DECISIVE CAMPAIGNS

ARDENNES OFFENSIVE

MATRIX

VR
Designs

CONTENTS

1. INTRODUCTION

1.1. VERSION

This version of the manual corresponds with game version 0.94. Date stamped the 15th of September 2021.

1.2. A WORD FROM VIC

Welcome!

Ardennes is a special game in many ways. It is an operational game, like the previous games in the *Decisive Campaigns* series, but in this latest instalment the scale has moved so far down that we start to approach tactical dimensions.

At one km/hex, four rounds per day and with mostly battalion-level units, you will feel like you are there. In the thick of it. The need for abstraction, necessary in higher scale simulations, has diminished noticeably. Troops are now modeled per squad and per single vehicle or gun. New rules have been introduced such as lines of sight, traffic jams, kampfgruppen and height levels. The aim is that Ardennes Offensive will feel both familiar and fresh at the same time.

When inspecting the map you can almost make out every single house. We have gone out of our way to make the map more immersive and bristling with detail. This includes six different ground states, of which 3 are added purely for aesthetics.

In many ways this fourth *Decisive Campaigns* game is a very classic wargame design. The map, counter and troops artwork should further strengthen this sense of playing a classic game. It is in its essence really just a counter-pusher and nothing more than that. But, by really focusing on making it do what it does well, I think we have delivered a very fun and realistic game.

Note that I, Vic, have teamed up with Davide Gambina for this game and he has been building all the scenarios while I have been

focusing on game design, the editors, the AI, the game rules and the game engine.

The interface has received a makeover and should be less overwhelming, without sacrificing complexity.

The left (select unit) – right (move to clicked hex) click system from Shadow Empire has been put into this game as well. This allows for much quicker turns than with previous titles in this series.

It has been equipped with new editors, initially developed for the DC:Community Project and tested over multiple years, but improved and extended upon for this release. They allow modding on two levels: Simple and Intermediate.

Using the simple editor a player can import maps and libraries and quickly construct a playable scenario.

Using the intermediate editors players can create new content in the form of new troop type libraries, new maps, new model (TOE) libraries and new officer libraries to move beyond the scope of the Ardennes Offensive.

The libraries also allow scenario designers to partially re-use work from other designers and for me to easily roll out new (or updated) functionalities with game patches and updates.

I hope you'll enjoy your purchase. And my sincere thanks for your support and keeping me in the business of making wargames!

Best wishes,
Vic

1.3. A WORD FROM DAVIDE

It has been well over two years since Vic asked me to be the scenario designer for his next *Decisive Campaigns* game. And I have to say I am very proud to have contributed to the birth of this fourth chapter in the series.

My role was quite extensive and while Vic focused on the engine, AI and rules I focused mostly on the scenario design, maps and orders of battle.

The Ardennes Offensive is one of the most known battles of the second world war. During my long life as a wargamer, I was born in 1961, I played and tested countless Ardennes Offensive PC games. I tried to mix all the positive experiences of that past in the development of the scenarios by exploiting the wide possibilities offered by the new AI, graphics and editors.

The Ardennes Offensive is an extremely feature-rich game and especially in the big campaign. The sense of freedom and control for the human player is absolute!

You can really feel the responsibility that any decision has on your men on the battlefield.

This is a Wargame made by wargamers for wargamers!

Hope you like and enjoy our work,
Davide

1.4. THE SETTING

The days are getting shorter... Temperatures approach freezing... Snow starts to fall...

The year 1944 is almost over… As is the Reich…

The strategic situation for the German forces at the end of 1944 is grim and with little hope.

The Allied advance seems to have been temporarily halted, but the Soviets seem unstoppable and are poised to launch their final assault towards Berlin.

The German armed forces are exhausted and depleted of manpower and equipment. Once proud cities and industrial centres, such as the Ruhr, are now mostly smoking ruins after suffering years of aerial bombardments.

Germany is running on its last legs. Though propaganda, collective denial and focus on the tactical picture instead of the strategic picture makes many believe an "endsieg" might still be snatched from the jaws

of defeat; especially the rank and file in the West had this hope, as they had just stopped the Allied advance on the borders of the Reich and afterwards they had defeated the Allied airborne troops at Arnhem.

But if one was to look objectively at the strategic situation map and factoring in the huge allied production, manpower, equipment and air

Fall 1944, American halftracks and Shermans are blazing their way into yet another German-held village in Belgium. The Wehrmacht troops pictured here are lacking armour and AT-guns and have to make do with just Machineguns, some Panzerfausts, and a Panzerschreck. They are delaying the American advance, but will inevitably have to retreat.

power advantages there was only one possible conclusion: Germany had lost the war.

"Or not?" so Hitler and the German high command must have asked themselves. Hope springs eternal, right? Betting everything on a single roll of the dice, might still provide Germany with a small but real chance to turn the tide.

A strategy of optimizing defensive operations would buy time, but would eventually bring certain defeat. So the German leadership favored a 5% chance for success (and 95% chance of fast defeat) over a 100% chance of slow but sure failure.

The Germans pulled and scraped all their last resources together and put them in, and behind, the Ardennes. Concentrating them there would prevent them being sent off to the east, where they could attempt to prevent the Soviets from taking Koenigsberg, Warsaw and Budapest.

The main reason for focusing on the Western Front was that the Eastern Front did not provide the opportunity for capturing any strategic targets. The Western Front did. In theory, a pincer movement from the Ardennes all the way to Antwerp would cut off much of the Allied forces in Belgium and the Netherlands and simultaneously take the main supply port. Such a devastating blow would force the Allies to accept a truce allowing the transfer of forces back to the east to defeat the Russians in a final battle before the gates of the Reich.

Delusional dreams? Maybe, maybe not. The Germans, however, never had the chance to put their strategic hypothesis to the test because after some limited initial success their forces failed to keep up the pace and failed to cross the Meuse river.

German operational optimism (or desperation?) had been too great.

But did they miss a roll on the dice? Or was it an impossible mission to begin with?

In *Decisive Campaigns*: The Ardennes Offensive, we are going to take a closer look at the operational challenges of the fighting as well as exploring several what-if variants.

The Germans had managed to line up an impressive, and mostly up-to strength order of battle, on a relatively narrow front in the Ardennes.

Two panzer armies had assembled to break through the Allied lines between Monschau and Echternach and then race to the Meuse: the 6th SS Panzer Army to the north and 5th Panzer Army to the south. Seven armored divisions equipped with the most modern tanks, including the giant Tiger II, stood ready. The 7th Army was added to form a screen to protect the southern flank of the advance from counter-attack.

German measures to hide their troop concentrations were successful and on the launch of the Ardennes Offensive, the 16th of December, the American forces were caught by surprise.

However, surprised or not, this was not 1939 and most enemy forces rallied quickly and fought a hard fight. Only in the center of the front, where the Americans were weak enough to be completely brushed aside, did the defense quickly fail.

The inadequate road networks played havoc on the 6th SS Panzer Army which for a large part was bogged down on muddy country roads and held up before well defended villages and positions. A combination of sub-optimal and uninspired leadership, tight enemy

TIGER II

The Tiger II was the evolution with better armor and a longer gun. It combined the Tiger's armour thickness with the sloping armour of the Panther medium tank. The tank weighed almost 70 tonnes and was protected by up to 185 mm of armour. It was armed with the long barrelled 8.8 cm KwK 43 L/71 anti-tank cannon. It was another later-war monster tank, able to destroy anything the allies could throw at it. Almost all of these tanks in the Ardennes were either destroyed by air or abandoned due to lack of fuel or mechanical problems.

lines and murderous American artillery support caused the drive of the northernmost Panzer Army to fail almost completely. The initial success of Kampfgruppe Peiper is the notable exception. But exceptions do not make the rule.

It was only the 5th Panzer Army that broke through, but this success was far from complete as the American 101st Airborne Division managed to reach Bastogne before the Germans. This led to a major logistical nightmare for the Germans. The Germans never managed to clear the Americans out of Bastogne. The failure to capture this vital crossroad fatally slowed down the advance of the panzers towards the Meuse in addition to crippling the German supply system.

By the 23rd of December, the spearheads of 5th Panzer Army approached the Meuse near Dinant, but they were overextended and missing the protection of 6th SS Panzer Army for their northern flank. Furthermore, fresh British troops were waiting for them. To further seal the fate of the offensive, the weather suddenly cleared, unleashing the full force of allied air superiority. The forest roads were soon littered with burning German vehicles and tanks.

The 7th Army was supposed to protect the 5th Panzer Army (advancing on the Meuse) from being cut off by Patton's armor attacking from the south. It managed to slow down the Americans, but could not prevent the siege of Bastogne being lifted.

The Germans didn't give up quickly and kept trying to find an advantage for several weeks.

On the 12th of January 1945, the Soviets unleashed their long expected monster offensive, and German high command quickly started pulling divisions out of the line in the Ardennes to be rushed to the east. Too little… too late…. But that is another story.

Historically the Ardennes Offensive resulted in a failure. But maybe you can do better? If only you could move faster through that horrible road network… If only you could just capture Bastogne before the 101st Airborne arrived... If only the weather wouldn't clear up…

Or if playing as the Americans you could try to stop the panzers from encircling Bastogne in the first place… holding St.Vith against the odds… or maybe launching a huge pincer counterattack that, opposed to history, actually would succeed and cut the tip of the German bulge off.

The rugged landscape provides you with plenty of defensive opportunities, but it's a sword that cuts both ways, as you'll surely find out when you try to wrestle the initiative from the Germans.

1.5. A WORD OF ADVICE

It is recommended that you start playing on some of the smaller scenarios to get a hang of the game and its rules and then progressively move on to the medium-sized scenarios and, only then, tackle one of the big campaign scenarios.

Of course, you are at liberty to ignore this advice.

1.6. THE SCENARIOS

Scenarios include their own flavor texts and documentation of their specific rules. This way later content, mods and player-made scenarios will not cause the manual to be incomplete. Nevertheless a scenario overview (at game launch time) PDF has been included with the game.

1.7. THE EDITORS

The ruleset for this game is well-suited for basically all European theater battles on the same scale as the Ardennes scenarios.

It is easiest to make scenarios that take place in the Ardennes around the same time, with the same units, as their data and graphics have already been created and are available as troop-, model- and officer libraries. You'll just need to use the simple editor to import maps and libraries to set things up.

However if you are willing to use multiple intermediate editors you can make your own libraries and maps to create something completely different from the Ardennes Offensive scenarios.

Documentation for the editor is not included in this manual. This was partly done to keep the manual size to a handy format. Help for scenario designing will thus be provided online at www.vrdesigns.net .

2. QUICK START

To give you an idea how to play. we'll briefly walk you through how to start a new game, move your units and go to the next turn.

After launching the game you'll find yourself on the main menu screen. Click the "Arracourt" scenario button. It is a small scenario and an excellent introduction to playing the game.

This will bring you to the scenario setup screen. Here you will have to set the Allies in the "opponents" section to AI and the Axis to

human. You of course will be playing the "human" side. You can switch between AI and human by clicking on the line in question.
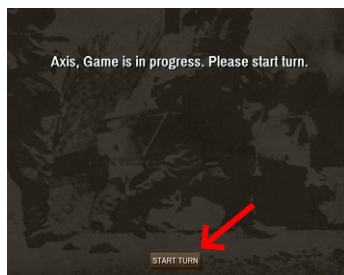
When that is done, click the big start button.

You'll have seen some text flashing on the screen, indicating a number of processing events and non-playable phases being executed. Eventually you'll be asked to start your turn, which you can do by clicking the only button on the screen (or by pressing space key).

You'll get a number of messages, which you can quickly click through since you can always re-read them later in the REPS tab.

After clicking through all of the start of turn messages you'll find yourself in the map screen. Now... to move a unit you need to first have a unit selected. You do this by left-clicking on the unit on the

map. And then you'll need to click on the "MOVE" order mode tab. (or vice versa)

When in this "MOVE" order mode (shortkey M) the hexes your currently selected unit can move to will be highlighted. If you mouse over them you'll see a movement arrow appearing. Right click on the destination hex to move the unit. Left click on any other unit to select that other unit instead.

Remember: When in "move mode": Left click to select a unit, Right click on the target hex of the selected unit to move/attack with the selected unit.

Along with moving your units, it is also possible to attack enemy units. This is indicated with a red cross-hair target (for artillery) or a red attack arrow (for regular attack) over the enemy unit. Just as if you were to move, you can right click on this enemy unit. This will not start the attack immediately but bring you to the attack setup popup.

In the attack setup popup, you'll get a preview of the odds. You can then either press the cancel button or one of the attack buttons. After clicking the attack button the combat will be initiated and resolved.

When you have made all your moves and attacks, click the end turn button. Your opponent will then move. After your opponent has finished his/her move you'll enter your next turn.
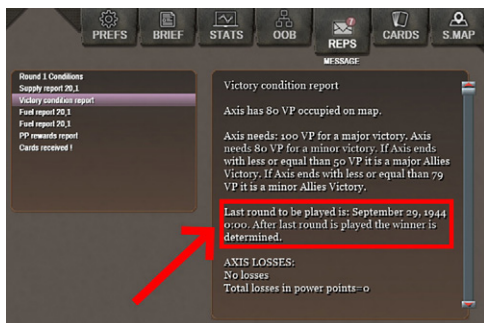
Your turns will continue until you have played your last turn. Check the last turn of the scenario in the REPS tab, in the victory condition report. The turn after your last turn the winner of the scenario will be determined and your game will be considered finished.

3. THE INTERFACE

This part of the manual will help you understand what you are seeing on the most important screens, windows and tabs in the game.

3.1. MAIN MENU SCREEN

Directly after the intro sequence you'll see the main menu.

To get a game started you can immediately load a scenario (like "St. Vith" for example) by clicking on its button. It's also possible to load any scenario by using the "Load scenario" button.

For a description of all scenarios provided with the game please consult the separate PDF with the scenario lists.

Load Scenario
Click here to load any scenario from any directory.

Load Saved Game
Click here to load a game in progress or a PBEM game sent to you by an opponent.

Import Zip
Scenario designers might distribute their work in the form of a .dczip file. This button allows you to unpack and install their contents in your game directory.

Credits
Take a look at the people who helped make this game what it is today.

Scenario bank

A link to the VR Designs website which also contains a scenario bank. This should be a good place to upload any scenario design work to.

Sound Prefs

A mini preferences window that just allows you to adjust the sound and music volume. For more preferences and options you'll need to start an actual game and go to the PREFS tab in the map screen.

Quit

Closes the game application and returns you to your desktop.

Simple editor

The easiest editor. To use it you need to import trooptype-, model- and officer libraries as well as a map file. Help for scenario design and documentation explaining the editors is provided separately from the game manual. Please go to www.vrdesigns.net to find this documentation.

Trooptype editor

An intermediate editor that allows you to make trooptype libraries. Help for scenario design and documentation explaining the editors is provided separately from the game manual. Please go to www. vrdesigns.net to find this documentation.

Historical unit editor

An intermediate editor that allows you to make model libraries. Help for scenario design and documentation explaining the editors is provided separately from the game manual. Please go to www. vrdesigns.net to find this documentation.

Officer editor

An intermediate editor that allows you to make officer libraries. Help for scenario design and documentation explaining the editors is provided separately from the game manual. Please go to www. vrdesigns.net to find this documentation.

Map editor

An intermediate editor that allows you to make your own maps. Help for scenario design and documentation explaining the editors is provided separately from the game manual. Please go to www.vrdesigns.net to find this documentation.

3.1.1. WHAT IS MY GAME VERSION?

To identify the game version you have installed, look in the bottom left corner of the main menu. Noting the game version and scenario version is important when reporting any possible glitches or bugs to the developer on the Matrix forums.

3.2. SCENARIO SETUP SCREEN

After loading a scenario you will be presented with this screen. Here you can configure the scenario and start it by pressing the "start" button.

3.2.1. AI SETTINGS

Here you can configure your AI opponent. You can set the "difficulty" and the "speed". Higher difficulties grant the AI more combat and mobility bonuses while the slower you set the speed for the AI the more time it will take to ponder its moves.

3.2.2. SETTINGS

Some general settings can be set here as well as some scenario specific settings (like weather).

Fog of war

Enable for a realistic experience. If disabled, it means you can see all enemy units, even without any line of sight. However when disabled the actual combat calculations still take place based on actual recon points. (So even though the players see everything, that does not mean your soldiers see everything.)

Passwords

Only enable this if you are playing against another human player and do not want your opponent to be able to log in to your turn.

PBEM protection

PBEM stands for play-by-email. Only enable this if you are playing against another human player and you are very competitive. Having this option enabled means that the opponent will be notified if you reload the same game.

Hide AI moves

To have a slightly quicker turn time during AI turns, you can enable hiding the AI's moves.

Uncertainty

A great new feature that adds more uncertainty and randomness to combat and unit quality.

3.2.3. OTHER

There are a few other items on this screen as well.

A **Opponents**

You can toggle each side either to human or AI. Make sure at least one human player is selected.

B **Scenario description**

You can read about scenario specific rules and variants in this text area. Note that the little headings above the text area are tabs you can click to show different pages of text.

3.3. GAME LOOP SCREEN

Once you have started a game you'll go to the "game loop" screen. You'll also be sent here after ending a turn.

Once all the calculations are done before the next human player's turn you will be allowed to login.

Login

If you are playing against the AI, click here to log in. If you are doing a PBEM game with passwords enabled, then the game will prompt you to give / enter your password. Make sure to remember the password you enter as there is no way to recover it if you lose it.

Save+Quit

If you are playing a PBEM game this option will show up as well. Instead of logging in to your opponent's turn you'll save the game at this point and email the save file to your opponent.

3.3.1. MESSAGES

After you have logged-in, the game loop screen will show you the most important messages for your current turn.

   Just press any key to click through them.

3.4. MAP SCREEN

This is the most important screen in the game. You'll spend a lot of time here.

The key areas in the map screen are the following:

A **Screen selection tabs**
Here you can switch between "map screen" and "history screen".

B **Drop down tabs**
Here you access a number of drop-down tabs.
Here you can also click on the "end turn" button in the top-right of the screen.

C **Order mode tabs**
Here you can change the order mode you are currently using. Here you can also get the minimap and unit stacks info enabled on the left-hand side of the screen.

D **Right-hand sidebars**
Here you can change the information that is displayed on the right-hand side of the screen.

E **Bottom window**
Here you can see the core statistics of the selected unit.

F **Hexes and counters**
Here you see the actual map. Left click a unit or hex to select it and right click on the target hex to move the selected unit there.

3.4.1. DROP DOWN TABS
The following tabs are available here:

Prefs
This drop down tab allows you to fine-tune a large number of display settings as well as the volume settings.

Brief
In this drop down tab you can re-read the scenario briefing.

Statistics
All kinds of statistics can be inspected in this drop down tab.

Order of battle (OOB)
In this drop down tab you can inspect your whole order of battle in a collapsible hierarchical view.

Reports
In this drop down tab you can inspect some detailed reports (and review those messages seen in the game loop screen again) on topics like victory conditions and replacement troop reports.

Cards
In this drop down tab you inspect or play the action cards you have available.

Strategic map
This drop down tab gives you an overview of important towns and the whole map.

3.4.2. ORDER MODE TABS
The following tabs are available here:

Shown / Hidden
Clicking on this tab will either hide the bottom window (allowing more of the map to be seen) or show it again.

Stack & Mini-map
Click this tab to either hide or show the unit stack and mini-map window to the left-hand side of the screen.

Move order mode
Click this tab to enter move order mode. When in move order mode left click a unit to select it, right click on a hex in range to move there or to start combat.

Group move order mode
Same as move order except that all units in the hex will try to move simultaneously.

Supply mode
Click this tab to enter supply view mode. This mode allows you to see how far away your units are from supply sources and dumps. When in this mode left click on a hex to see the supply path to it from the selected origin (list boxes in bottom window.)

Inspect mode
A mode that allows you to click on units and prevents you from inadvertently moving them. In inspect mode, nothing can happen by accident.

3.4.3. RIGHT-HAND SIDE PANEL TABS
The following tabs can show or hide information in the right-hand side of the screen. Click on the selected tab again to show nothing but the map in the right-hand side of the screen.

Hex
Click this tab to see details about the selected hex. Includes information on the landscape type, combat history and supply sources/dumps.

Unit
Click this tab to see details about the selected unit. Includes information on its carry and weight points, standing orders and replacement troops stats.

Officer
Click this tab to see details about the commander of the selected HQ (or the HQ of the selected unit). This tab also allows you to play officer cards.

3.4.4. BOTTOM WINDOW

The bottom window gives you the core statistics of the selected unit.

The key areas in this window are:

A The unit counter

Here you can always see the big version of the unit counter for the selected units. Below it you can also view information on your current recon state for that unit.

B Movement mode and movement type

Here you can see the icon of the movement type the unit will use. The background is either ● black for the unit being in combat movement mode or o white for the unit being in march movement mode. Click on it to toggle the movement mode.

C Intercept fire mode

Here you can change the standing order for intercept fire.

	Trigger happy No matter the chance to hit the unit will open fire.
	Regular The unit will open fire if it has a reasonable chance (33% or more) to hit the enemy.
	Conservative The unit will only open fire if it has a good chance (66% or more) to hit the enemy.
	Never The unit will never open fire when the enemy is moving. This is a good mode if you do not want to reveal your presence or want to save ammunition.

D Retreat mode

Here you can change the standing order for the retreat mode.

	Fight to the last man The unit will never try to retreat to preserve itself. It will only retreat if it panics.
	Stubborn The unit will only try to retreat after 75% of its troops have been chased off the battlefield or killed.
	Regular The unit will only try to retreat after 50% of its troops have been chased off the battlefield or killed.
	Flexible The unit will only try to retreat after 25% of its troops have been chased off the battlefield or killed.

E Unit statistics

Here you can inspect the core statistics of the selected unit.

	Action points Action points (AP) are needed to move your units.
	HQ power HQ power % gives the unit a bonus during combat. HQ power is 100% if HQ is within 5 hexes of the unit, 75% if within 10 hexes, 50% if within 15 hexes, 25% if within 20 hexes and 0% if further away.
	Supply consumption Supply consumption % shows you if the unit has consumed its needed supply consumption. 100% means all is good. Below 100% indicates there is an immediate lack of supplies and this will cause severe combat penalties and loss of readiness.
	Offensive modifier for low supplies If enough supply and fuel stocks are present with the unit this will show "OK", meaning there will be no penalties in offensive combat. If supply and/or fuel is running low, a combat penalty % will be shown here.
	Defensive modifier for low supplies If enough supply and fuel stocks are present with the unit this will show "OK", meaning there will be no penalties in defensive combat. If supply and/or fuel is running low, a combat penalty % will be shown here.

 Integrity The integrity of the unit is the % of troops prescribed in its TOE (table of organization and equipment) still present. If it drops severely, the unit can break if panicking. (Battlegroups always break if panicking.) Mouse over it to see what % of losses the unit can take before it might break. If 'BG' is shown here that means the unit is a battlegroup/kampfgruppe and thus has no integrity.
Vigor The vigor of the unit determines the maximum readiness number for this unit. This maximum readiness is shown here. Mouse over it to see the raw vigor points.
Readiness Readiness decreases with movement and combat. It is a major modifier in combat and also influences the number of action points available.
Experience Experience is a big modifier in combat. Low experience values are expressed with bronze stars, medium values with silver stars and high values with gold stars.
Morale Morale helps the unit to keep fighting while losses mount. Low morale will risk the unit panicking when suffering casualties.
Entrenchment Entrenchment is a big modifier in defensive combat.
Engineer points Engineer points can be used to blow up or repair bridges.
Uncertainty rules When using the uncertainty rules this dice is shown. The number on the dice is our estimation of one (the loaded one) of the two dice the unit will throw when in combat. A "?" question mark means we have no clue yet. Mouse over the dice symbol to see detailed numbers on why we show a certain number.

F Troops

Here you can see information on the troops that are in the unit. The people type (Wehrmacht, Luftwaffe, SS) and the troop type and quantity. To get more information you need to click on its illustration to open the troop type popup window.

G Merged / Split mode

Here you can switch between showing the troops in either merged or split mode. If there are more troop types than can be displayed in the bottom window some of them will be merged (for example 100

engineers and 100 volksgrenadiers would be shown as 200 infantry). If you are using split mode there will never be any merging and instead scroll buttons will appear if necessary.

3.4.5. RIGHT-HAND HEX SIDEBAR

This window shows detailed info about the selected hex.

The key areas in this window are

A The core hex info

Here you can see the picture and the name of the landscape type of the hex. Mouse over it for detailed info on the modifiers this landscape type gives. If any victory points are present on the hex they are also displayed next to a flag icon.

B Orders that target selected hex

In the unit side panel you can find orders for individual units, here you can find the orders that target a hex.

Attack

This order will open the combat preparation popup window with the current selected hex as the target for a land attack. Once in that popup window you'll be able to select the units that will participate in the combat.

Ranged Attack

This order will open the combat preparation popup window with the currently selected hex as the target for an artillery attack. Once in that popup window you'll be able to select the units that will participate in the combat.

Keep in mind you can target any assumed enemy hex, even if you do not have enough recon on it to see any enemy units.

C Hex Stats

Here you can inspect the most important statistics of the selected hex.

Recon

Shows you the effective recon points. Mouse over this stat to see more detailed info.

Hide

Shows the hide points provided by the landscape type of the hex. Effective recon needs to be at least 20 points to spot a unit with 0 hide points. However, if the hex the unit is in has a positive hide number you'll need more effective recon points to spot the unit. For example if hide points are 20, then you'll need 40 effective recon points to spot the unit.

Obstruct

Shows the percentage of recon points that will be lost on this hex when a line of sight (LOS) crosses this landscape type.

Height

Shows the height level of the hex. Remember that moving uphill is usually slower and fighting uphill is usually costly.

Best LOS

Shows the percentage of recon points that will be applied by the unit with the best line of sight on the hex.

Zoc penalty

Shows the extra action points (AP) you'll need to pay to move into this hex. Mouse over this stat to see details on the origins of the penalties.

Battle AP

Shows the extra action points (AP) you'll need to pay to attack this hex again. These penalties are caused by previous battles.

Previous attack stack

Shows the stack points from previous attacks on the hex. These will be added in the overstack calculations for any new attacks.

Previous artillery attack stack

Shows the artillery stack points from previous attacks on the hex. These will be added in the overstack calculations for any new artillery attacks.

Total stack

The current total stack points in the hex. Keep in mind that above 200 points the hex is considered overstacked, and the defenders will suffer penalties.

Location

If a location, like a city, town or a fortification, is present it will be shown here.

D Hex combat history

Here you can see a quick log of ranged fire events from the previous turn. This can help you to determine where enemy artillery might be hiding. An explosion symbol is shown to indicate a hex that received fire and an artillery symbol is shown to indicate a hex where artillery fire originated.

Note that the latest entry has the icons highlighted in red. This is especially useful if your troops fall victim to intercept fire.

E Hex supply assets

If a hex contains either a supply source or a supply base, then in this section you'll be given detailed statistics about the remaining supply and fuel as well as statistics on what has already been sent out.

3.4.6. RIGHT-HAND UNIT SIDEBAR
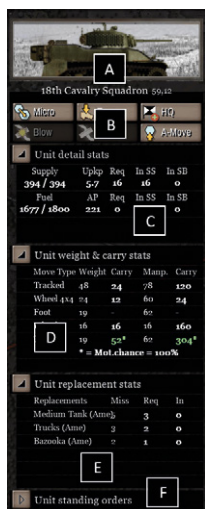
This window shows detailed info on the selected unit. The key areas in this window are:

A **The core unit info**

Here you can see a picture of the unit's movement type as well as its name.

B **Orders that target selected hex**

The order modes (move, group move, inspect) are the most used orders for your units. Here a number of more specialized orders are available.

Micro

This order will open a popup window that will allow you to micro-manage your units. Micro management operations include: transferring troops to other units in hex, creating battlegroups and scrapping equipment.

Transport

This order will open a popup window that will allow you to let truck units load or unload other units.

HQ

This order will open a popup window that will allow you to set a new HQ for the unit in question. Keep in mind that assigning too many units to a HQ might overburden it when there are not enough staff points available or the commander has limited capabilities in leading his staff.

Blow

This order will open a popup that will allow you to select the bridge to be blown up. Note that the unit must have at least 50 AP to make an attempt.

Repair

This order will open a popup that will allow you to select a bridge that needs to be repaired. For this order to be available the unit will need to have adequate EP for bridging the river size and AP to move.

Auto-move

This order will open the auto-move popup window that will allow you to set a final destination for the unit (and optionally others under the same HQ). Auto-move will be executed as far as possible immediately and thereafter at the start of every turn.

C Unit detail stats

On the first line the supply (think: ammo, food, spare parts) details are shown and on the second line the fuel details are shown.

The first line shows from left to right:

- **Supply:** the amount of supply points currently available / the ideal amount of supply points.
- **Upkeep:** if no fighting is done this amount of supply will keep the unit at peak readiness for X game rounds.
- **Req:** the amount of supply requested by the unit at the start of this turn.
- **In SS:** the amount of supply delivered at the start of the turn from supply source(s).
- **In SB:** the amount of supply delivered at the start of the turn from supply base(s).

The second line shows from left to right:

- **Fuel:** the amount of fuel points currently available / the ideal amount of fuel points.
- **AP:** how many action points could ideally be spent with the current fuel reserves.
- **Req:** the amount of supply requested by the unit at the start of this turn.

- **In SS:** the amount of supply delivered at the start of the turn from supply source(s).
- **In SB:** the amount of supply delivered at the start of the turn from supply base(s).

D Unit weight and carry stats

The movement type of the unit is shown in the illustration (A), but if you want to know the nitty gritty of why this unit has this movement type, consult this table.

The weight points and carry points of all movement types present in the unit are displayed here.

Note that a unit will assign carry points from faster movement types to the (perceived) slowest movement types. For example a unit with infantry, halftracks and artillery will assign the halftracks first to the artillery since artillery has a slower movement type than infantry.

E Unit replacement stats

Replacement troops can arrive at high HQs by events and cards. From here they will be sent to subordinate units that are missing troops. In this table you can see if the unit you are currently inspecting is missing (**Miss**) troops from its TOE (table of organisation and equipment) and if any replacement troops have been requested by the unit (**Req**) and most importantly if anything has been received (**In**).

3.4.7. RIGHT-HAND OFFICER SIDEBAR

This window shows detailed info on the currently selected unit. The key areas in this window are:

A The core officer info

Here you can see a portrait picture of the officer as well as his name. Click on the portrait to go to the officer popup window.

Furthermore, 3 key statistics are displayed. Each one can be moused-over for further details.
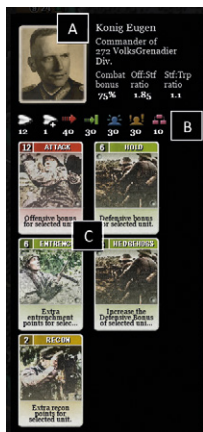
The combat bonus is the most important. It shows the actual bonus a unit will receive in combat if a unit is in 100% HQ power range.

An officer: staff ratio below 1 means you have a problem: the officer is commanding more staff than he is capable of commanding.

A staff:troops ratio below 1 means you have a problem: the HQ has more troops under command than it has staff points to lead them.

B Officer stats

Each officer has a number of stats:

	Command points Command points (CP) are needed to play officer cards.
	Command The higher the command stat the more new command points (CP) you'll get every start of turn.
	Audacity The higher it is the better the red officer cards will perform.
	Determination The higher it is the better the green officer cards will perform.
	Charisma The higher it is the better the blue officer cards will perform.
	Intuition The higher it is the better the brown officer cards will perform.
	Organization The higher it is the better the purple officer cards will perform.

C Officer cards

Here you can find the officer cards this officer could play this turn (if enough CP is available).

You can mouse over a card to get more info and you can click it to consider playing it.

Note that an officer can only play one card per round and that, after playing a card, all cards will disappear until the start of the next round.

3.5. POPUP WINDOWS

There are various pop ups in the game. Some will speak for themselves. For some of the more complex ones, this manual will help you to understand them better.

3.5.1. COMBAT SETUP POPUP

When in move mode and you right click on an enemy unit in range, it will not automatically start combat, but will first bring you to the combat setup popup. Here you can configure which units will join in the attack, how they will attack and what the probable impact of all the modifiers will be.

You can quickly leave this screen by pressing the ESC key or clicking the cancel button.

Note that pressing the SPACE key immediately launches a regular attack.

A Eligible forces

Here you see all friendly units that could join the attack on the target hex (**H**). Click on a unit in this box to make it join the attack. Mouse over a unit to see its full name. Units that are already planned to join the attack will be in box **E** .

B Estimation of offensive mods

Based on an internally previewed simulation it shows the attack point strength that will be brought upon the defenders based on your currently selected attacking forces. The icons before the second-to-last icon show the different modifiers and you can mouse over them to see more detail. The second-to-last icon shows the unmodified attack points per combat round. The last icon shows the attack points modified by all aforementioned modifiers.

Note that only the total attack points are previewed but that the modifiers for attack points and hit points are shown.

C Estimation of defensive mods

Same as **B** but for the defenders of the hex.

Note that if your recon on the target hex is limited, the estimation might be far off the mark.

D Enemy forces

Here you see all the enemy units that will defend the hex against your attack. Keep in mind that if your recon points on the hex are limited you might not necessarily see all units.

E Attacking forces

Here you see all friendly units that will attack the target hex (**H**) once you press an attack button (**J**). Click on a unit in this box to make it join the attack. Mouse over a unit to see its full name. Units that can still be added to the attack will be in box **A.**

F Attack type

The attack type is either regular attack or ranged attack. You can switch between them by pressing the switch button.

G Map

Especially for ranged attacks it can be useful to go to a special attacker selection mode that allows you to see the whole map in order to select participants for the attack. Once in the map popup you can easily switch back to the current popup window.

H Map

The target hex for the attackers will be in the center. Friendly units will either have a white, red or green rectangle around them. White means a unit can be selected to join the attack. Red means it cannot be selected (too far away, no AP). Green means it is already selected.

I Odds

The odds show the ratio of the attacker's attack points versus the defender's attack points. Note that hit points are not taken into account for the odds calculator. The odds show you the probable losses. For example 1:1 odds means that losses will probably be similar for attacker and defender. Odds 2:1 means that the defender will probably suffer twice the losses.

Note that a number of modifiers, notably the attack startup modifier, is not taken into account in the modifiers preview calculations and the odds calculation. So the odds have a slight tendency to be optimistic.

J Attack

When you're happy with your selection of attacking units, you can press one of the four attack buttons. Mouse over them to see details on their differences. Once pressed, the attack begins.

K Combat totals

Shows the total troops of each unit group (infantry, tanks, etc..)

involved. It also shows details on stack points and recon points. Lower recon points will mean more advantage for the defenders. Also keep a critical eye on the stack points. Normally, you'll want to avoid overstacked attacks as they'll make you suffer more casualties.

3.5.2. MICRO MANAGEMENT POPUP

In the unit sidebar you can access this collection of orders. Micro management includes transferring troops from one unit to another (in the same hex), transferring part of a unit to a newly formed battlegroup/kampfgruppe or scrapping equipment.

A **Source unit list**

Note that you see the same list of units under A as under B . It is just that the unit selected in the source unit list is going to lose the troops.

B Target unit list

If a unit is selected in this list, the troops lost by the unit selected under **A** will be transferred to this selected unit.

However, you can also select "New KG/Team" in this target list. If you do so a new unit will be created in the same hex and that unit will receive the troops selected in the list boxes.

Furthermore you can also select "Scrap" in the target list. If you do so the troops you'll select with the sliders in **D** will be scrapped and (partially) returned as rear-area troops.

C Unit stats

For both the source and the target unit, we are showing you the weight and carry points. This allows you to transfer troops in a way that makes sure a unit will stay mobile or mechanized. We are also showing power points here because units should always have 50 power points left.

D List boxes

Here you can specify how many troops of each troop type of the source unit should be transferred or scrapped.

If a certain source unit troop types cannot be transferred because the troop type does not exist in the TOE of the target unit, they will be shown in red in the left list box with the remark "no target unit TOE match".

If the troop type exists in the TOE but the number of troops for the troop type exceeds the limit, it will be shown in red in the right list box.

Any problems indicated in red will usually also be mentioned in **F**.

E Pagination

If either the source or the target unit has very many different troop types you can use pagination to navigate through the troop type lists.

F Transfer possible?

Either it shows in white "transfer possible" or in red and shows the issue as to why you cannot press the transfer button just below.

Buttons

After you have chosen the source and target unit and you have made your selection in the listbox of what is to be transferred, go ahead and press transfer.

3.5.3. TRANSPORT POPUP

In the unit sidebar you can access the transport order when you have a transporter unit selected. A unit is a transporter unit if more than 80% of its equipment/troops consists of trucks.

Clicking it will bring you to this popup. Here you can either detach a unit that is already being transported by a transporter unit or you can attach a unit to be transported by a transporter unit.

A **Transporter unit**

Here you'll see the transporter unit you had selected when clicking on the transport order.

Note that its key statistics for transporting are shown. You should only attach units for transport that do not exceed the manpower or carry weight limits..

B **Attached units**

Here is the list of all the units that are currently being transported by the transporter unit. If in the map screen you move the transporter

unit, these attached units will automatically move with the transporter unit also. To the right you can click on "detach" in order to stop a unit being transported.

C **Other units**

These are units that could be attached to the transporter unit. To do so click the "attach" button. Make sure to keep an eye on the carry & weight and manpower carry & manpower stats in A . If you overload your transporter unit it will not be able to move at motorized speed.

D **Buttons**

Here you can exit this popup.

3.6. OTHER UI ELEMENTS

In this chapter we'll focus on a few non-window user interface elements.

3.6.1. COUNTERS

A counter is another word for the blocky unit graphics. Many types of information are displayed on each counter.

Regime
Name
Supplies received
Division / Brigade / HQ
The most present trooptype
The movement type
Readiness and Integrity
Supply reserves
Strength
Action Points
Fuel reserves
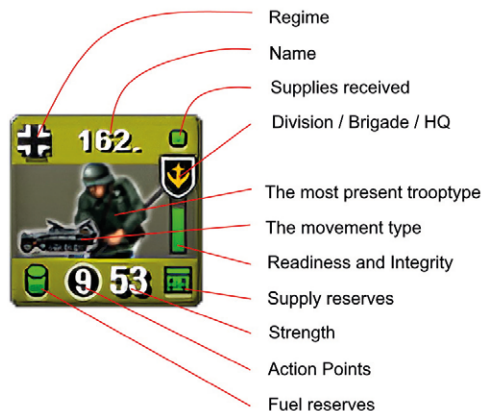
Regime

A symbol showing the regime (Germany / USA) controlling the unit.

Name

An abbreviation of the unit's name.

Supplies received

- Is the unit still in your supply network?
- If a unit is out of supply (no supplies received) this block will be black.
- If a unit is receiving everything it requested this block will be green.
- Yellow, blue and red signify progressively decreasing access to supplies.

HQ

The shield or symbol of the HQ is displayed here.

The most present trooptype

If a unit has multiple troop types, the one that includes the most soldiers will be shown on top of the counter.

The movement type

If the movement type of the unit is different from the movement type of the most present trooptype, then a small picture of the actual movement type will be displayed.

Readiness and integrity

A full bar indicates full integrity, while a low bar indicates a unit with low integrity.

The color of the bar indicates the readiness score. Green means readiness is above 75 points, yellow means readiness is above 50 points, blue means readiness is above 25 and red means readiness is below 25.

Supply reserves

A green crate indicates that supplies are close to maximum. Yellow, blue and red indicate increasingly lower reserves.

Strength

An abstract measure of strength roughly equal to 1 tank or 10 soldiers per strength point.

Action points

Each point in the circle represents 10 AP. If the background of the circle is black it means the unit is in combat mode. If the circle is white it means the unit is in march mode.

Fuel reserves

A green oil drum indicates that fuel reserves are close to maximum. Yellow, blue and red indicate increasingly lower reserves.

Note: Keep in mind that even if a unit has not received any supplies it might still have (semi) full reserves to operate.

3.6.2. MAP LEGEND

The map contains a lot of information and it's best viewed in maximum zoom mode.
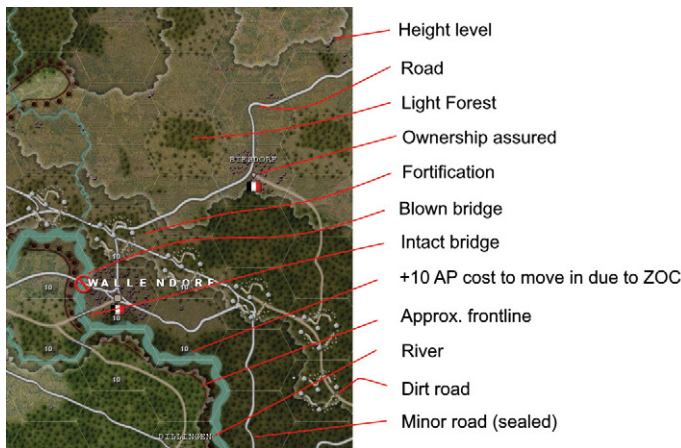
Most symbols are straightforward. In case you are not sure what kind of river or road or town is in a hex, then mouse over the landscape type illustration in the hex side panel and it will show you the exact features (landscape type, rivers, roads, traffic points, etc...) present in the hex.

Here are some special symbols you can find on the map that need explanation:

	LOS If you switch LOS on in Prefs you'll see eye symbols on the hexes of the map. Green means at least one of your units has an excellent line of sight. Yellow, blue and red are increasingly less so. No eye symbol while in this mode means no LOS.
	Hex combat history The artillery symbol shows a source of fire while the explosion symbol shows a targeted hex. The most recent (intercept fire) will be shown highlighted in red symbols.
	Supply base The more crates the bigger the supply base. It is shown with a truck if it is in build-up mode. It is shown with a gray exclamation mark if in deplete mode. A yellow exclamation mark is shown if being evacuated and a red exclamation mark if it is being destroyed.
	Supply source The higher it is the better the green officer cards will perform.
	Traffic congestion There can be up to six of these little truck symbols inside one hex (one for each road direction) and they signify traffic points that have passed through the roads that have exceeded the road's capabilities.
	Enemy presence marker If your supply system is unable to get supplies or fuel to one of your units or supply bases, due to enemy units blocking the path, an enemy presence marker will be placed. Its bright orange if unverified and will change to transparent after you have checked it out by moving a unit close or on to it.

3.6.3. SHORTKEYS

M	Move order mode
G	Group move order mode
S	Supply order mode
ESC	Exit popup/tab Exit history screen Go to inspect order mode
SPACE	In combat setup popup starts battle and closes results popup.
1	Switch to troop silhouette counters
2	Switch to NATO counters
0	Hide/Show counters
3	Small/Big counters
+	Zoom in
-	Zoom out
H	Go to history screen
F1	Prefs Tab
F2	Briefing Tab
F3	Stats Tab
F4	OOB Tab
F5	Reps Tab
F6	Cards Tab
F7	Strategic Map Tab

4. THE RULES

This chapter discusses all the rules of the game. At the start of your round, your logistics system will try to get supplies and fuel from your supply sources to your units. After this, the unit will take their upkeep and recover or increase some of their statistics. The player will then be allowed to start their turn and it will be up to you to move your units and give other orders.

4.1. UNIT UPKEEP AND RECOVERY

At the start of every turn, after receiving supplies and fuel from your logistical network, your units will consume upkeep. They may also recover readiness and morale as well as increase their engineer points and entrenchment.

4.1.1. SUPPLY CONSUMPTION AND READINESS DETERMINATION

If troops can consume supplies their readiness will recover.
This represents the consumption of rations, medical supplies, non-combat related losses, batteries, spare parts and ammunition for minor fire fights.

Every troop type has a basic supply usage. The unit's ideal supply consumption usage will be the sum of that of all its troops.

If the supply points for this supply consumption are present, the supply consumption stat will increase with up to 20 points and readiness also increases with 20 points

If the supply points for this supply consumption are not present, the supply consumption stat will decrease with 10 points and readiness decreases with 20 points but will never go below 10 points

If the supply points for this supply consumption are partially present, the negative effects will be reduced and readiness might still go up a little bit.

4.1.2. MAXIMUM READINESS DETERMINED BY VIGOR

Maximum readiness = SQR(Vigor)*10
Maximum readiness is determined by vigor. Vigor itself can go down at start of turn when a unit moved or attacked the previous turn (-5) or by suffering combat casualties (half the percentage of KIA percentage applied as vigor loss).

It can go up by not having moved or offensively attacked/bombarded/ fired for a full turn (+15 vigor). There is also a +50% bonus to the increase if there is no enemy ZOC on the hex. A further +50% bonus is applied to the previous subtotal if the previous turn was a night turn.

On the German border with Belgium and France the old Siegfried Line had been hastily reinforced. Together with the arrival of many 'fresh' Volksgrenadier divisions the Wehrmacht managed to halt the allied advance here and furthermore, use the area behind it to build up for the Ardennes Offensive. In this illustration we see from left to right a destroyed American jeep, an 88mm Flak gun, and a Tiger tank.

The vigor increase can be reduced if the unit was attacked during the enemy's turn. A reduction between 50% and 100% depending on readiness will be applied, the lower the readiness the logarithmically the bigger the reduction.

Recovery of vigor is modified for inverse current vigor to simulate the effect of it being more difficult to recover from over-exhaustion. Strong advice: rest your units before their vigor drops below 50 points.

4.1.3. ACTION POINTS DETERMINATION

Readiness determines action points.

After readiness has been updated, the action points for this unit will be set to 50 + readiness / 2. These action points are then modified with the supply consumption stat if it is below 100. It is therefore possible to end up with a unit that has 0 AP, though this will only happen many rounds after a unit has been cut off from receiving supplies.

4.1.4. RESERVE ACTION POINTS

Units that did not move can gain reserve action points.

If a unit did not move in the previous turn it will get reserve action points awarded. These are separately tracked from normal action points and they can only be used for the first move to a neighboring hex. In normal conditions 20 reserve action points can be gained per round and you can keep gaining them until 100 reserve action points have been reached.

The purpose of these points is to allow a unit to do an especially difficult move like crossing a river without a bridge or mounting a very steep forested hill.

Reserve AP are immediately lost if a move is made or a retreat to another hex is made during combat. Partial loss occurs when readiness is lost in combat and 50% readiness loss corresponds with full loss of reserve AP, 10% readiness loss corresponds with 20% loss of reserve AP.

If the regular AP has been determined to be lower than 50, for example due to lack of supply consumption, then the reserve AP total will (newly added and already existing) suffer a penalty. This will occur rarely, but helps enforce that at some point after running out of supplies a unit will become almost completely immobile.

4.1.5. SUPPLY DEFENSIVE AND OFFENSIVE PENALTIES

Low supply or fuel stocks means rationing and thus combat penalties. Offensive operations require more stocks than defensive operations.

If too few supplies and fuel are in stock with the unit, its defensive and/or offensive performance might be reduced. This happens when there is not enough stock to allow full usage of the unit's weapons for all the projected combat rounds.

Supply and fuel consumption for defensive combat is usually 3 times lower than for offensive combat. But inspect the troops type details if in doubt.

To determine the defensive penalty we calculate the number of defensive combat rounds the unit has stocks for. If this is lower than 20 combat rounds, rationing will take place and a defensive penalty will be incurred.

To determine the offensive penalty we calculate the number of offensive combat rounds the unit has stocks for. If this is lower than 12.5 combat rounds rationing will take place and a defensive penalty will be incurred.

Note that these penalties can be deceiving in the case of a shortage of fuel stocks. In actual combat the penalty for low fuel stocks is only applied to the troop types that use fuel. So for example a motorized infantry formation (with trucks) will fight just as well with missing fuel stocks as with full fuel stocks. This is because the trucks do not participate much in the fight and it's the foot soldiers who'll be doing the fighting.

4.1.6. MORALE RECOVERY

Morale of well stocked units will always slowly increase back towards base morale.

Morale of badly stocked units will go down.

If the unit is suffering a defensive penalty due to lack of adequate supply/fuel stocks it has a chance to get morale reductions instead of morale increases. At 100% defensive penalty this will always be a decrease, at -50% defensive penalty there is a 50% chance it will be a decrease instead and at -10% defensive penalty there is just a 10% chance it will be a decrease. If no decrease is suffered then this means morale will increase.

If morale is to be increased it will slowly recover up to the base morale of the troop type in question. 5% of the base morale will be added to the morale score. This can be further boosted if the unit is in HQ power range of a HQ with adequate staff percentages. The commander of the HQ with adequate staff percentages can further help increase morale.

If morale is to be decreased it will be reduced by up to 10 points if the unit's experience is at 0. It will go down 7 points if the experience is at 30. It will go down 5 points if the experience is at 50. Only 1 point will be removed if the experience is 90.

50MM PAK GUN

The sudden appearance of heavily armoured Soviet tanks like the T-34 and KV-1 made it clear that even the 50mm PAK gun was not up to the job. However, on the western front, this gun was more than adequate to take out a Sherman. The first pre-production guns were delivered in November 1941. In April 1942, the Wehrmacht had 44 guns in service. By 1943, the PaK 40 formed the bulk of German anti-tank artillery. Later it was phased out in favour of even heavier AT guns and especially mechanized AT guns like the Hetzer.

4.1.7. ENGINEER POINTS INCREASE

Your engineers will get new EP start of every turn. Note however if a unit moves it loses its EP.

Engineer points (EP) go up every turn based on the amount of AP available. So if 50 AP is available the EP will go up with 50% of the EP gain statistic of its troop types. At 100 AP full EP growth will be awarded.

4.1.8. ENTRENCHMENT INCREASE

Your entrenchment will automatically go up the start of every turn. Note: if a unit moves it loses its entrenchment.

The entrenchment will go up with the entrenchment capability of the troop type and up to the landscape type's maximum entrenchment value. The troops will always reach the minimum entrenchment of the landscape type of the hex they are in.

TROOP TYPE ENTRENCHMENT CAPABILITY	
Troop Type	**Entrenchment capability**
Engineers	60
Infantry	40
Artillery / guns / flak	40
Tanks / afv / trucks	20

Snow hexes will halve entrenchment speed. This represents the difficulties of digging fox holes and trenches in snow covered and partially frozen ground.

LANDSCAPE TYPES MINIMUM AND MAXIMUM ENTRENCHMENT VALUES		
Landscape type	**Infantry minimum entrenchment ***	**Infantry maximum entrenchment ***
Marsh	20	100
Plains	40	150
Fields	50	180
Light Forest	60	200
Heavy Forest	70	225

Rural Village	50	200
Light Urban	75	225
Heavy Urban	100	300
Mud	No modifier	No modifier
Snow	+20	No modifier

* = Artillery/guns and flak have half these values. Tanks/afv and trucks have a quarter of these values.

Fortifications present in a Hex will add to the entrenchment values of a landscape type. Although the presence of fortifications can seriously increase the entrenchment of the defenders, the fortifications can be destroyed by structural damage done by combat / artillery fire or aerial attacks. Even partial damage to fortifications will reduce their added entrenchment values.

FORTIFICATIONS ENTRENCHMENT TOPPING UP VALUES		
Location type	Extra infantry minimum entrenchment *	Extra infantry maximum entrenchment *
Light Fortifications	+30	+90
Fortifications	+60	+150
Fortress	+80	+210

* = Artillery/guns and flak have half these values. Tanks/afv and trucks have a quarter of these values.

4.2. UNIT MOVEMENT

Moving troops into a neighboring hex costs action points (AP). The cost is determined by a number of factors. Each landscape type has an AP cost for each movement type. This AP cost might be replaced by the AP cost of a movement type for a road connecting the source and the target hex.

Then there might be additional costs in the form of AP cost for height levels, crossing rivers without bridge, ZOC (zone of control) penalties and/or previous battle AP.

It is important to be fully aware that almost all units are composed of different troop types. Troop types that might have different movement types. Especially on roads, the wheel and tracked movement types are much faster than the foot or artillery movement type. It is possible for faster troops to carry slower troops, as well.

4.2.1. LANDSCAPE TYPES

Basically villages, urban areas, plains and fields allow for good speed for motorized and mechanized troop types, but forests and marshes are hard to traverse for vehicles, but less so for infantry.

ACTION POINT COSTS TO MOVE IN TO LANDSCAPE TYPES, PER MOVEMENT TYPE.						
Landscape type	Artillery	Foot	Horse	Wheel	Tracked	Logistics
Marsh	100	30	65	75	60	58
Marsh snow	75	25	45	42	29	41
Plains	60	20	40	32	24	32
Plains mud	70	25	40	42	24	41
Plains snow	75	25	45	42	29	41
Fields	60	20	40	32	24	32
Fields mud	70	25	40	42	24	41
Fields snow	75	25	45	42	29	41
Light forest	70	25	45	42	32	41
Light forest mud	80	30	45	52	32	46
Light forest snow	85	30	50	52	37	46
Heavy forest	80	35	55	55	40	48
Heavy forest mud	90	40	55	65	40	58
Heavy forest snow	95	45	60	65	45	58
Rural village	60	20	40	32	24	32
Rural village mud	70	25	40	42	24	41
Rural village snow	75	25	45	42	29	41

Light urban	60	20	40	24	18	24
Light urban mud	70	25	40	24	18	24
Light urban snow	75	25	45	34	23	24
Heavy urban	60	20	40	24	18	24
Heavy urban mud	60	20	40	24	18	24
Heavy urban snow	60	20	40	24	18	24

Notes:

The scale used (1km hexes) in the game presumes some tracks and particularly logging roads to be present in almost all hexes. Their existence is modeled in the landscape type AP costs and is not modeled visually on every hex graphic. This note also explains why for example heavy tanks can drive through heavy forest hexes, albeit at a hefty AP cost.

There are some troop types with 4x4 wheel movement type. This movement type acts exactly the same as the tracked movement type.

The AP cost for horse movement type might seem high, but keep in mind that it concerns horses that will be pulling equipment like artillery guns.

4.2.2. ROAD TYPES
Roads are crucial for logistics and fast vehicle movement
Roads have lower movement costs and, if present, will be used instead of the higher movement cost of a landscape type.

In general roads perform miracles for the mobility of motorized and mechanized troops. If when moving a unit, the AP of the road type is lower than that of the landscape type, then the road type AP cost is used.

ACTION POINT COSTS TO MOVE OVER ROAD TYPES, PER MOVEMENT TYPE						
Road type	Artillery	Foot	Horse	Wheel	Tracked	Logistics
Dirt road	60	20	30	12	12	5
Dirt road mud	100	25	35	24	16	10
Minor road	60	20	20	10	10	2
Major road	60	20	20	10	10	1
Railroad	60	20	35	24	24	5

Roads only provide their full bonus as long as usage of the road in question stays within its traffic points. For more information about traffic points, see the section on logistics.

TRAFFIC POINTS PROVIDED BY ROAD TYPE	
Road type	Traffic points
Dirt road	1500
Minor road	6000
Major road	30000
Railroad	1500

The moment traffic points are exceeded by the combination of your logistical activities and unit movements any reduction in movement AP cost (compared to the plain landscape type AP cost) will be reduced, eventually to 0.

EFFECTS OF EXCEEDING THE TRAFFIC POINTS OF A ROAD TYPE	
Traffic point usage	Effect
Lower than 100%	Full road effect
Between 100% and 200%	0-33% less road effect
200%	33% less road effect
Between 200% and 300%	33-66% less road effect
300%	66% less road effect
Between 300% and 400%	66-100% less road effect
400% or more	No road effect at all

The traffic points are halved at the start of your next turn. But any extra traffic points caused due to events or cards (like air strikes) are exempt from this halving.

Notes:

For calculating the traffic point usage when moving units, the traffic points that will be caused by the unit that is moving are added into the calculations before movement occurs.

When moving units over roads each weight point counts as one traffic point. During the logistics phase each supply point counts as 0.1 traffic points and each fuel point as 0.3 traffic points.

4.2.3. HEIGHT LEVELS

A difference in height level, especially off-road, can cause great delays

If you move a unit from one hex to a target hex and that target hex has a different height value there will be some extra AP cost to move there. Especially if it concerns off-road movement as it is significantly more difficult to climb or descend.

EXTRA AP COST DUE TO HEIGHT LEVEL DIFFERENCE				
Height difference	**Foot off-road**	**Tracked off-road**	**Wheel off-road**	**Road**
Target 3 level lower	+25 AP	+50 AP	+100 AP	+25 AP
Target 2 level lower	+10 AP	+20 AP	+40 AP	+10 AP
Target 1 level lower	+5 AP	+10 AP	+20 AP	+5 AP
Target 1 level higher	+10 AP	+20 AP	+40 AP	+5 AP
Target 2 level higher	+20 AP	+40 AP	+80 AP	+10 AP
Target 3 level higher	+50 AP	+100 AP	+200 AP	+25 AP

Note that a snow hex increases the extra AP cost by +50%. This is done to simulate the effect of slippery surfaces, lack of surface visibility and wind driven snow piles.

The Hetzer was a development of the Panzer 38t, designed to provide a light but powerful anti-tank weapon armed with the 75mm L48 gun. Many Abteilung in 1944 were assigned to many infantry divisions. The Hetzer was the most common late-war German tank destroyer. It was available in large numbers and was mechanically reliable. Its small size made it handy to conceal. It was intended to be used in defensive battles and ambushes, which, when it was used as intended, it did so with good success.

Notes:

The supply system does not suffer any penalties from height levels.

That each troop type has a height cost modifier. For infantry this is 100%. For tracked 200% and for wheeled 400%. You'll see these values correspond with the costs in the table above. We are mentioning this because these values are moddable.

4.2.4. RIVER TYPES

Rivers without bridges are formidable obstacles to vehicles and guns

If your troops have to cross rivers to get to the target hex this can cause extra action point (AP) cost. This is only the case if no bridge is present.

EXTRA AP COST FOR CROSSING RIVER TYPE PER MOVEMENT TYPE						
River type	Artillery	Foot	Horse	Wheel	Tracked	Logistics
Minor river	+60	+20	+20	+60	+60	+60
Medium river	+100	+40	+40	+100	+100	+100
Major river	+140	+60	+60	+140	+140	+140
XL river	blocked	+80	+80	blocked	blocked	+180

4.2.5. ZONE OF CONTROL

Units can slow down enemy units moving near them

All units exercise zone of control (ZOC) points in the direct hexes around them.

If the hex you want to move troops into has enemy ZOC points this means you'll be paying +10 AP extra. And even+20 AP extra if there is a river to be crossed under enemy ZOC.

ZOC simulates a combination of the fuzziness of the hex, where the enemy troops are, enemy patrols, fields of fire, mines, etc.

4.2.6. COMBAT AND MARCH MOVEMENT MODE

Use march movement mode if units have a long march ahead to the frontlines.

You can select the movement mode of a unit by choosing between march mode and combat mode. March movement mode is the fastest, but makes the unit vulnerable in combat. Combat movement mode is slower, but avoids taking excessive damage due to unforeseen combat or intercept fire.

To switch from combat movement mode to march movement mode costs 25 action points and 25% loss of readiness. The reverse change is free of cost. This simulates the cost of organizing a proper march column.

In combat movement mode all the regular rules apply. But in march movement mode there are the following changes:

- Movement action point cost is halved, but only on roads.
- Readiness cost for movement is doubled.
- Traffic footprint of movement is doubled.
- If a unit finds itself under fire it suffers serious penalties. See the combat section.
- If a unit finds itself under fire it will switch to combat move mode automatically.

4.2.7. PREVIOUS BATTLE AP
Combat can slow down the advance.
If the hex your troops are moving into was taken this turn by battle it might have previous battle AP on it. These points act as extra cost to move into the hex.

If a previous battle has taken more AP than it would have cost to move into the hex without battle, the difference is put on the hex as previous battle AP.

Previous battle AP simulates the delaying effect of protracted combat.

4.2.8. CARRYING TROOPS
Foot soldiers and artillery can be carried by vehicles or horses.
A unit moves as a whole, but it can be made up of different troops with different movement types. If inside a unit, no troops that can carry others are present, it will move with the AP cost of the slowest movement type.

However troops with carry points can carry other troops. For example, trucks can carry infantry.

If everybody cannot be carried, the slowest troops will be carried first. For example, a unit with infantry, artillery and just a few trucks, might get its artillery motorized but not its infantry.

For one individual to carry another, the carrying individual needs to have higher carry points than the carried individual has weight points.

JAGDPANTHER

The Jagdpanther was a development of the Panzer V designed to provide a low and powerful anti-tank weapon armed with the famous 88mm L71 gun. It was a monster tank, capable of obliterating anything the allies could throw at it.

Furthermore, to be fully carried the carried individuals manpower points need to be carried as well. You can inspect each troop type to see its weight/carry and manpower/carry statistics.

Manpower can be spread out over multiple carrying individuals, the weight cannot. So for example heavy artillery (weight 3) cannot be carried by regular trucks (carries max 2 weight), even if there are multiple available. But for example the manpower of a heavy artillery (manpower 10) can be carried by 2 jeeps (each carries max 5 manpower).

In previous *Decisive Campaigns* games, the loss of a single truck could mean the difference between a foot unit and a motorized unit. No longer. Now a linear approach is used to determine the probability that a unit is motorized. A unit can still be motorized, for example, even though it is missing up to 33% of the needed vehicles. When a unit is missing 16.5% of its vehicles there is a 50% chance it will still be motorized. When missing 8.25% there is a 75% chance it will still be motorized.

4.2.9. FUEL COST

If you move units with vehicles they consume their fuel stocks.

Some troop types like vehicles consume fuel for every AP they move. If a unit does not have enough fuel in stock to pay the cost for the AP in question, the movement will be blocked.

Note: If your unit is out of fuel and is without hope of resupply, it might be better to scrap your vehicles and return mobility to remaining infantry.

4.2.10. READINESS COST

If you move units they lose readiness, especially non-motorized troops.
Moving costs readiness. In the case of infantry this is because marching is quite exhausting; in the case of vehicles it is because usage always creates some breakdowns that need repairs.

Moving foot movement type troops their full 100 AP movement means they'll lose 30 readiness points. Moving vehicles their full 100 AP means they'll lose 10 readiness points.

Notes:
Marching an infantry unit turn after turn will consume more readiness than it will recover. 30 readiness can be expended by just moving, but only 20 readiness can be recovered at the start of the next turn.

If foot movement troops are carried by vehicles they'll suffer the same and much lower readiness loss as their vehicles do (10 points).

4.3. RECON AND LINE OF SIGHT

Now in this department, the recon department, this *Decisive Campaigns* sees a lot of new rules. Notably, the recon point system has been made logarithmic instead of linear, line of sight has been added and rules to more permanently mark units as spotted or identified have been implemented.

4.3.1. RECON

You need recon points on hexes to see the enemy.
Troops spread out their recon points to neighboring hexes up to 10 hexes away.

In the game interface and the rules you'll see recon values mentioned on hexes. These actually concern effective recon points. These are a logarithmic derivative of raw recon points.

The amount of raw recon points a unit has depends on the troops inside it. Larger units have more points. It's a linear matter.

The total raw recon points of a unit is then modified for its experience points (XP). If a unit has more than 30 experience points it receives a positive modifier, which at 55 XP is +100% and at 80 XP reaches the maximum modifier of +200%. If a unit has less than 30 XP it receives at worst a -66% negative modifier, at 15 XP it is -33%.

These raw recon points are then spread out over the lines of sight (LOS) of the unit. The raw recon points are only fully applied if the LOS is 100%, if the LOS is less, then only that percentage of the raw recon points is applied. More about that in the next section. Put basically, hills and forests break line of sight.

The resulting raw recon points of a unit on the hexes around it is then modified for distance, weather type and time of day. Also see the next section. Basically the further away and the worse the visibility, the less raw recon points remain.

The remaining raw recon points are then put through a log10 function and multiplied by 30. What? Yes, well... that is the formula and it is difficult to explain. The table below might help you more.

NEBELWERFER 150

The Nebelwerfer was the German multiple launch rocket system used during the Second World War. Together with the Soviet Katyushas, the Nebelwerfer was the first commonly used multiple launch rocket system. The 15 cm Nebelwerfer 41 rocket launcher consisted of five barrels on a Pak 35/36 gun carriage, was introduced in 1940, had a range 6900 metres and a shell of 32 k.

FORMULA RESULTS FOR TRANSFORMING RAW RECON POINTS INTO EFFECTIVE RECON POINTS		
Raw recon points	Effective recon points	Info level on unit with 10 hide points
2000	100	Full
1000	90	Full
500	81	Partial (much more correct estimation)
250	72	Partial (more correct estimation)
125	63	Partial (less correct estimation)
62	54	Partial (much less correct estimation)
31	45	Minimal
15	36	Minimal
7	21	Minimal
3	15	Minimal

The use of the logarithmic scale means that it now actually pays off to use small scouting forces. As you can see in the table above a force 10 times the size (and raw recon points) of a smaller force will barely have 2 times the number of effective recon points. This simulates the fact that it does not make much difference if you have 1 guy with binoculars on a hill top or 10 guys with binoculars on that same hill top.

Note: Actually engaging in multi-round combat can provide you with a lot of extra recon on a hex, as can air recon cards.

4.3.2. LINE OF SIGHT AND OBSTRUCTIONS MODIFIERS

Hills, towns and forests will partially or fully block your line of sight. The line of sight (LOS) system is not a strict LOS like we know from more tactical games. The LOS system used in this game has the ability to slightly bend around obstacles. This simulates that at the scale used, recon is gathered as well by small groups of reconnaissance troops moving slightly outside of the hex of the unit, as well as enemy troops

maybe not always sticking to their exact hex. Also, other ways of gathering information might give some boost as well.
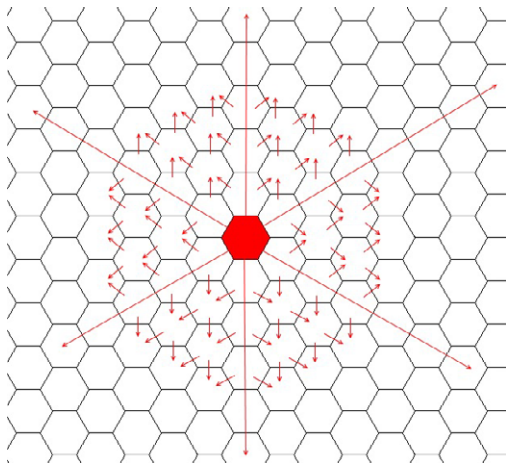
Obstructions and shadows can obstruct LOS. The Hex next to the Observer can always be seen, however, as it can not be obstructed or hidden in a shadow.

If a hex has the same height level (and only if the same level) as the observing unit the obstruction percentage of the landscape type is taken into account. Obstruction decreases your recon on the hex and hexes behind it. For the hex in question it has a limited effect.

OBSTRUCTION PERCENTAGES OF LANDSCAPE TYPES		
Landscape type	**First hex**	**Hexes behind first hex**
Light forest	40%	80%
Heavy forest	50%	100%
Rural village	30%	60%
Light urban	30%	60%
Heavy urban	50%	100%

A unit thus has a LOS percentage on the hexes around it. 100% is perfect LOS and less is imperfect LOS. A unit will only get partial recon points with an imperfect LOS and cannot have recon points at all on a hex it doesn't have a LOS on.

> **Note:** For example, if we are calculating the recon points of a unit on two hexes directly north of it that are both lightly forested. This unit will then have -40% recon on the first hex and -88% recon the second hex.

Height level differences can cause so-called shadows to be dropped which can obscure the LOS of a unit.

Illustration: Shadow cases

If the hex in question is higher than the observer unit (case #1) then it will cast a permanent shadow for its height level and all height levels below it.

If the hex in question is the same height as the observer (case #2) then it will cast a permanent shadow on all Height Levels below it.

If the hex in question is lower than the observer (case #3) then it will cast a limited shadow on all height levels below it, but modified for distance. This rule does not apply for immediate neighbor hexes of the observer unit. The further away from the observer the height level drop occurs the longer the shadows will be.

4.3.3. DISTANCE, WEATHER AND DAY TIME MODIFIERS

You have optimal recon with clear weather during daytime.

Even if there are no shadows and no obstructions, your recon points will degrade due to distance. Your units have better recon on a hex at distance 1 than a hex at distance 2, for example.

The strength of the degradation of your recon points is dependent on the weather and day type.

DEGRADATION OF RECON POINTS DUE TO DISTANCE, PER WEATHER TYPE / DAY TYPE										
Type	Dist 1	Dist 2	Dist 3	Dist 4	Dist 5	Dist 6	Dist 7	Dist 8	Dist 9	Dist 10
Clear	full	/2	/4	/8	/16	/32	/64	/128	/256	/512
Hazy	full	/2	/4	/8	/16	/32	/64	/128	none	none
Overcast	full	/2	/4	/8	/16	/32	/64	none	none	none
Lt.Precipitation	/3	/9	/27	/81	/243	none	none	none	none	none
Hv.Precipitation	/4	/16	/64	/256	none	none	none	none	none	none
Dark night *	/20	none	none	none	none	none	none	none	none	none
Hazy night	/4	/20	/100	none	none	none	none	none	none	none
Starry night	/3	/12	/48	/184	none	none	none	none	none	none

* = this includes nights that are overcast or have precipitation

4.3.4. HIDE POINTS

Having recon points on a hex does not assure you'll spot enemy units in that hex.

The question of if you can see an enemy unit depends on two things: first your recon points on a hex and second the enemy units hide points.

Most importantly a unit can get automatic hide points from its hex's landscape type.

HIDE POINTS OF LANDSCAPE TYPES	
Landscape type	**Hide points**
Light forest	34
Heavy forest	44
Rural village	34
Light urban	34
Heavy urban	44
Marsh	14
All other landscapes	4

These hide points (if any) will then get up to a +40% bonus if the unit has more experience (XP) than 30 points. It will get up to a -40% penalty on its hide points if the unit's XP is lower than 30.

After this up to a +40% bonus to the hide points can be added if total stack points in the Hex are lower than one third (33%) of the maximum stack in the hex. This simulates the troops being harder to spot due to the low quantity of them being present.

Up to a -100% penalty on hide points can be added if the total stack points in the hex are higher than the maximum stack points. At three times the maximum hex stack points being present, the hide points are completely reduced to zero. At two times the maximum hex stack points being present, the hide point receives a -50% penalty.

If a unit is spotted, the hide points of the unit will be halved and if the observer has at least 1 effective recon point on the hex it will always, at minimum, see the unit as a counter with a "?".

A unit that is also identified will have its hide points halved again. So a unit that is spotted + identified loses three quarters of its hide points.

4.3.5. SPOTTED AND IDENTIFIED UNITS
Once a unit is spotted or identified and it does not move, it will stay spotted or identified.
Once you have gotten at least minimal info on an enemy unit it will be considered spotted. This means its hide points will be divided by two.

A unit will also become spotted if you run into an ambush or see at least one of its individuals during combat.

Once you have gotten partial info on an enemy unit it will be considered identified. This means its hide points will be divided by two. That is on top of the division by two for it being spotted as well.

If you have at least 1 recon point on a hex with a spotted or identified unit it will always be shown to you.

A unit that is spotted but not identified and that, without the spotted state, would not show in partial info mode will stay in minimal info mode.

However a unit will lose its identified and/or spotted status by moving out of its hex during its turn.

The status of spotted and identified is updated at the start and end of your turn.

4.3.6. UNIT DETAIL LEVEL

The more recon points you have on an enemy unit the more you will know about it.

The effective recon points you have on a hex minus the hide points of the unit that is being observed determines the unit's detail level.

If the effective recon points minus the hide points is zero or lower you will not be aware that the unit is present in the hex.

If the effective recon points minus the hide points is higher than zero but lower than 20 you will have minimal information on the unit. Basically you'll just know there is a unit but have no clue about its name or composition.

If the effective recon points minus the hide points is 20 or higher, but lower than 80, you will have partial information on the unit. This means you'll know the name and have a good guess on the troops and the statistics it has. The higher the score the more precise your guess will be.

If the effective recon points minus the hide points is 80 points or higher you'll have perfect information on the unit.

4.4. LOGISTICAL NETWORK

For units to be supplied you need a friendly path between the unit and a supply source

Supply and fuel arrives from off map in so called supply sources. From these supply sources it is dispatched to your units and possibly to your supply bases.

Your units and supply bases make requests that can be lower than what the supply and fuel they are missing. This is due to a supply standing order or a difference between maximum intake and the usage of troop types. The supply source then tries to get as many supply and fuel requests fulfilled.

The logistical action point cost between your supply source and the requesting entity is determined by distance, road network, traffic congestion and can be improved by having supply bases along the route. If the action point costs rise above 100 action points (AP) only a

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PANZER IVH

The Panzer IV was the most widely manufactured German tank and the second-most widely manufactured German armored fighting vehicle of the Second World War, with some 8,500 built. The Panzer IV chassis was used as the base for many other fighting vehicles, including the Sturmgeschütz IV assault gun, Jagdpanzer IV tank destroyer, the Wirbelwind self-propelled anti-aircraft gun, and the Brummbär self-propelled gun. The Panzer IV saw service in all German combat theaters and was the only German tank to remain in continuous production throughout the war. It received various upgrades and design modifications, intended to counter new threats, extending its service life. Generally, these involved increasing the Panzer IV's armor protection or upgrading its weapons, although during the last months of the war, with Germany's pressing need for rapid replacement of losses, design changes also included simplifications to speed up the manufacturing process.

percentage of the request can be delivered. Above 250 AP nothing will be delivered as the target hex is considered out of range of the supply source.

Note: Supply sources use the logistics movement type for determining the action point costs for getting supply or fuel to a target hex.

Supply bases play a special role as they can be either used as a kind of mini supply sources (consuming supply and fuel within them) or they can be used to boost the range of your supply sources by providing up to 80 free AP.

4.4.1. UNIT REQUESTS
Units request supplies and fuel from supply sources
Troop types have a maximum storage amount for supply and fuel. If their current stocks at start of turn are lower than the maximum storage amount, the unit will at most request the difference and it will be limited to their maximum replenish rate.

Note: In practice it is only artillery that has a serious difference between the supplies (ammo) it will spend in offensive usage and its maximum replenish rate. This is done to simulate that you cannot give maximum impact artillery barrages every round.

Units can also have their supply request percentage standing order changed. You can choose between 100%, 75% and 50%. This percentage is applied to the final supply and fuel requests of a unit.

Note that the supply request percentage standing order can be set for each HQ. If you set a higher HQ to, for example, 50% it will mean all units below that HQ will only request 50% as well. If you for example set your Corps HQ to 50% and a subordinate division HQ also to 50% that will mean that division will effectively only request 25%.

4.4.2. SUPPLY BASES AND REQUESTS

Supply bases can request supply and fuel as well, when in build-up mode

Supply bases come in several sizes. The bigger the size the more logistical free action points they can provide and the more supply and fuel they'll have stocked for optional consumption by units.

SUPPLY BASES STATISTICS				
	Minor	**Medium**	**Major**	**Strategic**
Logistical free AP	20	40	60	80
Supply stock	1000	4000	15000	50000
Fuel stock	1000	4000	15000	50000
Max evacuation per round	50%	25%	15%	10%
Max destroy per round	100%	50%	30%	20%
Deplete logistical range	20 AP	40 AP	60 AP	80 AP
Minimum city needed	Minor City II	Minor City III	Major City I	Major City III

The structural point percentage of a supply base is the percentage of the stocks needed by the supply base. If it is below 100% it will reduce the logistical free AP the supply base gives. The percentage used is the average of the percentages for fuel and supply.

A supply base can be set to five different modes.

The first mode is regular mode. In this mode the supply base will focus on providing free logistical AP to supply source logistics and extending their range. In this mode any shortages of stocks will not be replenished and stay as their current levels.

The second mode is build-up mode. This mode is the same as regular mode with the exception that any missing supply or fuel stocks will be requested from supply source(s).

The third mode is deplete mode. In this mode the supply base will provide zero free logistical AP to supply source logistics, but will itself act as a mini supply source distributing its stocks to nearby units. This is done before supply sources distribute supplies and fuel. The range is limited, but adequate for units that are close by.

The fourth mode is evacuate mode. In this mode the supply base will try to send its stocks back to the supply source(s). It is relatively slow to completely evacuate a big supply base.

The fifth mode is destroy mode. In this mode the supply base will destroy its stocks. For big supply bases this takes time, but it's twice as fast as evacuating. It might be a crucial mode for the American player to avoid fuel falling into German hands.

Note: Something the German player will really want to do is use the deplete mode on captured American supply bases to provide their panzers with much needed extra fuel.

When a supply base is captured 100% of the fuel is captured, but only 25% of the supplies because the Americans and Germans are using mostly non-compatible ammunition and spare-parts.

It is possible that a supply base at scenario start is in fixed mode. Fixed regular, fixed deplete, etc... When in fixed mode it means the player cannot change the mode of the supply base. The fixed mode is removed upon capture of the supply base.

Also be aware that supply bases with no (or extremely low) stocks will be removed from the map.

4.4.3. SUPPLY SOURCES FULFILLING REQUESTS

The more costly in AP the path between supply source and unit, the less it will receive.

The supply sources try to service all requests (units and supply bases) within its range. If there are not enough stocks at the supply source to serve everybody, then everybody will receive a bit less than requested.

But the most important is the range. Because if the requesting units or supply bases (build-up mode) are not within the optimal 100 action point logistical movement type range, they'll not be able to be served fully. Between 100 and 150 action point range only 75% of the request

will be delivered, between 150 and 200 action point range only 50% of the request will be delivered and between 200 and 250 action points only 25% will be delivered.

Supply bases can however give free AP to the supply sources. This can extend their range significantly. The supply source will try to find a path that optimizes the use of supply bases (without traversing ridiculous routes).

Illustration: AP cost for a supply source to reach a certain hex and the effect of a supply base

In the illustration above you can see that due to the route passing a supply base, the AP cost will not increase until the free AP given by the supply base is depleted.

In the case where the route passes multiple supply bases the free AP is not added up. Instead the maximum of the new supply bonus AP and current free AP before entering the supply base's hex is taken. So for example if the route goes first through a major supply base (gives 60 free AP) and then 10 AP later it goes through a medium supply base (gives 40 free AP) the effect is nil since there are still 50 free APs left. However, if later on with only 30 free AP left it goes through another medium supply base the free AP will be increased to 40.

Keep in mind that supply and fuel deliveries from the supply source put traffic points on the trajectories used for delivery. Yes this means your logistics can actually clog roads and prevent units from using them at optimal speed.

WIRBELWIND SDKFZ161-4

The Wirbelwind was a development of the Panzer IV designed to provide a vehicle offering AA fire support, armed with the standard 20mm AA gun quadruple mounting.

Note that for fuel delivery, the binary fuel delivery rule is used if the range from supply source or base is more than 100 action points. Whereas supply will often only get partially delivered, fuel gets either fully delivered or not at all. The chance for full delivery is equal to the percentage of normal non-fuel supplies that will be delivered.

Notes:

All the movement rules from the earlier chapter apply to the supply source logistics movement type. This notably includes possible road congestion.

A unit might receive supply over several different trajectories. This happens when after part of the requested supply and fuel has been delivered, a road has gotten so much congestion that another road becomes the faster route.

4.4.4. ENEMY PRESENCE MARKERS

Since you are not sure of the ownership of most hexes it is possible that you might think a certain road is in friendly hands, when it is actually in enemy hands. In assumed ownership view mode you'll never know for certain, but in the logistics phase your logistics can.

 If a supply source chooses a route for delivery that it thought was in friendly hands, but is actually blocked by an enemy unit, an enemy presence marker will be placed and a different route chosen, if possible. You can see these markers during your turn to see where your logistics ran into unexpected enemy ownership. It means an enemy unit is closer to the hex in question than a friendly unit. It could be on top of the enemy unit's hex or it could be a number of hexes away from it.

Note: Once you move over a colored enemy presence marker it will turn to gray to indicate that no enemy unit was (or is anymore) present on that hex. Colored and gray presence markers also have a different effect on presumed hex ownership calculations.

4.4.5. OTHER LOGISTICAL OPERATIONS

Apart from the supply sources sending supply and fuel to units and supply bases there are a few other logistical operations that can take place.

Supplies and fuel from supply bases (evacuate mode) can be sent back to supply sources. This works the same as supply/fuel delivery and the range from supply source to supply base can reduce the quantities being sent back. This also uses free AP from supply bases on a route and generates traffic points.

Replacement troops can be sent from higher HQs to any subordinate unit/HQ. This works almost the same as supply/fuel delivery, except here the hex of the higher HQ is used to calculate the range to the unit requesting the replacement troops. This also uses free AP from supply bases on a route and generates traffic points.

<note>Note that excess troops (compared to the TOE of a unit) can also be sent back to a higher HQ. But that should happen only very rarely in this game. You are not allowed, due to the scale of this game, to change the OOB of units and thus make a unit oversized.</note>

4.5. TROOPS MICRO MANAGEMENT

There are three things you can do concerning micromanagement. You can transfer troops from one unit to another, you can form kampfgruppen / battlegroups and you can scrap equipment.

4.5.1. TRANSFERRING TROOPS

If units are in the same hex you can transfer troops from one unit to another. However the TOE of the target unit must be respected and you cannot exceed it, nor can you force, for example fallschirmjaeger, into an SS unit.

You cannot reduce the source unit below 50 power points of troops (equivalent to 10 tanks or 100 men). The exception is if you transfer everything out of the source unit.

If you transfer everything out of a unit it will disappear from the map. The unit receiving the troops will be reduced to 0 action points and will not be able to move on that turn.

Note: A kampfgruppe or battlegroup has no TOE and there are thus less restrictions on what you can transfer to it.

4.5.2. CREATING A KAMPFGRUPPE

If you do not want to be bothered with TOE limitations you can create a kampfgruppe or a battlegroup (for the Americans) to transfer troops to. The newly formed kampfgruppe will have 0 AP.

To form a kampfgruppe it must receive at least 50 power points of troops (equivalent to 10 tanks or 100 men).

It costs political points (PP) to create a kampfgruppe.

4.5.3. SCRAPPING TROOPS

In some cases you will want to scrap (or scuttle if you like) equipment like guns and tanks. For example: when you are out of fuel and you want the infantry to still be able to move. Or another example: if you have to get a unit through dense forest or over a river to escape destruction.

Upon doing this action the equipment will be removed from play, but the manpower, like tank or gun crews, will be returned as low grade infantry.

Scrapping can thus change the move type of a unit from artillery/wheeled/tracked to infantry.

Doing any scrapping reduces the unit's AP by 25 points.

4.6. TRANSPORTING UNITS

Units that have at least 80% of its troop types consisting of troop types that can transport, (motorized/mechanized and with carry points) is considered a transporter unit.

A transporter unit can select other units to be transported. One transporter unit can transport one or more transportable units.

For movement calculations, the transporter unit and the transported units all act as if all their troops were in one single unit.

There are no combat penalties for transported units (unless, of course, they are using march movement mode). That said, units might be unloaded from transporter units if there is a lack of transports after battle.

4.7. HQS AND OFFICERS

Every HQ will have staff members and a commanding officer. Together they provide a bonus, especially to combat, but also to morale recovery. On top of that, officers will have officer cards available for giving an extra bonus to units on crucial moments.

The design idea is the officer commands the staff and the staff commands the frontline troops.

Each officer has a number of staff points he can command. Some officers can command more staff than others. If the officer has more staff than he can optimally handle, his bonus to the staff for combat and morale will drop.

Staff can command a certain number of power points (frontline troops) and if too few staff are available the combat and morale bonus will drop.

4.7.1. COMBAT BONUS

If the staff to troops ratio is above 1 the staff will provide a base 25% combat bonus to the troops. However, the experience points of the staff will be added on top of that. If the commanding officer has an officer to staff ratio that is above 1, the percentage for the experience points of the staff will be increased with the officers bonus.

For example: divisional HQ has good ratios with regular staff. The commanding officer has a 20% combat bonus and the staff have 40

experience points. That will mean the combat bonus for the frontline troops will be 25% + (40% + 8%) = 73%. That 8% is 20% of 40 from the commanding officer's additional bonus.

The combat bonus for the frontline units will be reduced if their HQ power is lower than 100%. At 0% there will be no bonus.

If the staff to troops ratio is below 1 or the officer to staff ratio is below 1, their respective effects will be linearly decreased. There is no further advantage to having a ratio above 1.

-**Note:** Political staff give only half the combat bonus.

4.7.2. MORALE BONUS

If morale is to be increased, it will slowly recover up to the base morale of the troop type in question. It will go up by 5% of the troops base morale. This can be further boosted if the unit is in HQ power range of a HQ with adequate staff percentages. The commander of the HQ with adequate staff percentages can further help increase morale.

It follows the same calculations as for the combat bonus. If the staff to troops ratio is above 1 the staff will provide a base 25% morale bonus to the troops. Additionally, the experience points of the staff will be added on top of that. If the commanding officer has an officer to staff ratio that is above 1, then that percentage of the experience points of the staff will be increased by the officer's bonus.

Note: Political staff give double the morale bonus.

4.7.3. HQ POWER PERCENTAGE

Each HQ has a certain range in which it can optimally command its subordinate units. After this range is exceeded the HQ power on its units will drop. This will cause a reduction of the combat and morale bonus given. Also it will reduce the effect of officer cards that might be played.

4.7.4. OFFICER STATS AND CARD PLAYING

The key officer statistic for card usage is command level. The higher the command level of the officer the more command points the officer will gain each turn.

In order to play a card an officer must have enough command points to pay the command points cost of his card.

Cards come in five colours. Each one has an effect based on a different officer statistic.

Red cards will give better effects with high audacity. Usually related to offensive action.

Green cards will give better effects with high determination. Usually related to defensive action.

Blue cards will give better effects with high charisma. Usually related to morale.

Brown cards will give better effects with high intuition. Usually related to recon.

Purple cards will give better effects with high organization. Usually related to higher level HQ commanders cards.

4.8. COMBAT

As veterans of the DC series know, combat calculations are especially complicated. So we'll start this section with the different modes of

SDKFZ251

The SdKfz 251 Mittlerer MG was a German armored half-track which could bring a squad of 10 soldiers into battle alongside the tanks. It provided reasonable armor protection against small arms fire or shells but was vulnerable to tanks or anti-tank weapons and airstrikes as it had an open top. It was armed with an MG 34 or MG 42 in the front and an additional rear MG. More than 15000 were built.

combat and most important modifiers before going into the details of actual combat resolution.

4.8.1. REGULAR ATTACKS

A regular attack is an attack where your units push into the target hex with the aim to remove the defending units and take the hex.

After successful completion of a regular attack, any attacking units that didn't retreat by the time of victory, will be allowed to move into the conquered hex at the cost of zero action points.

Sometimes it is not possible for the whole of a unit to join in a regular attack. For example: because some of its troops do not have the action points to move into difficult terrain. The game allows partial attacks. The troops that can join the attack will and the others will either wait it out in their hex of origin or provide ranged fire to support the attack. An example of this is a motorized unit spotting some enemy stragglers on a forested hill next to the road and sending the infantry in to attack, while the trucks wait on the road.

4.8.2. RANGED ATTACKS

It is also possible to attack a hex from a distance without actually moving your troops into it. This can be done by troop types that have either direct fire capability or indirect fire capability. The difference between the two is that troop types with direct fire capability will need line of sight (LOS) on the target hex. Units capable of indirect fire do not need this, but do benefit a lot from having recon on the target hex, either from their own LOS or from recon done by other units and communicated to them via radio.

4.8.3. INTERCEPT FIRE

When your units move the enemy might engage them with intercept fire. Likewise, when the enemy moves your units might engage them with intercept fire. Intercept fire helps smooth over the design artifacts

of a igo-ugo turn system and it also provides excitement, helps the defensive side to get more historical results and gives plenty of tactical opportunities. A chance for intercept fire occurs every time a unit moves from one hex to another (or when a unit executes a regular attack; in which case its defensive support will intercept fire).

Note: During the Ardennes offensive many a German attack was thwarted by quick and accurate American artillery fire on the attacker's assembly areas and lines of advance. This is simulated in the game by defensive support intercept fire.

Note that there is an exception: units moving into a hex for 0 action point cost (due to prior regular combat) will not be targetable by intercept fire.

In order to be eligible to conduct intercept fire a unit must have at least 40 action points left. Furthermore, it must have a line of sight percentage above 10% on the target hex (for direct ranged fire) and the unit's regime must have at least 26 recon points on the target hex (for direct and indirect ranged fire).

Intercept fire is never a sure thing. It requires quick reactions and communications. There is a difficulty factor to properly spotting the enemy moving as well as a human factor concerning being ready to fire when it is actually needed. The chance that a unit is actually eligible for intercept fire on a specific enemy move is: intercept combat modifier the unit has on Hex * (experience/30) * (readiness/100).

The above mentioned intercept combat modifier is either the LOS% or if lower (recon points-20)/0.6.

The Americans signals and communications are near perfect with plenty of radios being available and excellent procedures. However, the Germans often lacked radio equipment and had to use runners and landlines. Hence there is an added difficulty for Germans. For indirect fire (artillery) they have a generic -50% chance to conduct intercept fire and a further -15% per hex the artillery unit is away from

its target. A compounded calculation is used so there is still a chance at, for example, 10 hex distance. Be aware that if the artillery unit has a direct line of sight (LOS) these communication penalties do not apply!

The number of the participating eligible units that actually do intercept fire depends on the number of eligible units that can. Each unit gets assigned a score. This score is (action points * intercept fire chance / 100). The highest scoring units will be selected first. Units with good fire and lots of action points will thus have tendency to fire first. At least one unit will be selected for intercept fire, and units will be added until the intercept stack score exceeds the (total score of all eligible units / (6-(average AP/20))). So for example: When 3 intercept fire eligible units (each 80AP+) all have the ability to conduct intercept fire they will fire in the following order: All 3 units during the first enemy move, then only 2 units during the second enemy move and during the third enemy move the last remaining unit with 40+ AP left will fire.

Note: The fact that not all units do intercept fire en-masse makes it impossible to use gamey tactics where you sacrifice one unit to deplete the intercept fire opportunities of the enemy.

When intercept fire combat starts the targeted unit will not benefit from entrenchment points as it is on the move. Furthermore, the targeted unit will lose action points if it loses readiness during this combat. Note that intercept fire lasts for only 2 combat rounds. Short and surprising. The targeted unit has no chance to fire back due to the disruptive effect.

Notes:
Units with ranged capable troop types that have mixed ranges will have reduced chances to intercept fire when it excludes a firing resolution for part of its troops.

It can happen that you come under intercept fire by a unit on a hex you have no (or not enough) recon on. You should still get an indication of the kind of the shelling... like heavy artillery or mortar fire in this case.

4.8.4. BATTLE RESOLUTION

The moment battle commences, all troops are split up into individuals (10 man squads or single tanks). These individuals then battle it out for several combat rounds, each combat round costing 10 action points (AP). The moment an attacking unit is out of AP, it ceases its combat participation.

When combat starts the combat loop is started. The combat loop basically plays combat rounds until either the attacker has run out of action points, has retreated, has been wiped out or is victorious.

The following things happen in the following order in each combat round:

Set cover points

When combat starts, each individual is given a random number of cover points. This number is 20 + 1d30 + hide points (landscape type, experience, spotted, identified rules like discussed in the recon section are calculated). Cover Points above 65 are divided by 1.5. Cover points after this above 75 are divided by 2. Cover points above 85 are divided by 2.5. Cover points cannot be higher than 90.

Initiative determination

In the first round only. Every individual gets a random initiative between 0 and its initiative score. The individual with the highest initiative will attack first during the combat steps loop.

Check capitulation

Only defenders have a chance to capitulate. And only if they are retreating or have retreated. If an individual's morale is lower than 33 and readiness is lower than 50 then there is a chance it capitulates.

Set concentric attack bonus

Every round this is calculated anew because units might have retreated in the first combat rounds and that might severely reduce the remaining bonus given by an initial concentric attack. The concentric bonus will be halved if units from different HQs are involved.

Combat round steps loop

This loop concerns the brunt of the calculations and executes the actual attacks for each individual involved in combat for this combat round. All individuals attack each other. See the section further down for a detailed breakdown of the combat round steps loop.

Check out of action points

If an attacking unit does not have enough action points (AP) left to pay for the next combat round (10 AP) it retreats.

Check breakthrough

If an individual is not hit for 2 consecutive combat rounds and has made at least one successful attack so far (any type of hit) then it will break through. Also if the individual attacker has not even been targeted (let alone hit) in the last 2 combat rounds it will break through. There is a chance the breakthrough fails if the attack is overstacked. If the defender has only "backbench" individuals left, the breakthrough always succeeds.

Check safe retreat

If an individual started retreating in combat round X it will have safely retreated in combat round X+2. In effect suffering 2 combat rounds of possible enemy fire without being able to return fire.

Check panic retreat

If the percentage of the individuals lost in combat drops below the morale of a unit then there is a chance its remaining individuals will panic and the unit will start a panic retreat. Units that panic and

that have no avenue of retreat have their morale doubled for this calculation. If the unit does a panic retreat, but there is no avenue for retreating the unit, all individuals in the unit will capitulate.

If no panic roll is made, because the percentage of lost individuals is lower than base morale, we also will make a reduced chance check panic retreat roll. This roll will occur more often but has less chance to succeed than the regular check panic retreat roll.

No panic retreats are possible if under strictly ranged attack or intercept fire.

Note: This reduced chance panic roll has been added to the rules to make both 'base morale' and 'morale' a factor in the panic testing. 'Base morale' represents for me the mental and ideological constitution, where 'morale' represents the current state of mind. It is possible, for example, a Volkssturm unit which goes up to 100 morale will defend longer without panicking, but just having 100 morale will not make it a fanatical SS unit that defends a position to the last man.

Check orderly retreat
If the percentage of killed + retreated individuals suffered by a unit triggers the retreat standing order percentage of a unit, then it will start with a so-called orderly retreat. Units that have no avenue of retreat will not be able to obey their standing order and will probably eventually suffer a panic retreat resulting in capitulation.

Check end of the battle
Here it is checked if the battle has ended. First the number of individuals still in combat are counted on both sides. If no defending individuals are left and there are still attackers left and it is a ranged attack the attack continues until the attackers run out of action points or maximum combat rounds (intercept fire).

If no attacking individuals are left and still defending individuals are left the defender will have held their hex.

If no defending individuals are left and still attacking individuals are left the attacker will have succeeded in capturing the hex.

If no individuals are left on either side it will be considered a stand off, where the attacker did not succeed in capturing the hex, but the defender will have retreated.

Battle result morale effects

At the end of the battle, for each unit, a check is made for the individuals it lost versus the enemies it killed. This ratio is weighted for power points and each ratio corresponds with a number of six sided dice that will determine the unit morale change.

LOSS RATIO TO MORALE DICE CONVERSION	
Ratio losses : kills	Morale dice
0.25 or lower	+ 4d6
0.25-0.33	+ 3d6
0.33-0.5	+ 2d6
0.5-0.66	+ 1d6
1.5-2	- 1d6
2-3	- 2d6
3-4	- 3d6
4 or higher	- 4d6

The morale dice are rolled and their value will be the percentage change to the morale of the unit.

However, this change cannot be more negative than the actual percentage of troops the unit lost.

High morale can protect units from morale loss. If a 1d100 roll is below current morale then the morale change is halved.

Furthermore, if it concerns ranged attack or intercept fire the effect is halved.

Depletion of fuel and ammo stocks

For every combat round an individual makes, and for any attacks on

other individuals, the fuel and ammo stocks of its unit will get depleted and the offensive and defensive supply modifiers will be updated.

Individuals doing intercept fire only consume a quarter of the ammo they would have done in a regular offensive attack, making their consumption rate comparable to defensive combat when under regular attack.

The high consumption rate for attacks is only used for the minimal AP to attack into the hex (but the minimum is 25 AP). The remaining AP spent in battle is charged randomly between defensive and offensive fuel consumption cost.

Notes:

No fuel is consumed if it concerns a ranged attack or intercept fire.

Regular tank attacks that take many combat rounds will lead to high fuel expenditure. This simulates the fact that many tactical manoeuvres, within the hex, were made. Like temporary retreats, flanking attempts, counter-attacks, etc.

Structural point damage

When the end of the battle is reached, structural damage is given to any fortifications in the hex.

Suppression effect

During ranged fire and intercept fire the defending side will lose 10 AP per 5 readiness points lost.

You can thus use ranged fire to deplete the action points (AP) of the defender and take away his chance to intercept fire later. Regular combat costs 10 AP per combat round, for the defender also. A defending unit that is forced to retreat in regular combat loses all AP.

Actual retreats

At this point a unit that has been retreating for 2 combat rounds will actually leave the battlefield. Attackers go back to where they came

from. Only defending units that were stationed in the lost hex will retreat to a different hex. The hex they will choose to retreat to will be the one in the most opposite direction of the angle of attack, that is also reachable for them with 100 AP. So if a unit is attacked from the north it will usually retreat to the south.

If a unit has no avenues of retreat at 100AP or less it will check if it can find such an avenue if it scraps vehicles and/or guns and if so will do so in order to make the retreat possible.

4.8.5. COMBAT ROUND STEPS LOOP

In the combat round steps loop we cycle through all individuals (highest initiative roll first) and then test for each one if it can attack. An individual can attack if it has made less attacks this combat round then its statistics allow. Furthermore, the individual must not be in the process of retreating, nor already have retreated. Individuals with multiple attacks per combat round can be called multiple times during this loop. Every step in this loop is the test and execution of an attack for a different individual. In each step the following will happen:

Find a target

Semi-randomly an opponent from the enemy side is chosen. It is semi-random because the randomness depends on the number of tries the

STUG IIIG

The Sturmgeschütz III assault gun was Germany's most-produced armored fighting vehicle of World War II. It was built on the chassis of the Panzer III tank. Initially intended as a mobile, armoured light gun for infantry support, the StuG was continually modified and was widely employed as a tank destroyer in the 75mm versions.

individual statistics allow. If it has only 1 try in finding its favourite target it is purely random. But if it has more tries it will pick the target it favors.

An individual can always attack an enemy "backbench" individual if the attacking individual has either accomplished a breakthrough or if it has ranged attack capacity. Furthermore, indirect ranged attack capacity individuals cannot fire on enemy individuals that have broken through.

Indirect (artillery) fire can always hit "backbench" individuals, but direct fire is different.

Direct fire is less likely to have the chance these "backbench" individuals will present themselves as a target if they could avoid it. With direct ranged fire, the selection of "backbench" target candidates is allowed for an individual if it rolls a 1d100 above (LOS% * (100 - ((landscape hide + 10) * (3-attacker height level data))).

In regular combat it needs to roll a 1d100 above (100 - ((landscape hide + 10) * (3-attacker height level delta)). These formulas simulate that cover helps protect "backbench" troop types, but that from a higher vantage point the effect of the cover in the hex becomes less important.

During intercept fire combat the target is on the move and "backbench" individuals are fully targetable.

Normally an individual will randomly consider 3 adversaries and pick the one that is most favourable to attack. Any hidden targets (cover points > current recon) will be three times less likely to be chosen. This is for regular attack mode. If it concerns ranged fire a lucky hit roll needs to be made in order for the hidden target to have any chance to be chosen. The lucky hit roll succeeds if 1d400 is less than the current enemy stack points in hex.

Note that normally the defender initially has an advantage as it has initially better recon on the hex the battle occurs in than the attacker.

Find preventer
It is possible the target individual is of a type that another individual from that same side wants to defend. This may lead to the "preventer"

being attacked instead of the original target. Halftracks are usually "preventers".

Individual attack
The actual attack is executed. See the section below for the complex details of resolving an individual attack.

Individual counterattack
The attacked individual will now counterattack its attacker. If the attacked individual is already attacked more often than its "maximum attacked" score then counterattack is not possible. A counterattack is the same as an individual attack except that it is weaker and incurs negative modifiers. See the next section for details.

If the attacked individual is in the process of retreating, counterattack is not possible. Note that regularly retreating individuals have some positive modifiers to increase their survival chance.

No counterattack is possible if the attacked individual cannot see its attacker. No counterattack is possible if the attacker is out of range for the weapons of the individual or if it concerns intercept fire combat.

4.8.6. INDIVIDUAL ATTACK

An actual attack from one individual on another takes place either as a regular attack or as a counterattack. Counter attacks are lighter in effect.

Determine if hit scored
The attack points for the attacker are calculated as are the hitpoints for the defender.

The attack score is based on either the soft attack or the soft defence statistic of the attacker's troop type.

The hitpoints score is based on the hitpoints of the defending troop type (it can change depending on if the attacker is an infantry type or not).

A plethora of modifiers are then applied on both scores. See the next section for all the modifiers that can be applied.

The attack score and the hitpoint score are finally both randomized and will both result in a value between 0 and their calculated value. If the attack score is higher a hit is scored, otherwise it is a "miss" and ineffectual.

Hit scored

If a hit is scored based on the statistics of the attacking troop type it is determined if it is a retreat hit, kill hit or pinned hit.

Experience gain

Experience can be gained if a hit is scored. This is true for the individual in question, but also for the staff in its HQ (far away) commanding it.

The greener the troops the more chance they'll gain experience. Learning is a law of diminishing returns...

Kill hit

The targeted individual is destroyed. A kill hit gives the individual scoring it 25 experience. The target is killed and considered KIA / MIA.

Retreat hit

A Retreat Hit gives the individual scoring it 10 experience. The target that is hit goes into immediate retreat and loses 50% readiness and 10% of its morale. Normally it also loses -100 entrench points, but if it concerns ranged fire, the original pre-combat entrenchment can only be destroyed by 1/3.

Pinned hit

A pinned hit gives the individual scoring it 5 experience. The target that is hit loses 50% readiness, 50% of its entrenchment and 5% of its morale. Normally also -50 entrench points, but if it concerns ranged fire, original pre-combat entrenchment can only be destroyed by 1/3.

Extra morale loss due to low ammo

If an individual receives any kind of hit and is low on supply (not fuel) then its morale is reduced. This effect is more severe if it affects troops that are sent into offensive action without adequate ammo.

EFFECTS OF LOW SUPPLY ON MORALE DURING BATTLE		
Ammo (supply) allotted during the battle	Extra morale loss when hit while defending hex	Extra morale loss when hit while attacking hex
100%	none	none
75%	-5%	-10%
50%	-10%	-20%
25%	-15%	-30%
0%	-20%	-40%

Note: Whenever there is a reference made to ammo it actually concerns supply points, but this is done to clarify that supplies are used as ammo. In other cases, supplies might be used for replacement parts and food as they are a generic concept leaning heavily to modeling ammo, but not exclusively so.

Losing cover points

If an individual is hit in a regular attack or with ranged direct fire, its cover points will drop to 0.

If an individual is hit in a ranged attack / intercept fire with indirect fire and has $1d80 <$ current effective recon on hex then cover points will drop to 0.

If an individual is fired upon but not actually hit, there is still a chance it might move and be spotted and the individual will lose some cover points.

The individual that is firing will also expose itself and lose some cover points.

4.8.7. MODIFIERS APPLIED DURING INDIVIDUAL ATTACK

The following modifiers can apply to the attacking individual's attack score and/or the defending individual's hitpoint score.

Ammunition and fuel modifier [attack score]

The individual can get penalties if its unit is low on ammo or fuel. If a unit is low on supply and/or ammo it will start rationing stock. This reduces combat effectiveness.

Note that ranged fire (ranged attack or intercept fire) does not consume fuel and thus no negative fuel modifier can be suffered in these attack modes.

EFFECTS OF LOW AMMO OR FUEL ON ATTACK SCORE		
Ammo or fuel allotted during the battle	Attack score modifier for the side attacking the hex	Attack score modifier for the side defending the hex
100%	none	none
75%	-25%	-16%
50%	-50%	-33%
25%	-75%	-50%
0%	-100%	-66%

Attack startup modifier [attack score]
Most infantry have limited effectiveness in the first two combat rounds when they are the initiators of the attack. For round one it is a -50% modifier on attack score and for round two a -25% modifier. For tanks and armored cars this is only half what it is for infantry, so tanks take -25% on combat round one and -12.5% on combat round two. This models the need for the attacker to close the distance with the enemy and "cross no-mans land" and while doing this be subject to enemy fire. Tanks are better at quickly closing the distance...

Note that ranged fire and intercept fire do not require closing the distance with the enemy and thus no attack startup modifiers are applied with these attack modes.

Direct fire line of sight modifier [attack score]
The attack score is modified by the LOS% the unit has on the target hex. So if LOS is 50% then the attack score will be halved.

Direct fire weapon range modifier [attack score]
Most direct weapons have reduced efficacy when firing from further away. Attack scores will be reduced accordingly to the range modifier table of the troop type that is firing.

Indirect fire line of sight modifier [attack score]

Attack score is increased with the LOS% the unit has on the target hex.

If a unit is one height level lower, a 50% bonus is given. Two height levels lower, a 100% bonus is given and three height levels lower a 150% bonus is given.

Although games and movies often give the impression that the German panzer forces principally contained Tiger tanks they were, in fact, mainly composed of Panthers, Panzer IVs, and StuGs. The latter model is shown in the illustration. Although the StuG was mostly designed for use in a defensive role it often saw itself, due to the wehrmacht lacking real panzers, thrown into offensive actions and defensive counterattacks.

KUBELWAGEN

The German answer to the Jeep, the Kubelwagen was a light military vehicle designed by Ferdinand Porsche and built by Volkswagen. in more than 50.000 units during WWII. This kind of vehicle helps especially with reconnaissance missions.

Note: Nothing makes artillery fire so deadly as the gun crews having a direct line of sight on their targets. However, keep in mind that if your gun crews see the enemy, the enemy probably sees them as well...

Night turn penalty [attack score]

Attack score is modified downwards based on the experience points of the individual in question. More experienced units are better at night fighting. Note that this penalty only applies to ambush / regular combat and not to ranged or intercept fire combat.

Note: Night turns see huge recon point reductions compared to day turns. This in itself makes night combat sometimes ineffective (due to both sides not spotting each other), sometimes bloody (because one side has good recon and the other has not).

NIGHT FIGHTING PENALTY	
Experience points	**Penalty**
0	-80%
15	-70%
30	-60%
45	-50%
60	-40%
75	-33%
90	-33%

March mode [attack score + hitpoints]

If the unit entered combat in march mode it will suffer the following modifiers in the first four combat rounds:

MARCH MODE COMBAT MODIFIERS		
Combat Round	Attack score	Hitpoints
Combat round 1	-90%	-95%
Combat round 2	-70%	-85%
Combat round 3	-50%	-70%
Combat round 4	-30%	-50%
Combat round 5	-10%	-25%

Note that this only happens if the march mode unit is attacked during the enemy's turn or blunders into opportunity fire or an ambush.

Note: A unit in march mode should be pictured as a unit in a long column, with soldiers neatly marching in formation, rifle over the soldier. Tanks with their hatches open and guns towed behind trucks. No-one is ready for combat in march mode.

Counter attack modifier [attack score]

If this attack is a counterattack then a -50% penalty is applied on the attack score.

Max attacked modifier [attack score]

The attack score gets modified if its target individual has already been attacked more than the maximum number of times it can effectively be attacked, during this combat round. Most troop types have a maximum attacked value of 3. Attacking it with double the amount of max attacked stat (6) results in a modifier of -50% on the attack score. Triple the amount (9) in a modifier of -33%, etc…

This rule models the effect that at some point outnumbering the enemy gives diminishing returns.

The max attacked modifier is not applied for indirect ranged fire or indirect intercept fire.

Landscape modifier [attack score]

The landscape of a hex can modify the attack score. Keep in mind that the defenders of the hex get different modifiers than the offensive side.

LANDSCAPE MODIFIERS ON		
Landscape type	Attack score modifier for the side attacking the hex	Attack score modifier for the side defending the hex
Marsh	Tank -50%	Tank -50%
Marsh snow	Tank -25%	Tank -25%
Plains	-	-
Fields	-	-
Light Forest	Guns -40%, tank -30%	Guns -20%, tank -20%
Heavy Forest	Gun -60%, tank -50%	Guns -40%, tank -32%
Rural Village	Guns -40%, tank -20%	Guns -20%, tank -12%
Light Urban	Guns -60%, tank -60%	Guns -30%, tank -40%
Heavy Urban	Guns -80%, tank -70%	Guns -40%, tank -46%

Also be aware that in regular combat both sides use landscape of the hex being attacked, but in ranged combat or intercept fire each side uses the landscape of the hex they are present in.

Readiness modifier [attack score + hitpoints]

The effect of the readiness modifier on the attack score of the offensive side is enormous and the readiness percentage is used as a full modifier. Readiness of 25 means a penalty of -75%, readiness of 50 means a penalty of -50%. For the defending side only 2/3 of its attack score is modified by readiness. For a readiness score of 25 this means a penalty of -50% for defenders.

For both sides the hitpoints score is for 50% modified for readiness. So with a readiness of 75 that means a modifier of -12.5% on hitpoints for the attacker and 2/3s of that for the defender..

Special rule if under artillery fire

If an individual is targeted by artillery, the hitpoints score counts only for 16% of the readiness score. So with readiness 75 that means a modifier of -4% on hitpoints.

Supply consumption modifier [attack score + hitpoints]

The attack score and the hitpoints are modified by 75% for the supply consumption percentage. This models the fact that units that have no or little supply stocks left, after multiple rounds of supply problems, become very easy to destroy as they'll have no ammunition left and will have developed morale issues as well.

> **Note:** It might seem that the supply consumption modifier is a doubling of the ammunition modifier and that is in many ways the case. This rule emphasizes that combat effectiveness stops dropping linearly and takes a nose dive when rationing is no longer an option and the last bullets have been fired. Also, the supply consumption score of a unit takes time to recover (up to a full day in the worst case) and the supply consumption modifier ensures you will allow the unit to recover before committing it to combat again.

Experience modifier [attack score + hitpoints]

The attack score and hitpoints are modified for experience. Each experience point is a 1% positive modifier.

Concentric modifier [attack score]

The more sides you attack from, the more positive the modifier the offensive side will get on its attack score. The modifier varies from +10% for attacking from 2 neighbouring hex sides, to +200% to attacking from all six hex sides.

Surprise combat / ambush modifier [attack score]

If the offensive side walks into an ambush, the attack score of the defensive side is doubled. This is something you can expect to see happen often if

you're advancing into enemy terrain during night turns. Blundering into an ambush during darkness might very well be a very bloody affair.

Orderly retreating target modifier [attack score]

If the target individual is part of the offensive side and is in an orderly retreat, the attack score will be divided by 4. If the target is part of the defensive side and is in an orderly retreat, the attack score will only be divided by 2.

Panicking target modifier [attack score]

If the target individual is from the defensive side and it is retreating in panic, the attack score will be doubled. If the target is from the offensive side there will be no modifier, but it will be missing its divide-by-4 modifier for an orderly retreat. Panicking units and their retreating individuals will thus be subject to 2 turns of continuous enemy fire, without entrenchment protection.

Entrenchment modifier [hitpoints]

The target gets a 1% point bonus on its hitpoints for each entrenchment point. Only the side defending is receiving this modifier. If it concerns intercept fire combat, the unit that got intercepted does not benefit from any entrenchment, even if defending.

- In regular combat the attacker has no entrenchment.
- With intercept fire the defender has no entrenchment.
- With ranged fire both sides have entrenchment.

River modifier [hitpoints]

Attacks across rivers decrease the attacker's hitpoints.

RIVER MODIFIERS ON ATTACKING SIDE'S INDIVIDUAL'S HITPOINTS		
River type	Tanks / motorized	Infantry / guns
Minor river	-50%	-30%
Medium river	-60%	-45%
Major river	-70%	-60%
XL river	-80%	-75%

The river modifier is no longer applied once an individual has achieved a "breakthrough" state.

Overstacking modifier [hitpoints]

Overstacking happens when one of the two sides has more stack points in battle than the maximum stack points. If you overstack then your troops will be more vulnerable (due to being too close to each other) and thus will fight less well. You can overstack in defence as well as in offence.

Overstacking makes attack and defence stronger when considering the totals, but at the individual level hitpoints will be lower.

MAXIMUM STACK POINTS FOR THE ATTACKER	
Attacking from how many hex sides	Stack points
1 hex side	100
2 hex sides	200
3 hex sides	300
4 hex sides	400
5 hex sides	500
6 hex sides	600

The maximum stack points for the defender is always 200.

Note that any battle stack caused from previous attacks on the hex will be added to the stack points of the attacker.

High ground [hitpoints]

Your troops have an advantage if they are looking down on the enemy and if they can fire downhill.

M3 HALFTRACK

The M3 Half-track is the famous armored personnel carrier used by the Allies during World War II . Was mass- produced as a platform for many weapons, with 15.000 standard M3 and more than 38.000 variants manufactured.

HITPOINTS MODIFIER FOR HEIGHT DIFFERENCE	
Height difference	**HP modifier for defending units**
Target 3 level lower	-75%
Target 2 level lower	-50%
Target 1 level lower	-25%
Target 1 level higher	+25%
Target 2 level higher	+100%
Target 3 level higher	+150%

This hitpoint modifier only applies in Ranged Direct Fire and Non-Ranged Fire. It does not affect Indirect Fire.

Hidden defender modifier [hitpoints]

If you have low recon on the hex you are attacking, the hitpoints of some of the individuals defending the hex can be increased by up to 200%. Keep in mind that during the battle you'll quickly gain more recon points and this hitpoint modifier might evaporate quickly. The combination of good entrenchment and low recon points for the attacker can really help the defender.

Close combat modifier [hitpoints]

The hitpoints score of an indirect ranged fire troop type (like artillery) will be modified with -66% if it is attacked by an individual that has broken through the lines. If the attack takes place without the attacking individual having the "broken through" state, the modifier on the hitpoints score is only -33%. This rule emphasizes that some troop types are really not meant for close combat.

Battlegroup / Kampfgruppen modifier

If a battlegroup or kampfgruppe unit has less than 50 power points left in it, it will suffer a penalty on its hitpoints. When down to 25 power points this penalty will be -50%. When down to 12 power points this penalty will be -75%.

Also, battlegroup individuals' attack scores will suffer a -15% penalty, to reflect their lower level of organization (and higher level of improvisation,

which is cool, but not necessarily more effective than careful planning). Battlegroups that panic during retreat will always break.

Staff modifier[attack score]

The combat modifier of the HQ of the unit will be applied. Note that this modifier will be reduced if HQ power of the unit is lower than 100%. Also HQ units themselves will never benefit from the staff modifier.

4.9. BRIDGES

Bridges are crucial as they allow normal road movement costs over rivers. If a bridge is destroyed, the river crossing cost will be applied and these extra AP costs can be enormous, especially for guns and vehicles.

Big and XL rivers are the best lines of defense and your best bet to stop an offensive in its tracks.

4.9.1. BLOWING BRIDGES UP

Any unit can attempt to blow up a bridge in its hex. However engineers are especially good at it (3x better than regular troops). Attempting to blow up a bridge costs 50 action points. The chance for success depends on the size of the river (and thus the bridge).

STRUCTURAL POINTS OF BRIDGES	
River type	Bridge structural points
Minor river	1000
Medium river	2000
Large river	3000
XL river	4000

These "blow" points are about 3 points per soldier or about 10 points per engineer. In the case of engineers the blow points are positively modified with saved up engineer points (EP).

When a "blow" attempt is made a random number between 0 and the blow points of the unit is picked. Also a random number between 0 and the bridge structural points is picked. If the blow roll is higher than the bridge structural point roll the "blow" attempt is successful.

Note: When conducting retrograde operations a bridge is a pickle. Do you blow the bridge up early leaving some of your units on the wrong side of the river… without supply or a way to get heavy equipment over the river… or do you blow it up late? Risking a failed roll and allowing the enemy the chance to capture the bridge intact…

4.9.2. REPAIRING BRIDGES

To repair a bridge the unit needs to have enough engineer points (EP).

River type	EP required to repair
Minor river	100
Medium river	200
Large river	300
XL river	400

Engineer units gain 0.5 engineer point (EP) per turn per engineer, but they lose their EP when they move.

Note: Some Ardennes scenarios also have cards available to repair bridges. These cards model not the combat engineers (present in units on map) but the more mundane rear-area construction crews.

4.10. REPLACEMENT TROOPS

It is possible for replacement troops to arrive from off-map. Either by events or by cards played by you. When this happens the replacement troops will be added to the troops of your highest HQ(s).

Then the next turn during the logistics calculations they'll be sent to units requesting replacement troops.

Using the replacements standing order, you can give priority to a unit to receive its replacements requests above all others.

Note that a maximum of 10% (or minimum 1 individual) of the table of organisation and equipment (TOE) can be delivered to a unit per turn.

In theory, it is also possible troops are returned to high HQ if they no longer match with the TOE of the unit they are present in. The same % is applied there.

4.11. HEX OWNERSHIP AND FUZZINESS

It is important to understand there is a difference between assumed hex ownership and real hex ownership. The only hexes you can be 100% sure of are assured ownership hexes.

Assured hex ownership is only possible for hexes that have either:

- victory points (VP) on them
- friendly units on them
- minor city at level II or higher

For the other non-assured hexes you will presume who is owning them based on the recon you have on enemy units. This assumed

M4 SHERMAN

The Sherman was the most widely used medium tank by the United States. It was reliable, relatively cheap to produce, and available in great numbers. However, it could not stand up in a head-to-head fight with the german panzers with its short barreled gun. Its upgraded version with a longer barreled 76mm gun performed much better.

ownership can be different from the real ownership. This can lead to nasty surprises during movement, retreats and supply logistics.

During a unit's retreat, it will seek a retreat hex. This hex must be unoccupied by enemy units and the retreating unit must have 25% more ZOC points on that hex than the enemy.

During logistics the real ownership of a hex is determined from expanding the maximum distance from the assured ownership hexes first over road hexes and after that over non-road hexes.

It is this supply logistics calculation result, but done for assumed ownership, that is shown as the regime coloring layer on the map during your turn.

Note: In order to assure you supply deliveries arrive, make sure to keep units on your roads and especially on your crossroads. Units on roads to also patrol those same roads to keep your supply system safe.

4.12. UNCERTAINTY RULES

The designer, Vic, loves them, but some people hate them as they make combat more of a single roll (or just a few rolls) of the dice. So they are fully optional to use or not.

There has always been a luck factor in *Decisive Campaigns*, but it has always been applied at the individual (10 soldiers, 1 tank, 1 gun in DC4) level during combat. Considering there are many individuals in a typical combat, its random effect was trivial due to the rolls evening out given the quantity of individuals involved.

Hence the uncertainty rules have been added to provide a random effect on a unit-wide basis.

It simulates the fact that some units are better run than others, some have excellent cadres, others have pencil-pushers. Some might have excellent cadres but be under a dark spell, or the inverse.

The point is that I think there should be meaningful random factors that you cannot predict. That is what the uncertainty rules bring.

Every time you launch a game each unit will have a different uncertainty d6 (six sided dice) allocated to it. At game start it will be shown as "?" question mark. You'll discover its real value only after using a unit multiple times. This is due to a nifty system that simulates loaded dice. Some units will have more heavily loaded dice than others, some will be loaded to give high rolls, some will be loaded to give low rolls.

But do not despair… in combat the uncertainty rules make every unit roll two six-sided dice (only once at start of combat and valid for the duration of the combat.) One die is a normal die (1d6) and the other die is the earlier discussed loaded die (1d6).

If an individual fights against another individual the difference of their unit's dice rolls will give either the defender a positive hitpoint modifier or the attacker a positive attack value modifier. The difference between the attackers 2d6 roll and the defenders 2d6 roll gives a 10% positive modifier for each point of difference. The minimum roll being 2 and the maximum roll being 12; thus, this can cause a maximum modifier of +100%.

But because it's taken into account for hitpoints as well as attack points the effective impact can in the most extreme case quadruple the

performance of a troop. While rare, it is possible for remarkable feats or catastrophes to occur, and this is why playing with uncertainty rules makes it much more difficult to predict the battles' outcomes.

4.13. AI ADVANTAGES

This chapter has become a bit of a standard addition to VR Designs' manuals. As always, I prefer to openly disclose any advantages the AI gets.

The initial idea was that at "normal difficulty" setting the AI would have no advantages. However in the end I was forced to give a few advantages to make sure the AI would not collapse due to long term planning mistakes.

The AI has the following standard advantages:

- The AI has more fuel arriving at its supply sources than human players. This avoids the AI completely screwing up and grinding itself to a stand still and becoming a sitting duck at the same time. It has proved too hard to properly code the dilemma between moving to a better position versus conserving fuel. This is an obvious design compromise.
- The AI traffic points are wiped at start of turn instead of divided by two. This makes it a bit easier for the AI to receive supplies over a bad and overused road connection. This is just a little

M10 WOLVERINE

The M10 Wolverine was numerically the most important US tank destroyer of World War II. It combined thin but sloped armor and a reasonably potent anti-tank weapon mounted in an open-topped turret. Despite the introduction of more powerful and better types as replacements, the M10 remained in service until the end of the war.

M18 HELLCAT

In contrast to the M10 and M36 tank destroyers, which used the heavy chassis of the M4 Sherman, the M18 Hellcat was designed from the start to be a fast tank destroyer. As a result, it was smaller, lighter and significantly faster, but carried the same gun as the Sherman 76 mm models.

helper to offset the AI's tendency to treat all the different road types more or less similarly.

- The AI units' vigor points, if they get recovered, recover at double the speed of human players. This still requires the AI to stop and rest its units now and then, it will just be done faster than for a human player. This offsets the AI tendency to over-move its units.

The AI has the following extra advantages in most scenarios (but they can be disabled in the editor):

- The AI has only half the readiness loss a human suffers when moving a unit.
- The AI gets the full concentric bonus even if attacking with units from mixed HQs.

If you want the AI to have more advantages, to add more challenge to your game, you'll have to increase the "normal difficulty" in the scenario setup window to something higher. Be prepared to be wiped off the map if you put the difficulty setting really high!

It is also to be noted that AI Speed "fast" is noticeably less clever than AI speed "normal". Whereas the AI speed "slow" adds less improvement per time unit spent.

5. CREDITS

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