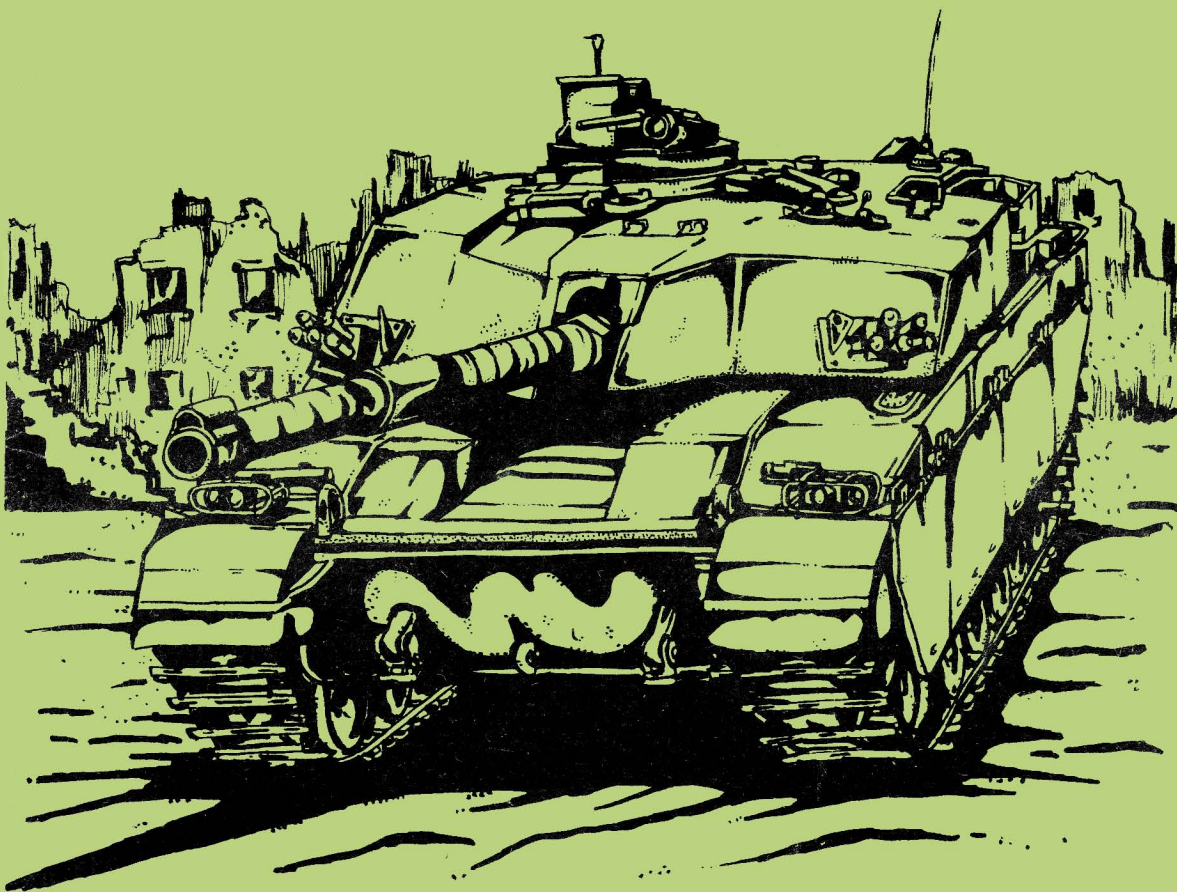


CHALLENGER

**ULTRA MODERN WARGAMES RULES
For Battle Group Level Games 1950 to 1990
Revised Edition**



by Bruce Rea-Taylor

The following alterations were not included in the revised edition but should now be added.

Pg14. Add under Helicopters; "+8 Any but AA guns, AAGW, MG's and Autocannons against hovering helicopters.

Pg39. 22.2 delete "and also during the aircraft movement phase 2.6(1) before all other aircraft movement"

22.4 Helicopters may fire AAGW at aircraft in phase 6.3(1) if they did not move in any of the earlier phases. (add to end of section)

22.5. 2nd line of 1st sentence; add between "Move and IN"; "more than half move"

Pg39. *Change speeds as follows:-

	N of E	Contour
Slow	1500m	3000m
Medium	1800m	4000m
Fast	2500m	5000m

Pg39. 22.4 Delete from first sentence "and in phase 3.6(i)" and replace with "with all weapons"
Change second sentence to "They may fire in phases 2.6(iii) or 2.6(vii) with guns only".

Delete third sentence.

Pg39. 3rd para, 1st sentence, delete "area fire weapons and at other helicopters and" and add after "circumstances" ; "at" other aircraft.
2nd sentence delete "and air to ground".

Pg39. Delete last paragraph "helicopters.....phase 6.3(i)".

Pg40. 22.6 Line 8, add after "any may fire at hovering helicopters";- "with a +8 modifier".
Line 9 add new sentence; "A popup manoeuvre counts as moving".

Pg40. 22.6 Note: delete "6.3(i)" at end and add "6.2(ii) and 6.2(vi), and if missile fired in these phases it may not fire in phase 6.3(i)".

INTRODUCTION

These rules I hope balance playability with the complexity of modern warfare and cover the use of most weapon systems in use or likely to be introduced in the next decade.

The sequence of play is designed to give a fully integrated move and fire system between the players and highlights the advantages and disadvantages of Anti Tank Guided Weapons. The system is akin to many boardgames and once learned flows as quickly as any alternate move system.

Achieving a hit is based very much on the fire control system of a vehicle and well reflects the ability of the latest systems to hit what they see. Each armour factor on a vehicle is to 25mm of armour at 0°, slope being taken into in the thickness. The penetration factor of kinetic energy rounds is based on a 50% factor i.e. if it would penetrate 200mm (8) of armour at a thousand metres, it is given a penetration factor of 13. Autocannon have been modified to give a representation of their high rate of fire.

HEAT rounds are not so modified as their performance can vary greatly and they require a reasonable overkill to disable a vehicle. HESH or HEP is not the super round that it appears in some rules, it has a maximum engagement range of 800m after that you really need to start lobbing it, use the direct area fire rules.

Modern infantry fire stresses volume rather than accuracy and I have therefore considered it a form of area fire and combined on the same effects table as artillery.

Helicopters are treated as very fast vehicles and are highly effective but fragile anti-tank vehicles, the full range of their abilities is catered for. Aircraft are an important part of the modern battlefield, but I have limited their impact on the game to direct support of ground elements all aircraft appearing over the table being considered as having penetrated the appropriate air defence zones.

Finally, I would like to thank the members of the Liverpool Wargames Association and Nottingham Wargames Club for their helpful suggestions and playtesting of these rules.



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Ground Scales

2.1 GROUND SCALE

One inch equals 50 metres, or alternatively 1 millimetre equals 2 metres. Except for artillery fire zone sizes, all distances in the rules are in metres.

2.2 TIME SCALE

One move equals two minutes. For campaign purposes it is suggested that one move equals ten minutes.

2.3 FIGURE SCALE

Vehicles and heavy weapons are represented by a single model, infantry elements should be represented by an appropriate number of figures on a base no wider than 50mm or deeper than 25mm. They should be of 1/285th or 1/300th scale. The rules may be used with a larger scale with an appropriate change in the ground scale.

Game Requirements

3.1 DICE

For the Direct Fire Table and the Deviation Table, a D20 is required, otherwise for all other die roll a D10 is required. Except for the penetration tables and suppressive fire, the higher the number rolled the more favourable the result. With the penetration tables the difference or less in the factors must be rolled to obtain a result.

3.2 MARKERS

Different coloured or shaped markers should be used to indicate the following: Suppressed element, neutralised element, disabled element. Element firing ATGW and its target. The corners and centre of an artillery fire zone or chemical or smoke screen. The cheapest form of counter is the small coloured tiddlywink counters, 'RISK' counters are also appropriate. Cotton wool may be used to represent smoke screens and dyed cotton wool for vehicles that have suffered a catastrophic hit. (See page 66 for markers supplied with rules)

3.3 PLAYING AREA

The playing area should be at least 6 feet by 4 feet, and the most common size is 8 feet by 6 feet. A game being played across the short side for an encounter or competitive game, or down the length for an attack/defence game.

3.4 TERRAIN

For an effective game, terrain for the modern period needs to be highly detailed as unless there is plenty of cover elements tend to be hit easily and are quickly disabled. The table should be well covered in hedges or bushes if appropriate. Hills should be of the contoured variety. In a European terrain there should be a good road network with small towns or villages every 1500 to 2000 metres. In a desert terrain, there should be a plentiful supply of one contour hills to represent folds in the ground giving hulldown positions.

Game Set Up

4.1 ENCOUNTER AND COMPETITIVE GAMES

For competitive or encounter games, armies of 20,000 points a side should be chosen, preferably from an agreed list such as "Ultra Modern Army Lists and Organisations" to give balanced and realistic forces. Artillery should be restricted to a maximum of seven batteries excluding mortars of less than 90mm, as shown on the following page.

	Dedicated Batteries	Direct Support Batteries	General Support or Counter Batteries
Western Style Armies	Up to 2	Up to 5	Up to 2
Warpac Style Armies	Up to 3	None	Up to 6

Dedicated Batteries may not be registered, all others may be.

The amount of pregame reconnaissance, use of aircraft, electronic and NBC warfare should be agreed before the game. For championship style games, none of these should be used.

Unless pregame reconnaissance is being allowed, both sides should either enter the table in the first move or be set up, up to 6 inches/150mm in from the table edge.

Objectives should be set and victory based on the control of these and the resulting losses.

4.2 ATTACK/DEFENCE GAMES

In an attack/defence game the defender should be limited to 10,000 points including reserves.

He may be dug in and have a maximum of four artillery batteries. His dedicated batteries may be registered. The attacker has 20,000 points, dedicated batteries are not registered, but all general support artillery may be pre-planned.

As with a competitive game the amount of reconnaissance etc. should be agreed as well as the presence of field fortification, booby traps and mines.

The defender should set up to two thirds of the way across the table with any reserves off table, however, no dug in troops should be more than half way across the table. The attacker should enter the table by the third move at the latest, the pre-planned fire should not last more than half the estimated length of the game.

Pre Game Reconnaissance

With the agreement of both players any of the following reconnaissance options may be used in the applicable games.

5.1 RADIO INTERCEPT

Both players may use the radio intercept rules in encounter and attack/defence games. See Electronic Warfare rules, paragraph 19.2

5.2 GROUND RECONNAISSANCE MISSIONS

Designated reconnaissance units may carry out an agreed number of moves on table either to occupy positions or identify the location of opposing units by suppressive fire. This may be used in encounter, competitive, and by the attacker in attack/defence games.

5.3 AIR RECONNAISSANCE MISSIONS

All reconnaissance flights must be pre-planned at either very high or low level. They are limited to one pass across the playing area. Unless the aircraft is fitted with Data Linescan, air reconnaissance is only useful in attack/defence games as it would take at least an hour for information to be available at Battlegroup HQ, with the Linescan this is available immediately, it is the interpretation that is then the problem. In encounter games where there are no troops deployed on the table or at least only up to 6" in, a low level reconnaissance aircraft will test for each company sized unit, independent platoon or section including off table artillery. They will be spotted as follows:-

Company sized 8 or better, platoon or section 9 or better

-1 on the die roll if the unit is infantry only or dug in.

If spotted the units size, main vehicle type and general area of entry on to the table must be given. Off table artillery positions that are spotted may be fired upon by Counterbattery fire.

If a very high level mission is flown, Company sized units are spotted on a 9 and platoon sized units on a 10 with the same die roll modifiers as above. Only the general information such as infantry company, tank platoon need be given if spotted and artillery does not specify its type. Any unit which is identified by a low flying aircraft may attempt to acquire it with any A.A. weapons except LMGs and none AA mtd HMGs counting the range as 1000m for acquisition and firing purposes. Any weapon which can reach Very High may attempt to acquire and fire at a very high flying reconnaissance aircraft.

Defending aircraft in an attack/defence game operate as above as do attacking aircraft except for those at low level which must have a flight path plotted. This is compared with the defenders' deployment map and any unit within 500m of the flight path is tested for as above. Any unit that is within 500m of the flight path may attempt to fire with A.A. weapons as above.

Sequence of Play

6.1 INITIAL MOVE PHASES CARRIED OUT BY BOTH PLAYERS

- 6.1 (i) Both players test for, request, or note the arrival of programmed aircraft, and plot any flight paths required.
- 6.1 (ii) Both players request and plot indirect area fire.
- 6.1 (iii) Both players declare any elements on anti aircraft overwatch.

6.2 PHASES CARRIED OUT SEQUENTIALLY

- 6.2 (i) First player moves any or all of his elements as required.
- 6.2 (ii) Second player fires ATGW's and any other element that did not move more than half a move in its last movement phase.
- 6.2 (iii) First player fires any direct fire element that did not move more than half a move in phase 2.(i).
- 6.2 (iv) Second player resolves ATGW fire.
- 6.2 (v) Second player moves any or all of his elements as required.
- 6.2 (vi) First player fires ATGW's and any other element that did not move more than half a move in its last movement phase.
- 6.2 (vii) Second player fires any direct fire element that did not move more than half a move in phase 2.(v).
- 6.2 (viii) First player resolves ATGW fire.

6.3 END OF MOVE PHASES CARRIED OUT BY BOTH PLAYERS

- 6.3 (i) Both players carry out air strikes and anti-aircraft fire.
- 6.3 (ii) Resolve both players indirect area fire.
- 6.3 (iii) Test morale of both players units as required.
- 6.3 (iv) Suppression and neutralisation removal phase.

6.4 INITIATIVE

In attack/defence games the attacking player should be the first player and the game, after any pre game reconnaissance, should commence with phase 6.3(i) to allow pre-programmed air strikes and pre-planned fire to take place before any movement.

In competition/encounter games the players should dice to see who is the first player.

In the section 6.1 and 6.3 either player may carry out the actions first within each phase, but if players cannot agree it is suggested that at the beginning of phase 6.1 (i) each player throws a dice and the higher carries out all actions first in each phase.

Orders

All units should be given general orders at the beginning of the game down to at least company level, independent platoon or section. The orders should specify the type of mission the unit is on, reconnaissance, support, assault and hold etc., its move objective and its route. Any cross attachment should be specified and artillery nets designated.

Orders may be altered to react to changing circumstances that are reported to a higher level command but if this is by a radio link and electronic warfare is being used, the link may be cut and the orders not arrive. If an umpire is present, he should check carefully that orders are being followed.

PRE-GAME CHECKLIST

The following should be carried out or agreed upon before the game begins:

- (i) Each player should draw a map on which to show his initial setup, objectives and routes of units, defences and boobytraps, pre-planned fire and flightpaths and release points of aircraft.
- (ii) Wind Direction - before any orders are written the general wind direction should be decided. If the players are sitting North-South on the table, there is a 50/50 chance the wind is blowing from the west or east. The first time the actual wind direction is needed to be known, a D10 is thrown, on a 1-3 the wind is from the southeast/southwest, on a 4-6 from the east/west, on a 7-9 from the northeast/northwest, on a 10 there is no wind.
- (iii) If an attack/defence game what defences are allowed to the defender must be agreed, so that the attacker may use the necessary engineering equipment, and the number of moves of pre-planned fire must be agreed.
- (iv) In all games the amount of electronic warfare, NBC, and aircraft and how obtained must be agreed. Also any special weather conditions, or whether any of the game is to be at night.

Command & Communication

7.1 GENERAL

All elements must have a chain of command, and a communication network. The lowest level of command in the game is the platoon, although certain support sections will have the same status. Thus a company usually consists of three or four platoons plus if infantry, one or two sections of mortars or heavy anti-tank weapons.

7.1 NETWORK

All elements of a company will usually be on the same communications net, though for Command Control purposes each platoon or independent section is considered separately. The highest level of command on the table is usually a battalion level battlegroup whose command elements are on the same net as all its constituent company commanders, artillery observers, support and any reinforcing unit. It will also have a higher command net to its regiment, brigade or division. All such command elements are considered as a platoon for the purposes of command control. Command and observer elements may move and communicate but may not carry out any direct fire whilst communicating. All other elements may do all three.

7.3 DEFENSIVE

Units occupying defensive positions and who are considered to have been there for some time are able to lay wire communications, with field telephones, between all positions. These wires should be indicated on a players map and may be broken in the following circumstances, on die roll equal or higher than the number shown.

Potential cause of break	Die Roll Required
Crossed by tracked vehicle or enemy infantry on foot	10
Within an artillery fire zone up to 160mm calibre	9
Within a Salvo or Heavy rocket fire zone or artillery over 160mm calibre	8

7.4 COMMUNICATION

Coloured smoke and signal flares, whistles and flags may be used to signal pre-arranged actions providing they are visible to the element being communicated with. Such signals should be specified before the game.

Radios in modern armies usually have the range and power to communicate with all elements on the table and heavy use of them is made to control the modern battlefield environment. If they fail, chaos can well ensue. The effects of this form part of the reason for Command Control.

7.5 COMMAND CONTROL

In order to retain control and cohesion of units all elements must remain within the radius given below from its next highest command level depending upon the operational role it is carrying out.

UNIT	Attack/Encounter	Defence	Recce
Elements of a platoon or individual section	200m	400m	1000m
Platoon or troop HQ	500m	1000m	2000m
Company, Squadron or Battery HQ	2000m	3000m	4000m

Elements that do not have a radio and are not connected by a field telephone must stay within 100m of their command element and if attacking within sight.

7.6 COMMAND CONTROL LOST

Command Control is lost when a command element is disabled or the communication system fails (ECM-jamming 19.3) or is cut. A loss of command control requires a unit to take a morale check, it also cannot receive or issue orders until control is restored. If a command element is disabled a new element is designated as the command element at the end of the second morale phase after the phase in which it is lost.

Movement

8.1 GENERAL

The basic move distances are based on a M60's cross-country speed of 15Kph which gives a move rate of 250m per minute or if moving during a full move 500m. It is then considered to be moving during both its own and opponent's movement phases.

There are three movement tables given below for tracked, half-tracked and wheeled vehicles, and for infantry elements, see vehicle data sheets for whether a wheeled vehicle is fast, medium or slow. Note this is not dependent on its mobility.

8.2

Tracked Vehicle	Combat Mode	Travel Mode	Road Bonus	Towing	Linear Obstacle	Turn More Than 45°	Reverse	Open Woods Poor Going Scrub	Dense Woods Bad Going
Very High Mobility	1000m	1500m	+500m	-25%	-10%	-10%	150m	750m	150m
High Mobility	750m	1200m	+400m	-25%	-10%	-10%	100m	600m	150m
Standard Mobility	500m	1000m	+300m	-25%	-10%	-10%	100m	400m	100m
Low Mobility	400m	800m	+200m	-25%	-10%	-10%	75m	300m	100m

8.3

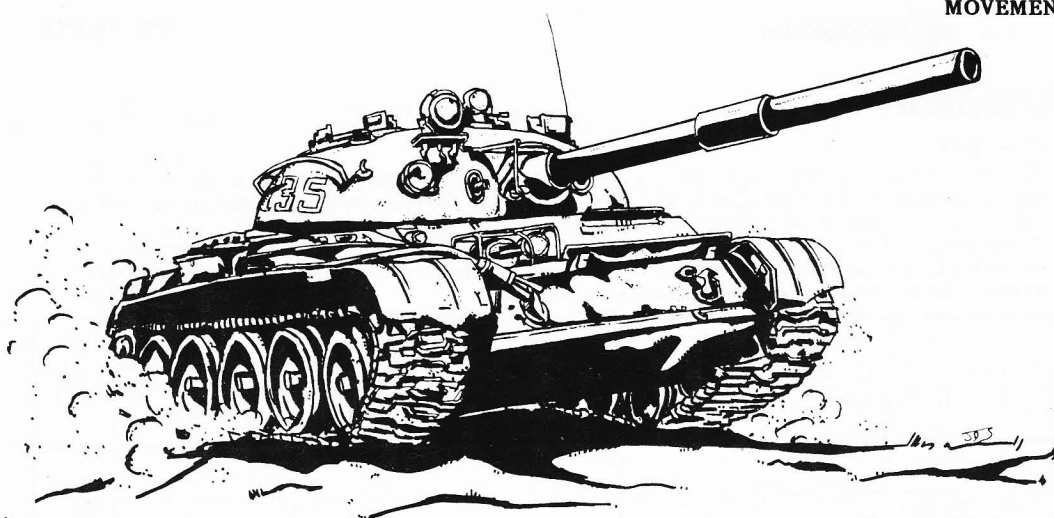
Half Tracked and Wheeled Vehicles	Combat Mode	Road Speed			Towing	Linear Obstacle	Reverse	Open Woods Poor Going Scrub	Dense Wood Bad Going
		Fast	Medium	Slow					
High Mobility	750m	1250m	1000m	750m	-25%	-25%	100m	500m	50m
Medium Mobility	500m	1250m	1000m	750m	-25%	-50%	100m	250m	-
Low Mobility	250m	1250m	1000m	750m	-25%	-75%	100m	100m	-

Note: High mobility wheeled vehicles are 6 x 6 or 8 x 8 AFVs or specialist vehicles such as the Stalwart. Their road speed is based on whether their maximum speed is over 90Kmph, or 60Kmph. Medium mobility covers 4 x 4 AFVs, jeeps, landrovers, 6 x 6 and 8 x 8 trucks. Low mobility is for any 4 x 2, 6 x 4 etc. trucks or cars.

8.4

Element	Combat Mode	Travel Mode	Linear Obstacle	Open Woods Poor Going Scrub	Dense Wood Bad Going
Infantry	100m	150m	- 50m	100m	50m
Carrying support weapons	75m	100m	- 50m	50m	25m
Manhandling weapons	25m	50m	-	25m	-
Animals	200m	300m	-100m	150m	100m
Animals towing	100m	200m	-	50m	-

Note:- Infantry support weapons are ATGW, Lt AAGW, SFG, HMG, Mortars up to 82mm and RCL's up to 75mm (larger if wheeled). However, note the set up times.



8.5 COMBAT MODE

The common speed used in a battle zone with the vehicle in low or medium gear.

8.6 TRAVEL MODE

This is considered a form of strategic move mainly to be used in campaign and attack/defence games, especially when doctrine is being used. The vehicle is in high gear, cannot fire and has a reduced chance of observation and a high chance of being observed. The Travel Mode for wheeled vehicles is twice that of its combat or road movement distance. Vehicles in travel mode may not cross linear obstacles, reverse or enter any bad going or woods. The deductions for towing and turns may apply.

Travel mode may not be used in competition games and in other games a unit may be in travel mode at the beginning of the first move and must have specified orders as to how long they will remain in travel mode, once a unit has left travel mode it may not re-enter it during a game.

8.7 ROAD SPEED

This is an addition made to tracked vehicle combat or travel mode speed and a vehicle must spend at least half the move on a road to claim this bonus: changing gears takes time and effort with tracked vehicles.

Wheeled vehicles may use proportional movement on and off roads, see vehicle data for whether a wheeled vehicle is fast, medium or slow, note this is not dependent on its mobility.

8.8 TOWING, LINEAR OBSTACLES AND TURNS

These deductions are cumulative and apply to the total speed available. Linear obstacles include hedges, shallow ditches and low walls. They may not be crossed by vehicles in travel mode.

8.9 OPEN WOODS, SCRUB AND POOR GOING

Open woods and scrubland include any planted woodlands, and those with light sub-vegetation as well as high cornfields. Poor going includes sandy areas, ploughed fields and snow.

8.10 DENSE WOODS AND BAD GOING

These include forest, thick woodland, waterlogged ground, dunes and snowdrifts as well as heavily broken or stoney ground.

8.11 AUXILIARY PROPELLED GUNS

Bofors 155mm, G5, FH70 move 250m in combat mode with a road speed of 450m. 85mm SD-44 57mm ch-26 move at 400m in combat mode with a road speed of 600m. Auxiliary propelled guns may not cross linear obstacles or enter woods or bad going, they may however be concealed at the edge.

8.12 AMPHIBIOUS VEHICLES

Amphibious vehicles with internal buoyancy move at 300m per move. Those with screens take two moves to erect and move at 200m per move; exception is the 'S' Tank which takes six moves to erect. Deep wading and snorkelling vehicles move 100m per move, they must start the game prepared and take one and three moves respectively to prepare for action after crossing the

river. River banks suitable for entrance and exit must be designated before the game commences.

8.13 ENTERING OR LEAVING A VEHICLE

Infantry elements take quarter of a move to leave a vehicle and this may take place at any time during a movement phase. The vehicles movement is reduced by this amount and the infantry may move no more than 50m in the phase of disembarking. Infantry elements take a half move to embark. These times are doubled if support weapons are being carried.

8.14 TOWING AND SET-UP TIMES

To unhitch or hitch up tows, takes the following times, this includes time required to prepare a towed weapon for action:

Weapon	Time
A/T guns up to 57mm, RCL's, A.A. up to 25mm, SFMG and HMG, Mortars up to 82mm	Half Move
A/T guns over 57mm, Field guns up to 122mm, A.A. up to 57mm, Mortars up to 120mm, SP FCR.	One Move
Heavier Weapons, Towed FCR.	Two Moves
Self-propelled guns up to 155mm, and mortars	One Move (to fire indirect)
Self-propelled guns over 155m	Two Moves (to fire indirect)
Salvo Rockets	One Move
Heavy Rockets	Six Moves

Except for self-propelled artillery and salvo rockets that are not towed, all weapons take the same time to prepare to move off. Self-propelled weapons take half this time.

Vehicles with integral FCR must be on overwatch to use them.

Visibility

9.1 EFFECT OF WEATHER

Daytime visibility in open terrain is usually 5000m, but this can be affected by the weather prevailing as follows:-

Weather Condition	Visibility
Haze, light rain, dust, overcast	3000m
Light snow, heavy rain, mist	1000m
Heavy snow, fog, sandstorm	200 m

Visibility for other terrain is as follows:

9.2 EFFECT OF TERRAIN

Terrain	Visibility
Into the edge of a built up area or smokescreen	50m
Within a built up area or smokescreen	100m
Inside or into a dense wood	50m
Into or inside a light wood	100m

9.3 CONTOURS AND HEIGHT

A contour is considered to be two metres high thus a vehicle is hullo down behind one contour and out of sight behind two. To count as firing from a hullo down position an element must be touching the contour other wise it will count its target as hullo down. ATGW vehicles that may fire from an out of sight position using a vehicle periscope must be touching the second contour. If neither the firer or the target are touching a contour, but there is a contour between them, they both count as hullo down and in cover.

Note, for acquisition purposes, only a hedge counts as a single contour hill.

When there is intervening ground or other obstacles between the observer and his target, there may be dead ground behind the intervening terrain. Measure the distance between the obstacle and the far edge of the intervening contour or other obstacle then refer to the deadground chart. Multiply this distance by the number on the chart to give the amount of dead ground behind the back edge of the contour or other obstacle.

For these purposes:

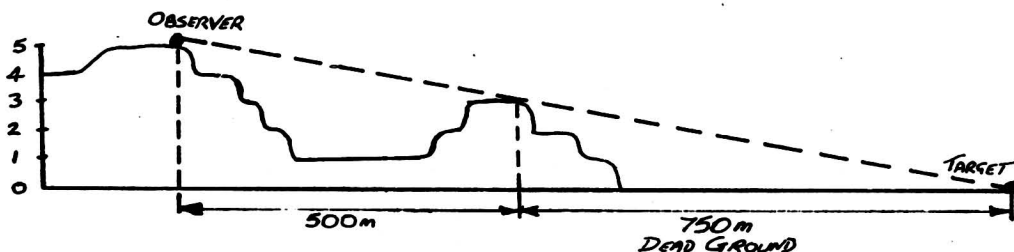
A wood may be between three and six contours high.

A two storey building is four contours high with other higher buildings adding two contours per additional storey. Generally a built up area should be treated as four contours high.

A smokescreen is six contours high.

FOR EXAMPLE

A unit observing from a five contour hill at a unit on the table level, if there was an intervening hill three contours high, the unit would have to be at least $1\frac{1}{2}$ the distance from the observer to the intervening hill in order to be seen.



9.4 DEADGROUND CHART

Observers Height above Target	Intervening Contour Height Above Target	Multiplier
2 Contours	1 Contour	1
3 "	1 "	$\frac{1}{2}$
3 "	2 "	2
4 "	1 "	$\frac{1}{3}$
4 "	2 "	1
4 "	3 "	3
5 "	1 "	$\frac{1}{4}$
5 "	2 "	$\frac{2}{3}$
5 "	3 "	$1\frac{1}{2}$
5 "	4 "	4
6 "	1 "	$\frac{1}{6}$
6 "	2 "	$\frac{1}{2}$
6 "	3 "	1
6 "	4 "	2
6 "	5 "	5

Acquisition

10.1 GENERAL

In order to fire at an element or call down indirect fire on a target it must be acquired at the time the fire is carried out or requested. The element remains acquired until the line of sight to it is broken or the number to see it after all modifiers rises to exceed 10. A vehicle which makes more than a half move may only acquire to make a request.

10.2 NUMBER OF ACQUISITIONS

All elements except artillery observers may only make one acquisition per phase.

Exception - see ATGW fire. However any target element that is within 100m of the target being acquired that requires the same number or less is also spotted if the target element is acquired and the fire may be changed to one of these targets, in the next fire phase, providing there is no change in the acquisition number.

Artillery observers may make up to two acquisitions but only one fire point may be selected.

The second acquisition must be at a target more than 250m from the first.

10.3 TARGET CLASSES

All elements are given a target class depending on their size and aspect being presented to the acquirer. Vehicles have three aspects, front side and hulldown and these are given in the vehicle data. Other elements are shown below and have only one aspect. Trucks, light trucks, jeeps and landrovers have their target size reduced by 1 if hulldown.

Target Class	Element Type
A	Large truck - 3 tons and over
B	Light trucks, eg. Unimog, 1 ton Landrover
C	Jeeps and Landrovers. A/T large, light A.A. up to 20mm
D	Stripped Jeeps/Landrovers, Beach buggies, Krakas. A/T guns up to 90mm. RCLs over 90mm.
E	Infantry support groups.
F	Infantry groups.
G*	Vehicle periscopes, single infantrymen/Observers.

* Note: These targets may not be hit by direct fire weapons unless engaging in direct area fire.

10.4 COVER

A target is either in the open or cover. To count as being in cover it must comply with one of the following:-

- If a vehicle, has spent at least half its move in a wood or amongst scrub or broken ground, buildings, or has come into sight from behind terrain which blocks sight and has not moved more than 250m whilst in sight.
- If any other element, has spent at least half its move in a wood, in or amongst buildings, scrub or broken ground, or be deployed in or behind a linear obstacle such as a hedge, wall or gully, or deployed on and just behind a crestline.
- If an element comes over a crestline it cannot count as being in cover that move, however far it moves, to an observer on a lower level unless there is terrain which appears to be higher to the observer behind that element - it is being skyline.

10.5 HULLDOWN

Hulldown is when a vehicle is exposing a minimum part of its hull or turret in order to fire.

A vehicle may not move more than half a move and take up a hulldown position, it must either stay turret down or be fully exposed and move into a hulldown position on the next move; this is because it takes time and fine judgement to effectively occupy a hulldown position, it may fire in that move however if not 'turret down'.

A hulldown position will give an area of dead ground below a vehicle depending on whether the vehicle is Warpac or Western built. The dead ground if one contour higher than the proposed target is 200m Western/500m Warpac, if two contours higher 400m/1000m, if three contours 600m/1500m.

Hulldown for vehicles is represented by changing the target size of the vehicle as shown on the vehicle data charts and counts as being in cover.

If an observing element is at least three contours higher than an element which is claiming hulldown, it is only hulldown if it is at least 1500m away, if the observer is two contours higher 1000m, one contour higher 500m.

10.6 DUG IN

For vehicles treat as if hulldown, for other elements the modifier shown on the table is used.

10.7 ACQUISITION TABLE

TARGET TYPE	TARGET IN OPEN							TARGET IN COVER							TARGET TYPE
	Up to 50m	200	500	1000	2000	3000	5000	Up to 50m	200	500	1000	2000	3000	5000	
A	1	1	1	3	4	6	8	1	2	3	5	6	8	10	A
B	1	1	2	4	5	7	9	1	3	4	6	7	9	11	B
C	1	2	3	5	6	8	10	2	4	5	7	8	10	12	C
D	1	2	5	8	9	10	11	2	5	6	8	10	12	-	D
E	2	3	6	9	10	11	12	3	6	8	10	11	12	-	E
F	2	3	7	10	11	12	-	4	7	9	11	12	-	-	F
G	2	4	8	11	12	-	-	5	8	10	12	-	-	-	G

The number required is increased or decreased for any one of the following that apply, i.e. all factors are cumulative:-

- 1 Acquirer higher, element being acquired fired ATGW or infantry A/T weapon with no pronounced backflash, rifles, LMG or Lt Mortar, Element being acquired moved between 50m and 250m within sight.
- 2 Element being acquired fired ATGW or infantry A/T weapon with pronounced backflash, Lt. AAGW, SFGM or HMG, Mortar up to 82mm, RCL up to 90mm, autocannons, and guns up to 40mm, element being acquired moved between 250m and 750m within sight, element being acquired 'handed on' by friends on the same net.
- 3 Element being acquired fired RCL over 90mm or gun over 40mm, or other mortars, missiles or rockets. Element being acquired moved more than 750m within sight.
- +1 Observing through artillery fire-zone.
- +1 Observing on the move, or Helicopter performing pop-up, or using mast sight, or vehicle using periscope or Emerson turret.
- +2 AFV suppressed, any target element dug in, Sensor level one at night, or through smoke with TI and GSR.
- +2 Observing through salvo rocket artillery fire zone.
- +2 On AA overwatch (not against Helicopters)
- +3 Other elements suppressed, observing out of visibility arc, through partial smoke, snow, fog, or heavy rain, Sensor level two at night or through smoke with TI and GSR.
- +3 Observing while in travel mode.
- +4 Sensor level 3 at night or through smoke with TI and GSR.
- +6 Observing at night with no sensors.

Note:- Observing on the move applies if movement was made during the last movement phase.



Direct Fire

DIRECT FIRE

11.1 GENERAL

Direct fire is carried out by anti-tank and anti-helicopter weapons, for small arms fire see direct area fire.

An element may fire up to twice in one turn at the appropriate phase and is considered to be a number of rounds fired or a burst of fire from an automatic weapon. The exception is anti-tank guided weapons which fire only a single missile and anti-tank weapons carried by an infantry squad.

The following requirement for direct fire must be met; ATGW fire is described separately.

11.2 REQUIREMENTS FOR DIRECT FIRE

- (i) The target must first be acquired. Acquisition for phase 2.6(ii) and 2.6(vi) may take place any time during the target's immediately preceding movement phase and fire is considered to be resolved at that point. A vehicle or element which has moved is put back in the place it was hit if disabled but not if neutralised or suppressed. Acquisition for phase 2.6(iii) and 2.6(vii) are at targets visible at that point in time.
- (ii) To fire an element must not have moved more than a half move in its immediately preceding movement phase. An element counts as firing on the move if it moved in its last movement phase, ie. if it has not spent a movement phase stationary.
- (iv) However, a vehicle in combat mode that is not reversing or crossing difficult terrain may move the following distances before the Direct Fire Number Modifier applies:-
No stabilisation - 50m. Stabilised - 100m. Modern Stabilisation - 150m.

11.3 RESOLUTION OF DIRECT FIRE

If a target is acquired, fire may be resolved on the Direct Fire Table cross referencing the type of weapon, the ranging system if any and the range in metres to the target. The fire number is modified according to the targets and own units actions and a twenty-sided dice is rolled with the following results:-

Die Roll is 2 less than the modified fire number = Target missed.

Die Roll is 1 less than the modified fire number = Target missed but suppressed.

Die Roll is equal or more than the modified fire number = One hit on target.

Die Roll is 5 or more than the modified fire number = Two hits on target from all but autocannons, ATGW, and infantry squad LAD.

If a target is hit it is always suppressed.

11.4 RESULT OF A HIT

If a hit is made refer to the appropriate penetration table, one for weapons firing a kinetic energy round and one for those firing chemical energy rounds only, the round being fired must be specified at the time of acquisition. To resolve whether a vehicle has been penetrated and disabled, take the vehicle armour factor for the aspect of the vehicle that has been hit, and deduct this from the penetration factor with the following results:-

- (i) If the armour factor is more than one higher it is not penetrated.
- (ii) If the armour factor is only one higher the vehicle is neutralised on a die roll of 10.
- (iii) If the penetration factor is ten or more higher the vehicle is penetrated and disabled.
- (iv) If the penetration factor is higher by less than ten then this number or less must be rolled on a dice to penetrate and disable the vehicle. If this die roll is one more than required or a ten the vehicle is neutralised.
- (v) If the penetration factor is equal to the armour factor, the vehicle may be neutralised on a die roll of 9 or 10.

11.5 HEAT

HEAT rounds must always roll even if it is an automatic penetration and on a 10 fails to form a jet properly and the vehicle is only neutralised.

11.6 AUTOCANNONS

Autocannons including the ARES 75mm and 90mm, and the Israeli 60mm add the following to their penetration factor for each two numbers above that required to hit up to a maximum of six factors;

Single barrel	+1	Triple Barrel	+3
Twin Barrel	+2	Gatling Gun	+3
Chain Gun	+2	Quad Barrel	+4

Note;- Autocannons include 12.7mm and 14.5mm HMG's in this case.

AUTOCANNON EXAMPLE

A stationary Fox fires its 30mm Rarden cannon at a stationary BMP at a range of 1000m. For its first shot, it requires an 8 +1 for a 'C' class target = 9. At 1000m its penetration factor is 3, if it rolls a 9 or 10 this factor will be used giving a 10% chance of disabling the BMP, if it rolled an 11 or 12, this would be increased to 4, giving a 20% chance of a disabling hit. If it rolled a 20, this would increase the penetration factor by 5 to 8, giving a 60% chance of a disable.

A moving M163 Vulcan firing its 20mm gatling gun at a moving BMP at a range of 1000m requires a 16 to obtain a hit with a penetration factor of 2, not enough to disable at that range, however if it rolls an 18, this increased by 3 to 5 and on a roll of 20 this is plus 6 to give 8, and a 60% chance of a disable.

11.7 SPECIAL ARMOUR

- (i) **Spaced Armour** - additional armour either forming part of the vehicle's structure or bolted on the outside to give additional protection against chemical energy weapons, this includes side skirts. Their effect on kinetic energy rounds if any, is included in the basic armour factor and it is therefore only added if hit by a chemical energy round. It is denoted by an 's' followed by a number. For example: Leopard 1A4 7s3 3s4 2
- (ii) **Laminated or Chobham Armour** - covers various modern arrayed armour using ceramics, laminated materials or interspersed fuel. Their effect against kinetic energy rounds is included in the basic armour factor. It is denoted by a 'c' followed by a number giving the additional protection. For example: Challenger 15c10 5c6 3c4
- (iii) **Active Armour** - a new concept whereby the attacked armour block explodes when hit disrupting a chemical HEAT jet or perhaps even deflecting a solid shot round. It is noted by an 'a' and may be combined with other forms of armour. This armour will deflect a kinetic energy round on a 10 causing the vehicle to be suppressed only and will disrupt a chemical energy round on a 7 or higher, the vehicle however being neutralised. For example: Israeli Centurion 8a 3as2 2

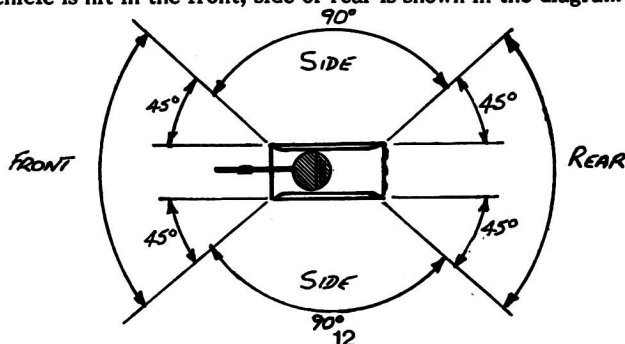
11.8 INFANTRY ANTI-TANK WEAPONS

These are classified into three types as follows:-

- (i) **LAW** - Light Anti-Tank Weapon. This is a single man-portable weapon with separate reloadable ammunition and is carried by an infantry squad, although it may sometime be crew served. Enough ammunition is carried for three moves of fire by the squad, more ammunition will be carried in the squad's transport, or stock-piled if in field defences. As with tank guns more than one hit can be made in a fire phase.
- (ii) **LAD** - Light Anti-Tank Weapon - Disposable. This is a one-shot throwaway weapon and up to three may be carried by a single infantryman with up to ten being the maximum for a squad, although this is unusual. Up to three may be fired by an infantry squad in a move with deductions from infantry small arms fire if being carried out. They are bought as three round groups per infantry squad.
- (iii) **MAW** - Medium Anti-Tank Weapon. Heavier and longer ranged weapons, usually crew served with up to three rounds of fire per launcher, more carried in transport or stockpiled in defence.

11.9 VEHICLE ASPECTS AND ANGLES OF FIRE

Whether a vehicle is hit in the front, side or rear is shown in the diagram below:



Non-turreted vehicles have an angle of fire $22\frac{1}{2}$ either side of their centre line, if the target is outside this arc but within 45, it may fire but counts as moving unstabilised. The 'S' Tank is an exception to this, it may fire up to 45 either side of the centre line without counting as moving and up to 90 counting as moving unstabilised.

11.10 DIRECT FIRE TABLE

Weapon	Ranging System	Up to 100m	250	500	750	1000	1500	2000	2500	3000	3500	4000	4500
Guns over 100mm	Laser I.F.C.	2	2	2	2	2	5	8	10	14	16	18	-
	Laser	2	2	2	2	3	7	10	13	15	17	19	-
	Optical/RMG	2	2	2	3	4	9	12	16	19	20	-	-
	Stad./None	2	2	2	4	5	11	15	18	19	20	-	-
Guns up to 100mm	Laser I.F.C.	2	2	2	3	4	7	11	15	19	-	-	-
	Laser	2	2	2	4	5	10	14	18	20	-	-	-
	Optical/RMG	2	2	2	5	7	12	18	20	-	-	-	-
	Stad./None	2	2	3	7	9	14	19	20	-	-	-	-
Guns up to 57mm	Laser I.F.C.	2	2	2	4	8	12	18	20	-	-	-	-
	Laser	2	2	3	6	10	16	20	-	-	-	-	-
	Optical/RMG	2	3	5	8	14	18	20	-	-	-	-	-
	Stad./None	2	3	6	10	16	19	20	-	-	-	-	-
Ammo Modifier	HEAT	-	-	-	-	-	+1	+2	+2	+3	+3	+3	-
	HEAT-FS	-	-	-	-	+1	+2	+3	+3	+4	+4	+4	-
	HESH	-	-	-	-	+1	+3	+3	+4	+4	+5	+5	-
Autocannon over 37mm		2	2	2	2	3	7	10	13	15	17	19	-
Autocannon over 25mm		2	3	4	5	8	10	12	15	18	20	-	-
Autocannon over 15mm		2	3	6	8	10	12	15	18	20	-	-	-
Cannon and HMG to 15mm		2	4	8	12	15	18	20	-	-	-	-	-
RCL over 100mm & LPG's		2	4	6	10	14	18	20	-	-	-	-	-
RCL over 75mm		2	5	9	12	18	20	-	-	-	-	-	-
RCL over 57mm		5	9	13	16	19	-	-	-	-	-	-	-
RCL up to 57mm		6	11	16	18	-	-	-	-	-	-	-	-
Infantry A/T (3)					as above up to 57mm RCL								
Infantry A/T (2)		7	13	18	-	-	-	-	-	-	-	-	-
Infantry A/T (1)		8	15	-	-	-	-	-	-	-	-	-	-
Howitzers		3	6	8	10	12	18	20	-	-	-	-	-
ATGW	1st Generation	15	13	11	9	7	5	5	5	6	8	10	14
	1½ Generation	13	11	9	7	5	5	5	5	5	7	9	13
	2nd Generation	11	8	6	5	5	5	5	5	5	6	8	11
	3rd Generation	9	7	5	4	4	4	4	4	4	4	6	8
AAGW		15	13	11	10	10	10	10	11	12	12	12	12

DIRECT FIRE NUMBER MODIFIERS

All

-2 Second or subsequent phase of firing at the same target, except with ATGW.

+1 Modern stabilised firing on the move.

+2 Stabilised firing on the move.

+3 Unstabilised firing on the move.

+2 Self suppressed, except ATGW.

+2 Target moved more than 250m within sight.

+3 Target moved more than 750m within sight

+4 Target moved more than 250m but less than 100m in sight.

+2 Target dug in.

+2 Firing pivot, cupola, ball mounted or fixed machine guns or autocannons.

-2 RCL with spotting rifle or LPG with laser over 500m, autocannon with laser ranging over 1000m.

Note:- Moving modifiers are not cumulative.

TARGET CLASS

-1 A Class target

+1 C Class target

+2 D Class target

+3 E Class target.

ATGW

- +4 2nd generation ATGW suppressed.
- +8 1st and 1½ generation ATGW suppressed.
- +4 ATGW firing at Manoeuvre evade target.
- +6 ATGW firing at Cover evade target or ATGW target moving in partial smoke.
- +8 ATGW firing at Smoke evade target or target moved out of sight.

HELICOPTERS

- +6 Firing at helicopter performing Pop-up.
- +4 Firing at helicopter flying N of E.
- 2 FCR locked on.
- + Missile factor (page 48).

11.11 PENETRATION TABLE - KINETIC ENERGY ROUNDS

Gun	Ammunition	HEAT	HESH	Up to 250m	500	750	1Km	1.5	2Km	2.5	3Km	3.5	4Km
130mm	AP/HE	20	-	19	18	16	15	14	13	11	9	8	5
125mm	APFSDS	19	-	20	19	19	18	17	16	15	13	11	9
	APFSDM	19	-	22	21	21	19	18	17	16	14	12	10
122mm	APHE	18	-	17	16	14	13	12	11	10	8	7	4
120mm	APFSDM	17	18	23	22	22	20	19	18	16	14	12	10
	APFSDS	17	18	21	20	20	19	18	16	15	13	11	7
	APDS	17	18	19	18	18	17	16	14	12	10	9	6
115mm	APFSDS	17	-	19	18	17	16	14	12	10	9	8	6
105mm	APFSDM	16	17	20	19	19	18	17	16	15	13	11	8
	APFSDS	16	17	19	18	18	17	16	14	12	10	9	6
	APDS	16	17	18	17	16	15	13	11	9	8	7	5
100mm	APFSDS	15	-	17	16	15	14	13	11	9	7	-	-
	APDS	15	-	16	15	13	13	11	10	8	6	-	-
	APHE	15	-	15	14	13	12	11	10	9	7	-	-
90mm	APFSDS	13	14	16	15	14	14	13	12	9	7	-	-
	APHE	13	14	15	14	14	13	11	9	7	6	-	-
	APCBC/AP	12	-	13	12	11	9	8	6	4	3	-	-
85mm	APHE	12	-	14	12	9	8	7	7	6	5	-	-
	HVAP	12	-	15	12	10	9	8	7	6	5	-	-
	AP	11	-	12	10	9	8	6	4	3	2	-	-
83.4mm	APDS	-	-	16	15	15	14	13	12	9	7	-	-
77mm/17Pdr	APDS	-	-	14	13	12	11	10	8	6	5	-	-
76mm	APHE	11	12	12	8	7	6	6	5	5	4	-	-
	HVAP	11	12	10	7	6	6	5	5	4	3	-	-
75mm	APFSDS	10	-	14	13	12	12	11	10	7	5	-	-
75mm L60-70	AP	-	-	12	11	10	9	8	6	5	4	-	-
75mm L40-8	AP	-	-	9	8	7	6	5	4	3	2	-	-
60mm	APFSDS	-	-	12	11	10	10	9	8	5	3	-	-
57mm	APHE	7	-	8	6	6	5	5	4	3	2	1	-
40mm	AP	-	-	6	6	5	5	4	3	2	1	1	-
37mm	AP	-	-	6	5	5	4	3	2	1	1	-	-
35mm	APDS	-	-	7	7	6	5	5	4	3	2	1	-
	AP	-	-	5	5	4	4	3	3	2	1	-	-
30mm	APDM	-	-	6	6	5	5	4	3	2	1	1	-
	APDS	-	-	6	5	4	4	3	2	1	1	-	-
	AP	-	-	5	4	3	3	2	1	1	1	-	-
25mm	APDS	-	-	5	5	4	4	3	2	1	1	-	-
	AP	-	-	5	4	3	2	2	1	1	1	-	-
23mm	AP	-	-	4	3	3	2	1	1	1	1	-	-
20mm	AP	-	-	4	3	3	2	1	1	1	-	-	-
14.5mm	AP	-	-	3	3	2	2	1	1	-	-	-	-
12.7mm	AP	-	-	3	2	2	1	1	1	-	-	-	-

11.12 PENETRATION TABLE - CHEMICAL ENERGY ROUNDS

Weapon	Type	Penetration	Built by	Remarks
Fieldgun/Howitzer	Up to 76mm Up to 90mm Up to 110mm Up to 130mm Up to 155mm Over 155mm	10 12 14 15 17 18	All All All All All All	See Artillery For Other Ammunition
Demolition Gun	165mm	20	US/GB	HESH
M-55 RCL	57mm	8	US/China	also HE
T52/M20 RCL	75mm	9	US/China	also HE
T21/M60 RCL	82mm	9	Czech/China	also HE
B10/M59 RCL	82mm	10	USSR/Czech	also HE
Pv1110 RCL	90mm	15	Sweden	also HE
SM58/61 RCL	95mm	12	Finland	also HE
M1969/M27 RCL	105mm	13	Arg/US	also HE
M40A1 RCL	106mm	15	US	also HESH (16) HE
B11 RCL	107mm	15	USSR	
Wombat/Mobat RCL	120mm	17	GB	HESH
SPG9/2A20 LPG	73mm	13	USSR	
Mecar LPG	90mm	14	Belgium	also HE, Smoke
M162 Gun/Launcher	152mm	20	US	
Folgore Tripod	As over 57mm RCL	15	Italy	
RPG 2 LAW	A/T (1)	7	USSR	
Type 56 LAW	A/T (1)	10	China	
SARPAC LAW	A/T (1)	12	France	also illum
Bazooka LAW	A/T (1)	9	Many	also HE
Bazooka LAW	A/T (1)	11	Many	new ammo, also HE
M57 LAW	A/T (1)	12	Yugo	
RPG 7 LAW	A/T (2)	12	USSR	
RPG 16 LAW	A/T (2)	20	USSR	
Type 69 LAW	A/T (2)	12	China	
C-90 LAW	A/T (2)	18	Spain	
ACIP 300 LAW	A/T (2)	20	France	also illum
RPG 18 LAD	A/T (1)	11	USSR	
Type 74 LAD	A/T (1)	8	China	
M72A1/2 LAD	A/T (1)	12	US	
Miniman LAD	A/T (1)	14	Sweden	
Viper LAD	A/T (2)	16	US	
LAW 80 LAD	A/T (2)	16	GB	
Armburst LAD	A/T (2)	12	W. Germany	
Picket LAD	A/T (2)	18	Israel	
Carl Gustav M2 MAW	A/T (2)	16	Sweden/GB	also HE, Smoke, illum
PZF-44 MAW	A/T (2)	15	W. German	
APILAS MAW	A/T (2)	28	France	
M67 MAW	A/T (3)	15	US	
C. Gustav S550 MAW	A/T (3)	16	Sweden/GB	also HE, Smoke, illum
Folgore MAW	A/T (3)	15	Italy	
Blindicide MAW	A/T (3)	12	Belgium	also HE, Smoke, illum
LRAC 89 MAW	A/T (3)	16	France	also smoke, illum

Note: All ammunition is HEAT unless otherwise specified.

Anti-Tank Guided Weapons

12.1 GENERAL

ATGW's may only be fired if the firing element did not move more than half a move in its immediately preceding movement phase and may only be fired once per game turn during phase 6.2(ii) or 6.2(vi). To indicate firing a marker should be placed on the firing and target elements. The fire is not resolved until phase 6.2(iv) or 6.2(viii) as the opposing player has an opportunity to spot the firing and take action during phase 6.2(iii) or 6.2(vii).

12.2 FIRING AT ATGW ELEMENTS

The ATGW firing element may be spotted normally and be suppressed, neutralised or disabled by direct fire. If suppressed the modifiers for suppressed ATGW are applied when resolving ATGW fire, if neutralised or disabled the missile marker is removed from the target.

12.3 SPOTTING FIRING ATGW's

If the ATGW firing element is not neutralised or disabled the target may attempt to spot the incoming missile and take evasive action, this is after all firing for phases 2.6(iii) or (vii). The missile may also be spotted by friends on the same command net. If the missile is not spotted the cover evade modifier applies if the target moved completely out of sight in its movement phase. If the missile is spotted then one of the following may be carried out if circumstances permit:-

- 12.4 COVER EVADE - If a vehicle has moved less than half a move in its preceding movement phase it may move to any cover within 100m and the cover evade modifier will apply when resolving ATGW fire. If by doing this it moves out of sight the smoke modifier also applies.
 - 12.5 MANOEUVRE EVADE - A vehicle that is unable to carry out a cover evade, either by reason of having moved too far or there is no cover within 100m may count this modifier. It is considered to have attempted to dodge the missile at the last possible moment.
 - 12.6 SMOKE EVADE - If a vehicle is equipped with smoke dischargers it may fire these in the direction of the missile. If it has a smoke generator working it may reverse into the screen. The smoke evade modifier then applies.
- NOTE: If a spotting attempt is only made by the target vehicle then only he will evade, if any other friends attempt to spot, all vehicles of that unit will evade if a missile is spotted. The choice must be made before any dice are rolled.

12.7 RESOLVING ATGW FIRE

This is resolved as a direct fire HEAT round, for the purposes of a dud round and penetration.

12.8 MISSILE CONTROLLERS

Missile vehicles can only be fired fully exposed or hullo down except for the following:

- | | |
|------------------------------|--|
| Vehicles with periscope | - Rakette with SS.11 and Fv438 may fire from full defilade. |
| Vehicles with remote control | - Striker, Fv438, and Russian BRDM series with Swatter, Snapper or Sagger may have their controller up to 100m from the vehicle. Double this distance must be added to the minimum range due to the time taken to gather the missile. |
| Third Generation Missiles | - These are at present only fired from helicopters. They are usually laser designated or controlled and the missile can be totally remote from the designator. The missile platform must have the designator within a 45° front arc and the minimum range is taken from the launch platform. |

12.9 ATGW SPOTTING TABLE

Missile Generation	Range Up to 1000m	Range Up to 2000m	Range Over 2000m
1st & 1½	9	6	3
2nd	10	8	6
3rd	-	9	8

DIE ROLL MODIFIERS

- +2 Missile with Pronounced Backflash (and not firing from full defilade)
- +1 Each missile after first fired at same target group
- 2 Self Suppressed
- 2 Self Moving (more than 50m) in previous phase
- 2 Self Firing in this phase
- 2 Not target but spotting for element on same command net.

Note:- Target group is elements of one platoon plus any others being fired at within 100m of any of the platoon being fired at.

12.10 ATGW CHARACTERISTICS TABLE

Missile	Generation	Min. Range	Max. Range	Penetration	Backblast	Remarks
Snapper	1st	150m	2300m	14	No	
Swatter	1st	500m	2500m	18	No	
Swatter B	1½	500m	3500m	21	No	
Sagger	1st	300m	3000m	16	No	
Sagger B	1½	300m	3000m	18	No	
Spigot	2nd	100m	2500m	20	Yes	
Spandrel	2nd	100m	3000m	20	Yes	
Spiral	2nd	1000m	4000m	28	Yes	
TOW	2nd	65m	3750m	22	Yes	
TOW 2	2nd	65m	3750m	28	Yes	
TOW 3	2nd	65m	3750m	35	Yes	
Dragon	2nd	60-250m	1000m	20	Yes	1st for spotting
Shillelagh	1½	500m	3000m	30	No	
Hellfire	3rd	500m	6000m	40	No	
Milan	2nd	25m	2000m	20	No	
HOT	2nd	75m	4000m	30	Yes	
SS 10	1st	300m	1600m	16	No	
SS 11	1st	500m	3000m	24	No	
Harpon	1½	400m	3000m	24	No	
Entac	1st	400m	2000m	22	No	
Cobra	1st	400m	2000m	20	No	
Mamba	1st	300m	2000m	19	Yes	
KAM-3D	1st	350m	1800m	16	No	
KAM-9	2nd	75m	4000m	24	Yes	
Bantam	1st	300m	2000m	19	No	
Swingfire	1½	150m	4000m	24	No	
Vigilant	1st	200m	1375m	16	No	
Kun Wu	1st	400m	2000m	19	No	
Toger (Is)	3rd	100m	4500m	32	No	
Bill (Sn)	3rd	150m	2000m	24	No	See notes below
ADATS	2nd	500m	6000m	35	Yes	

- Notes 1) Bill missiles have a 60% chance of hitting the side armour and a 40% chance of hitting the frontal armour.
- 2) TOW vehicles are normally pointed for TOW 2.

Direct Area Fire

13.1 GENERAL

Direct Area Fire is used by infantry, vehicles, guns and howitzers firing at short range, to fire at infantry, softskinned vehicles, constructions and field defences. It is also used in suppressive fire or reconnaissance by fire.

13.2 INFANTRY SMALL-ARMS FIRE

Infantry fire may be carried out in any direct fire phase providing the firing element has not moved more than half, unless such a move brings them to within 50m of an enemy element when they may also fire - this represents close assault with short range fire and grenades.

This half move includes any movement made in a vehicle and the time taken to dismount.

For example, a vehicle may make a quarter move, the infantry may dismount taking a quarter move and they may then fire from immediately adjacent to the vehicle.

SFMG, HMG and autogrenade launchers take a half move to set up and so may not fire in any move in which movement takes place.

Note:- That infantry may fire at AFV targets with LAD and LAW in the same phase as small arms. However, note the die roll deductions.

13.3 RESOLVING SMALL ARMS FIRE

To carry out infantry fire take the fire number from the small arms fire number table making any addition for using a squad automatic weapon then check this number on the Smallarms and Artillery Fire Table, making the appropriate column shifts and die roll modifiers.

For example, a semi-automatic rifle squad fires at an infantry squad in soft cover at a range of 200m. The fire Number is 6, increased to 8 because they also have a SAW. The fire number is moved back one column to the left because the target is in soft cover becoming a 7 and a 6 or more on the die is required to have any effect on the target.

13.4 CREW SERVED WEAPONS

Crew served weapons such as light mortars, auto grenade launchers, crew served guns, mortars, and anti-tank weapons all fire on the crew line of the Smallarms Fire Number Table.

13.5 SNIPERS

Snipers if being used also use this line but may fire out to 1200m as indicated. They may never disable a 3 or more man squad such a result always counts as a neutralisation. They are most effective against Command elements which, if neutralised, cause a morale check. If being used in an attack/defence game snipers should be marked on the defending players map and not placed on the table until they have first fired.

13.6 AUTOCANNON, GUNS AND HOWITZERS

Autocannons, guns and howitzers firing HE, HESH or HEAT at infantry elements, softskinned vehicles, constructions or field defences in a direct fire mode use the same fire number as shown on the small arms and artillery fire table with the appropriate modifications for range and type of round used. The fire is effective against only one target element, 50 sq.m. of construction or bunker. The maximum range of direct area fire is as shown for that weapon on the direct fire table.

13.7 DIRECT FIRE MODIFIERS

	Column Shift	Die Roll Modifier
Autocannon, guns and howitzers over 1000m		-1
Autocannons over 1500m		-3
Guns and Howitzers over 1500m		-2
Guns and Howitzers over 2000m		-3
Using HESH against constructions and field defences	1 to Right	
Using HESH or HEAT against infantry elements	1 to Left	

13.8 SUPPRESSIVE FIRE

Suppressive fire is a form of direct area fire used either to make a suspected enemy keep his head down, draw his fire or support an assault into a position. It may be fired at the edges of a road, a linear obstacle, the edge of a built up area or individual buildings, woods or identified field defences. It may only be fired in the following circumstances:-

- (i) if fire has been received from the area to be suppressed.
- (ii) the area to be suppressed is to be assaulted in the next movement phase.
- (iii) fire ordered before the game to be carried out by units designated as reconnaissance in order to draw enemy fire from suspected positions.

Suppressive fire may only be carried out in phases 2.6(ii) and 2.6(vi), however the element firing may have moved more than half a move in its preceding movement phase.

13.9 RESOLVING SUPPRESSIVE FIRE

The fire factor and maximum range for suppressive fire is as for the following table:

Firing Weapon	Fire Factor	Max. Range
Rifle Group	1	250m
Rifle Group with S.A.W.	2	250m
All machine guns	2	500m
Autocannon	2	750m
Lt Mortars, Gren Launchers, Gatlings & Miniguns	3	750m
Larger guns capable of firing HE	2	1000m

NOTE: A vehicle may fire either its main gun or coax mg. Autocannons may fire with coax mg.

The maximum width per element covered by suppressive fire is 50m. The total fire factor at the appropriate range is added and divided by the number of 25m lengths in the total width covered by the suppressive fire, this number is rounded up to the nearest whole number. Note that with larger targets the area covered by the suppressive fire will be based upon the maximum width per element whilst with smaller targets it will be the size of the target. The number arrived at or less must be rolled on a D10 to suppress any element. Each element suppressed has a chance of being disabled or neutralised. Roll a D10 and on a 7 or greater the element is neutralised and on a 10 it is disabled. Armoured targets cannot be disabled by suppressive fire.

Suppressive fire must be aimed at the middle or corner of a feature, or at the point from which fire has been received. It penetrates 50m into a built up area and 100m into any other terrain.

If an element which has not fired before in a game is covered by suppressive fire, it must take a morale check, whether or not it was affected by the fire, and if it fails it must return fire in its next movement phase.

13.10 SUPPRESSIVE FIRE EXAMPLE

5 M2 Bradleys are advancing on a wood when a missile is fired at them from the centre. The range is 450m, and they each fire their 25mm autocannon and co-ax m.g. for a total of $5 \times 2 \times 2 = 20$ fire factors. The maximum spread is 250m which is less than the total length of the wood so the fire factor is divided by $250 \div 25m = 10$ equals 2. The fire is centred on where the missile was fired from and any element in the zone is suppressed on a roll of 1 or 2. If the range had been under 250m each M2 could have added its infantry element firing from under armour giving a suppressive fire factor of 2.5 rounded up to 3. If the missile had come from a built up area 100m long this would have resulted in a suppressive fire factor of 5 as the fire could have been more concentrated.

Indirect Area Fire

INDIRECT AREA FIRE

14.1 GENERAL

Indirect Area Fire is carried out by artillery and rocket batteries, where the target is out of sight of the battery and fire is controlled by an observer.

14.2 ARTILLERY BATTERIES

- (i) Company level mortar or light gun platoon or section - 2 to 6 light guns or mortars usually of 60-82mm calibre, sometimes up to 120mm. Will have an observer team for each platoon they are supporting. This team will usually be combined with the platoon command unit. Dedicated fire support only.
- (ii) Battalion level mortar or gun support batteries - usually 4 to 6 mortars up to 120mm or a gun battery up to 122mm. May be in dedicated or direct fire support.
- (iii) Brigade or Regimental artillery or mortar batteries. There is usually a battalion consisting of three batteries of guns up to 155mm or mortars up to 160mm at this level each battery consisting of from 5 to 8 guns. In Western style armies at least one of these will be in direct support, whilst in Warpac style armies they will be in general support, although in both cases some may be for dedicated fire support.
- (iv) Divisional artillery batteries. These are batteries of guns of 152mm or larger and salvo or heavy rockets which may be in direct or general fire support.
- (v) Army or Corps Level batteries - may be of any calibre but will be in general support or for counter-battery fire only.

14.3 OBSERVERS

Western style artillery batteries usually have 3 or more observers and these will be detached out to the units they are ordered to support. In Warpac style armies there are usually only 2 observer teams per battery only one of which is observing at a time. Western observers may use direct fire support to increase the amount of fire by calling down the fire of any available battery as well as their own that has not had a request made by its own observer. All western style batteries in dedicated or direct support must have at least 1 observer on the table. In Warpac armies an observer may only call down his own dedicated battery, plus general fire support, ie. he has to request higher approval for other artillery. In Western armies platoon commanders and other higher levels of command may also request artillery support. If on the same net as the batteries observer, the fire arrives in the move stated on the Fire Mission Table, if not an extra move later. This means that only the battery attached to the observer has no additional delay. In Warpac armies company commanders may request dedicated artillery support with an additional moves delay and Battle Group commanders may request general fire support. All fire support requested by none observer elements is subject to unregistered fire deviation. In competition games it is suggested that all armies are treated as for Western.

14.4 TYPES OF FIRE SUPPORT

- (i) DEDICATED FIRE SUPPORT
The battery is dedicated to the on table Battlegroup and is available immediately for protective fire in attack/defence games or for opportunity fire in all games. It will have all its observers on table with the battlegroup and if the range requires it will be on table itself.
- (ii) DIRECT FIRE SUPPORT
The battery has a single observer on table and may carry out all types of fire mission shown on the Fire Mission Table. It is usually based off table, again some mortar batteries may be on table.
- (iii) GENERAL FIRE SUPPORT
These batteries have no observers on table, but may be called upon by any observer on table to carry out any but protective fire missions, however see reaction fire. Always based off table.
- (iv) COUNTER BATTERY FIRE SUPPORT
Only notionally attached to the game table in order to suppress artillery fire in the general area. May not carry out any other fire missions and are always based off table.

14.5 FIRE SUPPORT MISSIONS

- (i) PROTECTIVE FIRE MISSIONS
This is used to provide an instant barrage of fire in support of a defending unit. It may be called down by an observer or a command element from the unit it is supporting. It may be called down by the observing element if an enemy element is seen moving within

300 metres of the fire point or fire must have been seen coming from within 100 metres of the fire point. Dedicated fire support batteries may have up to three such fire points and direct fire support batteries up to one. These fire missions must be planned before the game starts and their exact position shown on a map.

(ii) REACTIVE FIRE MISSIONS

This is a form of Protective fire in reverse for Warpac style armies who through doctrine do not have direct fire support batteries. Up to one terrain feature per general fire support battery being used may be designated as a reactive fire point. If fire is observed or movement seen by a designated company of higher level of command element, coming from this terrain feature, fire may be called down immediately from that designated battery. Terrain features and designated command elements must be designated before the game commences.

(iii) OPPORTUNITY FIRE MISSIONS

The standard form of artillery fire missions. This mission can be carried out by any battery with the turns delay as shown on the Fire Mission Chart. Opportunity fire may be brought down on the position of the target or if it is moving, on a point which the target is likely to move through within 250m. If when the fire is to arrive the target is not within 100m of this point the battery will only fire for one turn at the sustained rate of fire. All such points should be marked on a map so that the opponent does not avoid the fire.

(iv) PLANNED FIRE MISSIONS

- (a) Available to Direct and General Fire Support batteries only except where pregame reconnaissance has identified enemy batteries and
- (b) Counterbattery fire support may also be planned.
- (c) Planned fire should not be allowed for more than half the estimated length of a game.
- (d) All such fire must be planned before the game commences, although after any pregame reconnaissance allowed

(v) INTERDICTION FIRE MISSIONS

- (a) May be carried out by any battery which is not carrying out another fire mission at a low sustained rate of fire.
- (b) Direct support batteries may have up to three different such missions throughout a game and General fire support batteries up to one. The number of turns of fire and the fire points must be plotted before the game begins.
- (c) An extra turns delay is added when switching from Interdictive fire to Opportunity fire.
- (d) Interdictive fire is not allowed for salvo rockets and can only be ground burst HE.

(vi) COUNTERBATTERY FIRE MISSIONS

- (a) Counterbattery fire is carried out by either batteries designated for counterbattery fire, which may not carry out any other fire missions, and are fully supported by location and rangefinding equipment and other batteries who occasionally may be used for this role and may have such equipment attached.
- (b) The chance of locating a battery for counterbattery fire purposes is shown on the Counterbattery Fire Table.
- (c) The fire is centred on one of the firing guns diced for at random and is always rolled for on the deviation table whether it is on target or not.

14.6 ARTILLERY FIRE ZONES

The beaten zone for an artillery battery is as shown over the page. This is for a simple concentration for a six or eight gun battery. If only 3 or 4 guns are firing, the beaten zone is half this area by width, if only 1 or 2 guns, half this again by depth. A fire zone template is included in the back of the rules. Programmed Fire, Protective fire and registered fire from dedicated batteries may also use a linear concentration. This is of half the depth and twice the width of that given for a simple concentration and its position and direction must be shown on the players map.

The beaten zone for Salvo and Heavy Rockets is for individual launchers. Each launcher after the first pair only increases the beaten zone by half the width shown.

For the vehicles - 2 columns to the right for the extra batteries and one column to the right for moving in the open, giving column 12. As A/T bomblets are being used, the die roll is modified by +2. Each vehicle is diced for and is suppressed on a 1, neutralised on a 4 and may be disabled on a 7. The BMP's are automatically disabled, the fire number 12 is more than 10 higher than the BMP's rear armour value. The T62's are disabled on anything but a 10, ie. 12 less the T62's rear armour value of 3 = 9.

- (iii) A single battery of 122mm firing at a cross roads at a supply convoy of trucks as interdiction fire. The base column is 8 which is moved one to the right for the target moving in the open, giving 9. The dice roll is modified by +2 for the soft transport element and -3 for interdiction fire up to 160mm. Each element is diced for and is suppressed on a 5, neutralised on a 7 and disabled on a 9. Note, any elements carried by the trucks would then be diced for under escaping from disabled vehicles counting as 0 armour and HE rounds over 90mm.

14.10 REGISTERED FIRE

- (i) Artillery batteries are able to use registered fire when they have had time to survey in their gun positions and possible fire zones. Such registration is usually only available to defending armies whose batteries have been in place for some time and to attacking armies carrying out a pre-planned bombardment in support of a deliberate attack upon a known enemy position.
- (ii) For the purposes of a once off game, rather than a campaign, if the battle is a competition or encounter, then neither side will count as being registered. If it is an attack versus defence game then the defender may have all batteries registered, whilst the attacker may have any but dedicated batteries registered. Exception: any battery which is on table and can see its target may count its fire as registered.
- (iii) The effect of registration is to increase the batteries' accuracy by reducing the effects of deviation.
- (iv) Once fire has been brought down on a point and an 'on target' deviation result has been achieved, this point will then be considered registered for the remainder of the game for the firing battery(s) only.

14.11 DEVIATION

- (i) All indirect artillery fire is subject to deviation, the extent of which is dependent on whether the firing battery is registered or not.
- (ii) A twenty sided dice is thrown and the appropriate deviation table is consulted. For each fire at the same fire point, that is not on target with its first fire, the appropriate die roll modifier is added for each additional fire until an on target result is obtained.
- (iii) Non-specialist artillery observers always use the unregistered fire column.
- (iv) If more than one battery is firing at the same fire point then all use the same deviation distance. If registered and unregistered batteries fire at the same target, then all count as unregistered.

14.12 SUSTAINED FIRE

Even Modern Artillery can only manage a high rate of fire for a short period of time due to fatigue and ammunition limitations. After an initial burst of fire, artillery keeps to a sustained fire rate with the appropriate die roll modifier on the Artillery Fire Chart.

Dedicated Fire Batteries
Direct Fire Batteries
General/Counterbattery

Up to 3 turns of burst fire
Up to 2 turns of burst fire
Up to 1 turn of burst fire

No battery of more than 160mm calibre can burst fire for more than one turn.

A battery must cease fire for a minimum of three moves before beginning again with a period of burst fire.

Note; Batteries firing at two thirds their maximum range always fire at sustained rate and are unregistered. This does not apply to salvo rockets which are always registered.

14.13 RANGES AND ANGLES OF FIRE

See the TTG army list for maximum ranges of artillery weapons. Minimum ranges for indirect fire and dead ground behind crests is as the following table.

Weapon	Minimum Range	Dead Ground
Mortars up to 82mm	250m	Nil
Mortars over 82mm	750m	Nil
Guns	1000m	2000m
Gun Howitzers	1000m	250m
Howitzers	1000m	Nil
Salvo Rockets	Quarter range	100m
Heavy Rockets	Half range	Nil

The arc of fire for artillery pieces is 30° either side of the carriage centre line unless having 360° traverse.

14.14 DEVIATION TABLE

Die Roll	Registered Fire	Unregistered Fire
1	100Rt	300Lg
2	100Lt	300Sh
3	100Lg	200Lg
4	100Sh	200Sh
5	50Rt, 50Lg	50Rt, 200Lg
6	50Rt, 50Sh	50Rt, 200Sh
7	50Lt, 50Lg	50Lt, 200Lg
8	50Lt, 50Sh	50Lt, 200Sh
9	50Sh	50Rt, 100Lg
10	50Sh	50Rt, 100Sh
11	50Lg	50Lt, 100Lg
12	50Lg	50Lt, 100Sh
13	50Rt	100Rt
14	50Rt	100Lt
15	50Lt	100Lg
16	50Lt	100Sh
17	On Target	50Lt
18	On Target	50Rt
19	On Target	On Target
20	On Target	On Target
	+3 on the dice for each fire after the first	+2 on the dice for each fire after the first

14.15 AMMUNITION TYPES**(i) GROUND BURST HE**

Used by nearly all indirect fire weapons.

(ii) AIR BURST HE

Effective against unprotected elements, used by most indirect fire weapons.

(iii) ILLUMINATION ROUNDS

See night rules for effect, used by all except for large calibre guns and howitzers, Salvo and Heavy Rockets.

(iv) SMOKE ROUNDS

See smoke rules for type and effect, used by all except large calibre guns and howitzers and Heavy Rockets.

(v) HEAT ROUNDS

Used by some gun and howitzers for self defence, see Direct Fire rules.

(vi) CLGP ROUNDS

Much has been expected of Cannon Launched Guided Projectiles but the only known working example is the U.S. Army's Copperhead which is only being introduced in limited quantities.

INDIRECT AREA FIRE

It is used against vehicles and other protected targets which have to be spotted by an observer attached to the firing battery who is equipped with a laser designator. A 4 or better is required to obtain a hit. The target is observed during Phase 1.6(ii) and must still be in view in the artillery resolution phase 3.6(ii) and within 500m of its original position. If not visible another target within 100m of the original point of aim may be chosen and the score to hit rises to 6.

The effect of a hit is as for that calibre HEAT round against the vehicles rear armour. Maximum range is 15 kilometres.

(vii) SUB-MUNITIONS

Fired from guns of more than 152mm, Salvo and Heavy Rockets.

- (a) Minelet - see section on minewarfare.
- (b) Bomblet - these are of two types, anti-personnel grenades, for use against unprotected targets, and hollow-charge grenades for use against armoured vehicles. They are fired as normal HE but with the appropriate modifiers.
- (c) Anti-Armour - such as SADARM, ASSAULTBREAKER. These are self-homing anti-armour warheads carried by the larger salvo and heavy rockets. To request such a missile the observer must have located a group of at least 5 vehicles and retain them in view until the missile arrives, these payloads are scarce and expensive. The munitions search pattern for a single salvo or heavy rocket launcher is as for a 6 gun 203mm artillery battery. All vehicles within this area are potential targets and must be diced for requiring a 6 or better. The effect is as for a HEAT round with a fire factor of 10 against the rear armour.

14.16 FIRE MISSION TABLE

Battery	Protective Fire	Opportunity Fire	Planned Fire	Interdictive Fire	Counterbattery Fire
Dedicated Fire	Yes Immediate	Yes Immediate	No	No	No
Direct Fire	Yes Immediate	Yes One Move	Yes	Yes	Yes One Move
General Fire	Reaction Fire	Yes Two Moves	Yes	Yes	Yes One Moves
Counter Battery	No	No	No	No	Yes Immediate

NOTE: Moves delay represents time for communication and approval from higher command. This may be affected by electronic jamming see 19.3(i).

14.17 COUNTERBATTERY FIRE TABLE

Battery Type and Equipment	Range to Target			
	0-5Km	5-15Km	15-30Km	30Km+
Unaided Battery	9	10	-	-
Equipped with Sound & Flash Ranging	6	7	9	10
Equipped with Counter Mortar/ Counter Artillery Radar	5	6	8	9

Die Roll Modifiers

Registered CounterBattery Fire Support	+1
Each round of fire from the target battery	+1
Salvo Rockets firing	+2
Mortars firing (radar only)	+1
Target battery dug in or camouflaged (S & R only)	-1

(13.11) **SMALL ARMS FIRE NUMBER TABLE**

Infantry Group Type	50m	100m	200m	300m	600m	800m	1000m	1200m	1800m
3 or more man squads									
Machine Pistol	12	9	4	2	0	0	0	-	-
Bolt Action Rifle	10	6	5	4	3	2	0	-	-
Semi Auto Rifle	11	7	6	5	3	2	0	-	-
Auto Rifle	12	9	7	4	2	0	0	-	-
Addition for S.A.W.	-	+1	+2	+2	+1	+1	+1	-	-
1 or 2 man squads									
Light Machine Gun	5	6	6	5	4	3	3	2	-
SFMG	4	7	7	7	6	6	5	4	2
HMG	4	6	6	6	6	6	5	4	3
Lt. Mortar	-	4	5	5	5	4	-	-	-
Auto Grenade Launcher	-	5	7	7	7	6	5	-	-
Flamethrower	12	6*	-	-	-	-	-	-	-
Crew/Sniper*	6	4	3	2	1	1*	1*	1*	-
Minigun	6	9	9	9	8	8	7	5	3
Canister	12	12	10	9	8	7	6	4	-

14.18 **SMALL ARMS AND ARTILLERY FIRE TABLE**

Mortars and Rockets Guns and Howitzers Autocannons																Up to Up to Up to	60mm 90mm 27mm	90mm 130mm 35mm	120 mm 160 mm 57mm	160 mm 250 mm	larger larger				
Die Roll	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
1												S	S	S	S										
2											S	S	S	N	N										
3										S	S	S	N	N	D										
4									S	S	N	N	N	D	D										
5								S	S	N	N	N	D	D	D										
6							S	S	N	N	N	D	D	D	D										
7						S	S	N	N	D	D	D	D	D	D										
8				S	S	S	N	N	D	D	D	D	D	D	DA										
9		S	S	S	N	N	D	D	D	D	D	DA	DA	DA	DA										
10	S	N	N	N	D	D	D	DA	DA	DA	DA	DA	DA	DA	DA										
11	N	N	D	D	D	D	DA	DA	DA	DA	DA	DA	DA	DA	DA										
12	N	D	D	D	D	D	DA	DA	DA	DA	DA	DA	DA	DA	DA										
13	D	D	D	D	D	D	DA	DA	DA	DA	DA	DA	DA	DA	DA										
14	D	D	D	D	D	D	DA	DA	DA	DA	DA	DA	DA	DA	DA										

- Notes
1. Most armies use semi or automatic rifles, the others are included for those who wish to use them. See infantry data for notes on weapons.
 2. The 100m range for flamethrowers is for vehicle mounts only.
 3. Gun Mortars, these take fire numbers as for mortars in table 14.18 above and apply any Direct Fire Modifiers for guns from table 14.19. If they fire HEAT/Bomblet such as the new Russian automatic 82mm mortar, then use the Direct Fire Modifiers for appropriate bomblet.

14.19 MODIFIERS FOR SMALL ARMS AND ARTILLERY FIRE TABLE

		Column Shift	Die Roll Modifier
All Fire	Target in concrete cover	3 to left	-
	Target in hard cover	2 to left	-
	Target in soft cover	1 to left	-
	Target moving in the open	1 to right	-
	Own element moving	1 to left	-
	Own element suppressed		-2
	Target soft transport element		+2
	Target open topped AFV or heavy weapon		+1
Small Arms	Each LAW or LAD fired		-2
Indirect Artillery Fire	Each extra artillery battery firing	1 to right	-
	Using anti-personnel bomblet - others/AFV		+2 / -2
	Using anti-tank bomblet - others/AFV		-2 / +2
	Using mixed bomblets		+1
	Using airburst HE - others?AFV		+1 / -1
	Using white phosphor smoke	4 to left	-
	If using RAP	1 to left	-
	Sustained rate of fire up to 160mm		-2
	Sustained rate of fire over 160mm		-3
	Interdictive rate of fire up to 160mm		-3
	Interdictive rate of fire over 160mm		-4
Direct Fire	Autocannons, guns and howitzers range over 1000m		-1
	Autocannons over 1500m		-3
	Guns and Howitzers over 1500m		-2
	Guns and Howitzers over 2000m		-3
	Using HE against constructions & field defences	1 to right	-
	Using HESH or HEAT against infantry elements	1 to left	-
	Each extra barrel of a multiple mount		+1
Air to ground Modifiers	Gatlings		+2
	Each gun firing		+1
	Minigun firing		+2
	Three barrel gatling firing		+3
	Six barrel gatling firing		+4
	Rockets up to 81mm against AFV's		+4
	Rockets over 81mm against AFV's		+5
	Each additional 250kg bomb weight		+1

14.20 FIRE TABLE RESULTS

S = All target types suppressed.

N = A.F.V.'s suppressed, all other types neutralised.

D = A.F.V.'s neutralised, all others disabled.

DA= All targets disabled except AFV which have a chance of being disabled.

A.F.V. disabled by throwing difference or less between the modified Fire Number and the A.F.V.'s rear armour if a gun or howitzer, side armour if mortar or salvo rocket, front armour if small arms fire from over 50m if closer rear armour. If not disabled, then is neutralised.

Side armour should be used for all air attacks except ATGW and Helicopters flying N of E, which depend on aspect.

14.21 COVER DEFINITION**(i) CONCRETE COVER**

Reinforced concrete buildings or permanent defences. Small arms fire is only effective against occupants. Artillery fire is counted both against the structure and the occupants. The structure is diced for first testing for each 50 metre square of building or floor if more than two stories high or for each bunker within the beaten zone. If the structure is destroyed, on a DA only, the occupants test as if not in cover otherwise as with the full cover modifier. If destroyed counts as hard cover thereafter, it cannot be destroyed further.

(ii) HARD COVER

Brick or stone buildings and field defences. Small arms fire only effective against occupants. Artillery fire is as for concrete cover except that it is destroyed on a K result. If destroyed counts as soft cover.

(iii) SOFT COVER

This is infantry and heavy weapons elements stationary and using natural cover such as hedges, ditches, the edge of a wood, shell scrapes etc. Also dug in vehicles.

Smoke

15.1 ARTILLERY

There are two types of smoke round, base ejected and white phosphorous. Base ejected is slow to thicken but covers a large area and lasts longer. White phosphor forms a screen quickly, has a HE effect but covers a smaller area and burns out quicker.

(i) BASE EJECTED SMOKE

This covers an area twice the size of the beaten zone producing it. The extra area is added downwind of the beaten zone which is twisted to line up with the wind. The screen is partial for the move after laying; it is then full for two moves followed by a move of partial screening before dissipating.

(ii) WHITE PHOSPHOR

This only covers the beaten zone and has a reduced HE effect. It is full immediately but only for the move after laying; it is then partial for another move.

(iii) MIXED SMOKE

A battery if provided with both rounds may fire one round of white phosphor giving a small but full screen, followed by a base ejected round in the next move giving a large full screen lasting for two moves before thinning.

(iv) MIXED SMOKE AND HE

This is a battery firing two guns with smoke and the remainder with HE. A partial smoke screen will cover the reduced HE area only.

(v) WIND

Wind speeds will affect smoke screens as follows, the speed being decided before the game:

Wind Speed	Affect
0-5Kts	only covers beaten zone but lasts extra move full
6-15Kts	normal
over 15Kts	base ejected only one move full

15.2 SMOKE DISCHARGERS

These are fired at the beginning of a movement phase, exception see ATGW spotting, and lay a smoke screen 50m ahead of the firer if hull mounted or on any arc if turret mounted. The screen is 100m wide by 50m deep and is an instant full screen lasting until the beginning of the next movement phase for that element. Smoke dischargers can only be used if under direct fire, the target of an observed ATGW or to escape fire from a previously located enemy. Smoke dischargers take one move stationary to reload, only if not suppressed, neutralised or firing.

15.3 VEHICLE EXHAUST GENERATORS

These are switched on throughout the movement phase and lay a partial smoke screen 40m wide along the length of the track of the vehicle. However, to form an effective screen the laying vehicle cannot move more than 400m in the movement phase. The laying vehicle is not covered by the smoke unless it drives back into it - see ATGW. The generator once switched on can operate for a maximum of three moves and once switched off cannot be used again for three moves due to problems with engine flooding. The screen only lasts until the beginning of the next movement phase.

15.4 SMOKE GRENADES

Infantry elements may form a smokescreen at the beginning of their movement phase, up to 50m away from the element. The screen is up to 50m wide by 25m deep and lasts until the end of the next movement phase. This is usually of white phosphor and is an instant full screen. Any enemy infantry elements within the screen are attacked on the small arms and artillery fire tables at a factor of 5 if not subject to any other direct fire within 50m.

15.5 SMOKE POTS AND CANNISTERS

These are usually the size of 5 gallon oil drums and are used in prepared assaults. Smoke pots produce a screen as for a gun up to 125mm treating it as mixed smoke when set off. Smoke cannisters may be attached to AFV's and produce a screen as for smoke generators for a maximum of one turn. The screen is however full.

Suppressed, Neutralised or Disabled

16.1 SUPPRESSION

An element which is suppressed has received fire which whilst not damaging has caused armoured vehicles to close down and other elements to think about seeking cover. It reduces fire morale and movement. A suppressed element may only move at half maximum speed for the terrain it is in. Suppression lasts until the suppression removal phase 3.6(iv) of the current game turn if caused in phase 2.6(ii) or 2.6(iii), or of the next game turn if caused in any other phase. All artillery if suppressed fire at sustained fire rate. Infantry elements escaping from disabled or leaving a suppressed vehicle are also themselves suppressed.

16.2 NEUTRALISATION

An element which has been neutralised has received damage either in terms of personnel or equipment such as vision blocks, radio aerials etc., which temporarily cause it to cease combat. It may not move towards a Known enemy position, but must move to cover within half a move or remain stationary, it remains in this position until it recovers. Elements may test for recovery in phase 3.6(iv) of the current game turn if caused in phase 2.6(ii) or 2.6(iii), or of the next game turn if caused in any other way. It remains neutralised unless a 4 or higher is rolled for an AFV or a 3 if any other type of element. When neutralised a command element is unable to communicate or give orders.

Elements carried in a vehicle which becomes neutralised may disembark counting as suppressed.

16.3 DISABLED

An element which is disabled has received severe personnel losses or if a vehicle serious or catastrophic damage and they are considered destroyed for game purposes.

In a campaign game, each element may be rolled for if you retain control of the battlefield or if the element has been removed from the battlefield before the end of the game and the following table consulted.

	slight damage	Minor damage	Major damage	Totally destroyed
A.F.V.	1-4	5,6	7,8	9,10
Other elements	1,2	3,4	5,6	7-10

16.4 TIMING OF VEHICLE DISABLEMENT AND ESCAPING FROM DISABLED VEHICLES

- (i) Vehicles disabled in Phases 2.6(iii) and 2.6(vii) are knocked out in the position they now occupy. Vehicles disabled in phases 2.6(ii) and 2.6(vi) are knocked out in the position currently occupied unless they moved out of sight during the preceding phase in which case the vehicle is moved back to the last position that they were in sight of the element that knocked them out. This may mean elements which have disembarked later in that movement phase may also have to be moved back and tested for as escaping from the vehicle. If knocked out in these phases whilst in sight, infantry which disembarked in the previous phase count as being neutralised.
- (ii) Occupants of vehicles which are disabled test to escape at the beginning of the morale phase by throwing the number or more shown on the table below. Test for each element separately except that if a 1 is thrown, that element and all remaining elements to be tested are disabled and the vehicle or construction has been destroyed by a catastrophic hit.

Vehicle or Construction Destroyed By	Infantry Element Armour Class Hit		Inf.Support Element Armour Class Hit	
	0-4	5+	0-4	5+
HE, HEAT over 90mm, HESH and Flame	7	6	9	8
Kinetic Energy Rounds 90mm or over	6	4	8	7
HE, HEAT under 90mm, Kinetic Energy Rounds under 90mm	5	3	7	6
Autocannons and MG	4	3	5	4



17.1 REASONS FOR MORALE CHECK

A morale check needs to be taken in the following circumstances by a platoon or independent section:-

1. The first time the unit suffers an element suppressed, neutralised or disabled.
2. If the unit command element is neutralised or disabled.
3. If a unit loses more elements in a move disabled than it disables of the enemy.
4. If a unit loses more than 25% of its elements disabled in one game turn or more than 50% of them are suppressed, neutralised or disabled.

17.2 RESOLVING MORALE CHECK

- (i) To test morale take the units morale grade and modify it by the following factors; the percentage factors are not cumulative;-

- +1 if in travel mode.
- if not in command control.
- if AFV moving in poor visibility or any unit at night or in smoke.
- if 25% or more of units elements are disabled or neutralised or 50% or more are suppressed.
- +2 if 50% or more of units elements are disabled, neutralised or 75% or more are suppressed.
- if under chemical attack.
- +3 if 75% or more of a unit is disabled or neutralised.
- if under nuclear attack.
- 1 if occupying defences, or AFV's in hull-down position to enemy.
- if more enemy elements disabled by own unit, or seen disabled within 500m, than unit has disabled itself this turn.

- (ii) Add the result of one die roll from the following table;-

Die Roll	1	2	3	4	5	6	7	8	9	10
Modifier	+3	+2	+1	+1	0	0	-1	-1	-2	-3

Now consult the following table+:-

Modified Morale Grade	1	2	3	4	5	6	7	8	9	10
Unit Test	OK	OK	OK	OK	1/2	1/2	Cover	Halt	Retire	Retire
Formation Test	OK	OK	OK	OK	OK	OK	Halt	Halt	Retire	Retire

1/2 Maximum advance is half move.

- Cover** Move to cover within half normal move and halt, unless already in cover, do not move to within 100m of previously acquired enemy, or element which requires 4 or less to acquire.
- Halt** Halt in present position or retire to cover within half normal move, retire 100m from previously acquired enemy, or an element which requires a 4 or less to acquire.
- Retire** Retire to regroup at pre-designated point, or off baseline at maximum speed if AFV or if infantry retire to nearest cover and become neutralised. Surrender to non-neutralised enemy elements within 50m.

- (iii) If a unit is within its higher command net radius and it is not required to take a test for any other cause it may attempt to regain good morale by taking a morale check with an additional +1. If it fails it remains at its current morale state. Units suffering a 'retire' result must, if AFV, reach a pre-designated point before testing.

17.3 FORMATION MORALE CHECK

- (i) A higher formation may also have to check its morale as a result of poor morale of an immediate subordinate unit that is suffering a 'retire' result. Thus a tank company that has a platoon forced to retire must check the morale of the command unit. Note that a higher level command unit may also have to check morale as an independent unit due to its own circumstances. If it fails on a 'retire' result or it is disabled then all its subordinate elements must take a morale check counting as being out of command control.
- (ii) To test a formation morale take the command units morale grade and modify it by the following factors;-
- +/- for any deductions already listed above in 17.2(i) that applies to itself.
 - +1 each subordinate unit that has a halt reaction.
 - +2 each subordinate unit that has a retire reaction or has been totally eliminated.

Add the result of the die roll from the table in 17.2(ii) above and consult the following morale results table;-

- Halt** All subordinate units halt and seek cover within half a move. A unit reaction of 'halt or Retire' overrules this.
- Retire** All units must retire to regroup. Except that units that still have good morale may act as a rearguard and units in field defences may stay in place.

17.4 MORALE LEVELS

For competition purposes all units should have a morale level of 3. Otherwise players may classify troops as they wish a guide being given below, see infantry data for further information.

Morale Grade	Troop Type
1	Elite formations with combat experience
2	Elite formations, Regulars with combat experience
3	Regulars, Conscripts with combat experience
4	Conscripts, Militia with combat experience
5	Poor Conscripts and Militia
6	Irregular Militia

Note should be taken of the differences in the armies being used and the troops graded accordingly. Thus militia in the Iraq-Iran war would be graded 4 but against the Israelis 5 or 6, they just would not be confident of winning.

Night Fighting

Darkness affects both movement and acquisition and most armies have ever more sophisticated night aids so that the battle may continue non-stop.

18.1 TARGET ACQUISITION

The following table gives the ranges and sensor classes at which the various nightfighting aids are effective.

Night Fighting Aid	Type	Target	Sensor Level 1 Up to	Sensor Level 2 Up to	Sensor Level 3 Up to
Flares Illumination Rd.	Grenades, Lt. Mortar	Any within	50m	-	-
	Mortars, guns up to 90	Any within	100m	-	-
	Mortars, guns over 90	Any within	200m	-	-
	Aircraft Flares	Any within	500m	-	-
White Searchlight	Small	Any up to	250m	500m	750m
	Large	Any up to	500m	1000m	1500m
Infra Red	Searchlight	Any up to	500m	1500m	2000m
	Support Weapons	Any up to	250m	500m	1000m
	Infantry	Any up to	100m	250m	500m
Image Intensifiers	Vehicle/Spt Weapon	Any up to	500m	1000m	1500m
	Infantry	Any up to	100m	250m	500m
Low Light T.V.	Vehicle Mtd.	Any up to	1000m	1500m	2000m
Thermal Imaging	Vehicle/Spt Weapon	Vehicle up to	1000m	1500m	2500m
	Artillery Location	Vehicle up to	1000m	2500m	5000m
	Infantry		500m	1000m	1500m
Ground Surveillance Radar	Manportable	Infantry Moving	500m	1000m	1500m
		Vehicle Moving	1500m	3000m	5000m
	Heavy or vehicle Mtd	Infantry Moving	750m	1500m	2000m
		Vehicle Moving	5000m	10000m	20000m

Notes

- Flares and illumination rounds last for one complete turn except for aircraft flares, which last two.
- Elements using white searchlights are detectable at twice each sensor range.
- Infra Red using elements are detectable at twice each sensor range.
- Image intensifying and Low Light TV have their ranges halved if there is complete darkness, but no deduction for partial smoke.
- Image intensifying and infra red night aids may not be used against targets illuminated by white searchlights or flares.
- Thermal imaging may be used to detect elements through smoke screens using appropriate sensor level modifier, but cannot be used through diesel exhaust smoke generators.

- (vii) The previous table gives the ranges at which the different Sensor level modifiers apply to acquire targets. eg:-

A vehicle mounted image intensifier operating at night has a modifier of +2 (Sensor level 1) up to 500m, +3 (Sensor level 2) up to 1000m, +4 (Sensor level 3) up to 1500m.

18.2 MOVEMENT AT NIGHT

Infantry elements move as for open woods.

Vehicles using driving lights, Infra Red, or Image Intensifying may move a maximum of 500m, without 250m. Full road bonus may be added if on a road for the whole movement phase.

Electronic Warfare

19.1 GENERAL

The effect of electronics and the micro-chip revolution is one of the big imponderables in any future war, the effect on acquisition and nightfighting is dealt with elsewhere and it is proposed to deal with only two further aspects here - detection and jamming.

19.2 DETECTION

Most electronic detection systems have been covered under the night and counterbattery rules. Two other aspects are covered below.

- (i) **Radio Interception** - If specialist radio interception equipment is provided any radio messages between on table units may be intercepted on a die roll of 9 or 10, and between on table and off table on a 10. During pre-game reconnaissance a radio intercept unit may roll for each enemy company or independent platoon and on a 10 may read its orders. A counterbattery unit equipped with radio intercept unit may roll a dice for each company or higher level command unit each turn and on a ten will have detected the location of that unit and may bring down fire as normal counterbattery on that point, all such fire counts as unregistered and lasts for two moves at the sustained rate of fire.

- (ii) **Ground Sensors** - Used as a form of tripwire detection. Will locate moving enemy units, either to alert troops to the presence of the enemy, set off booby traps or bring down protective fire - usually from company mortars, at night or in dead ground. Sensors may be set up to 250m from a defending unit and will detect moving infantry elements on a die roll of a 6 or better within 100m of the sensor and vehicles on a 3 or better within 500m. The position of the sensor must be marked on the players map. More sophisticated sensors may be dropped from aircraft along likely enemy approach routes to provide information for interdiction fire which if the sensor detects a target brings down fire at the sustained rate of fire not the interdiction rate or allow an air strike to be targeted on that point. Such sensors require an ECM aircraft to control them orbiting within 20000m.

19.3 JAMMING

- (i) **Radio Jamming** - General radio jamming affects the transfer of orders, requests, and command control. Levels of jamming may be agreed before the game or if allowed paid for by level in a competition game. Thus if the jamming level is one, each time an element wishes to communicate, if a 1 is rolled the attempt fails, if it is level 3 then on a 1,2 or 3 the attempt fails. The jamming level drops by one, to a minimum of one for each five game turns representing units finding less affected channels. The using players troops are not affected by their own jamming. Note a unit also tests when it is required to take a morale check and is out of command if it fails.
- (ii) **Radar Jamming** - The specific radar to be jammed must be specified before the game begins and the jammer is usually carried by aircraft although some ground mounts are known. A jamming system or pod may cover a number of different radars at the appropriate cost. All types of radar may be jammed, but this must be for a specific weapon like SA-2 radar not just all A.A. radar.

19.4 R.P.V.s

R.P.V.s are small pilotless aircraft which are extremely hard to see visually and have a small radar signature. It moves as for a medium speed helicopter at high altitude and may be acquired and fired upon by A.A. weapons as for aircraft except that it has no saving throw. It is aborted and destroyed as for a helicopter. The link to the controller may also be affected by specific jamming if the link is cut the R.P.V. is lost.

R.P.V.s can be used as an artillery observer. It is equipped with a lowlight T.V. and has a data-link to a designated artillery observer. It acquires as normal counting neither as moving or higher, but counts the sensor modifiers as if it were night due to the difficulty of the ground observer interpreting the picture, any artillery fire called down counts as unregistered.

Nuclear, Biological & Chemical Warfare

20.1 GENERAL

It is to be hoped that none of these weapons are used on the battlefield. Their impact on a game is tremendous and their use should be strictly controlled. They should not be used in a competition game and in other games the level of approval to request a strike should be agreed before the game. Biological weapons are not considered here.

20.2 CHEMICALS

Russian doctrine stress the use of chemicals and they certainly retain large stocks. Only two forms will be considered here, persistent and non-persistent. Their effect on troops is to suppress those elements which are within or which enter the affected area for 5 moves if non-persistent or until decontaminated - after the game if persistent. Elements are disabled by chemical attack as shown on the following table:

Element	Persistent		Non-Persistent
	Initial Move	Subsequent Moves	Initial Move Only
Prepared A.F.Vs	9	10	10
Unprepared A.F.Vs but fitted with N.B.C. systems	7	10	8
Other Vehicles	4	7	6
Prepared Infantry	8	10	9
Unprepared infantry but with N.B.C. kit	6	10	7
Unprepared infantry	3	6	5

The above number is modified for any of the following that apply:

- 1 No wind
- 1 Used at night
- +1 Wind speed over 15Kts.
- +1 Bright sunlight
- +2 Raining

20.3 CHEMICAL DELIVERY

Chemicals can be delivered as follows:

- (i) Artillery - The initial affected area is the same size as the artillery fire zone, this is extended downwind on the following move as for a smokescreen.
- (ii) Aircraft Bombs - each bomb covers a 50m x 100m area along the aircraft's flightpath, this doubles in width on the following move to 100m.
- (iii) Aircraft Sprays - This produces a strip of chemicals 100m wide per aircraft along the length of its flightpath from the point it is switched on. The point it is to be switched on and off must be decided and plotted at the time the aircraft's flightpath is noted on the players map. The maximum length that an aircraft can normally lay is 4000m.
- (iv) Chemical Mines - Prelaid defensive mines each producing a 50m x 50m affected area, increasing to 100m x 100m in the second move.

20.4 CHEMICAL ENDURANCE

Non-persistent chemicals last 5 moves and are affected by wind, they will drift 50m downwind for every 5Kts of wind speed. Their endurance is reduced by one turn for every 5Kts of wind speed over 15Kts.

Persistent chemicals do not drift and last the entire game.

20.5 NUCLEAR WEAPONS

Nuclear weapons may be delivered by heavy rockets and artillery down to 155mm as indicated on the data tables, or various aircraft delivery systems. Only one weapon may be delivered per turn and its point of impact must be determined as for normal artillery. Only low yield weapons are considered as anything larger would defeat the purpose of the game.

The area affected by a nuclear weapon is as follows:

Delivery System	RADIUS		
	Primary Zone	Secondary Zone	Tertiary Zone
Artillery	250m	500m	1000m
Rockets and Aircraft Bombs	500m	1000m	2000m
Neutron Enhanced Bombs	750m	1000m	1500m

20.6 EFFECTS ON ELEMENTS

Zone	Element	Neutralised	Disabled
Primary	Unprotected elements	-	1
	Elements in hard cover	-	1
	Armoured Vehicles	-	1
Secondary	Unprotected elements	3	3
	Elements in hard cover	3	5
	Armoured Vehicles	4	8
Tertiary	Unprotected elements	4	6
	Elements in hard cover	6	8
	Armoured vehicles	8	10

20.7 EFFECTS ON TERRAIN AND MOVEMENT

All structures destroyed in Primary zone, light structures in secondary zone, roads in built up areas impassable in these zones.

All trees and foliage burnt in primary zone and blown down in secondary and tertiary zones, roads impassable through woods in these zones.

No units may enter a primary zone for the remainder of the game unless caused by neutron bomb, when A.F.V.s may enter. A.F.V.s may enter secondary zone but not unprotected elements which if still there must leave.

For damage to terrain, treat neutron bombs as an artillery delivered weapon.

Engineering & Mines

21.1 GENERAL

Most engineering works take too long to be considered within a game, but in order to speed a game up the time taken has been reduced by a two-thirds for all actions listed in this section. Unless otherwise stated, these actions are carried out in the movement phase and the unit cannot fire in its fire phases that turn.

21.2 CONSTRUCTIONS

Building times are as follows:

Construction	Time
Foxhole or weapons pit	10 turns for unit digging it
Log bunker	36 turns for one squad
Vehicle or Artillery position	5 turns for vehicle with dozerblade 2 turns for specialist engineer vehicle
Anti-Tank Ditch	10 turns per 50m with engineer vehicle
Trench System	5 turns per 50m with engineer vehicle
Anti-Tank Barricade - Log	30 turns per 50m by two squads 10 turns with engineer vehicle help
Anti-Tank Barricade - Rubble	10 turns for vehicle with dozerblade
Triple layer barbed wire	5 turns per 50m for one squad

21.3 BRIDGING

Assembly and laying times for Soviet and NATO types given below:

Type	Name	Assembly	Notes
<u>SOVIET</u> AVLB	MTU, -55, 20	1 turn	Spans small rivers, streams, A/T ditches up to 25m
Truck Mtd. Bridge	TMM	10 turns	Span 50m carried on four trucks
Pontoon Bridge Set	PMP	5 turns	Span 100m to carry tanks or 200m for trucks and APC only. Carried on 24 trucks. Double length for Army Level units
Hvy. Pontoon Bridge	TPP	20 turns	Span 250m carries anything. Carried on 108 lorries.
<u>NATO</u> AVLB	M48/60 Leopard/ Chieftain	1 turn	as Soviet
Ribbon Bridge		10 turns	Span 200m carries all.
Pontoon Bridge	M4T6	15 turns	Span 50m per section.
Girder Bridge	Bailey	20 turns	Span 50m per section.

21.4 FERRIES

Assault boats carry one squad can be assembled and launched in one move, thereafter move at 50m per move as do larger ferries. Several ferries are made up of pontoon bridge sections and these can often carry more than one vehicle, the assembly times given are for one vehicle lift only.

Ferry	Assembly	Notes
SOVIET		
PMP Sections	2 turns	in various sizes up to 170t
GSP Ferry	1 turn	carries one tank
PTS-M	Mobile	carries up to 70 men or lorry and tow
K-61	Mobile	carried up to 50 men or lorry and tow
BAV	Mobile	carries up to 28 men
NATO		
Ribbon Bridge Section	2 turns	in various sizes up to 120t
M3T6 Bridge Section	30 turns	in various sizes
MAB	2 turns	carries one tank

21.5 MINE TYPES AND EFFECTS

The effective position of a minefield can have a crucial effect on a battle and it can be a perilous job to clear.

- (i) ANTI-TANK - AT, for each 25m of a field crossed by a vehicle roll a dice, the vehicle hits a mine on a 6 or better - roll again on a 1 or 2 the vehicle is neutralised otherwise it is disabled if the mine was a normal type: 1 or 2 vehicle suppressed, 3 to 5 neutralised, otherwise disabled if a scatter mine.
- (ii) ANTI-PERSONNEL- AP, affects all but AFV as follows: for each 25m of field crossed, roll a dice a mine explodes on a six if buried, 7 if scattermine, or 8 if a surface mine, roll again for effect, 1 or 2 suppressed, 3 to 6 neutralised, 7 or higher disabled. AFV's have a chance of being affected, 1 - 6 nothing, 7 - 9 suppressed, 10 neutralised.

21.6 MINELAYING

Buried or surface mines are usually laid before the game and must be marked on the players map, they may be marked or unmarked on the table - a matter of cost. Scatter mines are smaller and can be easily laid during the game.

Treat all minefields as units 100m long by 25m wide and they may be laid as follows:

Automatic Minelayer may lay one unit of buried mines in a turn or two units or surface mines. Manual minelaying requires two squads five turns to lay one unit of buried mines. Scatter Mines may be laid by (1) Artillery covering artillery fire zone.

- (2) Automatic box launchers covering two units per half turn from vehicle mount, helicopter or aircraft pass.

21.7 MINECLEARING

Mines may be cleared as follows:-

- (i) Rollers, Ploughs or flails, maximum move for rollers 300m, for others 200m. They clear a one vehicle wide path, but there is still a chance of mine being missed and on a die roll of a one any vehicle including the clearing vehicle explodes a mine.
- (ii) Explosives line charge - These are rocket launched flexible tubes of explosives which clear one vehicle wide lane up to 100m in length for US M-173 - takes one move to set up before firing, 150m for British Giant Viper and 175m for Russian Armoured Vehicle Launched (from BTR 50Pk or T55A(M)).
- (iii) Artillery fire can partially clear minefields. For every two moves the field is under fire of between 90 & 105mm guns increase the die roll to hit by 1, for every move under fire from up to 180mm guns increase by 2, and for over 180mm & Salvo Rockets increase by 3.
- (iv) Successful traverse of an element across a field leaves an element width passage, there is still a chance to set off a mine as for (i) above and an infantry element does not clear a passage across an Anti-tank field.
- (v) Manual clearance can take hours, if not days, with modern mines.

21.8 BOOBY TRAPS

These may be used in attack/defence games and their position should be marked on the players.

- (i) Remote controlled charges - These may be set up in or adjacent to any piece of cover or in a road. They may be of AP or AT size and their position must be visible to the firing element who must have spotted an enemy element before detonating the charge; it will fail to detonate on a roll of a 1. The effect is as for the equivalent mine. If of AT strength and set in a road it will crater it.
- (ii) Trip-wire or sensor controlled AP charges - Used for ambush or harassment, will be set off by a unit passing within 25m on a roll of 5 or more.
- (iii) Claymore Mine - Used in connection with either of the above counting as a flamethrower against all infantry units within a 90 ° arc of its front, and up to 100m range. Its direction must be marked on the map.

21.9 DEMOLITIONS

Engineers may remove or fill in defences as follows:-

Fill in 25m of A/T ditch	2 squads vehicle with dozer Vehicle with fascine	10 turns 2 turns 1 turn
Remove 25m A/T Barricade - Log	2 squads vehicle with dozer Engineer vehicle	10 turns 5 turns 2 turns
Remove 25mm A/T Barricade - Rubble	2 squads vehicle with dozer Engineer vehicle	20 turns 10 turns 4 turns

Destroying log bunker with satchel charges - placed during movement phase by infantry element that is not neutralised, if the element is still not neutralised or disabled in the following own player's fire phase, it will destroy the bunker on a 5 or better. If it was a concrete bunker a 8 or better.

21.10 BRIDGE DESTRUCTION

Permanent bridges count as concrete cover against artillery fire. Temporary or wooden bridges count as hard cover. They take 20 turns to prepare for demolition. On a 1 or 2, the charges fail to go off, 3 to 8 the bridge is demolished, 9 or 10 can still take infantry element.



Helicopter Operations

22.1 GENERAL

Helicopters are an important and complex part of modern warfare. Helicopters are becoming more sophisticated and carrying a heavier weapons load to deal with all forms of ground elements and increasingly against their own kind. Despite armour on the latest attack helicopters, they are still fragile machines and I hope the following rules reflect their strength and weaknesses.

Helicopters bought in direct support arrive two moves after they are requested. If in general support three moves after requested.

22.2 MOVEMENT

Helicopters can be considered as very fast vehicles and move during the movement phase 2.6(i) or 2.6(v) after all other movement and also during the aircraft movement phase 2.6(i) before all other aircraft movement. They will fly at Nap of Earth or Contour Level.

MOVEMENT

		Forward Speed		Backwards, Sideways or Pop Up
		N of E	Contour	
SLOW	Cruising speed 200Kts	1000m	1500m	150m
MEDIUM	Cruising speed 250Kts	1200m	2000m	200m
FAST	Cruising speed 250Kts+	1800m	2500m	250m

22.3 LOADING AND UNLOADING

Element Type	Unloading	Loading
Infantry (hovering)	1 phase	1 phase
Infantry	1 phase	1 phase
Internal loads (vehicles)	1 phase	1 phase
Internal loads (other)	2 phases	4 phases
Slung loads	1 phase	1 phase

Notes

- The time for loading and unloading infantry from a hovering helicopter is per element.
- Vehicles that are slung loads take a further phase before they may move or fire.
- Elements may be unloaded in phase 3.6(i) but may not move more than 50m from the helicopter.
- Other heavy loads include support weapons and ammunition not loaded or towed by a vehicle.
- It is suggested that Mi24 helicopters not be allowed to move in N of E (this is optional for club games only).

22.4 FIRING

Helicopters may fire in phase 2.6(ii) or 2.6(vi) and phase 3.6(i). They may not fire in phases 2.6(iii) or 2.6(vii). ATGW's may only be fired in phase 2.6(ii) or 2.6(vi) and area fire weapons in phase 3.6(i).

Machine guns, autocannons, grenade launchers fire as their ground mounted equivalent, including deductions for moving and stabilisation, however the helicopter may have made a full move in phase 2.6(i) or 2.6(v) and still fire in phase 2.6(ii) or 2.6(vi). ATGW's fire as their ground mounted equivalent. The helicopter may not have moved more than half a move in phase 2.6(i) or 2.6(v) and the deduction for stabilisation and movement apply.

During phase 3.6(i) helicopters may only fire area fire weapons and at other helicopters and in certain circumstances other aircraft. See section on air to air and air to ground combat.

Helicopters may fire guns in phases 6.2(ii) and 6.2(vi) and as area fire weapons once in phase 6.3(i).

22.5 POP UP MANOEUVRE

Specialist attack helicopters may perform a pop up manoeuvre during phase 2.6(ii) or 2.6(vi) if they did not move in phase 2.6(i) or 2.6(v). In this, the helicopter rises from behind cover and fires during phase 2.6(ii) or 2.6(vi), it then drops behind cover at the end of phase 2.6(iv) or 2.6(viii) and can make a limited move in any direction to avoid indirect fire.

22.6 ANTI AIRCRAFT FIRE AT HELICOPTERS

Treat Helicopters as vehicles for acquisition and firing. They are however counted as armoured. This armour applies all round. For small arms and artillery fire test as for AFV's on both a D and DA result. If a helicopter is disabled the occupants are all disabled if at contour height. if at N of E, hovering or landing use the escape from vehicles table with the following modifiers: if hovering +1, if moving up to $\frac{1}{2}$ +2, if moving more than $\frac{1}{2}$ +3.

See direct fire table (Pg13) and section below for AAGW fire against helicopters.

Only guns designed for AA fire, MG's and autocannons may fire at moving helicopters, ie. those that moved during phase 2.6(v). Any may fire at hovering helicopters.

Radar may not be used against N of E helicopter targets.

Note:- Helicopters may be fired at by guns in phases 6.2(ii), (iii), (vi) and (vii), missiles in phase 6.3(i).

22.7 AAGW FIRE AGAINST HELICOPTERS

For AAGW fire the target is acquired and fired at as for ATGW fire using the appropriate factors. The helicopter may attempt to spot the missile as a second generation ATGW and if spotted can carry out evasive action counting as Pop-up modifier.

Penetration factor for AAGW missiles are:-

Redeye/Stinger/Blowpipe/SA 7/SATCP	7
RBSYO/Chapperal/SA 13/SA 9/Crotale/Tigercat	9
SAB/Roland/Rapier/Indigo/Sidewinder/Attol	10

22.8 MAST SIGHTS

Some helicopters are being fitted with mast sights which will allow them to direct fire as if using a periscope equipped vehicle, use a laser designator, or acquire a target before deciding to perform a pop-up manoeuvre.

Third generation missiles may be fired from full defilade.

22.9 AIR TO AIR FIRE AGAINST HELICOPTERS

With the increasing effectiveness of helicopters as anti-tank weapons more consideration is being given to hunting them either with other helicopters or specially prepared aircraft, the first of which to enter service will be the Alphajet.

Helicopter v helicopter is treated as for ground firing vehicles. Aircraft attempt to spot helicopters at an assumed range of 2000m using visual only counting as if on overwatch, and the minimum range for firing is 500m. Treat firing an air to air missile as an AAGW using either the sidewinder or Attoll factor. Note some helicopters are now being fitted with AAGWs and may fire back after the aircraft has fired. The helicopter must be within a 45° arc of the aircraft's flightpath to acquire it.



Aircraft Operations

23.1 TYPES OF AIRCRAFT AND THEIR MISSIONS

- (A) Strategic Bomber - such as B-52G, Tu 16, Vulcan. The mission must be planned before the game specifying the load, turn of arrival, flightpath, height and point of weapons release. Only one such mission may be planned per game. It may be cancelled but cannot be retargeted.
- (B) Tactical Bomber - such as F-111F, Su 24, Buccaneer. The mission must be planned as for (A) above, but if an air liaison team is available its flight path, height, and point of release may be altered providing this is down at least one move before it is due to arrive.
- (C) Ground Attack Fighter - such as F-4E, Mig 27, Jaguar GR1. The most common form of air support may be requested, preplanned, or on call.
- (D) Light Ground Attack - such as A-1H, Hawk, AT-37B. These are training aircraft, older aircraft and specialist COIN aircraft, used by smaller air forces, for counter-insurgency or if you are desperate. Missions as for (C).
- (E) Specialist Ground Attack - such as A-10A, Frogfoot, Harrier, Alphajet, AC-130. Their missions require them to spend longer over the table and may carry out, anti-tank, fire support or anti-helicopter operations. The specific operation must be specified before the game. They may be preplanned or on call missions.
- (F) Observation and Liaison - such as O-2, OV-10. These aircraft will be on call or have preplanned missions.
- (G) Tactical Transport - such as C-130H, Andover C.1, An 24. Their mission must be preplanned and will usually take the form of an air drop unless an airfield features in the terrain. Their mission may be altered as for (B) above.
- (H) Strategic transport - such as C-141B, C-5A, An-22, Il-86. Their mission must be planned and executed as for (A) above.
- (J) Reconnaissance - such as RF-4D, Mirage 111R. These missions must be preplanned before the game - see pre-game reconnaissance.
- (K) Electronic warfare aircraft - such as F-4G, EA-6B, Yak-28E. These may be planned to accompany any of the above missions. They will remain on station until the mission is complete if using active jamming or until stores expended if on flak suppression.
- (L) Fighters. These are not considered, aircraft appearing over the table are assumed to have penetrated the main air defence zone or for air drops air superiority has been obtained. Even if aircraft are over the table at the same time they will not engage in air to air combat, excepting anti-helicopter missions.

23.2 PLANNING MISSIONS

- (i) Preplanned mission aircraft will only make one pass over the table if A,B,G,H,J two passes if C,D, five passes or turns on the table if E, unlimited if gunship or F.
- (ii) For requested aircraft use the system in the Ultra Modern Army Lists and Organisations.
- (iii) On Call aircraft must be requested by an air liaison team, they will arrive in the move after that in which they are requested and the number of passes allowed is as in (i) above.
- (iv) Time of Arrival - unless it is an attack/defence game no aircraft may be programmed on turn one.

23.3 FLIGHT PATHS

If carrying out a preplanned mission the flightpath will be specified before the game for all but type D,E,F aircraft whose entry point must be specified. For requested or on call aircraft, the flightpath or point of entry must be specified at the time the request is made.

All flight paths except for type D,E,F aircraft, are a straight line crossing both players baselines. For subsequent passes they may enter the exited baseline at any point but must exit at the original entry point and so on, unless carrying out a lofting attack when the aircraft's direction is reverse after releasing its load and it returns along its entry track.

Type (D) aircraft may make up to two turns with a radius of at least 500m and exit either baseline.

Type E and F aircraft may stay on table by making turns of at least 500m radius, their minimum move distance if jet powered is 5000m or 2500m if prop powered.

Aircraft which do not enter the table but release guided weapons are considered to be orbiting at the distance of the release point for the whole game turn.

23.4 HEIGHT

Aircraft may be at contour, low, medium, high or very high altitude usually depending on the load being carried and the mission, unless remaining on the table they may not change altitude until they have exited the table. Between passes they may change between contour and medium at will but to go to high or very high requires an extra turn off table. Aircraft on table may change their height at the end of a turn.

23.5 AIR TO GROUND ACQUISITION

Unless the point of release has been pre-planned, designated by an air liaison team and or laser designator, an aircraft may make up to four acquisition attempts, one in each quarter of its flight path. These must be at a point at least 1000m ahead unless it is an orbiting type E or F aircraft. See Weapon loads for release distances and height requirements. Acquisition is as for the appropriate ground acquisition with the following amendments:

- (i) Acquirer higher only counts at low altitude.
- (ii) Always use the largest target aspect unless at contour level.
- (iii) Observing on the move does not count if second crewman available.
- (iv) +2 acquiring from high.
- (v) No acquisition can be made from very high.

23.6 AIR TO GROUND FIRING

Aircraft may fire guns and rocket pods twice in one phase providing there is at least a quarter of the flight path between each fire. All other weapons may only be used once per turn. Unless preplanned or designated, all firing must be at an acquired target. All areas covered on artillery fire zone is that for 'up to 90mm' guns.

23.7 GUNS

These may be fired from contour or low level either as direct fire or area fire. The minimum range for firing is 250m. Direct fire counts as for the equivalent ground fired weapon. Area Fire uses the autocannon line on the small arms and artillery fire table with the area covered being A-G-H-B on the Artillery Fire Zone. MG's will first take their fire numbers from the small arms fire number table. See Modifiers for number of barrels firing.

23.8 ROCKET PODS

These are an area fire weapons and may be used from contour to medium level. They have a minimum range of 500m and a maximum range of 2000m. The area covered is A-G-H-B per pair of pods extending along the flight path by the same area for each additional pair fired. Rocket pods count as having a fire number of 12 with die roll modifiers against AFV's of +4 for rockets up to 81mm in calibre and +5 over.

23.9 BOMBS

These are area fire weapons with a beaten zone equivalent to A-G-H-B if standard HE bombs per pair of bombs dropped, this is extended along the flightpath by the same area for each additional pair of bombs dropped. The HE value of a 250Kg bomb is 8, with a die roll modifier for each 250Kg above that weight.

Cluster bombs cover an area A-F-D-C with a value of 10 counting as anti-personnel bomblets if high fragmentation and anti-tank bomblets if cluster.

Bombs must be released 1000m from the point of aim at low level, with an additional 500m per level above this. They may not be released at contour level unless retarded bombs are being used.

Bombs are always subject to deviation as for unregistered fire.

23.10 GUIDED BOMBS

These are standard bombs guided by laser or T.V., they may be released up to 4Km away if at low level or 8Km if at a higher level.

They are subject to deviation as for registered fire.

23.11 GUIDED MISSILES

These are as for guided bombs, except the maximum release distance is up to 12Km.

23.12 ANTI RADAR MISSILES

These may be used by an ECM aircraft whose ECM is preprogrammed for use against the radar threat detected. The ECM aircraft needs to throw its ECM number or better to lock on before releasing the missile which is not subject to deviation and counts as a HE value of 12.

23.12 ANTI AIRCRAFT FIRE

This is carried out throughout the aircraft phase and is an integration between the firing weapon and the ability of the aircraft to avoid, jam or absorb their effects.

23.13 AA OVERWATCH

Anti Aircraft elements on AA overwatch cannot move in any move in which they have been declared as being on overwatch in phase 6.1(iii). They may fire in phase 6.2 but if so they may not fire in phase 6.3. Acquisition of ground targets has a modifier of +2. FCR may be used in phase 6.2 giving a -2 Direct Fire Number modifier against helicopters.

23.14 ACQUISITION - VISUAL

This includes the ability to react and lock on to the target.

	Range				
	1000m	2000m	5000m	10000m	10000m+
Element on Overwatch	1	2	3	5	6
Other elements	1	3	5	8	9

Modifiers

- | | |
|---------------------------------|---|
| -1 Aircraft type A,G or H | +2 Aircraft at contour or very high level |
| -1 Aircraft has fired this turn | +2 Aircraft not in visibility arc. |
| +1 Aircraft aborting | +1 Aircraft high |
| +1 Self moving | +5 R.P.V. |
| +2 Self suppressed | |

23.15 ACQUISITION RADAR

This depends on the radar system of the firing missile or gun. A radar will control as many missile or gun systems as designed. Missile radars can usually track and fire at up to three targets, a gun battery will usually fire at one target. See A.A. data for radar factors of missiles, gun fire control radar may be between 2 and 5 depending on system, usually treat as 5. Roll one die and the radar is locked on if the number rolled is equal or more than the modified radar factor. Radar lock on gives a -1 on its AA factor.

RADAR MODIFIERS

Aircraft at Contour Level	+3	Each point of specific jamming	+1
Aircraft at Low Level	+1	Each two points of general radar jamming	+1
Aircraft at High	-1	Each 5000m or part of range	+1
Aircraft at Very High	-2	Target R.P.V.	+4

23.16 RESOLUTION OF ANTI AIRCRAFT FIRE

An anti-aircraft element may only fire once during phase 3(i) and it may not have fired in any of the previous fire phases. It may, however, make up to two acquisition attempts, one in each of two quarters of an aircraft's flightpath, these acquisition attempts may not be in contiguous quarters i.e. if the attempt is made in the first quarter, an attempt may not be made until the third quarter. The aircraft is moved along its flightpath and a request to fire A.A. may be made at any point, however if the aircraft declares that it is dropping its load or firing no A.A. fire may be carried out until this is resolved.

At the beginning of phase 3(i) each aircraft should have a marker placed on the A.A. fire track at 0. Each time a missile or gun is fired roll a die and for each point greater than the A.A. factor the marker is moved on to the track. After each successful throw, however, the aircraft similarly throws and the marker moved down one for each point greater than its ECM factor against missiles, combat factor against guns. Note that the marker can never go below the number it was on before being fired at.

23.17 ANTI AIRCRAFT FIRE TRACK

The A.A. Fire Track shows the current status of the aircraft with any modifiers to its score or firing attempts which will apply for the rest of the phase. If it is on point 7 or 8 of the track it will complete its run, using the same die roll modifiers as for point 6, and will then abort, on leaving the table, however, there is a chance of it failing to return and will be destroyed on a die roll of 1 or 2.

If it is on point 9 it will abort immediately and can carry out no more firing, it will be destroyed on a roll of 1 to 4 after leaving the table.

A.A. FIRE TRACK

0	1	2	3	4	5	6	7	8	9	10
N/E	+1 Acq	+1 Acq +1 Firing	+1A +2F	+2A +2F	+2A +3F	+2A +4F	Abort After Run	Abort After Run	Abort After Run	Destroyed

Note firing guns or missiles must be on table unless attack is against artillery positions, which may be defended by their own flak.

Note also that firing addition is deducted from any deviation roll made.

23.20 ANTI-AIRCRAFT EXAMPLE

An Israeli Kfir C.2 is making a low level bombing run across the table against a reserve Syrian tank column. During the first quarter of its flightpath, two SA-6 launchers attempt a radar acquisition at a range of 12000m requiring a 7 or better due to the range +3 and height +1. One of the SA6 locks on and fires a missile. The missile factor is a 2 and it throws a 7 putting the Kfir's marker at 5 on the A.A. Fire Track. The Kfir's ECM factor is 3 and it rolls a 5 moving the marker back to 3.

In the next quarter move, it crosses the front line and two SA7 operators who are moving up in BTR50s attempt a visual acquisition at a range of 1000m and 1500m requiring a 2 and 4 respectively on the other element's line due to range and self moving. Both spot and fire a missile at a factor of 3. The first throws a 2 and has no effect, the second a 4 moving the marker on to 4, however, the Kfir throws a 6 moving the marker back to 3. Note, even though the Kfir throws 3 above its ECM factor, it cannot reduce its marker below 3 until the end of the run. AZSU-23-4 which is on A.A. overwatch also attempts to spot at a range of 2300m requiring a 2 to acquire visually. It fires at a factor of 7 less 3 for it being a quad mounting, giving 4 (note if it had attempted a radar location requiring a 5, factor 3 + 1 for range and +1 for height, it would have reduced the A.A. factor to 3). It throws a 9 for effect moving the marker to 8, the Kfir throws a 4, one higher than its combat factor reducing this to 7, which is an abort after this run.

The Kfir then announces that it will attempt to acquire the tank column at a range of 1500m. The factor against an A class target moving in the open is 3, -1 for acquirer higher, -2 target moving more than 250m, +1 observing on the move (single seater) finally +2 for distraction due to A.A. fire giving a final acquisition of 3, if it acquires and fires its cannon, there would be +4 on its chance of a hit or if it drops bombs or fires rockets, 4 is deducted from its deviation roll. The Kfir now continues its run aborting once it leaves the table; there is a one in five chance that it will not reach its base and the SA6 launcher that failed to lock on in the first quarter may make a further attempt in the third or fourth quarter.



APPENDIX

Points Values

(i) ARMoured FIGHTING VEHICLES

Many vehicles are already listed with points in the vehicle data tables at the back of the rules. For other vehicles add up the points for all of the following that apply:-

- (a) **ARMOUR** - 10pts per each armour factor, 5pts per each 0 armour fact. Spaced and laminated armour 5pts per factor. The total for all three aspects are totalled. 40pts per aspect for active armour.
- (b) **SPEED** - Tracked vehicles, low mobility 10pts, standard mobility 20pts, high mobility 30pts, very high mobility 50pts, wheeled or half-tracked vehicles:

	Fast	Medium	Slow
High Mobility	30pts	20pts	10pts
Medium Mobility	20pts	10pts	5pts
Low Mobility	10pts	5pts	0pts

- (c) **TARGET SIZE** - Based on front and side aspects.

A/A 0 pts, B/A 5pts, B/B 10pts, C/B 15pts, C/C 20pts, D/C 25pts, D/D 30pts.
If the hulldown aspect is more than one lower than the front add 10pts.

- (d) **ARMAMENT** - For main armament guns, missiles or HEAT weapons, see attached tables.
Co-ax mg 5pts, HMG 10pts, 20mm 20pts.

Pivot mg 10pts, 12.7mm HMG 20pts, 14.5mm HMG 25pts.

TURRET or Cupola mg 12pts, Cupola 12.7mm HMG 30pts, Cupola 14.5mm HMG 35pts.

Bow or fixed mg 5pts.

- (e) **RANGING** - Laser I.F.C. 60pts Stadiametric 20pts
Laser 40pts Stabilised 5pts
Optical/RMG 30pts Modern Stabilised 10pts

- (f) **NIGHT FIGHTING EQUIPMENT** -

Thermal Imaging	40pts	Infra Red (Support Weapons)	15pts
Low Light T.V.	30pts	Infra Red (Infantry)	10pts
Image Intensifying (vehicle)	25pts	Image Intensifying Driving	10pts
Image Intensifying (Infantry)	15pts	Infra Red Driving	5pts
Infra Red (Searchlight)	20pts		

- (g) **OTHER EQUIPMENT** -

Smoke Dischargers, Pots, Generators or Cannisters.	10pts	Mineclearing Rollers	60pts
Flamethrower	20pts	Mineclearing plough or flails	50pts
Specialist Engineering Equipment	50pts	Auto Minelayer	75pts
AVLB Bridge	100pts	Scattermine layer	100pts
Dozer blade	10pts	Open Topped	-10pts
		Fixed Main Gun	-10pts

(ii) **INFANTRY ELEMENTS**

(a) Infantry Squad armed with	Machine Pistol	6pts
	Bolt Action Rifle	8pts
	Semi Auto Rifle	10pts
	Auto Rifle	10pts
	plus Squad Automatic Weapon	4pts
(b) Infantry element with	Light Machine Gun	10pts
	S.F.M.G.	15pts
	Lt. Mortar	8pts
	Auto Grenade Launcher	12pts
	Flamethrower	10pts
	Sniper	10pts
	Artillery/Mortar OP	80pts

Note:- Anti-tank weapons must be added to these cost.

ARTILLERY

- (iii) See artillery, mortar and salvo rocket data sheets at the end of the rules for points cost. Add the cost of any artillery tows, command vehicles and command to give the cost of the artillery battery. Divide by 2 if off table and modify this for and of the factors below. On table costs should also be modified for armour types.

Registered	+10%	Using CLGP	+20%
Dedicated Battery	+10%	Using Minelet	+25%
General Fire Support Battery	-20%	Using Bomblet	+20%
Counter Battery	+10%	Anti-Armour	+40%
Using White Phosphor	+5%	Using Rocket Assisted Projectiles	+10%

(iv) **SOFT TRANSPORT**

Trucks - 3 tons and over -	medium mobility speed	30pts
	low mobility speed	20pts
Light Trucks - up to 3 tons-	medium mobility medium speed	20pts
	low mobility medium speed	15pts
Jeep, landrover	medium mobility fast speed	20pts
Beach buggy/chassis	high mobility fast speed	25pts
Mule or Krakas load.		
platform	medium mobility low speed	10pts
auxiliary propulsion unit		10pts
Animal unit to carry one squad or tow a heavy weapon		5pts
Tank Transporter	low mobility medium speed	40pts
Specialist Artillery tractor or load carried such as Stalwart,		
Gamma Goat, ZIL-135	high mobility medium speed	40pts
GT-T, AT-T, M548	high mobility tracked	50pts

(v) **COMMAND AND ELECTRONICS**

Platoon or independent section additional points for command	10pts
Company or higher level command	20pts
Morale Grade to increase or decrease by one factor - plus or minus 5% of unit cost per level from the base of 3	
Ground Surveillance Radar	100pts
Counter Mortar/Artillery Radar	500pts
Sound and Flash Ranging Equipment	200pts
Radio Intercept Equipment	150pts
Ground Sensors	50pts
Jamming per factor used	100pts
Laser Designator	30pts
R.P.V.	100pts
Air Liaison Team	80pts.

(vi) ENGINEERING

To Dig in an element or unit, 10% of cost of unit

Log Bunker 30pts

Concrete Bunker 50pts

Anti-Tank Ditch per 50m 20pts

Anti-tank Barricade per 50m 20pts

Barbed Wire per 50m 5pts

Mines - per unit anti-Tank Anti-Personnel

Buried 50pts 30pts

Surface 40pts 10pts

Scatter 50pts 20pts

Dummy 5pts 5pts

50m section of bridge 100pts

Ferry section to carry one MBT 150pts

Assault Boat 5pts

Remote Controlled Charge including sensor or tripwire controlled 50pts

Claymore Mine 40pts

Give an element satchel charges 5pts

(vii) HELICOPTERS

Scout/Light Attack/Liaison 300pts

Attack 400pts

Assault 200pts

Lift 300pts

add to the above target size, armour and night sensors from the A.F.V. points. The armament may be taken from the ground equivalent or from the following (note, with regard to missiles it counts as a single launcher):-

Per rocket pod up to 81mm is 50pts, and over 81mm is 75pts.

Minigun 20pts.

Speed: Fast 50pts, Medium 30pts, Slow 10pts.

Combat factor cost from aircraft section.

Mast sight 40pts

(viii) AIRCRAFT

(A) Strategic Bomber 400pts

(B) Tactical Bomber 300pts

(C) Ground Attack Fighter 400pts

(D) Light Ground Attack 200pts

(E) Specialist Ground Attack 500pts

(F) Observation of Liaison 100pts

(G) Tactical Transport 200pts

(H) Strategic Transport 400pts

(J) Reconnaissance 300pts

(K) With data linescan 400pts

(L) Electronic Warfare 500pts

Add the cost of radar, ECM, and Combat Factor from the table below and any fixed armament as for ground vehicles, to give the total cost of the aircraft.

Radar, ECM or Combat Factor	1	2	3	4	5	6
Points Cost	60pts	50pts	40pts	30pts	20pts	10pts

AIRCRAFT LOADS -

per rocket pod up to 81mm 40pts

over 81mm 60pts

Bombs per 250Kg 5pts

Guided Bomb per 250Kg 10pts

Guided Missile per 250Kg 15pts

Cluster Bomb per 250Kg 10pts

Anti Radar Missile 100pts

(ix) **ANTI-AIRCRAFT ELEMENTS**

Missile Launchers add the cost of the height band, Radar and Missile Factors from the following:

Height Band		Radar Factor		Missile Factor	
Very High	40pts	1	60pts	0	50pts
High	30pts	2	50pts	1	40pts
Medium	30pts	3	40pts	2	30pts
Low	20pts	4	30pts	3	20pts
		5	20pts		

Anti-Aircraft Guns that are radar controlled add the radar factor costs from the above.

Sidewinder costs 30pts per missile.

Attoll costs 25pts per missile.

(x) **ITEMS FOR WHICH POINTS ARE NOT PAID**

Nuclear, Biological and Chemical weapons and defences are not costed as they should be used under the strict control of an umpire in campaign games only. Amphibious capabilities have not been costed as they are rarely used.

(xi) **MAIN ARMAMENT POINTS COST**

175pts	120mm firing APFSDM
170pts	125mm firing APFSDM
160pts	120mm firing APFSDS
155pts	125mm firing APFSDS, 105mm firing APFSDM
140pts	120mm firing APDS, 105mm firing APFSDS
130pts	115mm firing APFSDS
125pts	90mm autocannon firing APFSDS
120pts	105mm firing APDS
110pts	122mm firing APHE, 75mm autocannon firing APFSDS
100pts	105mm firing G-HEAT, 100mm firing APFSDS, 90mm firing APFSDS, 83.4mm firing APDS.
90pts	100mm firing APHE or APDS, 90mm firing APHE, 60mm autocannon firing APFSDS
80pts	105mm firing HEAT, 30mm Gatling firing APFSDM
75pts	100mm firing HEAT, Twin 57mm auto, Twin 35mm auto firing APDS, Quad 25mm auto firing APDS
70pts	85mm firing APHE or HVAP, Twin 37 or 40mm auto firing AP, 30mm chain gun or twin barreled firing APFSDM, 25 or 30mm Gatling firing APDS.
65pts	90mm firing HEAT, 35/57mm auto firing APDS, Quad 20/30mm auto, 25mm Gatling with AP.
60pts	85mm firing HEAT, 37 or 40mm auto, Twin 35mm auto firing AP, 30mm auto firing APFSDM, Twin or chain 30mm auto firing APDS, 30mm Gatling firing AP, 25mm chain gun firing APDS, triple or Gatling 20mm auto, triple or Gatling 23mm auto
55pts	76mm firing APHE or HEAT, Twin or chain 30mm firing AP, 25mm chain gun firing AP, Quad 14.5mm
50pts	76mm firing HESH, 75mm firing HEAT, 35mm auto firing AP, 30mm auto firing APDS, 25mm auto firing APDS, twin or chain 20mm auto, twin or chain 23mm auto, triple or Gatling 14.5mm, Quad 12.7mm
45pts	76mm firing HVAP, 30mm auto firing AP, 25mm firing AP, triple or Gatling 12.7mm
40pts	57mm firing APHE, 20mm auto, 23mm auto, twin 14.5mm
35pts	14.5mm auto, twin 12.7mm auto
30pts	37mm firing AP, 12.7mm auto

OLDER AFV GUNS

45pts	75mm L40/8 firing AP for Sherman, Chaffee, PzIV.
65pts	75mm L60/70 firing AP for AMX13, EBR, Panther.
65pts	90mm firing APCBC for M26, M46, ARL-44, M-56, M36.
55pts	85mm firing AP for T34/85, T-44.
80pts	77mm/17Pdr firing APDS for Comet, Firefly, Archer.

(xii) NOTES ON MAIN ARMAMENTS

125mm	firing APFSDS, HEAT-FS, HE	in T-64, T-72, T-74, T-80
122mm	firing APHE, HEAT, HE	in JS-III, T-10M
120mm	firing APFSDS, HEAT	in Leopard 11, M1A1
120mm	firing APFSDS, APDS, HEAT, HESH, Smoke, illum, Can	in Challenger, Chieftain
115mm	firing APFSDS, HEAT-FS, HE	in T-62
105mm	firing APFSDS, G-HEAT, HE, Smoke, illum	in AMX30B2, no APFSDS in AMX30 or AMX10RC
105mm	firing APFSDS, APDS, HEAT, HESH/HEP, Smoke, illum, canister	in M60A1, Leopard 1, Centurian, 'S' Tank, M48A5, APFSDS only with M1 M60A3, MERKAVA, others may have
105mm	firing HEAT, HE	in AMX13, Sherman Mk51
100mm	firing APDS, HEAT, HE, APHE	in T54, T55, no APDS in SU100, T59 APFSDS in T-12
90mm	firing APFSDS, HEAT, HE	in ERC90S
90mm	firing HEAT, HE	in AML90, AMX13, IKv91
90mm	firing APHE, HEAT, HE, Smoke	in M48A3, M47
85mm	firing APHE, HVAP, HEAT, HE	in T34/85, ASU85, T62, T63
76mm	firing APHE, AP, HEAT, HE	in PT76
76mm	firing HESH	in Scorpion

(xiii) HEAT WEAPONS POINTS COST

60pts	165mm demolition guns
50pts	120mm Wombat RCL
45pts	106mm, 107mm RCL
40pts	90mm LPG, 105mm RCL
30pts	73mm SPG-9 LPG, 90mm RCL
25pts	95mm RCL
20pts	82mm RCLs, Folgore tripod
15pts	75mm RCL, Apilas Maw, M67 Maw, C.Gustav S550 Maw, Folgore Maw, LRAC Maw
12pts	Blindicide Maw
10pts	57mm RCL, RPG-16 LAW, ACIP300 LAW
9pts	C-90 LAW, Picket LAD
8pts	Viper LAD, LAW 80 LAD, C.Gustav M2 Maw
7pts	PZF44 Maw
6pts	RPG7 LAW, Type 69 LAW, Armburst LAD
5pts	Miniman LAD
4pts	Sarpac LAW, Bazooka N.LAW, M57 LAW, RPG18 LAD, M72A1/s LAD
3pts	Type 56 LAW, Bazooka O.LAW, Type 74 LAD
2pts	RPG2 LAW

NOTES

1. Unless permanently vehicle mounted all of the above have a crew squad operating them, or if LAW or LAD are added to an infantry squad.
2. Unless in field defences or within 50m of transport vehicles only three rounds are carried by a squad for the above. More than one LAW or LAD may be allocated to an infantry squad.

(xiv) ATGW MISSILE COSTS

200pts	Hellfire	80pts	Milan
160pts	Tow 3	165pts	ADATS
135pts	HOT	70pts	Sagger B
125pts	Tow 2, Spiral	65pts	Swatter, Entac
120pts	Shillelagh(152mm gun launcher)	60pts	Cobra
110pts	KAM 9	55pts	Sagger, Mamba, Bantam, Kun Wu
95pts	Swingfire, Harpon	50pts	Dragon, SS10
90pts	Spigot, Spandrel, TOW	45pts	Snapper, KAM-3D, Vigilant
85pts	SS11, Swatter B		

NOTE

Crew served missiles have a maximum of three rounds, jeep or light truck, six rounds otherwise as noted on vehicle data.

(xv) ARTILLERY COST

Mortar	Up to 60mm	25pts
	Up to 90mm	35pts
	Up to 120mm	45pts
	Up to 160mm	50pts
	Larger	55pts
110pts	180mm S-23 USSR, 203mm USSR, 203mm M110A2 USA, 175mm USA	
100pts	FH-70 155mm Int, TP 155mm Finland, M71 Israeli, GS 155mm South Africa, FH-77 155mm Sweden, M198 155mm USA	
95pts	M59 155mm USA	
90pts	M50 155mm France, 203mm USA	
85pts	M46 130mm USSR	
80pts	D-20 152mm USSR, M1937 152mm	
75pts	150/39 Sweden, 155mm M114 USA	
70pts	M60 122mm Finland, M1943 152mm USSR, 122mm D-74 USSR	
65pts	M1937 122mm USSR, 5.5in GB, 105mm L.G. GB	
60pts	M61/37 105mm Finland, M18/40 105mm France, T4140 105mm Sweden, M46 105mm Swiss, D-30 122mm USSR, M101 105mm W.German	
55pts	Model 56 105mm Italy, M1938 122mm USSR, M102 105mm USA, M101 105mm USA	
50pts	M1942 76mm USSR, 25pdr GB	
45pts	M1966 76mm USSR	
40pts	M116 75mm USA	

For full details of artillery, see Ultra Modern Army Lists and Organisation.

HEAVY ROCKETS

Missile	Range	Reload Time	Cost
Pluton, Lance, Frog 7, Ss21	10-120Km	5 moves	150pts
Scud, Pershing 1A	150-250Km	10 moves	200pts
Scaleboard, Pershing 11	200-650Km	10 moves	300pts

Cost includes launch vehicle and three reloads.

The Ultra Modern Lists

Except for artillery and helicopters, the points in the companion volume "Ultra Modern Army Lists and Organisations" may be used without alteration. Whilst there might be some anomalies these should average themselves out. A corrected points list will be published shortly in the "Ultra Modern Digest". You may, of course, calculate the new points from the tables in the back of these rules. The armament of infantry should be as listed in the infantry notes (24.7).

Helicopter points listed in (24.4) are for "under command" and should be divided by 3 for "general support" or 2/3rds if in "direct support".

For artillery, use the following table to calculate battery values. Mortars may only be in direct support or dedicated if up to 120mm. Artillery over 155mm and MRL's may only be in general support.

Multiply the following points by the number of guns in the battery:-

Guns	Dedicated	Direct	General	Mortars
Up to 90mm	25pts	20pts	15pts	
Up to 125mm	35pts	30pts	25pts	Up to 60mm
Up to 130mm	40pts	35pts	30pts	Up to 90mm
Up to 160mm	45pts	40pts	30pts	Up to 120mm
Up to 250mm	60pts	50pts	40pts	Up to 160mm
	70pts	60pts	45pts	Larger

MRL's points listed in 24.3 should be divided by 4 to give the general support value.

NOTES ON VEHICLE DATA**VEHICLE DATA****(i) TYPE**

MBT	Main Battletank
AVR	Armoured Vehicle Reconnaissance
AMC	Armoured Mortar Carrier
AIFV	Armoured Infantry Fighting Vehicle normally has turreted weapon or may fire from under armour
AOPV	Armoured Observation Post Vehicle
APC	Armoured Personnel Carrier
TDM	Tank Destroyer Missile
TDG	Tank Destroyer Gun
AADV	Armoured Air Defence Vehicle
AICV	Armoured Infantry Command Vehicle
AABV	Armoured Airborne Vehicle
AVLI	Armoured Vehicle Loading Infantry
FUA	Armoured Vehicle passengers may fight from under armour

(ii) MAIN ARMAMENT

See Gun Data Table for ammunition types. A = Autocannon, C = Chain Gun, G = Gatling, F = Field casement, p = Pivot, c = cupola. Cupola mtd weapons do not count suppressed when carrying out area fire.

(iii) NIGHT FIGHTING

IR = Infra Red
II = Image Intensifying
TI = Thermal Imaging
D = Driving only

(iv) TABLE HEADINGS

MA	Main Armament	A	Fully amphibious vehicle
RANG	Type or ranging	AS	Amphibious when screen erected
STAB	Stabilised main armament	SN	Snorkel fitted
MOB	Mobility	D	Deep wading capability up to 3 meters depth. All other vehicles are capable of shallow wading only in depths up to 1 meter.
SD	Smoke discharger fitted		
SG	Smoke generator fitted		
NF	Night fighting equipment		
PV	Points Value		
AMP	Amphibious		

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
RUSSIAN																
T85	MBT	125mm	IFC	MOD	MG	c12.7mm	H	A/A/B	13c10	5c5	3c2	IR,II	Y	S	Previously known as T80 (SD,SG)	630
T74-80	MBT	125mm	IFC	MOD	MG	p12.7mm	H	B/A/C	11c5	5c3	3	IR,II	Y	SN	(SD,SG)	560
T72	MBT	125mm	Laser	MOD	MG	p12.7mm	H	B/A/C	11	5c2	3	IR,II	Y	SN	(SG)	500
T64	MBT	125mm	Laser	MOD	MG	p12.7mm	H	B/A/C	11	5	3	IR,II	Y	SN	(SG)	490
T62	MBT	115mm	STAD	Yes	MG	p12.7mm	ST	B/A/C	8	3	2	IR	Y	SN	(SG)Some Laser & IR at 390pts.	365
T55/54	MBT	100mm	STAD	Yes	MG	p12.7mm	ST	B/A/C	8	4	2	IR	Y	SN	(SG)Some laser & II at 360pts.	335
PT76C	AVR	76mm	STAD	Yes	MG	p12.7mm	ST	B/A/C	1	0	0	IR	-	A		165
BRDM2	AVR	14.5mmA	-	-	MG	-	MMF	C/C/D	1	0	0	IR	Y	A		120
BRDM2S	TDM	Sagger	-	-	-	-	MMF	C/C/D	1	0	0	IR	Y	A	(6+8)Sagger, if Sagger B fitted = 150pts.	135
BRDM3	TDM	Spandrel	-	-	-	-	MMF	C/C/E	1	0	0	IR,II	Y	A	(5+10)Spandrel carried	185
BRDM2U	ACCC	-	-	-	-	-	MMF	C/C/E	1	0	0	IR	Y	A		90
BMP1/2	AIFV	73mmL	-	-	MG	-	H	C/B/D	2	0	0	IR	Y	A	Also Sagger(1+4) (FUA,SG)	195
BMP3	AIFV	30mmA	-	-	MG	-	H	C/B/D	2	0	0	IR,II	Y	A	Some with Spigot at 260pts. (FUA,SG,SD)	170
BMP-Shu	AICV	-	-	-	-	-	H	C/B/D	2	0	0	IR	Y	A	(FUA,SG)	105
BMP-R	AVR	73mmL	-	-	MG	-	H	C/B/D	2	0	0	IR,II	Y	A	(FUA,SG)	145
BMD	AAVB	73mmL	-	-	MG	-	H	C/B/D	1	0	0	IR	Y	A	Sagger(1+2), 2 x bow mg with auto GL with 81mm mortar All are (FUA,SG)	195 207 120
BTR50PK	APC	p MG	-	-	-	-	ST	B/B/C	1	0	0	IRD	Y	A		65
MT-LB	AIFV	MG	-	-	-	-	H	C/B/D	1	0	0	IRD	Y	A	(FUA)	82
BTR70	AIFV	14.5mmA	-	-	MG	-	HMF	B/B/D	1	0	0	IR,II	Y	A	(FUA)	125
BTR60PB	APC	14.5mmA	-	-	MG	-	HMM	B/B/D	1	0	0	IR	Y	A		110
ASU85	AABV	85mm	STAD	-	MG	p12.7mm	ST	C/B/D	3	1	-	IR,II	-	-	(SG)	220
ASU57	AABV	57mm	STAD	-	-	-	ST	C/C/D	0	0	0	IRD	-	-	Open topped	100
ARCV-2	AOPV	12.7mmp	-	-	-	-	H	B/A/C	1	0	0	IR,II	Y	A	GSR	200
BMP-SON	AOPV	MG	-	-	-	-	H	C/B/C	3	0	0	IR,II	Y	A	(SG) CAR	622
ZSU57-2	AADV	2x57mmA	-	-	-	-	ST	A/A/B	1	0	0	IRD	-	-	Open topped	110
ZSU23-4	AADV	4x23mmA	-	MOD	-	-	ST	A/A/B	0	0	0	IRD	Y	A	FCR 3	160
BTR50P	ARC	PtMG	-	-	-	-	ST	B/B/C	1	0	0	IRD	-	A	Open topped	55
BTR60P	APC	PtMG	-	-	-	-	HMM	B/B/D	1	0	0	IRD	-	A	Open topped	65
BRDM1	AVR	PtMG	-	-	-	-	MMF	C/C/D	1	0	0	-	-	A		70
BTR40	APC	PtMG	-	-	-	-	MMF	C/C/D	0	0	0	-	-	-	Open topped	55

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
WARPAC																
OT65A	AVR	82mm RCL	-	-	MG	-	MMF	C/C/D	1	0	0	IRD	Y	A		90
FUG65	AVR	PtMG	-	-	-	-	MMF	C/C/D	1	0	0	IRD	Y	A		75
OT64A	APC	PtMG	-	-	-	-	HMF	B/A/C	1	0	0	IRD	Y	A		70
OT64C	APC	14.5mmA	-	-	MG	-	HMF	B/A/C	1	0	0	IRD	Y	A	Some Sagger(2+3) at 155pts.	100
OT62A	APC	PtMG	-	-	-	-	H	B/B/C	1	0	0	IRD	Y	A		75
OT62B	APC	82mmRCL	-	-	MG	-	H	B/B/C	1	0	0	IRD	Y	A		90
OT62C	APC	14.5mm	-	-	MG	-	H	B/B/C	1	0	0	IRD	Y	A		105
OT810	APC	82mmRCL	-	-	-	-	HMM	B/B/C	0	0	0	-	-	-	Open topped	55
PSZH-IV	APC	14.5mm	-	-	MG	-	MMF	C/B/D	1	0	0	IRD	Y	A		115
TAB72	APC	14.5mmA	-	-	MG	-	HMF	B/B/C	1	0	0	IRD	Y	A	(FUA)	105
BTR152	APC	PtMG	-	-	-	-	MMM	B/B/C	0	0	0	-	-	-	Open topped	35
BTR50P	APC	PtMG	-	-	-	-	ST	B/B/C	1	0	0	IRD	-	-	Open topped	55
BTR40	APC	PtMG	-	-	-	-	MMF	C/C/D	0	0	0	-	-	-	Open topped	55
SU76	TOG	76mm	STAD	-	-	-	ST	C/C/D	1	1	0	-	-	-	Open topped	140
AMERICAN																
M1 Abrams	MBT	120mm	IFC	MOD	MG	c12.7mm pMG	VH	A/A/B	14c10	6c6	4c4	IR,II, II.	Y	D	(SD,SG) M1A1 with 20mm is 725pts.	705
M60A3	MBT	105mm	Laser	MOD	MG	c12.7mm	ST	A/A/B	8	3	2	IR,II, II	Y	SN	(SD,SG)	435
M60A2	MBT	152mm	Laser	MOD	MG	c12.7mm	ST	A/A/B	9	3	2	IR,II	Y	SN	(SD)fires Shillelagh 13 carried.	400
M60A1Rise	MBT	105mm	OPT	MOD	MG	c12.7mm	ST	A/A/B	8	3	2	IR,II	Y	SN	(SD)	380
M60A1	MBT	105mm	OPT	-	MG	c12.7mm	ST	A/A/B	8	3	2	IR	Y	SN		355
M48A5	MBT	105mm	OPT	-	MG	2x pMG	ST	A/A/B	7	4	2	IR	Y	D		345
M48A3	MBT	90mm	OPT	-	MG	c12.7mm	ST	A/A/B	7	4	2	IR	Y	D		325
M47	MBT	90mm	OPT	-	MG	p12.7mm	ST	A/A/B	7	3	2	IRD	-	-	Bow MG	295
M551 Sheridan	AABV	152mm	Laser	Yes	MG	p12.7mm	H	B/A/C	3	1	1	IR	Y	AS	Fires Shillelagh carries 8 (SD)	295
M2 Bradley	AIFV	25mmCG	-	MOD	MG	-	VH	B/B/C	5c5	2c3	2c2	IR,II II.	Y	A	Fires TOW(2+5) (FUA,SD,SG)	455
M3 Bradley	AIFV	25mmCG	-	MOD	MG	-	VH	B/B/C	5c5	2c3	2c2	IR,II II.	Y	A	Fires TOW(2+8) (SD,SG)	455
M113A1/2	APC	p12.7	-	-	-	-	H	B/B/C	1	0	0	IID	Y	A		100
M113ACAV	CFV	c12.7	-	-	-	2xpMG's	H	B/B/D	1	0	0	IID	-	A	Open topped	120
M106A1	AMC	107mmM	-	-	-	p12.7mm	H	B/B/D	1	0	0	IID	-	A	Open topped firing	135
M125A1	AMC	81mmM	-	-	-	p12.7mm	H	B/B/D	1	0	0	IID	-	A	Open topped firing	125
M150	TDM	TOW(1+14)	-	-	-	-	H	B/B/D	1	0	0	IID	-	A	Open topped firing	195
M901	TDM	TOW(2+10)	-	-	-	pMG	H	B/B/D	1	0	0	LLTV	-	A	(SD)	255

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
America Contd.																
LVT7A1	AVLI	12.7mm	-	-	MG	-	H	A/A/C	1	1	0	II	-	A	(SG)	125
M163	AADG	20mmG	-	-	-	-	H	B/B/C	1s1	0s1	0	IID	-	A		140
M48	AADM	Chap'1	-	-	-	-	H	B/B/B	5	5	5	IRD	-	-	4 Chapparral carried	95
Sgt York	AADG	2x40mm	-	MOD	-	-	ST	A/A/A	4	2	1	II	Y	-	FRC 2 (SD)	255
HIP M60	MBT	105mm	IFC	MOD	MG	p12.7mm	VH	A/A/B	8s4	3s4	2s2	II,IR	Y	-	Experimental(SD,SG)	510
RDF	AABV	75mmA	IFC	MOD	MG	-	VH	C/B/D	3s4	1s2	1	II,IR	Y	-	Experimental (SD)	365
M24 AM	AVR	75mm	STAD	-	MG	p12.7mm	ST	B/B/C	2	1	0	-	-	-		155
M59 AM	APC	p12.7	-	-	-	-	ST	B/B/C	1	0	0	-	-	-		70
M8 AM	AVR	37mm	STAD	-	-	p12.7mm	MMF	C/B/D	1	0	0	-	-	-	Open topped	115
M20 AM	AVR	p12.7	-	-	-	-	MMF	C/B/E	1	0	0	-	-	-	Open topped	75
M41 AM	AVR	76mm	STAD	-	MG	p12.7mm	H	B/A/C	2	1	1	IR	-	-		195
M727	AADV	Hawk(3)	-	-	-	-	H	A/A/B	5	5	5	IRD	-	-	FCR 2	145
MLRS	MRL	227mm	-	-	-	-	H	A/A/B	0	0	0	IID	-	-	(SD)	200
M9R1 Fist	AOPV	-	-	-	-	pMG	H	B/B/E	1	0	0	II,II IR,LLTV.	-	A	(SD)	220
M75	APC	p12.7	-	-	-	-	H	A/A/C	1	0	0	IRD	-	-	(SD)	95
Commando	APC	p12.7	-	-	-	-	MMF	C/B/D	1	0	0	-	-	A	(FUA)	75
V-150/20	APC	20mmA	-	-	-	-	MMF	B/B/D	1	0	0	-	-	A	(FUA,SD)	110
V-150/90	TDG	90mmLPG	-	-	MG	pMG	MMF	B/B/D	1	0	0	-	-	A	(SD)	125
V-150/20G	AADV	20mmG	-	-	-	-	MMF	B/B/C	1	0	0	-	-	A		110
V-150TOW	TDM	TOW(1+6)	-	-	-	pMG	MMF	C/B/D	1	0	0	-	-	A		190
V-150/81M	AMC	-	-	-	-	pMG	MMF	C/B/D	1	0	0	-	-	A		100
M47E/M	MBT	90mm	OPT	-	MG	pMG	ST	A/A/B	7	3	2	IR	-	-		295
M36B2	TDG	90mm	STAD	-	-	p12.7mm	ST	A/A/B	3	1	1	-	-	-	Open topped	190
M18	TDG	76mm	STAD	-	-	p12.7mm	H	B/A/C	1	0	0	-	-	-	Open topped	130
M42	AADV	2x40mm	-	-	-	pMG	H	A/A/C	1	0	0	-	-	-	Open topped	120
Chalmite	APC	2xMG	-	-	-	-	MMF	C/B/D	1	0	0	-	-	A	(FUA)	79
M15A1	AADV	37mmA	-	-	2x12.7	-	MMM	B/B/C	0	0	0	-	-	-	Open topped	105
M16	AADV	4x13.7	-	-	-	-	MMM	B/B/C	0	0	0	-	-	-	Open topped	75
BRITISH																
Challenger	MBT	120mm	IFC	MOD	MG	cMG	H	A/A/B	15c10	5c6	3c4	IR,II	Y	-	later TI (SD)	642
Chieftain	MBT	120mm	IFC	MOD	MG	cMG	ST	A/A/B	12	4	2	IR,II	Y	-	(SD)	462
Centurion	MBT	105mm	RNG	MOD	MG	pMG	ST	A/A/B	8	3	2	IR	-	-	(SD)	355
Scorpion	AVR	76mm	RNG	-	MG	-	VH	C/C/D	2	1	0	IR,II	Y	AS	(SD)	220
Scimitar	AVR	30mmA	-	-	MG	-	VH	C/C/D	2	1	0	IR,II	Y	AS	(SD)	190
Striker	TDM	Swing'r	-	-	-	cMG	VH	C/C/E	2	1	0	IR,II	Y	AS	(SD)Swingfire(5+5)	247
Spartan	AIVR	cMG	-	-	-	-	VH	C/C/E	2	1	0	IR,II	Y	AS	(SD)	162
Ferret 4	AVR	MG	-	-	-	-	MMM	C/C/E	0	0	0	IRD	-	D	(SD)	82
Ferret 1/2	AVR	pMG	-	-	-	-	MMM	C/C/E	0	0	0	IRD	-	D	(SD)Open topped	70
Fox	AVR	30mmA	-	-	MG	-	MMF	C/C/D	1	0	0	IR,II	Y	AS	(SD)	145

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
British Contd.																
FV432	APC	pMG	-	-	-	-	ST	B/B/D	1	0	0	IID	Y	AS	(SD) with tMG=92pts.	90
FV438	TDM	Swin'r	-	-	-	pMG	ST	B/B/E	1	0	0	IID	Y	AS	(SD)Swingfire(2+14)	165
Saracen	AIFV	MG	-	-	-	-	HMM	B/B/D	0	0	0	IRD	-	-	(SD)	82
MCV80	AIFV	30mmA	-	MOD	MG	-	VH	B/B/C	3	1	0	IR, II	Y	-	(SD)tMG only=80pts.	200
AT105	APC	2xMG	-	-	-	-	HMF	B/B/C	0	0	0	IID	-	-	(SD)various armament	89
Saxon																
TR1	AADV	Rapier	-	-	-	pMG	H	B/B/C	0	0	0	IID	-	A	8 Rapier carried	205
Saladin	AVR	76mm	STAD	-	MG	-	HMM	B/B/C	1	1	0	-	-	-	(SD)	140
WEST GERMAN																
Leop.2	MBT	120mm	IFC	MOD	MG	2xpMG	VH	A/A/B	13c10	5c6	3c3	IR, II, TI.	Y	SN	(SD)	660
Leop.1A1	MBT	105mm	OPT	MOD	MG	pMG	H	A/A/B	6	2s2	2	IR	Y	SN	(SD)Some with laser at 345pts.	335
Leop 1A1	MBT	105mm	OPT	MOD	MG	pMG	H	A/A/B	7s2	2s2	2	IR, II	Y	SN	(SD) Some with laser at 380pts.	370
A1/1A2																
Leop 1A3 /4	MBT	105mm	OPT	MOD	MG	pMG	H	A/A/B	7s4	3s4	2	IR, II	Y	SN	(SD) Some with Laser at 390pts.	420
M48A2GA2	MBT	105mm	OPT	MOD	MG	pMG	ST	A/A/B	8	4	2	IR, II	Y	D	(SD)	360
Luchs	AVR	20mmA	-	-	MG	pMG	HMF	A/A/C	2	1	1	IR, II	Y	A	(SD)	170
SPz11-2	AVR	20mmA	-	-	-	-	H	C/C/D	2	0	0	IR	-	-	(SD)	150
SPz22-2	ACVR	pMG	-	-	-	-	H	C/C/E	2	0	0	IR	-	-	(SD)	130
SPz51-2	AMC	81mmM	-	-	-	-	H	C/C/E	2	0	0	IRD	-	-	(SD)Open topped firing	130
SPz12-3	AIFV	20mmA	-	-	-	-	ST	C/B/D	2	1	0	IR	-	-	(SD)	140
SPz52-3	AMC	120mmM	-	-	-	-	ST	C/B/E	2	1	0	IRD	-	-	(SD)Open topped firing	130
Marder	AIFV	20mmA	-	-	MG	cMG	H	B/B/C	5	2	1	IR	Y	D	(FUA,SD)	207
Marder A1	AIFV	20mmA	-	-	MG	cMG	H	B/B/C	5	2	1	IR, II	Y	D	(FUA,SD)(1+4)Milan, TI later.	292
TPz1	APC	pMG	-	-	-	-	HMF	B/A/D	1	0	0	IRD	Y	A	(FUA,SD)	95
M113A1	APC	pMG	-	-	-	-	H	B/B/D	1	0	0	IID	-	A	(SD)	100
M113ACP	AOPV	pMG	-	-	-	cMG	H	B/B/D	1	0	0	IR, II TI.	-	A	(SD)Also + CAR.	142
Jaguar 1	TDM	HOT (1+20)	-	-	-	pMG	H	C/B/D	4s3	2s3	0	IR, II	Y	D	(SD) bow MG, TI later.	325
Jaguar 2	TDM	TOW	-	-	-	pMG	H	C/B/D	4s3	2s3	0	IR, II	Y	D	(SD)(1+18)TOW, TI later	310
Rakette	TDM	SS11	-	-	-	pMG	H	C/B/D	4	2	0	IR	Y	D	(SD) bow MG(2+14)SS11	240
Kanone	TDG	90mmF	OPT	-	MG	pMG	H	C/B/D	5	2	0	IR	Y	D	(SD)Some laser rang- ing & II N.Fighting.	285
Gepard	AADV	2x35mmA	-	MOD	-	-	H	A/A/B	3	2	1	IID	Y	-	(SD) FCR 3	220
Roland 2	AADV	Roland	-	-	-	-	H	A/A/A	2	1	0	IID	Y	-	(SD) FCR 3	195

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
DUTCH																
YP408	APC	c12.7	-	-	-	-	HMM	B/B/D	1	0	0	IR	-	-	(SD)	110
YPR765	AIFV	25mmA	-	-	MG	-	H	B/B/C	3s3	2s3	1s2	IR, II	Y	A	(SD)	225
YPR765	TDM	TOW	-	-	-	pMG	H	B/B/E	2s3	1s3	1s2	IR, II	Y	A	(FUA, SD) TOW (2+10)	300
YPR765C	AICV	c12.7	-	-	-	-	H	B/B/D	3s3	2s3	1s2	IR, II	Y	A	(FUA, SD)	215
M113CR	AVR	25mmA	-	-	-	-	H	C/B/D	2	0	0	IRD	-	A	(SD)	135
AUSTRIA																
Leonidas	APC	p12.7	-	-	-	-	H	C/B/D	1	0	0	IID	Y	-	(FUA, SD)	105
NORWAY																
NM116	TDG	90mm	Laser	-	MG	pMG	ST	B/B/C	2	1	0	II	-	-	(SD)	220
NM135	APC	20mmA	-	-	MG	-	H	B/B/C	1	0	0	IRD	-	A	(SD)	120
CANADA																
Lynx	AVR	c12.7	-	-	-	pMG	H	C/B/D	1	0	0	IRD	-	A	(SD)	120
Cougar	TDG	76mm	Laser	-	MG	-	HMF	B/A/C	1	0	0	IR, II	Y	A	(SD)	183
Grizzly	APC	12.7mm	-	-	MG	-	HMF	B/A/C	1	0	0	IID	Y	A	(FUA, SD)	110
FRENCH																
AMX30B2	MBT	105mm	Laser	MOD	20mmA	pMG	H	B/A/C	5	2	2	IR, II	Y	SN	(SD)	360
AMX30	MBT	105mm	OPT	-	20mmA	pMG	H	B/A/C	5	2	2	IR, II	Y	SN	(SD) Some co-ax 12.7mm	320
AMX13	TDG	90mm	OPT	-	MG	-	H	B/B/C	3	1	0	IR	-	-	(SD)	215
AMX13 SS	TDM	75mm	STAD	-	MG	-	H	B/B/C	3	1	0	IR	-	-	(SD) Harpon ATGW(4)	285
AMX10RC	AVR	105mm	Laser	-	MG	-	HMF	B/B/C	3	2	0	IR, II	Y	A	(SD) also has LLTV	280
ERC90S	AVR	90mm	Laser	-	MG	-	HMF	B/B/C	2	1	0	IR, II	Y	-	-	255
EBR	AVR	90mm	STAD	-	MG	-	HMF	B/B/C	3	1	2	IR	-	-	(SD) Fixed bow, rear MG	230
AML90	AVR	90mm	STAD	-	MG	-	MMF	C/C/D	1	0	0	IR	-	-	(SD)	180
AML60	AVR	GM60mm	-	-	2xMG	-	MMF	C/C/D	1	0	0	IR	-	-	(SD)	125
AMX10P	AIFV	20mm	-	-	MG	-	H	B/B/D	2	0	0	IR, II	Y	A	(SD)	160
AMXVC1	AIFV	p12.7	-	-	-	-	H	B/B/C	2	1	0	IRD	-	-	(FUA) with MG=92pts.	100
VAB	APG	pMG	-	-	-	-	MMF	B/B/D	1	0	0	IRD	Y	A	-	75
VAB MEP	TDM	HOT	-	-	-	-	MMF	B/B/C	1	0	0	IR, II	Y	A	HOT (4 + 12)	210
Histo																
AMX13DCA	AADV	2x30mm	-	-	-	-	H	A/A/B	1	1	0	IRD	-	-	(SD) FCR 3	165
ISRAELI																
Centurion	MBT	105mm	RHMG	MOD	MG	2xpMG	ST	A/A/B	8	3	2	IR	-	-	-	355
Cent. (UG)	MBT	105mm	Laser	MOD	MG	2xpMG	ST	A/A/B	8A	3As2	2	IR, II	-	-	(SD)	470
M48/60 UG	MBT	105mm	Laser	-	MG	2xpMG	ST	A/A/B	8A	3A	2	IR, II	-	-	(SD)	460
T1-67	MBT	105mm	OPT	-	MG	p12.7mm	ST	B/A/C	8	4	2	IR	Y	-	-	375
Merkava	MBT	105mm	Laser	MOD	MG	2xpMG	H	B/A/C	12c8	6c4	3c3	IR, II	Y	-	Mk1	540
Sherman	MBT	105mm	OPT	-	MG	p12.7mm	ST	B/A/C	3	2	1	IR	-	-	Mk51	225
RBV	AVR	p12.7	-	-	-	-	MMF	C/C/D	0	0	0	-	-	-	Open topped, to 4 MG.	65
M3	APC	p12.7	-	-	-	-	MMM	B/B/C	0	0	0	-	-	-	Open topped	50
Shoet	APC	p12.7	-	-	-	-	MMF	B/B/C	0	0	0	-	-	-	Open topped. Mk2.	55

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
SWEDEN																
S Tank	MBT	105mm	OPT	-	2MG	LMG	H	B/A/C	12	4	2	IR, II	-	AS	(SD)	412
Centurion	MBT	105mm	RMG	MOD	MG	pMG	ST	A/A/B	8	3	2	IRD	-	-	(SD)	340
IKV91	TDG	90mm	Laser	-	MG	pMG	H	B/A/C	4	2s2	1	IR, II	Y	A	(SD)	270
Pbv302	AIFV	20mm	-	-	-	-	H	B/B/D	1	1s2	0	IRD	Y	A	(SD)	140
CHINA																
T59	MBT	100mm	STAD	-	MG	p12.7mm	ST	B/A/C	7	3	2	IR	-	D	Fixed bow MG	305
T62	AVR	85mm	STAD	-	MG	p12.7mm	ST	B/A/C	1	0	0	-	-	A		160
T63	MBT	85mm	STAD	-	MG	p12.7mm	ST	B/A/C	4	2	1	-	-	-		210
T34/85	MBT	85mm	STAD	-	MG	-	ST	B/A/C	4	3	2	-	-	-		215
SU100	TDG	100mm	STAD	-	-	-	ST	B/A/C	5	2	2	-	-	-		215
K63	APC	p12.7	-	-	-	-	H	B/B/C	1	0	0	-	-	-		80
ITALIAN																
OF-40	MBT	105mm	Laser	-	MG	pMG	H	A/A/B	7s4	3s4	2	IR	Y	-	(SD)	395
Vcc-Cam-illino	APC	c12.7	-	-	-	pMG	H	B/B/D	2	1	0	IRD	Y	A	(FUA)	130
Fiat6616	AVR	20mm	-	-	MG	-	MMF	C/B/D	0	0	0	IRD	-	A	(SD)	95
Fiat6614	APC	p12.7	-	-	-	-	MMF	C/B/D	0	0	0	-	-	A	(FUA)	70
FRENCH Contd.																
Shahine	AADV	*	-	-	-	-	H	A/A/A	0	0	0	IID	Y	-	(SD)Crotale (6)*	135
M3	APC	p12.7	-	-	-	-	MMF	C/B/D	0	0	0	-	-	A	with FCR 3 (FUA)	105
SPANISH																
BRM600	APC	pMG	-	-	-	-	HMF	B/A/D	0	0	0	IRD	-	-	(FUA)	75
BLR	APC	cMG	-	-	-	-	MMF	B/B/D	0	0	0	IRD	-	-	(FUA)	72
SWISS																
Pz61	MBT	105mm	OPT	-	20mm	pMG	ST	B/A/C	5	2	1	IRD	Y	-	(SD)	300
Pz68	MBT	105mm	OPT	MOD	MG	pMG	ST	B/A/C	5	2	1	IRD	Y	-	(SD)	295
M113	APC	20mm	-	-	-	-	H	B/B/C	1	0	0	IRD	-	A		105
YUGOSLAVIA																
M60	APC	p12.7	-	-	-	bow MG	ST	B/B/D	1	0	0	IRD	-	A	Some 2x82mmRCL @ 130	90
M980	APC	20mm	-	-	MG	-	H	C/B/D	2	0	0	IRD	Y	A	(FUA)Sagger (2+2)	180
EGYPT																
Walid	APC	p12.7	-	-	-	-	MMM	B/B/C	0	0	0	-	-	-	Open topped	45
T34/100	TDG	100mm	STAD	-	-	-	ST	A/A/C	3	1	0	-	-	-	Open topped	175
AUSTRALIA																
M113A1LSV	AVR	12.7mm	-	-	MG	-	H	B/B/C	1	0	0	IR	-	A	(SD)	125
M113A1T	APC	2xMG	-	-	-	-	H	B/B/C	1	0	0	IRD	-	A	(SD)	99
M113A1FSV	TDG	76mm	-	-	MG	-	H	B/B/C	1s2	0s2	0	IRD	-	A	(SD)	150

VEHICLE	TYPE	MA	RANG	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	NBC	AMP	Remarks	PV
									Front	Side	Rear					
JAPAN																
Type 74	MBT	105mm	Laser	MOD	MG	p12.7mm	H	B/A/C	7	3	2	IR	Y	-	(SD)	380
Type 61	MBT	90mm	OPT	-	MG	p12.7mm	ST	A/A/B	4	2	1	IRD	-	-		255
Type 73	APC	c12.7	-	-	-	Bow MG	H	C/B/D	2	0	0	II	Y	A	(SD)	145
Type SU60	APC	p12.7	-	-	-	Bow MG	ST	B/B/D	1	0	0	IRD	-	-		90
Type SV60	AMC	81mmM	-	-	-	p12.7mm	ST	B/B/D	1	0	0	IRD	-	-	5x60 107mmM = 130pts	120
Type 60	TDG	RCL's	-	-	-	-	ST	C/C/D	1	0	0	IRD	-	-	2 x 106mm RCL	155
Type 75	MRL	103mm	-	-	-	p12.7mm	H	B/B/C	1	0	0	IRD	-	-		205

NEW SOVIET EQUIPMENT

SU130	TDG	130mm	OPT	-	HMG	p14.5mm	ST	A/A/B	10	3	2	IR	-	-	May Have Laser Ran'g	390
IT/SU122	TDG	122mm	OPT	-	HMG	p14.5mm	M	A/A/B	9	3	2	IR	-	-		320

Note: the guns on the two above vehicles are standard field guns and HEAT rounds may not be available for them. The SU130 may also have image intensifying eqpt.

SP Guns

NAME	GUN	Max Range	RAP	MOB	AAMG	TARGET SIZE	ARMOUR			NF	NBC	AMP		Remarks	PV
							Front	Side	Rear						
K63/122	122mm	11.8km	-	H	-	A/A/B	0	0	0	-	-	-	China	HE, HEAT	105
Tatra/152	152mm	18.5km	37km	MMM	p12.7mm	A/A/B	0	0	0	-	-	-	Czech	APHE, HE, SMOKE	125
155GCT	155mm	23.5km	30.5km	H	p12.7mm	A/A/B	2	0	0	IID	Y	-	France	(SD) HE, Illum, SMOKE, BOMBLET	200
155 F3	155mm	21.6km	25.3km	H	-	B/A/B	0	0	0	IRD	-	-	France	Open top. HE, Illum, SMOKE.	135
105MK61	105mm	15km	-	H	pMG	B/A/B	1	0	0	IRD	-	-	France	HE, HEAT, SMOKE	130
SP-70	155mm	24km	31km	H	pMG	A/A/B	2	0	0	IID	Y	-	Inter	(SD) HE, ILL, SMOKE, BOMBLET	190
L-33	155mm	21km	-	ST	pMG	A/A/B	0	0	0	IID	-	-	Israel	HE, Illum, SMOKE	150
M-50	155mm	17.6km	-	ST	-	A/A/B	0	0	0	IRD	-	-	Israel	HE, Illum. Open topped	130
Banderkannon	155mm	25.6km	-	LOW	pMG	A/A/B	1	0	0	IID	Y	-	Sweden	(SD) HE, SMOKE	150
SAU-152	152mm	24km	37km	H	cMG	A/A/B	1	0	0	IR	Y	-	USSR	HE, HEAT, Illum, SMOKE	182
SAU-122	122mm	15.3km	21.9km	H	p12.7mm	B/A/C	1	0	0	IR	Y	A	USSR	HE, HEAT, SMOKE, CHEMICAL	155
Abbot	105mm	17km	-	ST	pMG	B/A/C	1	0	0	IRD	-	AS	GB	HE, HESH, SMOKE (SD)	135
M110	203mm	16.8km	-	H	-	A/A/C	0	0	0	IID	-	-	USA	HE	145
M110A2	203mm	21.3km	29.1km	H	-	A/A/C	0	0	0	IID	-	-	USA	HE, BOMBLET	165
M107	175mm	32.7km	-	H	-	A/A/C	0	0	0	IID	-	-	USA	HE	165
M109	155mm	14.6km	20km	H	p12.7mm	B/A/C	1	0	0	IID	-	-	USA	HE, BOMBLET, MINELET, Illum, SMOKE, CLGP	160
M109A1	155mm	18.1km	24km	H	p12.7mm	B/A/C	1	0	0	IID	-	-	USA	as above	165
M108	105mm	11.5km	-	H	p12.7mm	B/A/C	1	0	0	IRD	-	-	USA	HE, HEP, Illum, SMOKE	135
M55	203mm	16.8km	-	ST	p12.7mm	A/A/B	0	0	0	IRD	-	-	USA	HE	150
M44	155mm	14.6km	-	H	p12.7mm	A/A/B	0	0	0	IRD	-	-	USA	HE, Illum, SMOKE	145

24.3 MULTIPLE ROCKET LAUNCHERS

Country	Launcher	Type	Calibre	Reload Time	Range	Ammunition	PV
Austria	Steyr 630M2	1	130mm	3	8200m	HE, Smk	140
China	Type 63	3	107mm	2	8050m	HE	115
China	CA5/140	3	140mm	3	9810m	HE, Smk, Chem	110
Czech	M-51	1	130mm	3	8200m	HE, Smk	140
Czech	RM-70	1	122mm	2/5	20500m	HE, Smk, Chem	135
Egypt	Walid	3	140mm	3	14000m	HE	110
France	Rafele	1	147mm	6	32000m	HE, bomblet	110
F.G.R.	LARS	1	110mm	6	15000m	HE, Smk, Bomb, Mine	105
Israel	BM24	2	240mm	3	10700m	HE, Smk	120
Italy	FIROS 6	2	51mm	3	6550m	HE, Bomblet	90
Italy	FIROS 25	1	122mm	5	27000m	HE, Smk, Bomblet	120
Japan	Type 67	4	307mm	6	30000m	HE	95
Japan	Type 75	1	130mm	5	15000m	HE, Smk	120
S. Korea	MRLS	1	155mm	4	?	HE	130
Poland	WP-8	4	140mm	2	9810m	HE, Smk	110
Romania	M-51	1	130mm	3	8200m	HE, Smk	140
S. Africa	MRLS	1	127mm	4	?	HE	120
Spain	L10/D3	2	300mm	5	17000m	HE, Smk	100
Spain	L21/E2/E3	1	216mm	6	14500m	HE, Smk	115
Spain	L8/G3	1	381mm	6	23500m	HE	115
USSR	BM25	3	250mm	4	30000m	HE, Chem	125
USSR	BM24	2	240mm	3	11000m	HE, Smk, Chem	120
USSR	BMD-20	3	200mm	3	20000m	HE, Chem	115
USSR	BM/RPU-14-16	3	140mm	3	9810m	HE, Smk, Chem	110
USSR	BM-13-16	3	132mm	3	9000m	HE, Smk, Chem	110
USSR	BM21	1	122mm	5	20380m	HE, Smk, Chem	120
USA	MRLS	1	227m	4	30000m	HE, Smk, Bomb, Mine	135
Yugo	YMRL32 OGANS	1	128mm	5	18000m	HE, Smk, Chem	120
Yugo	M63PLAMAN	1	120mm	5	9600m	HE, Smk	115
Taiwan	Kung Feng	1	126mm	5	?	HE	120

NOTES

1. Czech RM70 may reload once in two moves, thereafter at the 5 moves rate.
2. U.S. MRLS may fire as a single rocket every move, firing as Type 4.

Helicopters

NOTE:- Basic load includes standard guns & electronics, Weapon loads are typical only.

* APACHE with 8 Hellfire, 2 x 19 Rkts = 990pts
 BLACKHAWK with 2 pivot mg = 370pts.
 SEA STALLION with 3 miniguns = 475pts.
 SEA STALLION CH-53E with 3 miniguns = 495pts.
 KIOWA with Mast Sight, Laser Des, 2 Stinger
 AAGW=550pts.

Helicopter	Type	Speed	Size	Crew + Passengers	Armour	Sensor	Combat Factor	Armament Notes	PV
AH-64 Apache	Attack	Fast	D/C	2	4	II,IR	2	Modern stabilised 30mm gatling gun. Laser designator any combination of 4x4 hellfire ATGW or 19x70mm rkts.	690 *
AH-IS/T Cobra	Attack	Fast	D/C	2	2	II,IR	3	Modern stabilised 20 or 30mm gatling gun. Up to 8 tow or 4x19 rkts. (with 8 TOW = 755pts)	630
AH-10/Q Cobra	Attack	Fast	D/C	2	2	IR	3	Modern stabilised 7.62mm minigun and auto g/launcher, up to 4x19 70mm rkts, or 2 miniguns or 1 20mm cannon some 2-8 tow. (with 4 x 19 70mm = 797)	597
UH-IN Iroquis also Bell 214 AB212	Assault	Medium	C/B	1+14	0		4	May carry 2 minigun or 2x19 70mm RP or door mtd pivot MG's. 1500kg load.	280
UH-1D/H Iroquis also Bell 204/5 AB205	Assault	Medium	C/B	1+14	0		4	As DH-IN 1000kg load	280
EH-1H Iroquis	ECM	Medium	C/B	4	1		4	ECM jamming level 5 (within 3km)	810
UH-60A Blackhawk	Assault	Fast	C/B	3+11	2	II,IR	3	2 door mtd pivot mg. some may carry RP's, hellfire, AAGW, stinger or sidewinder, 2000kg load	350 *
CH-46D Sea Knight	Assault	Slow	B/A	2+24	0		5	1500kg load	240
CH-47D Chinook	Lift	Fast	B/A	2+44	1		4	12700kg load	395
CH-54B Tarle	Lift	Slow	B/A	3	0		5	18500kg load	350
HH-3E	Rescue	Medium	B/A	2+30	2	IR	4	Pivot door mtd mg's. 2250kg load	415
CH-53A Sea Stallion	Lift	Fast	B/A	3+38	1	IR	5	11000kg load, up to 3 miniguns door mtd.pivot mg's.	415*
CH-53E Sea Stallion	Lift	Fast	B/A	3+55	2	IR	4	14000kg load, CH-53A	435
OH-58C Kiowa	Scout	Slow	D/C	2+2	0	II,TI	2	Up to 1 minigun or 2 stinger laser designator may have mast sight	415*
OH-6A Cayuse	Scout	Medium	D/C	2+2	0	IR	2	Up to 1 minigun or auto grenade launcher	420
Hughes 500 Defender	Scout/Lt Attack	Medium	D/C	1+4	0	II,IR	3	Up to 1 minigun up to 30mm chain gun. Up to 4 tow. Has mast sight. Laser designator.	425*

Helicopter	Type	Speed	Size	Crew+ Passengers	Armour	Sensor	Combat Factor	Armament Notes	PV
Bell 47G	Scout	Slow	D/C	2+1	0		5	350kg load	360
Allouette II Liama	Scout	Slow	D/C	1+4	0		4	600kg load	370
Allouette III	Liaison	Slow	C/B	1+6	0		4	1mg or stabilised 20mm autocannon 4 AS11 or 2 AS12 or 2 RP's. 750kg load (SS11 = 445pts.)	360
Super Frelon	Lift	Medium	B/A	2+30	1		4	5000kg load	375
Puma	Assault	Fast	C/B	1+20	1		3	3200kg load as Allouette III	315
Gazelle	Scout	Fast	D/C	1+4	0	IR	3	2mg, 2RP, 4 AS11 or 2 AS12, 4-6 Hot (with 6 HOT = 580pts)	445
MBB B0105M	Scout/ Lt Attack	Medium	D/C	1+4	1	II,IR	3	700kg load, up to 6 Hot may have mast sight (with 6 HOT = 565pts)	430
Augusta A109A Hirundo	Scout	Fast	D/C	1+7	1	II,IR	2	1000kg load, 2 MG's, 4 RP's, 4/8 Tow (with 2mg, 4 RP's = 770)	360
Augusta A129 Mangosta	Attack	Fast	D/C	2	3	II,IR	2	up to 8 Tow, 12.7mm HMG, Has mast sight hellfire (8 TOW=725)	580
Westland Sea Kings H6.4	Assault	Medium	B/A	2+28	1		4	2720kg load as Allouette III	275
Westland Lynx AH1	Assault/Lt Attack	Fast	C/B	1+10	1		3	8+8 Hot/Tow mg or 20mm cannon 1360kg load (with 8 TOW = 565pts)	340
Westland Scout AH1	Scout	Slow	D/C	2+4	0		3	as Allouette III	380
Westland Wessex HC2	Assault	Slow	B/A	2+16	0		5	as Allouette III (with 2 SS11 = 325)	240
PZL Mi2 Hoplite	Scout	Slow	C/B	1+8	0		4	RP's up to 4 Sagger ATGW, 700kg load	350
Mi4 Hound	Assault	Slow	B/A	1+14	0		5	2000kg load	240
Mi6 Hook	Lift	Medium	A/M	5+65-90	2		6	18000kg load, pivot 12.7mm HMG in nose	360
Mi8 HipC	Assault	Medium	C/B	2+28	1		4	4x32 57mm RP	285
Mi8 Hip D	ECM	Medium	C/B	5	1	IR	4	ECM jamming level 4 against within 2km	705
Mi8 Hip E	Assault	Medium	C/B	3+8	2		4	6x57mm RP, 12.7mm in nose, 4 Swatter or Sagger ATGW	315*
Mi10 Harke	Lift	Slow	A/H	2+28	1		6	11000kg load	330
Mi24 Hind A	Assault	Fast	C/B	4+8	2	IR	3	2000kg load, 12.7mm HMG in nose, 4RP, 4Sagger/Swatter	365*
Mi24 Hind D	Attack	Fast	C/B	2	2	IR,II	3	12.7mm HMG Gatling stabilised, 4 RP, 3 Swatter ATGW laser designator	635*
Mi24 Hind E	Attack	Fast	C/B	2	3	IR,II	3	as Hind D but with spiral ATGW	640*
Mi26 Halo	Lift	Fast	A/A	5+20	2		6	20000kg load	380

* Mi8 HIPE with 6 x 57mm RP & 4 Sagger = 850pts.

Mi24 HIND D with 4 x 57mm RP & 4 Swatter B = 920pts.

Mi24 HINDA with 4 x 57mm RP & 4 Sagger = 820pts.

Mi24 HIND E with 4 x 57mm RP & 4 Spiral = 965pts.

Aircraft Details

Aircraft	Name	Radar	ECM	Combat Factor	Aircraft	Name	Radar	ECM	Combat Factor
A-1H	Skyraider	-	6	5	Galeb		-	6	6
A-4M	Skyhawk	-	4	4	Ha220		-	6	6
A-6E	Intruder	-	2	5	Hawk		-	5	4
A-7H	Corsair II	-	3	4	Hunter		-	4	4
A-10A	Thunderbolt II	-	3	3	Jaguar		-	3	4
AT-37B	Dragonfly	-	6	5	Jastreb		-	5	5
AV-8B	Harrier	(3)	3	2	Kfir C-2		3	3	3
A5	Fantan	-	4	4	Lightning		3	4	3
AC-130	Hercules	-	6	6	M1G 17	Fresco	(5)	5	4
	Gunship				M1G 19	Farmer	(5)	4	4
Alphajet					M1G 21	Fishbed	4	4	3
B-52H	Strato	3	2	6	M1G 23	Flogger	3	3	3
	Fortress				M1G 25	Foxbat	3	2	4
Buccaneer 5.2		-	3	5	M1G 27	Flogger	(3)	3	3
C-130H	Hercules	-	6	6	Mirage III		(3)	4	3
C-141B	Starlifter	-	6	6	Mirage 5		(3)	3	4
Draken	J35F	3	4	3	Mirage FI		3	3	3
EA-6B	Prowler	2	1	5	0-2	Birdog	-	5	5
F-1A		3	4	4	OV-10D	Bronco	-	4	5
F-4E	Phantom	3	3	4	SAAB 105		-	5	6
F-4G	Wild Weasel	2	2	4	Su 7	Fitter	-	5	6
F-5A	Tiger	-	5	4	Su 17/20	Fitter	-	5	5
F-5E	Tiger	4	4	3	Su 24	Fencer	3	3	5
F-14A	Tomcat	1	2	4	Su 29	Frogfoot	-	3	4
F-15A	Eagle	2	2	2	Tornado		(2)	2	4
F-16A	Falcon	2	3	2	Tu 16	Badger	-	5	6
F-84F	Thunderstreak	-	5	5	Tu 22m	Backfire	3	2	5
F-86F	Sabre	-	6	4	Viggen	JA 39	3	3	3
F-100D	S.Sabre	-	5	5	Vulcan		-	3	6
F-102A	Dagger	3	4	4	YAK 28E	Firebar	-	2	5
F102A	Dagger	3	4	4					
F104G	Starfighter	3	4	4					
F-111F	Aadvark	3	2	5					
G91Y		-	5	4					

NOTES

- Further data on aircraft can be found in Ultra Modern Army Lists and Organisations.
- Radar factors in brackets are only applicable to certain models of that aircraft.
- This is only a selection of the most common aircraft, others should be interpreted from this table.

A.A. Missiles

Missile	Radar	Visual	Factor	Range	Height
Patriot	2	No	0	60Km	VH
Imp. Hawk	2	No	2	40Km	H
Chapparral	No	Yes	2	5Km	L
Stinger	No	Yes	1	5Km	L
Redeye	No	Yes	2	3.4Km	L
SA 13	No	Yes	0	7Km	M
SA 11	3	No	0	28Km	H
SA 9	No	Yes	2	7Km	M
SA 8	3	No	1	12Km	M
SA 7	No	Yes	3	3.5Km	L
SA 6	3	No	2	35Km	H
SA 4	3	No	2	70Km	VH
SA 3	4	No	3	35Km	H
SA 2	5	No	3	44Km	VH
Roland	3	No	1	6Km	M
Crotale	3	No	1	8.5Km	M
Rapier	3	Yes	0	6.5Km	M
Blowpipe	No	Yes	2	3.2Km	L
Indigo	4	Yes	1	10Km	M
Spada	3	No	1	25Km	M
RBS 70	2	Yes	0	5Km	L
Tigercat	No	Yes	2	6.5Km	L
Bloodhound	4	No	2	80Km	VH
SATCP	No	Yes	1	5Km	L
Sidewinder	Varies	Yes	1	5Km	Varies
Atoll	Varies	Yes	2	3Km	Varies
Javelin	No	Yes	1	4Km	L
ADATS	2	Yes	1	8Km	M

Note; VH & H missiles may not fire at contour targets and add 1 to factor at low level targets.

ANTI-AIRCRAFT GUNS

LMG	No	Yes	9	250m	L
HMG	No	Yes	8	500m	L
Up to 25mm	Yes	Yes	7	1500m	L
Up to 30mm	Yes	Yes	6	3000m	M
Up to 40mm	Yes	Yes	6	3500m	M
Up to 57mm	Yes	Yes	6	4000m	M
Larger	Yes	Yes	7	7500m	H

GUN MODIFIERS

Add 500m to range if twin barreled and deduct 1 from the AA Factor. 250m if LMG.

Add 500m to range if gatling and deduct 2 from the AA Factor.

Add 1000m to range if triple barreled and deduct 2 from the AA Factor.

Add 1000m to the range if quadruple barreled and deduct 3 from the AA Factor.

Infantry Notes

Country	Rifle	SAW	LAW	LAD	MAW	Remarks
Argentina	AR	Yes	Bazooka	-	-	70% conscript
Australia	SAR/AR	Yes	-	M72	C.Gustav	Regular Army
Austria	SAR/AR	-	-	M72 Miniman	C.Gustav	80% conscript
Belgium	AR	Yes	-	M72	Blindicide	30% conscript
Canada	SAR	Yes	-	M72	C.Gustav	Small Regular Army
China	AR	-	Type 56 Type 69	Type 74	-	50% conscript
Czechoslovakia	AR	Yes	RPG-7	-	-	70% conscript
Denmark	AR	-	-	M72	C.Gustav	40% conscript
Egypt	AR	Yes	RPG-7	-	-	75% conscript
Finland	AR	Yes	-	M72	-	70% conscript
France	AR	-	-	-	LRAC	60% conscript
Germany W.	AR	-	-	-	PzF44	50% conscript
Germany E.	AR	Yes	RPG-7	-	C.Gustav	-
Greece	SAR/AR	Yes	Bazooka	-	M67	80% conscript
Hungary	AR	Yes	RPG-7	-	-	60% conscript
India	SAR/AR	Yes	Bazooka	-	-	Regular Army
Iran	AR	-	Bazooka	-	-	60% conscript
Iraq	AR	-	RPG-7	-	-	85% conscript
Israel	AR	Yes	Bazooka	M72 Picket	C.Gustav	Citizen Army
Japan	AR	-	Bazooka	-	-	Regular Army
Jordan	AR	Yes	-	M72	-	Regular Army
Korea N.	AR	Yes	RPG-2/7	-	-	Mainly conscript
Korea S.	AR	-	Bazooka	-	-	Mainly conscript
Libya	AR	-	RPG-7	-	-	Regular Army
Netherlands	AR	Yes	-	M72	C.Gustav	60% conscript
Norway	AR	-	-	M72	C.Gustav	90% conscript
Pakistan	SAR/AR	Yes	Bazooka	-	Blindicide	Regular Army
Poland	AR	Yes	RPG-7	-	-	75% conscript
Romania	AR	Yes	RPG-7	-	-	70% conscript
S. Arabia	AR	-	-	-	M67	Regular Army
S. Africa	AR	Yes	Bazooka	-	-	80% conscript
Spain	AR	-	C-90	-	-	75% conscript
Sweden	AR	Yes	-	Miniman	C.Gustav	80% conscript
Switzerland	AR	Yes	-	M72	Blindicide	Citizen Army
Syria	AR	-	RPG-7	-	-	70% conscript
Taiwan	SAR/AR	-	Bazooka	-	M67	Mainly conscript
Turkey	AR	-	Bazooka	-	-	90% conscript
USSR	AR	Yes	RPG-7/16	RPG-18	-	75% conscript
UK	SAR	Yes	-	M72	C.Gustav	Regular Army
USA	AR	-	-	M72	(M67)	Regular Army
Yugoslavia	AR	Yes	RPG-7	-	-	75% conscript

EXAMPLES OF SMALL UNIT ORGANISATION**SOVIET SECTION IN BMP OR BTR 60/70**

- 1 three man AR squad with SAW (RPK)
- 1 three man AR squad with RPG-7/17
- 1 two man squad with LMG

Three of the above sections makes a platoon with one squad becoming a command squad and another having a sniper attached and another a Lt AAGW.

AMERICAN SECTION IN M113

- 1 four man AR squad
- 1 two man squad with LMG
- 1 two man squad with Dragon ATGW

US platoon command is in a separate M113

- 1 three man AR Command Squad
- 1 two man squad with LMG

BRITISH SECTION IN Fv432

- 1 four man SAR squad may have SAW (L4 Bren)
- 1 two man squad with LMG
- 1 two man squad with C.Gustav

British platoon command in separate Fv432

- 1 four man SAR command Squad
- 1 two man squad with Lt.Mortar

Bibliography

Weapons and Tactics of the Soviet Army, by David C. Isby
 Main Battletanks, by Christopher F. Foss
 Armour and Artillery 1982-83
 Weapon Systems 1981-82
 Infantry Weapons 1981-82
 How to make War, by James F. Dunnigan
 Tanks of the World 1983, by F.M. Von Senger und Etterlin
 Anti Tank, by Richard E. Simpkin
 Tank Warfare, by Richard E. Simpkin
 Mechanised Infantry, by Richard E. Simpkin

Janes
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 Arms and Armour Press
 Arms and Armour Press
 Brasseys
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 Brasseys

GAME COUNTERS

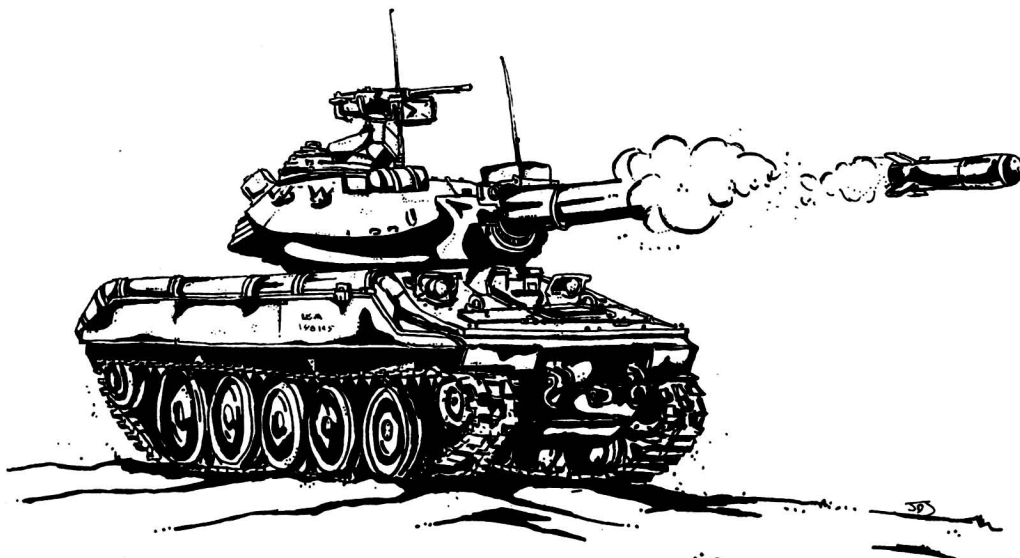
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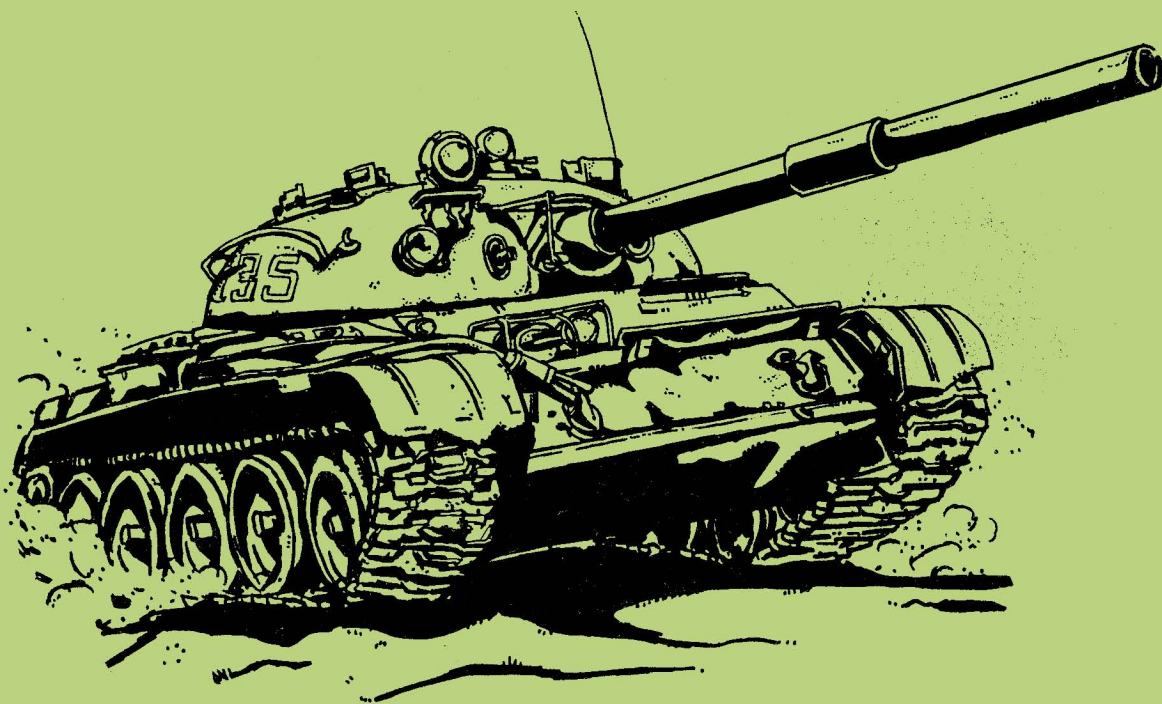


Missile Target & Firer Suppressed Neutralised Artillery Fire Zone Smoke Zone Marker KO'd

Abbreviations

AAGW	Anti Aircraft Guided Weapons
AP	Armoured Piercing
APC	Armoured Piercing Capped
APDS	Armoured Piercing Discarding Sabot
APFSDM	Armoured Piercing Fin Stabilised Discarding Sabot Depleted Uranium
APFSDS	Armoured Piercing Fin Stabilised Discarding Sabot
APHE	Armoured Piercing High Explosive
ATGW	Anti-Tank Guided Weapon
CLGP	Cannon Launched Guided Projectile
G HEAT	High Explosive Anti-Tank Spin Stabilised
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEAT-FS	High Explosive Anti-Tank Fin Stabilised
HESH	High Explosive Squash Head
HVAP	High Velocity Armoured Piercing
IFC	Improved Fire Control
LAD	Light Anti-Tank Weapon Disposable
LAW	Light Anti-Tank Weapon
LLTV	Low Light Television
LPG	Low Pressure Gun
MAW	Medium Anti-Tank Weapon
RCL	Recoilless Rifle
RMG	Ranging Machine Gun
SAW	Squad Automatic Weapon
SFMG	Sustained Fire Machine Gun
WP	White Phosphor Smoke





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CHALLENGER Q.R. SHEET

SEQUENCE OF PLAY

INITIAL MOVE PHASE (BOTH PLAYERS)

- 1) Test, request, note aircraft & flight paths.
- 2) Request, plot indirect area fire.
- 3) Declare AA Overwatch.

SEQUENTIAL PHASE

- 1) Player 1 moves.
- 2) Player 2's ATGW fire, and elements that moved less than ½ moves.
- 3) Player 1 fires direct fire elements that did not move more than ½ move.
- 4) Player 2 resolves ATGW fire.
- 5) Player 2 moves.
- 6) Player 1 fires ATGW and any elements that did not move more than ½ move.
- 7) Player 2 fires any direct fire from elements that did not make more than ½ move.
- 8) Player 1 resolves his ATGW fire.

END OF MOVE PHASE (BOTH PLAYERS)

- 1) Carry out air strikes, and AA Fire
- 2) Resolve indirect area fire
- 3) Test morale
- 4) Suppression & Neutralisation removal phase.

MOVEMENT TABLES

Tracked Vehicles	Combat Mode	Travel Mode	Road Bonus	Towing	Linear Obstacle	Turn More Than 45°	Reverse	Open Woods	Dense Woods
V.H.Mobility	1000m	1500m	+500m	-25%	-10%	-10%	150m	750m	150m
H. Mobility	750m	1200m	+400m	-25%	-10%	-10%	100m	600m	150m
St. Mobility	500m	1000m	+300m	-25%	-10%	-10%	100m	400m	100m
L. Mobility	400m	800m	+200m	-25%	-10%	-10%	75m	300m	100m

HALF TRACKS & WHEELED	Combat Mode	Road Speed			Towing	Linear Obstacle	Reverse	Open Woods	Dense Woods
		Fast	Medium	Slow					
H. Mobility	750m	1250m	1000m	750m	-25%	-25%	100m	500m	50m
M. Mobility	500m	1250m	1000m	750m	-25%	-50%	100m	250m	-
L. Mobility	250m	1250m	1000m	750m	-25%	-75%	100m	100m	-

INFANTRY & ANIMALS	Combat Mode	Travel Mode	Linear Obstacle	Open Woods	Dense Woods
Infantry	100m	150m	-50m	100m	50m
+ Support Weapons	75m	100m	-50m	50m	25m
Manhandling Weapons	25m	50m	-	25m	-
Animals	200m	300m	-100m	150m	100m
Animals Towing	100m	200m	-	50m	-

Open Woods also includes Scrub and other Poor Going.
Dense Woods also includes all other Bad Going.

ACQUISITION

TARGET IN THE OPEN

Target Type	Up to 50m	200	500	1000	2000	3000	5000
A	1	1	1	2	3	5	10
B	1	1	2	3	4	6	8
C	1	2	3	4	5	8	9
D	1	2	5	8	9	10	11
E	2	3	6	9	10	11	12
F	2	3	7	10	11	12	-
G	2	4	8	11	12	-	-

TARGET IN COVER							
A	1	2	3	4	5	8	10
B	1	3	4	5	7	9	10
C	2	4	5	7	8	10	11
D	2	5	6	8	10	11	12
E	3	6	8	10	11	12	-
F	4	7	9	11	12	-	-
G	5	8	10	12	-	-	-

- 1 Higher, weapon fired & no back flash, Rifles, LMG or Lt Mortar, Moved 50m to 250m in sight
- 2 Weapon fired with back flash, Lt AAGW, SFMG/HMG, Mortar up to 82mm, RCL up to 90mm, Autocannon & guns up to 40mm, Moved 250m to 750m in sight. Handed over by friends on same net.
- 3 Fired RCL over 90mm or gun over 40mm, Other mortars, missiles or rockets. Moved 750m plus in sight.
- +1 Observing through artillery zone. Observing on the move, making emergency halt.
- +2 AFV Suppressed, Target dug-in, Sensor 1. Observing through salvo rocket zone.
- +3 Others suppressed, out of visibility arc, Through partial smoke, snow, fog, H.Rain, Sensor 2 at night. In travel mode.
- +4 Sensor 3 at night
- +6 At night with no sensors.

DIRECT FIRE TABLE

Weapon	Ranging System	Up to 100m	250	500	750	1000	1500	2000	2500	3000	3500	4000	4500
Guns over 100mm	Laser I.F.C.	2	2	2	2	2	5	8	10	14	16	18	-
	Laser	2	2	2	2	3	7	10	13	15	17	19	-
	Optical/R.M.G.	2	2	2	3	4	9	12	16	19	20	-	-
	Stad./None	2	2	2	4	5	11	15	18	19	20	-	-
Guns Up to 100mm	Laser I.F.C.	2	2	2	3	4	7	11	15	19	-	-	-
	Laser	2	2	2	4	5	10	14	18	20	-	-	-
	Optical/R.M.G.	2	2	2	5	7	12	18	20	-	-	-	-
	Stad./None	2	2	3	7	9	14	19	20	-	-	-	-
Guns Up to 57mm	Laser I.F.C.	2	2	2	4	8	12	18	20	-	-	-	-
	Laser	2	2	3	6	10	16	20	-	-	-	-	-
	Optical/R.M.G.	2	3	5	8	14	18	20	-	-	-	-	-
	Stad./None	2	3	6	10	16	19	20	-	-	-	-	-
Ammo Mod'r	HEAT	-	-	-	-	-	+1	+2	+2	+3	+3	+3	-
	HEAT-FS	-	-	-	-	-	+1	+2	+3	+3	+4	+4	-
	MESH	-	-	-	-	-	+1	+3	+3	+4	+4	+5	-
	Over 37mm	2	2	2	2	3	7	10	13	15	17	19	-
Auto Cannon	Over 25mm	2	3	4	5	8	10	12	15	18	20	-	-
	Over 15mm	2	3	6	8	10	12	15	18	20	-	-	-
	Cannon & HMG up to 15mm	2	4	8	12	15	18	20	-	-	-	-	-
RCL's	Over 100m & LPG's	2	4	6	10	14	18	20	-	-	-	-	-
	Over 75mm	2	5	9	12	18	20	-	-	-	-	-	-
	Over 57mm	5	9	13	16	19	-	-	-	-	-	-	-
	Up to 57mm	6	11	16	18	-	-	-	-	-	-	-	-
Infantry A/T (3)	Infantry A/T (2)	7	13	18	-	-	-	-	-	-	-	-	-
	Infantry A/T (1)	8	15	-	-	-	-	-	-	-	-	-	-
	Howitzers	3	6	8	10	12	18	20	-	-	-	-	-
	1st Generation	15	13	11	9	7	3	3	3	4	6	8	14
ATGW	1½ Generation	13	11	7	5	3	3	3	3	3	5	7	13
	2nd Generation	11	5	4	3	3	3	3	3	3	4	6	11
	3rd Generation	7	4	3	3	3	3	3	3	3	3	5	7

MODIFIERS

- | | | |
|------------------------------|------------------------|---|
| -2 2nd & Sub phase of firing | +1 Modern Stab. firing | +2 target moved 250m+ in sight |
| -1 A Class target | +2 Stabilised firing. | +3 target moved 750m+ in sight |
| +1 C Class target | +3 Unstabilised firing | +4 target moved 250m+ but less than 100m in sight |
| +2 D Class target | +2 Self Suppressed | +2 pivot or fixed weapon firing. |
| +3 E Class target | +2 Target dug-in | ATGW |
| | HELICOPTERS | +4 2nd Generation suppressed |
| | +6 Firing AT Pop-Up | +8 1st & 1½ Gen. Suppressed |
| | +4 Firing AT N of E | +4 Firing at Manoeuvre evade |
| | | +6 Firing at Cover evade |
| | | +8 Firing at smoke evade |

PENETRATION TABLE - KINETIC ENERGY ROUNDS

Gun	Ammunition	HEAT	HESH	Up to 250m	500	750	1K	1.5K	2K	2½K	3K	3½K	4K
125mm	APFSDS	19	-	20	19	19	18	17	16	15	13	11	9
120mm	APFSDS	17	18	21	20	20	19	18	16	15	13	11	7
	APDS	17	18	19	18	18	17	16	14	12	10	9	6
115mm	APFSDS	17	-	19	18	17	16	14	12	10	9	8	6
105mm	APFSDS	16	17	19	18	18	17	16	14	12	10	9	6
	APDS	16	17	18	17	16	15	13	11	9	8	7	5
100mm	APDS	15	-	16	15	13	13	11	10	8	6	-	-
76mm	APHE	11	12	12	8	7	6	6	5	5	4	-	-
75mm	APFSDS	10	-	14	13	12	12	11	10	7	5	-	-
30mm	AP	-	-	5	4	3	3	2	1	1	1	-	-
25mm	AP	-	-	5	4	3	2	2	1	1	1	-	-
20mm	AP	-	-	4	3	3	2	1	1	1	-	-	-
14.5mm	AP	-	-	3	3	2	2	1	1	-	-	-	-
12.7mm	AP	-	-	3	2	2	1	1	1	-	-	-	-

AUTOCANNONS

Increase penetration factor for each 2 above that to hit (max of 6 factors)
by:- Single +1 Triple, Gatling +3 Twin, Chain +2 Quad +4

DIRECT AREA FIRE MODIFIERS

	Column Shift	Die Roll Mod.
Autocannon, Guns & Hws 1000+		-1
Autocannons over 1500		-3
Guns & Hws over 1500m		-2
Guns & Hws over 2000m		-3
Using MESH against constructions and field defences	1 to Rt	
Using HESH/HEAT against infantry elements	1 to Lt	

CHALLENGER QUICK REFERENCE SHEET

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DEVIATION TABLE - Indirect Area Fire.

+1	In travel mode Not in command control Poor visibility/night 25%+ suppressed, Neutralised or disabled.	-1	In field def's, AFV hulldown More enemy disabled in 500m than suffered this turn
+2	50%+ (as above) Under chemical attack	+1	Attempting to regain morale.
+3	75%+ (as above) Under nuclear attack		

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MORALE RESULT

1 or 2 Maximum advance half move.

3 Move to cover within $\frac{1}{2}$ move and halt, If in cover no move to within 100m of enemy acquired.

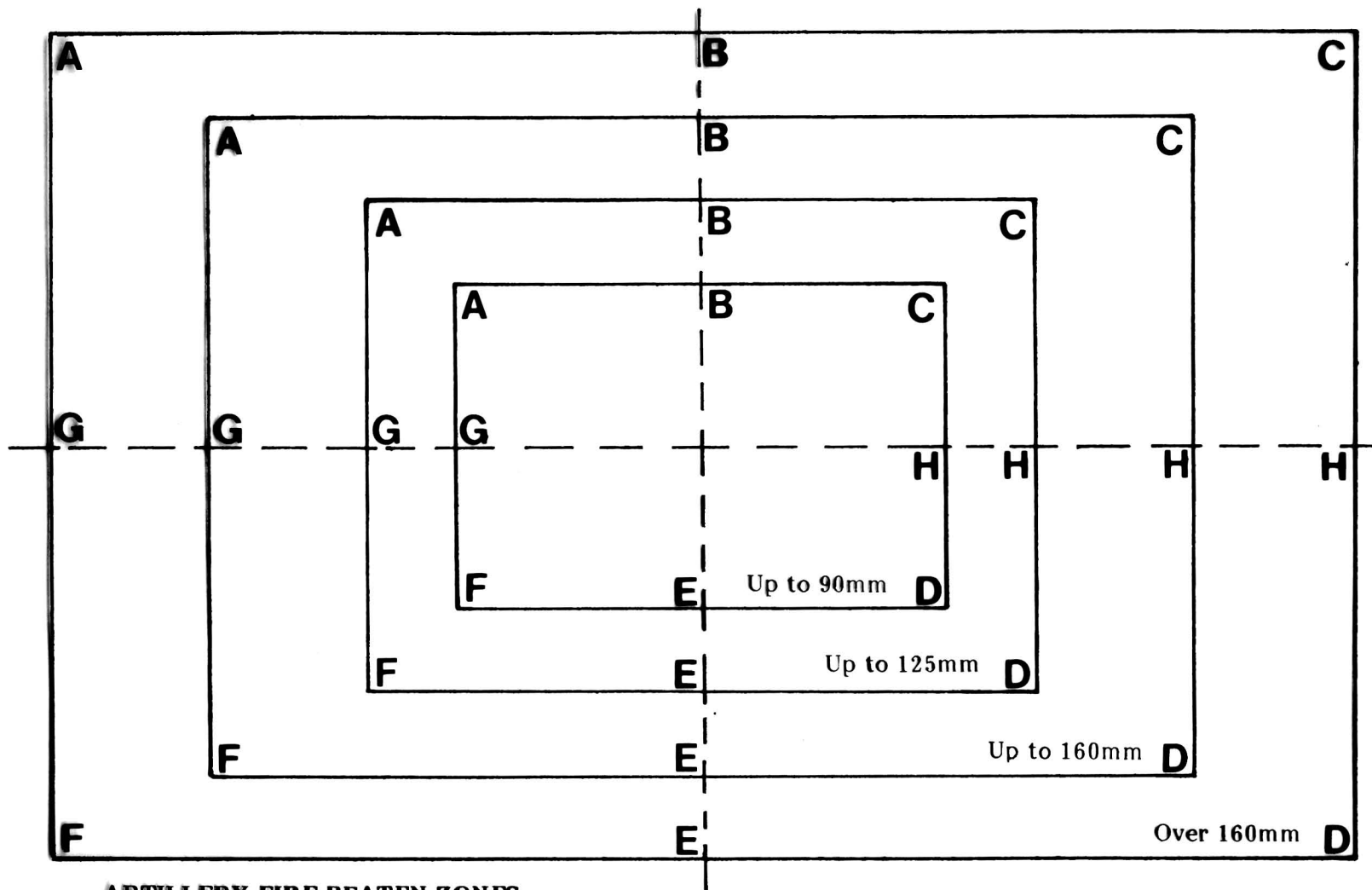
4 Halt or retire to cover within $\frac{1}{2}$ move. Suppressed.

5+ Retire to regroup, or off baseline at max speed if AFV, or to nearest cover if Inf, neutralised. Inf surrender to non-neutralised enemy within 50m.

VEHICLE DATA

CHALLENGER ULTRA MODERN RULES

VEHICLE	MAIN GUN	RANGING	STAB	Co-ax	AAMG	MOB	TARGET SIZE	ARMOUR			NF	SD/SG	Remarks	PV
								Front	Side	Rear				
RUSSIAN														
T85	125mm	IFC	MOD	MG	c12.7mm	H	A/A/B	13c10	5c5	3c2	IR,II	both		630
T74-80	125mm	IFC	MOD	MG	p12.7mm	H	B/A/C	11c5	5c3	3	IR,II	both		560
T72	125mm	Laser	MOD	MG	p12.7mm	H	B/A/C	11	5c2	3	IR,II	SG		500
T64	125mm	Laser	MOD	MG	p12.7mm	H	B/A/C	11	5	3	IR,II	SG		490
T62	115mm	STAD	Yes	MG	p12.7mm	ST	B/A/C	8	3	2	IR	SG	Some have Laser	365
T55/54	100mm	STAD	yes	MG	p12.7mm	ST	B/A/C	8	4	2	IR	SG	Some have Laser	335
PT76	76mm	STAD	yes	MG	p12.7mm	ST	B/A/C	1	0	0	IR			165
BRDM2	14.5mmA	-	-	MG	-	MMF	C/C/D	1	0	0	IR			120
BRDM2S	Sagger(6+8)	-	-	-	-	MMF	C/C/D	1	0	0	IR		If Sagger B(150)	135
BRDM3	Spandrel(5+10)	-	-	-	-	MMF	C/C/E	1	0	0	IR,II			185
BMP1/2	73mmL	-	-	MG	-	H	C/B/D	2	0	0	IR	SG	+Sagger (1+4)	195
BMP3	30mmA	-	-	MG	-	H	C/B/D	2	0	0	IR,II	both	Some Spigot(FUA)	170
BMP-R	73mmL	-	-	MG	-	H	C/B/D	2	0	0	IR,II	SG	(FUA)	145
BTR60PB	14.5mmA	-	-	MG	-	HMM	B/B/D	1	0	0	IR			110
ZSU57-2	2x57mmA	-	-	-	-	ST	A/A/B	1	0	0	IRD		Open topped	110
ZSU23-4	4x23mmA	-	MOD	-	-	ST	A/A/B	0	0	0	IID		FCR 3	160
AMERICAN														
M1 Abrams	105mm	IFC	MOD	MG	p12.7mm+pMG	VH	A/A/B	14c10	6c6	4c4	IR,II	both	Also II	705
M60A3	105mm	Laser	MOD	MG	c12.7mm	ST	A/A/B	8	3	2	IR,II	both	Also II	435
M60A2	152mmGL	Laser	MOD	MG	c12.7mm	ST	A/A/B	9	3	2	IR,II	SD	Shillelagh(13)	400
M60A1	105mm	OPT	MOD*	MG	c12.7mm	ST	A/A/B	8	3	2	IR,II*	SD*	*M60A1 Rise only	380/355
M48A5	105mm	OPT	-	MG	2 x pMG	ST	A/A/B	7	4	2	IR			345
Sheridan	152mmGL	Laser	Yes	MG	p12.7mm	H	B/A/C	3	1	1	IR	SD	Shillelagh (8)	295
M2	25mmCG	-	MOD	MG	-	VH	B/B/C	5c5	2c3	2c2	IR,II	both	(FUA) Also II	455
M3	25mmCG	-	MOD	MG	-	VH	B/B/C	5c5	2c3	2c2	IR,II	both	TOW (2+8)	455
M113A1/2	p12.7mm	-	-	-	-	H	B/B/C	1	0	0	IID			100
M113ACAV	c12.7mm	-	-	-	2 x pMG	H	B/B/D	1	0	0	IID		Open Topped	120
M106	107mmM	-	-	-	p12.7mm	H	B/B/D	1	0	0	IID		Open topped ?	135
M125	81mmM	-	-	-	p12.7mm	H	B/B/D	1	0	0	IID		Open topped ?	125
M150	TOW(1+14)	-	-	-	-	H	B/B/D	1	0	0	IID		Open topped ?	195
M901	TOW(2+10)	-	-	-	pMG	H	B/B/D	1	0	0	LLTV	SD		255
M163	20mmG	-	-	-	-	H	B/B/C	1s1	0s1	0	IID			140
Sgt York	2x40mm	-	MOD	-	-	ST	A/A/A	4	2	1	II	SD	FRC 2	255
Commando	p12.7mm	-	-	-	-	MMF	C/B/D	1	0	0			(FUA)	75
BRITISH														
Challenger	120mm	IFC	MOD	MG	cMG	H	A/A/B	15c10	5c6	3c4	IR,II	SD	Later II	642
Chieftain	120mm	IFC	MOD	MG	cMG	ST	A/A/B	12	4	2	IR,II	SD		462
Centurion	105mm	RNG	MOD	MG	pMG	ST	A/A/B	8	3	2	IR	SD		355
Scorpion	76mm	RNG	-	MG	-	VH	C/C/D	2	1	0	IR,II	SD		220
Scimitar	30mmA	-	-	MG	-	VH	C/C/D	2	1	0	IR,II	SD		190
Striker	Swingfire	-	-	-	cMG	VH	C/C/E	2	1	0	IR,II	SD	Swingfire(5+5)	247
Spartan	cMG	-	-	-	-	VH	C/C/E	2	1	0	IR,II	SD		162
Ferret	MG	-	-	-	-	MMF	C/C/E	0	0	0	IRD	SD		82
Fox	30mmA	-	-	MG	-	MMF	C/C/D	1	0	0	IR,II	SD		145
FV432	pMG	-	-	-	-	ST	B/B/D	1	0	0	IID	SD	with tMG 92pts	90
FV438	Swingfire	-	-	-	pMG	ST	B/B/E	1	0	0	IID	SD	Swingfire(2+14)	165
MCV80	30mmA	-	MOD	MG	-	VH	B/B/C	3	1	0	IR,II	SD	tMG only 80pts.	200
WEST GERMANY														
Leopard 2	120mm	IFC	MOD	MG	2 x pMG	VH	A/A/B	13c10	5c6	3c3	IR,II	SD	Also II	660
Leop1A1	105mm	OPT	MOD	MG	pMG	H	A/A/B	6	2s2	2	IR	SD	Some with Laser	335
Leop A1/2	105mm	OPT	MOD	MG	pMG	H	A/A/B	7s2	2s2	2	IR,II	SD	Some with Laser	370
Leop A3/4	105mm	OPT	MOD	MG	pMG	H	A/A/B	7s4	3s4	2	IR,II	SD	Some with Laser	420
Luchs	20mmA	-	-	MG	pMG	MMF	A/A/C	2	1	1	IR,II	SD		170
Marder	20mmA	-	-	MG	cMG	H	B/B/C	5	2	1	IR	SD	(FUA)	207
Jaguar 1	HOT(1+20)	-	-	-	pMG	H	C/B/D	4s3	2s3	0	IR,II	SD	Bow MG	325
Jaguar 2	TOW(1+18)	-	-	-	pMG	H	C/B/D	4s3	2s3	0	IR,II	SD	TI later	310
Kanone	90mmF	OPT	-	MG	pMG	H	C/B/D	5	2	0	IR	SD	Some with Laser	285
Gepard	2 x 35mmA	-	MOD	-	-	H	A/A/B	3	2	1	IID	SD	FCR 3	220
FRENCH														
AMX30B2	105mm	Laser	MOD	20mmA	pMG	H	B/A/C	5	2	2	IR,II	SD		360
AMX30	105mm	OPT	-	20mmA	pMG	H	B/A/C	5	2	2	IR,II	SD	Some Co-ax 12.7.	320
AMX13	90mm	OPT	-	MG	-	H	B/B/C	3	1	0	IR	SD		215
AMX13 SS	75mm	STAD	-	MG	-	H	B/B/C	3	1	0	IR	SD	Harpon (4)	285
AMX10RC	105mm	Laser	-	MG	-	MMF	B/B/C	3	2	0	IR,II	SD	Also LLTV	280
ERC90S	90mm	Laser	-	MG	-	MMF	B/B/C	2	1	0	IR,II			255
EBR	90mm	STAD	-	MG	-	MMF	B/B/C	3	1	2	IR	SD	Bow & Rear MG	230
AML90	90mm	STAD	-	MG	-	MMF	C/C/D	1	0	0	IR	SD		180
AML60	GM60mm	-	-	2xMG	-	MMF	C/C/D	1	0	0	IR	SD		125
AMX10P	20mm	-	-	MG	-	H	B/B/D	2	0	0	IR,II	SD		160
AMXVC1	p12.7mm	-	-	-	-	H	B/B/C	2	1	0	IRD		(FUA) MG=92pts	100
VAB	pMG	-	-	-	-	MMF	B/B/D	1	0	0	IRD			75
ISRAELI														
Centurion	105mm	RHMG	MOD	MG	2 x pMG	ST	A/A/B	8	3	2	IR			355
Cent (UG)	105mm	Laser	MOD	MG	2 x pMG	ST	A/A/B	8A	3As2	2	IR,II	SD		470
M45/60	105mm	Laser	-	MG	2 x pMG	ST	A/A/B	8A	3A	2	IR,II	SD		460
T1-67	105mm	OPT	-	MG	p12.7mm	ST	B/A/C	8	4	2	IR			375
Merkava	105mm	Laser	MOD	MG	2 x pMG	H	B/A/C	12c8	6c4	3c3	IR,II		Mk1	540
Sherman	105mm	OPT	-	MG	p12.7mm	ST	B/A/C	3	2	1	IR		Mk51	225
RBV	p12.7mm	-	-	Up to 4	-	MMF	C/C/D	0	0	0			Open topped	65
M3	p12.7mm	-	-	-	-	MMF	B/B/C	0	0	0			Open topped	50
Shoet	p12.7mm	-	-	-	-	MMF	B/B/C	0	0	0			Open topped Mk2	55
SWEDEN														
S Tank	105mm	OPT	-	2MG	LMG	H	B/A/C	12	4	2	IR,II	SD		412
IKV91	90mm	Laser	-	MG	pMG	H	B/A/C	4	2s2	1	IR,II	SD		270
Pbv302	20mm	-	-	-	-	H	B/B/D	1	1s2	0	IRD	SD		140



ARTILLERY FIRE BEATEN ZONES

- 1-2 guns — A B H G
- 3-4 guns — A B E F
- 5-8 guns — A C D F

ULTRA MODERN RULES

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