

TRONSOFT GAMES

Battle of the Bulge

Battle Manual — version 1.0.1



The Ardennes offensive, 16–31 December 1944. Sixteen daily turns over 806 hexes of real Belgian and Luxembourg ground, 182 counters, and one decimal die. This manual gives the full rules and every table in the game. All of the tables below are generated directly from the shipped data, so they cannot differ from what the game uses.

Players: 1 · Play length: 45-90 minutes · Complexity: low

1. The map

The board is a pointy-top hexagonal grid of 26 columns by 31 rows, 806 hexes in all, laid over the Ardennes between longitude 4.78 and 6.62 and latitude 49.52 and 50.72. Each hex is 5 km across the flats, giving a row pitch of 4.330 km. The map is not drawn by hand: every place in it sits at its real coordinates, the rivers are traced as polylines and marked onto the hexsides they actually cross, and the roads are pathed between the towns they connected.

1.1 Terrain

Defence multiplies the total defence strength in the hex. Movement is the cost in movement points to enter it off-road.

Terrain	Defence	Movement	Hexes on the map
Open	×1	1	260
Woods	×1.5	2	215
Broken ground	×1.5	2	105
Forested ridges	×2	3	144
Moor	×1.5	3	18
Town	×2	1	60
City	×3	1	4

1.2 Rivers, roads and bridges

A minor river costs 1 extra movement point to cross and halves the attack strength of a formation attacking across it without engineers. The Meuse is a major river: 3 movement points, attack strength quartered, and it may only be crossed at an intact bridge. Roads run in two classes; the through routes cost 1 of a movement point per hex and the lateral roads 1.5, but only 2 formations may use a given road hex at road rate in one turn.

Allied engineers prepare demolitions: at the start of each Allied turn, any bridge over a major river with a German formation on or next to either end is blown on a roll of 2 or more. A blown major crossing is never rebuilt. Minor crossings can be repaired. A German column that reaches a bridge inside its own turn can still get across before the charges are fired.

1.3 Objectives

Place	Points	Place	Points
Liège	20	Ettelbruck	3
Luxembourg City	14	Hotton	3
Namur	14	Krinkelt-Rocherath	3
Bastogne	12	La Roche	3
Dinant	12	Monschau	3
Givet	10	Neufchâteau	3
Huy	10	Saint-Hubert	3
Elsenborn Ridge	8	Trois-Ponts	3
St. Vith	8	Vielsalm	3

Place	Points	Place	Points
Verviers	8	Wiltz	3
Spa	7	Barvaux	2
Andenne	6	Bettembourg	2
Arlon	6	Büllingen	2
Ciney	6	Echternach	2
Eupen	6	Gouvy	2
Marche-en-Famenne	6	Grandménil	2
Celles	5	La Gleize	2
Houffalize	5	Martelange	2
Malmedy	5	Mersch	2
Aywaille	4	Noville	2
Manhay	4	Ortheuville	2
Rochefort	4	Schönberg	2
Stavelot	4	Stoumont	2
Werbomont	4	Bleialf	1
Baraque de Fraiture	3	Durbuy	1
Bütgenbach	3	Hosingen	1
Clervaux	3	Marvie	1
Diekirch	3	Vianden	1

Fuel dumps captured intact add to the German pool: Büllingen (3), Stavelot (4), Spa (5), Bastogne (3).

2. The counters

There are 182 counters: 81 German and 101 Allied, at regiment, brigade and combat-command scale. Each carries an attack strength, a defence strength and a movement allowance. Every counter has two steps unless noted; a formation that has lost a step is turned to its reduced side and fights at 55 per cent of its printed strengths, rounded up.

Type	Attack	Defence	Movement	Steps	Mechanised
Volksgrenadier	4	4	4	2	no
Infantry	5	5	4	2	no
Fallschirmjäger	5	5	4	2	no
Panzer	9	7	8	2	armour
Panzergrenadier	6	6	8	2	yes
Reconnaissance	4	3	9	1	yes
Panzer brigade	7	6	8	1	armour
Combat command	8	6	8	2	armour
Parachute inf.	6	6	4	2	no
Cavalry group	3	3	9	1	yes
Engineers	1	3	4	1	no
Artillery	5	2	4	1	no
Armoured bde.	7	6	8	2	armour
Infantry bde.	5	5	4	2	no

Stacking is 3 formations to a hex. A formation exerts a zone of control into the six hexes around it: entering one stops movement immediately, and a formation may not move directly from one enemy zone of control into another.

3. Sequence of play

Each turn is one day. There are sixteen of them in the campaign, from 16 to 31 December 1944.

Step	What happens
Weather	Rolled or scripted for the whole turn. Governs flying and movement.
German reinforcement	Formations due this turn arrive at their entry points.
German supply	Traced from the German rear. Unsupplied formations are marked.
German movement	Each formation spends up to its allowance.
German combat	Attacks declared and resolved one hex at a time.
German exploitation	Mechanised formations in supply that did not retreat get 4 more movement points.
Allied demolition	Threatened major-river bridges are blown.
Allied air	The day's air points are allocated.
Allied reinforcement, supply, movement, combat, exploitation	As above but, the Allied player.
Interdiction	Leftover Allied air points hunt German road hexes overnight.

3.1 Movement

A formation's allowance is its printed movement factor, halved if it is out of supply, reduced by one in snow, and halved again for German mechanised formations when the fuel pool is empty. A formation that has not moved may always make one hex however expensive it is.

3.2 Fuel

The German player receives fuel at the start of each turn on a declining schedule: 10, 9, 8, 7, 6, 5, 5, 4, 4, 3, 3, 3, 2, 2, 2, 2. A German mechanised formation spending more than 4 movement points in a turn burns one point of it. Captured Allied dumps add to the pool.

3.3 Supply

Supply is traced from each side's own rear at a cost of 1 per road hex and 3 per hex off road, up to a budget of 22. A formation that cannot be reached attacks and moves at half effect, and loses a step after 4 consecutive turns cut off. Isolated Allied garrisons holding a town can be supplied by air when the weather allows flying.

4. Weather

Weather	Air points	Movement	Effect
Fog	0	normal	No flying. Fog favours the attacker.
Snow	0	-1	No flying. Snow slows every column.
Overcast	2	normal	Broken cloud. A few sorties get through.
Clear	8	normal	Jabo weather. The roads are hunted.

The first 8 days follow the weather as it was: fog, fog, snow, fog, overcast, fog, clear, clear. After that it is rolled each turn on the decimal die - 1 to 5 clear, 6 to 8 overcast, 9 or 10 snow.

4.1 Air power

Air points are spent by the Allied player at 2 points per column shift in an attack. Whatever is left at the end of the Allied turn interdicts German road hexes, which cost extra to move through on the following turn.

5. Combat

Total the attack strengths of every formation going in, applying the river and terrain modifiers below. Total the defence strengths in the target hex and multiply by the terrain. Reduce to a ratio, find the column, apply shifts, and roll one ten-sided die.

Modifier	Effect
Armour attacking into clear ground	×1.5
Armour attacking into forest, city or marsh	×0.75
Elite formation, attacking or defending	×1.1
Attacking across a minor river without engineers	×0.75
Attacking across a major river without engineers	×0.5
Out of supply, attacking	×0.5
Out of supply, defending	×0.8
Defending artillery within 2 hexes	added after terrain at ×0.7, best 2 guns
German attack, turns 1 and 2 (surprise)	+1 column
Allied air support	+1 column per 2 points

5.1 The combat results table

Roll one decimal die and read the column.

Odds	1	2	3	4	5	6	7	8	9	10
1:3	AE	AE	AL	AL	AR	AR	AR	EX	DR	DR
1:2	AE	AL	AL	AR	AR	AR	EX	DR	DR	DL
1:1	AL	AL	AR	AR	EX	EX	DR	DR	DL	DL
3:2	AL	AR	AR	EX	EX	DR	DR	DL	DL	DE

Odds	1	2	3	4	5	6	7	8	9	10
2:1	AR	AR	EX	EX	DR	DR	DL	DL	DE	DE
3:1	AR	EX	DR	DR	DL	DL	DL	DE	DE	DE
4:1	EX	DR	DL	DL	DL	DE	DE	DE	DE	DE
5:1	DR	DL	DL	DE	DE	DE	DE	DE	DE	DE
6:1	DL	DL	DE	DE	DE	DE	DE	DE	DE	DE
8:1	DL	DE	DE	DE	DE	DE	DE	DE	DE	DE
Result	Meaning									
AE	The attack is thrown back in pieces: the attacker loses two steps.									
AL	The attack fails: the attacker loses a step.									
AR	The attack falls back to its start line.									
EX	Exchange: both sides lose a step and the defender gives ground.									
DR	The defence retreats.									
DL	The defence loses a step and retreats.									
DE	The defence is destroyed.									

5.2 Strongpoints

A defender in a town or a city does not retreat. Any result that would push it back costs it a step instead, and the position holds until it is destroyed. This is why Bastogne, St. Vith and Elsenborn have to be fought for.

5.3 Advance

When a hex is cleared, the attacking formations may advance into it, armour first, up to the stacking limit.

6. Victory

At the end of the last turn the German player scores the value of every objective held, plus 12 points for each formation standing west of the Meuse, plus one point for every three Allied steps destroyed, less one point for every three German steps lost.

German points	Result
111 or more	German decisive victory
89 or more	German victory
69 or more	German marginal victory
48 or more	Draw
30 or more	Allied marginal victory
12 or more	Allied victory
anything less	Allied decisive victory

The ladder is calibrated against the game's own simulation rather than chosen by eye. Scoring the salient as it actually stood on 31 December 1944 gives about 67 points, which falls at the top of the Draw band; and the median result of two evenly matched computer opponents falls in the same band. Playing to the historical outcome is therefore a draw, and a German victory means doing better than the offensive actually did.

7. Scenarios

The Ardennes Offensive

16 December 1944 - 31 December 1944 Turns 1–16.

The full sixteen days. Three armies go in through the fog and the Allied command has to work out what is happening while it happens.

Breakthrough

16 - 21 December 1944 Turns 1–6. Objectives west of the Ourthe count double.

The first six days only. Can the panzer armies get clear of the Ardennes before the weather lifts? Objectives west of the Ourthe count double.

Race to the Meuse

22 - 31 December 1944 Turns 7–16. Opens with the first 6 turns already played.

Begins with the salient already driven in and the skies clearing. The spearheads are low on fuel and the Allies are arriving in strength.

The Shoulders

16 - 23 December 1944 Turns 1–8.

Elsenborn in the north and Echternach in the south. The Sixth Panzer and Seventh Armies only - the centre is left to its own devices.

Hold Bastogne

18 - 27 December 1944 Turns 3–12. Opens with the first 2 turns already played.

The road hub and the ring around it. The Fifth Panzer Army must take Bastogne and keep going; Third Army has to reach it.

8. Playing it

Drag to pan, scroll or pinch to zoom, tap a hex to see what is standing in it. The arrow keys pan, plus and minus zoom, Enter ends the phase and Escape clears the selection. The layout reflows for narrow screens.

8.1 Moving

Click one of your formations. Every hex it can reach is shaded, and moving the pointer over one traces the route it would take. Click to move. Clicking the same hex again cycles through the formations stacked in it.

8.2 The fire slip

In the combat phase, click the enemy hex you mean to attack, then click your own adjacent formations to put them in. The slip on the right totals both sides, reduces them to a column, and prints the whole row of the combat table with all ten faces of the die showing before you commit. When you roll, the result is marked on the cell it landed in.

8.3 Saving

The game keeps one saved position in browser local storage, under the key `tronsoft_battle_of_the_bulge_save`. Save from the right-hand rail; resume from the title screen. If the browser refuses storage the game still plays and says so.

8.4 The computer opponent

Three levels. The cadet attacks on odds it likes the look of; the veteran reads the expected value first; the ace takes nothing it does not have to. All three will play either side, and choosing to command neither leaves them to fight the campaign out while you watch.

9. Notes on the design

Three of the rules in this game were not designed in advance. They were added because repeated computer-against-computer campaigns showed something wrong. Bastogne fell in every single game until defenders in built-up ground stopped retreating; the northern shoulder collapsed every time until artillery was allowed to fire in defence; and German columns reached the Meuse in nearly half of all games until the demolition rule was written. Measured over repeated campaigns at veteran level, the German player now wins about 43 per cent, the Allied player about 36, with the rest drawn.

Two things remain unhistorical and are worth knowing about. The computer takes Marche-en-Famenne in roughly two games in three and Monschau in roughly three in five; both held in 1944. The plan values road junctions highly enough to fight for them rather than going around, which is defensible as play and wrong as history.