA	RP M.
AT grenade	crunch			UK	
AT grenade	crunch	75		USSR	
ATR boys 1	700	20	1937	UK	3
ATR ptrd 41	700	25	1941	USSR	1
ATR ptrs 41	700	25	1941	USSR	3
Panzerbuche 38	500	25		German	1
Panzerbuche 39	500	25		German	1
PanzerbucheS18	500	35		German	5
ATR 97	50	12		Japanes	3
ATR w2/35	500	20		Polish	5

ATR - Anti tank rifle

All anti tank weapons are fired in the same manner as cannon except that ranging is automatic at a range of 150mm or less. For targets over 150mm, ranging must be done using the Anti-Tank Ranging Table.

Weapon	Damage dice		
	Armour	Semi Armour	Soft Skinned
PIAT	2d8	2d10	2d12
ATR	2d6	2d8	2d10
Bazooka type	2d10	2d12	3d10

The only major form of infantry weapon not covered so far is the flame thrower. The following rules govern the use of this weapon;

FLAME THROWERS

- 1) The flame thrower (infantry) has a maximum of five shots before it is exhausted.
- 2) The maximum range for an infantry flame thrower is 100mm.
- 3) Any infantry caught by a flame thrower are killed.
- 4) All soft skinned vehicles hit roll 4D12 for damage.
- 5) Semi armoured vehicles roll 3D10 for effect.
- 6) Armour rolls 1D10 for effect.
- 7) Flame throwers will clear one room of a building per shot.

Now we move on to Melee and morale. The morale tables include vehicle crews, gun crews and infantry.

To determine the outcome of hand to hand combat, each player rolls 1 six sided die and then adds the score to the appropriate score given by the following table.

MELEE

Condition	Infantry						
	German	UK	USA	USSR	Japanese	Italian	Other
Elite	+3	+2	+2	+2	+4	+2	+2
Regular	+2	+2	+1	+2	+3	+1	+1
Conscript	+2	+1	+1				
Surprised	-3	-3	-4	-4	-3	-5	-5
Bayonet	+2	+2	+1	+2	+3	+1	+1
Uphill-1	-1	-2	-2	-2	-2	-2	
Knife +3	+2	+2	+2	+2	+1	+2	
Downhill	+2	+2	+2	+2	+2	+2	+2
2 to 1 od	+4	+4	+3	+3	+3	+3	+3
3 to 1 od	+6	+6	+5	+5	+5	+5	+5

For each melee, a separate die roll must be made. ie. if two men attack one, then the player with two men will roll for each man attacking. If the defender kills the first attacker, he must then face the second as if it were a new attack.

The higher score will win, but if the scores are equal, then the defender wins.

MORALE

Once you have determined how many men have been killed, you may need to take a morale test. Morale is an important factor and cannot be ignored. The following list gives the times a morale test MUST be taken;

- 1) When fired on for the first time.
- 2) When fired on from the flank or rear.
- 3) If an officer or N.C.O. is killed.
- 4) If under surprise attack.
- 5) If in melee.
- 6) If under shell or flame attack.
- 7) If outnumbered by 2 to 1 or more.
- 8) If friendly units in sight are retreating.
- 9) If 25% casualties in one move.
- 10) Infantry without AT weapons within 200mm of enemy armour.
- 11) Vehicle has been immobilised.
- 12) Vehicle has been destroyed.
- 13) Friendly units withdrawing on flanks.



MORALE TABLE FOR INFANTRY

Moving forward	+1
Officer present	+2
Friendly MG firing on enemy	+1 (not AFV)
Soft cover	+1
Supported by armour	+2
Medium cover	+2
Hard cover	+3
Artillery support	+2
Deployed	+2
conscript	-2
Elite	+2
Fanatics	+3
Veteran	+1
Poorly led	-1
Up Hill from enemy	+1
Each victory this game	+2
Each man killed during game	-1 (each)
Each man killed this move	-1 (each)
Officer killed	-4
Behind enemy lines	-3
fired on from flank or rear	-2
Under artillery/armoured fire	-3
retreating	-2
previous morale less than 0	-3
under flame attack	-3
under rocket attack	-5
under surprise/first fire	-2
no radio	-1
outnumbered	-2
in melee	-3
Friendly units withdrawing	-3
Unsupported	-3
Each battle lost this game	-2

If a unit's leader is killed, then two moves must elapse before another member can take command. The members of a section must be within 25mm of each other to be considered a unit. A group of 10 men could be spread out over 250mm and still be considered a unit. If any man gets beyond 250mm away from a member of his unit, then he is considered no longer part of the unit and his morale factor drops by 10 points.

Messages may be passed by word of mouth from man to man at a rate of 100mm per move. This only applies when men are within 50mm of each other. The best idea is to keep the CO in the centre of a section if they are spread out as a message can be passed from the centre to the left and right far more quickly than it can be passed from one end of a line to the other.

You will need to write down the morale result and eventual morale score for each unit as this will be referred to on any following morale test.

MORALE RESULTS FOR INFANTRY

Score	Result	Action
-20 & less	If not in melee	Drop weapons and flee.
	If in melee	Surrender.
-12 to-19	Retreat to nearest friendly unit. If unable to retreat surrender.	No return fire
-6 to-11	If in the open	Fall back returning fire.
	In cover	Heads down no fire for three moves.
-5 to-1	Move to nearest cover	Return fire allowed
0 to 9	Follow orders.	
> 10	If within 200mm of enemy charge	otherwise follow orders

MORALE TEST FOR VEHICLE AND FIELD GUN CREWS

Officer or NCO present	+1
Moving forward	+1
Each friendly AFV in sight	+1
Firing	+1
Under shell fire	-2 (does not include AFV)
Under flame attack	-2
Under small arms fire	-1 (does not include AFV)
Behind enemy lines	-1
No radio contact	-2 (does not include USSR AFV)
Supported by artillery	+1
Supported by AFVs	+2 (does not include AFV)
Each man killed last move	-1
Fired on/ from flank or rear	-2
Under first/surprise fire	-2 (from cannon)
Light damage to vehicle	-1
Medium damage to vehicle	-2
Severe damage to vehicle	-3
Vehicle immobile	-5
Unable to return fire	-2
Each hit on vehicle	-2
Vehicle destroyed	-10
Commander killed	-4

Players roll 1 six sided die and add the score to the result of the figures given in the above tables.

MORALE RESULTS FOR AFV AND FIELD GUN CREWS

-15 and below	:	Retreat at full speed until out of the battle zone. If unable to retreat, surrender.
-6 to -14	:	Move to cover in reverse, infantry debus. Return fire is allowed . If immobile evacuate.
0 to -5	:	Move to cover. If immobile and not able to return fire evacuate.
1 to 4	:	Halt for one move.
5 to 9	:	Follow orders.
10 and above	:	If less that 200mm from enemy advance. Otherwise follow orders. (does not apply to field guns)

The final section of this chapter deals with infantry movement. The table below shows the distance that is achieved by infantry for differing conditions;

INFANTRY MOVEMENT

Ground	Crawl	Swim	Walk	Run	Sprint	Retreat
Bicycle			90	120	140	
Horseback	20	50	120	150	150	
Paved	20		45	90	120	130
Soft	20		40	80	100	120
Ploughed	20		35	70	80	110
Mud/snow	20		30	60	70	
Trench	20		25	50	65	
River		15				25
Hill	20		20	40	55	100
Firing weapons			25			
Desert	20		20	40	55	100

Infantry carrying heavy machine guns, mortars, bazookas, rocket launchers, etc., cannot sprint. If infantry carrying these types of weapons, have to sprint, they MUST drop their weapons.

(Replace these figures with ones carrying only rifles or SMGs). Infantry movement is based on a man in full combat dress with kit and weapons. 80mm represents about 6.5 MPH. Infantry on foot could not be expected to cover more than 20 miles in a day.

INFANTRY ORGANISATION

Description.	Number of Men
Section	8-12
Platoon	32-48
Company	120
Battalion	7000-8000

(You should rarely exceed company strength in a game.)

ACTION & REACTION TABLE

Action/Reaction	Portion of move used	
Set up LMG	20%	
Set up MMG	30%	
Set up HMG	50%	
Set up mortar	100%	
Guns	Limber	Unlimber
15-47mm	25%	50%
48-75mm	50%	75%
76-105mm	75%	100%
106mm <	100%	150%
Secure a Building	100% (Per room)	
Dismount from a Vehicle	25%	
Mount on a Vehicle	50%	
Cross a Fence or Hedge	50%	
Cross Barbed Wire or Bocage	75%	

100% = 1 move



WEATHER

The subject of weather does not often appear in wargames books, but this aspect was very important in fighting many campaigns. The Russian Front, Africa, D-Day were all influenced to a great extent by the prevailing weather conditions.

In the following tables, I have given a set of weather conditions for different theatres of the war. Following that, a key table which explains the symbols.

USSR & EASTERN EUROPE

MONTH	DIE	ROLL					
		1	2	3	4	5	6
JAN		G	G	H	A	B	I
FEB		G	G	H	A	B	I
MAR		G	H	A	B	I	C
APR		A	B	B	B	C	C
MAY		B	B	B	J	C	D
JUN		B	B	C	C	D	D
JUL		B	B	C	C	D	D
AUG		A	B	C	D	D	D
SEP		B	B	B	J	C	D
OCT		G	H	A	B	I	C
NOV		A	B	B	B	C	C
DEC		G	H	A	B	I	C

SOUTHERN EUROPE

MONTH	DIE	ROLL					
		1	2	3	4	5	6
JAN		G	G	H	I	J	A
FEB		G	H	I	J	A	B
MAR		H	I	J	A	B	C
APR		A	B	B	B	C	D
MAY		A	B	B	J	C	D
JUN		B	C	D	D	D	D
JUL		C	C	D	D	D	D
AUG		A	A	B	C	D	D
SEP		A	A	B	C	D	D
OCT		A	B	B	B	C	D
NOV		H	I	J	A	B	C
DEC		G	H	I	J	A	B

NORTH WESTERN EUROPE

MONTH	DIE	ROLL
-------	-----	------

	1	2	3	4	5	6
JAN	G	G	H	A	A	B
FEB	G	H	I	J	A	B
MAR	A	B	I	J	C	C
APR	A	B	C	C	C	D
MAY	B	C	C	C	C	D
JUN	B	C	D	D	D	D
JUL	B	C	D	D	D	D
AUG	A	B	C	D	D	D
SEP	A	B	B	J	C	D
OCT	A	B	I	J	C	C
NOV	A	B	I	J	C	C
DEC	G	H	I	J	A	B

NORTH AFRICA

MONTH	DIE ROLL					
	1	2	3	4	5	6
JAN	E	E	F	F	F	F
FEB	D	E	E	F	F	F
MAR	D	D	E	E	F	F
APR	C	D	E	E	F	F
MAY	B	C	D	E	F	F
JUN	B	C	D	D	E	F
JUL	B	C	C	D	E	F
AUG	B	B	C	D	E	F
SEP	B	C	D	E	F	F
OCT	B	C	D	D	E	F
NOV	D	D	E	E	F	F
DEC	E	E	E	F	F	F



SOUTHERN ASIA

MONTH	DIE ROLL
-------	----------

	1	2	3	4	5	6
JAN	A	B	B	C	C	C
FEB	A	A	B	B	C	C
MAR	A	A	A	B	B	C
APR	A	A	A	B	B	B
MAY	A	A	B	B	C	C
JUN	A	B	C	C	D	D
JUL	A	B	C	D	D	D
AUG	A	A	B	C	D	D
SEP	A	A	B	B	C	C
OCT	A	A	B	B	B	C
NOV	A	A	A	B	B	C
DEC	A	A	B	B	C	C

PACIFIC ISLANDS

MONTH	DIE	ROLL	1	2	3	4	5	6
JAN			C	D	D	D	D	D
FEB			C	D	D	D	D	D
MAR			B	C	D	D	D	D
APR			B	C	D	D	D	D
MAY			A	B	C	C	D	D
JUN			A	A	B	B	B	C
JUL			A	A	A	A	A	B
AUG			A	A	A	A	A	B
SEP			A	A	A	A	B	B
OCT			A	A	B	B	C	C
NOV			A	B	C	C	D	D
DEC			A	B	C	D	D	D



NORTHERN ASIA

MONTH	DIE	ROLL	1	2	3	4	5	6
JAN			B	C	D	D	D	D

FEB		A	B	C	D	D	D
MAR		A	B	C	D	D	D
APR		A	B	C	C	D	D
MAY		A	A	A	B	B	B
JUN		A	A	A	A	B	B
JUL		A	A	A	A	B	B
AUG		A	A	A	A	B	B
SEP		A	A	B	B	B	C
OCT		A	B	C	C	D	D
NOV		B	C	D	D	D	D
DEC		C	D	D	D	D	D

EXPLANATION OF SYMBOLS.

- A - Heavy rain. Visibility cut by 50%. All planes grounded. Vehicles cut to half speed. Morale drops two points.
- B - Light rain. Visibility cut by 30%. All planes grounded. Vehicles cut speed by 25%.
- C - Cloudy. Visibility cut by 15%.
- D - Fine.
- E - Sand storm. Visibility down by 80%. All planes grounded. Men and vehicles move to cover.
- F - Drought. Morale down by 4 points.
- G - Snow storm. Visibility down by 80%. All planes grounded. All vehicles halted. All men at walking speed.
- H - Sleet. Visibility down 65%. All planes grounded. Vehicles cut to half speed.
- I - Fog. Visibility down 90%. All planes grounded. Vehicles cut to half speed.
- J - Mist. Visibility down by 50%.

To find the weather conditions decide on which front the battle is taking place, then roll a six sided die. Refer to the appropriate Theatre Table then look up the meaning of the code.

To change weather conditions roll a six sided die every ten moves. If you get a 1,2, or 3, then the weather condition moves to the right of the last weather condition. If you roll a 4,5, or 6 then it moves to the left.



MISCELLANEOUS

This chapter deals with areas that do not readily fit into a category and are not really worthy of a chapter of their own. It does contain some important information and should be looked at carefully.

MINE FIELDS

A mine field takes a great deal of time to set up. For major mine fields, it is a good idea to map out the area by drawing a map before the game starts. If some scattered mines are laid, they should also be marked on the map.

Once enemy infantry or vehicles enter the mine field, roll the % dice to determine if a mine has been set off. There is a 75% chance of setting mines for the first move in a mine field. Add 5% for each successive move. ie. If a vehicle enters a mine field and does not set off a mine, the chances of setting off a mine will increase each move by 5%.

Men cannot set off anti-tank mines as they are set for a pressure greater than a soldier's weight. Anti personnel mines have a blast circle of 75mm. Any men caught in that area have a 50% chance of survival.

If a semi armoured or soft skinned vehicle sets off an anti-tank mine it is destroyed and the crewmen are killed. If it hits an anti personnel mine, it will have its wheels/tracks damaged and will be immobilised.

If an armoured vehicle hits an anti tank mine it has a 60% chance of being destroyed. If not destroyed, it becomes immobilised. Use your % dice to determine the outcome.

Mine clearing can be done with flail tanks or by specials squads of sappers. Flail tanks can clear mine fields moving at half speed. A squad of five men can clear an area of 50mm by 50mm every two moves.

Laying mine fields is not feasible as it would take far too long in a game situation. Therefore when mines are used, you should draw a map before the game.

VEHICLE MOVEMENT

Although vehicles differ in their performance, they are all similar in the fact that they cannot go from stationary to full speed in one move. It takes two moves to reach full speed and two moves to go from full speed to stationary.

REVERSING VEHICLES

Reversing a vehicle cuts speed by 75% for wheeled, and 50% for tracked vehicles. Some vehicles had steering at both ends so this rule does not apply to them.

ABANDONED VEHICLES

Although it may be true that both sides made extensive use of captured equipment during the war, the vehicles concerned were generally obtained after a battle and most needed extensive repairs before they could go back into action.

For the purpose of these rules, the only vehicles that can be captured and used are soft skinned or semi armoured vehicles which have been abandoned without being damaged.

Armoured vehicles are not reusable. In most cases tanks had self destruct charges fitted which the crew would ignite before bailing out.

If damage to a vehicle is light (ie, tyre damage), and the crew can return fire or could be reasonably assumed to be safer in the vehicle than out, they may remain in the vehicle as long as their morale holds out.

STAR SHELLS & SMOKE BOMBS

Star shells can be used to illuminate an area 200mm x 200mm during night operations. They remain effective for three moves.

The area they light up can be worked out by using the same firing procedure as artillery.

Smoke may be laid by artillery, smoke dischargers or grenades and is effected by weather in the following ways.

Sand storm / Snow storm / Heavy rain - smoke has no effect.

Light rain / Sleet - smoke lasts one move after laying.

Other conditions - smoke lasts 2 moves after laying.

The area covered by smoke is as follows :

50mm x 25mm for smoke dischargers and smoke grenades. 2 x blast circle for artillery.

CHANCE CARDS

You can also make up a series of chance cards. These can cover areas that the rules do not. ie. 'Air strikes on your supply depot have cut off all supply for ten moves', 'A stray mine brews up a vehicle closest to the front line' etc.

These cards can bring about misfortune or fortune for each player and add a new dimension to the game. You could select a chance card by rolling a six when rolling dice for movement and fire.

PLACING DEMOLITION CHARGES

If during a battle one side needs to blow a bridge or some such structure then charges can be laid by sappers.

It takes two moves for two men to lay one charge and it takes three charges to demolish 100mm of a structure. When the charges have been laid, there is a 75%

chance of success. If 75 or less is not rolled by the percent dice on the first roll, then all the charges have to be re-laid.

If charges are to be removed, it takes three men one move to remove one charge.

VEHICLES MOVING THROUGH WALLS

No soft skinned or semi armoured vehicle may attempt this. Armour may only crash through brick and wooden walls with the turret turned backwards to avoid damage to the cannon. Self propelled guns must reverse through.

PLAYING GOD

A word needs to be said about the 'god like' position of the players in a wargame. Since players can see all that is occurring on a wargames table there is a tendency to move tanks away from bushes containing infantry with flame throwers or bazookas. This can be avoided by using markers and noting on paper what the markers represent. Once the marker is within visible range it can be replaced with the infantry squad or vehicle it represents.

More will be said about maps in a future chapter.

VEHICLE COLLISIONS

On occasion, vehicles collided either by accident or by deliberate ramming. The following tables give the outcomes of such collisions;

Weight of Vehicle	Speed of Vehicle					
	0-5	6-10	11-20	21-30	31-40	41<
0-5	-10	-11	-12	-13	-14	-15
6-10	-8	-9	-10	-11	-12	-13
11-15	-7	-8	-9	-10	-11	-12
16-20	-5	-6	-7	-8	-9	-10
21-30	-1	-2	-3	-4	-5	-6
31-40	+2	+1	0	-1	-2	-3
>40+4	+3	+2	+1	0	-1	

Soft skinned -10
Semi armour -5
Armour +5

If two vehicles collide, then they each must have their points worked out. The results are given in the table below;

5 and less : Vehicle U.S.
0 to -4 : Vehicle badly damaged. Cut to 25% speed.

- 1 to 5 : Vehicle damaged. Cut speed by 25%.
- 6 and over : No damage. Vehicle remain stationary for two moves

If a damaged vehicle needs to be moved out of the way then it can be towed by any vehicle of a similar weight. It takes three moves to attach a towing line and it can be moved at a rate of 50mm per move.

In the case of armour, damaged vehicles can be pushed out of the way by a tank of similar or greater weight at a rate of 50mm per move.

BRIDGE BUILDING

This is done by engineers and takes 5 moves for a single span demountable bridge and 20 moves for a pontoon bridge.



POINT VALUES

In order to select two opposing sides of equal status or to give an attacker an advantage in a game, you can refer to the following tables which give points for men and vehicles. To use this section you must decide how many points each side can have at the start of the game. Each player can then select different groups of men and vehicles.

One player may decide to have a few heavy tanks which cost more in points, and another may decide to have a lot of light tanks which do not cost as much.

The vehicle points have been worked out on the basis of speed, armour, and armament. This does not take into account some features such as sloped armour but does give some representation of a vehicle's fighting ability.

The formula adds the vehicle's top speed to its maximum armour thickness and the size of its gun in MMs. This was then divided by two to keep the numbers manageable. If you come across vehicles that are not mentioned here, you can use this formula to work out the point values.

POINT VALUES FOR INFANTRY

Pistol	1	Rifle	2	SMG	3
LMG	4	MMG	5	HMG	6
Bazooka	6	Flame	6	Mortar	6
Officer	3	NCO	2	Private	1
ATR	4	grenade	1	AT mine	10

ie. A private with a rifle is worth 3 points, an officer with a pistol is worth 4 points and so on.

POINT VALUES FOR VEHICLES

FRENCH			
Renault ft17	14	Hotchkiss h35	50
Char B1	100	Renault amc35	49
Char somua s35	63	Renault r35	45
Renault amr33vm	12		

ITALIAN			
Semovente da75/18	63	Carro armato m13/40	49
Semovente m41 75/32	74	Fiat 3000t	22

JAPANESE			
Ha go	39	Chi ha	48
Te ke / Te ne	38	Ho ro	100
Ka mi	33		

GERMAN			
Panz i	28	Panz ii a-e	38
Sdkfz 234/1	51	Sdkfz 222	47
Sdkfz 231	44	Sdkfz 232	36
Panz ii f	40	Wirbelwind	77
Panz iii a-d	74	Ostwind	56
Panzjg i b	41	Puma	67
Panz iii e-g	83	Panz iii j-l	83
Panz iii m-n	90	Panz iv a-e	72
Sdkfz 234/3	79	Stug iii kwk75	75
Panz iv f-g	94	Panz iv h-j	95
Panther d	102	Panther a	107
Panther g	115	Marder	76
Sdkfz 234/4	70	Jagdpanz iv	100
Hetzer	80	Stug iv	100
Brumbar	100	Stug iii stuk75	75
Tiger i	111	Tiger ii	149
Jagdpanther	99	Nashorn	72
Elefant	110	Wespe	76
Stug iii105mm	90	Jagdtiger	199
Hummel	103	Sfh	13
Panz i b150mm	100	Sturmtiger	277
Bergepanther	69	Bergepanzer hetzer	43
Panzerbefehlswagon	24	Sdkfz 251	23
Sdkfz 251/1	64	Sdkfz 251/9	61
Sdkfz 251/10	42	Truck	17
Kublewagon	25	Sdkfz 7	28
Sdkfz 11	30	BMW	20

ENGLISH / AMERICAN			
Sherman flail	56	BARV	56
Lee ARV	41	Crocodile	82
M3 GMC	64	DD Sherman	56
Ark 59SBG	59	AEC III A/C	51
Humber AC	48	Panhard Amd	44
Staghound	69	Greyhound	57
Daimler AC	60	Humber scout	21
Daimler dingo	43	Lee Grant	97
M3 Stuart	62	M5 Honey	72
Valentine i-vii	67	Sentinal	63
Tetrarch	48	Cruiser a9-13	40
Cruiser i-ii	54	Matilda ii	67
Churchill i-ii	116	Churchill iii-iv	89
Crusader iii	71	Valentine viii-x	75
Churchill vi-vii	93	Sherman i-vii	94
Jumbo	103	Cromwell iii-vii	85

Chaffee	74	Hellcat	68
Sherman 'a' models	94	Sherman 'b' models	112
Comet	104	Jackson	85
Churchill v	120	Sexton	81
Bishop	90	Priest	94
Firefly	94	M40 GMC	84
M41 GMC	108	Motor-cycle	26
Jeep	27	Dodge	28
M3 Ht	26	M16 ht	34
White scout	34	Matador	17
5 ton truck	17	Bren carrier	22
DUKW	12	Buffalo	15
Achilles	83	Centaur 95mm	101
Cromwell vi-viii	97	Pershing	111
Challenger	94	Archer	76
Morris 15cwt	20	Chevrolet	21

If you use point values to set up a battle, you can also use them to determine the outcome of a battle which may be in doubt.

If the game has come to an end and there is no clear victor, then you can add the points values for each side's losses during the game. Subtract 10 points for each 100mm of ground gained since the start of the game. (If you loose ground then add 10 points for each 100mm lost.) The winner is the side with the lowest number of points.

Field guns are based on 1 point per mm of barrel width. ie 75mm = 75 points



CAMPAIGN MAPS

If you intend to fight a lengthy campaign, it may be of some help to make a 10:1 scaled down map. This could comprise an area of 10 x 10 playing boards. If, for example, your playing board was 3 metres by 2 metres, a 10:1 scale map would be 300mm by 200mm. A number of these maps could be drawn side by side on a large piece of paper. You should make each map different and match up roads etc. between the different ones. Mark out on each map, buildings, hills, rivers, roads etc. You can also include mine fields.

Use a series of markers to determine troop concentrations and select one of the board maps as the one to actually play on.

When one board has been set up, play can begin. Use the markers to move troops to and from the area of conflict. Remember that movement and fire on the campaign board is one tenth the range of that on the playing board.

The campaign map will alleviate the unrealistic aspect of vehicles and men appearing on the playing board from nowhere.

If two opposing forces meet on a campaign map (and you already have a game board set up with a battle in progress) you can use the same rules scaled down to 1:10. You can, in effect, have a full blown battle going on the campaign map and fight out a section of the battle on the playing board.

NOTE :

It is a good idea for the umpire to move some markers from each opposing force as well as some civilian markers on the campaign map. This could lead to a situation where strafing raids are made against civilian targets or even one's own troops, as was often the case.



SUPPLY

The question of supply will effect most games that you play. If at the beginning of the game all men and vehicles are selected, then they can be moved at any time (except when using a campaign map).

If you are running low on men and vehicles then you may need to resupply your front line. You may request supplies every three moves. Supplies may not exceed 300 points (see points values) in any one move.

The question of whether supply will be available or not will depend on two things.

1) What side you are on and 2) what year it is.

If you are using a campaign map, then your supplies will reach the board by moving on the map. If you are not using a campaign map, then you must refer to the table on page 53.7 (?)

A request for supply may only be made in the following circumstances;

- 1) If all your forces are in retreat for more than two moves
- 2) If you have suffered more than 40% losses overall.
- 3) If you need a specific vehicle for a specific task. ie bridge layer.
- 4) If your attack has failed.
- 5) If the enemy is counter attacking.
- 6) If you have lost 25% or more of the territory you held at the start of the game.

The tables below will tell you whether your request for supply has been granted. Use % dice.

NORTH AFRICA							
YEAR	NATIONALITY						
	UK	USA	USSR	Ger	Jap	Ita	Other
1940	70		50	70			
1941	45		75	20		40	
1942	70	70	50	10		70	
1943	80	80	20	5		70	

MEDITERRANEAN							
YEAR	NATIONALITY						
	UK	USA	USSR	Ger	Jap	Ita	Other
1940	65			40			
1941	40			70	65	30	
1942	70			65	60	20	
1943	65	60		60	50	25	
1944	75	80		40	20	45	
1945	80	80		20		60	

NORTH WEST EUROPE							
YEAR	NATIONALITY						
	UK	USA	USSR	Ger	Jap	Ita	Other
1939	80			80			
1940	35			70			70
1941				70			
1942				60			
1943				60			
1944	90	90		20			70
1945	90	90		10			70

USSR & EASTERN EUROPE							
YEAR	NATIONALITY						
	UK	USA	USSR	Ger	Jap	Ita	Other
1941			40	90			20
1942			50	70			10
1943			60	50			20
1944			70	30			30
1945			80	10			40

PACIFIC							
YEAR	NATIONALITY						
	UK	USA	USSR	Ger	Jap	Ita	Other
1941	30	30			70		30
1942	40	40			60		30
1943	60	60			60		40
1944	70	70			60		50
1945	80	80			40		60
1946	90	90			20		70

% chance of supply

If you are not using a campaign map then roll one six sided die to determine when supplies reach the board.

- 1 - 2 moves
- 2 - 4 moves

3 - 6 moves
4 - 7 moves
5 - 8 moves
6 - 9 moves

Supply may only be requested when the given conditions apply again.

APPENDIX A**MAJOR BATTLES**

It may be of some use to know what dates battles began and ended. This will help in setting up a battle and selecting the types of vehicles to use.

North West Europe.

Polish campaign	Sept 1 1939 - Sep 27 1939
Finnish campaign	Nov 30 1939 - Feb 1940
Invasion of Norway	Apr 9 1940 - Jun 1940
Assault on France	May 10 1940
Dunkirk	May 31 1940
D Day	Jun 6 1944
Arnhem	Sep 17 1944
Battle of the Bulge	Dec 16 1944
End in Europe	May 7 1945

North Africa

Wavell's opening offensive	Dec 9 1940
Ethiopian campaign	Jan 19 1941 - Nov 27 1941
Rommel's first offensive	Feb 14 1941 - Mar 27 1941
Operation Brevity	May 15 1941
Operation Battleaxe	Jun 15 1941 - Jun 17 1941
Crusader battles	Nov 18 1941 - Dec 31 1941
Rommel's drive to Gazala	Jan 21 1942 - Jun 18 1942
Fall of Tobruk	Jun 21 1942
German advance to El Alemein	Jun 26 1942
El Alemein 1st battle	Jun 26 1942
Alam Halfa	Sep 1 1942 - Sep 4 1942
El Alemein 2nd battle	Oct 24 1942 - Nov 4 1942
Operation Torch	Nov 8 1942 - Dec 1 1942
8th army advance	Dec 12 1942 - Feb 14 1943
Kasserine	Feb 14 1943 - Feb 25 1943
Breaking the Mareth line	Mar 6 1943 - Apr 6 1943
End in Africa	May 12 1943

Mediterranean

Italian attack on Greece	Oct 28 1940
Invasion of Yugoslavia	Apr 6 1941 - Apr 17 1941
German attack on Greece	Apr 6 1941 - Apr 28 1941
Attack on Crete	May 20 1941 - May 30 1941
Invasion of Sicily	Jun 10 1943 - Aug 17 1943
First landings in Italy	Sep 3 1943
Gustav line	Oct 12 1943 - Dec 27 1943
Ensur	Jan 22 1944
Gothic line	Oct 20 1944
End in Italy	May 2 1945

The Russian front

Barbarossa begins	Jun 22 1941
The Finnish attacks	Jan 29 1941 - Dec 6 1941
Lenningrad	Sept 1 1941
Moscow 1st battle	Sep 30 1941 - Nov 29 1941
Moscow 2nd battle	Dec 5 1941 - Jan 5 1942
End in Stalingrad	Jan 31 1942
Kursk	July 5 1942 - Aug 23 1942
End in Lenningrad	Jan 19 1944
Fall of Berlin	Apr 16 1945

South East Asia

Pearl harbour	Dec 7 1941
Invasion of Malaya	Dec 8 1941 - Jan 31 1942
Fall of Hong Kong	Dec 8 1941 - Dec 25 1941
Fall of the Philippines	Dec 8 1941 - May 6 1942
Fall of Dutch east Indies	Jan 11 1942 - Mar 8 1942
Fall of Burma	Jan 15 1942 - May 15 1942
New Guinea	Jul 22 1942
Guadalcanal	Aug 7 1942
Solomons	Jul 2 1943
Arakan	Feb 24 1943
Chindit operations	Feb 8 1943 - Aug 4 1943
Marianas	Jul 9 1943
Marshalls	Nov 20 1943
Imphal	Mar 7 1944 - Apr 7 1944
Leyte gulf	Oct 20 1944
Clearing the Philippines	Jan 9 1945
Iwo Jima	Feb 19 1945
Okinawa	Apr 1 1945
Rangoon falls	May 3 1945
End in the Pacific	Nov 1 1945



APPENDIX B

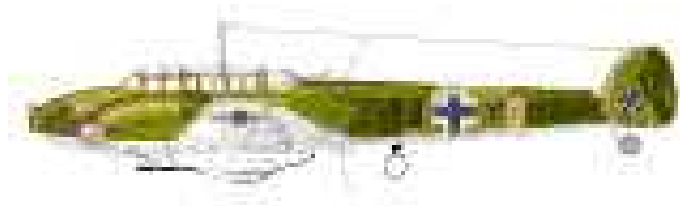
ABBREVIATIONS

AT	Anti-tank
AC	Armoured car
AFV	Armoured fighting vehicle
AP	Armour piercing
ATR	Anti-tank rifle
LMG	Light machine gun
MMG	Medium machine gun
HMG	Heavy machine gun
US	Un-serviceable
FOO	Forward observation officer
NCO	Non commissioned officer
MPG	Miles per gallon
MPH	Miles per hour
RPM	Rounds per move
HE	High explosive
MMs	Millimetres
UK	United Kingdom
Ger	Germany
USSR	Russia
Ita	Italian
Jap	Japan
Aus	Australia
SMG	Sub machine gun
Yds	Yards
Pdr	Pounder
DD	Duplex drive (amphibious tank)
GMC	Gun motor carriage
HT	Half track
HQ	Head quarters
SPA	Self propelled artillery
SPG	Self propelled gun
KWK	Tank weapon
Pak	Anti-tank weapon
Flak	Anti-aircraft weapon



GLOSSARY

Armour	Specially hardened metal.
Assault gun	A tank chassis minus the turret with a superstructure to hold a larger gun.
Barrage	A large number of field gun firing at an area.
Bogie	Running wheel on an AFV.
Brewed up	Vehicle on fire and exploding.
Carbine	Small semi automatic rifle.
Char (French)	Tank
Debus	Passengers getting down from a vehicle.
Deployed	Combat ready troops.
Elevation	Vertical movement of a gun barrel.
Flail	Mine clearing device attached to a tank.
Howitzer	Gun which can fire only HE shells.
Immobilised	Vehicle which can no longer move.
Limbered	Field gun attached to its tractor.
Magazine	Chamber holding bullets.
Melee	Hand to hand combat. (Pron. MELAY)
Morale	Overall mood of the troops.
Panzer (German)	Tank
Range	Distance between a gun and it's target.
Semi armour	Vehicles which are not fully armoured.
Soft skinned	Vehicles with no armour.
Spaced armour	Sheets of armour mounted on struts which protect the tank.
Traverse	Horizontal movement of a gun barrel.
Turret	Armoured box on top of a tank which can traverse.



ADDENDUM

AIR ATTACKS.

It is important to include a section on air attacks in this book as strikes against ground forces played an important role in many battles in all theatres of the war.

In this section we shall not discuss plane vs plane warfare as this is fraught with difficulties and is far too complex to include in what is basically a ground warfare book.

We shall deal instead with air vs ground attacks and although the rules have to be simple, I hope they will be fairly realistic.

The main difficulty in dealing with air attacks is the speed of the plane itself. If you convert our scale of 12mm = 1 m.p.h. to the average attack speed of a plane (approx. 300 m.p.h.) you end up with a move of 3.60 metres. This is far longer than the average wargames board which at six feet is just about half this distance.

Dealing with the aircraft first we have to set a speed of one board length or width per move. Assuming the board is six feet long and four feet wide. If the plane attacks down the board, the attack move will cover the whole length of the board. Because the single attack move of a plane would exceed the length or width of almost any games board, this has been found to be the most practical way of dealing with the situation.

You will need at least one 12 sided die to operate these rules. Two six sided dice will not work as the odds are considerably changed.

The player using the plane must select a point of entry on the board for the plane and it must then fly in a straight line across the board to the exit point. The plane may enter the board at a corner or edge and fly across diagonally in a straight line, although as you will see it may move up and down vertically.

There will be 12 points across the board which will be represented by twelve rolls of the die.

Because playing surfaces will vary in size, the best way to do this is to measure the length of the attack run and divide it by 12.

The player controlling the air attack then uses the 'AIRCRAFT ATTACK RUN TABLE' (below) to mark out his plane's flight path across the board. There are some basic rules to follow for flight paths and these are as follows :

- 1) A plane may not raise or drop more than one vertical box for every horizontal box moved.
- 2) A plane may not drop bombs below altitude 7.
- 3) A plane may not fire rockets above altitude 9.
- 4) A plane may not use cannon or machine guns above altitude 7.

If both sides call in an air strike in the same move, then both planes attack each other and the strafing round is lost for both sides.

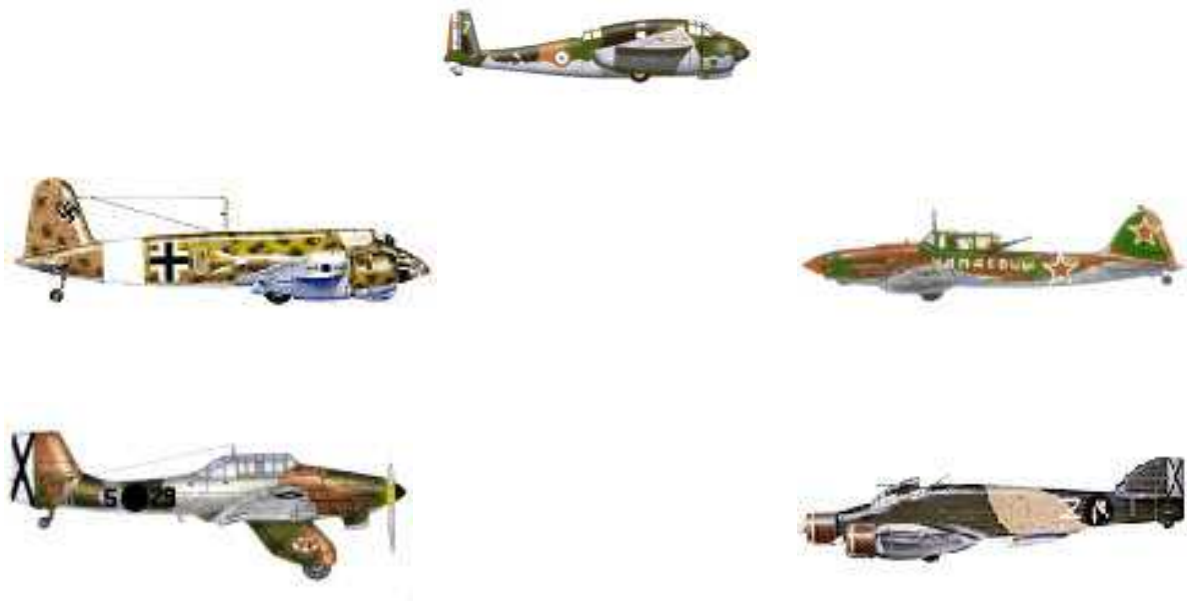
CALL AN AIR STRIKE (% chance)

Year	Axis	Allied
1939	75	20
1940	85	25
1941	90	30
1942	80	40
1943	65	55
1944	30	70
1945	15	85
1946	5	95

AIRCRAFT ATTACK RUN TABLE.

	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Once the player controlling the aircraft has marked out the flight plan, the player controlling the ground forces under attack marks out a similar plan which show where any anti aircraft guns are firing.



	1	2	3	4	5	6	7	8	9	10	11	12
1										A		A
2		A				A	A	A			A	
3	A	A	A				A					
4												
5				A								A
6						A	A					
7	A									A	A	A
8		A							A			
9												
10			A			A						
11							A					
12			A							A		
			1				2				3	

The dice roll will determine the altitude of each shot, but the player controlling AA fire may choose which of the 4 boxes across in each fire segment, the shot will explode.

Now the two sheets are compared to see if there was any damage to the aircraft.

	1	2	3	4	5	6	7	8	9	10	11	12
1										A		A
2		A				A	A	A			A	
3	A	A	A				A					
4												
5				A								A
6	X					A	A					
7	A	X								A	A	A
8		A	X						A			
9				X								X
10			A		X	A					X	
11						X	A			X		
12			A				X	X	X	A		
			1				2				3	

As you can see, several AA shots went close to their targets, but none actually attained a hit.

BOMBS

To determine where bombs fall roll 1 six sided die. The number rolled determines the point of impact from the bomb's release point. I.e., if a bomb is released in section 3 and a four is rolled on the die then the bomb will fall in section 7. The length of each section is 100 mm so an air attack covers 1200 mm from beginning to end but only part of this will be the actual target area.

Bombs.

Damage area 100mm long by 50 mm wide.

Bombs will destroy all targets within the damage area. Infantry must be dealt with as a high calibre (155mm) artillery weapon.

It is not always safe to drop bombs when diving in an attack. Take attack plan 8 as an example. If a bomb is released at position 1, it's possible striking points are 2,3,4,5,6,7. You will note that the plane is flying very close to the ground at sections 5,6 and 7. So that, if you were to roll a 4,5 or 6, the plane could be caught in the blast of the bomb.

Although the plane travels faster than the bomb, the blast of the explosion could cause the plane some damage or may even cause it to crash. If the plane drops bombs and is flying on the flat above the bombs, roll 1 six sided die. 1,2,3, or 4 has no effect, 5 means the plane is damaged and must withdraw, 6 means it crashes 500mm ahead.

AIR TO GROUND ROCKETS

Rocket fire is done in the same manner as bombs except the six sided die roll is used in the following way;

A roll of 1 or 2 means one section ahead.

A roll of 3 or 4 means two sections ahead.

A roll of 5 or 6 means three sections ahead.

Rockets may only be fired on a downward run and cannot be fired below 10 on the vertical scale.

Rockets destroy any vehicle target. Any building hit is deemed severely damaged and on fire. Deal with infantry and buildings the same as a 105mm artillery weapon.

The area of effect is 100 mm x 40 mm.

AIRCRAFT CANNON

Aircraft cannons may be fired one vertical level above 12 and on the flat. The following die rolls apply.

1 2 or 3 causes hits to fall one section in front.

4 5 or 6 causes hits to fall two sections in front.

Aircraft cannons destroy all soft vehicle targets. Immobilise all hard vehicle targets. Infantry and buildings are to be dealt with as 75mm artillery weapons. Aircraft cannons strike an area 75mm each side of the attack line.

The area of effect is 100 mm x 30 mm.

MACHINE GUNS

Machine guns may only be used on the flat part of the attack run and always strike one section ahead of where they are fired.

Machine guns are dealt with under the ordinary rules at a range of between 300 and 400 yards. Remember most planes had several machine guns which, for these rules, are considered heavy machine guns. Machine guns strike an area 100 mm x 20 mm.

ANTI AIRCRAFT FIRE

Return fire from the ground.

Although it may be the case that a lucky shot from small arms occasionally brought down a plane, we will discount all small arms under the level of heavy machine guns. And even heavy machine guns must be mounted as specific anti aircraft guns. A machine gunner picking up a heavy machine gun and firing it at a plane (if at all physically possible) would be much more of a danger to his companions than the pilot of the plane.

If you have anti aircraft guns like the German quad 20mm, each barrel is counted as a separate weapon and can be rolled individually. ie. If each barrel has six shots, then the total die rolls will be twenty four.

Quad machine gun mountings count as one shot per gun. Remember range limits apply so check this with the appropriate tables.

EFFECT OF HITS ON AN AIRCRAFT

When a hit has been recorded the following rules apply.

Roll 1 six sided die.

Machine guns.

- 1.2.3. No effect
- 4. Hits on plane puncture oil line. Only two more attacks may be made before the plane must withdraw.
- 5. Severe damage. Withdraw plane from combat.
- 6. Pilot killed. plane crashes 500 mm ahead.

20 - 40 mm AA guns

- 1.2. No effect.
- 3.4. Hits on plane force it to withdraw from combat.
- 5.6. Plane engine knocked out plane crashes off board.

41mm and above AA guns

- 1 No effect.
- 2.3. Hits on plane force it to withdraw.
- 4.5.6. Plane explodes, wreckage falls over a 400mm diameter 500mm ahead.

PARATROOP DROPS

Set coordinates as you would do for artillery then roll the % dice as follows.

0 - 20	200 mm undershot
21- 40	200 mm overshoot
41- 60	200 mm left
61- 80	200 mm right
81- 99	on target

Use an artillery blast sheet to determine where troops land. Paratroops dropping into;

Rivers	- drown
On buildings	- 50 % chance of injury
Trees	- 20 % chance of injury

When they land they take 1 move to remove chutes etc. and cannot fire during this time.



DAMAGE TABLES

Damage tables are used to record all hits on vehicles and buildings. Each row on a vehicle damage table represents one vehicle.

To find out how much damage has been done to a particular vehicle the person firing rolls a specified number of damage dice which are defined in the various tables. The resulting number is then marked off on the damage table and any resulting damage to the vehicle must be immediately taken into account.

DAMAGE EXPLANATION

Tracks - as each of the double lines is reached more damage is done to the vehicles tracks / wheels and there is a corresponding loss of speed. This is -25%, -50% and -99%. No Crew are killed in the track damage section. If the weapon firing can penetrate the armour of the vehicle hit then if all track boxes are full the damage continues into the engine. If the weapon firing cannot penetrate then the additional damage is disregarded.

At the foot of the damage table there is a section showing the number of moves it takes to repair damage. In some cases damage can only be repaired by engineers or replaced parts must be acquired from a field workshop.

As you can see there are different sections for vehicle damage and crew casualties. If there is less than 5 crew then use crew casualties are moved across to the right. I.e. If there are only 2 crew then crew casualties only take place when the loader and commander are hit.

The Section headed AMO is used to determine if the vehicles ammunition explodes.

The semi armour / soft skinned damage tables include passenger casualties in the carrying compartment so don't forget to mark off boxes in the Infantry Damage Sheet as well.

INFANTRY DAMAGE SHEETS

The infantry damage sheet shows casualties for each section. Sections are used 4 per platoon. Each time a section is hit and casualties are taken mark them off left to right.

BUILDING DAMAGE SHEETS

Each of these structures has a surrounding coating of boxes. Once high explosive fire breaks through this protective layer the occupants are rolled for under the ARTILLERY vs INFANTRY table which is found under the chapter on artillery fire.

Damage tables are located at the end on this book

VEHICLE SPECIFICATIONS

BRITISH

Name	Model	Speed	Armour thickness			TF	TS	TR	Secondary Guns	Main Gun Size Type	Length	Width	Height	Range	Crew	Rate of Fire	Date of Intro
			RD/CC	HF	HS												
Matilda II	A 12	180/96	78	60	14	78	60	25	1	40mm 2pdr	18/5	8/6	8/3	160	4	3	1939
Matilda II/2	A 12	180/96	78	60	25	78	60	25	1	40mm 2pdr	19/9	8/6	8	160	4	3	1938
Matilda II/345	A 12	180/96	78	70	55	75	75	75	1	40mm 2pdr	18/5	8/6	8/3	170	4	3	
Cruiser III	A 13	366/168	14	6		14	6		1	40mm 2pdr	19/9	8/4	8/6	100	4	3	1938
Cruiser IVA	A 13/2	360/168	30	6	6	30	8	14	1	40mm 2pdr	19/9	8/4	8/6	90	4	3	1939
Valentine I/II/III	A 14	180/96	60	60	8	65	60	8	1	40mm 2pdr	17/9	8/7	7/5	105	3 4	3	1940
Valentine IV/V/VI	A 14	180/96	60	60	8	65	60	8	1	40mm 2pdr	17/9	8/7	7/5	183	4	3	
Valentine VIII IX X	A 14	180/96	60	60	8	65	60	8	1	57mm 6pdr	19/4	8/9	7/1	183		3	
Valentine XI	A 14	180/96	60	60	8	65	60	8	1	75mm	17/9	8/7	7/5	183	3-4	3	
Cruiser I/Ics	A 15	330/180	40	14	7	40	24	30	2	40mm 2pdr	19/6	9/1	7/4	236	5	3	1940
Cruiser II	A 15	324/180	49	7	7	49	7	7	2	40mm 2pdr	19/8	8/8	7/4	100	4-5	3	1941
Cruiser I/Ics										3in howit							
Cruiser III	A 15	324/180	51	7	7	51	7	7	1	57mm 6pdr	19/8	8/8	7/4	100	3	3	1941
Churchill I	A 22	186/96	102		16	102		16	1	40mm 2pdr	24/5	10/8	8/2	90	5	3	1940
Churchill II									2	75mm							1941
Churchill III	A 22	180/96	89	76	64	89	89	15	2	57mm 95mm	25/2	10/8	9/2	120	5	3	1942
Churchill IV V VI										75mm							
Churchill VII	A 22	186/96	152	95	25	152	95	95	2	75mm	24/5	11/4	9	120	5	3	1942
Churchill VIII										95mm							1943
Cromwell I/II	A 27m	480/216	76	76	8	85	66	61	1	57mm 6pdr	20/9	10/0	9/3	173	5	3	1942
Cromwell III																	1943
Cromwell IV/V	A 27	364/216	85	76	8	101	66	61	2	75mm 136	20/9	9/6	8/2	173	5	3	1943
Cromwell VI										QF							
Cromwell VIcs	A 27	384/216	85	76	8	102	66	61	2	95mm How	20/9	10/0	9/4	120	5	3	
Cromwell VIII																	
Challenger I	A 30	384/180	85	76	20	100	66	61	1	76.2mm	26/4	9/6	8	135	5	4	1944
Cornet	A 34	384/192	102	80	14	80	80	80	2	77mm	25/1	10/0	8/9	123	5	4	1945
Archer	240/150	60	50	8	20	20	8	1	76.2mm	18/6	9/0	7/4	140	4	4	1944	
Sexton	276/228	38	25	10					2	88mm	20/1	8/9	8/0	180	6	3	1942
Firefly	M4A4 VC	312/180	65	38	38	85	55	53	2	76.2mm	20/5	8/7	10/4		5	4	1944
Humber II AC	540/300	15	14	7	30	25	25	1	15mm	15/0	7/2	7/9	250	3	6	1941	
Humber IV										37mm							4
AEC III AC	420/180	57	25	6	65	60	60	1	40mm	17/0	9/0	8/4	250	3-4	3	1942	
										57mm 75mm							
Daimler I AC	600/300	16	10	7	30	10	10		40mm	13/5	8/0	7/4	205	3	3	1941	
Tetrarch III	480/336	16	4	4	16	14	4	1	40mm	13/3	7/7	6/9	140	3	3	1940	
Bishop	180/84	60		8						88mm	18/7	9/2	10/1	90	4	3	1942
Centaur	A 27 L	336/192	65	76	37	80	66	61	1-2	57mm	21/9	9/6	7/9	185	5	3	1942
Vickers VI A/B	420/300	14	6	4	10	10	4	1	15mm	12/9	6/9	7/4	130	3	3	1936	
Vickers II	182/120	12	8	8	8	8		3	3 pdr	17/6	9/1	9/9	120	5	3	1926	
Lancaster AC	540/	12	10	4	14			1		20/0	6/7	9/3	200	2-3		1926	
Rolly Royce AC	540/	8	8		8	8		1	Some with	16/2	6/4	8/4	180	3		1914	
Daimler Dingo	660/372	30	10	7				1		10/5	5/7	4/9	200	2		1940	
Bren Carrier	380/180	12	12	12				1	Some with	12/4	6/9	5/3	100	4-5		1939	
Quad Tractor	420/									14/9	7/6	7/9		2-6		1936	



RUSSIAN

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^g th	Width	Hie ^g ht	Range	Crew	Rate of fire	Date of intro
BT 7		456/	22	13	6	22	15		2	37mm 45mm	19/2	7/2	7/6	270	3	4	1935
T 27		300/	10		4				1		8/8	5/4	4/5	125	2		1931
T 28		240/	15	16	6	25	25	25	2	45mm 27mm 37mm	16/3	8/0	8/0	125	3	3	1931
T 28 C		300/	30		20	80			4	45mm 76.2mm	24/9	9/4	9/4	140	6	3	1933
T 34 76A		396/	45	18	16	75	75	75	3	76.2mm	19/9	10/0	8/7	250	4	3	1940
T 34 76B		372/	47	45	16	45	45	45	5	76.2mm	19/9	10/2	8/0	188	5	4	1941
T 34 76C		372/			18	60			2	76.2mm	20/4	9/7	7/9	188	5	4	1942
T 34 76D/E/F		372/							2	76.2mm	20/4	9/7	7/9	188	5	4	1942
T34 85		372/	47	45	16	75	75	75	3	85mm 1943	20/3	9/9	9/1	220	5	4	1944
T 35		216/	30	20	11	20	20		5	37mm 76.2mm	32/4	10/8	11/4	93	10	4	1933
T 37		264/	9		4				1		12/6	6/6	6/1	125	2		1934
T 38		300/	9		4				1		12/7	7/9	5/5	143	2		1936
T 40		330/	14		7				1	20mm 12.7mm	13/8	7/8	6/6	175	2	6	1941
T 44		384/	90		15				2	85mm	20/3	10/3	8/0	150	4	3	1945
T 50		384/	37		15				2	45mm	17/4	8/3	7/2	200	4	3	1941
T 60		324/	20		7				1	20mm	13/8	7/9	5/9	150	2	6	1941
T 70		384/	45	16	10	75	35	10	1	45mm 146	14/4	8/0	6/9	279	2	3	1943
SU 76		336/	35	16	10	25	12			76.2mm	20/4	9/7		166	4	4	1943
SU 100		360/	54		20				2	100mm	31/0	9/9	7/4	200	4	3	1944
SU 85		372/	45		20				2	85mm	26/9	9/9	8/4	250	4	3	1943
JSU 122		236/	110		20					122mm	36/9	11/0	8/9	150	5	3	1943
JS I/II		204/	120	90	20	160	90		3	122mm	22/6	10/2	9/1	100	4	3	1943
JS III		300/	132		30	230				143	22/2	10/8	8/1	118			1944
KV I		252/	75	75	30	90	75		3	76.2mm	22/6	11/6	9/0	210	5	4	1939
KV 85		300/	70	60	60	110	100	100		85mm							3
KV II		192/	100		35	120		35	1	152mm	22/7	10/8	12/0	100	6	2	1940
JSU 152		276/	110		20					152mm	29/4	11/0	8/9	150	5	2	1943
BA 10 AC		408/	15		6				2	45mm	15/3	6/9	7/3	185	4	3	1936
BA 64 AC		600/	10		6	10	10	10	1		12/0	5/1	6/3	375	2		1942

GERMAN

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^g th	Width	Hie ^g ht	Range	Crew	Rate of fire	Date of intro
Panzer 1 AUSF A	Pzkw 1 SdKfz 101	276/144	13		7	13		7	2		13/2	5/9	5/8	90	2		1934
Panzer 1 AUSF B	Pzkw 1 SdKfz 101	300/144	13	13	7	13	13	7	2		14/7	6/9	5/8	95	2		1936
Panzerbefehls- wagon	Pzkw 1 SdKfz 265	300/	32		8				1		14/7	6/9	6/6	105	3		1938
Panzerjäger 1	Pzkw 1B SdKfz 101	300/	15	10		6	6			47mm pak 143.3	14/6	6/0	7/4	88	3	3	1940
15cm sIG auf AUSF B	Pzkw 1		25	17	17	25	10	10		150mm sIG 33	14/6	6/2		74	4	2	1939
Panzer 2 AUSF A	Pzkw 2 SdKfz 121	300/138	14		10	14		10	1	20mm kwk 30	16/0	7/7	6/9	100	3	6	1935
Panzer 2 AUSF B	Pzkw 2 SdKfz 121	300/138	30		10	30		10	1	20mm kwk	16/0	7/7	6/9	120	3	6	1936
Panzer 2 AUSF C	Pzkw 2 SdKfz 121	300/138	30		10	30		10	1	20mm kwk 30	16/0	7/7	6/9	120	3	6	1937
Panzer 2 AUSF DE	Pzkw 2 SdKfz 121	420/138	30	20	14	30	14	14	1	20mm kwk	15/5	7/5	6/9	125	3	6	1939
Panzer 2 F AUSF G J	Pzkw 2 SdKfz 121	180/138 300/138	35 30	20	20	30	20	20	1	20mm 38 20mm 30	16/0	7/8	6/9	125	3	6	1940
Lynx AUSF L	Pzkw 2 SdKfz 123	450/	35	20		35	20		1	20mm 50mm	16/0	7/8	6/9	155	3	6	1941
Wespe	Pzkw 2 SdKfz 124	300/180	20	15	10	20	10	8	1	105mm JeFH 18/2	15/9	7/6	7/7	88	5	3	1942
Marder 2 Panzerjäger	Pzkw 2	300/	30		5	30				75mm 76.2mm	16/7	7/6	7/3	120	3	3	1942
Praga	Pzkw 2 38 t	312/108	52	19	10	25	16	11	2	37mm kwk 147	14/9	6/7	7/7	125	4	4	1937
Marder III	LT 38 SdKfz 139	312/132	52	15	15	25	16	11	1	75mm 76.2mm	14/9	7/0	7/7	115	4	3	1938
Bison	sIG 33/1 gw 38 M/H	252/	15		8	15				150mm sIG 33	16/3	7/1	8/1	125	4	2	1942
Hetzer 38 t	Jagdpanzer SdKfz 138	300/108	60	22	8	60	20	8	1	75mm Pak 148	16/0	8/8	6/9	112	4	3	1943
Marder 1	Panzerjag	252/			5	12				75mm 150mm	17/5	6/0	7/2	85	5	3	1942
Skoda	Pzkw 35	300/	35		12				2	37mm	16/1	7/1	7/3	120	4	4	1937
Panzer III A	Pzkw 3 SdKfz 141	240/126	30	14	14	30	30	14	3	37mm 145 kwk	18/9	9/4	7/9	100	5	4	1937
Panzer III B C	Pzkw 3 SdKfz 141	240/126	30	14	14	90	30	10	3	37mm 145 kwk	18/9	9/4	8/5	100	5	4	1938
Panzer III D	Pzkw 3 SdKfz 141	300/132	30	14	14	70	14	14	3	37mm 145 kwk	18/0	9/8	8/1	100	5	4	1938
Panzer III E	Pzkw 3 SdKfz 141	300/132	30	10	10	30	14	10	2	50mm 142 kwk	18/0	9/6	8/0	110	5	3	1939
Panzer III F G	Pzkw 3 SdKfz 141	360/132	30	30	21	30	30	30	2	50mm 142 kwk	18/0	9/9	8/1	110	5	3	1939
Panzer III H	Pzkw 3 SdKfz 141	300/132	30	18	18	80	30	18	2	50mm 142 kwk	18/4	9/4	8/4	93	5	3	1941
Panzer III J	Pzkw 3	300/132	30	30	30	80	30	30	2	50mm 142	21/4	9/9	8/4	110	5	3	1942

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^g th	Width	Hie ^g ht	Range	Crew	Rate of fire	Date of intro
Panzer III L	Sdkfz 141 Pzkwf 3	300/126	50	20	20	50	20	18	2	50mm 160	21/4	9/9	8/4	110	5	3	1942
Panzer III M N	Sdkfz 141 Pzkwf 3	222/150	50		20	57	20	30	2	75mm 124	21/4	9/9	8/4	94	5	3	1942
Sig 33/1		300/	22	20						150mm slG 33/1	15/5	7/3		124	5	1	1941
Stuig III A-E	Sdkfz 142	300/180	50	30	16	50	30	16		75mm 124	18/3	9/9	6/5	100	4	3	1940
Stug III F	Sdkfz 142 /1	300/180	50	30	16	50	30	16		75mm 143 stuk 40	18/3	9/9	6/5	100	4	3	1942
Stug III G	Sdkfz 142 /2	300/150	80	50	16	80	30	16	1	75mm 148 105mm	18/3 18/7	9/9 7/2	6/5 110	100	4	3	1942
Panzer IV A	Pzkwf 4 Sdkfz 161	222/150	20	30	8	20	30	8	2	75mm 124	18/8	9/4	8/7	94	5	3	1937
Panzer IV B	Pzkwf 4 Sdkfz 161	300/	30		8	30		8	1	75mm	19/3	9/4	8/7	125	5	3	1938
Panzer IV C	Pzkwf 4 Sdkfz 161	300/	30		8	30		8	1	75mm 124	19/6	9/4	8/7	125	5	3	1939
Panzer IV D	Pzkwf 4 Sdkfz 161	300/	30	20	8	30	20	8	2	75mm 124	19/8	9/6	8/9	125	5	3	1940
Panzer IV E	Pzkwf 4 Sdkfz 161	324/	30	30	10	30	30	10	2	75mm 124	19/8	9/6	8/9	120	5	3	1941
Panzer IV F1	Pzkwf 4 Sdkfz 161	324/150	50	30	10	50	30	10	2	75mm 143	19/9	9/7	8/9	125	5	3	1941
Panzer IV F2	Pzkwf 4 Sdkfz 161	300/	50	30	10	50	30	10	2	75mm 143	22/1	9/7	8/9	125	5	3	1942
Panzer 4 H	Pzkwf 4 Sdkfz 161	276/	50		10	50		10	2	75mm 148	23/4	11/0	8/9	125	5	3	1943
Panzer 4 J	Pzkwf 4 Sdkfz 161	279/150	80	33	30	80	30	30	2	75mm 148	23/4	11/0	8/9		5	3	1944
Wirbelwind		300/144	80	50	16	30	30	30	1	20mm x 4 Flak 38	19/5	9/7	8/9	120	5	6x4	1944
Flak panzer 4										37mm Flak 43	19/5	9/8	9/9	124	6	6	1944
Oswind		288/	80	50	16	30	30	30		20mm x 4 Flak 38	19/5	9/7	8/9	110	5	6x4	1943
Flak panzer 4										150mm FH 18/1	20/4	9/7	9/2	124	6	2	1944
Mobelwaggon Flakverling 38		300/144	30		16	10	10	10		88mm Pak 43/1	20/4	9/7	9/2	124	6	2	1944
Hummel	Pzkwf 4 Sdkfz 165	312/180	30	20	22	10	10	10	1	150mm FH 18/1	20/4	9/7	9/2	124	6	2	1944
Nashorn	Pzkwf 4 Sdkfz 164	300/180	30	20	22	10	10	10	1	88mm Pak 43/1	27/8	9/8	9/7	125	4	4	1943
Panzerjäger 4	Ausf H Sdkfz 162	300/156	60	80	40	80	80	40	1	75mm 148 Pak	20/1	10/7	6/2	125	4	3	1943
Jagdpanzer 4	Sdkfz 162	300/	85	30	40	80	40	40	1	75mm 170 stuk 42	23/9	10/6	6/5	105	4	3	
Brumbar	Ausf G	300/120	80	50	20	100	50	20		150mm stuk 43	19/0	8/0	9/4	124	5	2	1943
Stug 4	Pzkwf 4	300/150	100		20	100		10	1	75mm 148 stuk 40	18/4	9/8	7/1	105	4	3	1943
Panther D	Pzkwf 5 Sdkfz 171	408/204	80	50	15	100	50	20	1	75mm 170	22/9	11/5	9/9	105	5	3	1943
Panther A	Pzkwf 5 Sdkfz 171	408/180	80	50	15	110	50	20	3	75mm 170 kwk 42	22/9	11/5	10/4	110	5	3	1944
Panther G	Pzkwf 5 Sdkfz 171	276/252	80	50	20	120	50	20	3	75mm 170 kwk 42	22/9	11/5	10/0	73	5	3	1944
Bergepanther	Pzkwf 5 Sdkfz 176	312/	80		8				1	kwk 42	22/9	11/5	9/9	300	5		1944
Jagdpanther	Sdkfz 173	336/	80	40	17	120	50	40	1	88mm 171 pak 43/3	22/9	10/9	9/1	105	5	3	1944
Tiger 1	Pzkwf 6 Sdkfz 181	288/144	102	80	26	110	80	26	2	88mm 156 kwk 36	27/0	12/3	9/4	62	5	3	1942
Elefant	Tiger P Sdkfz 184	150/136	200	90	80	200	80	80	0-1	88mm 171 Pak 43/2	24/4	11/3	9/9	94	6	3	1943
Sturm ^t iger	Sturmpanz -er 6	288/156	102	63	84	102	84	84	1	380mm 154	20/8	12/3	11/4	87	5	1	1943
King tiger	Pzkwf 6 Sdkfz 182	288/136	150	65	80	185	80	80	2	88mm 171 kwk 43	23/9	12/3	10/1	68	5	3	1944
Jagdtiger	Sdkfz 186	288/136	150	80	30	250	80	80	1	128mm Pak 44	25/7	12/3	9/3	68	6	2	1943
Sdkfz 221		600/228	14	14	14				1	28mm	17/9	6/5	6/7	187	3	6	1938
Sdkfz 222			30	14	14					20mm kwk					6		
Sdkfz 231		480/	10	10	5	15	10	8	1	20mm	18/3	6/0	7/5	155	4	6	1934
Sdkfz 263		636/								kwk 30	19/9	7/2		160			
Sdkfz 232 grad 8rad		462/	30		5	30		5	1	20mm	19/2	7/3	9/6	170	4	6	1937
Sdkfz 233		636/								kwk 30							
Puma 234/2 Sdkfz 234/4	Sdkfz 234	462/	14						1	75mm 124 kwk 37	19/2	7/3	9/6	154	3	3	1942
Hanomag	Sdkfz 251	636/228	30	8	10	30		10	1	50mm 75mm	22/4	7/7	7/9	625	4	3	1944
Sdkfz 250		396/156	14	14	6				2		19/0	6/9	5/9	124	2+10		1939
Sdkfz 7		444/	15	15	8				1	20mm 75mm 37mm	15/0	6/4	6/6	186	4	6	1940
Sdkfz 11		372/216								20mm x 4	22/5	7/9	8/7	165	2+10	4	1938
Opel Blitz 4 x 2 Kublewagon		552/							1		18/2	6/9	6/6	96	2+8	6	1937
BMW & sidecar		360/								20mm x 4	19/9	7/5	8/6	200	2+8	6	1937

AMERICAN

Name	Model	Speed RD/CC	Arm our HP	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^g th	Width	Hie ^g ht	Range	Crew	Rate of fire	Date of intro
M2/3 Half Track		340/216	12	6	6				1-4	75mm	20/9	7/3	7/5	180	2+11	3	1941
Lee	M3a2/3/4	312/192	56	37	35	56	50	12	4	81mm mort 37mm m5/6 75mm m2/3	18/6	8/9	10/3	120	6	4	1941
White scout car	M3a1	660/366	12	7	6				2		18/4	6/4	6/9	60	2+6		1939
Grant	M3a5	312/192	50	30	35	56	50	50	3	37mm m5/6 75mm m2/3	18/6	8/9	10/3	120	6	4	1941
Stuart 1/2/3	M3a1/2/3	420/240	44	25	21	55	38	30	5	37mm m5 1.50	14/9	7/4	8/3	70	4	4	1941
Sherman 1/2/3 2a/3a	M4a1/2	312/180	58	44	39	85	65	60	2	75mm m3 76mm	20/5	8/7	10/4	100	5	3	1942 1943
Sherman 1b	M4a1 b	312/180	58	44	39	85	65	60	2	105mm	20/5	8/7	10/4	100	5	2	1944
Sherman 4/5 4a	M4a1 4/5 4a	312/216	58	63	38	85	57	54	2	75mm m3 76mm	20/7	8/9	11/0	100	5	3	1942
Sherman 4b	M4a1 b	312/216	58	63	38	85	57	54	2	105mm	20/7	8/9	11/0	100	5	2	1942
Sherman VC	M4a4 VC	312/216	51	38	38	76	76	51	2	76.2mm 17pdr	20/7	8/9	11/0	100	5	4	
Firefly	M4a3e2	264/204	140	76	28	178	152	108	3	76mm 95mm				100	5	3	1944
Sherman easy 8	M4a3e8	360/	58	38	38	92	65	65	3	76mm 1.52	24/8	8/9	11/3		6	3	
Sherman 7	M4a6	300/192	65	38	38	85	55	53	2	75mm 1.40	25/6	9/6			5	3	1944
Honey	M5	480/300	44	25	21	67	32	12	2	37mm	14/2	7/4	7/6	100	4	4	1942
Priest	M7	312/180	62		12				1	105mm m2	19/9	8/4	9/5	125	7	2	1942
Greyhound	M8	672/300	20	10	6				1	76mm	16/5	8/4		350	2-6		1943
6x6	M20		20	10	6	19	19	19	2	37mm m8			7/4			4	
Achilles	M9	384/240	38	19	10	57	25	25	1	3 inch	22/5	10/0	8/8	200	5	3	1942
Wolverine	M10									76.2mm						3	
GMC	M12	288/144	37	20	12					155mm m1							
Hellcat	M18	660/240	25	7	6	12	7	7	1	76mm m1a1	17/9	9/5	7/9	105	5	3	1944
Chaffee	M24	408/300	30	30	25	63	30	30	2	75mm m6 1.39	18/0	9/2	8/1	100	5	3	1944
Pershing	M26	360/216	101	76	13	102	76	76	3	90mm m3 1.53	22/3	11/4	9/0	100	5	3	1945
Jackson	M36	360/216	38	19	13	50	25	25	1	90mm m3	26/1	10/0	8/9	150	5	3	1944
AUV	M39	660/	25		6				1		17/4	9/5	5/9	105	2-7		
GMC	M40	288/240	12	12	12					155mm m1a1	29/7	10/4	8/9	107	8	2	1945
GMC	M8	432/216	44	25	25	55	32	32	1	75mm m2	16/3	7/5	8/9	120	4	3	1942
GMC	M41	372/192	30	30	24					155mm m1	19/2	9/4	7/9	110	12	2	1945
GMC	M43	288/192	100		12					8 inch howitzer	21/1	10/4	9/4	100	8	2	1945
Staghound	T17e1 M6	672/372	19	19	16	44	32	32	1	37mm m6 57mm	17/9	8/9	7/9	450	5	4	1942
Buffalo	Lvt a1/2	204/							2	20mm	24/5	11/1	9/9	150	3	6	1942
Bushmaster	3/4	72 wat								75mm	26/1	16/8	16/2	75		3	
Ram Mk II	M4a5	300/240			25	87			3	40mm 2 pdr	18/8	9/5	8/9	144	5	3	1942
Sentinel	AC1 AC2	240/	65		25	65		25	2	40mm 2 pdr	20/9	8/2	9/1	200	5	3	1942
Locust	M22	504/360	25	13	9	25	25		1	37mm m6 1.50	12/9	7/3	5/6	135	3	4	1944
Lynx	CDW	684/									12/0	6/0	5/8		2		
DUKW		460/90							1		31/0	8/3	8/9	220	1+25		1942
Jeep		636/300							2	Various	11/0	5/2	5/9	300	1+4		1940
Dodge 4 x 4		660/336							1	Various	15/9	5/9	7/6	225	1		1941
Chevrolet		600/							1		18/3	7/0	9/9	250	1+6		1938
Truck 8 ton	GMC CCKW 353	396/72							1		24/0	8/0	8/0	210	2+10		1931
ARV	M32 b1	300/216	50		12				2	81mm mortar	26/8	9/0	12/0	120	4-5		1943



FRENCH

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^t h	Width	Hieght	Range	Crew	Rate of fire	Date of intro
Renault	AMC 35	300/	25		25				1	47mm	15/0	7/4	7/8	100	3	3	1935
Renault	R 35	150/	40	40	40	45	45		1	37mm sa18	13/2	6/1	6/9	87	2	4	1936
Renault	FT 17	56/	22		6	22			1	8mm 37mm	16/5	5/9	6/7	22	2	6	1917
Renault	AMR 33 VM	444/	13		6	13			1		11/6	5/3		140	2		1934
Hotchkiss	H 35	296/	40	40	12	45	45	12	1	37mm 133 sa35	13/9	6/1	6/7	93	2	4	1936
Char B1 bis		204/	60	60	55	60	45	45	2	75mm 37mm	30/6	8/2	9/2	93	4	3	1930
Panhard	AMD 178	540/	18		6	18				25mm	15/0	7/4	7/8	146	3	6	1935
Char Souma	S 35	276/	56	40	35	55	45	45	3	47mm 124 sa35	17/9	6/9	8/9	160	3	3	1936
Char 2C		96/	45		6				4	75mm	33/6	9/8	13/2	100	12	3	1918
Chemillette Lorraine	371	264/	6	6	6						13/9	5/2	4/0	85	2		1937
Renault	AMR 35 2t	456/	13		5				1	13.2mm 25mm	14/2	6/0	5/9	125	2	6	
Char moyen	Renault D2	180/	20			40			2	75mm 47mm	16/9	7/3	8/9	96	3	3	1933
Char leger	FCM 36	180/				40			1	37mm	14/9	7/2	7/4	200	2	4	

ITALIAN

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^t h	Width	Hieght	Range	Crew	Rate of fire	Date of intro
Carro Veloce	CV 33	312/	15		5	15		5	2	20mm	10/5	4/7	4/2	78	2	6	1933
Carro Armato	L 6 40	312/	30		6	30		6	1	20mm m35	12/5	6/4	6/6	124	2	6	1941
Carro Armato	M13/40	240/	42	25	14	42	25	14	3	47mm 132	16/2	7/3	7/9	125	4	3	1940
Semovente	M41 90/53	264/	50	25	6	41	9		3	90mm	17/4	7/4	7/5	125	4	3	1942
Semovente	M41 75/18	240/	30	25	10	30	25	10	1	75mm 118	16/2	7/3	6/0	124	3	3	
Lancia	IZM	444/	6			6			2		18/9	6/4	7/9	270	6		1917
Auto Blinda	AB/40/1/3	564/ 672/	9						3	20mm 47mm	17/1	6/4	8/0	250	4	6	1940
Carro Armato	L 3 35	312/	13						2	flame	10/4	4/7	4/2	75	2		
Carro Armato	L 6 40	312/				30			1	20mm	12/5	6/4	6/8	75	2	6	1936

JAPANESE

Name	Model	Speed RD/CC	Arm our HF	HS	HR	TF	TS	TR	Seco ndar y	Main Gun	Len ^t h	Width	Hieght	Range	Crew	Rate of fire	Date of intro
Type 89b		204/	17	17	10	17	15	10	2	57mm type 90	14/1	7/0	7/2	100	4	3	1934
Ha Go	Type 95	336/	12	12	12	12	12	12	1	37mm (94) 57mm	14/4	6/9	7/2	156	3	4	1935
Chi Ha	Type 97	280/	25	35	8	25	30	25	2	47mm 57mm 145	16/1	7/6	7/4	180	4	3	1938
Te Ke (Ke Ke)	Type 97	288/	12		4					37mm type 97	12/1	5/9	5/9	155	2	4	1937
Type 92/94		300/			4				1		10/1	5/4	5/4	130	2		1934
Ka Mi	Type 2	276/ 72 wat	13		9				2	37mm	24/4	9/2	7/8	124 93	4-6	4	1942
Ho Ro	Type 38	300/	25		12					150mm	18/0	7/6	7/9	100	5	2	1942
Sumida	Type 2493	444/ 324 rai	16						1		21/6	6/3	9/8		6		1933
Toyota light truck	G1	540/													2		1935
Ho Ni	Type 1	312/	25		8	50		12		75mm type 3	20/0	8/0	8/2		5	3	

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THE DAMAGE TABLES

The following pages are the damage tables referred to in this manual.



BRICK/STONE BUILDING DAMAGE SHEET

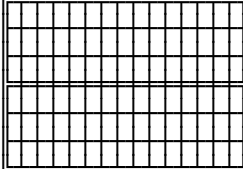
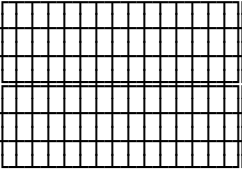
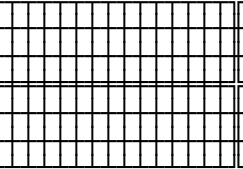
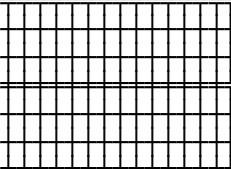
Used to record damage to brick buildings

The form consists of six identical grid-based diagrams arranged in a 3x2 grid. Each diagram is a 20x10 grid. The top and bottom rows are solid black. The left and right sides are also solid black. The interior is divided into several rooms by black lines representing walls. The layout is as follows: a top row of 20 cells; a second row with a gap between the 5th and 10th cells; a third row with a gap between the 5th and 10th cells; a fourth row with a gap between the 5th and 10th cells; a fifth row with a gap between the 5th and 10th cells; a sixth row with a gap between the 5th and 10th cells; a seventh row with a gap between the 5th and 10th cells; an eighth row with a gap between the 5th and 10th cells; a ninth row with a gap between the 5th and 10th cells; and a bottom row of 20 cells. The gaps represent openings or doorways between rooms.

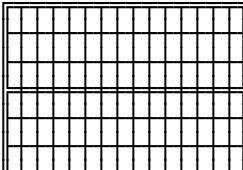
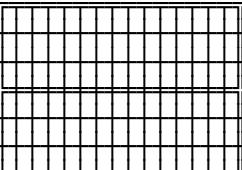
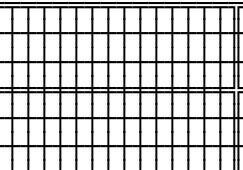
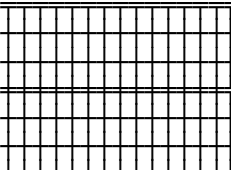


Used to record damage to bridges.

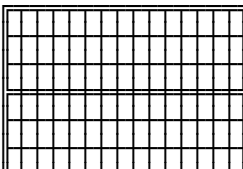
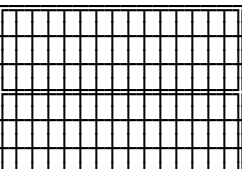
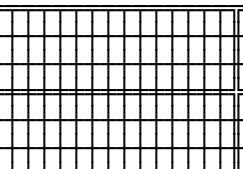
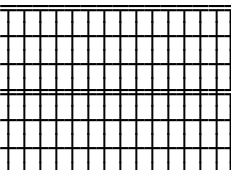
The size of the bridge and it's construction will determine how many bridge sections are selected.

1	2	3	4
			

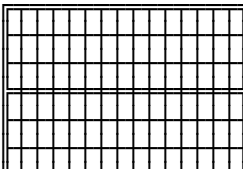
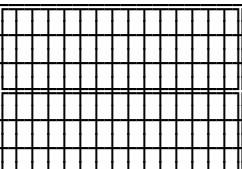
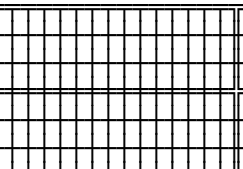
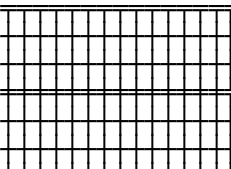
5 6 7 8

1	2	3	4
			

5 6 7 8

1	2	3	4
			

5 6 7 8

1	2	3	4
			

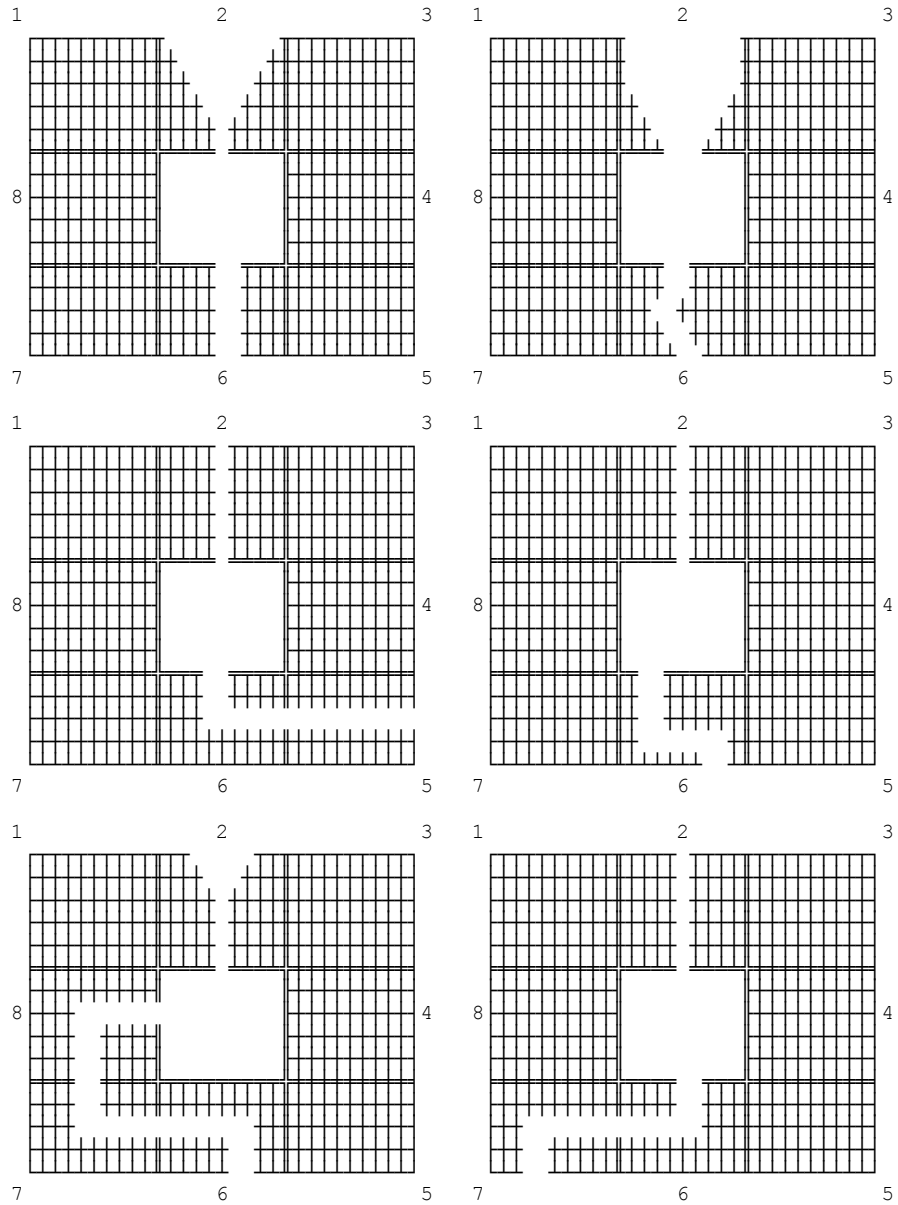
5 6 7 8

BRIDGE DAMAGE SHEET



Bunker damage sheet.

As with all damage sheets you are encouraged to make up your own versions to suit the game you are playing.

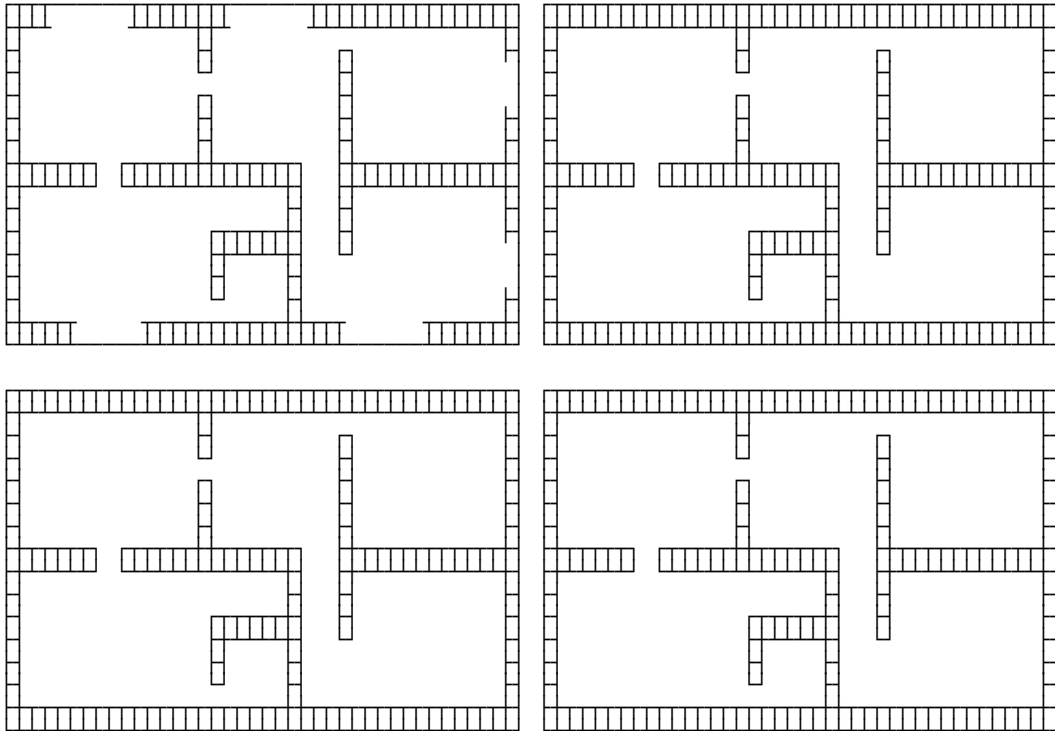


PILLBOX DAMAGE SHEET



WOODEN BUILDING DAMAGE SHEET

Used for wooden buildings.



NOTES

MOVEMENT

There is no doubt that some people will think the movement and fire sequence rules are tiresome and difficult. It is impossible in a turn based game to accurately simulate a real time battle but the system of movement and fire was developed to get as close as possible to reality.

If you are looking to speed things up then you can use a simpler method such as:

The winner of the move dice roll decides if they want to fire first or second and then:

Side A moves all vehicles and men simultaneously with side B

Side A fires

Side B fires with any units knocked out returning fire at 50% normal rate.

This is much less realistic as ranges on moving vehicles can change dramatically but it is slightly offset by the fact that vehicles then must lose some movement for each round they fire. ie. 1/3 of total rate of fire means a deduction of 1/3 of normal movement etc.

A difficulty arises when a concealed anti tank weapon fires on a vehicle that is moving towards it. If fire is done at the end on all movement then the vehicle is closer for all shots instead of gradually getting closer as it comes under fire. The only way to handle this is to use the ranging table for each shot and change range as the vehicle gets closer each 1/3 of a move.

An example is probably needed here to clarify this:

Example:

A tank is 500mm from an anti tank gun at the start of a move and is moving (more or less) directly towards it. The tank has a maximum move of 330mm.

The AT gun will fire at its full rate (3 shots).

The vehicles maximum move is divided by 3 and the resulting figure deducted from the starting range each time the AT gun fires.

Shot 1 is calculated at $500\text{mm} - 110\text{mm} = 390\text{mm}$

Shot 2 is calculated at $390\text{mm} - 110\text{mm} = 280\text{mm}$

Shot 3 is calculated at $280\text{mm} - 110\text{mm} = 170\text{mm}$

TANK & ANTI-TANK FIRE

Although the rules for tank fire are as realistic as I have been able to make them I do realise that some people are going to be a bit put off by the calculations of angle of impact and the sine of the vehicle size. If you want to you can simplify these rules (I encourage people to modify any rules to get better game play).

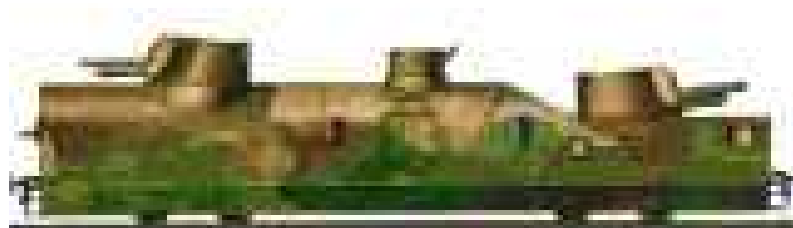
One way of doing this that would make it fairly easy is to include a Side and Front/Rear size measurement in the vehicle specification tables. This is simply the length x height for the side or width x height for the front or rear. This would be less realistic but will make things easier for game play.

I still suggest you deduct appropriate amounts for the angle of impact as this was a crucial factor in the ability of AP shot to penetrate. Using a simple protractor accomplishes that with a minimum of fuss.

SCALE

The more astute players will notice that the scale of 1mm = 1 yard makes 1/76th and 1/72nd scale miniatures positively huge. If you use this scale of miniatures (and they are certainly the most pleasing to build and paint) then you have to ignore certain inconsistencies of scale.

The rules are really intended for use with 1/300th scale miniatures and operate very well at that size.








































VEHICLE IDENTIFICATION

























GERMANY






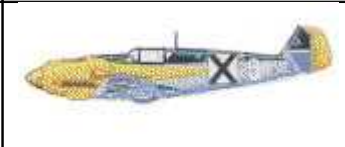













 Panzer I Series B	 Jagdpanzer Ib	 Sig33
 Pz I Command	 Pz II Series C	 Wespe
 Panzer II Series C	 Pzkw II F	 Wespe
 Marder II	 LAS 762	 Luchs
 Panzer III Series E	 Pzkw III G/H	 Pzkw III
 Pzkw III	 Pzkw III J	 Flammpanzer III N
 Pzkw III	 Pzkw III M	 Stug 33B
 STUG III B/E	 STUG III G/E	 Stuh 42
 Sig33 Pz II	 38T Series E	 Marder 38t

 <p>Hetzer</p>	 <p>Bison Sig33 auf38 t</p>	 <p>Marder PJ38</p>
 <p>Flakpanzer 38t</p>	 <p>Marder III M</p>	 <p>Marder III H</p>
 <p>Panzer IV Series C</p>	 <p>Pzkw IV D</p>	 <p>Pzkw IV E</p>
 <p>Pzkw IV F</p>	 <p>Pzkw IV F2 / G</p>	 <p>Pzkw IV J</p>
 <p>Pzkw IV H / J</p>	 <p>Pz SF IV A</p>	 <p>STUG IV</p>
 <p>Nashorn</p>	 <p>Brumbar</p>	 <p>Brumbar</p>
 <p>Hummel</p>	 <p>Jagdpanzer IV</p>	 <p>PJ IV 48</p>
 <p>Wirblewind</p>	 <p>Ostwind</p>	 <p>Panther</p>
 <p>Pzkw V A</p>	 <p>Pzkw V G</p>	 <p>Pzkw V</p>

		
Jagdpanther		Lorraine Schlepper
		
Pzkwf 35R f	Pzkwf 35R 731 f	
		
Pzkwf 35T	Pzkwf T26 b	Pzkwf VI Tiger E
		
Sturm Tiger	Elefant	Ferdinand
		
King Tiger	Jagd Tiger	Maus
		
		
Open Blitz		Bussing NAG
		
Kettenrad		Sdkfz 223
		
Sdkfz 221	Sdkfz 222	Sdkfz 231 6 RAD




























 <p>Sdkfz 231 8 RAD</p>	 <p>Sdkfz 233</p>	 <p>Sdkfz 234</p>
 <p>Sdkfz 234/2 Puma</p>	 <p>Sdkfz 234/1</p>	 <p>Sdkfz 234/3</p>
 <p>Sdkfz 234/4</p>	 <p>Krupp LZH 143</p>	 <p>RSO tractor</p>
 <p>Sdkfz 250 series 1</p>	 <p>Sdkfz 250/8</p>	 <p>Sdkfz 250/7 GO</p>
 <p>Sdkfz 250 boeb</p>	 <p>Sdkfz 250/10</p>	 <p>Sdkfz 250/9</p>
 <p>Sdkfz 253 boeb</p>	 <p>Sdkfz 253 boeb</p>	 <p>Sdkfz 250/11</p>
 <p>Sdkfz 251 series 1</p>	 <p>Sdkfz 251/10</p>	 <p>Flammwagen 16</p>
 <p>Wurfger 41</p>	 <p>Sdkfz 251/21</p>	 <p>Sdkfz 251/22</p>
 <p>Sdkfz 251/9</p>	 <p>Sdkfz 251/2</p>	 <p>Sdkfz 251</p>













		
OB pzw 42		Sdkfz 11
		
Sdkfz 7 series	Sdkfz 10/4	Sdkfz 6/2
		
	Sdkfz 7/1	Sdkfz 6
		
Kublewagon	Stower 40	
		
Nebelweffer	37mm Pak	50mm Pak
		
75mm Pak	88mm Flak	37mm Flak
		
20mm Flak	50mm	Mg 42
		
Mg 34		
		
HE 111	Ju 87B	FW190 G-2

 <p>Bf 110 D-2</p>	 <p>FW190 F-3</p>	 <p>Bf 110</p>
 <p>HS 129 B</p>	 <p>ME 109</p>	 <p>ME 109</p>
 <p>ME 109</p>	 <p>Ardo</p>	 <p>FW 189 A-1</p>
 <p>ME 262</p>	 <p>ME 410 A1</p>	 <p>Do</p>
 <p>JU 152 3M</p>	 <p>Do</p>	 <p>Do</p>
 <p>Goliath</p>	 <p>HS 129 B-3</p>	 <p>Do</p>
 <p>FW 189 A</p>		

USSR

		
T28e	T35	T28 m34
		
T26 M40	OT 133E	T26 m33
		
		
BT 7 m37	BT 7A	BT 5
		
BT2 m32	BT2 m33	KV 8
		
	PT34 85	BT 7
		
T 60	T 70	T 30
		
KV 1 m41	m39	KV 2
		
KV1 E m41	KV 85	T 50

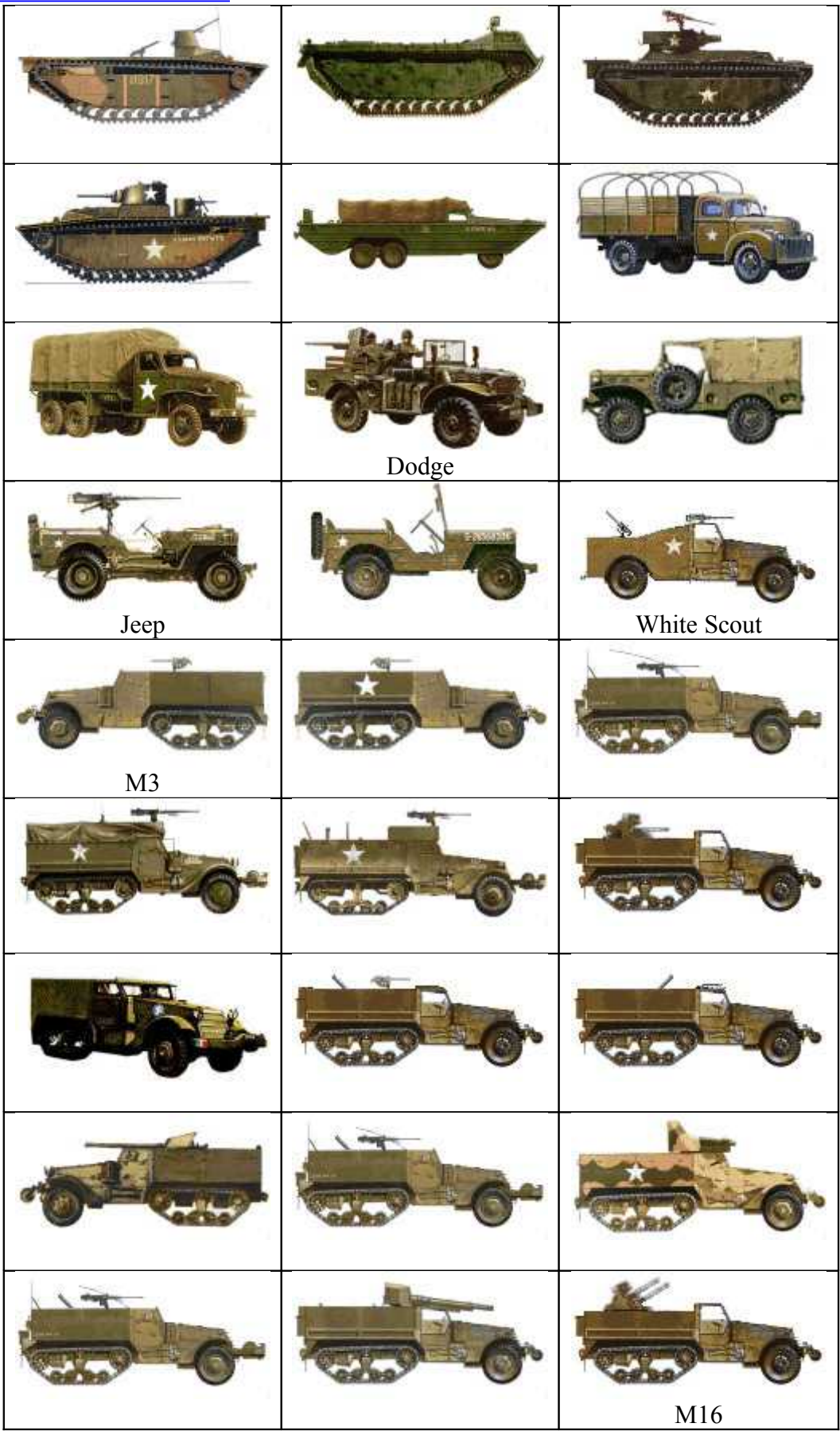
 <p>KV 85</p>	 <p>IS3</p>	 <p>IS2</p>
 <p>IS2m</p>	 <p>KV1s</p>	 <p>KV1s</p>
 <p>IS1</p>	 <p>ISU122</p>	 <p>ISU152</p>
 <p>T 34 m40</p>	 <p>M43</p>	 <p>85</p>
 <p>E m42</p>	 <p>M</p>	 <p>SU100</p>
 <p>SU85</p>	 <p>SU122</p>	 <p>SU152</p>
 <p>SU76M</p>	 <p>T27</p>	 <p>SU76M</p>
 <p>SU76M</p>	 <p>SU76M</p>	 <p>SU76M</p>
 <p>SU76M</p>	 <p>SU76M</p>	 <p>SU76M</p>

		
	BM31	GAZ 4M
		
BM13	BA10	
		
		
		
		
		
		

USA

		
 Stuart		
		
		
		
		
 Chaffee	 Hellcat	
 Lee / Grant		 Pershing
 Sherman		

		
	 <p>Calliope</p>	
	 <p>Crab</p>	
		
		 <p>Calliope</p>
	 <p>Preist</p>	
		
	 <p>M 20</p>	
 <p>Buffalo</p>		






























Dodge

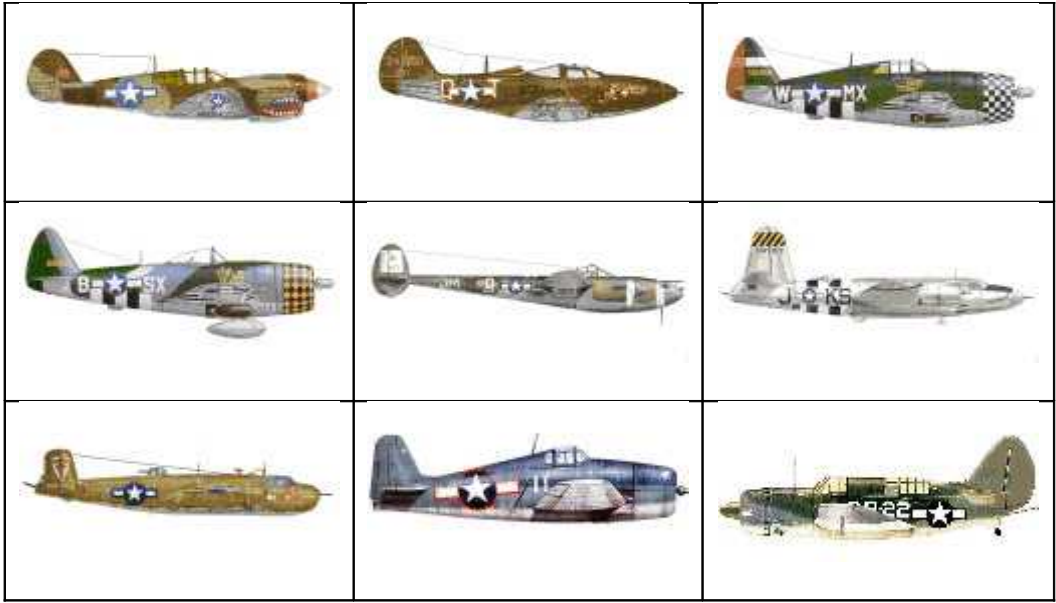
Jeep

White Scout

M3

M16

		
		
		
 <p>.30 Cal</p>	 <p>.50 Cal</p>	 <p>Bazooka</p>
 <p>20mm AA</p>		
		
		
		
		



UK

Valentine

Archer



























Bishop






















Matilda 2

Churchill

Crocodile

 <p>Cruiser</p>		
		
 <p>Crusader</p>		 <p>Challenger</p>
		 <p>Comet</p>
		
 <p>Preist</p>	 <p>Sexton</p>	 <p>Lee / Grant</p>
 <p>Achillies</p>	 <p>M3</p>	 <p>Firefly</p>
		
 <p>Kangaroo</p>		

	 <p>Honey</p>	 <p>Tetrach</p>
 <p>Humber</p>		
		 <p>AEC</p>
 <p>Staghound</p>		
 <p>Rolls Royce AC</p>		
 <p>Daimler Dingo</p>		
 <p>Bren carrier</p>		
		
 <p>Cheverolet</p>		 <p>Jeep</p>

 <p>Morris Quad</p>	 <p>Bedford</p>	 <p>Bedford</p>
 <p>Morris 15cwt</p>	 <p>Morris 15cwt</p>	 <p>Morris 15cwt</p>
 <p>25 Pdr</p>	 <p>25 Pdr</p>	 <p>25 Pdr</p>
 <p>6 Pdr</p>	 <p>17 Pdr</p>	 <p>17 Pdr</p>
 <p>RAF aircraft</p>	 <p>RAF aircraft</p>	 <p>RAF aircraft</p>
 <p>RAF aircraft</p>	 <p>RAF aircraft</p>	 <p>RAF aircraft</p>
 <p>RAF aircraft</p>	 <p>RAF aircraft</p>	 <p>RAF aircraft</p>
 <p>RAF aircraft</p>	 <p>RAF aircraft</p>	 <p>RAF aircraft</p>
 <p>RAF aircraft</p>	 <p>RAF aircraft</p>	 <p>RAF aircraft</p>



JAPAN



ITALY



