

# **Fire! Ogon! Feuer!**

## **WWII Skirmish Rules**

### **Main Rules**

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## **INTRODUCTION**

These rules are designed for use by both beginners and veteran players. Play can be quick and easy OR made more realistic and slower by adding advanced options.

Combat during World War II focused on volume of fire into a specific area combined with rapid movement of combat units. The weapon systems were poor by modern standards and there was a constant design battle between shell penetration versus vehicle armor. According to US tactical manuals, in 1944 a US Sherman tank firing at a stationary tank only 1500 yards distance, had to fire 13 rounds at the target before it reached a 50% hit probability.

## **SCALES**

1 Turn = 30 seconds  
1 Casting = 1 vehicle  
1 Infantry counter = 5 men or 1 weapon's system  
Distance scale varies. See Rule 1.1

## **SEQUENCE OF PLAY**

### **MOVEMENT PHASE**

1. Road Movement
2. Cross-Country Movement
3. Aircraft Movement
4. Aircraft & AA Fire Resolutions
5. Mount / Dismount Vehicles
6. Infantry Movement Clarification: The movement sequence is conducted simultaneously whenever possible. In close combat situations, the SLOWER vehicle moves first AND movement is-alternated in 1/4 allowance segments.

### **ARTILLERY FIRE PHASE**

- A. Determine the actual impact point of the barrage
- B. Resolve damage to units in the impact zone
- C. Adjust rounds for next turn & Call for new fire

### **DIRECT FIRE PHASE**

1. Anti-Tank vs Tank
2. Tank vs Tank & Vehicles
3. Tank vs Infantry & AT systems
4. Infantry vs Infantry

## MELEE PHASE

- A. Infantry vs Infantry Melees
- B. Infantry Assaults vs Tanks & Bunkers

## CHANGE AIRCRAFT MOVEMENT DIRECTION ARROW UP TO 90 DEGREES

## MOVEMENT

### 1.1 Distance Scales

If using 15mm. (OO/HO) scale vehicles ONE inch equals 7 yards.

If using 1/285 (1/300) castings, players can choose one of three distance scales. The 1 inch = 25 yards scale is the closest but requires a vast playing area. The 1 inch = 100 yards is recommended for beginners and fast play.

The most common scale is 1 inch equals 50 yards which provides the best balance between movement and weapons' ranges.

For players using centimeters, the 1 cm = 10 meters (same as 1:25) is quick to measure ranges; OR the 1 cm = 20 meters (same as 1 : 50) can speed up play.

### 1.2 Movement Codes

For faster play, the MPH speed has been converted to a single speed identified by a letter code. The code states how many inches/cm that a vehicle can move per turn. A conversion chart is provided in order to classify unlisted vehicles.

SCALE	CODE						
	A	B	C	D	E	F	G
1:25	6"	12"	20"	30"	40"	50"	60"
1:50	3"	6"	10"	15"	24"	36"	48"
1:100	2"	4"	6"	8"	12"	18"	24"
1:10 cm	15cm	30cm	50cm	75cm	100cm	125cm	150cm
MPH Conv	1-5	6-10	11-15	16-20	21-30	31-40	41+

### 1.3 Vehicle Road Movement

The road movement rate can only be used if the entire turn is spent on the road. At any time that the vehicle exits the road, its movement allowance reverts to the cross-country rate. If it wants to move off road after exceeding its cross-country rate, it cannot do so. It must stop at that point on the road. Example : A scout car (F/E 1:50 rates) can move up to 36 inches as long as it stays on the road. Once it moves off road, then the maximum it can move is 24 inches.

### 1.4 Cross-Country Movement and Terrain Modifications

Cross-country rates are used the most. These rates can be further reduced by difficult terrain or weather. Vehicles can always move at A speed regardless of the modifications. REDUCE ONE LETTER CODE ... Woods, Rough, Snow, Streams, Fords REDUCE TWO LETTER CODES ... Swamp and Mud

### 1.5 Infantry Movement

Due to the time/ distance scales, infantry movement would be very slow. For playability purposes, infantry and weapon system units move at the extended rate of 100 yards per turn. Weapon systems cannot fire the turn that they move.

## **TANK AND ANTI-TANK DIRECT FIRES**

### 2.1 Spotting and Sighting

Spotting an enemy unit on the battlefield involves many variables. Movement, terrain, firing and luck are only a few -elements involved in spotting. Even a tank in the open cannot be spotted if nobody is looking at it. As a result spotting rules are very difficult to define.

Some players will try elaborate measures to conceal and camouflage their castings. This is not to be considered in the rules just as a vehicle in the open is not automatically seen. In the basic system once a vehicle has been spotted, it will remain spotted for the entire battle. For advanced games, it must be spotted again by each new firer and/or if the target is lost behind terrain. Automatic Spotting situations are 1. A vehicle that moves within 500 yards of the enemy. 2. A vehicle that fires within 500 yards of the enemy. 3. A vehicle is on a road and within 1000 yards of the enemy. 4. The distances are doubled in desert situations. 5. Other vehicles are spotted using the Spotting Chart. Spotting Chart The basic chance to spot is 60%. The CHANCE is modified by:

#### TARGET LOCATION

On the Road +10  
In the Woods -20  
Defilade -20  
In a House -10  
Desert +30

#### TARGET SILHOUETTE

HIGH +10  
AVERAGE 0  
LOW -5  
SMALL -10  
NONE -20

#### OTHER SITUATIONS

Stationary Inf -20  
Target Moved +10

Stationary Firer +10  
Range 1500-3000 -20  
Range 3000+ yds -30

Sighting of the guns on the target is more important than knowing that an enemy is in the area. Gun telescopes and other sighting equipment have their effectiveness included in the gun's chance to hit rating for different ranges. Still a valid Line of Sight must be established between the target and the firer.

SIGHTING rules are:

A. Determine if a Line of Sight can be traced from the firer to the target. Several methods are commonly used, so the players can select the one which suits them best.

1. Place the end of a string on each vehicle. If the string does not touch any terrain, then it is a valid LOS.
2. Place a mirror/ periscope next to the firer. If he can see the target, then a valid LOS is established.
3. A combination of methods can be used.

## 2.2 Firing Procedures

Each vehicle's gun is listed with a basic percentage chance to hit a target at a specific range plus the armor class that can be penetrated at that range. The Base chance to hit is modified by the following conditions:

TARGET SILHOUETTE  
HIGH +10  
AVERAGE 0  
LOW -5  
SMALL -10  
NONE -15

TARGET STATUS  
In Woods/Building -10  
Is an Anti-tank gun -15  
DEFILADE -10  
MOVING -10  
FIRER MOVED -20

## 2.3 Angle of Fire

The angle of fire refers to the location on the vehicle being hit. This will determine the armor class of the vehicle. In Basic games, the turret armor will always be frontal. The hull armor will

be frontal unless the rear of the vehicle is in the LOS, then it will be side armor.

In Advanced games, the angle will depend on the actual facing of the target. The areas are designated on a 45 degree angle drawn from the center of the target. A line can be drawn by extending a line from a vehicle's rear corner through the opposite front corner. We use a/string to determine the angle.

#### 2.4 Hit Location

After a hit is made, the firer rolls to determine which part of the vehicle was hit. The firer may choose a suspension shot, due to his inability to penetrate armor. If so, then ADD ONE to the die roll.

Roll a d10.  
1,2,3 Turret  
4,5,6,7 Hull  
8,9,0 ... Suspension

#### 2.5 Suspension Hit Damage

In Basic games, a suspension hit always immobilizes the vehicle. In Advanced games, use the table below for more realism. Suspension results against a defilade target are changed to a miss.

Roll a d10 and modify the result if necessary.

Modifiers:  
2-4 wheels..+2  
6-8 wheels..-1  
Moving..+1  
Skirt Armor.-3

Die Roll  
0-1-2 = No Damage  
3-4 = Immobile for 10 turns  
5-6 Immobile for 20 turns  
7-8-9 Immobilized for battle

#### 2.6 Vehicle Damage

In non-campaign battles, vehicles are destroyed if their hull or turret armor is penetrated. In campaigns destroyed vehicles can be recovered and repaired by the victor. In some cases a turret destroyed vehicle with a good engine can be retreated off board. The following is only a recommended table for use in campaigns. Roll a d10.

<b>Hit Location</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>0</b>
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TURRET	X	X	X	T	T	T	T	E	E	E
HULL	X	X	X	T	T	T	E	E	E	E
SUSPENSION	X	X	E	E	E	E	E	E	E	E

Minefield hits are automatic E result.

T = Turret, main gun and control systems.

E = Engine, controls, communication and track/wheels

X = Damage is too extensive and the vehicle cannot be repaired.

## INFANTRY COMBAT

### 3.1 Infantry vs Infantry Melees

Melees were disruptive and costly to both the winner and loser. The outcome would often depend on the amount of close firepower which was available to a unit.

Infantry melees are resolved by each side rolling a d10 and adding its Melee rating (Roll + MF). The side with the higher total is the winner. The loser is destroyed. If both totals are the same, then both sides are destroyed. Artillery and Administrative section have a MF of +1. Suppressed have a -2 MF modifier.

### 3.2 Infantry vs Tank Assaults

An assault on a tank or bunker would result in heavy casualties. The loser of a close combat assault is destroyed. A winning infantry unit becomes suppressed. A suppressed infantry unit cannot assault a tank or bunker. Assault Sequence : 1. Tank/ Bunker fire against the infantry unit. 2. Supporting infantry/ CSW can fire at the attackers 3. Surviving assault units can melee the tank/bunker. There is a 30% chance for the assault to succeed. The chance modifiers:

Vehicle:

Did Not Move +10

Moved at C or D speed -10

Moved at E, F, G speed -30

Max Turret AC rating is 1 +10

Infantry unit is a

Flamethrower +20

Engineer +15

Suicide Sqd +30

### 3.3 Suicide Squads

Suicide squads can be effective but costly in lost victory points, lost units. A player must identify which units have been reclassified as suicide units. once reclassified, the unit must on that turn attempt to assault the NEAREST enemy tank or bunker. only Japanese units can

assault non-tank/bunker units. Once a suicide squad melees it is destroyed whether it won the melee or not.

Japanese suicide squads are not automatically destroyed, if they are fighting infantry, weapon systems, artillery or administration units BUT they must continue attacking until they are destroyed. Only R, RF and SMG units of the following nationalities can be reclassified: Russian Guard 1941-42; German Waffen SS 1945; Japanese 1931-45.

### 3.4 Squad Anti-tank Systems

These may organic to an infantry unit or deployed as a separate unit (counter).  
(% hit chance / AC penetration)

Type	Nation	100yd	150yd	200yd	300yd	500yd
2.36" Bazooka	US	75/6	40/6	10/6	5/6	5/6
Rifle Grenade	US	40/5	-	-	-	-
PIAT	GB	40/6	10/6	-	-	-
AT Rifle	ALL	85/2	50/2	15/1	10/1	5/1
PzFaust 60	GE	5/11	-	-	-	-
PzFaust 100	GE	10/11	5/11	-	-	-
Rifle Grenade	GE	40/4	10/4	5/4	-	-
PzBuchse 39	GE	85/2	50/2	15/1	10/1	5/1
PzSchreck 43	GE	25/11	5/11	-	-	-
PzSchreck 54	GE	50/11	20/11	5/11	-	-

### 3.5 Infantry Fire Procedures

Infantry units can fire at infantry units, crew served weapon systems, open topped vehicles, enclosed vehicles with a maximum AC rating of ONE, and buildings/ positions. Infantry fire expressed as Fire Intensity Rating (FIR) represents a volume of fire at a target or into a 100 yard square target area. All fire into a target area is combined into a single total.

A hit target will be either be suppressed or destroyed. Suppressed units cannot fire or move until they have recovered morale. TMG = Tank MG; FT = Flamethrowers; T-HE = Tank main gun fire

Type	FIR	MF	Max Range
R	1	4	500
RF	2	5	500
SMG	3	5	300

LMG	3	3	500
MMG	4	2	1000
TMG	4	n/a	1000
HMG	5	2	1500
FT	3	2	100
T-HE	3	n/a	1500 (vs non-vehicles)

Modifiers: FIR  
 Target Moved -1  
 Firer Moved -1  
 Target in Hard Cover -3  
 Target-in Cover -2  
 Tgt riding on vehicle -1

<b>FIR</b>	<b>% to Hit</b>	<b>Effects</b>
1-3	5%	Sup
4-6	10%	Sup
7-8	15%	Sup
9	20%	Sup
10	25%	Elim
11-14	30%	Elim
15-19	40%	Elim
20	50%	Elim

<b>Minefield Damage Chart</b>			
<b>Target</b>	<b>Type Mines</b>		
	<b>AT</b>	<b>AP</b>	<b>GP</b>
Infantry	10%	80%	50%
Wheel Veh.	50%	50%	50%
Tracked Hull AC(1-3)	70%	10%	40%
Tracked Hull AC(4+)	50%	0%	30%

### 3.6 Minefields

A minefield section is 100 yards X 50 Yards. It is classified as Hasty, marked on the board, OR Deliberate, marked on the deployment sheet and revealed as an enemy unit enters it. Minefields are also classified as AP (anti-personnel), AT (antitank) or Mixed (GP). Each vehicle or

fireteam must roll for damage when they enter and exit the minefield. Vehicle passengers check only if their vehicle is damaged. In basic rules a damaged vehicle is destroyed. In advanced battles, the damage result is immobilized and the engine is destroyed in a campaign. 3.61 A minefield section can be cleared if a. It is hit by artillery b. A minesweeper tank moves onto it c. An infantry unit spends three turns in it. It does not have to roll for casualties IF it was a known minefield and its mission was stated by the owning player as he moved the unit.

#### **4.0 ARTILLERY**

4.1 Artillery Requests 4.11 Written requests are required for all off-board/indirect fire. Fire must be conducted by battery. Only guns using direct fire can fire individually. A battery must be deployed in order to fire.

4.12 Order Options:

- A. FIRE at Registration point #?. Listed on deployment map. The initial fire may include a shift from a reg. point.
- B. REPEAT. Fire again at last location.
- C. SHIFT A/D # & R/L #. Add or Drop AND Right or Left shifts in yards. The maximum shift allowed is 800 yards per direction.
- D. CEASE FIRE.

4.2 Time Lapse for Initial call to Impact

The time lapse is the turn delay from the request for fire to its impact. The lapse will occur any time a new fire mission (Order A) is initiated. The short delay factor is based on both sides using pre-registered firing points. Each side can plot up to 10 FRPs during pregame setup.

Nationality Time Lapse

Germany, France 3

UK & Commonwealth 3

USA 2

Minor Axis, Italy 4

USSR, Japan 4

China 6

4.3 Artillery Firing Error

There is always a chance (due to human error, wind, gun tube wear) that rounds will land off target. Other causes include unobserved map fire and distance to the target. Observed fire is when the target can be seen, valid LOS, by any friendly unit. Unobserved fire is when the target is not in an LOS. Guns can use direct fire at enemy units in their LOS.

<p style="text-align: center;"><b>ERROR CHART</b> <b>(Roll a d10 for yards off)</b></p>
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Type of Fire	0-1	2	3	4	5	6	7	8	9
UNOBSERVED	0	100	100	150	100	200	250	300	400
OBSERVED	0	0	50	50	100	100	150	150	200

Roll a second d10 to determine direction of error.

1,2,3 LONG  
4,5 SHORT  
6,7 LEFT  
8,9,0 RIGHT

<b>ADVANCED: Range &amp; Nationality die roll Modifiers</b>				
Nationality	0-2000	2001-5000	5001-10000	10001+
Germany	-1	0	+1	+2
Italy, Minor Axis	0	+1	+2	+3
USSR, Japan, China	0	+1	+2	+3
USA, UK, France	-1	0	+1	+2

#### 4.4 Mortars and Off-board Artillery

4.41 Due to their limited range mortars do not roll on the error chart. The maximum range for guns up to 90mm is 3000 yards and 4500 for all larger guns. They must still fire as batteries. Use the caliber equivalent column on the Artillery Hit Chart and the Barrage Damage Zone Chart.

4.42 Off-board batteries are located 1000 yards from the edge of the board. Counter-battery fire at an off-board battery will require four turns of continuous fire to zero in on the battery. It will then destroy ONE gun per turn of sustained fire.

#### 4.5 Barrage Damage Zone

Batteries fire either a Spread or Converged Pattern. The pattern is listed on the call for fire. A Spread pattern is the basic pattern (The only pattern used in basic games.). The Converged pattern has a smaller damage zone but its lethality is increased. The damage zone is measured as diameter, with the impact point as the center. The damage zone in yards:

<b>SPREAD</b>	<b>Up to 79mm</b>	<b>80-109mm</b>	<b>110-159mm</b>	<b>160mm+</b>
One gun	25	50	50	75
Four gun	100	200	200	300
Six gun	150	300	300	450
<b>Converged</b>	<b>Up to 79mm</b>	<b>80-109mm</b>	<b>110-159mm</b>	<b>160mm+</b>

One gun	15	15	25	25
Four gun	60	60	100	100
Six gun	90	90	150	150

#### 4.6 Artillery Percentage To Hit Chart

The Firer will roll separately for each vehicle or infantry unit located in or partially in the damage zone. Each target is rated according to its type and protective cover. The basic chance to hit is adjusted if the target moved. In the basic rules a hit will destroy the vehicle/infantry unit. In the advanced rules, a second die roll is made to determine if the target is destroyed (ODD) or IMMOBILIZED (EVEN). AC is the front turret armor. AC11 vehicles can only be immobilized.

#### TARGET CLASS:

A= Infantry in Open or passengers in trucks, on tanks

B= Infantry in Trenches/Foxholes/ Halftracks B= Vehicles with AC1 or Open tops

C= Infantry in buildings/ruins; Vehicles with AC 2-4

D= Infantry in Bunkers; Vehicles with AC 5-11

#### Modifiers for Moving :

Infantry -5

A-B -5

C-D -10

E-F-G -15

Percentage to Hit Spread (Converged)				
CLASS	Up to 75mm	76-110mm	111-160mm	161mm+
A	35 (40)	50 (70)	70 (85)	85 (100)
B	25 (40)	40 (60)	60 (75)	75 (90)
C	15 (30)	30 (50)	50 (65)	60 (75)
D	0 (15)	15 (30)	35 (50)	50 (65)

#### 4.7 Naval Guns

Naval guns are rated as a Four gun battery of 175mm+ guns. They can only fire a Spread Pattern. They are located 5000 yards from the board edge. They are not subject to counter-battery fire.

#### 4.8 Artillery Set up Time (Optional Advanced Rules)

Off-board batteries will start the battle deployed. On-board batteries are designated during deployment asset up or in transit. It is recommended that all batteries begin the game deployed. The actual time to deploy a battery would require a large number of 30-second turns. However

for playability purposes a breakdown-set up time frame has been provided. The turn that a gun begins or completes breakdown/set up, it cannot fire or move. There is a delay for SPGs due to the need to place firing stakes and prepare direction data.

<b>Gun Type</b>	<b>Breakdown</b>	<b>Set Up</b>
Self Propelled Guns	1	3
Towed Guns 100mm	3	6
Towed Guns up to 99mm	2	4
Mortars	1	2
AT guns up to 51mm	1	2
AT guns between 52mm-81mm	2	3
AT guns over 82mm	2	4

For unit ToEs, use the lists in the Eagles , Crowns and Oak Leaves files.

### VEHICLE REFERENCES

#### Non-Vehicle Point Costs

100 = One Airstrike ... One Naval Salvo ... Off-Board Batteries

10 = Infantry Fireteam ... LMG

15 = Inf AT team Mortars 20-110mm MMG

20 = Mortar 111mm+...HMG...500 yd section of Barbwire

20 = 200 yd section of Trenches

50 = Bunkers-MGs or AT guns cost extra

50 = 100 yd deep X 300 yd wide section of GP minefield

60 = 100 yd deep X 300 yd wide section of AP minefield

60 = 100 yd deep X 300 yd wide section of AT minefield

Special Tanks cost the basic vehicle rate plus the modification. Example : Crocodile = Tank + Flamethrower Tanks without main guns cost the same as a halftrack plus specie equipment. Example : Bridgelayer = HT + LMG + Bridge Most halftracks were used as weapons' platforms. Many German HT variants are listed on the reference chart. US HTs also wounted various AA and Artillery systems. Also every country had some variant equipped with mortars. 5 points = Flamethrower ... Fascine ... Mineclearer 5 points = Carpetlayer .... Swim Ability 25 points = Bridgelayers..Anti-Bunker Mortars Dustbins and UK Rams are rated as Halftracks.

#### Reference Code Definitions

PTS..Vehicle Cost

SIL..Silhouette

C-C..Cross-Country

RD...Road

AV...Average

H...High

L...Low

SM...Small

(#)..AT gun pt cost

Turret and Hull AC codes: One number is same AC for all sides.

#/# = Front/ Side and Rear;

### = Front/ Side/ Rear

Common Names for vehicles

Pzkw V Panther	Sdkfz 234/2 Puma	Jgpz 38 Hetzer
Sdkfz 164 Nashorn	Sdkfz 138 Marder III	Pzkw VI Tiger
A11 Matilda	A12 Matilda III	A15 Crusader
M4 Sherman	M7 Priest	M24 Chaffee
M5 Stuart	M26 Pershing	M10 Wolverine
M18 Hellcat	M36 Jackson	M8 Greyhound
M3A1 Grant/Lee	M12 King Kong	

Transport Vehicles (Add Pts if Armed with MGs)								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	MGs	Load
Motorcycles	10	None	G	E	.	.	LMG	-
Wagons	5	Sm	A	A	.	.	.	2 FTs
2 Axle Truck	5	L	F	B	.	.	.	2 FTs
3 Axle Truck	5	Av	E	A	.	.	.	4 FTs
Jeeps	5	Sm	G	E	.	.	.	1 FTS
Kubelwagen	5	SM	G	D	.	.	.	1 FT
Schwimwagen	5	Sm	G	D	.	.	1 FT	
BREN (UK)	10	Sm	F	C	.	1	?	1 FT
Sdkfz 7	5	H	F	C	.	.	.	2 FTs
Sdkfz 250-HT	10	L	F	D	1	1	MMG	1 FT
Sdkfz 251-HT	10	Av	F	C	1	1	MMG	2 FTs
US M3 HT	10	AV	F	D	1	1	HMG	2 FTs
US DUKW-Swim	15	H	A	A	1	1	HMG	6 FTs
Buffalo-Swim	15	H	A	A	1	1	HMG	2 FTS

RUSSIAN REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
BT 7	20	L	F	E	1	2/1	45mm	2 MMG
BA 32	20	Sm	F	D	1	1	45mm	2 MMG
T26s	15	Sm	D	C	2/1	2/1	45mm	2 MMG
T28	50	H	D	C	4/1	2/1	76mm	3 MMG
T35	50	H	D	C	2/1	2/1	76+2x45mm	5 MMG
T60	25	Sm	E	D	1	1	20mm	1 MMG
T70	25	Sm	F	C	3/1	2/1	45mm	1 MMG
KV I	55	H	E	B	7/4	5/4	76mm	3 MMG
KV Ic	60	H	E	B	7/6	9/4	76mm	3 MMG
KV II	90	H	D	B	7/6	5/4	152mm	2 MMG
KV 85	60	H	D	B	9/7	5/4	85mm	3 MMG
JS I	80	H	E	C	8/5	10/5/4	85mm	3 MMG
JS II	90	H	D	C	8/6	11/7/5	122mm	1 HMG
JS III	100	H	E	C	11	11/7/5	122mm	2 MMG
JSU 122	100	H	D	C	10/4/3	8/5/4	122mm	1 HMG
JSU 152(SP)	100	H	D	B	10/4/3	11/5/4	152/122mm	1HMG
T34	55	L	F	E	5/4/2	7/4/5	76mm	2 MMG
T34c	60	Av	F	E	5/4/2	7/4/5	76L41	2 MMG
T34/85	70	H	E	E	5/6/5	7/4/5	85mm	2 MMG
T34/85B	80	H	E	E	7/6/5	10/4/5	85mm	2 MMG
SU 76	50	L	E	C	2/1	4/1	76L41	1 MMG
SU 85	60	L	F	E	5/3	5/3/4	85mm	-
SU 100	90	L	F	E	10/3	10/3/4	100L55	-
SU 122	90	L	E	E	5/3	5/3/4	122mm	-
SU 152(SP)	100	H	D	B	5/3	8/3/4	152 HOW SP	-

RUSSIAN GUN TYPE HIT % / AC-PENETRATION								
GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
45mm AT (15)	95/3	85/3	65/2	20/2	10/1	-	-	-
76mm AT (35)	95/5	90/4	75/4	40/3	20/3	10/2	5/2	-
85mm AT (50)	95/9	90/9	85/8	75/6	50/5	25/4	10/3	5/3

100mm AT(60)	95/11	95/10	90/10	75/9	50/9	25/9	15/8	10/7
45L66 AT(20)	95/5	90/4	75/3	25/3	10/2	5/2	-	-
20mm	95/2	90/2	65/1	15/1	-	-	-	-
45mm	90/3	65/3	40/2	10/1	5/1	-	-	-
76mm	90/4	65/4	40/3	20/3	10/2	5/2	-	-
76L41	90/4	80/4	65/4	30/3	20/3	10/2	5/2	-
85mm	95/10	85/9	75/7	65/6	40/5	20/5	10/4	5/3
100L55	95/11	90/11	85/10	65/10	40/9	20/9	15/8	10/7
122mm	95/11	90/11	85/10	65/10	40/10	25/9	15/9	10/8
122/152HOW	95/10	80/9	60/8	25/6	15/5	10/4	5/4	-

100mm, 100L55 and 122mm have a 3000 yd range with 5%/AC6 rating.

POLISH REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
7TP	20	Sm	D	B	2/1	3/2/1	37mm	1 MMG
TK/TKS	15	Sm	E	C	1	1	20mm	-
WZ34a-AC	15	L	E	C	1	1	37mm	2 LMG

POLISH GUN TYPE HIT % / AC-PENETRATION					
GUN	RANGE				
	100	300	600	1000	1250
20mm	95/2	75/2	40/1	10/1	-
37mm	90/3	75/2	40/1	10/1	5/1

**GERMAN REFERENCE SHEET**

<b>Vehicle</b>	<b>PTS</b>	<b>SIL</b>	<b>RD</b>	<b>C-C</b>	<b>Turret</b>	<b>Hull</b>	<b>Gun Type</b>	<b>MGs</b>
Sdkfz 221	10	SM	G	E	1	1	-	1 MMG
Sdkfz 222	15	Sm	G	E	1	1	20mm	1 MMG
Sdkfz 231	15	L	F	D	1	1	20L55	1 MMG
Sdkfz 233	20	Sm	G	E	2/1	2/1	75L24	1 MMG
Sdkfz 234-1	20	L	G	E	3/1	3/1	20mm	1 HMG
Sdkfz 234-2	40	L	G	E	2/1	4/1	50L60	1 HMG
Sdkfz 234-3	40	L	G	E	2/1/2	3/1	75L24	1 MMG
Sdkfz 234-4	40	L	G	E	1/0	3/1	75L46	1 HMG
Sdkfz250-8	40	L	F	D	1	1	75L24	1 MMG
Sdkfz 250-10	35	L	F	C	1	1	37mm	1 MMG
Sdkfz 251-9	40	L	F	C	1	1	75L24	2 MMG
Sdkfz 251-10	35	L	F	C	1	1	37mm	1 MMG
Sdkfz 101	50	Sm	E	B	1/1/0	1	47L43	-
Sdkfz 131	50	L	E	C	1/1/0	2/1	75L46	-
Sdkfz 164	50	H	E	C	1/1/0	4/2	88L71	-
Pzkw 35T	35	L	E	B	2/1	2/1/2	37mm	2 MMG
Pzkw 38T	35	L	E	C	3/2	3/2	37mm	2 MMG
Pzkw Ic	20	Sm	G	E	2	2	1 HMG	1 MMG
Pzkw If	25	Sm	D	B	4/3	4/3	-	2 MMG
Pzkw II	20	Sm	E	C	2/1	2/1	20mm	1 MMG
Pzkw IIj	25	Sm	D	B	5/3	5/3	20mm	1 HMG
Pzkw IIIe	40	L	E	C	2	2	37mm	3 MMG
Pzkw IIIf	50	L	E	C	2	2	50L42	2 MMG
Pzkw IIIg/h	50	L	E	C	3/2	3/2	50L42	2 MMG
Pzkw IIIj/m	50	L	E	C	5/2	4/2/3	50L60	2 MMG
Pzkw IIIn	55	L	E	C	5/2	4/2/3	75L24	2 MMG
Pzkw IVD	55	Av	E	C	2	2	75L24	2 MMG
Pzkw IVF	60	Av	E	C	4/2	5/2	75L43	2 MMG
Pzkw IVG	70	Av	E	C	4/3	6/3	75L43	2 MMG
Pzkw V D/G	80	H	F	D	11/3	11/4/3	75L70	2 MMG
LYNX	20	Sm	F	C	2/1/2	2/1/2	20mm	1 MMG
JGPZ V	90	H	E	D	11/3/2	11/4/3	88L71	1 MMG

TIGER I	79	H	E	C	9/5	6/5	88L56	2 MMG
TIGER II	100	H	E	B	11/5	11/5	88L71	2 MMG
JagdTiger	100	H	B	A	11/5	11/4/5	128mm	1H+MMG
ELEFANT	100	H	B	A	11/5	11/5/7	88L71	-
STG IIID	40	L	E	C	3/3/2	3/2	75L48	-
STG IIIF	40	L	E	C	3/3/2	3/2	75L24	-
STG IIIG	55	L	E	C	5/2	7/2/4	75L48	-
STG IV	60	L	E	C	7/2	5/2	75L48	1 MMG
STH 42	20	L	E	C	5/2	5/2/3	105HOW	1 MMG
JGPZ 38	60	L	E	B	10/2/3	10/2/3	75L48	1 MMG
JGPZ IV	60	L	E	B	7/2	5/2	75L48	-
JGPZ IVB	70	L	E	B	9/3	9/2	75L70	-
BRUMBAR	85	H	D	B	10/3/2	10/2	150HOW	-
STRUMTIGER	100	H	D	B	11/5/4	11/4	380mm	1 MMG
SD 138(MD3)	60	Av	E	B	1/1/0	4/2/1	76mm	-
WESPE	20	L	D	B	1	2/1	105HOW	1 MMG
HUMMEL	25	H	D	C	1	2/1	150HOW	1 MMG
K18 IV	20	Av	E	C	2	2	105mm	1 MMG
OSTWIND	20	Av	E	C	2	5/2	Twn37mm	1 MMG
WIRBELWIND	25	Av	E	C	1/2/1	5/2	Qd20mm	1 MMG

**GERMAN  
GUN TYPE HIT % / AC-PENETRATION**

GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
37mmPak35(15)	95/3	80/3	65/2	15/2	5/1	-	-	-
50mmPak38(20)	99/5	95/5	90/4	60/3	30/3	10/2	-	-
75mmPak40(35)	99/9	95/8	90/7	85/6	65/5	40/5	10/4	5/4
75mmPak41(45)	99/11	95/11	90/11	85/10	65/10	40/9	15/7	5/5
76mmPak.36(35)	99/8	95/7	90/6	85/5	65/4	40/4	15/3	5/3
88L56/FLK(60)	99/9	99/9	95/8	90/7	85/6	65/5	40/5	20/4
20mm	95/2	85/2	40/1	10/1	-	-	-	-
37mm	95/3	75/2	25/2	15/1	10/1	-	-	-
50L42	95/3	85/3	65/2	30/2	15/2	10/1	-	-
50L60	99/5	95/4	85/4	65/3	30/3	10/2	-	-
75L24	95/3	85/3	65/3	30/2	15/2	5/2	-	-

75L46	95/9	90/8	85/7	65/6	40/5	20/5	10/4	5/4
75L43/48	95/8	90/7	85/6	75/5	50/5	30/5	15/4	5/3
75L70	99/10	95/10	93/9	90/9	85/8	65/7	40/6	20/5
88L71	99/11	95/11	95/11	90/10	85/10	65/10	40/9	25/9
105mm	99/11	95/10	90/10	85/10	65/9	40/9	30/8	15/7
128mm	99/11	95/11	90/11	85/11	75/11	65/11	40/11	25/10
380 GUN	95/11	85/11	65/11	40/9	15/9	5/9	-	-
2.8 PzB	95/5	50/4	30/3	10/2	5/1	-	-	-

88mm, 75L70, 105mm & 128mm have a 3000 yd range with 10/5 rating

<b>HUNGARIAN REFERENCE SHEET</b>								
<b>Vehicle</b>	<b>PTS</b>	<b>SIL</b>	<b>RD</b>	<b>C-C</b>	<b>Turret</b>	<b>Hull</b>	<b>Gun Type</b>	<b>MGs</b>
TURAN I	25	L	E	C	3/1	3/1	40mm	2 LMG
TURAN II	40	L	E	C	3/1	3/1	75mm	1 LMG
ZRYNI	25	L	E	C	3/2	3/2	-	105HOW
M39 CSABA	15	Av	F	D	2/1	1	-	4 LMG
NIMROD Fik	20	L	E	C	2/1	1	Twn 40mm	-
ADK2-RUM)	15	Av	F	D	1	1	1 HMG	1 MMG
CKD-R2 (RUM)	20	L	E	C	2/1	2/1	37L46	1 MMG
<b>HUNGARIAN GUN TYPE HIT % / AC-PENETRATION</b>								
<b>GUN</b>	<b>RANGE</b>							
	<b>100</b>	<b>300</b>	<b>600</b>	<b>1000</b>	<b>1250</b>	<b>1500</b>	<b>2000</b>	<b>2500</b>
40mm	95/3	85/3	65/2	20/2	10/1	5/1	-	-
75mm	95/3	85/3	65/3	30/2	15/2	10/2	-	-
105/150HOW	95/10	85/10	65/8	30/7	15/6	5/5	(GER Also)	
37L46 (RUM)	95/3	75/3	65/2	25/2	10/1	-	-	-

BRITISH REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
Vickers(Bel)	20	L	D	B	1	1	20mm or	1 HMG
A9	20	L	E	C	1	1	2 pdr	3 LMG
A10	25	L	D	B	2/1	2/1	2 pdr	2 LMG
A11	15	L	B	B	4	4/3/7	-	1 MMG
A12	35	L	C	B	4	5/5/4	2 pdr	1 MMG
A13-I	20	L	E	C	1/2	1	2 pdr	1 MMG
A13-II	25	L	E	C	2/2/1	2/2/1	2 pdr	1 MMG
A15	25	L	E	C	3/2	3/1/2	2 pdr	1 LMG
A15-III	35	L	E	C	3/2	3/2	6 pdr	1 LMG
Valentine 3	35	L	C	B	4	4/3/1	2 pdr	1 MMG
Valentine 8	50	L	C	B	4	4/3/1	6 pdr	1 MMG
Churchill 1	50	Av	C	B	5/4	5/4	2p+76mm	1 LMG
Churchill 2	35	Av	C	B	5/4	5/4	2 pdr	2 LMG
Churchill 7	60	Av	C	B	9/5	10/5	75L40	2 MMG
Cromwell 4	55	Av	F	D	4/4/3	4/2	75L40	2 MMG
Cromwell 7	60	Av	F	D	6/4/3	6/2	75L40	2 MMG
Comet	70	Av	E	D	6/4/3	4/2	77mm	2 MMG
Firefly	80	Av	E	C	8/3	5/3	17 pdr	1M+1HMG
Achilles TD	70	Av	E	D	5/2	6/2	17 pdr	1M+1HMG
Humbar	15	SM	G	D	1	2/1	1 HMG	1 LMG
SA Rec Car 2	15	L	F	D	1	1	1 HMG	1 LMG
Morris	15	L	F	D	1	1	-	1 LMG
Damiler 2	25	Sm	G	E	1	1	-	2 pdr

For US used vehicles consult the American reference sheet.  
Grant = M3A1; Sherman = M4A3; Stuart = M3

BRITISH GUN TYPE HIT % / AC-PENETRATION								
GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
2 pdr AT (15)	98/3	95/3	85/2	50/2	20/1	5/1	-	-
6 pdr AT (20)	98/6	95/5	90/5	75/4	40/3	20/3	5/2	-
17 pdr AT(55)	99/11	95/11	85/10	75/10	55/9	25/8	10/6	5/5
76mm AT (40)	99/9	95/8	90/7	75/7	50/6	25/5	10/5	5/4
20mm (Bel)	95/2	90/2	60/1	10/1	-	-	-	-
2 pdr	95/3	85/3	65/2	30/2	15/1	10/1	-	-
6 pdr	95/6	90/5	85/5	50/4	25/3	15/3	5/2	-
17 pdr	99/11	95/11	85/10	75/10	50/9	25/8	10/6	5/5
76mm	95/3	75/3	50/3	20/2	10/2	5/2	-	-
77mm	99/10	95/9	90/8	85/7	65/7	40/6	20/5	5/4
75L40	99/5	95/5	85/4	50/4	30/3	10/3	5/5	-

### Notes on Captured Vehicles

Both the Axis and the Allies used captured equipment during the war. Many of the Minor Axis powers were given captured British and French vehicles during 1940 and 1941. There are also photos of US and UK troops using German equipment. Some equipment was modified and upgraded by the new owners. Another area of confusion is the sell or loan of equipment to other countries. Many exile units (Polish, French, etc) were given UK and later US vehicles. Between 1941-42 the US sent many vehicles to the UK, China and Russia. Many minor powers on both sides were outfitted with outdated equipment by their dominant allies.

AMERICAN REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
M3 Stuart	25	Sm	F	E	3/2	3/2	37mm	2 MMG
M5/M5A1	30	L	F	E	4/2	5/2	37mm	2 MMG
M3A1 Lee	50	H	E	C	5/3	4/2	37+75L31	2 MMG
M3A4 Lee IV	50	H	E	C	5/3	5/2	37+75L40	2 MMG
M4A1	60	Av	E	C	6/4	6/2/3	76L53	2M+1HMG
M4A3	55	Av	E	C	4/3	5/2/3	75L40	2M+1HMG
M4A3/A1	60	Av	E	C	8/3	6/2/3	75L40	2M+1HMG
M4A3/CS	30	Av	E	C	5/3	6/2/3	105HOW	2M+1HMG
M4A3/E2	70	Av	D	C	10/10/4	10/4/3	76L53	2M+1HMG
M4A3/E8	60	Av	E	D	6/4	6/2/3	76L53	2M+1HMG
M10 TD	50	Av	E	D	5/2	5/2/1	76L53	1 HMG
M18 TD	55	Av	G	E	5/2	2/1	76L53	1 HMG
M36 TD	60	Av	E	C	5/3	5/2/1	90L53	1 HMG
M24	35	L	F	E	2/2	4/2/1	75L40	2M+1HMG
M26	90	H	E	C	7/4	10/4/5	90L53	2M+1HMG
T26/E4	100	H	D	C	10/4	10/4/5	90L73	2M+1HMG
M8	25	L	G	E	1	2/1	37mm	1 HMG
M20	25	L	G	E	1	2/1	2.3RR-Opt	1HMG
M7	20	H	E	C	2/1	3/1	105HOW	1 HMG
M12	25	H	D	B	1/0	2/1	155HOW	-

AMERICAN GUN TYPE HIT % / AC-PENETRATION								
GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
37mm AT (15)	99/3	95/3	85/2	50/2	15/1	5/1	-	-
57mm AT (20)	99/6	95/5	90/5	75/4	40/3	15/3	5/2	-
76mm AT (35)	99/9	95/8	90/8	75/6	50/6	25/5	10/4	5/4
90mm AT (50)	99/11	95/11	90/11	85/9	75/9	50/8	40/7	15/6
37mm	95/3	90/3	65/2	30/2	10/1	5/1	-	-
75L31	95/4	75/4	50/4	30/3	10/3	5/2	-	-
75L40	95/5	90/4	85/4	50/4	25/3	10/3	5/2	-
76L53	99/9	95/8	90/8	75/7	50/6	25/5	10/4	5/4

90L53	99/11	95/10	90/10	75/9	65/9	40/8	25/7	10/6
90L73	99/11	95/11	90/11	65/11	50/10	40/10	25/9	10/9
105/155HOW	95/9	85/9	70/8	5/6	15/4	5/2	-	-

The 90mm AT/ Tank guns have a 3000 yd range with 5%/AC5 rating

<b>FRENCH REFERENCE SHEET</b>								
<b>Vehicle</b>	<b>PTS</b>	<b>SIL</b>	<b>RD</b>	<b>C-C</b>	<b>Turret</b>	<b>Hull</b>	<b>Gun Type</b>	<b>MGs</b>
Panhard AC	10	Sm	F	D	1	1	---	1 LMG
FT 17	15	Sm	A	A	2/1	1	37mm	-
H35	20	Sm	E	B	3	2	37mm	1 LMG
H39	20	Sm	E	B	3	2	37L33	1 LMG
Somua	25	L	E	C	3	2	47mm	1 LMG
Char D2	30	Av	D	B	3	3	75+45mm	1 LMG
Char B1	35	Av	D	B	3	4/3	75+45mm	1 LMG
AMC 35	20	Sm	E	C	2	2	47mm	1 LMG
CLM 36	20	Sm	D	C	3/2	3	37mm	1 LMG
CLR 35	20	Sm	C	B	3/2	3	37mm	1 LMG
CLR 40	20	Sm	C	B	3/2	3	37L33	1 LMG
AMR 35	20	Sm	F	D	2	2/1	20mm	1 HMG

<b>FRENCH GUN TYPE HIT % / AC-PENETRATION</b>								
<b>GUN</b>	<b>RANGE</b>							
	<b>100</b>	<b>300</b>	<b>600</b>	<b>1000</b>	<b>1250</b>	<b>1500</b>	<b>2000</b>	<b>2500</b>
37mm	90/2	60/2	30/1	5/1	-	-	-	-
37L33	90/2	65/2	40/2	10/2	5/1	-	-	-
45 & 47mm	95/3	75/3	50/2	20/2	10/1	5/1	-	-
75mm	90/4	65/4	40/3	10/2	5/2	-	-	-

ITALIAN REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
Aubo 40	10	L	G	E	1	1	-	2 MMG
Aubo 41	15	L	G	E	1	1	20mm	2 MMG
L3-33	10	Sm	E	B	1	1	-	2 HMG
L6-40	15	Sm	E	B	2/1	2/1	20mm	1 LMG
P26-40	55	L	E	C	4/3	4/4/3	75L34	2 LMG
M40 SEM	20	SM	E	B	3/2	3/2	75L18	1 LMG
M42 SEM	50	Sm	E	B	3/2	3/2	75L34	1 LMG
M43 SEM	55	Sm	E	B	4/3/1	4/3/1	105mm	1 LMG
M11-39	25	L	E	B	2/1	2/1	37mm	2 LMG
M13-40	35	L	E	B	3/2	2	47mm	3 LMG
M15-42	35	L	E	B	3/2	3/2	47mm	3 LMG

ITALIAN GUN TYPE HIT % / AC-PENETRATION								
GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
20mm	95/2	90/2	60/1	10/1	-	-	-	-
37mm	90/2	65/2	40/1	10/1	5/1	-	-	-
47mm	95/3	85/2	65/2	20/1	10/1	5/1	-	-
75L18	90/4	65/3	40/3	20/2	10/2	5/1	-	-
75L34	95/4	85/4	65/3	30/3	15/2	10/2	5/1	-
105mm	95/10	85/9	65/8	30/7	15/6	5/5	-	-

JAPANESE REFERENCE SHEET								
Vehicle	PTS	SIL	RD	C-C	Turret	Hull	Gun Type	MGs
T2 Ho-I	25	Av	E	C	3/2/0	2	75mm	1 LMG
Type 38 SP	25	Av	E	C	2/1/0	2	150HOW	1 LMG
T95 HaGo	20	Sm	E	C	1	1	37mm	1M+1LMG
T97 ChiHa	25	L	E	C	2	2	57mm	1M+1LMG
T97m Shinhoto	25	L	E	C	2	2	47mm	1M+1LMG
Type 98a	20	Sm	E	C	1	1	37mm	1 LMG
M93 Sumida	15	Av	D	C	1	1	-	4 LMG
M92 Osaka	15	Av	E	C	1	1	-	2 MMG
T2 KaMi(Amph)	20	L	E	C	2/1	1	37mm	2 LMG
T1	25	L	D	C	3/2/1	2	47L40	1 MMG
T4 Ho-Ro	25	L	E	C	3/2/1	2	150HOW	-

JAPANESE GUN TYPE HIT % / AC-PENETRATION								
GUN	RANGE							
	100	300	600	1000	1250	1500	2000	2500
37mm	90/2	65/2	40/2	15/1	5/1	-	-	-
47mm	95/4	90/3	80/2	50/2	20/2	5/2	-	-
57mm	90/4	65/3	40/2	15/1	5/1	-	-	-
75mm	95/5	90/4	75/4	40/4	20/3	10/3	5/2	-
150HOW	95/9	85/9	65/8	30/7	15/4	5/2	-	-